Measuring Competitive Intelligence Outcomes and Impact

Rhiannon Gainor

School of Information Studies, Faculty of Education

McGill University, Montreal

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Abstract

This qualitative research attempts to answer calls for research into competitive intelligence (CI) measurement. Its objectives are: first, to clarify discourse related to CI value and measurement, as first step to addressing methodological challenges; second, to understand from senior managers and executives who use CI how CI is valued, and the challenges facing CI measurement and the implementation of measures in their organizations; and third, to establish a critical framework which can be used as a starting point to evolve from prescriptive CI measures best practices in CI measurement.

Individual semi-structured interviews and negotiated shared texts were used to investigate two groups: experts in intelligence measurement from a variety of intelligence fields; and users of CI who are employed in senior management roles within their organizations. Participants were asked to discuss their measurement practices, and their conceptualizations of measurement and value.

The findings of this research are that CI is used at multiple stages of the decision as an input into organizational decision-making by senior managers and executives of organizations, who believe that CI is most suited to strategic planning activities. When CI is used, perceived outcomes and benefits are individual and cognitive, and organizational. Anticipated beneficial organizational outcomes are both 'active', such as improved customer relationships, and 'latent', such as organizational preparedness. A revised conceptual model presented in the discussion encapsulates these outcomes and benefits, and the role of CI within the organization.

From the responses of the research participants an evaluation framework was developed as a tool to foster the critical evaluation of prescriptive measurement models and support comparative discussion. The framework, presented here, is applied to four prescriptive models in

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the literature. A determination is made that a flexible multi-method approach that supports a multi-faceted perspective of CI use and CI effectiveness is required.

This research confirms the findings of other researchers that CI measurement is infrequently used, and that when it is in use process and user satisfaction measures substitute for outcome and impact measurement. It also confirms that there is a relationship between CI and organizational strategy, and that the value of CI is realized through decision-making. Discussions of anticipated outcomes, which would inform the selection of measures of effectiveness (MOEs) were however in conflict with the findings of other studies, indicating that more research needs to be done.

Unexpected findings include: the discovery of CI practices not discussed elsewhere in the literature; the pre-eminence of responsiveness in determining user satisfaction; the tension for organizations between the cost-effectiveness of measurement activities and the acceptance of inaccurate measurement; and the extraordinarily close parallels in value conceptualizations between CI and other information services, which indicates a possibility for shared measurement tools.

Contributions and significance of this research include a rare account of CI users, a unique comparative discussion of intelligence measurement experts, a conceptual model that accounts for the role of CI in organizational decision-making and its varied benefits, and an evaluation framework for prescriptive CI measurement which potentially provides a starting point for the comparative discussion necessary to develop best practice.

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Résumé

La présente étude qualitative tente de répondre à l'appel pour plus d'études sur la mesure de la veille concurrentielle. Les objectifs sont 1) de clarifier le discours relatif à la valeur et à la mesure de la veille, comme première étape pour répondre aux défis méthodologiques; 2) de comprendre du point de vue des hauts dirigeants et administrateurs qui utilisent la veille, quelle est la valeur qu'ils y accordent et quels sont les défis de mesurer et de mettre en œuvre un processus d'évaluation de la veille concurrentielle dans leur organisation; et 3) d'établir un cadre critique servant de point de départ pour permettre d'aller au-delà des mesures prescriptives de la veille et identifie un système d'évaluation des bonnes pratiques de veille concurrentielle.

Deux groupes de personnes ont été approchés au moyen d'entrevues semi-structurées et d'une méthodologie de « textes partagés et négociés »: des experts en mesure de la veille provenant d'une variété de domaines; et des utilisateurs de la veille occupant un poste de haut dirigeant dans une organisation. Les participants ont discuté de leurs pratiques d'évaluation ainsi que de leur conceptualisation de l'évaluation et de la valeur de la veille.

L'étude démontre que la veille est utilisée dans la prise de décision organisationnelle à plusiers étapes par les hauts dirigeants et les administrateurs qui croient que la veille est plus appropriée aux activités de planification stratégique. Lorsque la veille est utilisée, les résultats et les avantages perçus sont de l'ordre individuel, cognitif et organisationnel. Les résultats organisationnels bénéfiques anticipés sont à la fois « actifs », par exemple une amélioration des relations clients, et « latents », par exemple la préparation des dirigeants à prendre du décision. Un modèle conceptuel révisé présenté dans la discussion tient compte de ces résultats et bénéfices, ainsi que du rôle de la veille au sein de l'organisation.

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D'après les réponses des participants, un cadre d'évaluation a été développé comme outil pour favoriser la comparaison des modèles de mesures prescriptives et pour appuyer une discussion comparative. Le cadre, présenté ici, est appliqué à quatre modèles prescriptifs existants dans la littérature. Il a été déterminé qu'une approche multiméthode flexible appuyant une perspective multifacette de l'utilisation et de l'efficacité de la veille était nécessaire.

Létude confirme les résultats obtenus par d'autres chercheurs à savoir que la mesure de la veille n'est pas fréquemment utilisée et que lorsqu'elle est utilisée, l'évaluation des processus et de la satisfaction des utilisateurs est substituée à l'évaluation des résultats et de l'impact. Elle confirme également qu'il existe une relation entre la veille et la stratégie organisationnelle et que la valeur de la veille existe dans la prise de décision. Les discussions des résultats anticipés, qui informeraient la sélection des mesures d'efficacité, étaient cependant en conflit avec les résultats publiés, confirmant que d'autres études sont nécessaires à ce chapitre.

Les résultats non anticipés comprennent la découverte de pratiques de veille discutées nulle part ailleurs dans la littérature scientifique; la prééminence de la réactivité pour déterminer la satisfaction des utilisateurs; la tension pour les organisations entre la rentabilité des activités de mesure et l'acceptabilité de mesures non exactes; et le parallèle extraordinairement rapproché entre la conceptualisation de la valeur relativement à la veille et celle des autres services d'information, ce qui laisse présager la possibilité d'outils de mesure communs.

Les contributions de l'étude et sa signification incluent le rare point de vue des utilisateurs de la veille concurrentielle, une discussion comparative unique d'experts sur la mesure de la veille, un modèle conceptuel qui tient compte du rôle de la veille dans la prise de décisions et ses divers avantages, ainsi qu'un cadre d'évaluation pour les mesures prescriptives de veille qui offrent potentiellement un point de départ pour une discussion comparative nécessaire au développement de bonnes pratiques.

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Dedication

To my family, who still aren't sure exactly what I've been researching.

You *could* read this and then you would know what I have been doing, but I recognize this is probably the only page most of you will read of my thesis. So here's what I want to say: If I were all alone in the world, maybe I could have started a PhD. But I could never have finished one. Thank you for all the love and support. This is our accomplishment, not mine.

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Preface

The research presented here uses an original research design. Interviews with intelligence experts and users of competitive intelligence (CI) have generated empirical evidence as to: the relationship between CI, organizational decision-making, and organizational strategy; the outcomes and benefits to the organization when CI is used; and the most appropriate methods for determining CI outcomes and impact.

This empirical evidence has in turn resulted in two significant conceptual contributions to the literature of competitive intelligence and measurement: a conceptual model that encapsulates the role of competitive intelligence in organizational decision-making, and its anticipated outcomes and impact to the organization; and an evaluation framework for competitive intelligence measurement that supports a prospective migration in this field from prescriptive measurement and descriptions of unique practices, to the evolution of best practices.

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Table of Contents

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Chapter 1: Introduction

Through measurement, managers of information services quantify their performance and value, and communicate with stakeholders. Identifying and quantifying value, however, has historically been an accounting-based activity that has relied on financial figures that do not capture significant intangibles for organizations, such as innovation (Lev, 2001).

In the field of library and information studies (LIS), scholars are investigating the value of information services to users, asking how managers and researchers can go beyond process measures such as usage statistics as arbiters of success, to outcome and impact measures, conceptualizing success in terms of outcomes and impact that frame information activities against organizational purposes and mandates. These questions acknowledge that, for example, the purpose of a library is more than the simple distribution of books, and the related process measure of circulation statistics may not be a valid measure as to whether the library has successfully fulfilled its purpose.

In her article arguing for new measurement methods in determining the value of academic libraries, Tenopir (2012) has stated that the library process measures historically in use are in reality 'implicit measures', whose use are motivated by the belief that users, in using the library, are demonstrating their understanding and endorsement of library value. She argues that such measures do not demonstrate outcome or impact, giving the example of a book that was checked out, but never read.

Town (2011) has described LIS process measures for libraries as being rooted in business values of profit and savings, rather than values specific to LIS. Town (2011) also describes the challenges for libraries and information services in moving away from process measures, to

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outcome and impact measures which speak to institutional purpose, which is typically not profit-motivated in traditional library services.

Some public libraries are attempting to bridge the business and library value perspectives with a multi-method multi-perspective approach to measurement. Such measurement contextualizes public library activities within government goals and programs, and connects, for example, historic preservation activities and activities to preserve indigenous knowledge to larger plans to improve local tourism (Ahmed, 2010; J. L. Management Services, 2009).

In the LIS literature are found examples of LIS professionals and researchers attempting to develop outcome and impact measures which might better demonstrate the value of information services against organizational purpose and mandates, and not just functionality or cost-effectiveness. 'Impact' has been defined by Poll for library-type services as "the tangible or intangible difference or change in an individual or group resulting from the contact with library services", while outcomes are "direct, pre-defined effects of the output related to goals and objectives of the library's planning" such as customer satisfaction levels (2012, p. 123).

Information services may provide financial benefits to clients and parent organizations, but often the results of the services are cognitive, personal, and cannot be accurately represented by dollars. This has led managers, such as librarians, to ask if the value of information services could be more accurately demonstrated to stakeholders (Poll & Payne, 2006) and if the representation of value requires a shift in discourse around the topic of measurement to evolve new, non-financial, qualitative measures (Town, 2011).

Poll (2012) notes the extreme difficulty in identifying and quantifying impact. One challenge in determining the intangible and often cognitive effects of information services is that other influences must be accounted for. The knowledge management (KM) literature provides a more substantial body of research than LIS into the effects of contextual factors in business and

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government environments, such as decision-maker competence or organizational processes upon information activities. Peled (2011) provides a particularly gripping example with his case study research into the failures of the US Open Data Program, failures due to participants seeking power through information control.

The conceptual and methodological concerns for measurement described briefly here mandate qualitative research methods. This research takes an instance of an information service – a competitive intelligence unit – and presents a research study to investigate how the value of the service can be identified, quantified, and represented to stakeholders when its primary purpose, to inform and improve decision-making, is intangible.

1.1 Background

A knowledge-based view of the firm (Grant, 1996) suggests that the information capabilities of organizations determine performance. 'Performance' is a complex concept which for this study denotes the quantity and quality of desired beneficial results accruing due to purposeful organizational activities against yardstick standards (internal or external) of productivity and profitability. Competitive intelligence (CI) is a type of information service used by organizations: the process and the products of an organization's data collection and analysis about the competitive environment (Fleisher & Blenkhorn, 2001), with close historic and practical ties to covert intelligence, military intelligence, business intelligence, and market intelligence (Buchda, 2007; Juhari & Stephens, 2006). Managers of organizations have indicated when surveyed that the primary benefit they expect to receive from CI is improved decision-making (Marin & Poulter, 2004), resulting in savings of time and money from improvements to internal business processes (Herring, 2006), improvements in customer service (Qingjiu & Prescott, 2000), and improved ability to anticipate threats and opportunities in the marketplace

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(Hannula & Pirttimaki, 2003), among others. Most expected outcomes can be loosely grouped under financial outputs, improved client relationships, and innovation in products and services.

1.2 Problem Statement

No evidence has yet been found to establish the relationship, if any, between CI and potential benefits, although some correlations have been found between CI use and positive organizational performance (e.g., Adidam, Banerjee, & Shukla, 2012). This situation has complicated the development of performance-based measures for CI.

Scholars and practitioners of competitive intelligence indicate in the literature that significant challenges exist in identifying how to measure the outcomes and impact of intelligence. These challenges are frequently attributed to conceptual and methodological problems of measurement also cited in intellectual capital (IC), knowledge management (KM), and library and information studies (LIS) measurement literatures. These methodological issues are related to intangible results, secondary effects, and the occasional time lag for results to appear (see for example Kujansivu & Lönnqvist, 2009). Methodological challenges are further complicated for CI in that if the purpose of CI is to improve decision-making, any research into CI value as it affects decision-making must necessarily rely on highly subjective data and attempt to quantify cognitive effects.

There is evidence of conceptual inconsistency in describing measurement and value across authors and publications, as found, for example, by Wright and Calof (2006) in their small study examining published competitive intelligence research in three countries. Publications about intelligence measurement give incomplete descriptions of how the measurement tools and methods were developed. For example, they may offer elliptical references as to why the tools

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and methods presented differ from those of other authors or practitioners. Comparative discussion regarding conceptual models of intelligence measurement is elusive.

Scholars have applied prescriptive models of measurement to measure the value and performance of CI, but these have not been evaluated (e.g., Cohen, 2009; McGonagle & Vella, 2002; Davison, 2000), 'prescriptive' meaning conceptualized and proposed but not subjected to testing or by application by others. CI measurement in practice has defaulted to activity measures of process and usage (Ganesh, Miree, & Prescott, 2004), while CI practitioners call for improvements to measurement (Marin & Poulter, 2004). In the literature there are significant assumptions being made about intelligence benefits that are unsubstantiated by research (Lönnqvist & Pirttimäki, 2006), partly because there is a lack of research-based evidence. In response, scholars interested in determining the value of CI have made calls for empirical data (Hughes, 2005), case studies (Wright & Calof, 2006), and additional fieldwork, so that measures of competitive intelligence outcomes might be developed (Marin & Poulter, 2004) and that the benefit and value of CI to organizations might be determined.

1.3 Objectives and Research Questions

The purpose of this research, in light of these calls for research, is twofold. First, to determine what relationship, if any, exists between CI and decision outcomes; and second, data collected will be used to evaluate prescriptive models of CI measurement in the literature. In order to investigate CI value and how to represent that value, to that end three interrelated research questions were formulated:

1. How, when, and by whom is CI used as an input into organizational decision-making?
2. When CI is used, what are the perceived organizational outcomes or benefits?
3. In light of organizational constraints, which measurement methods identified in the literature are most appropriate for use in determining CI outcome and impact?

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In order to address these research questions, a research study in two parts has been developed.

The first study, which has been termed the 'experts study', is a qualitative, exploratory study that served as a kind of pilot for the next stages of the research. Its purpose is to clarify ambiguous concepts in intelligence services literature specifically related to measurement of intelligence outcomes and impact. In that study, face-to-face interviews were held with five subject experts from various intelligence fields and countries regarding their conceptualizations of intelligence measurement, followed by the development of shared negotiated texts to try and achieve clarity in describing participants' conceptual frameworks and measurement practices. Participant responses were compared and contrasted in defining key terms, descriptions of current practice in outcome measurement, and requirements for future best practice. This study provided an opportunity for the researcher to test her own conceptual framework, and to develop some criteria and context for assessing prescriptive models of CI measurement in determining outcomes and impacts.

The second study, which has been termed the 'users study', is also a qualitative and exploratory study using interviews and negotiated shared texts. Its purpose is to investigate from the perspective of the user of CI (what is sometimes termed in CI literature as the 'CI client') how CI is used and valued, particularly within organizational decision-making. Interviews were held with twelve CI users, some face to face, others over the phone. These participants, all in senior management and executive roles in their organizations, were identified through a variety of personal and professional networks of the researcher, and selected for participation as single representatives of their organization. Participant responses, describing their organizational practices and personal opinions about the value of CI, were compared in examining CI usage, CI

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valuation, and CI measurement, including developing a second list of criteria for assessing prescriptive models of CI measurement.

An evaluation framework for prescriptive measurement models is developed from the findings of both studies. Four prescriptive models of CI impact and outcome measurement were selected for examination with this evaluation framework: Cohen's 2009 book on how to measure impact, conceptualizing performance from a user perspective, resulting in a dashboard for controlling corporate intelligence and performance; Davison's article from 2000 proposing the use of advertising effectiveness measures to capture the return on investment for competitive intelligence departments; Herring's 1996 white paper proposal for a management-oriented evaluation system that evaluates in CI in light of the strategic goals of the organization; and finally, McGonagle and Vella's tactical/strategic, active/defensive conceptualization of CI valuation in their 2002 book on competitive intelligence.

Each of these prescriptive models is evaluated and assessed against evaluation framework developed from the findings of the two studies.

1.4 Significance

The value of these two studies is that they cumulatively build a conceptual model of CI measurement that takes into account its dynamic value within the organization, particularly its role in advising/influencing a decision, which field research assessing CI value has not yet done (see Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004), thus filling a gap in the literature, and informing future research methodology into CI value and practices. Another outcome will be the testing of prescriptive measurement methods and tools in the CI literature, which will help inform not only CI measurement research, but also practice. Most particularly, valuable data and insight will be gained into how outcomes of intelligence can

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be identified and assessed objectively. CI practitioners have reported that measurement is a priority area of development for the field (Hannula & Pirttimaki, 2003; Qingjiu & Prescott, 2000). This data will be applied to developing measurement tools and methods for practical use.

CI scholars have argued that the primary purpose of intelligence is to inform decision-making, with the intent to increase the likelihood of the most optimal outcomes (Bose, 2008). CI units can be described as a specialized type of information service, with CI deliverables being a specialized type of information product, used with the intent to develop more effective decision-making. Understanding the impact of these intelligence services and products upon decision-making, and through decision-making upon organizational outcomes, has implications for performance measurement to demonstrate the value of information services in LIS and other fields, improvement to organizational decision-making processes, and the role of competitive intelligence services.

1.5 Terms

Provided here is a list of the key terms used in the research, along with their definitions:

Benefits: These include beneficial results of the use of CI, such as cognitive support, organizational preparedness, positive outputs, etc.

Business Intelligence: also known as BI. In the literature BI may be defined as intelligence about one's own organization, while CI is intelligence about other organizations; BI and CI are also used as interchangeable terms by some practitioners and researchers (Bouthillier & Shearer, 2003). For the purposes of this research, BI is operationally considered to be synonymous with CI, given the close relationship and near-identical practices (Buchda 2007; Lönnqvist and Pirttimäki, 2006)

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CI: Competitive intelligence. CI is defined within the field as both a product (the CI deliverables, such as reports) and a process (see the CI cycle, figure 1, section 2.2.1). For this study, CI encompasses business intelligence (BI), market intelligence, and those activities undertaken by an organization to monitor the competitive environment for the purpose of economic advantage. CI is operationally defined as the products which serve as inputs into decision-making

CI unit: A department or sub-organization with dedicated resources and staff specifically tasked with generating competitive intelligence deliverables for internal CI clients and decision makers

Client relationships: Interactions with internal clients, such as decision makers receiving deliverables, and external clients who pay for services and/or products. An indicator of CI value

Constructs: "…constructs are theoretical creations of phenomena that cannot be directly or indirectly observed. [For example,] Overall organizational performance is a construct that cannot be directly observed and must be measured using theoretically derived indicators." Carton & Hofer, 2006, p. 105)

Decision: A completed three-stage decision-making activity, consisting of problem definition, problem conceptualization, and selection of choice (Rolland, 2004)

Decision-making: A three-stage process by which an organizational decision-making unit identifies a problem situation, weighs situational factors and intelligence inputs, and then makes a selection of best choice (Rolland, 2004)

Deliverables: CI products such as industry reports and competitor profiles which are the end result of the CI cycle (see Fig. 1)

Effectiveness: The degree to which results obtained compare to the original objectives (Cohen, 2009)

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Finances: Financial gains and losses in the organization as indicated in an annual report, such as revenue, sales, and stock value. An indicator of CI value

Impact: How well or poorly the outcomes have met an organization's strategic objectives and goals as expressed in a formal strategic plan (Cohen, 2009; Poll & Payne, 2006)

Indicators: Either attributes or closely related effects of a phenomenon that provide scope and insight for measurement. In this study innovation, finances, and customer relationships are used as indicators of CI value

Innovation: Development of new products, services, and solutions to problems related to products and services. An indicator of CI value

Intangible: the result or effect of a decision which is imperceptible to the five physical senses, often related to a) cognition and subjective experience; or b) outcomes which are so diffuse that they prohibit quantification. For example, the decision-maker reports feeling more confident about choice selection; or, the executives report that the organization overall is better prepared to avoid problem areas.

Internal Clients: Defined for this study as employees within the organization who receive CI deliverables

Measure: A method or tool by which data regarding a phenomenon of interest is obtained and then represented on an accepted scale of quantity/value

Measurement: The activity of identifying and then quantifying phenomena on an accepted scale of quantity/value

Metrics: A suite of measures which in combination provide a more robust, multi-faceted view of the phenomenon to be measured (Kankanhalli & Tan, 2004)

Outcomes: "Outcomes are the results of a system's operations. Desirable outcomes are really the broad goals or objectives for which the system was created...Outcomes are generally

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not tangible" (Boyce, Meadow, & Kraft 1994, p. 242). Outcomes build on outputs and may take time to manifest

Outputs: Outputs are typically immediately visible and often quantifiable by numbers, indicating an easily identified volume of activity

Performance: The quantity and quality of desired beneficial results accruing due to purposeful organizational activities against yardstick standards (internal or external) of productivity and profitability

Strategic Decision: Complex and atypical decisions, made at a high conceptual level to accomplish a specifically strategic purpose for the organization, or long-term objective, in which formal and rational decision-making processes are likely to be invoked (Harrison & Pelletier, 1993)

Tangible: a result of a decision which is perceptible to the five physical senses and therefore is amenable to counting activities. For example, increased production rates; alternatively, time saved on the production of a single unit by an altered production process.

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Chapter 2: Literature Review and Conceptual Framework

2.1 Introduction to Literature Review

The purpose of this literature review is to identify the gaps, challenges, and needs identified by scholars and practitioners related to competitive intelligence (CI) measurement, and directions indicated for research. The literature review consists of three main sections. The first describes CI and its measurement literature. Since most organizations believe the value of CI hinges upon its use to support decision-making (Hannula & Pirttimäki 2003; Marin & Poulter 2004), the second section reviews models of decision-making and the relationship of information to the decision-making process. The third section reviews intangibles measurement practice and conceptualization, and relates them to the needs and challenges identified in the CI literature.

The articles reviewed here were found first during searches of the databases LISA, LISTA, and Library and Information Studies Full Text from September 2010 to October 2011, using terms such as metrics, performance, and measurement in conjunction with competitive intelligence, with searches such as "measure* AND competitive intelligence". This initial search was followed by subsequent searches starting in January 2012 to September 2012 in additional databases, such as Emerald and JSTOR, for articles related to intangible measurement and decision-making. The bibliographies of the articles retrieved by database searches were reviewed to identify additional readings. Some searching was also done online with Google Scholar under relevant keywords, and follow-up searches were made through 2013 to monitor publications in this area.

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2.2 Competitive Intelligence

This section gives some background into CI, its terminology and history, before reviewing practices in CI measurement and potential value of CI research to the larger field of library and information studies (LIS). The intent of this section is to sketch out the current state of research and practice in the CI field generally for the reader before providing a more detailed review of CI measurement literature.

2.2.1 CI background

The literature review begins with a general description of competitive intelligence. The purpose is to provide the reader with some background about CI, including terminology and history that will contextualize and frame later discussions of CI and measurement. This section concludes by making connections between CI and the larger field of LIS, to explain why researcher considers research into CI to be of value to LIS research and practice.

2.2.1.1 CI terminology

Competitive intelligence (CI) is both a process and a product. It is the process by which an organization, or an individual, takes information and analyzes it, to understand the competitive environment. It is also the products that result from such analysis, such as reports and company profiles, which are then used to inform decision-making. Bergeron and Hiller (2002) provide a definition of CI from an LIS perspective. They define CI as the collection, transmission, analysis and dissemination of publicly available, ethically and legally obtained *relevant* information as a means of producing *actionable knowledge*. Actionable knowledge is a basis for the improvement of corporate decision-making and action. Cohen (2009) has distinguished CI as going beyond the identification of issues or making predictions, to making recommendations, taking a proactive role in strategic decision-making. CI monitors and attempts

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to anticipate the competitive environment for competitive advantage, and is popularly believed by practitioners and scholars to provide organizations with a competitive edge (Bose 2008; Yap & Rashid, 2011).

The literature review in this paper draws upon research in business intelligence (BI) and competitive intelligence activities. Bouthillier and Shearer (2003), in their review of BI and CI, note that although in some instances the terms have been used interchangeably, the scope of BI is typically larger, including internal and external information activities for the organization, while CI is narrower in scope, focusing solely on the competitive external environment. As described the conceptual review done by Buchda (2007) the terms BI and CI share common processes (sourcing data for analysis) for similar purposes (to inform decision-making, and support management). Lönnqvist and Pirttimäki state that for BI and CI, "all the definitions share the same focus …they all include the idea of analysis of data and information" (2006, p. 32). For this paper, 'CI' will be considered a synonym for BI, recognizing those commonalities.

The CI activities of data analysis and information are termed "the intelligence cycle". The intelligence cycle, although variously described by authors (Bouthillier & Shearer, 2003), contain common elements in a sequence of problem identification, information sourcing, information analysis, generation of intelligence products, and dissemination to decision-makers.

In the larger CI literature the analysis stage and the resulting quality of CI deliverables (accuracy, timeliness, etc.) loom large. For this research and its focus on macro-level discussions of impact post-dissemination stage, however, it was implicit to the conversations with participants that the CI deliverables had been previously assessed and found to be adequately reliable and accurate for decision-making purposes.

A visual of this cycle is provided here:

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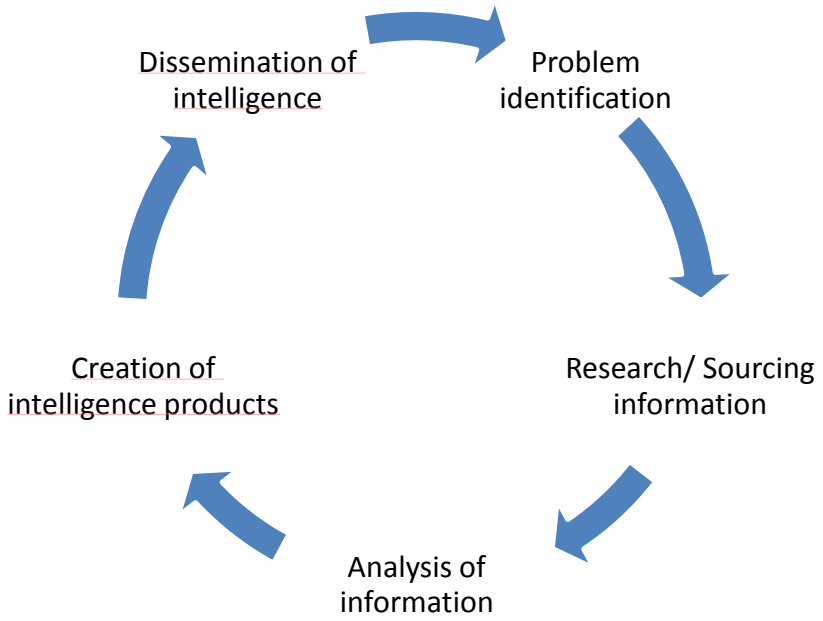

Figure 1: CI Cycle

It is what happens with CI after dissemination that is of interest to this study, namely how the CI deliverables are used within organizational decision-making processes. Although distinctions may be made between business, competitive, strategic, and market intelligence (for example), as described here the role of CI within organizational decision-making is fundamentally the same regardless of those distinctions, and therefore the same for the purposes of examining decision outcomes and impact. As a result, no distinction is made within this study between CI and other types of intelligence produced and used within organizations.

2.2.1.2 Historic roots leading to current practice

Competitive intelligence and military intelligence both rely on the discreet sourcing of information in order to anticipate and outmaneuver a competitor. Some authors have suggested that competitive intelligence and military intelligence were born together in the ancient strategies and philosophies of Moses, Confucius, and Sun Tzu (Juhari & Stephens, 2006).

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Modern business applications of military intelligence gathering practices began in the 1950s, both in the U.S. and in Japan (Juhari & Stephens, 2006), although the Japanese government's sponsorship of the Japan External Trade Organization (JETRO) is evidence of how much significant governmental support there has been for an intelligence culture in Japan (for a description of this program, see Ikeya & Ishikawa, 2001). The development of computer technology in subsequent decades, and the possibilities of previously unknown information access, has propelled the growth of CI (Juhari & Stephens 2006; Fair 1966).

In the 1980s CI was starting to be formalized as a field of practice. Michael Porter (1980) coined the term "competitor intelligence" in his book *Competitive Strategy,* signaling the need for new strategies in business management. Also in the 1980s Jan Herring, a former CIA officer, was approached by Motorola to create the kind of "corporate CIA" Fair had foreseen in the 1960s, made possible by not only technological developments but also complex conceptual models rooted in military-espionage applications (Fair, 1966). Herring would go on to consult with various other American corporations (Herring, 1999), indicating the new premium business placed on information about the competitive environment. Growing numbers of CI practitioners were heralded by the formation of SCIP, the Society for Competitive Intelligence Professionals (now Strategic and Competitive Intelligence Professionals), in 1986 (Strategic and Competitive Intelligence Professionals, n.d.). An exhaustive review of CI in the 1990s, which also discusses the establishment of CI training and education, and establishment of professional ethics, can be found in the literature review done by Bergeron and Hiller (2002).

With the growth of practice and the appearance of practitioner accounts in the literature, scholars began to conduct research into the field of competitive intelligence, as terminology, concepts, and practices began to stabilize following experimentation (Cohen, 2009). Research and conceptual development, however, have as yet been limited, and in response to those limits

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Ganesh, Miree, and Prescott (2004) recently set out a research agenda for CI researchers. Their literature review found that the field needs to move toward conceptual maturity, and that the CI research literature has to date predominantly consisted of the results of surveys. Recent calls in the 2000s have been made by other scholars for additional and more rigorous scholarly research and fieldwork (Calof & Wright, 2008; Hughes 2005; Pirttimäki, Lönnqvist, & Karjaluoto, 2006; Wright & Calof, 2006), while other scholars express concern regarding the still-immature theoretical and conceptual aspects of CI. Lönnqvist and Pirttimäki (2006) note the existence of 'unverified assumptions' in the literature, and Hannula and Pirttimäki (2003) point out that authors are promoting their own individual conceptions of intelligence rather than using those generally agreed-upon with other researchers.

2.2.1.3 The value of CI to, and its relationship with, information studies

In a knowledge-based view of the firm (Grant, 1996) an organization is viewed as existing to source, store, share, and use information in decision-making. Jin (2008), in his study of CI workers, defined CI as a form of information work within the organization. This 'information work', namely intelligence, has been proposed as a subset of knowledge management (KM) by authors arguing for closer conceptual relationships between scholars and practitioners working in CI/BI and KM (Herschel & Jones, 2005; Liebowitz, 2006). More detailed discussion of the relationship between CI and KM, written by LIS scholars and providing discussion of the core information-related concepts and practices that these fields share, can be found in Bouthillier and Shearer (2005) and Bouthillier and Dalkir (2005).

Some LIS educators have suggested that the LIS field would benefit from a closer integration with intelligence studies (Jin & Bouthillier, 2012), recognizing that the role of CI is

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to add value to organizations by transforming data into information, and information into knowledge and intelligence (Bouthillier & Shearer, 2003).

Saayman et al. (2008) give a description of the function and purpose of CI. They state that the goal of CI is to provide "actionable intelligence", which they define as information that has been synthesised, analysed, evaluated, and contextualised. They add that competitive intelligence (CI) is a part of the strategic information management process. This description is useful because it explicitly states common areas of interest for CI and LIS. Both are involved in research of, and training of practitioners in, the sourcing, evaluation, contextualization, use, and valuation of information, for the provision of information services.

2.2.2 Why are we measuring CI?

Now that a definition of CI, its history, value, and interest to LIS have been provided, this section sets forth the argument for CI measurement research. It begins with a review of what has been reported as inadequate current practice in CI measurement, and then presents the arguments made by scholars for why measurement is needed. The section concludes with a review of the calls for research in CI measurement.

2.2.2.1 Is CI being measured by practitioners?

CI suffers as a field of research and practice from problematic measurement. Although the literature states that there is a need for measurement, there is little measurement evident in practice.

The results of CI practitioner surveys have indicated that organizations tend to do little, if any, formal measurement of CI processes, products, or outcomes (Herring, 1996; Marin & Poulter, 2004; Prescott & Bharwaj, 1995). It is unsurprising then that little has been written about CI measurement. Blenkhorn and Fleisher (2007) point out in the literature review prefacing their

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study of CI practitioners that most of what has been written about assessments of CI value consists of practitioners' anecdotal experiences rather than scholarly (meaning rigorous, valid, and reliable) studies.

Prescott and Bharwaj (1995) did a large-scale survey of members of the Society of Competitive Intelligence Professionals (SCIP) to understand the components of CI programs. Respondents indicated that although they believed that CI benefits could be seen in decision-making, sharing information, and identifying new opportunities, they were uncertain as to how CI impacted strategic areas in their organizations, namely market position, revenues, customer service, and increased capabilities. The authors suggested that metrics needed to be developed to enable CI units to better assess their role and impact within organizations.

Nearly a decade later, Marin and Poulter (2004) did another survey of SCIP members, with some interviews of survey participants. The purpose of their study was to better understand CI practices and practitioners. One finding of the study was that "few organizations have any mechanisms in place to measure the value of competitive intelligence," though some organizations made an attempt to track usage of electronic CI resources (p. 172). The authors attributed, at least in part, the non-existence of measures to the problem of quantifying CI value and effectiveness.

Studies such as these have repeatedly found that organizations using CI are not measuring CI processes or outcomes, although there are documented exceptions (e.g., Pirttimäki, Lönnqvist, & Karjaluoto 2006). Herring (1996) conducted a small field survey and found that, as did Marin and Poulter (2004), organizations using CI do almost no evaluation or measurement of CI. None of the executives he surveyed were using any formal evaluation, although they might do unexpected and informal evaluation when reviewing budgets and/or trying to control costs.

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Blenkhorn and Fleisher (2007) confirmed there are few formal measures in use, or often no measures at all.

Simultaneously, however, as researchers are finding a dearth of CI measurement activity in organizations, practitioners of CI, when surveyed, have stated that they are aware of the need for measurement and consider its development a priority for their field of practice (Hannula & Pirttimaki, 2003; Qingjiu & Prescott, 2000).

2.2.2.2 Arguments for CI measurement raised by scholars

Kankanhalli and Tan (2004) summed up the value of measurement in the preface to their review of KM metrics for knowledge management systems and initiatives: metrics are needed to fulfil two purposes, to advance scholarly research, and to improve professional practice. Illustrating some of the differences between KM and CI, Lönnqvist and Pirttimäki (2006) state that from their survey of BI/CI literature, two primary reasons for measurement are given: to improve process, and to prove value.

From a practical perspective, the value of measuring competitive intelligence is that it fosters improvement by providing data on performance (Blenkhorn & Fleisher, 2007). It gives reassurance to high level stakeholders that there will be a return on investment, while staff, knowing that measurement activities are taking place, have an incentive to improve processes and deliverables (Buchda, 2007). Surveys have indicated that while there is little use of CI performance measures in organizations, as described in the previous section, CI practitioners are aware of the need of measurement to advance practices in their field (e.g., Qingjiu & Prescott, 2000).

CI research could also be improved with the development of measures that go beyond process improvement to critically examine the outcomes, results, or impact of intelligence. As

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Poll and Payne point out in their review of impact measures for information services, moving beyond usage statistics and satisfaction measures to a critical evaluation of outcomes brings us to "the deeper issues associated with our contribution to learning, teaching, and research" (2006, p. 560).

2.2.2.3 Calls for measurement research and tools

As reviewed in the previous section, authors discussing CI measurement repeatedly call for measures to be developed, recognizing that they are necessary to conceptually develop the field, and strengthen research (Blenkhorn & Fleisher, 2007; Prescott & Bharwaj, 1995).

Some studies have shown that a correlation exists between CI use and organizational success, such as the study by Adidam, Banerjee, and Shukla (2012) which found that in a survey of 145 Indian firms, those organizations which used CI had demonstrated better financial performance than those who did not use CI. Subramanian and IsHak (1998) also found that possession of a CI function (which they termed competitor analysis systems) was related to corporate success in a questionnaire administered to American executives in 85 companies.

A handful of other studies have found similar correlations. For example, Daft, Sormunen, and Parks (1988) interviewed CEOs at over 50 manufacturing companies to investigate how executives' information activities to understand their competitive environments were affected by uncertainty. Their study indicated that executives at higher-performing or more successful companies were more likely to solicit information about their competitive environments. Research going beyond correlation to provide evidence of causal relationships has however proven elusive, although authors such as Subramanian and IsHak (1998) and Yap and Rashid (2011) have noted a need for research into whether such a causal link exists.

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It may be that there is a link between how CI is used to inform organizational strategy, and positive organizational outcomes. Teo and Choo (2001) administered a survey to executives in Singapore and found not only a correlation between CI use and corporate performance, but that high-quality CI led to what they termed 'strategic benefits' for the organization, which they defined as revenue generation, cost reduction, and managerial effectiveness. Yap and Rashid (2011) conducted a survey of Malaysian CEOs and found a positive correlation between possession of a formal CI unit to support strategic decision-making and corporate performance. Jaworski and Wee (1992) were also interested in investigating linkages between CI, organizational strategy, and corporate success. A finding resulting from their interview and survey data of CI producers and users was that financial performance in comparison to competitors was improved if CI was practiced in an organization. Although this study's findings would seem to provide some research-based support for the argument that CI is of value to strategic planning, its research methodology is not fully described and as a result findings should be viewed with some reservations.

Field research is needed to provide evidence of CI use in decision-making and to identify indicators of positive outcomes (benefits) resulting from that use. Ganesh, Miree, and Prescott (2004), in their paper identifying ten needs in the CI research literature, state there is a need for CI effectiveness measures and for research into how CI impacts organizational performance. They also call for CI researchers to move away from survey tools and instead use field research methods, looking at context and events unfolding over time. In their discussion they note that few studies have examined the intelligence user's perspective regarding the value CI brings as an input to decision-making.

The criticism that the literature in this area to date has been overly reliant on surveys and that field research is needed to provide the evidence necessary to support the development of CI

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measurement tools and methods has been echoed by other scholars. Wright and Calof (2006), in their admittedly small review of research articles in the literature, found little consistency in measurement or conceptualization between researchers across countries and called for more rigorously conducted research, and for case studies. In a study of the CI literature, Calof and Wright (2008) again found little research had been conducted with methodological rigour, and suggested that part of the issue was that a) the research was at too high a conceptual level, and b) scholars were trying to examine too many processes simultaneously. They recommended that if researchers would focus on one segment of the CI cycle, it would improve the quality of the research.

One of these segments in need of focused research in order to develop CI measurement is the point at which CI becomes an input into organizational processes, rather than an output of the CI unit. Hughes (2005) argues in a conceptual paper for the existence of a beneficial link between CI practices and organizational strategy formulation, but there is not yet any evidence to support the claim of such a relationship. A call by a practitioner, frequently cited by scholars in the literature (Sawka, in Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004), has been made for CI researchers to investigate how CI factors into decision-making. If the value of CI is in how it improves decision-making, as scholars have argued, this relationship needs investigation.

2.2.3 Approaches to CI measurement

Following the previous section's review of arguments for improved CI measurement, the discussion here of CI measurement tools and methods in use consists of three sub-sections. The first looks at CI as a product, a process, and an input to improved organizational outcomes,

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asking what the research literature has said about successfully quantified aspects of CI. It attempts to answer the question, what can be measured in CI?

The next sub-section takes the classification of CI measurement approaches in practice developed by Buchda (2007) and reviews current methods in CI measurement. It attempts to give a partial answer to the question, 'how can we measure CI?', by demonstrating the strengths and weaknesses of current measurement approaches in determining CI value, namely, how well CI has improved the decision-making process and therefore organizational outcomes.

The final sub-section summarizes the conceptual and methodological challenges of measuring CI outcomes as described in the research literature.

2.2.3.1 What can be measured in CI?

Prescriptive models for the measurement of CI value have been proposed, but they have not been evaluated or tested by other scholars (Herring 1996; Kujansivu & Lönnqvist, 2009; Pirttimäki, Lönnqvist, & Karjaluoto, 2006; McGonagle & Vella, 2002; Davison, 2000). Additionally, there is a lack of consensus between scholars in their models, although there are similarities in their recommendations. This section attempts to distil what elements of CI have been successfully measured and/or assessed related to CI products, process, and results.

Looking at CI as a product, Bose (2008) states in his literature review of CI processes and tools that the value of CI is often measured by its characteristics: accuracy, objectivity, usability, relevance, readiness (i.e., responsiveness to the intelligence requirements of decision makers), and its timeliness. With its checklist of quality factors, this approach to measurement is easily developed and applied. Fleisher and Blenkhorn's (2001) discussion of critical factors for CI performance that can be measured and controlled is an example.

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CI processes lend themselves to measurement, as seen in proposed tools such as the scale developed by Darroch (2003) to evaluate how well information is disseminated within the organization. Usage statistics, for example, for organizations with CI databases and other electronic resources have been applied to evaluate CI in terms of how it is accessed and shared. Taking this process approach, Pirttimäki, Lönnqvist, and Karjaluoto (2006) conducted an action research case study and found that input-output ratios could be developed looking at person and system activity in four chosen measurement focus areas: financial, process, learning and growth, and customer, through investigation of costs, usage of databases, working hours, etc.

Although CI can be evaluated or measured as a product or a process, the true value of CI is in its application, as previously argued (e.g., Hughes, 2005; Teo & Choo, 2001), namely, how it is used by decision-makers. In the action research case study conducted by Pirttimäki, Lönnqvist, and Karjaluoto (2006), they used qualitative data gathered by satisfaction surveys to augment their quantitative data regarding CI processes in four focus areas. The satisfaction survey is a tool by which some evidence of the role and value of CI in the decision-making process can be obtained.

To sidestep the problems of time and other methodological and conceptual challenges in intelligence measurement, CI researchers and practitioners will sometimes use satisfaction surveys as a surrogate for effectiveness measures. Satisfaction measures, however, are not a replacement for robust multi-perspective performance measures. In the field of materials management information systems, Yuthas and Young (1998) conducted a laboratory experiment to try and determine whether materials management performance measures (inventory cost, turnover, etc), system usage, and user satisfaction exhibited sufficient correlation to justify their interchangeable use in determining system success. Although the authors found some weak correlation, the relationships were not strong enough to support the idea that (for example) user

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satisfaction gives an accurate picture of management performance. This study provides evidence that satisfaction surveys for information systems, although they provide useful insight, do not provide an adequate standalone measure of effectiveness or success.

In a literature review of BI measurement, Lönnqvist and Pirttimäki (2006) ask how performance measures can quantify BI. They concluded that it is much easier to measure process than outcomes. Although, as discussed elsewhere in this chapter, no study has yet linked CI as an input to subsequent decision outcomes, two studies have demonstrated that outputs and outcomes of specific organizational initiatives can be identified and potentially assessed. Jääskeläinen and Lönnqvist (2009) conducted qualitative research into two public services in Helsinki in an effort to develop productivity measures. They found that shorter-term output factors could be identified, but that defining what measures should be used to assess them was difficult. In another study, Kujansivu and Lönnqvist (2009) conducted a case study investigating how to measure the impact of an intellectual capital initiative. They found that although it took time for longer-term outcomes to appear, it was possible to assess the organizational impact of an initiative with a two stage approach, using a set of indicators and a subjective evaluation carried out using interviews. Their conclusion was that shorter-term outputs usually could be evaluated but that longer-term and typically intangible outcomes required subjective assessment in order to capture any data about them, due to the longer time horizons for them to appear and the scant resources available for carrying out any assessment of outcomes.

2.2.3.2 How can CI be measured?

Reviewing measures that have been proposed in the CI literature, Buchda (2007) proposed a classification and analysis framework for them, grouping them into three types:

i. Measures of Effectiveness (MOE)
ii. Return on Investment (ROI)

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iii. Balanced Scorecard-Related (BSC-Related)

To this typology has been added another heading on multi-method, multi-perspective measurement. In this section each of these types will be summarized and critiqued for its application to CI contexts. Although calls have been made for more empirical testing of CI measurement, the measurement methods and tools reviewed here are prescriptive, proposed by scholars, and have not been subject to testing.

i. Measures of Effectiveness (MOE)

The MOE approach was advocated by Herring (1996) at the conclusion of multi-stage exploratory research he conducted in the 1990s for the Society of Competitive Intelligence Professionals (SCIP), to investigate possible methods of performance measurement for CI. MOEs, simply put, identify outcomes which indicate CI did its job, with the intent of proving functionality and value to justify investment. Herring suggests four MOEs for CI: time savings, cost savings, cost avoidance, and revenue enhancement.

In another example, a set of potential MOEs is provided in a study by The Futures Group (in Davison, 2000; Herring, 1996; McGonagle and Vella, 2002). The study consisted of interviews with US companies to identify their MOEs. The most common measures identified were:

- Actions taken
- Market share changes
- Financial goals met
- Leads generated
- New products developed

Herring (1996) supported the use of MOEs because he concluded that measurement of CI effectiveness (effectiveness being how well CI is achieving its goals, see Fleisher & Blenkorn, 2001) required a qualitative and quantitative evaluation of the entire CI cycle in cooperation with

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management, in order to ensure that CI activities were aligned with strategic objectives, thus ensuring value. He argues that an MOE approach allows the user to address management expectations, and establishes a framework for the most valuable assessment of CI: that of the executives using and overseeing the CI processes and products. The problem with using MOEs, however, is that implementing them can be difficult, and as Buchda (2007) pointed out, MOEs typically are selected on the basis of desirability, rather than research that has proven what benefits can be expected to result from CI.

ii. Return on Investment (ROI)

ROI methods attempt to prove profit by subtracting costs from the revenue generated by a given activity. Davison (2000) brought together literature on CI and literature on advertising effectiveness measures to conceptualize a Competitive Intelligence Measurement Model (CIMM). This model was developed to provide a more tangible method than MOEs for determining CI effectiveness. The formula below gives the return on investment for competitive intelligence (ROCII), with the intent to produce an answer quantifiable in dollars:

$$\text{ROCII} = (\text{CI outputs} - \text{CI inputs}) / \text{CI inputs}$$

Kilmetz and Bridge (1999) provide a practitioners' report of how to use ROI methods, recounting a business case, to illustrate the need for users of ROI methods to engage in modelling potential scenario outcomes of current decisions. These potential scenarios are developed in order to forecast likely and hoped-for returns, a task that provides data in the form of most-likely outputs, to be used in formulas such as the one above.

Davison (2000) acknowledges three significant weaknesses of a ROI method for CI. These weaknesses are uncertainty regarding the accuracy of forecasts used in the model, the inability of the formula to account for intangible results and qualities of CI, and that the model does not include any consideration of organizational strategy. Davison suggests possible

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solutions for two of these weaknesses. First, to gauge the potential accuracy of current predictions by evaluating the accuracy of previous predictions. Second, to use Likert scales to evaluate decision makers' satisfaction regarding the intangible qualities of CI products and processes, such as quality, relevance, accuracy, etc. For the third weakness, however, Davison provides no solution or proposed additional measure, simply stating that a ROI model, not having long-term data, cannot measure strategic outputs and outcomes.

Feedback from CI practitioners about ROI has indicated that these weaknesses have in the past made ROI measures insufficient to assess CI performance (Blenkhorn & Fleisher, 2007).

iii. Balanced Scorecard (BSC)

The balanced scorecard, originally developed by Kaplan and Norton (1992), is a measurement approach that allows users to examine organizational functions from multiple perspectives, in relation to one another, with the intent of monitoring and improving performance. Lönnqvist and Pirttimäki (2006), in their literature review to identify and assess measurement approaches for determining value and managing processes for CI in an organization, suggest that a BSC approach is the most beneficial. Pirttimäki, Lönnqvist, and Karjaluoto (2006) undertook a case study, applying a BSC to the CI unit of a company, and argued that this approach has to be tailored to the needs of a specific context and organization, including tracking of usage rates for CI products, satisfaction surveys, and win/loss ratios for specific decisions.

While the BSC allows the user to address some of the complexity of CI processes, its weakness is that it does not show clear evidence of causal relationships between CI inputs and outcomes (Buchda, 2007; Nørreklit, 2000). Another weakness is that it rests upon the presupposition that viable measures and targets have already been established. Sharma and Dijaw (2011) proposed a BSC approach to CI management and used an IT firm in Singapore

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with a CI unit as a test case. The BSC they developed used process measures, such as number of attendees at seminars, and customer satisfaction, to build targets and inform the choice of measures. This approach fails to address the need to demonstrate effectiveness in meeting purpose and sidesteps the problem of how to identify and represent intangible outcomes.

iv. Multi-method, multi-perspective measurement

Other measurement approaches have been taken that do not fit within the typology developed by Buchda (2007). McGonagle and Vella in their book *Bottom Line Competitive Intelligence* (2002) make recommendations for CI measurement. They divide CI as defensive (done by all employees to protect sensitive information) or active (the collection and analysis of data by CI professionals), and then conceptualize competitive intelligence for measurement as follows:

> …most people trying to measure CI's impact assume that there is only one style of CI, strategy-oriented, and apply what they feel would be appropriate measures…We will then take the lessons from this body of experience and apply them to each type of CI, strategy-oriented, tactics-oriented, target-oriented, and technology-oriented, taking in account the differences in mission, audiences, and deliverables. (p. 16)

In other words, they take into account the 'orientation', or focus of the CI activity (a specific competitor, a monitoring of technological developments within an industry) and use it to inform their selection of measurement tools.

This multi-method multi-conceptual approach permits the measurer to incorporate both financial measures with 'softer', strategy fulfilment and goal-oriented measures. Cohen's book *Business Intelligence: Evaluation and Impact on Performance* (2009) takes a similar multi-method approach as McGongale and Vella (2002). However Cohen conceptualizes CI, or what

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she called 'strategic intelligence' for measurement within a framework of effectiveness and decision-making that relates the performance of the CI unit to the performance of the organization. The end result of her approach is the development of a dashboard (as with the BSC approach) that ideally conveys a salient and simple picture of a CI unit's performance to the organization.

The strength of these approaches, their conceptual frameworks, may however also be a deterrent to use by practitioners, who may find the resultant lengthy questionnaires and process unfeasible. In addition, the measures proposed may not address lingering questions for executives regarding the financial impact of the organization. The issue of financial impact will be addressed further in chapter 6, which will examine these measures in more detail.

In summary, the three measurement approaches, BSC, ROI, and MOE, are useful in providing some quantification of CI performance. However, as described above, the weakness of these measurement approaches is that they do not provide evidence of causal relationships, which is also a problem for adapting intangibles measures in the fields of knowledge management (KM) and intellectual capital (IC) to CI. For example the Intangible Assets Monitor which attempts to quantify intangibles such as corporate knowledge as organizational assets (Sveiby, 1998), and House of Quality, a management tool and conceptual map which manages quality by relating product requirements to desired standards, including those of competitors (Hauser & Clausing, 2001), are both useful for identifying and representing intangible assets. However they do not provide evidence of dynamic relationships, which is necessary to represent if the value of CI is in its decision outcomes and subsequent organizational impact.

The multi-method multi-perspective approaches developed by McGonagle and Vella (2002) and Cohen (2009) do capture the dynamic use of CI, recognizing it is a fluid process and not a static asset. Cohen, in particular, is notable for also incorporating the decision-making

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process into her measurement approach. However the high-level conceptualizations of practice and the lengthy process in selecting measures for use, and some questions about the reliability or completeness of the financial measures, may be deterrents to use by practitioners.

2.2.3.3 Challenges to measuring CI (conceptual and methodological)

The literature review to this point has touched on the difficulties regarding CI measurement described in various research studies. This section brings together and summarizes what researchers have identified as the conceptual and methodological problems they face in researching CI measurement.

Conceptual challenges include inconsistency among scholars in the field, such as interchanges of the terms 'business intelligence' (BI) and 'competitive intelligence' (Buchda, 2007). Wright and Calof (2006) found that in a comparison of case studies in the literature, there is little consistency in terms of measurement and output value. Lönnqvist and Pirttimäki (2006) also complain of conceptualizations of output value, stating that the literature "includes a lot of unverified assumptions" about the possible benefits of intelligence to organizations (p. 33).

Methodological challenges reported by scholars in the literature exist related to the necessarily subjective reporting of decision-makers (Buchda, 2007), access to decision-makers (Cappel & Boone, 1995), allowing for sometimes significant time delay for results to be manifested (Kujansivu & Lönnqvist, 2009), nebulous outcomes (Blenkhorn & Fleischer, 2007), and linking intelligence through the decision to outcomes in a cause and effect relationship when many other factors may be at play (Marshall & de la Harpe, 2009). Some authors have argued that the unique situation of each industry and organization renders the standardization of measurement tools impossible; rather, they argue, the unique situation of each organization and

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industry will require individually tailored measurement (e.g., Kilmetz & Bridge, 1999; Lönnqvist & Pirttimäki, 2006; Rothberg & Erickson, 2005).

Another problem in advancing research and practice may also be ignorance of the value of measurement. Herring's (1996) small survey of senior executives overseeing a CI program indicated that while none of the executives participating in his study were evaluating CI, they were open to doing so once the idea was introduced to them.

These issues are further discussed in chapter 3, which details a small study conducted to examine these issues in more detail. The literature review and findings of that study attempt to provide some comparative discussion around intelligence measurement challenges.

2.2.3.4 In summary: Next directions for CI measurement

As discussed earlier in the section on measurement methods and approaches in the literature, CI benefits can be identified with indicators of effectiveness, such as time savings (MOEs). However, these MOEs vary. A sample of the most common are as follows. Hannula and Pirttimaki (2003) found that for Finnish companies, their most-expected benefits of CI were better information for decision-making; ability to anticipate threats and opportunities; growing knowledge, that is, increasing employee knowledge in ways that might not be applied to the problem at hand, but might be useful later; and savings of time and money. Marin and Poulter (2004) studied CI practitioners and discovered that CI often is intended to help decision makers to make decisions. Jaworski and Wee (1992) found that CI was designed to help increasing the quality of strategic planning by improving knowledge of the market. Qingjiu and Prescott, (2000) who studied Chinese CI practitioners, found that respondents believed that CI should result in improvements for decision-making and customer service.

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Of all lists of reasons given by researchers, providing help to decision-making – often described as strategic decision-making – is the most commonly cited reason for implementing CI (see also Herring, 1996; Bose, 2008). Arguably most indicators of this improved decision-making, as described in the literature reviewed in the previous paragraph, can be loosely grouped under three categories: financial outputs, improved client relationships, and innovation in products and services. These three have been selected as indicators because while hoped-for CI MOEs described by surveyed organizations vary, there are some fundamental consistencies. Organizations appear to agree that improved decision-making should favourably impact their financial situation, hence the indicator 'financial outputs'. The indicator 'improved client relationships' attempts to capture first, beneficial effects to external client relationships of the organization, such as increased sales and improved organizational image. Second, it attempts to capture the satisfaction of internal clients of the CI unit, whose beneficial outcomes may only be an increase in general knowledge regarding a problem, and not translate into a specific action. The third indicator, 'innovation', relates to changes in processes, services, and products. Generalizing such changes rather than specifically tying them to a specific industry, organization, or product, will hopefully support the development of baseline outcome measurement, possibly refuting claims made by, among others, Rothberg and Erickson (2005) regarding the impossibility of standardized measures for CI due to variations in practice.

Since supporting, and presumably improving, decision-making is the most commonly-cited reason for CI to be developed and used in organizations, this presents a challenge for developing measures, which are currently reported to be limited in development and application. Unlike process measures which can, for example, calculate employee-hours against numbers of CI products developed to determine costs of CI, measures attempting to connect CI practices and products to decision-making cannot be as straightforward. Decision-making is not a linear

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process, and it can be complex. Any tool that measures decision-making and its effects will necessarily involve qualitative methods. Further complications are related to questions of accuracy in self-reporting on what is essentially an internal and subjective activity, and in allowing time to lapse for intangibles to appear (Kujansivu & Lönnqvist, 2009). Although no measurement model has yet been developed that addresses CI's role in decision-making, there has been a call by a practitioner to examine how CI factors into decision-making (Sawka, in Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004) which has been echoed by scholars' comments.

2.3 Decision-Making

In order to understand the role of CI in decision-making, and therefore its potential value to organizations, the research questions as discussed in the introduction relate to organizational decision-making. This research is not an investigation of decision-making itself, but rather seeks to understand the role of CI within the process of organizational decision-making, and from understanding that role, better identify in turn its relationship to the results of a decision.

Research into decision-making has found that formal hierarchies and requirements mean that there are typologies and processes of decision-making that are specific to organizations, and therefore distinct from individual decision-making (March, 1991). This section reviews theoretical approaches to organizational decision-making research, and provides an operational definition of decisions and decision-making. The remainder of the section reviews research investigating the relationship of information to decision-making, in order to more clearly depict the symbiotic relationship of CI products and decision-making within organizations, and thereby better inform the proposed methodology of the research.

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2.3.1 Organizational decision-making: A brief history

Cyert and March (1963) described organizations as decision-making entities that were engaged in searching for solutions, in an environment that requires information about competitors and markets. Research to understand organizational decision-making has spanned a spectrum of rationality in the past century. The earliest decision-making research, such as that published by Knight in the 1920s and later by Savage in the 1950s, presented rational models of decision-making (Radner, 2000). In the rational model, decision-making was a logic sequence of cognitive steps that resulted in the selection of the optimal choice. This rational choice model, however, was soon discovered to be normative rather than descriptive: people did not always follow logic, nor did they make optimal choices.

Simon (1955) presented a new model to address the limitations of the rational model: 'bounded rationality'. Bounded rationality accounted for the fact that in his research into organizational decision-making Simon found that people, and organizations, would sometimes make poor choices, compromised choices, or even no choice at all, and that they would often only act according to the dictates of logic within certain limits. In bounded rationality 'rationality' still exists, however. There is still a sequence of reasoned steps, which Simon (1960) called intelligence, design, and choice.

In the 1970s 'irrational' models of decision-making started to appear in the literature. Cohen, March, and Olsen (1972) presented the 'garbage can model' of decision-making, proposing, based on their research in universities, that decision-making in organizations was not about logic at all. Rather, they suggested, organizations are really organized anarchies in which problems and solutions are dumped in together and options are selected without logical process under conditions of ambiguity, conflict, and misunderstanding.

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In 1976 Mintzberg, Raisinghani, and Théorêt published research of organizational decision-making that, while rejecting the idea that organizational decision-making was conducted in distinct sequential steps, gave evidence that there were elements of rationality and process involved. In their field study of 25 strategic decision-making processes, they determined that although there was a basic underlying structure, decisions did not necessarily go through a sequence. They found that the three essential phases of a decision (which they termed identification, diagnosis, and selection) and their accompanying activity-routines, such as screening of choices, could and often did overlap. Decision-makers would conduct phases simultaneously, or cycle back to earlier stages, before ending the decision process.

In the 1980s Daft and Weick (1984) suggested that organizations were really 'interpretation systems'. The function of the organization, in this view, is to scan the environment (internally and externally), interpret the results of that scanning activity, and learn from the interpretation. This interpretation system perspective means that decision-making can only be understood retrospectively: as situations occur which require a decision, decisions are often made by the group without conscious recognition of what is occurring. As a result, 'sensemaking' must occur after the fact in order to understand/interpret the decision, and thereby allow organizations to generate meaning (e.g., Weick, 2010).

In his book on information management in intelligent organizations, Choo (1998) has suggested that there are two primary perspectives in the literature on organizational decision-making:

1. The rational decision-making perspective, in its modern, bounded form, first developed by Simon, March, and Cyert; and
2. The enactment perspective, where organizations serve as interpretation systems, acknowledging messy contexts, first developed by Weick and Daft.

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Of course, Choo's division of decision research into these two perspectives is not final or even conclusive, as more research continues to be done. For example Paul, Sanders, and Haseman (2005) suggest that decision-making may be in actuality a combination of (not a division between) Simon's bounded rationality and the irrational anarchy of the garbage can model, rather than rationality and interpretation systems.

Rational, anarchistic, and interpretive perspectives, whether we regard them as separate philosophical camps or degrees of combination on a scale, offer insight into the selection of research methodologies, and together can potentially provide richer data and deeper understanding to the researcher. The best selection of perspective to inform the choice of methodology and interpretation depends very much on the researcher's conceptualization of what a decision is.

2.3.2 What is a decision?

March (1991) argued in his essay on how decisions happen in organizations that there are three ways to consider decisions: first, as a logical choice of the most desirable consequence; second, as the result of the logic and rules specific to an organization; or third, as an outcome artifact to which meaning must be assigned. This section presents some of the process-based conceptualizations of decisions and decision-making in the literature, in order to support the development of an operational definition. This operational definition will in turn inform a research methodology that acknowledges organization-specific environment and context.

2.3.2.1 Process-based definitions of a decision

Mintzberg, Raisinghani, and Théorêt (1976) defined a decision as "a specific commitment to action", with the decision-making process being "a set of actions and dynamic factors that begins with the identification of a stimulus for action and ends with the specific

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commitment to action" (p. 246). The group of people involved in the commitment to action has been termed by Duncan (1972) an 'organizational decision unit'. This unit is defined as "a formally specified work group within the organization under a superior charged with a formally defined set of responsibilities directed toward the attainment of the goals of the organization" (p. 313).

Many researchers define a decision by a multi-stage decision-making process, with the loose assumption of multiple players' involvement. They range from simple three-stage models, such as Simon's three-stage model of intelligence, design, and choice, to more complex models, such as the one developed by Citroen (2011). In Citroen's research into the role of information in the decision-making processes of executives, he found that there were six stages of decision-making, which were:

1. Defining the problem;
2. Analysis, where additional information sought to inform judgment, including information about competitor activities;
3. Alternatives are developed;
4. Best alternatives and options are selected;
5. Feedback is sought from information sources to weigh consequences (this stage is not always present in the decision-making process); and
6. A final decision is made.

Carroll and Johnson (1990) in their handbook on decision-making research, also suggest that there are six stages to a decision, but they label those stages differently than Citroen. Their list, provided here for the purpose of comparison, is:

1. Recognition;
2. Formulation;
3. Alternative generation;
4. Information search;
5. Evaluation/ choice; and
6. Action/feedback.

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A comparison of these two lists demonstrates that there is little difference between them. In another example, the research done by Mintzberg, Raisinghani, and Théorêt (1976) in describing strategic decision-making echoes these six-stage models, suggesting that there are only three stages or phases, with 'routines', or activities assigned to the phases of decision-making process, that can occur, or iteratively re-occur, at any time. Below is a breakdown of the three phases, with their attendant routines:

i. Identification Phase
   - -Decision recognition
   - -Diagnosis

ii. Development Phase
   - -Search
   - -Design

iii. Selection Phase
   - -Screen
   - -Evaluation-choice
   - -Authorization

The work done by Mintzberg, Raisinghani, and Théorêt was informed by Simon's three-stage model, as are models developed by other researchers. Rolland (2004) conducted a four-year qualitative research study of 92 firms to understand how KM strategies impacted the phases of decision-making. His simple model without routines has three stages labeled problem definition, conception, and selection.

The essence of a decision, then, according to these researchers, is in action. First there is a trigger, what Burnstein and Berbaum (1983) described in their review of two historic unstructured decision processes as recognition within the group that "a situation within its purview is discrepant from an ideal or expected state" where the expected state is synonymous with the standards and goals of the group (p. 536). This discrepancy may be due to changes in the competitive environment, and initiate what Buenger (1990) in her field research into

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organizational decision-making and competitive conditions termed 'patterns' of organizational behavior, such as team formation and internal perceptions of past successes.

Sutcliffe and McNamara (2001) studied 900 decisions made by financial institutions regarding loans, to investigate designed decision-making processes in organizations. In their study of the formal decision practices involved, they found that decisions were subject to what they termed 'hierarchies of influences'. A finding of their study was that decision outcomes were affected by both these influences and the processes of the decision-making process.

As Sutcliffe and McNamara (2001) note in their article, internal processes to build situational awareness and consensus on choice are frequently messy, involving as they do, many factors which the researcher must take into account. Langley, Mintzberg, Pitcher, Posada, and Saint-Macary (1995) warn in a conceptual paper on decision-making research that decisions cannot be studied in isolation. Rather, they argue, decisions nest, snowball, and recur within larger 'issue streams' and 'issue networks'. They warn that any researcher needs to be aware of, and account for, what they termed 'dynamic linkages'. However, within that messy and networked environment, researchers implicitly agree that if a choice has been made from two or more options, where a choice is selected based on anticipated outcome, a single decision can be identified.

2.3.2.2 Strategic decision-making

As discussed in the section on CI, researchers have identified organizational strategy (Herring, 1996), strategy formulation (Hughes 2005), and strategic decision-making (Bose, 2008) as being strongly related to CI and discovering CI value in application of CI deliverables. As a result, strategic decision-making is singled out for more thorough discussion here.

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Typologies of decisions have been variously formulated by researchers. Aguilar (1967) identified two categories for decision-making: complex and simple, based on what is 'programmable', and what, on the other hand, requires cognitive effort and innovation.

McKenzie, van Winkelen, and Grewal (2011) conducted a multi-method study of focus groups and interviews to investigate KM and decision-making in the field of intellectual capital. They found in their literature review that authors from a variety of scholarly fields conceptualize a basic typology of three different decision types. Simple decisions with foreseeable outcomes occur frequently and are usually associated with tactical issues for organizations. Complicated decisions occur less frequently and are associated with operational issues. The cause and effect linkages to outcomes are more difficult to identify. Complex decisions, the most infrequent, have significant outcomes and are associated with strategic issues. McKenzie, van Winkelen, and Grewal (2011) state that decision makers do not recognize a 'right answer' in making complex decisions because the outcomes cannot be predicted, but can only be understood in retrospect.

Strategic decision-making, those decisions that directly relate to market competiveness and innovation, has been identified as being not only complex, but having a high level of associated uncertainty that prompts increased monitoring of the competitive environment (Daft, Sormunen, & Parks, 1988; Harrison & Pelletier, 1993). It can be considered to deal with long-term processes (Rolland, 2004), and as a result is most likely to evoke documentation, rules and other formalities, and organizational memory. The weight placed on potentially significant outcomes of strategic decision-making mean that there is a possibility formal decision-making processes will improve chances of success (Harrison & Pelletier, 1993) and that a rational decision-making model is more closely followed (Citroen, 2011). For these reasons, strategic decision-making is of particular interest for this proposed research.

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2.3.3 The relationship between information and decision-making

Information has been demonstrated to affect the decision-making performance of an organization (Thomas, Clark, & Gioia, 1993; Heinrichs & Lim, 2005; Citroen, 2011). This relationship has been studied by various scholars in an attempt to understand how types and timing of information can best support the decision-making process. A review of research into this relationship provides some insight as to the relationship between CI and decision-making.

2.3.3.1 The role of information in decision-making

As Rolland (2004) demonstrated in his four-year study of executives, information, when managed, can lead to improved decision-making. The question then is, what is the optimal information management strategy to support decision-making processes in organizations? Some research findings have indicated that decision-makers require an information-rich environment, and will use information acquired at any time during the process, both to understand the problem and legitimize the selection of a choice (Paul, Saunders, & Haseman, 2005; Rolland, 2004). Citroen's (2011) research, asking executives to describe how they used information in making recent decisions, could not find a distinct pattern in how information available at a given moment changed the decision-making process. His research finding was that the quality of the information was more critical than timing in improving decision-making. March (1991) has stated that time may also affect decision outcomes in that decision-makers will monitor the information environment and wait on choice until a viable solution is identified.

Information quality and timeliness, however, are only two factors in a complex interaction which includes competitive conditions and organizational characteristics (Buenger, 1990). Aguilar (1967) defined 'scanning' as the activity by which companies stay abreast of competitor activities and industry trends, and determined that there are 'modes' or different ways

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of scanning the environment, depending on the information need or availability of information. A study of chief executives found that strategic uncertainty affected executives' information behaviours, producing more scanning activities to monitor the environment (Daft, Sormunen, & Parks, 1988). In another study, Hambrick (1982) tried to determine the relationship between executives' scanning activities and organizational strategies. A finding of that study was that competence, the ability to successfully navigate the competitive environment, was not based on the activity of scanning (sourcing of information) itself. Rather, competence was developed through inclination and ability to act upon information received about the external environment.

Choo (1993) conducted a study investigating how Canadian CEOs in the telecommunications industry acquire and use information about competitors to inform decision-making. He found two major elements affected the information use. First, the decision role fulfilled by the CEO (roles Choo labelled as negotiator, disturbance handler, resource allocator, entrepreneur) affected the CEO's reliance on CI. Second, that the perceived quality of the information source was more important to usage than the accessibility of the information or the environmental uncertainty.

In an analysis of decision-making research literature by De Dreu, Nijstad, and van Knippenberg (2008), the authors state that the cognitive information processes of group decision-making are driven by epistemic and social motivations. Their finding is that more positive decision-related interactions, such as accurate information sharing, are possible when two conditions are met. First, the members of the group are willing to expend effort to understand the problem and problem situation, and second, individuals within the group are concerned with achieving fairness and outcomes beneficial to the group rather than to self. However, these ideals are not always achieved. As March (1991) notes in his essay "How Decisions Happen in Organizations", individual egos can also affect information and decision-making when

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information overproduction is used to symbolize the 'ability and legitimacy' of decision makers. Cultural, social, and procedural issues present in organizations and individuals can negatively affect decision-making. Lovallo and Kahneman (2003) for example have warned that a superabundance of optimism can result in decision failures, independent of the information available.

It has been argued that the function of information in decision-making is to reduce uncertainty (Duncan, 1972). Uncertainty exists in decision-making when there is a set of probable outcomes from which to choose, but the probabilities of the outcomes' respective occurrences are unknown. Risk, in contrast, is when the probabilities of outcomes are known (Hansson, 2005). Studies of CEOs in telecommunications and publishing have found that executives are motivated by uncertainty to seek out information about their competitive environments and then use that information to inform decisions about business strategy and organizational change (Auster & Choo, 1994).

In a conceptual paper, March (1987) described information as a shaper of meaning in decision situations, changing both structures of the decision and preferences of the decision makers. He argues that 'good' information is not so much about the removal of uncertainty but rather about moving the group and 'apparatus' of decision-making in a productive direction, and is therefore significantly related to organizational interpretation and vision. March's position is obliquely supported by Bhardwaj's research (2000) into search processes for organizational decisions made with expectations of long-term outcomes. His research findings were that in search there is movement around an 'anchor' and movement of the anchor, where expectations and understanding change. Bhardwaj suggests that understanding this movement or change could require years or even decades of perspective in order for it to be understood.

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In a study of users of special library resources conducted by Marshall (1993) and the Special Library Association (SLA) in order to determine the impact of the materials produced by special librarians in law firms in the Toronto area, 84% of the 299 surveyed respondents stated that the information provided by special libraries (as represented by the materials produced) resulted in better informed decision-making. 54% stated that they had handled some aspect of decision-making differently as a result of receiving those materials, such as knowing whether to proceed to the next step in a task, deciding upon a course of action, or avoiding a poor choice.

In considering the role of information and how organizational processes might be best structured to support optimal decision-making, it must also be noted that some researchers argue that there is no real evidence that structured decision-making produces better outcomes than unstructured processes. In their study analyzing twelve cases of strategic choice, Harrison and Pelletier (1993) state there is no empirical evidence supporting the hypothesis that successful strategic outcomes hinge on structured decision-making environments. They go on to argue that real-life strategic decision-making is really about satisficing: flexible responses to dynamic conditions in which compromise must occur. In such a system, 'good enough' information will have to be taken where and when it can be found.

2.3.3.2 Understanding the role of CI in decision-making

Among intelligence analysts in the fields of covert and military intelligence, there is a strong belief, substantially supported by anecdotal evidence, that the accuracy, timing, and audience of intelligence significantly affects the outcomes, namely value, of intelligence itself. Their focus as a field of practice is to produce intelligence that is as accurate as possible, available at the moment it is required by a decision-maker. At the same time intelligence should be comprehensible to the recipient, however complex the materials from which the intelligence is

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developed (for examples of this practitioner perspective, see Clark, 2010; Moore, Krizan, & Moore, 2005).

This concept of intelligence, as a timed agent in formulating rational choice, stands in contrast to the perspective expressed in organizational decision-making literature. As described in the previous section, business information may or may not be available or accurate, information is used variously throughout a decision-making process that may be iterative or irrational, and decisions can wait upon the formulation of acceptable choices.

CI follows the covert and military intelligence model in that CI develops intelligence in response to needs or threats in the environment for the purpose of informing decision-makers in a given moment. Its development and use presupposes a rational model of decision-making. At the same time, CI is a business function. Unlike military contexts, for CI there may be time to wait upon solutions to appear, incomplete information may still be acceptably actionable, and interpretation and meaning can be retroactively discovered in fuzzy situations free of moral or political imperatives.

As discussed in earlier sections, the complex, strategic decision-making function is considered by many researchers to be where CI can be most useful to organizations (Herring, 1999; Bose, 2008). Executives however report two significant problems in conceptualizing strategic decision-making. First, it often involves high levels of uncertainty, even with CI products and processes present. Duncan's (1972) study of 22 decision groups, examining their uncertainty in relation to the organizational environment, found that the greatest uncertainty was present in dynamic-complex, opposed to static-simple, environments. His study participants indicated that their uncertainty was in their probability assessments – how sure they were that they had correctly calculated the probability of outcomes. Second, executives and managers may not make strategic decisions that actually support the organization's strategic objectives, due to

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either a problem visualizing the strategic plan, or disagreement within top management as to what the strategy is (Hambrick, 1982; Harrison & Pelletier, 1993). Therefore, it is critical that researchers investigating how CI deliverables inform decision-making carefully conceptualize and then operationalize the organizational decision-making process, both to inform research methodology and to ensure clarity of communication with subjects of the study.

2.3.4 In summary: Decision-making

This section on decision-making commenced with a short review of organizational decision-making models. It then reviewed definitions of decision-making rooted in process models, with a focus on strategic decision-making, as it is the type of decision-making where CI is considered to be most effective. Research into the relationship of information to decision-making was reviewed to potentially provide insight into research methodologies for investigation into CI and its relationship to decision-making.

Building on the literature reviewed in this section, most particularly Rolland (2004), who in turn based his work on Herbert Simon's research, a decision is defined as a three-stage process consisting of problem definition, problem conceptualization, and selection of what is believed to be the optimal choice. This model will be used because its simplicity and scope supports the research questions by identifying what elements (such as CI products) go into a decision. It should be noted here that the chief objection to using Simon's model is that although it is nearly identical in function to Rolland's model (Rolland's model makes the problem-solving aspects of decision-making slightly more explicit), the labels Simon used included 'intelligence' for the first problem definition stage. In the interests of clarity in research dealing with competitive intelligence, Rolland's model was chosen for the conceptual framework.

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This section of the literature review provides support for the following arguments. First, research into decision-making must be informed prior to data collection by the careful consideration of what decision-making model best suits the organization and particular information (intelligence) function to be studied. Second, organizational decision-making can be influenced by a variety of factors which must be accounted for when attempting to determine cause and effect relationships of decisions to their related outcomes. Finally, understanding decisions and their outcomes requires time and retrospect.

Although CI may be used in tactical or emergency decisions, decisions of most interest to this study are strategic decisions made in the past. Strategic decision-making involves an understanding of complex situations that is reported to be improved by use of CI products and monitoring of the competitive environment (Daft, Sormunen & Parks, 1988; Heinrichs & Lim, 2005), and novel choice situations that require effort-ful consideration of probabilities and outcomes, rather than programmed, intuitive response (Kahneman, 2003), which is more likely to be framed by formal decision-making processes and more likely to employ CI.

2.4 Intangibles Measurement

Following sections on CI and on decision-making, this section of the literature review starts off by identifying the purpose of measurement. It then reviews what measurement is, and distinguishes several closely related terms. The focus then narrows into the area of measurement of most interest for this research, intangibles measurement, and identifies outputs, outcomes, and impact as separate constructs. A summary is then given of intangibles measurement practices for fields where there is a concern to determine value by measuring the intangible outcomes of information services: knowledge management, intellectual capital, and library and information studies. This section on measurement practice in information services provides a counterpoint to

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the earlier section on intelligence measurement practice, for purposes of comparison and insight as to how CI recommendations and models of measurement might be evaluated. The section ends with a review of best practices and recommendations in the literature of intangibles measurement.

It is noted here that much of the measurement literature consists of conceptual articles. An explanation of this focus on conceptual work may be found in an article on practices in intangibles measurement: "an important function of measurement theory is to help us clarify what it is that we are talking about" (Bartholomew, 2010, p. 457). Discussion of measurement itself in the literature is typically abstract, summarizing and critiquing practices in measurement in order to clarify concepts and principles of measurement.

2.4.1 Defining measurement and its purpose

Measures may be required for one or more of several purposes, depending on the goal of measurement. Precise and verifiable statements make possible standardization, either of product or industry (Boyce, Meadow, & Kraft, 1994), or scholarly practice, enabling the advancement of research (Kankanhalli & Tan, 2004). Measurement can be used to improve employee behaviour (Flamholtz, 1980), and inform organizational change and growth (Brinkerhoff & Dressler, 1990). Measurement allows people to learn what works and what does not, by evaluating decisions and developing performance benchmarks (Kankanhalli & Tan, 2004). It also enables the collection of data to test hypotheses and theories (Carton & Hofer, 2006).

2.4.1.1 What is measurement?

Measurement describes and represents a phenomenon (Pike & Roos, 2004; Carton & Hofer, 2006) in the form of precise statements that others can understand and verify for themselves (Boyce, Meadow, & Kraft, 1994). Within the context of business performance,

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phenomena to be measured may be the outcomes that result from decision-making, which means that perception and context must be incorporated into the measure (Carton & Hofer, 2006).

Although descriptions of measurement and measures frequently take the form of numbers (for definitions and discussions of measurement in quantitative terms, see Bartholomew, 2010; Brinkerhoff & Dressler, 1990; Churchman, 1959), there are intangible constructs lacking physical properties that also require measurement, which are not numerically quantifiable. As a result, we need to conceptualize measurement in such a way that permits identification of phenomena that are only indirectly evident to the observer (Bartholomew, 2010; Viswanathan, 2010), ideally by assigning value to the attributes of the intangible to be measured (Carton & Hofer, 2006), otherwise termed its indicators.

Churchman (1959), a professor of business administration writing about measurement theory, tried to answer two questions: Why should measuring have this preferential status? What is it that measuring accomplishes that non-measuring does not? He concludes that specification and standardization make science possible. In describing what measurement does, he states that a would-be measurer must determine the answers to four questions before beginning actual measurement:

i. In what language he will express his results (language);
ii. To what objects and in what environments his results will apply (specification);
iii. How his results can be used (standardization); and
iv. How one can evaluate the use of the results (accuracy and control) (p. 85).

In Gorad's (2010) critique of social science measurement, he argues that social scientists need to spend more time thinking about pre-measurement steps and not rushing into using complex measurement tools. Although he uses very different language, both Gorad and Churchman are making the argument that measurement is more than just the use of a measurement tool; measurement requires thoughtful preparation in considering what is to be

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measured, how it will be measured, what tools will best accomplish the task, and how the results will be communicated.

In the same article, Gorad (2010) states that prerequisites of measurement include an observable and identifiable phenomenon; a measurement scale with a standard others can use; and an estimated margin of error for the measurement tool. It is possible to generate our own scales or tools of measurement. These measurement tools may (for example) use an ordinal scale. Suppes and Zinnes (1963), in their book chapter addressing theoretical questions of measurement, state that the primary problem of measurement is "…the problem of showing that any empirical relational system that purports to measure (by a simple number) a given property of the elements in the domain of the system is isomorphic (or possibly homomorphic) to an appropriately chosen numerical system" (p. 7).

In other words, if we are able to relate our developed ordinal scale measurement tool to other metrics or systems of representation that are accepted standards, we may develop what Suppes and Zinnes (1963) called "pointer measurement". Pointer measurement occurs when we have an assignment of value from a validated instrument that yields numerical values corresponding to a recognized numerical system, while providing a unique assignment of value.

2.4.1.2 Performance, evaluation, and assessment

There are three terms closely related to measurement that at times are treated as synonyms in casual usage: assessment, performance, and evaluation. Assessment is often used interchangeably in scholarly literature with measurement and evaluation (e.g., Orr, 1973).

Performance can be defined as a set of criteria critically applied to purposeful activity within organizations. Carton and Hofer (2006) in their handbook on measuring organizational performance called it a 'contextual concept' and a 'multi-dimensional construct' which "involves

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measurement of the effects of organizational actions" (p. 3). Performance varies by industry and sometimes organization, determining what results in relation to which situational values are 'good' or 'bad'.

'Benefit' and 'value' are two elements that help organizations measure performance. For this study, 'benefit' is a positive result causally linked to organizational activity and/or decision-making. 'Value' is related to internal perceptions of importance and usefulness, rooted for this study in perceived benefits of CI unit. Perceptions of value explored by this proposed research encompass both the tangible (How much money is invested in CI infrastructure?) and the intangible (How much respect is accorded to CI deliverables by internal clients of the CI unit?).

At times in scholarly literature the terms 'measurement' and 'evaluation' are not explicitly distinguished. In their use, however, it is clear that there is an implicit distinction. 'Measurement' is frequently used to refer to smaller-scale activity involving the use of measurement tools and the data collected. 'Evaluation' is frequently used to refer to larger scale, more reflective activity in which the measurement data is weighted within a larger context of organizational standards, to determine the value of the measured phenomenon against performance expectations (e.g., Delone & McLean, 2003; Flamholtz, 1980). In his conceptual paper proposing a framework of holistic measurement for library services, Nicholson (2004) distinguishes the two terms, supporting this implicit distinction. He states: "measurement produces data; however, evaluation creates information. The evaluation involves some method of judgment about the collected measures and metrics through some criteria. Judgment requires a viewpoint" (p. 502).

For this research, "evaluation" and "assessment" are considered to be interchangeable terms.

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2.4.2 Issues with intangibles measurement

Tangibles measurement, with its emphasis on quantitative measurement tools and easily perceived phenomena, is simply defined in many cases by counting. Intangibles measurement, on the other hand, presents challenges for representation and quantification of phenomena which may not be easily perceived with tactile senses. This lack of physical dimension presents specific challenges for would-be measurers, who acknowledge the value of intangibles such as 'innovation' to their organizations, and as a result, want to quantify them. This section reviews literature related to the measurement of intangibles, specifically as they relate to outcome and impact measurement.

2.4.2.1 Representing and quantifying intangibles

Intangibles typically cannot be seen or counted in the same way that tangible outputs of a system, such as boxes delivered, can be. As a result, as Bartholomew (2010) states in his essay on indirect measurement, intangibles typically require indirect measurement. Intangibles are usually represented by related indicators, selected from those things we can observe. Carton and Hofer (2006), in their handbook on measuring organizational performance, argue that the concept of 'performance' is just such an intangible construct, requiring the use of indicators in order for it to be measured.

The selection of intangibles for measurement, and their corresponding indicators, should relate in some way to the larger values and purposes of the organization, as suggested by Town (2011). In his article on library performance measurement, Town acknowledges the reality that such measures may be 'messy', but argues that evaluations should not rely solely on financial measures. Rather, performance measurement, to be valid, should be conducted with measures that fit within the context of those values systems intrinsic to library services. Town and

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Kyrillidou (2013) have subsequently proposed a 'library values scorecard' that would accompany a standard balanced scorecard in assessing library performance. This dual representation of library value, they argue, is a way to augment traditional business tools with representation of intangibles significant to the library's unique mandates. In this way, for example, library processes could be captured by the balanced scorecard, while 'library virtue' could be captured by the values scorecard. Although their prescriptive recommendation is intriguing, the authors acknowledge that the actual metrics with which such a scorecard could be populated requires further work.

The idea that business performance (and by extension, information services performance) should incorporate measures that go beyond simple dollar representations of value is not new, nor is it limited to libraries. A variety of proposals has been and still is being made as how best to represent intangibles key to organizational performance, in order to communicate with stakeholders, justify investment, and incentivize performance. In two examples, Allee (2000) has suggested that intellectual capital measurement needs to investigate ways to represent social and environmental success. Corona (2006), in doctoral research, investigated how a combination of financial and non-financial performance indicators could be used to help managers monitor investments.

Tools for the measurement of intangible indicators exist, for example in intellectual capital, which attempts to quantify the value of knowledge to an organization by assigning financial value to knowledge structures and employee competence in the organization (Sveiby, 1998). Criticisms and discussion of these tools persist, however, and evolutionary steps in measurement are proposed in the literature (e.g., Kannan & Aulbur, 2004; Pike & Roos, 2004). In a project attempting to investigate how intangibles might be better represented, The Brookings Institution asked Professor Baruch Lev at New York University to generate a report (Lev, 2001)

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as to how rules of accounting and financial disclosure might be adapted to provide better information regarding intangibles. In his report, Lev argues that intangible assets may be defined, but they cannot be measured precisely. He attributes much of the current failure to represent (measure) intangibles to the 'accounting' mindset prevalent in corporations. In this perspective, a dollar value is the default, and that which cannot be assigned a dollar value on the corporate balance sheet is ignored.

2.4.2.2 Outcome, output, and impact measurement

It has been suggested in the knowledge management measurement literature that outputs are a smaller, project-level result of an initiative or action, while outcomes are related to larger-scale issues that affect the organization as a whole (Department of the Navy Chief Information Officer, 2001). In CI measurement articles by Buchda (2007) and Davison (2000), outputs are described as both tangible and the immediately visible results of a CI unit's activities, such as CI product development and use, and the intangible long-term results such as fulfilment of an objective. In their case study, Pirttimäki, Lönnqvist, and Karjaluoto (2006) more clearly distinguish outputs from other results of intelligence services, describing outputs as assignments completed and user satisfaction, which produce in turn intangible "effects" such as improved decision-making, that may then lead to financial consequences for an organization. There is disagreement in the literature as to what outputs and outcomes are, and how they differ from each other and other concepts such as 'effect'.

Boyce, Meadow, and Kraft's text (1994) on measurement in the information sciences distinguishes outputs and outcomes. They conceptualize outcomes building on outputs over time, outputs being the more tangible and immediately observable results, stating: "Outcomes are the

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results of a system's operations. Desirable outcomes are really the broad goals or objectives for which the system was created...Outcomes are generally not tangible" (p. 242).

Arguments have been made for relating performance metrics to organizational goals and strategy in order to identify and quantify success in library science (Orr, 1973), intellectual capital (Joia, 2000), and competitive intelligence (Herring, 1996). DeLone and McLean (1992) analysed 180 conceptual and empirical studies in the field of information systems management to develop a measurement framework that could aid in identifying what they called the 'dependent variable' – information system success. Based on this study, they proposed an information system success taxonomy consisting of six categories: System Quality (technical level), Information Quality (semantic level), Use, User Satisfaction, Individual Impact, and Organizational Impact. This taxonomy has not remained static: the category of Service Quality was later added, and the Individual Impact and Organizational Impact categories were collapsed into the single category of Net Benefits (DeLone & McLean, 2003). However, their use of the term 'impact' in their original paper to describe intangible effects that, in the context of organizational values and purpose, can determine larger-scale organizational success has been echoed by LIS scholars such as Poll and Payne (2006), and Town (2011), although Poll (2012) in a later article substituted 'outcome' for the effects of outputs upon an organization, and reserved the term 'impact' for individuals and groups of people in contact with library services. Her later definition is echoed by other scholars, such as Williams, Wavell, Baxter, MacLennan, and Jobson (2005) in their study assessing the need for impact evaluation in the library, museum, and archives sector. They defined impact as "...the overall change in state, attitude, or behaviour of an individual or group after engagement with the service output" (p. 534). These variations demonstrate that definitions of impact and outcome are nebulous, vague, and can depend very

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much on the perceived need of the stakeholder. This holds implications for developing common conceptualizations of outcome and impact measurement.

From an organizational perspective, however, and for this research, if we conceptualize outputs, outcomes, and impact as results stemming from a decision and building upon one another over time, they can be distinguished from one another, as seen in the following figure:

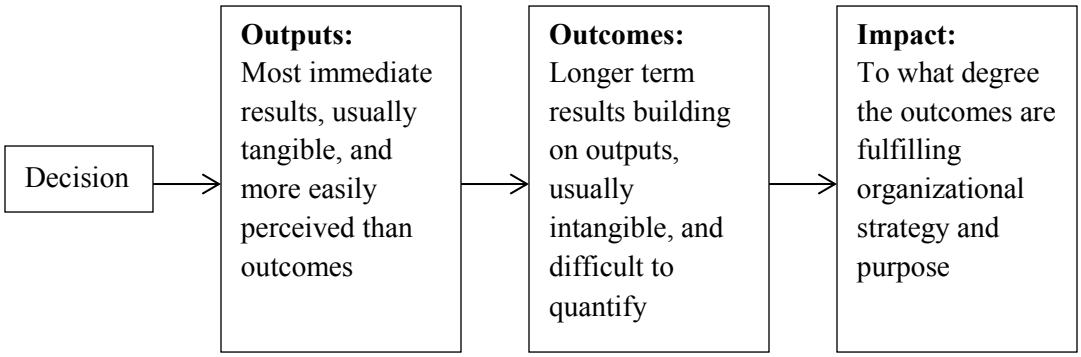

Figure 2: Differentiating between outputs, outcomes, and impacts

There are two significant challenges to measuring outcomes and impact described in the literature. One is the amount of time necessary to allow outcomes to develop and therefore impact to be determined. In his research investigating measurement of information technology value over time, Goh (2007) suggested that six months to two years were necessary for outcomes, what he called 'value effects', to be manifested.

The second challenge is identifying and then isolating influences and concurrent affective actions that may alter the outcome to be measured. In their review of impact measures for libraries and information services, Poll and Payne (2006) suggest that this problem could be partially addressed by developing benchmarking between institutions.

Another approach addressing these methodological difficulties involves a complex system of categories. Vuolle (2011) conducted field research investigating how mobile services affected business performance for organizations such as taxi services. She selected performance

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measurement tools by analyzing contextual factors, identifying and choosing performance impacts to be measured (employee, structural, relational, and monetary), and then defining performance measures (direct/indirect, and objective/subjective). Vuolle then developed a measurement tool for quantifying what she termed 'performance impact', determining from her research that the intangible consequences of investments in mobile services should be categorized for measurement as: potential/realized; expected/unplanned; tangible/intangible; and instant/long term, while measures used should be context (industry) specific. By such a detailed accounting of influences affecting, and manifestations of, the outcomes, a careful researcher may be able to isolate and represent a specific outcome more accurately, but without any guarantee of precision; note that Poll and Payne considered this approach 'nearly impossible' (2006, p. 560).

In evaluating impact, whether it is of a knowledge management solution or of CI, the outcomes need to be valued in the context of larger organizational goals. For their one-year research study with a multinational corporation in order to determine performance indicators for knowledge management, Del-Rey-Chamorro, Roy, van Wegen, and Steele (2003) created an 8-step framework to identify inputs and outputs, where outputs are identified by attributes, measurable actions, performance indicators, etc. The purpose of the framework is to then assess the contribution of a given KM solution against the organization's objectives. Such a comparison provides a valuable benchmark against which to identify the value of investment in information or intelligence services.

Dalkir and McIntyre (2011) suggest a result-based management accountability framework (RMAF) approach to intelligence evaluation research. They aligned their measurement tools with assets of strategic importance to the organization, and use indicators specific to the knowledge or intelligence initiative to collect quantitative, qualitative, and anecdotal data. While the focus of their research is slightly different from this research, which

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focuses on identifying the value of one specific factor (CI) in decision-making, rather than the value of the decision result, their approach is consistent with the conceptualizations given here regarding the time lapse between outcomes and outputs, and acknowledges the need for both subjective and objective data in order to understand the decision-making process.

2.4.2.3 Perspectives, practices, and problems of intangibles measurement

Information services of all kinds are concerned with proving the value of intangible, beneficial outcomes they produce. A high-level summary of the intangibles measurement discussion in knowledge management, intellectual capital, and library and information studies, as fields concerned with information services and intangibles representation to stakeholders, will be provided here in order to contextualize and inform conclusions about best practices in conceptualizing and approaching competitive intelligence measurement.

The intangibles measurement discussions within the three fields identified for review reveal in their respective literatures very different subtexts of purpose and expectation around measurement activities. These three perspectives are briefly summarized here.

In Knowledge Management (KM), the measurement priority is usually to determine if the knowledge is being shared and used (Bouthillier & Shearer, 2002; Darroch, 2003), addressing tensions between tacit and explicit knowledge. For example, the priority in measuring the performance of information system technology is to determine if it is being used and the contents are being disseminated (Delone & McLean, 2003). Liebowitz and Suen (2000) criticize business measurement tools currently used within organizations to quantify returns on investment in their review of a KPMG business performance evaluation tool. They state that many business performance metrics do not target the most valuable types of organizational knowledge, and that

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the metrics are based on questionable assumptions and biases. They offer the example of 'young employees' being mistaken as a synonym for an organization's vitality and innovativeness.

In contrast, in the literature of Intellectual Capital, intangibles are assets. Measurement is typically perceived as an activity that results in assets being represented on balance sheets, to inform stakeholders (see, for example, Dumay, 2009). In both IC and KM there are often presented strong arguments for relating success to organizational objectives (e.g., Del-Rey-Chamorro, Roy, van Wegen, & Steele, 2003; Joia, 2000). Although there are movements to non-financial performance indicators, this has been generally informed by an accounting-based philosophy with a reliance on scorecard and benchmarking approaches (Bontis, 2001; Kankanhalli & Tan, 2004).

Library and Information Studies offers a different approach to measuring the value of information and intangibles. There have been two 'streams' of measurement in the field, what Orr (1973) defined as 'effectiveness' and 'benefit'. These two terms in the context of this literature review could equally well be re-labelled 'process' and 'outcomes and impact', with the latter, once dominated by the former, now taking a more equal role. The need for libraries to justify their existence to taxpayers is pushing LIS academics and professionals to go beyond process measures (e.g., circulation statistics) to ask more profound questions about the role and purpose of libraries in society and how to measure success within that context, such as the work done by Poll (2012) and her team in developing ISO standards to represent the influence of libraries upon end users and within society.

The notion of 'impact' as a representation of value linked to end user outcomes is also promoted in a recently published literature review and report containing value measurement recommendations for academic libraries (Association of College and Research Libraries, 2010). The report reviews research studies investigating the economic, social, and student learning

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impact of libraries in order to set an agenda for measurement and value research in academic libraries that will identify ways to demonstrate frequently intangible contributions toward institutional goals, such as institutional ranking. One of the first 'next steps' identified in that report is for librarians to consider the formulation of outcome measures, framed within organizational goals, as a necessity for demonstrating the value of library services to organizations.

There is a critical scholarly narrative regarding intangibles measurement for KM, IC, and LIS, which can be summarized as follows:

1. A proliferation of recommended measures exist in the literature that are inadequately tested (Kankanhalli & Tan, 2004; O'Raghallaigh, Sammon, & Murphy, 2012);
2. Conceptual disagreement and problems are leading to measurement confusion and error (Bontis, 2001; Liebowitz & Suen, 2000; Palacios & Galván, 2007);
3. More research, specifically field research, is needed to develop better standards of measurement (Bontis, 2001; Kankanhalli & Tan, 2004);
4. Measurement of outcomes requires a lapse of time for them to manifest (Goh, 2007);
5. Measurement in practice does not follow measurement theory strictures and tenets (Pike & Roos, 2004; Flamholtz, 1980);
6. Those who need to measure are unaware of measures and how to use them effectively (Bontis, 2001; Churchill, 1979); and
7. An argument is made that there cannot be a standard set of measures for the field, due to issues of context and culture (Allee, 2000; Poll, 2012).

An additional significant methodological issue raised in this literature is the time required by the researcher. In her article reviewing directions in impact measurement for libraries, Poll (2012) states that because impact measures that prove impact rely heavily on quantitative research methods, the result is a considerable expenditure of time and effort on the part of the researcher/ measurer.

A comparison of this summary with the challenges to CI measurement, and the calls for research in the CI measurement literature, will demonstrate close parallels. The measurement challenges in CI research and practice held in common with KM, IC, and LIS potentially indicate

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that problems of measurement are related to the understanding and practice of measurement itself within the social sciences as a whole, as argued by Gorad (2010), and are not isolated to any particular research field.

2.4.3 Characteristics of effective measurement

What are the best practices in measurement? What makes measurement effective? This section reviews the characteristics of effective measurement, as described by scholars in KM, IC, LIS, and the social sciences generally. Much of this discussion revolves around the need for careful preparation with pre-measurement steps, namely to understand the purpose of the measurement, what constructs are being used, what indicators or attributes will be measured, and which measurement tools are best suited to measuring the indicators for the given purpose – thereby ensuring reliability and validity.

Measurement perspective can vary. In just a sampling of the literature already reviewed in previous sections, measurement purpose can be examined from the perspective of large-scale, even national or industrial, identity and strategy (Allee, 2000), the context of a single system's usefulness within an organization (DeLone & McLean, 2003), altering employee behavior (Flamholtz, 1980), or demonstrating value to stakeholders (Poll & Payne, 2006). The researcher would argue that although it is not explicitly stated in the articles reviewed here, the very first step needful for effective measurement is to understand the purpose of the measuring, namely, to answer two questions: who is the audience for this measurement data, and to what use will it be put?

Understanding this purpose then provides the necessary context, or perspective, to identify constructs. Viswanathan (2010) writes in his article on measurement in the social sciences that scholars need to be sure they first understand the concepts, or constructs, they are

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trying to measure. Good research, according to Viswanathan, requires that the scholar first develop conceptual and operational definitions of the construct prior to selection of measurement tools. The article by Orr (1973) on the goodness of library services is an example of this preliminary consideration of constructs. In that article he critically evaluates the primitives (constructs) of quality and value, and then building on those primitives provides a framework for consideration of various quantitative measurement tools.

A significant part of the conceptual/operational definitions of constructs is identifying the indicators relevant to that construct. Carton and Hofer (2006) in their text on organizational performance measurement describe the criteria for indicators. They state that the selected indicators (what they term 'attributes') must be stable over time, generalizable, and should facilitate identification or real-world observations. They also state that these indicators should be measured accurately; however, other authors have suggested that a known margin of error may be acceptable when accuracy is not possible (Gorad, 2010). In addition, the interrelationships of carefully selected indicators around a given construct, when examined, may increase the accuracy with which the construct is measured as its dimensions are more fully described (DeLone & McLean, 2003). In identifying these indicators there is a need for what Gorad termed 'explicitness', or the ability of the researcher to distinguish between or separate things to be measured; Carton and Hofer (2006) termed this 'precision'.

Once the construct is defined and its related indicators identified, measurement tools need to be selected. Measurement tools should be reliable: the results can be reproduced under similar circumstances. They should also be valid: the tools produce the data they are supposed to produce. In the articles reviewed here in this section, authors have given other criteria. Orr (1973) states, for example, that measures should also be appropriate, informative, and practical. Brinkerhoff and Dressler (1990) in their guide to productivity measurement state that effective

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measures must be related to and contextualized by organizational goals. These discussions above and beyond the criteria of reliability and validity, however, typically relate back to the purpose of the measurement and can be viewed as a discussion about turning data into information for specific audiences while meeting organizational constraints such as budget or time.

One element of measurement effectiveness that transcends audience or purpose, however, is turning 'measurement' into 'metrics': where a single measurement tool becomes instead a suite of tools which in combination provide a more robust, multi-faceted view of the phenomenon to be measured. This recommendation is phrased in a variety of ways. Nicholson (2004) calls for 'holistic, multi-perspective' measurement, while Boyce, Meadow, and Kraft (1994) call for 'composite' measures, and Churchill (1974) calls for 'multi-trait multi-method', stating:

> A fundamental principle in science is that any particular construct or trait should be measurable by at least two, and preferably more, different methods. Otherwise the researcher has no way of knowing whether the trait is anything but an artifact of the measurement procedure. (p. 70)

In brief, effective measurement of an intangible as presented in the literatures of KM, IC, and LIS requires pre-measurement steps in which the purpose of the measurement is considered, the construct is defined, and the indicators of the construct are selected. Measurement tools are then chosen to meet the requirements of reliability and validity, and any contextual needs such as simplicity or other practical considerations. A careful combination of measurement tools, or 'metrics', is essential to ensure that findings of a given tool are not an artefact of measurement itself.

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2.4.4 In summary: Intangibles measurement and the CI measurement literature

The discourse on intangibles measurement within KM, IC, LIS, and the social sciences generally indicates that the problems of measurement cited in the CI measurement literature are not unique to CI. Scholars criticize an abundance of untested measures and their problematic conceptualization and use. Yet the CI literature suggests that measurement cannot be standardized across industries (e.g., Kilmetz & Bridge, 1999; Lönnqvist & Pirttimäki, 2006; Rothberg & Erickson, 2005), although some standardization is necessary if there are to be validated measures and conceptual consistency.

This review of measurement literature outside of CI indicates that although there is a strong demand for financial indicators, more organizations are becoming open to non-financial performance indicators, as recognition grows for the effect intangibles can have upon an organization's financial performance. A corresponding need to quantify such intangibles for the purpose of managing them has led to tools such as the IC-Index and the Balanced Scorecard approach. Since the measurement of intangibles typically requires indirect measurement and the use of indicators, there are justified concerns as to the accuracy of such measures and how to represent intangibles to stakeholders when the assignment of a dollar value is not feasible.

The measurement literature indicates that most of the problems related to identification, representation, and quantification of intangibles can be tackled with careful consideration and selection of purpose, constructs, indicators, and tools. The CI literature indicates that there is a need for more research to determine first, what relation CI has to decision outcomes, and therefore how concepts of value, performance, and impact should be constructed, and second, what prescriptive models presented in the CI literature actually work well within organizational contexts. The larger measurement literature presented here, with its description of best practices

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and measurement theory, provides insight as to how such prescriptive models might be evaluated.

2.5 Conclusion

Building on the literature review provided, in conclusion this section distils the literature review into a conceptual framework for the proposed study, and describes how the study responds to calls in the literature. The conceptual framework consists of several elements: the indicators; the framing of CI as an input, and selected definitions of outcomes and impact; and the organizational decision-making model to be used. In this section, a diagram is presented which provides a visual aid to understanding the various elements of the conceptual framework. The focus of measurement for this study is also reviewed.

2.5.1 The conceptual model

The model presented here provides a visual to describe the conceptual framework. Here the first stage of organizational decision-making, the problem definition, leads to problem conceptualization, in which CI is one input among potentially many. The organizational decision-making process terminates with a selection from an array of possible actions.

Subsequent to the selection and ensuing activity, outputs begin to appear, followed in time by more intangible outcomes. These outcomes in turn impact the organization, either leading it to fulfilment of or divergence from the organization's strategic plan.

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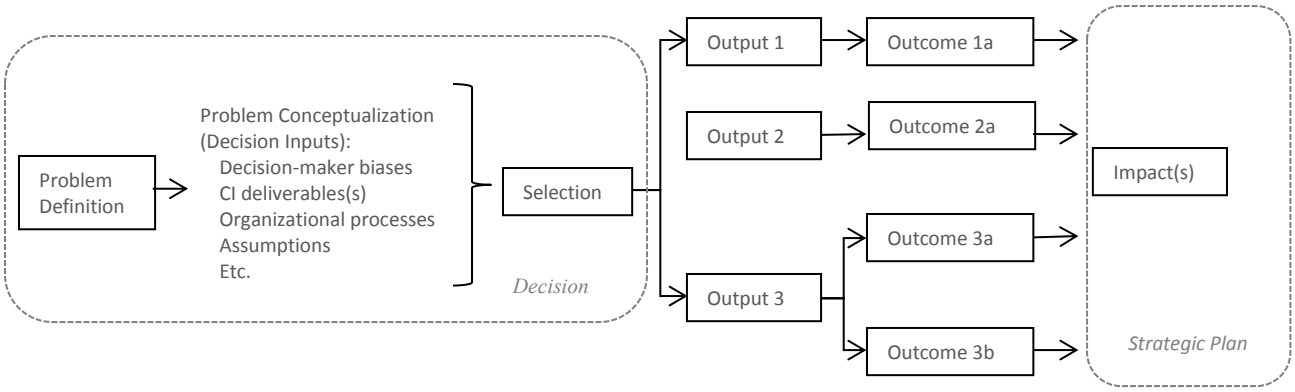

Figure 3: A model of the conceptual framework for the study

Following the recommendations made by Calof and Wright (2008) for scholars to build measurement models by examining smaller components of the CI cycle, the purpose of measurement in this research is to quantify impact and the outcomes that produce impact. To this end, the research will examine decisions influenced by CI, to determine whether CI truly improved the decision-making process.

In the proposed model, a 'good' measure becomes one that allows time for impact to manifest, accounts for the role of CI in decision-making, and relates CI to organizational strategy. Indicators (finances, innovation, and client relationships) of value or benefit can then be traced through tangible outputs in multiple dimensions of the organization. Based on Rolland's research (2004) a decision is defined as the completed three stage process of decision-making. As discussed in the literature review section for strategic decision-making, the decision type of most interest to the study is strategic decisions, with the purpose of the study to investigate the role of CI within the process of organizational decision-making.

This conceptualization of 'a good measure' is progressively built upon through the experts study and then the users study.

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2.5.2 Indicators

Scholars and practitioners have stated in the literature, when describing the problems of CI measurement, that industries and organizations are too diverse to permit the creation of one standard measure (Kilmetz & Bridge, 1999; Lönnqvist & Pirttimäki, 2006; Rothberg & Erickson, 2005). A potential implication of the research methodology proposed here is that if we conceptualize the primary value of CI as being improved strategic decision-making, and select indicators of decision-making effectiveness that address both the tangible immediate outputs of a decision, and the longer-term intangible outcomes of the decision, a basic, more generic model of measurement could be developed that would be applicable across multiple organizations and industries. For this research, this methodology will provide a way for the researcher to obtain evidence of CI value.

As noted in the literature review, many, but not all, proposed (desired) indicators of CI performance come under the headings of finances, innovation, and improved customer relationships. The researcher has hypothesized that these three indicators could function as a generic baseline for measurement. Although disparate organizations may have diverse needs in measurement, these three indicators are valuable and common to most. Furthermore, the testing of proposed measurement recommendations and the subsequent formulation of best practice in the field, namely, the maturation of CI measurement, requires that some consensus be formed around common constructs of what are expected and beneficial CI outcomes.

For this study, 'innovation' is defined as new products and new services. 'Client relationships' refers to the relationships of both internal and external clients. 'Finances' means cost avoidance, revenue generation, stock value, and cost savings. In the users study, the participant responses in identifying the value or benefits of CI to their respective organizations

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will be analysed to determine if such common indicators of value and benefit exist within the data set.

2.5.3 Inputs, outputs, outcomes, and impact

Although CI is a term that encompasses both process and product, for this study it will be operationalized as a product, which purpose is to bring value to the organization through reduced uncertainty and improved outcomes, by informing decision-making. As a product, it is conceptualized as one of potentially several inputs into the decision-making process.

In the model proposed here, borrowing the definition of Boyce, Meadow, and Kraft (1994), inputs such as CI, biases, and assumptions are inputs into the organizational decision-making process. Results then emerge from the decision. Outcomes build on outputs, outputs being the more tangible and immediately observable results of CI use in the decision-making process. The table below provides a sample of how outcomes can be identified, and defined, by outputs.

Outcome	Output
Marketability	New external clients
	Improved relationships with external clients (client retention, satisfaction)
	Increased use of organizational products and services by external clients (sales)
Receptivity	Improved satisfaction of internal clients
	Increased use of CI products by internal clients
Innovativeness	New product development
	New service development
	New solutions to problems related to products or services
Financial health	Cost avoidance
	Cost savings
	Revenue generated (sales/profits)
	Increased stock value

Table 1: Outcomes and outputs of CI

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This operational definition of outputs and outcomes will allow the researcher to identify, if possible, elements needed for the 'good', multi-dimensional CI measurement suggested by Blenkhorn and Fleisher (2007), for which tangible/intangible, qualitative/quantitative, subjective/objective data can be collected.

Impact is conceptualized as the intangible and longer-term effects which are related to an organization's fulfilment of its strategic plan (Poll & Payne, 2006).

2.5.4 Filling the gap in the literature

There have been calls for research to investigate the purportedly beneficial role of CI in decision-making (see Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004), but this has not yet been done. This is due to considerable challenges, both conceptual and methodological, not least of which is the need of time and retrospect to see results of decisions, and the subjective nature of decision-making. Some CI measurement tools and approaches have been suggested in the literature to examine outcomes, but these have generally been prescriptive and rooted in performance measures developed by other fields (e.g., Kujansivu & Lönnqvist, 2009; McGonagle & Vella, 2002; Davison, 2000).

Meanwhile in the literature there are significant assumptions being made about intelligence benefits that are unsubstantiated by research (Lönnqvist & Pirttimäki, 2006), partly because there is a lack of research-based evidence. Scholars interested in determining the value of CI have made calls for empirical data (Hughes, 2005), a more diverse use of research methods including fieldwork (Wright & Calof, 2006), and investigations into user perspectives (Ganesh, Miree, & Prescott, 2004), so that measures of competitive intelligence outcomes might be developed (Marin & Poulter, 2004).

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The purpose of this chapter has been to highlight certain calls in CI measurement research, and in doing so, illuminate the rationale behind the proposed research questions and methodology by describing the issues related to operational definitions of decision-making, and best practices in intangibles measurement.

The significance of this exploratory and qualitative research study described in this thesis is that it uses non-survey methods, instead relying on interviews and negotiated texts, to explore constructs of CI value and measurement in a comparative discussion. This comparative discussion and the data gathered from study participants regarding how CI is used, valued, and measured in organizations will then provide a framework within which prescriptive metrics of CI impact are assessed for function and value.

This research not only provides valuable data and insight into the outcomes of intelligence, thereby filling a gap in the literature, but also responds to calls of CI practitioners for advancements in CI measurement (Hannula & Pirttimaki, 2003; Qingjiu & Prescott, 2000). It is anticipated that for the fields of information studies and intelligence, this study will provide some evidence to answer questions regarding the value of information services, and whether intelligence services make a difference to organizations.

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Chapter 3: Methodology

3.1 Introduction

As discussed in the literature review, the research questions for this study were developed in response to multiple calls for research to investigate how CI performance can be measured, taking into account that the primary value of CI is in how well it informs decision-making (Sawka, in Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004). This chapter describes the research design developed in response to those calls for research and the research questions, along with the objectives, the methodology and its rationale, the data collection, and data analyses for this two-part research study.

Intelligence measurement is a field that has historically been dominated by prescriptive measurement models and unique accounts of measurement practice (Blenkhorn & Fleischer, 2007; Ganesh, Miree, & Prescott, 2004; Hastedt, 1991; Turner, 1991). Disagreement between authors as to the beneficial outcomes of intelligence, as described in the literature review, along with variations in terminology and definitions generate additional complexities. Given this lack of clarity, this qualitative, exploratory research study was designed to have two parts.

The first part is a study developed to obtain the perceptions and input of intelligence experts, who were asked to discuss with the researcher their perceptions of, and practices in, intelligence measurement. These experts provided insight and commentary for the conceptual framework of this study, and informed the design for the second part of the study, which is an examination of CI users. The CI users in the second study provided descriptions of CI use within their organizational decision-making processes, anticipated benefits of CI use, and CI measurement practices. These two studies are described below.

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3.2 Research Design

The research design was developed to respond not only to conceptual inconsistencies in the CI literature and calls for investigation into how measurement might capture the value of CI in relation to decision-making, as described above, but also calls for research methodologies other than surveys, which have been historically relied upon in CI research (Hughes, 2005), and criticisms regarding the lack of research from the user, rather than the practitioner, perspective (Ganesh, Miree, & Prescott, 2004).

In response to those calls the researcher chose to do an exploratory and qualitative study using semi-structured individual interviews and shared negotiated texts as the data collection methods with intelligence experts and users of competitive intelligence. There were three objectives for this research design. First, the researcher sought to clarify ambiguous concepts in intelligence services literature specifically related to measurement of intelligence outcomes and impact. Given this objective, the study with the experts was identified as a first exploratory step. Given the lack of research into the use of CI, the second objective was to determine from users of CI the role of CI in organizational decision-making, in order to better clarify the purpose and value of CI within organizations. The third objective was to obtain from intelligence experts and CI users insight into which measurement criteria should be met by ideal measurement tools, in order to evaluate prescriptive CI measures in the literature as a step toward establishing best practices.

The limited amount of research in the area of intelligence measurement and the need to investigate the subjective and cognitive experiences of decision-making mandated a qualitative approach to the research questions, which allowed the researcher to question and investigate the assumptions that can be implicit in a survey method. Interviews allowed the researcher to

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explore multiple, potentially overlooked, perspectives and practices by eliciting descriptions of practice from intelligence experts and CI users. Interviews as a method also had the benefit of circumventing problems such as confidentiality issues for CI users, access, and time and availability of participants, many of whom had difficulty finding time for an interview.

The original plan for this research was to follow the experts study with a case study of an organization, analyzing organizational decisions that involved CI use. During the recruitment period significant difficulties arose, related to both organizational sensitivity around confidential CI activities, and concerns for the time requested with senior management in order to conduct the detailed decision analyses. The difficulties of interviewing 'elites' in terms of access and time, and the need for creativity on the part of the researcher in establishing contact and adapting to the needs of executives, are well documented (e.g., Marshall & Rossman, 2006; Thomas, 1993). As a result, the research methodology presented here using interviews and shared texts with users of CI from a variety of organizations, was adopted. This revised methodology, interviewing individual senior managers from a variety of organizations outside of their workplaces, took into account the limited time of executives and side-stepped the difficulties of securing organizational access.

Post-interview, shared negotiated texts replaced more traditional transcription and coding of the interviews in this research design. Shared negotiated texts are rooted in the pragmatic concept of 'negotiated order', in which the people belonging to organizations negotiate and adjust a shared idea of truth (Parsons, 2010). This technique, a process of sharing and editing texts between parties in order to achieve consensus, is relied upon in negotiation and collaborative decision-making (e.g., Raiffa, Richardson, & Metcalfe, 2002) but may be adapted for use in qualitative research, recognizing that interviews as a research methodology are about negotiating meaning (Fontana & Frey, 2000).

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Shared negotiated texts were used for several reasons. For the researcher, the primary concern was to obtain as accurate a description as possible of the participants' experiences and views. Yin (1994) has recommended that researchers have participants in qualitative studies check the researcher's accuracy and comprehension of the subjective evaluations they provide. These shared texts were a way whereby the interviewer and interviewee could (hopefully) reach a greater shared understanding.

For the experts, who agreed to be quoted under their own names, the shared negotiated text was a way to ensure that they were comfortable with answering questions, and therefore more frank, knowing that there would be an opportunity for them to correct any misapprehensions or misstatements prior to data analysis and publication. For the users, who frequently expressed anxiety about confidentiality, a shared text was a way to provide reassurance and an opportunity for the participants to remove any item or statement that they considered to be sensitive in nature.

Finally, another benefit of the shared negotiated texts is that as the researcher compared disparate interviews, looking for commonalities, she had an opportunity to re-frame responses in a way that amplified subtext without distorting the descriptions provided. The researcher believes that the negotiated shared text method, specifically for this study and for these research questions, provided greater accuracy, reliability, and completeness than transcription and coding.

To simplify and make more comprehensible how the data collected with this research design answers the research questions, the following table has been provided:

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Research question	How the research question is addressed
1. How, when, and by whom is CI used as an input into organizational decision-making?	The users study participants provide descriptions of where CI is sourced; their organizational decision-making process; and how, under what circumstances, and by whom CI is used in that process.
2. When CI is used, what are the perceived organizational outcomes or benefits?	Users study participants describe from their experiences how CI has benefited, resulted in improved outcomes, or otherwise positively impacted their organizations.
3. In light of organizational constraints, which measurement methods identified in the literature are most appropriate for use in determining CI outcome and impact?	CI users describe measurement practice, perceived benefit and impact, and needs for CI. The expert and user studies jointly generate criteria for assessing prescriptive models of outcome-based performance (impact) measurement.

Table 2: Research Questions and Data Collection

3.3 Participant selection and recruitment

3.3.1 Experts study selection and recruitment

The researcher conducted a field study in the summer of 2012, interviewing 5 intelligence experts working in Finland, the UK, and the US. For this study, since the participants had all spoken publicly and/or published regarding intelligence measurement, they agreed to permit the researcher to use their names in reporting on the study findings, with the understanding that the shared negotiated text developed post-interview would be the source of data for analysis, and not the interview recordings. The findings of this study informed the development of the conceptual framework, the research method, and data collection tools for the subsequent users study.

'Experts' were defined as scholars and practitioners in any field of intelligence (competitive, business, military) who have presented or published regarding intelligence measures, and/or have used intelligence measures in practice. A population of experts was identified from the literature and approximately 20 were identified. Selection criteria were that at

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least three different intelligence fields were represented by participants; academics and practitioners would be included; and at least two countries would be represented by participants. These selection criteria were developed in order to first, mirror the broad range of intelligence measurement literature which prompted the research questions; and second, to provide opportunity for a range of divergent opinions, in the belief that where or if those opinions converged, it might provide insight into potential areas of consensus.

Potential study participants were identified through publications and conferences. More than those who agreed to participate were approached for inclusion in the study however the challenges of time and access prohibited some from participation. All participants agreed to have their names published in this study, as authors and presenters of research and/or practice in the field of intelligence and measurement. The five participants were:

- Professor Antti Lönnqvist, Department of Information Management and Logistics, Tampere University of Technology, Finland
- Dr. Sheila Wright, Leicester Business School, De Montfort University, UK
- Mr. Andrew Beurschgens, Head, Market and Competitive Intelligence at a large UK mobile telecommunications firm; Board Member for the UK Competitive Intelligence Forum (UKCIF)
- Dr. Stephen Marrin, Centre for Intelligence and Security Studies, Department of Politics and History, Brunel University, UK
- Dr. John Kringen, Researcher at the Institute of Defense Analyses; formerly of the US European Command and the US Central Intelligence Agency

Face-to-face semi-structured interviews were conducted. Each participant agreed to an in-depth interview lasting approximately one hour, followed by discussion and review of the shared negotiated text. Each expert provided an intense review of his/her own measurement practices and conceptualizations. As a result, the findings for each expert should be considered not so much a representative of a population, but rather an in-depth representation of their own practice in order to meet the purposes of this study, which were to obtain critical review of the conceptual

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model, insight into the design of the second phase of the research, and to have scholars, authors, and educators of intelligence measurement elaborate upon materials found in the literature.

Participants were recruited with the recruitment email in Appendix A. In Finland, for example, the Tampere University of Technology has produced some recent graduates who did doctoral research in metrics for BI in conjunction with faculty. Of the four people approached for an interview, only one was available, Antti Lönnqvist, but he is the not only a faculty member at the school who has overseen this research, he is also a prolific researcher in this area in his own right. Sheila Wright and Stephen Marrin are equally well known in their respective academic fields. Participants when interviewed were also asked if they could refer the researcher to any other potential study participants.

3.3.2 Users study selection and recruitment

The researcher conducted interviews over the phone and face-to-face, interviewing 12 users of CI employed in senior management roles by 12 different companies in a range of industries. Participants were recruited and interviewed over the course of six weeks in the fall of 2013. For this study the researcher anonymized the names of the participants and their employers.

For the users study, all participants were required to meet the following two criteria:

1. Employed (or employed within the past year) in a senior management role at an organization; and
2. Uses CI to inform the fulfilment of job responsibilities.

Defining "senior management" was challenging. Job titles or income alone were not enough. For example, in this data set one participant has the title "Chief Operating Officer" and works in a 13-person family business; another participant has the title "Executive Director" and oversees roughly 2,000 employees. A set of criteria was identified. If participants met at least

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two of the four criteria listed below, for the purposes of this study they were considered to be "senior management":

1. Does the participant manage a budget?
2. Is the participant allowed to sign contracts on behalf of the organization?
3. Are there employees at the organization who report to the participant?
4. Is the participant involved in C-Suite meetings? (meetings involving the Chief Executive Officer, Chief Financial Officer, etc).

Participants were also required, as with the experts study, to speak fluent English. As a result, participants for the users study were recruited from developed English-speaking countries: Canada, Australia, and the United States.

The researcher recruited participants using previously established contacts in looking for the originally planned case study site, the LinkedIn networking site, personal and professional networks, and asking participants to recommend other potential candidates for the study. Since personal and professional networks were used, it was not always possible to initiate contact with participants through the recruitment email, found in Appendix D. However, when this was the case, that initial contact was immediately followed up by sending a copy of the recruitment email to the participant.

The final set of 12 participants had the following titles and areas of responsibility, and worked in the following industries:

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	Title	Area/Department	Industry
1	Integrated Systems Specialist	Sales	Pharmaceuticals
2	Regional Sales Manager	Sales	Renewable Energy
3	CEO	Executive	Finance
4	Senior Product Developer	Product Development	Software Development
5	Chief Compliance Officer	Legal	Marketing
6	Principal Advisor	Human Resources	Mining
7	Senior Product Manager	Product Development	Software Development
8	Senior Advisor	Business Development	Banking/Government
9	Chief Operating Officer	Executive	Recycling
10	Executive Director	Executive	Health/Government
11	Vice President	Executive	Charitable Nonprofit
12	Senior Director	Finance	Food/Manufacturing

Table 3: Users study Participant Data Set

The researcher originally anticipated recruiting between 10 to 15 participants. Guest, Bunce, and Johnson (2006) found in their analysis of research interviews that for well-designed qualitative research, 12 participants generally provide saturation. By the tenth interview, saturation was becoming apparent, as a typology of CI sourcing practices began to emerge from the data. In addition, descriptions of organizational decision-making practices and responses to questions were becoming familiar. Another two interviews were conducted, and in those two interviews nothing was described that had not been previously described by another, earlier, participant. Therefore at twelve participants the researcher concluded recruitment for the study, in the belief that a representative (not necessarily an exhaustive) range of practices had been obtained for analysis.

3.4 Instrumentation

Instrumentation for the experts study, which can be found in appendices A to C, consists of:

1. Invitation email;

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2. Interview guide; and
3. Informed consent form.

Instrumentation for the users study, which can be found in appendices D through F, consists of:

1. Recruitment email;
2. Interview guide; and
3. Informed consent form.

The questions in both interview guides were framed keeping in mind the recommendations made by Carroll and Johnson (1990) for interviews:

- Phrase questions in a logical way that aids recall;
- Clarify purpose and use of the data collected to motivate truthfulness rather than helpfulness;
- Provide interview situations that avoid distraction; and
- Avoid eliciting bias as possible.

The experts study interview guide was reviewed by the researcher's adviser at McGill's School of Information Studies for logic, flow, and comprehension, prior to use. The extremely small pool of intelligence measurement experts meant that it was not feasible to pilot test the interview guide. The users study interview guide questions were, however, pre-tested in two interviews with people who had previous work experiences in receiving and observing the use of CI. These two participants, colleagues of the researcher, checked for logic, flow, validity, and comprehensiveness of the questions, as well as timing of the interview.

One finding from the experts study that affected the users study was that participants variously conceptualized the purpose and therefore the value and function of intelligence, while agreeing that the purpose of intelligence is to improve decision outcomes. In order to try and explore potential variations in the conceptualization of CI in the users study, which the findings of the experts study indicated was necessary, the researcher determined to provide for four perspectives on the function of CI in decision-making in the interview. Through these the users

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could express conceptualizations of value in relation to the decision-making process, three explicitly: information services, information systems, and strategic planning; and one implicitly, through indicators of effectiveness referenced in participants' descriptions of CI value and benefit.

The first perspective of CI value is based on the research done by Marshall (1993) for the Special Libraries Association to investigate the impact of special libraries for decision-making, and will be called here an 'information service' perspective. It is information-centric, individual-centric, and implicitly reflects a service-oriented perspective. This section of the interview asked if they agreed or disagreed that CI helps with any of the following:

1. Remind you of facts already known
2. Help you feel more confident in making a choice
3. Make you more informed about an issue
4. Present a new dimension or new insight for consideration
5. Provide new information
6. Confirm a choice you would have made anyway
7. Other

The second perspective is a KM perspective, taking a larger view of the organization and organizational benefit. The researcher first recognized that this perspective was needed to balance the individual-centric perspective of special libraries research while reviewing measurement literature in the field of Information Systems Management. Within Information Systems Management, there is a body of performance measurement literature that was developed from the early days of corporate and government computer information systems. Authors of these measurement models predominantly conclude that in order to evaluate performance there must be effectiveness measures (relating purpose to eventual outcome) and some examination of how the system supports organizational decision-making and strategic activities (see Ahituv, 1980; King & Rodriguez, 1978; Segars & Grover, 1998).

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Their study findings reflect what is termed here an 'information systems' perspective, which is organization-centric. Operating on a larger scale, it implicitly assumes benefit to teams rather than individuals. The questions that were selected to reflect this information systems perspective are taken from research published in the field of business management, investigating planning systems. Venkatraman and Ramanujam (1987) conducted a literature analysis to determine key goals and capabilities of planning systems, and then tested their models with a mailed survey of 202 corporate planning units. They found that key objectives of planning systems which best allowed the identification of managerial and administrative benefits to the organization were the following:

1. enhancing managerial development
2. predicting future trends
3. short-term performance
4. long-term performance
5. gathering relevant information
6. avoiding problem areas

These key planning objectives, which harmonize closely with discussions in the CI literature regarding the benefits of CI to organizations, were used in the questionnaire to capture the 'information systems' perspective.

The third perspective identified was related to 'strategic planning'. As discussed in the literature review, researchers have identified organizational strategy (Herring, 1996), strategy formulation (Hughes 2005), and strategic decision-making (Bose, 2008) as being strongly related to CI and its value for organizations. Yet other authors, notably McGonagle and Vella (2002), have argued that CI can be either strategic or tactical and have value in either role, while Fleisher and Blenkhorn (2001) found in their study of CEOs that they believed CI to have tactical, rather than strategic, value.

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The researcher had originally conceptualized organizational impact of CI as being tied to whether CI led to fulfilment of organizational strategy, and wanted to explore how CI users related CI to, first, strategic decision-making, which might be considered reactive; and second, strategic planning, asking participants to describe how (whether) CI was used in developing corporate strategic plans, which might be considered a proactive use of CI. As a result, the interview guide included questions that specifically explored the relationship of CI to strategy, asking:

1. What would you consider to be the organization's strengths and weaknesses in the marketplace?
2. Does CI help the organization to navigate the marketplace strategically, or help in any way to identify opportunities of benefit to the organization?
3. Do you know of the existence of any strategic plan for the organization?
4. Do you feel that the CI unit, or its deliverables, have any connection or relationship to strategic planning at this organization?
5. Do you believe that CI should be involved in strategic planning for organizations? Or do you, for example, consider it to be more tactical in nature?

The fourth, or implicit, perspective on value, was rooted in the researcher's own questions regarding whether baseline standard indicators were useful, valid, or related to, CI. These indicators were innovation, client relationships, and financial performance of the organization. Participants were given the opportunity to state in their own words what value CI has for their organizations. Those answers and the discussions about CI use generally were examined in the data analysis stage to determine if there were and relationships drawn by participants between CI use, value, or benefit, and the three indicators, or any other indicators spontaneously expressed by participants.

3.5 Ethics

While the questions in the interviews did not ask for any private information, there were strong possibilities that the participants might have had concerns about answering them.

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For the expert interviews, the research questions asked the study participants to comment upon research and work they have published or otherwise made public. There was a possibility that a study participant could inadvertently reveal information or opinions s/he would like to keep confidential. In addition, participants may also have felt reluctance to answer questions fully and completely, knowing that the study findings would be published and critiqued.

For the user interviews, the research questions ask for information related to internal competitive practices, product and service development, and strategic planning. As a result, there was a strong likelihood that the researcher would acquire information or knowledge the organization, or the participant working for the organization, would like to keep confidential.

To help participants feel comfortable, and to prevent any potential publication of statements participants might then wish to retract or correct, several steps were taken by the researcher, as follows:

1. Participants were sent a copy of the interview questions prior to the interview, and were told that they could inform the researcher before or during the interview if they do not wish to share information in response to any question, or cease participation entirely (which was also reiterated in the free and informed consent forms, found in appendices C and F).
2. Participants were given told they might opt out of audio recording if they so wished. Because the research design did not call for content analysis to answer the research questions, this would not materially affect the researcher's understanding of the responses given by the participants, or the study findings.
3. All study participants were asked at a later date, post-interview, to review the researcher's notes and depictions of their organizations, measurement practices, etc., to try and ensure accuracy, and to allow participants to request the removal of any material they consider confidential or inaccurate from the study's findings.

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Although the experts study participants were offered the option of confidential participation, which would be assured by name changes and removal of identifying description in the published work(s), none of the study participants asked for this option as a condition of participation. Participants were told that they might ask for their name as a study participant to be removed in publications related to the study, at any time prior to publication.

For participants in the users study, all references to the participant, his/her organization, or identifiable organizational products, services, and activities have been anonymized. In recognition of the value of the participants' time, the researcher offered users study participants a $10 gift certificate to Amazon at the conclusion of the interview, as a token of appreciation and thanks.

Data from both studies has been stored on the researcher's password-protected laptop and on the McGill servers under her password-protected Minerva account. Physical recordings and notes taken during the interviews are kept securely locked. Only the researcher and her faculty supervisor have access to the raw data, which will be kept for five years in a secure location. Ethics certificates for both studies may be found in Appendices G and F.

3.6 Data Collection

3.6.1 Data collection for the experts study

Interviews with experts took on average just under an hour and were conducted face-to-face. Participants were asked to comment on their measurement conceptualizations and models in relation to intelligence and outcomes, rather than processes. Participants provided their definitions of the terms output, outcome, and impact; descriptions of their measurement tools and measurement methods; and critiques of current intelligence measurement research and practice. Responses of participants also provided some description of the history of their

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conceptualizations and their measurement models, and some informed critique of each model's purposes, strengths, and weaknesses. Participants were given the option of being recorded; one participant asked not to be recorded halfway through the interview. Four participants returned their negotiated texts with approval; one participant asked the researcher to review some of his/her publications before finalizing the text.

After the interview, the researcher reviewed the interview notes and recordings in order to capture notable quotes and partially transcribe responses of participants. Reponses were summarized and compressed in order to distil essential elements for comparison within the study. These summarized notes were then sent in electronic, written form to the experts study participants, who were given the opportunity to review and edit the researcher's notes and conclusions. Edits, once received, were incorporated into the texts, preparatory for data analysis.

Texts from the experts study are not shared since the participants generated them with the understanding that the texts would not be published. However a discussion of those texts has been published (Gainor & Bouthillier, 2014).

3.6.2 Data collection for the users study

Participants in the users study were asked to describe how organizational decisions are made and how CI does/does not function as a support or input into decision-making. Participants were also asked to identify situations in which CI would not be used, and to explain why CI would not be useful. These user interviews were designed to obtain essentially three things from the participant, in order to address the research questions:

1. A description of the organization's CI practices;
2. A description of the role and value of CI in the organization, including organizational decision-making; and
3. The participant's experiences and views on practices in, and the value of, measurement for CI.

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Nine of the 12 interviews, when completed, took approximately half an hour. The other three ranged up to one hour in length. Participants were given the option of being recorded; 11 of the 12 participant interviews were successfully recorded. Two participant interviews were conducted face-to-face, while the other interviews were conducted over the telephone.

Similar to that of the experts study, the data collection in the users study was a multi-stage process. During the interview, once permissions were secured, the interview was recorded and field notes were taken. Shared negotiated texts were then developed.

Immediately after the interview, referencing the field notes and recordings (when available), the researcher composed a two-page summary of the interview that re-phrased the researcher's understanding of the descriptions, practices, and opinions provided by the participant. Once this text was generated, it was emailed to the users study participant with a request that s/he review and approve it, providing edits where necessary. Half the participants (6) returned the text with some minor edits, which were immediately made in the researcher's notes. All participants returned their texts with their approval for use to the researcher.

The texts from the users study are provided in Appendix I.

3.7 Data Analysis

3.7.1 Data analysis for the experts study

In the experts study, upon receipt of the approved shared texts, the researcher compared participant discussions of measurement 1) to determine confirmation/refutation of, and to better understand, challenges to intelligence measurement described in the literature; and 2) to compare the measurement practices and conceptual models used by the participants. The conceptual model for the research study was confirmed and strengthened, as described in the findings, providing insight for the users study.

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The responses of the participants were analyzed for three elements. First, the definitions of key terms were compared for points of agreement and dissent to inform the operational definitions of these terms developed by the researcher. These terms, variously defined in the literature, were critical for the conceptual framework: output, outcome, and impact. Second, side-by-side comparison of the participants' own measurement models was conducted, examining described practices, attitudes, and conceptualizations. These definitions and models were used to inform the development of the users study. Finally, requirements for best practices for intelligence measurement, as identified by the participants, were then examined.

Criteria for measuring intelligence outcomes and impact were isolated in the shared texts, as were discussions regarding the ultimate purpose or benefit of intelligence, namely to what end intelligence informs decision-making. These were extracted from the text produced with each study participant. These criteria were then compiled into a single list, which was edited for repeat and similar entries. Measurement purposes, or objectives of measurement, were also compiled and examined for similarities and points of contrast. The criteria and purposes were then used to inform to inform a critical framework for assessing impact.

3.7.2 Data analysis for the users study

In the users study, upon receiving the approved summary notes, the researcher created a comparison table in Excel detailing 24 points of comparison between the study participants, such as how CI is sourced, how it is disseminated, participant beliefs about its usefulness and benefits, whether the organization has a strategic plan, how CI is believed to be used in developing the organization's strategic plan, etc. These points of comparison had been built into the interview guide and were extracted for comparative purposes. A complete list of these comparison points is provided here, since the comparison table is too large to be replicated here:

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1. Industry of organization
2. Role of participant
3. CI term
4. CI unit size
5. CI location
6. Employee training
7. Augments him/herself
8. Deliverables
9. Dissemination
10. Employee/department use role
11. Organizational strengths
12. Organizational weakness
13. Helps strategic navigation
14. Organizational decision-making process
15. Role of CI in decision-making
16. Constraining factors
17. Information Service Perspective
18. Information System Perspective
19. CI not useful when…
20. Current measures
21. Improvements to measurement
22. Strategic plan
23. CI is strategic or tactical
24. Connection to strategic plan

This comparison table built from this list was the starting point for data analysis. For example, was there consistency in CI terminology? Which respondents augmented CI deliverables with their own research? Was there consistency in describing the value of CI to strategic planning? Etc.

The comparison table provided a survey of the data as an entire data set and allowed for patterns of practice and use to emerge. It was used to develop a typology of CI development, organizational decision-making, and CI usage in both organizational decision-making and strategic planning. The table was also used to determine if relationships might exist between these typologies and other points of comparison.

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The researcher developed other tables and graphs to assign values to yes/no/sometimes responses, in order to determine if any additional patterns emerged. For example, did those who valued CI measurement more strongly support its use in strategic planning? Were those who objected to CI measurement more likely to have non-formal CI practices?

Next the researcher returned to the recordings and transcribed participant statements related to three specific areas:

1. CI use
2. CI value
3. CI measurement

The language of these statements was then examined for references to other indicators of success, namely innovation, customer relationships, and financial performance. The statements were also analysed to determine if outcome and impact measures establishing causality of CI and its hypothesized benefits would be feasible or valued. In this stage key words or verbalizations of value were extracted for further examination, comparison, and analysis within the framework of the summary notes and comparison table, and allowed for themes to emerge from the data collected. For example, some participants conceptualized CI as a "luxury" or "luxe" item for organizations. Extracting those comments and then returning to the descriptions and comparisons of practice in order to contextualize the responses provided another level of data analysis.

Chapter 4: Findings

As described in the methodology chapter, this research consists of two parts, an experts study and a users study. The findings for each study are presented separately within this chapter.

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4.1 Findings of the Experts Study

The findings of the experts study are grouped under four subheadings: definitions; perspectives on the purpose of intelligence; descriptions of participants' current outcome measurement practices; and participant recommendations for outcome measurement.

Findings of the study were that while participants' definitions for outputs and outcomes aligned, definitions of impact were unique to the participant. Participants' descriptions of their own practices in, and reactions to, measuring outcomes and impacts were varied and paralleled discussions in the literature: some had not measured intelligence outcomes and impact, although they had ideas about, research in, and conceptualizations of measurement; some used process and satisfaction measures as a surrogate for outcomes and impact; and one participant attempts to capture outcomes and impact through multiple methods, while acknowledging the inaccurate and time-consuming nature of the task.

A notable finding of this study, and one that had significant impact on the development of the users study, was that although participants agreed that the purpose of intelligence is to inform and improve decision-making, conceptualizations of intelligence outcomes and impact varied with the perspective of the participants as to the *function* of intelligence in the decision-making process. The three perspectives presented by the participants were behavioural change, intelligence analysis, and organizational value. Behavioural change, espoused by the participants working in the field of competitive intelligence, is the belief that the ultimate purpose of intelligence is to affect the reactions and information behaviours of the recipient. Intelligence analysis, most strongly argued for by the participant who had worked as a CIA analyst and who now is a professor researching and teaching about government and covert intelligence, summarizes a perspective that considers the intelligence deliverable to be the ultimate outcome.

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Its quality characteristics, such as accuracy and timeliness, are the measure of the outcome, and its quality implicitly supports and improves the decision-making of the recipient. The third perspective, organizational value, was represented by a professor researching business intelligence within a business faculty. In this perspective the outcomes of a decision informed by intelligence, and their subsequent effects upon the organization as a whole, is the valuable function of intelligence.

Participants agreed that significant conceptual and methodological challenges exist for developing intelligence outcome and impact measures, and argued for research into addressing the conceptual challenges as a priority for the development of effective measurement. Although they were unsure what future measurement tools might be, and some questioned if such measurement is possible, most gave detailed and sophisticated lists of criteria which would need to be met by a successful measure.

Details of these findings are presented below.

4.1.1 Definitions

Participants were asked to provide definitions for three terms: output, outcome, and impact, terms which were critical to validating the conceptual model developed by the researcher. Some definitions were closely aligned, while others varied widely.

All participants agreed that outputs are usually tangible and easily identified. Outputs may take the form of products such as reports, increased situational awareness or knowledge on the part of the intelligence recipient, subsequent actions, or events. Outputs were described as typically occurring soon after the intelligence has been delivered to an audience.

While all participants agreed that outcomes were distinct from outputs and typically intangible in nature, some significant discrepancies occurred in the definitions provided, related

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to the perceptions of the participant as to what outcomes were to be expected from intelligence use. Antti Lönnqvist defined outcomes as having an effect upon the organization as an entity. For the other participants, outcomes were described as an effect or intangible change within the decision maker, the decision itself, or the audience who received the intelligence. Such outcomes might be a decision-maker's perspective, the effect on the decision itself, or the changed information need or information reception due to intelligence provided, after a decision is made. Andrew Beurschgens, for example, defined outcomes as the intangible effects upon the audience, asking, is the audience stimulated, provoked, motivated? For him, this is the outcome of intelligence, and it is directly related to the 'salesmanship' of the CI practitioner, in other words, his/her ability to get an audience engaged in using intelligence.

The relationship between the three terms was variously defined. Antti Lönnqvist and John Kringen described outcomes at an organizational level, and described outcomes as building on, and being related to, outputs. Sheila Wright and Stephen Marrin stated that outcomes and outputs are unrelated and that the provision of intelligence may result in outputs or outcomes, both, or neither.

The greatest discrepancies in the definitions occurred around the concept of 'impact'. All agreed that intelligence impact is not, and should not be defined as, related to organizational strategy, although Antti Lönnqvist and John Kringen stated that the decision-maker(s) may link intelligence to strategy. Andrew Beurschgen offered the caveat that if a CI programme is aligned with corporate strategy then it is expected to influence the outcomes of strategic reviews.

Impact was variously defined as reduction of risk in the decision-making process (Sheila Wright), its effect upon policy (Stephen Marrin and John Kringen), its effect upon the decision-maker in the context of a decision (John Kringen), an indication of success that is closely related

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to, perhaps synonymous with, outcomes (Antti Lönnqvist), and simply, the magnitude of a given outcome's influence (Andrew Beurschgens).

4.1.2 Perspectives on purpose

Below is a figure that attempts to visually represent the interpretive lens through which each participant appeared to speak. Participants might well disagree with this visual but it is offered here not to pigeonhole participants, but rather to show some of the varying stances possible and represented by the participants in the answers they provided specifically for this study.

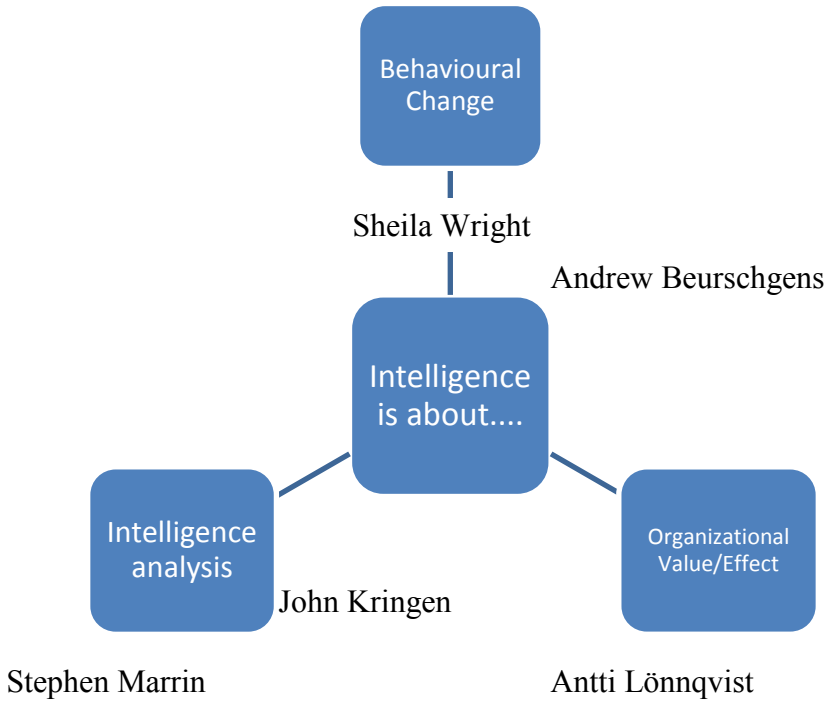

Figure 4: Perspectives on the 'about-ness' of intelligence

As stated in the literature review, intelligence is sometimes defined as a piece of information (the intelligence product) destined to inform a decision-making process. Intelligence is also defined as a function or process within organizations. Participants, in their discussions

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about intelligence and intelligence practices that related to measurement, appeared to represent differing viewpoints as to the role of intelligence as an organizational service or function to be valuated, as shown in Figure 4.

Sheila Wright stated that intelligence is about behavioural change: upon receipt of the intelligence, how is the audience affected? For example, how was the decision-maker influenced? Did his/her attitude toward a situation change? Stephen Marrin spoke of how intelligence is analysis: the analyst, how well the analyst performs, and the quality of the intelligence produced. Antti Lönnqvist took a management-level perspective, where the role of intelligence is a business function, intended to advance the goals of the larger organization. The other two participants, as shown here, occupy ground between two perspectives, with John Kringen leaning toward intelligence analysis, and Andrew Beurschgens leaning toward behavioural change.

Antti Lönnqvist's business management perspective and Sheila Wright's behavioural change perspective meant that their answers to the interview questions provided both intriguing contrasts and points of correlation. One such correlation occurred around the issue of precision and accuracy in measurement. Sheila Wright argued that it is impossible to measure intelligence value entirely and exactly. Instead a measurement approach would have to accept that only elements can be captured, which elements would provide a partial but adequate picture of value. Antti Lönnqvist, in a discussion about the cost-effectiveness of measurement, pointed out that academic research looks for accuracy and can make extreme investments in highly complex measurement tools to ensure accuracy and advance research. Business management, in contrast, is often willing to compromise on the accuracy of measurement in order to keep costs down, and to simplify measurement activities. He also stated that while accuracy is not possible with

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inaccurate phenomena such as intelligence outcomes, inaccurate measures can still be helpful, and so he does not see the inaccuracy of outcomes measurement as an obstacle.

4.1.3 Current measurement models

Participants were asked to describe how they currently measure intelligence outcomes and impact. Only three of the five participants reported that they have attempted to measure outcomes and impact.

Antti Lönnqvist described his outcome measurement approach as a *"generic model"* often found in business literature and used by other scholars. This generic model consists of direct, indirect, subjective, and objective measurement, and the need to take pre-measurement steps. The pre-measurement steps are questions which ask why there is a need for measurement, what is being measured, and identify success factors and standards in relation to the input(s) and the viewpoint(s) of the audience. While he sees conceptual and practical limitations in this model related to identifying success factors that address contextual variation, he sees its strength as being its customizability, and how that customization forces users to consider the purpose of the measurement activity, thus increasing its validity.

Antti Lönnqvist, in common with other participants, indicated that in his measurement approach, process measures are necessary to inform and make possible outcome measures:

> Anyone trying to measure the outcomes of intelligence needs to understand the intelligence process and what is on the manager's mind when requesting, using, and discussing intelligence. Then we can identify what new information is brought by the intelligence…For example, before we can measure impact we have to ask, is the information being accessed and then being used? So a process measure such as usage statistics is needed to be a part of outcome measurement.

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Andrew Beurschgens and John Kringen described customer feedback as the chief mechanism through which outcomes and impact might be assessed, if not measured. John Kringen stated that general practice at the CIA is to use a combination of process and satisfaction measures in combination with debriefing sessions to obtain insight into how well their service is valued by their users. Although he acknowledges it to be imperfect, he also considers this practice to be useful and *"workable"*. As a part of these measures they attempt to identify indicators ('signposts') of success. However, such feedback is not quantified by any kind of formal metric, and is not always available, due to problematic access to users, particularly high-level decision-makers. Similarly, Andrew Beurschgens, describing practices in CI, states that he uses a high level structured feedback approach, based on the work of Tim Powell (a CI practitioner and author of CI how-to texts such as Analyzing Your Competition: Its Management, Products, Industry and Markets, published by Find/Svp Info Clearing House) and research being done with the UK Competitive Intelligence Forum (UKCIF). Such user feedback, in his view, should relate to questions about the timeliness and usefulness of the intelligence, whether the stakeholders were better-informed about relevant issues, and if the decision-makers were better enabled to reach a consensus. He also described how technology tools, in tracking processes such as usage rates and new project development, might also identify outcomes and impacts such as the dollar value of business opportunities lost or gained.

Stephen Marrin and Shelia Wright do not have an outcome measurement tool or method that they use, although Stephen Marrin (2012) has conceptualized directions intelligence measurement could take, such as 'batting averages'. Sheila Wright stated in her interview that if she were asked to measure the outcomes or impact of CI, she would attempt to convince the requestor not to try the *"nearly impossible"*. She then continued with this statement, questioning the value of such measurement:

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> Rather than ask, what is the value of having CI, it is more useful to ask, what is the value of not having CI? Another question is, why do we need to prove the value of CI units? There are many business departments, like strategic planning, which are considered just 'a cost of business', which are not required to prove their value.

All participants agreed that intelligence measurement as it is currently practiced, including their own measurement practice, is problematic and could be improved. Responses given as to why these problems exist were voluminous and diverse. Participants were unified in citing problems with managing feedback mechanisms, namely gaining access to intelligence users, and the subjectivity of user statements. Participants also cited problems with establishing causal relationships between action and effect in intangibles, and isolating effects for measurement.

Significant conceptual problems for current measurement practices were also discussed. One was the lack of consistency in approach to measurement, which is directly related to non-standardized measurement tools. Another is attitudinal: under-valuation of both intelligence and measurement resulting in non-cooperation between departments, and managerial resistance or disinclination to participate, in organizations.

Stephen Marrin argued that a conceptual framework is needed for security intelligence measurement, stating *"fundamental concepts that would inform intelligence measurement are not yet developed"*. As an example, at one point in his interview, he cited the fact that while in business financial measures can be used as a fundamental quantifier of value, there is no *"single currency"* of value in intelligence.

John Kringen pointed out, specifically for security intelligence, that the weakness of current intelligence measurement is that there is no conceptual model of intelligence system

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dynamics that looks at both inputs and outputs, when outputs are policy outcomes either domestically or in *"recipient societies"*. Such conceptual models, he argues, are necessary in order to determine feasible outcome measurement. He also discussed in his interview the need for ways to quantify intelligence challenges in the context of the intelligence problem. He noted first, that rating intelligence by its accuracy is not an adequate reflection of performance. Very simple research tasks might result in perfect accuracy, while highly complex and challenging research tasks involving multiple stakeholders might result in less accurate, but potentially far more valuable, intelligence products. He has suggested that rating intelligence performance should be more like assigning scores to Olympic diving than to generating batting averages in baseball, but acknowledges the conceptual challenge to such a shift in perspective and measurement tools is that *"right now there is no agreement on the judging scales to be used"*.

These conceptual criticisms were echoed by Andrew Beurschgens, who stated that not only his own measurement approach, but all current competitive intelligence measurement approaches, lack consistency and rigour. He attributes these problems to inadequate research and literature into conceptual models upon which measurement might be based, commenting *"...there is not the same level of literature available on measurement models as there is now on the analysis part of the CI process."*

4.1.4 Measurement recommendations

All participants acknowledged that their measurement practices and conceptualizations were imperfect, and stated that they considered their measurement approach to be dynamically changing as they encountered new research and ideas for practice. Participants were asked to comment on what outcome measurement should be in the future, specifically naming desirable

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characteristics of an ideal robust and useful outcome measure for intelligence. Four of the five participants supplied homogenous lists of necessary characteristics.

In other comments, Stephen Marrin discussed the need for outcome measures which might relate to the role intelligence plays in decision-making and need for 'proxy' measures that could indirectly capture intangibles. Andrew Beurschgens suggested that a measurement model would need to allow for anecdotal evidence and account for the quick depreciation of deliverables, since a CI product is often a single-use item. Several participants also discussed the need for outcome measures to show organizational (inter-departmental) usage and reflect varying stakeholder perspectives.

According to those responses, robust and useful measures of intelligence outcomes would be:

- *Reliable:* not only meaning that the measurement tool be consistent, but that more than one measurement tool is used in a composite or multi-measurement method approach
- *Valid:* the audience and purpose of the measurement activity are addressed and made explicit by the choice of measurement tool(s) and approach(es)
- *Causal:* the measure relates intelligence to beneficial effects (traces causal relationships)
- *Credible:* results obtained are supported by evidence of value, either quantitative or qualitative, positive or negative. The data captured is non-politicized and objectively fair
- *Usable:* the measure is not only easy and simple to use but also to understand, fostering communication between measurer and audience

Other noteworthy but disagreed upon characteristics and elements were suggested. Sheila Wright, who defines CI as 'behavioural change', stated that an outcome measure should provide evidence of behavioural change. Andrew Beurschgens, who has worked with Sheila Wright in UKCIF, had in his list 'self-help' as an element for his proposed outcome measures, defining 'self-help' as those who will seek out intelligence in response to an information need, which could potentially be such a measure of behavioural change. He also believes, however, that measures can and should provide evidence of value to the organization as a whole. Along with

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Antti Lönnqvist he suggested that a 'suite' of measurement tools should include a financial measure.

4.1.5 In summary: The experts study

In summary, the participants confirmed criticisms extant in the literature: the multiplicity of models with their accompanying and varied terminology, the variously conceptualized outcomes of intelligence, and the use of 'good enough' measurement. Together these mandate improvement in measurement practices for intelligence fields. No field, as far as the participants are aware, has developed measurement tools that meet the criteria of 'good' measurement, as defined by the list of criteria provided by participants.

The juxtaposition of participants' current measurement practices with their critiques of the field and criteria for future measurement best practices provided a valuable starting point to the researcher for refining the design of the users study for the second phase of the research, confirming the strength of the conceptual model described in chapter two, pointing out the need to allow participants to express multiple value perspectives in discussing CI, and supplying elements of the critical evaluation framework subsequently developed in response to the third research question. These findings are discussed in chapter five. Additional discussion may be found in Gainor and Bouthillier (2014).

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4.2 Findings of the Users Study

The purpose of this research is to obtain descriptions from users of CI as to how CI is sourced, used, and valued within organizations, in order to answer the three research questions. Findings for the study are subdivided by CI practices, organizational decision-making, CI value, and CI measurement.

The first section examines the CI practices described by participants, thereby providing context for the research questions. A typology of CI practice is presented, consisting of four items: Internal Formal, Internal Shared, Outsourced, and Networked. In describing their CI activities, participants indicated that the key factor in determining their satisfaction with the CI services is the responsiveness (helpfulness, quickiness, etc.) of the CI unit. This section also includes a review of the wide range of terminology in use to describe CI activities.

The section on organizational decision-making, which specifically examines the participant descriptions of CI practices and organizational decision-making processes, answers the first research question, namely, "How, when, and by whom is CI used as an input into organizational decision-making?" Participants all used CI, and indicated that it was used at senior levels of their organizations with an overall preference for using it in strategic, rather than tactical, decision-making. Participants described CI as having a role in all three stages of the organizational decision-making processes: problem identification, problem conceptualization, and selection. In articulating the relationship between CI and decision-making, receptivity emerged as a primary factor that may inhibit the use of CI in organizational decision-making. Secondary factors were information quality and the salesmanship of the CI unit in presenting deliverables.

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The second research question is: "When CI is used, what are the perceived organizational outcomes or benefits?" As described in the research design section, multiple value perspectives were built into the interview guide in order to allow for more than one value perspective to be expressed by participants. The correlation of the findings for the information service and information system perspectives to the original research upon which the questions were based indicates a strong relationship between CI and other types of information services.

Participants stated in descriptions of their CI use that they expect CI to result in certain specific organizational outcomes, including: improved and more efficient services; improved customer relationships; and new business development. From an individual, cognitive information service perspective, participants agreed that the role of CI in decision-making is to make the decision-maker more informed, providing new information and new dimensions to be considered. From a larger information system perspective, participants indicated that the role of CI is longer-term more than short-term, providing relevant information, and identifying future trends. While the organizations described by the participants did not all use CI in formulating their strategic plans, the participants unanimously agreed (the only response to any of the research questions in either study in which there was unanimity) that CI *should* be used in strategic planning for the organization.

Participants had described factors that could inhibit the use of CI in decision-making. They also identified situations or problems in which CI is believed to lack value or utility, irrespective of decision-making styles and practices. CI was believed to lack value for small-budget organizations, organizations which lack a clear mission or purpose, and highly innovative organizations.

The fourth subsection of findings, titled CI Outcome and Impact Measurement, provides a partial responses to the third research question: "In light of organizational constraints, which

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measurement methods identified in the literature are most appropriate for use in determining CI outcome and impact?" Participant descriptions of CI measurement practices correlate to those presented in the literature, with only three participants reporting that CI measurement is conducted at their organizations, and most participants happy with their current measurement practices, or lack thereof.

Reasons for not measuring CI value were related to CI practices, the volume of CI activity, perceived responsibility, and an expressed disbelief in the informativeness of measurement itself. While participants for the most part experienced difficulty visualizing improvements to, or creation of, CI measurement tools, participants of the users study, as with the participants of the experts study, were able to provide a list of criteria that should be met by ideal CI measurement. This list, in combination with the list provided in the experts study and the discussion of measurement needs in organizations, jointly answer the third research question. The evaluation framework developed from these findings is presented in chapter four, the discussion.

4.2.1 CI practices

As shown in Table 3 of the methodology chapter, section 3.3.2, the study participants' roles at their organizations are a mixture of executive and senior management. Organizations in the data set belong to 11 different industries and range in size from a small family business of 13 employees, to a multi-national public corporation numbering hundreds of thousands of employees. This produced findings for a range of practices, as might be expected, but it also provided an opportunity for noteworthy commonalities to emerge.

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4.2.1.1 Terminology

The interviews included a preliminary discussion of terminology, in order to support clarity of communication. Participants reported that their organizations variously use 14 different terms to describe CI activities. A review of the terms provided by participants shows that they are conceptually related:

1. benchmarking
2. business analysis
3. business intelligence
4. competitive analysis
5. competitive watch
6. competitor analysis
7. data analytics
8. industry analysis
9. intelligence activities
10. market analysis
11. market intelligence
12. market research
13. marketing and strategy activities
14. research

One of the participants, the employee of the family-run business, stated that she had introduced CI activities to her organization the previous year. As a result they did not yet have a term for it, referring to it only as strategy or marketing activities. While some participants had a single specific term used for CI, a third of the participants stated that their organizations use multiple terms to describe CI activities. One participant for example explained that her department used the terms data analytics and competitor analysis, while other departments in her organization use other terms.

Half the participants lumped together under the terms on this list both true competitive intelligence activities (as defined by this research) and internal business operation-type data gathering and analysis, such as delivery or production rates, which were then used to set targets

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and goals for the organization, contextualized by competitor activities. Other organizations use terminology more critically.

Two participants stated that their use of multiple terms to describe competitive intelligence was related to the use to which CI is put, and distinguished between the activities of monitoring competitors and the external environment, and internal activities and goal-setting. One participant stated that there was a philosophical basis in the selection of terminology by his industry. He suggested that the term 'competitive intelligence' denotes aggressively competitive practices. His industry, the credit union industry, exhibits collaborative and supportive behaviours, with business practices and research transparently shared between organizations. 'Market research', in this less intensely competitive industry, is considered to be a more suitable term, and is in standard use.

With a larger data set and under other research conditions, teasing out these distinctions might be merited. For the purposes of relating these findings, and for this discussion, however, the terms provided by participants are collectively considered to be synonyms for 'competitive intelligence', since participants appeared to consider CI activities such as monitoring competitor production rates to be largely indivisible in sourcing and use from other related information activities, such as monitoring internal production rates.

4.2.1.2 Practices in sourcing CI

Practices in CI development and dissemination varied between organizations. Participants described formal internal CI units, casual and informally delegated CI assignments, outsourcing, and sharing of CI with competitors. The descriptions of organizational activities in sourcing competitive intelligence generated a simple typology of practice, consisting of four items: Internal Formal, Internal Shared, Networked, and Outsourced.

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Descriptions of the characteristics for each category are provided below, following the summary table inserted here for reference:

Participant	Industry	Role	Internal Formal	Internal Shared	Outsourced	Transparent Network
David	Pharmaceuticals	Sales	X			
Geoff	Marketing	Executive	X			
Tom	Mining	Human Resources	X			
Hans	Software development	Project development	X			
Pierre	Banking/ Government	Senior management	X			
Helen	Food/ Manufacturing	Senior management	X			
Spencer	Financial	Executive		X	X	X
Patrick	Fundraising/ Charitable Nonprofit	Executive		X	X	X
John	Software development	Project development		X		
Brian	Health/ Government/ Nonprofit	Executive			X	X
Tony	Energy	Sales			X	
Sarah	Recycling	Executive			X	

Table 4: Participants and CI practices type summary table

Internal Formal: The most popular description of CI sourcing activity was the kind of formal internal practice that is often captured in CI survey research, relying as it does on the research participation of self-identified CI practitioners. These are established internal units with formal processes and standard deliverables, and typically, but not always, have full-time employees dedicated to CI activities. These units will often also perform internal business intelligence activities relating to operations management, forecasting, benchmarking production rates, etc.

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For this research the responses of two participants who described CI duties formally assigned to departments with other responsibilities such as Marketing or Product Development, rather than a standalone CI unit, are included in this classification.

Internal Shared: The next type of practice, labelled here 'Internal Shared' describes organizations which do not have formal CI units, yet informal and loosely organized CI activities occur across departments in collaborative activities to address a discovered information need. While CI activities are not part of any team member's job description, these assignments may be made on a case-by-case basis. Patrick, who works for a charitable non-profit, described how research activities might be assigned at any level of the organization, to any employee, stating *"it's just part of our job"*.

Another participant, John, who works for a software development firm, described how a development team will, at the beginning of a project, assign team members to conduct research regarding competitor offerings and activities. These deliverables are single-use, shared within the team, and typically discarded after use. John described how development team members are assigned to look at similar offerings on the market, examining promotional materials, competitor websites and product reviews, and on occasion purchasing a competitor's product in order to evaluate it. John also noted (as did the other participant working in software development) that the client may also be a source of competitive intelligence, notifying them of competitor offerings and prices.

One interesting, if perhaps potentially alarming, note is that participants reported that the organizations conducting Internal Shared CI activities do not train employees in research methods or research ethics relating to CI practices.

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Outsourced: The third item in the typology is 'Outsourced'. Five participants stated that their organizations outsource their competitive intelligence. The reasons for outsourcing, the services provided, and the satisfaction of the participants with outsourcing varied widely.

Two participants, Tony and Sarah, relied entirely upon outsourced CI. Tony described how his organization purchases competitive intelligence reports from a competitive intelligence research company. He also described his deep dissatisfaction with the arrangement, calling its management *"fairly haphazard"*. Although he personally believes in the potential value of CI as a general rule, he condemned reports received in the past as *"fluff"*, at best containing only 50% valuable material, pointing out that when a report is purchased a price tag of $3,000 is common. The high one-time costs, in combination with little in-house coordination or service, and a track record of bad products previously purchased, have created a problem for the integration of competitive intelligence into business processes. According to Tony, it has also led to a lack of respect or value for competitive intelligence within the organization as a whole.

In contrast, Sarah sources her CI through a US federal government program. The Small Business Association's Business Development Center employs librarians and researchers to provide no-fee market research to small businesses, such as Sarah's. She expressed deep satisfaction with the service provided and the opportunity it provides to obtain inexpensive competitive intelligence, which she considers to be key to formulating plans for the growth of her business.

Other participants described outsourcing as a way to augment other CI activities, coping with needs that cannot be met in-house due to a lack of internal expertise or manpower. For example, Patrick, who works for a charitable non-profit, described how his organization will conduct Internal Shared activities, but when they find something of interest as a result of preliminary exploration in-house, an external researcher will be hired on contract who can

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provide *"a higher level of detail, better sourced, more robust in terms of quality of information gathered….that requires a more technical resource…we don't have the capacity to do that."*

Transparent Network: The fourth and final item in the typology is 'Transparent Network'. All participants who belong to such networks also use other practices described above, and do not solely rely on their networks to provide them with a complete picture of the competitive environment. Restricted sharing within the networks is sometimes legally enforced, as for Brian, whose network of government-run health services share their data regarding their financials and services in order to help each other raise standards of care while reducing costs.

Spencer and Patrick described these networks as a mandate for the survival of their industry. Spencer describes sharing information and conducting joint projects as a practice essential to helping credit unions survive a market wherein the *"real"* competitor is the banking industry. Patrick describes the sharing of information between charitable nonprofits as a form of practical coordination in order to ensure that more effective pitches are being made, sometimes in partnership, in order to secure finite resources.

Across this typology, regardless of the type of CI sourcing and deliverables, all participants described CI activities as being operationally close to decision-makers at an executive level, who closely oversee and receive reports from the CI unit, whatever form that CI unit may take, with the role of informing organizational decision-making to some extent.

An interesting discovery in the descriptions of practice was the frequency with which participants described augmenting the CI deliverables themselves and/or seeing executives supplement the CI deliverables. For instance, the participant from the mining industry, Tom, described how the CEO of the company would receive CI directly from the Internal Formal CI unit, and still do his own research activities in tandem with those deliverables. Hans, who largely rejected the concept of CI as being valuable for his cutting-edge software company, noted that

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his CEO, who is also the founder of the company, conducts his own CI activities in addition to what his employees produce for him. In total, eight, or two-thirds, of the participants stated that they themselves augment the CI they receive with their own individual research activities.

4.2.1.3 Customer service and satisfaction

Questions in the interviews attempted to obtain from participants descriptions of the CI services offered to them in their organizations, including training, dissemination, storage, and access. Participants appeared to be largely indifferent to these issues, instead focusing their evaluation of CI services on the responsiveness to user requests. David, who was extremely enthusiastic about the services provided by his organization's internal formal CI unit, which was tightly integrated into the business processes of the organization, stated:

> It's very tailored. It is constantly evolving…there'll be people that will say, well, wouldn't that be great if we could see this. Or wouldn't it be great if we had this information. And from that they'll include different aspects of that in the reports that they create. And so it's very fluid, you know, nothing is completely static in what they're doing, where they'll say, yeah, we can do that, and then they'll go and get that information, and then they'll include that into their report. And so it's constantly trying to be improved upon and more meaningful to the end user.

Satisfaction was not dependent upon the type or sophistication of the CI service. As described above, Sarah outsources no-fee CI from the Small Business Association, in contrast to David's highly formal and expensive CI services. Yet she, like David, expressed complete satisfaction with the services she receives, identifying the responsiveness of the employees (helpfulness, timeliness of service, friendliness, etc.) to her requests as a critical element in her satisfaction.

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A few participants additionally commented on the quality of the CI deliverable and the integration of the service with the business processes. Tony in particular was vocal regarding the problematic nature of a CI service that is not involved in the organization's operations and therefore cannot understand the needs of the employees.

Satisfaction appears to be contingent upon first and foremost the responsiveness and availability of the CI unit. Dissatisfaction was expressed when services were considered to be non-responsive or to lack initiative. Secondary factors in user satisfaction as reported by the participants are the integration of the CI unit and its services with the business processes of the organization, and the characteristics of the information contained in the deliverables: quality, comprehensiveness, accuracy, etc.

4.2.2 Organizational Decision-Making

Organizational decision-making, as described in the literature review chapter, was originally conceptualized for the purposes of this research as a process occurring in three linear stages, with CI as one of several inputs into determining choice selection. Participants were asked to describe the process of decision-making in their respective organizations, and the role of CI within that process, based on their own experiences and observations in senior management roles.

4.2.2.1 Organizational decision-making processes

When asked for descriptions of their organizational decision-making, participants tended to provide a sketchy overview of their process, supplementing the overview with some commentary regarding the amount of paperwork and collaboration involved. These descriptions did not neatly align with the decision models provided in the literature, and varied widely.

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Perhaps the most unusual response was from Tony, who described the decision-making process at his organization as exploratory and experimental. If a management-level employee identifies a potential business opportunity, such as opening a new country for sales, or offering a new service, the president will sign off on the activity as long as a customer (preferably a signed contract from a customer) is in evidence for the new market, new service, etc. In their organization when a new opportunity is identified, they like to *"kick the tires"*, believing that by testing the opportunity they will get the best information about it. A single customer serves as a pilot run of the opportunity, with profitability and feasibility then assessed in retrospect. A decision is only made whether to continue to pursue the opportunity presented.

Helen described organizational decision-making processes which vary depending on the department and the decision involved. For example, a decision to pull a product from supermarket shelves is both hierarchical and collaborative: executives need to sign off on it, yet at the same time many people need to be canvassed for input since it is a significant decision that resonates across the company. In another decision-making example she offered, a single department might have decisions that are nimble and entrepreneurial, yet involving large sums of money, if an employee comes up with an innovative idea that meets with an immediate supervisor's favour. Helen reports that for her organization, the role of CI is to help the organization navigate strategically in some instances. CI is used in different ways by different groups within the organization according to the decision situation and type, and so use and usefulness may be contextual.

Participants described varying levels of collaboration, bureaucracy, transparency, formality, and autonomy, in various combinations. Organizational decision-making was overseen and typically participated in by the most senior levels of the organization. The participants indicated that decision processes are affected by several factors, namely, the size of the budget

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involved, the scope of the proposed decision, the department or unit involved in the decision, and the style of leadership espoused by the president/CEO. This leadership style, of which organizational decision-making processes are a natural outcome, was central to several stories that participants told.

4.2.2.2 The role of CI in the decision-making process

In addition to describing the decision-making process for their organizations, participants were also asked to describe the role of CI within that process – Where was it used? How was it used? As with the descriptions of decision-making, the descriptions of how CI was used in that organizational process were varied.

One participant stated that CI was used to make forecasts, while another said that CI should not be relied upon (and was not at his organization) to foretell the future. While some participants stated that CI was relied upon in planning activities, others stated that CI had a peripheral role in their planning activities and was not a core element for them. One participant, John, named CI as an aid to distinguishing their product offerings in the market, iteratively informing the development of a new product, while another participant, Hans, said that CI was of minimal assistance in developing their products, since they were pursuing a disruptive model of market innovation.

Hans, who described this disruptive model, stated that although his organization does engage in CI activities, it is too innovative to pay CI much attention. As a result, employees actively follow a company policy of ignoring CI in planning meetings and decision-making, unless the CI is providing some notable customer feedback, considering their competitor activities in the light of *"distraction"*. Tony, in contrast, who was unhappy with his

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organization's outsourcing practices and contempt for CI, believed that CI should be better integrated within his company, arguing that CI is of value in supporting decisions.

In describing how CI is used, participants identified specific practices and expectations. Harkening back to the three-stage conceptual model of organizational decision-making developed for this research, these responses of participants describing how CI is used in supporting the decision-making process are compiled and subdivided into three headings: Problem Identification, Problem Conceptualization, and Selection.

Problem Identification:

1. Monitoring performance
2. Identification of problems
3. Identification of potential threats
4. Identification of opportunities

Problem Conceptualization:

5. Supplying an objective fact-based perspective
6. Standardizing practices
7. Forecasting value of choices
8. Understanding environmental trends
9. Identifying potential strategic alliances

Selection:

10. Feedback about the success of previous actions
11. Avoiding duplication of activities by other companies/helping distinguish offerings in market
12. Informing/relating choice to the strategic plan
13. Helping organizations figure out actions after choice selection
14. Informing targets set after choice selection

Although some entries could potentially belong to more than one stage of the decision-making process, this list demonstrates that CI is used by the participants to support all stages of the decision-making process.

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4.2.2.3 Strategic versus tactical decisions

At the commencement of the study, the researcher had conceptualized CI as being of most value and impact when used in strategic decision-making. A question within the interviews was provided for the researcher to ask if participants believed CI to be more strategic or tactical in nature, in order to confirm or refute this conceptualization. Five participants considered CI to be strategic in nature, and another five considered CI to be both strategic and tactical. One participant did not answer the question, while one considered CI to be solely tactical.

The emphasis on the strategic applications of CI is exemplified by Helen's response. She responded to the question by saying that CI is both tactical and strategic, and then emphasized the strategic aspects of CI by adding, *"if we're not using it strategically, we're not getting a return on investment"*.

CI was considered to be of more use when decisions were related to planning, which may explain why participants were more likely to identify CI as strategic rather than tactical. Tom stated that the role of CI within their organizational decision-making is for both long-term and short term planning, *"to provide kind of industry awareness in terms of potential business opportunities and for decisions…But it's mostly long-term, it's really, it is more strategic, there's a more strategic value of competitive intelligence here."*

Spencer referenced three types of decisions: strategic, tactical, and *"in the ditch"*, or emergency decision-making. He described how in his experience CI is of little value in a crisis when the survival of the moment, rather than planning, is at stake. He commented that emergency decision-making is *"common sense, that's gut, that's what you have to do in the moment, in the circumstances, you know, planning's hardly relevant, and so is research, except*

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you want to figure out where the other guy is and where he's shooting at you from". For him CI achieves its true value when it is used for strategic planning-related decisions.

4.2.2.4 Constraining factors affecting the utilization of CI

Most participants offered comments as to times, conditions, environments, and other management-related factors within the organization itself which affect the use of CI in decision-making, rendering it less effective. This is distinct from situations or problems in which CI is believed to lack value or utility, which are discussed in the following section on CI value.

The single most popular comment on factors inhibiting CI effectiveness and use were statements regarding receptivity. Receptivity has three elements: the attitude of the user; the time the user has to read, absorb, and apply it; and the work environment.

The willingness of the audience receiving the CI to believe the message contained therein and use it was identified as a potentially significant barrier to CI, with Brian pointing out, *"If a manager doesn't use it, it will be a waste of time."* Time was also a concern for other participants. David stated that in his organization there is an abundance of CI that employees find time-consuming. These employees have to find ways to manage the amount of time and effort necessary to understand and utilize the CI, while balancing other job responsibilities.

The third component of the concept of receptivity was environment. Brian described how internal employee and union conflicts might lead employees to disregard or even corrupt CI:

> If the environment is under temporary stress, then it could be a bad time to gather that intelligence. So that could be wasteful. There could be external factors that affect people's responses. Like if you compare your data during a period of industrial unrest, and people haven't been—collecting their data

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properly, because they're annoyed or something, that can affect the data. There are environmental issues that can affect that.

Additional factors that constrain CI effectiveness within organizations were identified. In addition to receptivity, the information quality and the *"salesmanship"* of the CI practitioner were elements affecting the adoption of CI. This finding parallels statements made by Andrew Beurschgens in the experts study regarding salesmanship of CI as a necessary element in realizing CI value.

4.2.3 CI Value

As described in section 3.5 which describes the instrumentation, the interview guide was developed so that the participants were given the opportunity to express multiple perspectives of value. The findings in relation to each of these perspectives are provided below.

4.2.3.1 Anticipated outcome value

Participants were asked to identify in their own words the value of CI. Their responses to this question, and their discussions of the relationship between CI and organizational decision-making, were examined to determine if any participants identified any outcomes related to CI that are related to the 'baseline' indicators of CI value as identified by the researcher in the literature review. These were customer relationships, innovation, and financial performance.

Participants did identify certain expected beneficial outcomes, framed by usage of CI to inform outputs, such as adding new product features (Hans, John) or revising a pricing structure (Spencer). These outputs lead to expected outcomes. For example, Pierre, when discussing the beneficial role of CI, said: *"[CI is] to inform those who work with the clientele, and it is to inform as well our clientele"*, adding that CI provides the ability to knowledgeably speak the language of businesses engaged in specific activities of interest. From this statement we can

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tease out that *"being more informed"* is a beneficial outcome not just about the decision-maker making a decision. It's also about supporting a vendor-client relationship.

Service (or process) efficiencies are another identified area of CI outcome and benefit. David, Helen, Tom, and Brian all described how CI is used to support decision-making through setting targets and benchmarks, and then also providing feedback on performance: were those targets met? How has the unit or organization performed against competitors? Where do we need to improve?

New business development was another identified beneficial outcome. The development of new product lines (Helen), identification of new potential strategic alliances to develop new products (John, Sarah), and support in distinguishing those products from those offered by competitors (John, Geoff) mean that participants believe CI has a cause-and-effect relationship in helping organizations with new business development.

In summary, participants have indicated that beneficial outcomes of CI, where they see a causal relationship, are:

1. Improved and more efficient services;
2. Improved customer relationships; and
3. New business development.

Of the three indicators of CI performance originally identified by the researcher, 'customer relationships' is the only one supported by the participant responses. Financial performance was not mentioned by any participant as being related to CI use, although we can extrapolate a relationship mediated by customers, service efficiencies, and new business. Innovation, the third indicator, was related by the researcher to the outcome of new business development, but participants challenged this conceptualization, as discussed in section 4.2.3.5.

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4.2.3.2 *Information service value perspective*

As discussed in the section on instrumentation, the interview question asking about the value and benefits of CI to the individual was taken from research conducted by Marshall (1993) for the Special Libraries Association. It is information-centric, individual-centric, and implicitly reflects a service-oriented perspective. This section of the interview asked if participants agreed or disagreed that CI informs organizational decision-making in the following ways:

1. Remind you of facts already known
2. Help you feel more confident in making a choice
3. Make you more informed about an issue
4. Present a new dimension or new insight for consideration
5. Provide new information
6. Confirm a choice you would have made anyway

Responses were typically monosyllabic, with participants stating 'yes', 'no', and occasionally 'sometimes/it depends'. The researcher did not find any patterns to the responses, or explanations for differences between respondents. Responses are provided in the table below.

	Remind of facts	More confident	More informed	New dimension	New information	Confirm choice
Hans	N	N	Maybe	Y	Maybe	N
Helen	Y	Y	Y	Y	Y	Y
Patrick	Y	Y	Y	Maybe	Maybe	N
Spencer	N	Y	Y	Y	Y	Y
Tony	N	Maybe	Y	Y	Y	Maybe
Pierre	Y	Y	Y	Y	Y	Y
Sarah	Y	Y	Y	Y	Y	Maybe
John	N	Y	Y	Y	Y	Y
Brian	N	Y	Y	Y	Y	Maybe
Geoff	Y	Maybe	Y	N	Maybe	Y
David	Y	Y	Y	Y	Y	Y
Tom	Y	Y	Y	Y	Y	Y

Table 5: Information Service Value Perspective Responses

In order to present a visual that would summarize the collective agreement/disagreement of the group with these statements, the researcher assigned 2 points to every 'yes' response, one

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point to every 'sometimes/maybe' response, and zero points to every 'no'. The points for each statement were then totaled and averaged for the 12 responses, to provide the graph below, ranging from least agreement for "CI reminds you of facts already known" (1.2 out of a possible 2) to most agreement for "CI makes you more informed about an issue" (1.9 out of a possible 2).

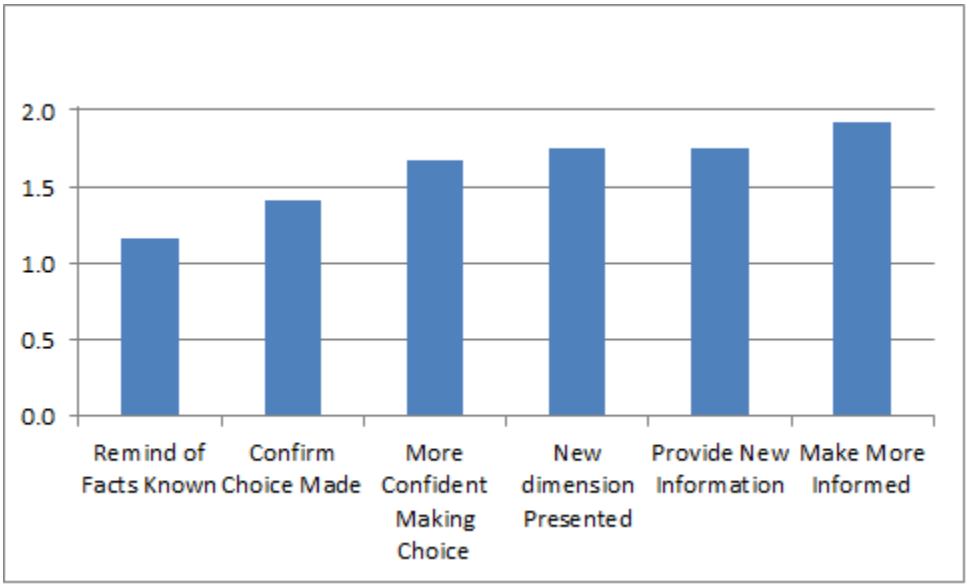

Figure 5: Information Service Value Perspective of Participants

The closest participants came to universal agreement was that the role of CI was to make them more informed, but even then one participant, Hans, a participant who argued throughout his interview in favour of his corporate policy to ignore CI when making decisions, gave a 'maybe', reflecting his anti-CI stance. He agreed that CI had value in presenting a new dimension, and that it might sometimes have a role in presenting new information.

At the end of the list, participants were asked if they had anything they would add to it. Three participants had something to add. Brian stated that CI can sometimes help you make the opposite choice, or know what not to do. John said that CI can prevent you from taking action. And Helen commented that CI should be reminding the decision-maker of organizational objectives, adding:

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> …we're making decisions all the time and our decisions are in line with what we see month to month. So it's not necessarily new-news, but it [the CI] is this really good reminder of something that's bad or something that's in decline and it's a constant reminder of the objective nature of that trend.

4.2.3.3 Information system value perspective

The question capturing what is termed here an information systems perspective was taken from research conducted by Venkatraman and Ramanujam (1987) in the field of business management, investigating key goals and capabilities of planning systems which best allowed the identification of managerial and administrative benefits to the organization as a result of the system.

Participants were asked if they believed CI to help with any of the following:

1. enhancing managerial development
2. predicting future trends
3. short-term performance
4. long-term performance
5. gathering relevant information
6. avoiding problem areas

Again participants provided yes/no/sometimes responses, typically monosyllabic, in response to the items on this list. Again as with the information service value perspective, the researcher was unable to find any pattern to the responses, or explanation for the differences between the participants' answers. The responses of the participants are provided below.

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	Enhance manager dev.	Predict trends	Short-term performance	Long-term performance	Gather info.	Avoid problems
Hans	N	Y	N	Y	Y	Y
Helen	N	Y	N	Y	Y	Y
Patrick	Y	Y	Maybe	Maybe	Maybe	Maybe
Spencer	Y	Y	Y	Y	Y	Y
Tony	N	Y	N	N	Y	N
Pierre	N	Y	Maybe	Y	Y	N
Sarah	Maybe	Y	Y	N	Y	Y
John	N	Y	N	Y	Y	Y
Brian	Y	Y	Y	Y	Y	N
Geoff	N	N	Y	Y	Y	N
David	Y	Y	Y	Y	Y	Y
Tom	Y	Y	N	Y	Y	Y

Table 6: Information System Value Perspective Responses

As described in the previous section on the information service perspective, responses were assigned a value (yes = 2, maybe = 1, no = 0) and then averaged in order to provide an overall visual that conveyed the aggregate agreement or disagreement of the study participants with the statements above.

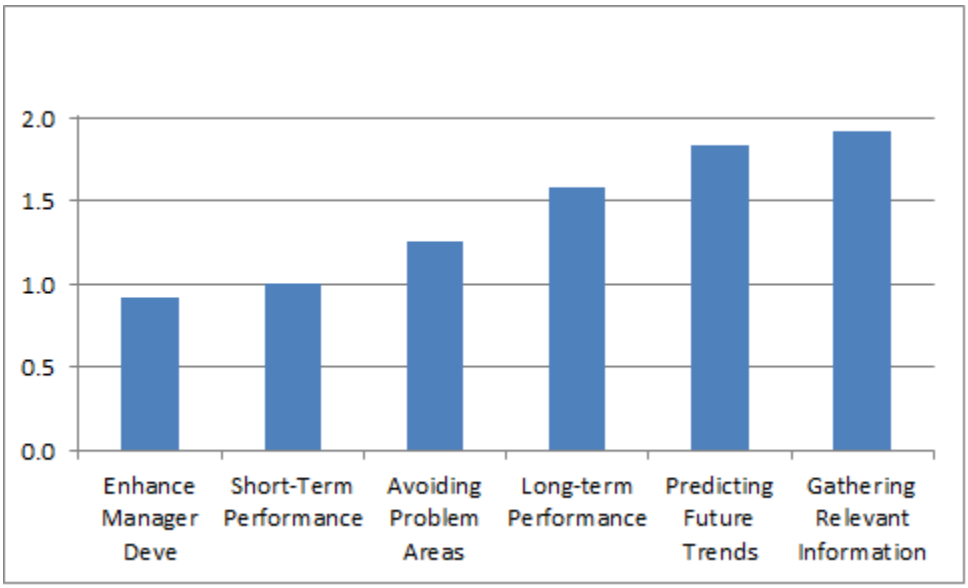

Figure 6: Information System Value Perspective of Participants

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Other than one 'maybe' from Patrick, who seemed doubtful about the role of CI for the organization as a whole, rather than a decision maker, participants agreed that CI helps with gathering information (1.9). As a group, they considered CI to have more value for long-term performance (1.6) than short-term performance (1.0) in the organization. Helen commented, when asked if CI helps with short-term performance, *"we don't really buy into the short-term performance, we really look at trends, so I would say no"*.

The most-disagreed-upon item was the role of CI in enhancing managerial development (0.9). Spencer was one of the participants who supported the idea of CI helping with managerial development, stating the market research helps to train employees: *"it will help people get stuff they might have gotten in college in some environments, what they might have got [in] a big corporation like Proctor and Gamble or something"*.

4.2.3.4 Strategic planning value perspective

The third value perspective is that of 'strategic planning'. Believing that impact measures for CI will need to incorporate a strategic value perspective, the researcher decided to test this belief by first asking participants to describe their organization's strengths and weaknesses in the marketplace, in order to contextualize the following questions:

1. Does CI help the organization to navigate the marketplace strategically, or help in any way to identify opportunities of benefit to the organization?
2. Do you know of the existence of any strategic plan for the organization?
3. Do you feel that the CI unit, or its deliverables, have any connection or relationship to strategic planning at this organization?
4. Do you believe that CI should be involved in strategic planning for organizations?

A fifth question, regarding participants' perceptions as to whether CI is more strategic or tactical for organizations, was reviewed in the section on strategic and tactical decision-making, section 4.2.2.3. As described in that section, a strong connection was drawn between CI and its

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role in strategic decision-making, although five of the participants believed that CI is both strategic and tactical in nature.

A table of responses is provided below. Although responses here were not always yes/no answers, some aspects of the discussion could be distilled into this table. For these questions, the default was 'yes'. Some responses were conditional. In those instances, the response has been given an 'X'.

	Sarah	Tony	Spencer	Hans	Brian	Patrick	David	John	Geoff	Tom	Pierre	Helen
CI helps with strategic navigation	Y	N	X	N	Y	N	Y	Y	Y	Y	Y	X
Organization has strategic plan	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
CI used in developing strategic plan	Y	N	N	X	X	X	Y	Y	Y	Y	Y	Y
Should CI be used in strategic planning	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Table 7: Strategic Planning Use Responses of Participants

As for the information service and information system value perspectives, values were assigned to the responses in order to generate a chart which conveys the aggregate responses. 24 is the highest possible score.

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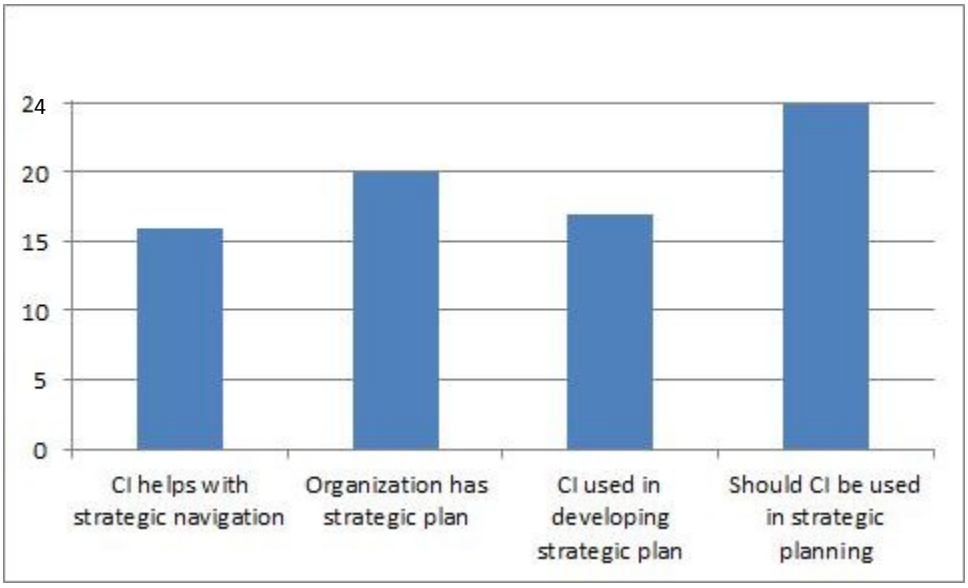

Figure 7: Strategic Value Perspective of Participants

Not all participants had strategic plans in place at their organizations. Of those ten who did have a strategic plan, not all believed that CI had a role in its formulation. The role of CI in developing strategic plans for the organization ranged from Geoff, who described how revisions and updates to the strategic plan for their marketing firm occurred in formal annual meetings in which CI deliverables were an essential part, to those who saw it as having a tangential or indirect role, such as Brian who stated that CI *"doesn't literally or causatively impact"* their strategic plan.

Only seven participants indicated that their organizations are using CI for strategic navigation, defined for this study as a short-term decision-making and planning activity distinct from, yet related to, the organization's formal strategic plan. It is rooted in an organizational awareness that the market is dynamic and needs monitoring in order to adaptively respond while still fulfilling strategic objectives.

Beyond these conflicted reports of practices, however, the critical finding of the strategic planning value perspective is that participants unanimously believed that CI *should* be used in

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strategic planning. It is significant that all participants endorsed an ideal of CI use and value in strategic planning. Even Hans, who espoused an anti-CI stance, when asked if CI should be involved in strategic planning activities, responded *"yes, it has to be. It has to be"*.

4.2.3.5 Instances when value is unrealized

At the end of the discussion about use and benefits of CI within their organizations, participants were asked the question, "where or when do you think CI is not useful?" One participant was unsure of how to answer the question, and did not provide a response. The other eleven participant answers fell into three categories: *size and luxury,* referencing the size and maturity of an organization and its perceived need for CI; *dictation and disruption*, which deals with information management issues related to CI; and finally *innovation*, which emerged from participants' comments about the nature of innovation in relation to CI. Described here are situations, problems, and organizations in which participants believe that CI would not provide value or benefit.

Size and luxury: Three participants believed that the size of the organization affected the ability of an organization to effectively use CI, with smaller organizations deriving less benefit than large ones. Two participants specifically referenced CI as a luxury in this context, with Spencer saying, *"for many of these small companies, that [CI] is a luxury"*, and Pierre stating that for a small business it is *"more luxe to have these kinds of activities"* than if you are in a large corporation.

In contrast, Sarah, who was operating the smallest organization in the data set, with only 13 employees, strongly supported the use of CI in all organizations, regardless of situation or size.

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Dictation and Disruption: Remote *"dictation"* with CI taking authoritative precedence over local first-hand knowledge was identified as something that negates CI value. David's comments were:

> I think that data analytics can get to the point where it becomes so granular that, you know, some people can feel that at a local level that things are being dictated to them from the organization as a whole, and that's overruling local market knowledge… in the majority of cases you need to stick with what you're given. But there are those instances too where it wouldn't necessarily apply to you because people have better insight from being where they are.

Along similar lines, Helen stated that CI is not valuable when it is used to the exclusion of other sources of information, specifically describing a sales context in which the numbers generated by their CI unit might obscure needed insight. She argued that quantitative data analytics should be supplemented with *"soft"* subjective information about customer relationships obtained from people working with those customers, saying *"you have to be really careful when you only rely on statistical data without digging into kind of the emotional portion, or the customer portion behind it"*.

The other management element was 'disruption' or a loss of focus, when CI causes the organization to lose its strategic vision. Pierre cautioned that market analysis can be a distraction and an active hindrance to organizations when they let the competition's activities influence and even dictate internal decisions. Patrick described this loss of focus, and the relationship of CI to strategy and organizational maturity in this way:

> I don't think it's [CI is] useful if you don't know what business you're in….In the context of some organizations, gathering this information could simply be noise. And distracting. And disruptive against the business strategy. You know,

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> and because it could take your eye off what you should be focused on….If you were to have competitive intelligence informing you from the get go about all of the amazing things that were out there and all of the challenges, you may be so overawed by the gap of where you are today, versus where your quote unquote competitors are, sometimes you may choose not to make the journey. Sometimes you have to immerse yourself in the business, be focussed on that, and be blinkered on that, be driven on that, and become excellent in that, and when you have excellence and you've demonstrated excellence and value, then you need to start paying attention to who's competing against you.

Innovation: The third category into which responses fell was 'innovation'. Three participants, Sarah, Hans, and Geoff, considered CI to lack value for truly innovative companies – an notable point of contrast to the earlier findings which identified CI as having a role in supporting new business and product development. Geoff described how innovative companies do not need CI as much as others in this way:

> It's hard to come up with a time when it [competitive analysis] would not be useful. But let's say you have a company that's so cutting-edge, so innovative, and continually leading the pack say you know like an Apple or a Google-type company. I'm sure they still do competitive analysis but sometimes they are so, so far ahead of the curve that it would probably diminish its value. I think only in that very limited situation would I say competitive analysis might not be very useful.

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4.2.4 CI Measurement Practices and Measurement Value

Participants were asked how CI is measured in their organizations, and their views on CI measurement, with the following questions:

1. What current CI performance measures are in use to evaluate the CI unit generally, its services, or its deliverables?
2. How useful and functional do you consider those measures to be?
3. How would you improve those measures, if at all?
4. Do you consider measurement of CI performance to be, or potentially be, useful in assessing performance? Does measurement have value for CI?

The responses to these questions are reviewed below.

A table summarizing the responses is provided here as a reference. The CI unit types (the typology of CI practices developed in section 4.2.1.2) are included in this table because participants frequently connected the value of CI measurement to their organization's CI practices.

	CI Unit Type	Does organization use CI measures?	Current practices are satisfactory?	Would/ Are CI measures useful?
Helen	Internal Formal	Y	Y	N
Pierre	Internal Formal	Y	Y	Limited
David	Internal Formal	Y	Y	Y
Geoff	Internal Formal	N	Y	N
Hans	Internal Formal	Unknown	Y	Limited
Tom	Internal Formal	Unknown	Maybe	Y
John	Internal Shared	Unknown	Y	Limited
Tony	Outsourced	N	N	Y
Sarah	Outsourced	N	Y	Limited
Spencer	Transparent Network, Internal Shared	N	N	Y
Brian	Transparent Network, Outsourced	N	Y	N
Patrick	Transparent Network, Outsourced, Internal Shared	N	Y	Limited

Table 8: Participant descriptions of measurement practices

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4.2.4.1 Current measurement practices

Only three participants reported that their organizations conduct CI measurement. These measures were of the type standard in the literature: process measures and surveys of client satisfaction. The majority of participants stated that they do not conduct measurement, with three uncertain as to what measurement is done. The majority of participants also indicated their satisfaction with existing, absent, or unknown forms of CI measurement.

Reasons for not measuring CI value were related to CI practices, volume of CI activity, perceived responsibility, and an expressed disbelief in the informativeness of measurement.

For Sarah, because competitive intelligence is outsourced, there are no competitive intelligence performance measures in place at the organization, and no perceived or anticipated need for measurement. Geoff and Patrick considered measurement to be an unnecessary activity and cost when there is not a full-time group of employees doing CI.

Comments about the limited value of CI performance measurement in relation to the organizational investment into CI raise questions for conceptualizing measurement. John was another participant who pointed to the limited informativeness or value of CI for an organization, such as his, which does not have an internal formal CI practice, but rather an informal internal and dispersed responsibility shared among all employees to do research. When asked if measurement would be valuable, his response did include a conceptualization of valuable measures, but concluded with *"I don't know how valuable that is sometimes"*.

Brian, whose CI practices were outsourced and transparent networks, dismissed the value of CI measurement, stating that his organization does not use any performance measures to assess the value of their benchmarking or intelligence activities, and that he cannot visualize a

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likely or useful performance measure. Instead, he goes by his instinct as to whether the data is used, useful, and beneficial to the organization as a whole, describing his performance measure as *"just my gut feeling on it. That it's useful and effective….it's not scientific by any means"*. For him, this is the only 'measure' he requires.

4.2.4.2 Participant perspectives on the value of impact measurement

When asked if measurement was valuable for CI and the organization, the participants were evenly split in their opinions: four believed it was, four believed it wasn't, and four believed it had some limited value. Part of the problem for analysing responses to these questions is that participants presented conflicting conceptualizations not only of measurement value, but what a valid and reliable measure actually is.

As described above, Brian stated that the only measure of performance or value he believes to be necessary is his *"gut feeling"*, which he acknowledged was not *"scientific"*. Yet he believed it to be a satisfactory, reliable, and valid measure. Other participants proposed measures which they considered to address the heart of the problem, namely, did CI meet its purpose? Helen proposed that a potential measure of a deliverable's value, such as a report for an executive, might be simply, *"does it offer insight?"* Patrick, whose organization used multiple methods to source CI, stated that:

> …irrespective of performance measures, is, the true measure is, did that work? Cause something different to happen, i.e., a new funding mechanism by government that flowed more funds to us. That's the real arbitrator of success and you don't need to have formal performance metrics and systems to be able to track that.

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Complicating the discussion were the varied conceptualizations of value and measurement presented by the study participants. The object or value to be measured was variously identified by participants as user satisfaction, cognitive effects, decision or activity outcomes, and quality of the CI deliverables. Some participants conceptualized the value of CI measurement activity itself as behavioural outcomes, in the idea that measurement should ideally induce improved CI and increased CI use, and/or result in service improvements.

Additionally complicating the discussion of measurement was (and is) the hesitation participants expressed regarding the value of measurement activities to the organization. A few participants argued for the value of CI measurement as a guiding management principle. Pierre was one of those participants who argued for CI measurement yet he was unsure how the outcomes or value of business intelligence could be assessed, and questioned whether the value returned (ROI) would be worth the time and effort involved to track CI outcomes and benefits:

> I think it's always a good thing to have performance measurement, I'm really for it. Now it depends how much it will cost to implement it and to—you know, how much efforts need to be put in. That's always the big question, you're never against something that will improve, or make you improve, but it will depend on the cost of it. That's the important question, how much it will cost to implement something, so the return on investment is the big question.

Even for organizations already engaged in CI measurement activities, there were questions of limited value or return on investment for formal measurement activities: is it really worth spending time, money, and resources on evaluating the outcomes, impact, and general performance of a CI function? David believed that to try and relate the relatively micro investment in CI to the outcomes of a project or a team would be nearly impossible and of little benefit to the organization, arguing that there could be *"no full measurement"* of its benefits, and

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that an accurate measure was not important, since the value of CI to his organization is self-evident. For participants who outsource or network their CI, the value of CI measurement was even more limited.

With three of the twelve participants, the researcher talked at more length about the feasibility of establishing a causal relationship between CI and organizational benefits as an element of performance measurement. These participants indicated that while they believed it to be possible to track such a causal relationship, they did not believe any such activity would be worthwhile, since the cost of CI is too minimal in light of organizational budgets, and the benefits are too diffuse and complex to capture.

4.2.4.3 Participant criteria for 'good' measurement

Participant responses to CI measurement questions were analysed and a list of criteria for CI measurement was extracted from those responses. While some participants expressed confusion and ignorance when asked how they might improve CI measurement practices at their organization, such as Brian who said *"I don't know how we'd do it",* participants for the most part were still able to articulate what criteria would need to be met by an ideal measure. Brian and Geoff are not included in the list below, since they did not believe measurement to be useful and offered no hypothetical measurement criteria. Hans admitted some limited usefulness for measurement but had no suggestions, so he also is not included in the list.

The list below provides the list of criteria extracted from the interviews, with the study participants who proposed the criteria in brackets:

- Simple and quick (John)
- Empirical and objective (Tom)
- Inexpensive (Pierre)
- Examines product quality (Sarah)

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- Demonstrates successful exploitation of opportunity, potentially through causality and process (Patrick)
- Examines the insight provided to the user (Helen)
- Demonstrates value of CI deliverable and fosters adoption behaviours (Tony)
- Helps identify problems retrospectively so mistakes aren't repeated (Spencer)
- A partial measure works as an indicator of overall performance; it does not need to be exhaustive or entirely accurate (David)

This distilled list of measurement criteria contains not just characteristics of ideal measurement, but also expectations for measurement outcomes, yet again underscoring the need for careful conceptualization of measures, measurement purpose, audience, and value, as well as of the activity or item to be measured.

4.2.5 In summary: the users study

The users study found that a typology of CI practices exists, which affects the value participants placed on CI measurement. CI users value the CI unit for its responsiveness above all other characteristics, and use CI to support their organizational decision-making in all three stages.

CI has been demonstrated to have a strong link to strategic decision-making, but is perceived by participants to hold the greatest value in its use for strategic planning. Anticipated benefits associated with CI use include improved outcomes for services, customer relationships, and business development; cognitive support for decision-makers; and support to the organization as an entity in understanding future trends and finding relevant information, among others.

Participants indicated that the value of CI may be compromised by the receptivity of its audience, and hold no value for organizations that are small and immature, or lack a clear mission, or which are highly innovative.

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Few participants conduct CI measurement at their organizations. Participants questioned the value of measurement activities in relation to CI costs, asking first whether the cost of measurement would outweigh the cost of the CI itself, and whether it would provide useful insight to organizations. Despite this, participants were able to provide a list of criteria that should be met by ideal CI measurement.

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Chapter 5: Discussion of Findings

5.1 Introduction

Participants in the experts study encouraged the researcher to address the conceptual problems of intelligence measurement as a critical preliminary to understanding and addressing its methodological challenges. As described in the previous chapter, the research confirmed that the multiplicity of measurement models, the variety of measurement conceptualizations and terminology in the literature attendant upon descriptions of unique practice and prescriptive models, mandate comparative discussion in order to move forward the evolution of best practices.

For this discussion, noteworthy findings related to the CI practices that frame the responses to the research questions are presented first, providing context to the later sections. Findings that respond to each of the three research questions are subsequently discussed in turn, highlighting the use of CI by senior-level managers in strategic planning, and the varied cognitive and organizational benefits and outcomes expected by users of CI.

Findings obtained in response to the first two research questions have been used to revise the conceptual model. The revised model, presented here, is an attempt to visually represent the role of CI in all stages of decision-making, and its anticipated benefits, outcomes, and impact as determined by the users study.

The second half of this chapter is devoted to answering the third research question. A critical evaluation framework is presented, rooted in the findings of the expert and user studies. Evaluation criteria recommended by study participants and included in this framework include: utility, meaning ease and simplicity of use; and validity, such as reliability, credibility, and

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objectivity. Also included are recommendations for the methodology, such as including a financial measure, and using multiple measurement tools.

This evaluation framework is applied to four prescriptive models of CI measurement in the literature in order both to test the framework, and to present some comparative discussion regarding measurement best practices. The four prescriptive models selected are ones that have been referenced in the literature review: Herring (1996), Davison (2000), McGonagle and Vella (2002), and Cohen (2009). Discrepancies between study participants in terminology, measurement constructs, and valuation had suggested to the researcher the need to include aids that enable the measurer to carefully conceptualize audience, purpose, and the item to be measured prior to the selection of a measurement tool. The multi-method multi-trait approach used by Cohen (2009), in combination with her careful conceptualizations, was most highly rated according to this evaluation framework, although more work needs to be done, particularly to simplify the measurement task and to address the still-problematic financial measures. The chapter then concludes by building on the evaluation framework to respond to the third and final research question, identifying "most appropriate" CI measurement for organizations.

5.2 Terminology, Conceptualizations, and Sourcing

5.2.1 Variation in terminology and definition

In both studies conducted for this doctoral dissertation, strong disparities in terminology existed between study participants. In the experts study, when asked to define a sample of terms related to measurement, participants gave varied answers. Even when there was consistency amongst participants, a broader reading of the literature could give examples of yet other researchers who disagree with the definitions provided in this study. For example, participants agreed that 'impact' should not relate to organizational strategy, and that intelligence is not

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related to strategy. Yet within the field of CI and BI, researchers have identified organizational strategy (Herring, 1996), strategy formulation (Hughes 2005), and strategic decision-making (Bose, 2008) as being strongly related to CI and discovering CI value in application of CI deliverables.

In the users study, participants described a wide range of terminology in use to label CI activities. Variations in terminology, even within organizations, were justified by some participants as clarifying the use to which CI was being put. Terms in use between organizations were not synonymous, often referencing activities that were related to CI but verging into other information activities. The terms however had strong, clear conceptual relationships to one another, and were related in that the end goal of the information activity was to inform organizational decision-making. Jin and Bouthillier's study (2008) investigating the human information behaviours of Canadian CI practitioners found that CI work is often done under a variety of names and labels. The 14 terms used by participants to describe their CI-related activities confirm those findings, and are collectively grouped under the term 'CI' for the purposes of this study.

5.2.2 Variation in conceptualizations

The variations in terminology reflect the diverse and sometimes uncertain conceptualizations of CI and CI measurement seen in the literature, as described in the literature review. Both the experts and the users study reveal that researchers and users of intelligence may have varying conceptualizations of intelligence value. While this research has not found any 'right' or 'wrong' conceptualization of value, these varying terms and conceptualizations indicate a need for researchers and practitioners to engage in discourse to develop standard terminology. Establishing agreed-upon conceptualizations of CI value is essential in order to

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identify and communicate that value to stakeholders, and is critical to establishing valid and reliable measurement.

5.2.3 Variation in CI sourcing

The methodology for the users study was designed in response to calls for methodologies other than the surveys which have historically been heavily relied upon in CI research, and a call for more CI research from a user perspective (Ganesh, Miree, & Prescott, 2004; Hughes, 2005; Wright & Calof, 2006). Since the research design did not rely upon CI practitioners to sponsor or participate in the study, or the self-selection of executives who have a formal CI unit and CI business practices, this research has been able to capture a disparate range of CI practices not described elsewhere, including organizations which have no employees specifically tasked with CI. The findings of the users study have indicated that the sourcing of CI may be divisible into four categories, as described in section 4.2.1.2: Internal Formal (what has been most often captured in past research), Internal Shared, Outsourced, and Transparent Network. While organizations might have more than one of these practices in use, and have variations within these labeled practices, this typology presents an opportunity to understand the rationale for and against CI measurement, and helps contextualize CI use and valuation.

Other findings in relation to sourcing practices were that the majority of participants stated that they augment the CI they receive with their own research activities, an unexpected finding of this study. Reasons for this augmentation may include a skepticism regarding the completeness of the CI deliverables, as expressed by one participant as the motivation for his own research activities, and may provide an interesting area for inclusion in future research investigating CI practices, including use and valuation. Choo (1993) found that for CEOs, their reliance upon CI varied depending on the decision role taken (e.g., negotiator v. disturbance

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handler). It may be that the decision role affects the trust these CI users place in CI deliverables, and their need to ensure its accuracy and exhaustivity.

5.3 CI use within organizations

In this section the findings which address the first research question are discussed. The first research question is, "how, when, and by whom is CI used as an input into organizational decision-making?"

5.3.1 CI integration with business processes

Based on the findings of the users study, three elements have been determined to affect how CI is utilized in organizations.

First, CI may be variably implemented with internal business processes depending on the CI sourcing practices implemented by the organization according to the typology of Internal Formal, Internal Shared, Transparent Networks, and Outsourced. Second, the style of organizational decision-making also affects CI use, with factors such as transparency, collaboration, and formality potentially affecting the role of CI. For example, CI may have a formal role in annual planning meetings. Alternatively it might be used to enable rapid 'entrepreneurial' and discretionary choice with rapid fact-checking.

A third category affecting the use of CI was identified by participants and has been labelled here 'constraining factors' which have been called 'enabler and inhibitor factors',by Garcia-Alsina, Ortoll, and Cobarsí-Morales (2013). These are contextual and management issues external to the use of CI, such as manager receptivity, environment, and time, that alternatively foster or discourage the use of CI and the realization of its value.

Participants described a wide range of decision-making processes at their organizations, with some connecting the needs and cultures of their industry to their decision-making. The use

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of CI and realization of its value may be impeded by constraining factors, such as receptivity, environment, and organizational maturity – issues related to organizational culture, business processes, or management styles, external to the CI and the CI service itself. This echoes other research findings that corporate environment/culture (Choo, Bergeron, Detlor, & Heaton, 2008) and corporate characteristics (Cohen, 2009), as well as other factors such as CI processes, participation, and searching habits (Garcia-Alsina, Ortoll, and Cobarsí-Morales, 2013) may inhibit or enable CI use and effectiveness.

When asked for details regarding business processes related to the CI unit, such as storage and dissemination practices for CI, participants were unable to provide them. They indicated that the 'responsiveness' of the CI unit, comprised of elements such as initiative, flexibility, timeliness, and helpfulness, was the preeminent factor in their satisfaction with their CI services. Although no explicit connection was made by this study between satisfaction with the perceived responsiveness of the CI unit and its integration with larger organizational business processes, a positive relationship may exist between them.

5.3.2 CI supports organizational decision-making

Participant responses in the users study cumulatively provide a picture of CI as a support to all stages of decision-making, thereby refuting the original conceptual framework, which had conceived of CI specifically as an input meant to inform the problem conceptualization stage of the decision process. This finding correlates with findings in other fields and of other researchers investigating the relationship between information, information services, and decision-making, such as the study of Paul, Sanders, and Haseman (2005) which determined that decision-makers require an information-rich environment and use information at all stages of the decision process,

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and the study conducted by Citroen (2011) which found that there was no discernible pattern as to how information affects decision-making processes.

5.3.3 Preferential strategic use of CI

Users study participants considered that CI is used in both tactical and strategic decision-making. As described previously, a link between CI and strategic decision-making has been found by Bose (2008), Daft, Sormunen, and Parks (1988), and Harrison and Pelletier (1993). This study confirmed that link, and found that a significant number of participants believed CI to have a role in tactical decision-making as well, as argued by McGonagle and Vella (2002). However, participant responses indicate that the use of CI in strategic decision-making is more prevalent and more valuable than in tactical decision-making.

Participants in both studies discussed organizational decision-making and the use of intelligence as being an activity specifically tasked to those individuals with responsibility for directing the organization. Participants agreed that CI should ideally be used in strategic planning and its related decisions, a finding that was particularly notable because it was the only question in either study to receive a unanimous answer. It worth highlighting that despite differences in management, industry, CI usage, decision-making, and perceived CI value and benefit, all participants believe that ideally CI should be used to support strategic planning activities. Hambrick (1982) found a link between environmental scanning activities and organizational strategy, while Hughes (2005) hypothesized a link between CI and organizational strategy functions. The findings here provide further evidence of the relationship between CI and organizational strategy development and implementation.

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5.4 Identified outcomes and benefits of CI

This section discusses the findings associated with the second research question, which is, "when CI is used, what are the perceived organizational outcomes or benefits?"

5.4.1 Anticipated outcomes from CI use

Participant responses in the users study were analysed to find what beneficial outcomes had been identified for the organization beyond improved decision-making processes, and supported and more accurate strategic planning. Identified outcomes extrapolated from these responses were: improved/more efficient services and processes; supported and improved customer relationships; and new business development, which participants considered to be separate from 'innovativeness'.

The researcher had originally conceptualized client relationships, innovativeness, and finances as being potential baseline indicators for CI performance, and an area in which causally-linked outcomes and measures could be established. Participants indicated that a causal relationship exists between CI and client relationships, confirming the finding of a survey conducted by Qingjiu and Prescott (2000). However, participants challenged the possibility of establishing causality between CI and organizational outcomes such as financial benefit, and the value of such a potentially complex and demanding undertaking when the cost of CI is typically a small to negligible item in the organizational budget. Finally, participants were conflicted as to the role of CI in innovation.

This finding provides some support for further research into how baseline indicators of CI performance may be utilized in CI impact measurement, as argued for in the literature review. These identified outcomes could also potentially provide some MOEs based in research determining causal relationships, rather than desirability, as called for by Buchda (2007).

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5.4.2 Anticipated benefits of CI use

Commonly anticipated benefits identified in the research, as described in the literature review, include improved decision-making (Hannula & Pirttimaki, 2003; Marin & Poulter, 2004), and improved strategic planning (Jaworski & Wee, 1992). This research confirms a causal relationship between CI and improved decision-making and improved strategic planning, where 'improved' denotes the decision-maker being provided with new information and insight, reminders of facts known, and helping the decision-maker feel confidence in choice.

Anticipated benefits of CI use identified by participants were both cognitive (the decision-makers will be more informed and more confident in making a choice) and organizational (the organization will perform better; the organization will avoid problem areas). The core value of CI appears to hinge for participants upon decision and strategic planning support, with more participants believing that CI was of value for long-term, rather than short-term, planning. A strong connection has been found between CI and organizational strategy, supporting the findings of Diffenbach (1983) and Ghoshal and Westney (1991) who found that most companies use CI in their strategic planning and their strategic decision-making.

Perceptions and experiences of participants regarding strategic planning and strategic value of CI were captured in a series of questions about the value of CI, through a variety of perspectives. Strong correlations were found with the special library impact research findings of Marshall (1993) and the organizational strategic planning research of Venkatraman and Ramanujam (1987). These similarities provide evidence that CI is a type of information service which can be conceptualized, studied, and measured in comparable ways to other information services, lending support to the arguments made by Liebowitz (2006), who believes the CI/KM divide is an artificial construct, and by Myburgh (2004), who argues that records and information management functions are in reality suited and similar to CI functions.

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These study findings also support the conceptualization of impact measures that connect CI to the strategic plans of organizations, as visualized by Herring (1996), and the researcher's original conceptualization of CI value as being dynamically rooted in decision activities, not deliverables or processes.

5.4.3 When benefits are not anticipated

Participants identified several situations in which CI is not valuable, including when it is used to the exclusion of other knowledge sources, 'dictating' to employees, and attention to competitors distracts from the strategic vision and goals of the organization. Some participants referenced innovativeness as being antipathetic to CI, appearing to consider the new business development role of CI (identifying new opportunities and opportunities for collaboration, helping the organization distinguish its products in the market) as a support to innovation, but not innovation itself. These findings raise questions as to how much the realization of CI value is connected to management of the organization; it also raises questions as to the role of CI in supporting innovation.

Another instance where CI is not valuable for participants is small or immature organizations. Adidam, Banerjee, and Shukla (2012) in discussing the adoption of CI in Indian firms used the term 'maturity' to describe how organizations progressively acquire more sophisticated CI practices. Comments such as that of the study participant who stated that for many in the nonprofit charitable sector, CI is *"a level of sophistication that goes beyond the requirements of the industry"* in contrast another participant's description of intense incorporation of CI into all business processes, demonstrate a range of maturity in CI practice that has implications for CI measurement activities.

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5.5 A revised conceptual model

The findings gathered in response to the first two research questions (and discussed previously in this chapter) have been brought together to revise the original conceptual model of the researcher, presented in the literature review (chapter 2).

In this revised model, participant responses as to how CI is used in decision-related activities are provided under each of the three decision stage headings. The researcher has assigned the comments of participants to each stage of the decision as they seemed to best fit, but acknowledges that some of these activities could be assigned to more than one of the decision stages. The 'decision supports' CI provides are presented in a position meant to denote the information-rich environment necessary for, and flexible information behaviours possible during, the decision process. The decision-making process results in outputs and outcomes, with the active outcomes identified here in the research findings as benefits and potential MOEs that are causally linked to CI by participants. The sample outputs in the conceptual model are examples provided by study participants. Latent outcomes are presented separately. Impact in this revised model is no longer only fulfilment of the strategic plan, but includes strategic plan formulation, reflecting the role of CI in strategic planning as described by the study participants.

Both the original and the revised conceptual models are presented here for ease of comparison. This revised model, rooted in both the literature and in the findings of this research, is offered as a conceptual model of CI use in decision-making and strategic planning that takes into account its dynamic value within the organization. The researcher does not suggest that this model is final or even complete, recognizing that more research needs to be done to test the model.

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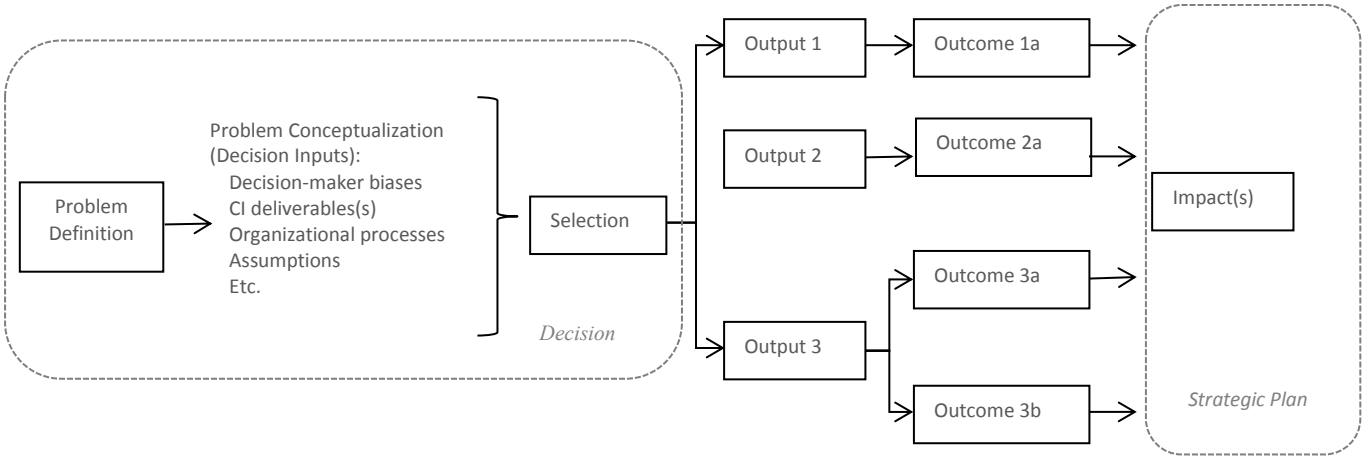

Figure 8: Original conceptual model of organizational decision-making

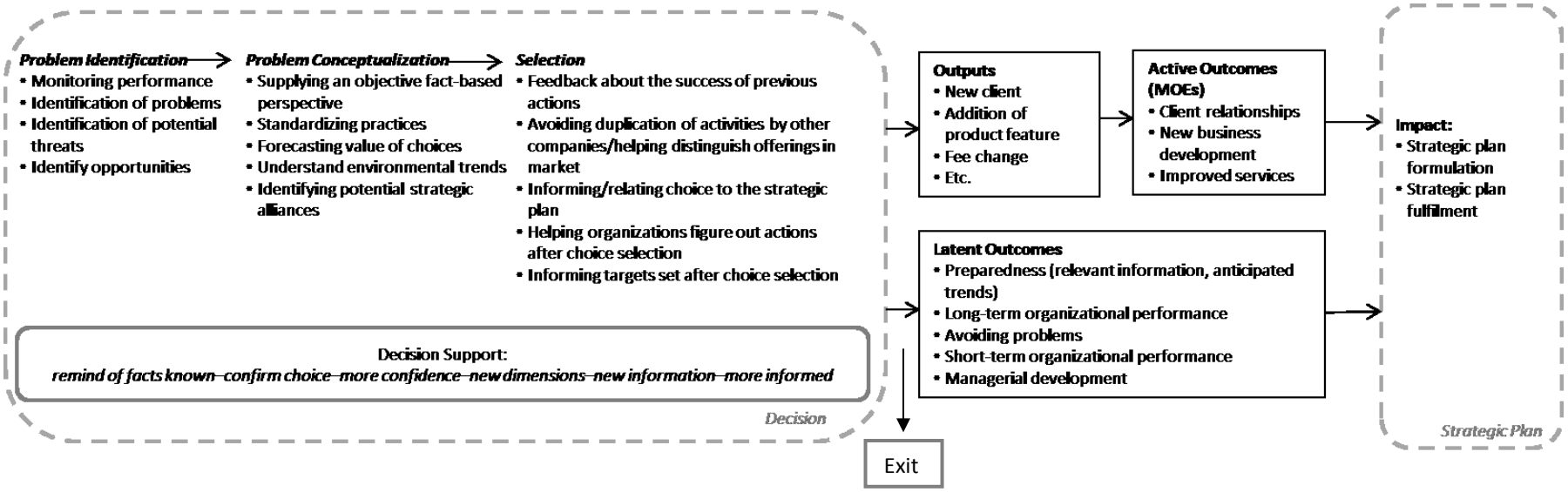

Figure 9: Conceptual model of the role of CI in organizational decision-making and strategic planning

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In this model, when a decision is made rather than an 'exit' (namely a decision to postpone or avoid choice selection) information service benefits are immediately available short-term decision supports for the decision process itself. CI, for example, has been confirmed by participants as having a role in reminding the decision-maker of facts known, presenting new information, and increasing the confidence of the decision-maker. These supports are applied to each stage of the decision-making process, as the decision-makers identify threats and opportunities in identifying a problem, standardize practice and forecast the value of potential choices in conceptualizing the problem, and set targets and calculate prospective actions as part of choice selection.

Information system benefits are realized post-decision with active and latent outcomes taking time to manifest. Active beneficial outcomes identified by the users study participants as being related to CI use in decision-making are client relationships, new business, and improved services. Latent beneficial outcomes of CI use to the organization include organizational preparedness, improved long and short-term organizational performance, problem avoidance, and manager development.

Collectively these lead to the impact of CI, which has been defined for this research as the role of CI in fulfilment of the organization's strategic plan. However, the users study indicates, and in turn the revised conceptual model shows, that the role of CI in relation to the organization's strategic plan is not just about fulfilment of, but also includes involvement in, developing the plan.

The findings summarized by this revised conceptual model respond to calls for research into the role of CI in decision-making (Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004). The model illustrates the complex and supportive role of CI for

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organizational decision-making, involving cognitive support, practical applications within decision-making processes, decision outcomes, and organizational impact.

5.6 The evaluation framework

Both the experts study and the users study resulted in lists of criteria which CI measures should meet. These criteria were amalgamated and, with other discussion from study participants and insights from measurement theory, developed into an evaluation framework for prescriptive CI measures. The construction of this framework is discussed below, along with its application to prescriptive CI impact and outcome measures.

5.6.1 The construction of the framework

Several researchers have responded to the call made by Prescott and Bharwaj (1995) for metrics to be developed that better enable CI units to assess their role and impact within their organizations. The prescriptive metrics developed by these researchers were in turn responded to with additional calls for scholarly research and consensus to replace singular reports of practice and conceptualizations unique to the researcher (Blenkhorn & Fleischer, 2007; Hannula & Pirttimäki, 2003).

The experts study sought to clarify discourse amongst intelligence researchers and practitioners in order to better conceptualize measurement for CI that addressed its dynamic role and purpose in organizational decision-making. The subsequent users study was then an opportunity for the researcher to examine not only organizational practices of CI use and CI measurement, but also user conceptualizations of CI value and the organizational constraints that may affect measurement activities. In both the intent was to develop comparative discussion of measurement practices and evaluation of prescriptive measurement in order to advance the development of best practices.

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To this end, participants were asked to provide criteria which would ideally be met by measures. Findings related to these criteria are developed here into an evaluation framework for prescriptive measures of CI impact and outcomes.

5.6.1.1 The assessment criteria

The lists produced in the expert and the user studies are provided in the findings chapter (sections 4.1.4 and 4.2.4.3, respectively). These lists as originally provided by study participants contained not just characteristics of ideal measurement, but also expectations for measurement outcomes, and suggested methodology, yet again underscoring the need for careful conceptualization to distinguish between measures, measurement purpose, audience, and value, as well as of the benefit, activity, or item to be measured.

The researcher combined the lists from the two studies, discarding duplicates and compressing criteria. Measurement criteria were isolated from issues related to purpose or effect, and from recommendations of method, resulting in the following three lists.

Distilled measurement criteria for use in evaluating prescriptive metrics and measurement tools are:

1. Simple
2. Quick
3. Empirical
4. Inexpensive
5. Reliable
6. Valid
7. Causal
8. Credible (also objective, using acceptable scales)
9. Provides evidence of organizational value
10. Margin of error (partial representation) identified and accepted

Recommendations for measurement methods are:

1. Identify purpose, audience, and phenomena of interest prior to measurement

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2. Use indicators to indirectly capture intangibles
3. Incorporate anecdotal evidence
4. Include a financial measure
5. Examine product in quality and use, accounting for quick depreciation of CI
6. Examine the insight provided to the user
7. Provide evidence of behavioural change (e.g., willing to seek out CI in response to need)
8. Identify the role of intelligence in decision-making
9. Capture organizational usage in a way that identifies inter-departmental use and varying stakeholder perspectives
10. Use aggregate or multi-method approach
11. Foster communication between measurer and audience using agreed-upon language, etc.

Suppliers of these criteria believed that the purpose of the measurement activity could prospectively be to:

1. Demonstrate successful exploitation of opportunity, potentially through causality and process
2. Demonstrate value of CI
3. Foster CI adoption behaviours
4. Help identify problems retrospectively so mistakes aren't repeated

The distilled list of measurement criteria and the measurement method recommendations are provided here as a tool with which the prescriptive metrics in the literature may be critically evaluated.

5.6.1.2 Relating 'good' measurement to the conceptual model

The original conceptual model for this research and the revised model construct CI value as being its dynamic use in organizational decision-making, first as conceptualized by other researchers (Hannula & Pirttimäki 2003; Marin & Poulter 2004) and then by participants of the users study. In this multi-stage decision-based model, time must be allowed to lapse in order for CI outputs, and then outcomes, to occur. Only then can the impact of the decision-making be manifested in relation to the fulfilment or frustration of the organization's strategic plan.

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Indicators of impact would then be related to the decision through outputs and outcomes, in order to establish a causal relationship from use to benefit.

A conceptualization of CI measurement that accounts for this model must place its emphasis on capturing the varying roles of CI in organizational decision-making. Measurement would capture use, and its subsequent outputs and outcomes, in order to evaluate impact. Impact could be defined as CI's effectiveness in aiding the organization to achieve its strategic goals. A shortcoming of this conceptualization is that the methodological challenges for identifying outcomes remain, as identified in the literature review, including the time which they may take to manifest over long time horizons.

An implication of the conceptual model is that subjective data must be collected from CI users. Kujansivu and Lönnqvist (2009) note that "subjective assessment may be the only practical approach to capturing information about outcomes" (p. 478). As previously noted however, subjective data is not synonymous with satisfaction measures, which historically have been used as a surrogate measure of performance (Ganesh, Miree, & Prescott, 2004; Poll & Payne, 2006). User satisfaction is insufficient as a standalone indicator of performance, since performance is a complex construct (Youthas and Young, 1998). Poll and Payne (2006) in their work on impact measures for libraries have termed user satisfaction "a facile outcome" that does not necessarily speak to the mission of the institution (p. 552). Questions that identify use, application, and perceived benefit must augment questions of user satisfaction in order to generate valid forms of CI measurement.

Aggregate measures, or multi-method measures, are part of this researcher's construct of good measurement, and are all the more important in consideration of the fact that these immediate short-term measures will be providing only partial evidence of performance that must necessarily speculate the longer-term performance of CI. An example of such recommendations

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was made by Lönnqvist and Pirttimäki (2006) in their case study of a Finnish telecommunications company. They recommended that performance measures should contain direct and objective, direct and subjective, indirect and objective, and indirect and subjective measures. In this conceptual model of CI and organizational decision-making, such a multi-pronged approach is necessary in order to capture the multi-faceted aspects of this dynamic relationship.

In a final note, in good measurement the developer of the measure and the user of the measure should both be able to clearly distinguish between the item to be measured, the measurement tool by which it is captured (such as a Likert scale), and a measure (such as a measure of satisfaction or use, utilizing a Likert scale as a tool). Careful conceptualizations with multiple measures examining various aspects of the item together create the performance metrics.

5.6.2 Results from the assessment of the prescriptive models

These evaluation criteria and the larger evaluation framework were applied to several prescriptive models of CI measurement in the literature. The selection criteria for prescriptive metrics to be evaluated were:

- Does the metric purport to capture CI impact and/or outcomes at an organizational level?
- Has the source of the metric been provided?
- Is the author's conceptualization of CI, its role/value/purpose, evident?

Measurement models that met these criteria were then put to two additional tests. First, only single representative measurement types were wanted in the group. For example, if two prescriptive ROI metrics were available, only one ROI metric was selected. The second was that the prescriptive measurement model be specifically designed for CI, which was conceptualized

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as intelligence about competitors and the environment that informs organizational decision-making. CI is therefore distinct from (for example) conceptualizations of business intelligence (BI) which include internal data analysis as an intelligence activity.

The resulting four prescriptive models for analysis represent four approaches in the literature to CI measurement. Three of them represent the CI measurement categories identified by Buchda (2007): Herring (1996) represents MOE, Davison (2000) represents ROI, and Cohen (2009) represents the BSC approach, since her process results in a BSC-style dashboard of results. The fourth measurement model, developed by McGonagle and Vella (2002), represents a "construct your own" school of unique-to-the-organization measurement not identified in Buchda's (2007) literature review, and which holds much in common with the prescriptive measurement developed by Cohen (2009).

This section provides an analysis of the prescriptive measurement models selected for examination, including descriptions of the authors' conceptualizations of CI value and of measurement. The summaries review the authors' source of their models, and how they conceptualize CI value, impact, and measurement. The measures used by the models are briefly reviewed in an attempt to provide a compressed overview of the elements the measures require, such as executive time, user feedback, access to the organization's strategic plan, etc.

In the second half of the section on each measurement model a critique is provided. Each is evaluated according to the critical framework provided above, with a discussion of the respective strengths and weaknesses of each and its measurement approach. A comparison of the four measurement models below demonstrates that the model presented by Cohen (2009) meets more of the assessment criteria and lends itself best to the conceptual model of CI's role in organizational decision-making.

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5.6.2.1 Herring

Summary

In 1996 Herring published "Measuring the Effectiveness of Competitive Intelligence: Assessing & Communicating CI's Value to Your Organization", which contained the findings and recommendations of a research study into CI measurement that was sponsored by the Society of Competitive Intelligence Professionals (SCIP). This small exploratory study included interviews with executives who manage companies with internal CI units. Based on that study and his own previous career experiences as a former CIA intelligence officer and then a founder of corporate CI practices at Motorola and other companies (Herring, 1999) Herring developed this prescriptive measure.

CI value is conceptualized for this measurement model as being its impact upon the organization through use of CI in decision-making, in order to accomplish organizational goals as laid out in the organization's strategic plan. CI value is described by the author as having three components. First is what Herring termed "actionable effects", wherein the use of a CI deliverable triggers subsequent actions that lead to beneficial outputs such as increasing sales or producing better products. Second is the effect of the CI upon decision-makers, asking, is CI "making them more competitive or ready to act?". Third is the "significant and tangible impact on the business itself" (1996, p. 43).

Herring notes that there are conflicting expectations of measurement between middle and senior management, stating that middle management with its "managing" mindset wants more quantitative evaluation, based on not only impact but also size and cost. In contrast, senior management is more interested in "action-oriented" CI measures that demonstrate the role of CI in decisions and activities that have a larger organizational impact.

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Measurement is conceptualized as measures of effectiveness (MOEs) that are developed in conjunction with executives, with the organization's strategic plan as a reference for goals to be supported by CI. Herring recommends the use of time savings, cost savings, cost avoidance, and revenue enhancement as a starting point for selection of MOEs. Management expectations for CI benefits dictate the MOE selection.

Specifics as to how quantifiable data about these MOEs should be captured are not explained. Herring skips over measurement tool selection, suggesting only that if MOEs are related to company goals, identification of actionable effects will provide the necessary link between the CI deliverable and its benefits to the organization.

Herring provides more detail about the process by which CI impact may be evaluated, and how to formulate MOEs. His process is summarized here:

1. Identify management expectations
2. Make expectations and MOEs part of CI planning
3. Identify and define key performance areas
4. Align strategic objectives, expectations and CI operations
5. Select most appropriate MOEs, including value add
6. Produce intelligence that links expectations and MOEs
7. Tailor results to management's decision-making style
8. Jointly evaluate qualitative results with management
9. Calculate and communicate quantitative results through users

While Herring recommends that results when possible should be measured in quantitative or financial terms, he also states his belief, based on his interviews with executives, that "the only credible evaluation would have to come from the executives themselves" and not CI practitioners (p. 44). This evaluation would necessarily be qualitative and subjective in the assessment of CI use and its role within the organization.

Critique

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Herring's prescriptive measure has several significant strengths. He addresses the role of CI in decision-making as a preliminary to realization of CI value. He encourages CI practitioners to consider how to tailor CI products and then evaluation within the context of supporting various types of decision-making. In his prescriptive process he instructs the measurer to conceptualize CI value, organizational decision-making style, and the needs of management as preliminary steps to the selection of measures, some of the critical pre-measurement steps that may be neglected in measurement activities (Churchman, 1959; Gorad, 2010).

The MOE approach to measurement potentially addresses problems with direct measurement of intangibles by using indicators of performance. The involvement of executives and of the strategic plan helps the CI practitioner to understand expectations and needs, and by what criteria the service will be evaluated, by those who oversee and use the service. All these strengths have positive implications for validity and reliability. Further, it meets the first ten of the eleven recommendations on the method criteria list.

This prescriptive measure also presents some weaknesses. Desirability does not mean that a particular MOE is a valid indicator of performance, and MOEs selected on such a basis by management who may have unrealistic expectations of CI presents significant potential challenges for the validity of a given MOE as a measure.

Although a measurement method, namely MOE, is recommended along with a process for formulating the MOEs, the actual measurement tools for capturing the MOE are not provided. The process provided stops short of discussing how or what data would be collected. This omission is particularly important in light of the recommendation for measurers to translate their findings into financial terms, when the executives are asked to evaluate CI use in supporting decision-making and in making executives "more competitive". These issues mean that the measurement model does not meet the criteria for reliability and validity. The lack of

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measurement tools provided prevents the measurement model and its measures from being evaluated by other criteria such as "demonstrates value" or "simplicity".

5.6.2.2 Davison

Summary

In 2001 Davison published an article much cited within the small body of CI measurement literature. This article was titled "Measuring competitive intelligence effectiveness: Insights from the advertising industry". It suggests that advertising effectiveness measures could be adapted for use in CI impact and outcome measurement, what Davison terms "CI effectiveness".

CI value is conceptualized in this approach as being of two types: short-term "tactical output" and longer-term "strategic output". Tactical outputs are defined as short-term use of CI that is more directly related to the "bottom line" (i.e., finances) of the organization. Strategic outputs are defined as "forward thinking" uses of CI for long range planning.

The central measurement method used by Davison is Return on Investment (ROI). For him, the purpose of measurement is to determine the effectiveness of CI, which has two components. One is to determine if CI is actionable, thereby providing support to choice selection in decision-making. Note that he acknowledges that 'actionableness' is dependent upon the decision-making processes of its users. The second component builds on the first and is the return on investment: whether CI has produced profit for the organization in response to its investment in CI.

Davison considers the value of strategic outputs for ROI as being impossible to quantify. As a result, he recommends a qualitative assessment of the strategic outputs, with quantitative ROI calculations saved for tactical outputs. Since he considers strategic and tactical outputs to be

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equivalent in value to the organization, the tactical outputs provide the value of the strategic. These ROI calculations are named by Davison Return on Competitive Intelligence Investment, or ROCII. A summary of the steps and calculations for determining ROCII are provided here.

Stage one: classifying objectives and outputs.

1. The CI unit establishes objectives of a given project (the deliverable) before commencement.
2. At the end of the project the CI unit revisits the original objectives to determine whether they were met. Confirmation of objectives met provides the first measure of effective CI.
3. Anticipated and realized outputs post-project are classified as short-term tactical or long-term strategic.

Stage two: outputs are subjectively assessed.

4. The CI unit generates some Likert scales to capture subjective decision maker assessments and satisfaction regarding the outputs.
5. Strategic outputs are captured through the fulfilment of objectives by the CI unit, and levels of decision-maker satisfaction. Previous prediction accuracy rates are used by the CI unit to estimate the likely accuracy of current predictions.
6. Tactical outputs are captured by assessing risk reduction as described by decision makers, objectives fulfilled by the CI unit, money saved or made as assessed by decision makers, and decision maker satisfaction.

Stage three: ROI is now calculated.

7. ROI is calculated using tactical outputs because it is “impossible” to measure strategic outputs. Tactical CI calculations are assumed to provide equivalent valuation of strategic CI outputs.
8. The percentage of uncertainty reduction as reported by decision makers is multiplied by the amount of money reported by the decision maker to be riding on the decision. The result provides a dollar value for the CI output.
9. The CI output dollar value is compared to CI costs (input) for the CI unit, providing a financial figure for return on investment.

Davison provides several calculations. Management informs the CI unit what an acceptable ROI will be for these calculations, so that performance may be benchmarked against

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it. The calculation provided above in steps eight and nine, by which the final dollar value of ROCII may be determined, is presented as:

(CI outputs – CI inputs)/CI inputs = Return on CI investment (ROCII)

CI inputs are considered by Davison to be relatively simple to determine, requiring measurers to calculate an approximate proportion of the unit's fixed costs utilized in a specific activity, such as employee time or information purchases. However some of the elements required by these calculations, such as percentage of uncertainty reduction for the decision maker, may be more difficult to determine, and be far more subjective.

Although the majority of this article focuses on the ROI calculations, Davison suggests some other supplemental measures of CI effectiveness: market share, actions taken, financial gains, lead generation, new product development, and quality of the CI deliverables. User or customer satisfaction is considered to be a strong measure of the quality of the CI overall.

Critique

Strengths of Davison's measure include clear and logical formulas for calculating the value of CI. Supplemental measures are provided to be used with ROCII, namely user satisfaction, objective fulfilment, and benchmarking of previous forecast accuracy. His conceptualization of measurement accounts for variations in decision-making styles and fosters communication between measurers and their audience by having them collaborate on, among other items, what an acceptable ROI is for a CI unit. The measure meets many of the method recommendations, including as it does a financial measure, the use of multiple methods to determine value, and a clearly conceptualized guide to distinguishing between types of CI and the corresponding measurement tools to be used for each. The ROCII calculations are simple to do and would as Davison conceptualizes them provide evidence of organizational value. The

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questions necessarily posed to users would be relatively brief, meeting the criterion of 'quick', although they may be difficult to answer after the lapse of time necessary to allow outputs to manifest.

Questions as to whether the margin of error for this prescriptive measure is acceptable, namely, that tactical and strategic CI are equally represented by an ROCII calculated solely by figures derived from tactical activities, are complicated by the significant opportunities present for bias and other subjective distortions to affect the formula inputs. Although the financial figure produced by these calculations may look quantitative and objective, the reality is that this remains a subjective measure.

ROCII rests upon the assumption that all CI should produce action. The users study, however, has indicated that CI may at times produce inaction, or the realization that no activity should be undertaken at a given moment. ROCII also rests on the assumption that users of CI will be able to accurately estimate elements of their decision-making processes, such as assigning percentage values to uncertainty in hindsight, or the value of a potential opportunity – and that the user reporting these items has no desire or need to shade the dollar values attributed to their activities. The reliability, validity, and credibility of the final financial figure attributed to CI as a representation of value would be highly suspect without very careful triangulation between decision makers and other sources of objective information.

5.6.2.3 McGonagle & Vella

Summary

In 2002 the book "Bottom-line Competitive Intelligence" was published. Its authors, McGonagle and Vella, who have jointly published eight volumes on competitive intelligence practices, provide descriptions of CI practice that divide CI into various types. Each type is then

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provided with conceptualizations of its value, audience, and deliverables, which are then used to inform recommendations for the selection of appropriate metrics that together provide a comprehensive assessment of CI's organizational impact. The measurement tools provided in the book are an assembly of tools in practice, augmented with a tool selection framework developed by the authors.

CI is conceptualized as being either defensive or active. Defensive CI is defined by those activities which are used to educate employees about protecting sensitive company information against attacks such as phishing, and is not within in the scope of this study. Active CI deals with those activities defined as being of interest for this research, namely, activities that monitor competitors and the environment to inform organizational decision-making.

McGonagle and Vella describe active CI as having four categories, which they divide by "orientation", or the focus of a specific CI activity: strategy-oriented CI, tactics-oriented CI, technology-oriented CI, and target-oriented CI. In this view of CI, the value of CI is inextricable from its varying purpose, audience, and the related changes to the CI deliverables, such as format and content.

These "CI styles" then inform the selection of CI measures. The authors state that in their view an inhibitor of useful CI measurement has been that "most people trying to measure CI's impact assume that there is only one style of CI, strategy-oriented" (p. 16). By recognizing that the activity affects the deliverable and the audience, and the correlating need for various measures for various types of CI, this assumption, and by implication its associated measurement problem, is corrected.

McGonagle and Vella identify impact as being inherently related to strategy-oriented CI. They distinguish between process and impact, and state that organizations need to measure both in order for the measure to be effective. Complications are identified for CI impact measurement,

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however. Since impact is qualitative, subjective, and often indirect, this presents problems for identifying CI value other than by use of indirect and anecdotal evidence.

In response to these problems, a faceted multi-measure approach is suggested. A complex guide is provided to the would-be measurer by which the reader of the book may sift through the "the most common types of financial metrics and other measurements now in use by CI professionals" (p. 135), in order to select measures and build his or her own individual metrics tailored to the organization.

Eleven categories are provided of CI measures, which the authors term "impacts". Users are asked to fill out a succession of four grids in order to determine which are most suitable for use. Of the 53 measures provided, 21 are process-related, 31 are impact-related, and 1 is both a process and an impact measure. The final list developed with the assistance of these grids is considered to be feasible for completion once every two years.

Measures provided in this comprehensive list of practice are items such as "number completed", which is the sum total of reports and presentations made in a given period of time. Another is "meeting objectives", which is described as "a question whether the end-user received CI that supported a decision he or she was facing", and classified as a direct process measure.

The authors have not attempted to select the best and most effective measures for presentation to the reader. Rather, they present as many potential measures as they can, with some comments supplementing the descriptions. For example, the measure "number requested" is the total number of requests received for CI. The authors classify "number requested" as an impact metric and state "This is a very crude metric, as it provides numbers, but rarely a sense of the value and impact of the CI unit. It is more properly adapted to an information centre-style operation".

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The measures listed by McGonagle and Vella could be divided into the following categories, which the researcher has developed and provided here to better illustrate in this short space the types of measures made available:

- *CI Unit Operations:* These are process measures related to job performance of employees and unit performance in terms of deliverables, cost savings to the organization with in-house research, etc. A significant subdivision of this category would be to examine the deliverables in terms of timeliness, quality, accuracy, and if they are actionable.
- *Customer Usage and Satisfaction:* Usage is objective and quantitative: how many reports produced over time, number of people served, follow-up requests, etc. Customer satisfaction is subjective and qualitative: perceived usefulness, relationships with CI unit employees, are needs being met.
- *Meeting Objectives:* Those measures which examine whether decisions are being supported effectively and appropriately, to help the CI unit and the organization generally understand the following. Are decisions informed by CI being implemented? Are recommendations made by the CI unit implemented? Does CI play a role in formulating strategy?
- *Organizational Outcomes:* Measures recommended for determining outcomes such as cost savings, savings of time, external customer relationships, and development of new services.

Critique

A strength of this do-it-yourself model is the multi-method and structured approach to the selection of measures, with its selection grid fostering a careful conceptualization of purpose, audience, and the item to be measured prior to the actual measurement activity. It provides a comprehensive array of measures in use within organizations, and it inherently acknowledges that use and application and therefore value of CI is connected to the quality of the CI itself and the process by which it is brought to the user.

Although the purpose of this effort is met, namely to be scrupulously thorough in describing measures in use, some problems are presented for reliability and validity in composing a metric that sums up the performance of a CI unit. The authors themselves

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acknowledge some of the measures to be of questionable value, with the potential for large margins of error.

Conceptual distinctions necessary for the careful formulation of measurement are not made. 'Impact' seems to cover inputs, outputs, and outcomes indiscriminately, complicating communication, clarity, and validity. 'Feedback' and 'surveys' are listed as "metrics", which they are not. For example, the category "written survey" essentially describes Likert scales but without defining what indicators of performance are to be captured. In addition there is some overlap in the measures, presumably to support the 'grid' activities, but some measures are essentially identical and may lead to confusion.

Another weakness of this approach is that it is a complex and lengthy method. Although an increase in time invested may assist in thoroughness and accuracy of measurement activities, previous research has demonstrated that decision makers are disinclined to place a priority upon CI measurement. They call for measures that are quick, simple, and cost-effective. A system of measurement that the authors themselves consider too demanding to be completed every calendar year may not be successfully implemented at an organization that questions the value of any measurement at all.

5.6.2.4 Cohen

Prescriptive CI metrics in the literature using a Balanced Scorecard approach did not meet the selection criteria for inclusion. As a result, a measure that includes the construction of a dashboard for informing executives about CI impact and other performance indicators was included here as a BSC 'type'.

Cohen's book on competitive intelligence practices, "Veille et Intelligence Stratégiques", was published by Hermes Science/Lavoisier in France in 2004. This book was translated and

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published in English by Wiley & Sons in 2009 under the title "Business Intelligence: Evaluation and Impact on Performance". In it Cohen, a professor of business at the University of Monaco, provides recommendations by which competitive intelligence may be measured based on her previous work, which includes two case studies to develop her prescriptive model.

CI is conceptualized by Cohen as having four attributes: information quality, service quality, usage, and effectiveness. Similar to McGonagle and Vella, she makes conceptual distinctions or categories of intelligence. For her, CI activities are narrowly distinguished between "watch" which is protective, informative, and anticipatory, and "intelligence" which is proactive, protective, and coordinating. For measurement of value purposes these collectively contribute to impact, which is defined as the effect upon corporate performance. She proposes that CI objectives should be aligned with organizational strategy objectives. This alignment then permits the CI unit to better evaluate the impact of CI on organizational performance. CI value to the organization lies in the achievement of its three objectives: anticipating threats and/or opportunities in the environment, satisfying information needs of the user, and providing support for strategic decision-making. In all three objectives CI realizes its value in its use by a decision-maker.

Her prescriptive model of measurement, similar to that of McGonagle and Vella (2002), provides an extensive list of prospective measures which is distilled down for the user with the use of a series of grids to be filled out. The results of these grids then inform would-be measurers which indicators are most suited to their organization, as chosen by four criteria: methods, products, use, and results. Impact is captured through the following four dimensions:

1. User satisfaction with information quality
2. User satisfaction with quality of services offered
3. Usage of CI products
4. Measures of CI effectiveness

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CI users are surveyed for their responses to questions which attempt to capture these four dimensions. Results of the measurement activity are then used to create a dashboard using financial and operational measures that lie along four axes: customer satisfaction, internal processes, innovation, and learning, much as is found in Balanced Scorecards (BSC). This dashboard is used to provide evidence of CI impact to the organization.

User satisfaction with deliverables is determined with the use of Likert scales which evaluate factors of the deliverables such as usefulness, completeness, precision, timeliness, reliability, accessibility, formatting, and topicality. User satisfaction with service quality is determined by Likert scales which assess the importance the user places on the CI. Twelve scales are presented to capture twelve potential functions of CI, such as anticipating threats, coordinating and communicating information, making recommendations, and implementing actions. The third dimension, CI usage, is determined by a series of up to 11 questions which ask about frequency with which the user requests CI, the influence of CI on outputs of decisions, the integration of CI with strategic decision-making, the percentage of influence on the decision-making process the user would attribute to CI, and the user's subjective assessments of quality and satisfaction.

Measures of CI effectiveness are designed to allow the measurer to compare original objectives to the results achieved. The user is asked to start the questionnaire by assigning importance to, and satisfaction with, the three objectives of CI (detecting threats/opportunities; meeting information needs; and decision support). For decision support, the user is also asked to identify details regarding the decisions made. The questionnaire continues by asking for descriptions of situations in which CI has produced "concrete" results, and a subjective evaluation of CI impact on corporate performance.

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A dashboard is then produced. Axes of this dashboard are Financial, Client, Internal Process, and Innovation and Learning. Top executives at the organization are asked questions regarding what CI impact is, and what it should be, which indicators best reflect impact for inclusion in the dashboard. For example, executives are asked to help determine the indicators for the financial axis, which may be profitability, ROI, proposed dividends, or cash flow. Expenses of the unit are compared against the results of the dashboard to provide evidence of performance.

Subsequent and related to the dashboard, which captures CI effectiveness, is produced an evaluation results grid. This multi-dimensional grid provides a summary of CI products and services, CI use, satisfaction with CI, evaluation of CI results, evaluation of CI impact on performance. CI impact indicators are tailored to the organization, using sales revenue, profitability, capital performance, client satisfaction, new clients, new products, life cycle, unit cost, etc. The dashboard and the grid provide what Cohen terms "a double perspective control panel" showing information relevant on one side to the CI manager, and the other to the executive CI user. She considers this double perspective to be essential to evaluating the performance and impact of CI, since with this method the measurer may connect CI objectives to organizational objectives, and subjective findings to objective findings.

Critique

Strengths of Cohen's prescriptive model are in the method she has developed, which meets all the criteria on the measurement methods list. Her conceptualizations of value, impact, and measurement of CI are all clear and distinct, connecting together intelligence, strategy, and performance. The grid to help users determine which measures are most useful to them, and

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encourages measurers to conceptualize for themselves their own measurement needs prior to implementing the measures.

The robustness of this model's methods, including a variety of measures to capture each element of impact, has positive implications for reliability and validity of the measure. The measurement tools used in this model involve establishing causality between activities and outcomes to some degree, and with significant executive input would likely be considered credible by its audience.

The weaknesses of this model however reflect those found in the three previous models. One significant challenge of this method is in its exhaustivity. There are 148 question items, consisting of a mix of requests for comment, Likert scales, and table items to be checked under the appropriate headings. As with the model developed by McGonagle and Vella, it is potentially too complex and demanding for a successful implementation when managers, including executives, are unconvinced of the need for CI measurement.

The second weakness of this model is held in common with the MOE model. Executives saying what they 'feel' is a good indicator when relationships have *not* been established between CI and desirable outcomes, even by an exhaustive questionnaire, has negative implications for validity. For example, how is the unit cost of a product linked to CI? These selected indicators need to be demonstrated to have roots in cause-and-effect relationships.

An additional question mark is the financial measures as described for the dashboard element. In common with Davison's (2001) ROCII, assigning a financial figure to the estimated value of CI is problematic: the source of these figures is not explained, and is not captured in the lengthy questionnaire, implying that this would be a subjective guesstimate. Since financial figures are known to be given a disproportionate amount of weight in performance evaluations (Lev, 2001) this is a particularly sensitive area for reliability and validity.

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5.7 Considerations for developing outcome and impact measurement

Building on the evaluation framework resulting from the two research studies, this section discusses the findings obtained in relation to the third research question: "in light of organizational constraints, which measurement methods identified in the literature are most appropriate for use in determining CI outcome and impact?"

5.7.1 Organizational constraints that affect measurement practices

This study presents some findings that may provide partial answers as reasons for the persistent lack of CI measurement activity within organizations, chiefly confusion regarding measurement, and questionable return on investment for measurement activities. When asked about measurement activities, participants gave descriptions that echoed the literature review. Few conducted measurement activities (Blenkhorn & Fleisher, 2007; Herring, 1996; Marin & Poulter, 2004; Prescott & Bharwaj, 1995). Many participants were satisfied with their existing measures, including lack of measures, and were disinterested in allocating resources to it (Kujansivu & Lönnqvist, 2009) in sharp counterpoint to surveys indicating that CI practitioners want measurement, and improved measurement (Hannula & Pirttimaki, 2003; Qingjiu & Prescott, 2000), although executives were open to the rationale for measurement when it was discussed (Herring, 1996).

Participants described a variety of CI practices, many of which are of very little cost to the organization. In those instances, senior management cannot justify the costs of undertaking measurement to evaluate what is for them a negligible expense. An additional problem is that senior management may not believe that measurement would provide any insight that they cannot immediately obtain themselves with a cursory examination of the business process and its deliverables. For them, measurement would be unnecessary in order to help them decide if the CI

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function is useful, effective, and worth the allocation of monies in the next year's budget. The problem here is that the lack of measurement then effectively prohibits the CI unit from making a case for its utility and continued existence when financial difficulties are experienced by the organization, and impedes the management, including service improvements, of the CI unit and its deliverables.

There is a need to acknowledge here that the scholarly and the practitioner viewpoints are not always homogeneous, and that this model of good CI measurement presents another instance of that case. While in an ideal world retrospective measures that causally relate decision-making through outputs and outcomes to impact would be used, the reality is that such measures would require a significant investment of time, money, and effort, an investment that most organizations would be unwilling to make, considering (reasonably) that it would be an expense and time commitment out of proportion to their budget allocations for CI.

As discussed in the literature review, the use of CI in organizational decision-making necessitates some form of (bounded) rational decision-making. In order to understand the benefits resulting from the decision over time, including outputs, outcomes, and impact, a retrospective view must be taken. In order to understand the role of CI in the decision-making process, subjective assessments are a critical element, and require the cooperation of CI users who make organizational decisions, and who may be unable or merely resistant to allocate time to measurement activities.

If standard, inexpensive practices in measurement could be established with a strong supportive narrative as to the management benefits of measurement, much of the objections to measurement could potentially be overcome. However, before such standards can be established, there are significant conceptual hurdles to be overcome. Participant responses in the interviews demonstrated that they variously conceptualized CI value, CI benefits and outcomes, the purpose

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of measurement, measurement tools, and what should be measured. Concepts of measurement were confused and elliptical, with for example one participant comfortably stating that "his gut" was his satisfactory measure of CI performance at his organization – and his organization was spending significant amounts of money and time on CI activities.

As a result, a 'good' measure at this time is conceptualized as being one that is perceived to be useful and practical. This means that CI measurement must take into account organizational constraints, including scant resources and potential lack of measurement expertise. Cost-effective and simple measures are far more likely to overcome management apathy toward quantifying CI impact than expensive and complex measures. These cost-effective and simple measures, however, should identify and capture expected use and benefits of CI in reliable and valid ways. In addition, practicality dictates that the measures must provide some conceptual support to the user, aiding the user to make critical distinctions between value and performance, measurement approach and measurement tool, etc.

5.7.2 Determining most appropriate measurement

As mentioned in the literature review, many scholars and practitioners have postulated that an insurmountable barrier to effective CI measurement is that organizations, their industries, and their products, are too disparate to permit the evolution of standardized measurement (e.g., Kilmetz & Bridge, 1999; Lönnqvist & Pirttimäki, 2006; Rothberg & Erickson, 2005). After examining the revised conceptual model of CI in organizational decision-making which shows expected outcomes and benefits, the measurement criteria developed through the expert and user studies, and the constraints faced by organizations that keeps them from measurement activities, we can now ask, how do we determine appropriate measurement for an organization? Is

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standardized measurement possible, or does each organization need to formulate its own, unique to its processes and products?

As demonstrated in the experts study, a concept of 'good' measurement can vary, depending on the individual's conception of 'good'. Fleisher and Blenkhorn (2001) state that the starting point for measuring CI is the "effectiveness question", namely, "is CI doing the right job?" (p. 114). For this research, the definition of effective CI has been taken from Cohen's book (2009) on CI measurement, which defines effectiveness as the degree to which results obtained compare to the original objectives. Matthews (2011), a practitioner who specializes in library performance measurement, relates outcomes to effectiveness measurement, and the key to answering the question, "Are we doing the right things?" (p. 87). Multiple researchers have connected the strategic planning and goals of an organization (the 'right things') to CI from viewpoints of both usage and benefit. This research has confirmed this relationship, suggesting that "the right things" are determined by the organization's strategic plan and corresponding goals. 'Good' measurement, then, must take into account the effectiveness of CI in meeting the individual organization's definition of "the right things".

The evaluation framework, with its two criteria lists, one for measurement characteristics, and the other for measurement methodology, was applied to four prescriptive CI metrics which variously conceptualized measurement, placing greater or lesser value on financial measures, the role of process and product as factors affecting impact, and the benefits or outcomes of CI to be captured by the measures. Cohen's (2009) multi-method approach, which was the most highly rated of the four prescriptive measures reviewed here, not only overcomes objections related to the perceived uniqueness of the organization, it also provides for a multi-faceted perspective of CI use and CI effectiveness. The preliminary questionnaire grids to be filled out allow the measurer to carefully conceptualize measurement activities as an important preliminary to

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measurement itself, and to tailor the measurement activity appropriately to the organization's conceptions of CI value.

A benefit of Cohen's approach is that it allows users from organizations with non-traditional CI practices, such as Transparent Networks or Internal Shared, to adapt the metric to their needs, while still providing standardized tools. Its success in meeting the measurement criteria provided by so many users of CI from a variety of industries and companies also provides evidence that standardized tools and approaches are feasible for CI measurement.

5.7.3 Developing measurement best practices

Authors in a variety of fields related to business and the social sciences have argued that measurement practices does not follow measurement theory strictures and tenets, resulting in data and instrumentation errors (Bontis, 2001; Pike & Roos, 2004; Flamholtz, 1980; Gorad, 2010). As discussed in chapter two, researchers who have developed the concepts of measurement (sometimes referred to as "measurement theory", see Sarle, 1997) have established certain criteria which measures must meet in order to achieve meaningful measurement. These include reliability, validity, a known margin of error or inaccuracy (Gorad, 2010), and use of a recognized scale of measurement that is accepted by your field (Suppes & Zinnes, 1963). Multiple measures that can capture the phenomenon of interest are necessary to ensure that the finding is not an artifact of the measurement tool itself (Churchill, 1974). There is additional need to carefully conceptualize the item to be measured and its indicators, to ensure not only that the indicators are actually related to the item in a cause-and-effect relationship, but also to ensure that the language and other needs of the audience are met (Carton & Hofer, 2006; Churchman, 1959). In all instances the purpose of the measurement activity needs to be identified as a preliminary step in order to support the validity of the findings (Viswanathan, 2010).

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If we presume the term 'measurement' to imply a credible degree of accuracy and reliability, and 'performance' to refer to an empirically established relationship, it is clear that CI measures in practice require more development and refinement. This research study has developed an evaluation framework for CI measurement, and has evaluated a handful of prescriptive impact measurement models. It has been determined that a guided do-it-yourself approach, culminating in multi-perspective communication tools, may be the best approach to outcome and impact measurement. However the measures in use which provide the data to inform the results of this prescriptive approach remain problematic. More work is required by researchers and practitioners to evolve best practices, specifically to address needs for simple cost-effective measures that are rooted in cause-and-effect relationships confirmed by research, and to address the continuing problem of financial representation of intelligence value.

5.8 In Summary

The research confirmed that CI measurement is infrequently used by organizations (Marin & Poulter, 2004; Prescott & Bharwaj, 1995) and, as discussed in the literature review, chiefly consists of process and user satisfaction measures. The research findings have also confirmed that the value of information is realized through all stages of the decision-making process (Paul, Saunders, & Haseman, 2005; Rolland, 2004), refuting the author's original conceptualization of CI as an input into decision-making at the problem conceptualization stage.

Some contradictions are presented. The users study confirmed that there is indeed a relationship between CI and organizational strategy (Bose, 2008; Hughes 2005), but this finding refutes the statements of participants in the experts study, who argued that this relationship does not exist. In addition, the discussion of anticipated outcomes in the users study did not conform to the literature. While some outcomes, such as improved customer relationships, and increasing

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employee knowledge, confirmed the findings of other studies (Hannula & Pirttimaki, 2003; Qingjiu and Prescott, 2000), other outcomes were not confirmed, such as time or money saved (Hannula & Pirttimaki, 2003; Herring, 1996), which potentially has implications for the development of MOEs.

Unexpected findings were the emergence of a clear typology of practice in sourcing CI, and the broad range of activities it encapsulates, some of which refute common conceptualizations of CI as a secretive and combative activity. Although CI had been originally conceptualized for this research as being similar to other information services, the extraordinary similarities in use, valuation, and measurement challenges between CI and other information services such as special libraries and information systems were another surprise, and indicate the potential for standard measurement across all types of information services. Other unexpected findings of this research are related to the users of CI: how they augment CI deliverables with their own CI activities; that in evaluating a CI unit, responsiveness is prioritized over practices such as access or training in determining satisfaction; and the potentially acceptable trade-off between cost-effectiveness and accuracy.

Findings have been discussed in this chapter in response to each of the three research questions in turn. It has been determined that CI is used by senior management to support all stages of organizational decision-making, but they believe it to be of most value when it is used in strategic planning. Outcomes and benefits of CI as described by users of CI are believed to be both cognitive, assisting the individual decision-maker, and organizational, providing both latent and active beneficial outcomes of improved organizational performance that comes with an increased knowledge of the competitive environment, improved customer relationships and services, and new business development.

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Organizational constraints of return on investment for measurement activity, in-house measurement expertise, expressed preferences of senior management, and the requirements of measurement theory, have been taken into account with application of the evaluation framework by the researcher to four representative models of CI measurement in the literature. A testing of the framework with four prescriptive measurement models has determined that the do-it-yourself tailored approach of Cohen (2009), in conjunction with her carefully conceptualized questionnaire for the measurer, is the most appropriate prescriptive measurement approach currently extant for measuring CI outcomes and impact, providing a necessary balance between standardizing practice and tailoring to individual circumstance. However, some problems remain.

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Chapter 6: Conclusion

6.1 In review

Special library services, intelligence units, and research departments share a common challenge: how to demonstrate performance and value to the organization, or impact, when much of the impact is intangible and difficult to quantify. This question is complicated by what is often a larger accounting-based value discourse within the organization, with impact reduced to a financial figure that is the "bottom line" return on investment. These financial figures, when they have been created, are often of questionable validity. Many organizations, abandoning the attempt to generate a financial figure, yet unsure of how to represent the impact or outcomes of these services, default to process measures and measures of satisfaction as a surrogate, if any measures are used at all.

Competitive intelligence (CI) was selected for this research as it is representative of the challenges facing these information services as they try to move valuation to more accurate and useful measures that capture intangibles related to the use of the information services' deliverables. These challenges are both conceptual and methodological. For CI, measurement is generally immature, with accounts of unique practice and conceptualization in the literature, but little comparative discussion, resulting in prescriptive models of impact measurement. Reports from CI practitioners indicate that performance measures of any kind are rarely used, although practitioners want to see measures developed and implemented within their organizations (Marin & Poulter, 2004).

This two-stage research attempted to answer calls for research into CI measurement. Its objectives were: first, to clarify discourse related to CI value and measurement, as preliminary to addressing methodological challenges; second, to investigate how CI is valued within the context

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of organizational decision-making, and the related challenges facing CI measurement and the implementation of measures in organizations; and third, to establish a critical framework which can be used as a starting point to evolve from prescriptive measures to best practice in CI measurement. To that end, three research questions were formulated:

1. How, when, and by whom is CI used as an input into organizational decision-making?
2. When CI is used, what are the perceived organizational outcomes or benefits?
3. In light of organizational constraints, which measurement methods identified in the literature are most appropriate for use in determining CI outcome and impact?

In order to address these research questions, the research was designed to have two qualitative and exploratory studies which draw together accounts of conceptualization and practice from intelligence experts, users of CI, and prescriptive models in the literature to replace standalone reports of practice with the rigour of scholarly research, as called for by Blenkhorn and Fleischer (2007).

The findings of the study in relation to measurement practices, measurement conceptualization, and suggestions for improvements to measurement demonstrate the complex and shifting discourse around CI and its value, and indicate some of the problems related to developing best practices in measurement. The revised conceptual model provided in the discussion, section 5.5, is provided as a starting point for identifying CI value through use, including decision support, and its outcomes. CI use and purpose need to be clearly conceptualized before CI value can be determined as an essential prerequisite to selection of CI measurement tools and approaches.

Findings of the research are that significant organizational constraints affect the feasibility of CI measurement, particularly in relation to the type of CI practices implemented at their organization, and the size of the organization and its CI unit. Participants expressed

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concerns regarding the value of measurement, with most expressing satisfaction with their measurement practices, including lack of measurement. In answering the research questions, it meant that an evaluation framework for CI measurement requires criteria that target usability issues, such as simplicity and cost-effectiveness, in order to ensure that the measure is feasible for implementation by practitioners, while still meeting requirements for reliability and validity. In addition, since participants and scholars variously conceptualize the audience of the measure, the value of CI as an item for measurement, the role of measurement, and the purpose of CI as a framer of effectiveness, a measurement method recommended for use would have to permit measurers to be adaptive to the varying needs of their organizations.

6.2 Contributions and significance of the research

Challenges to effective CI measurement, as described in the literature review, have historically included inconsistent conceptualizations, use of incomplete and potentially inaccurate measures, the subjectivity inherent in describing cognitive processes and intangibles; and identifying the role of CI in the decision-making process. This research has attempted to clarify conceptualizations related to CI measurement in order to lay groundwork for shared terminology and meaning, and to develop an evaluation framework for CI measurement that might indicate directions for the development of more accurate and reliable measures that take into account CI's purpose in informing organizational decision-making.

This research study responds to calls in the literature for research investigating the relationship between CI and strategic areas of the organization (Prescott & Bharwaj, 1995), the relationship between CI and decision-making (Blenkhorn & Fleisher, 2007; Lönnqvist & Pirttimäki 2006; Marin & Poulter, 2004), the relationship between CI and conceptualized benefits of CI use (Lönnqvist & Pirttimäki, 2006), and calls for research to develop CI

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measurement (Ganesh, Miree, & Prescott, 2004; Marin & Poulter, 2004; Wright & Calof, 2006). The users study provides a rare examination of CI use and measurement from the perspective of CI users, rather than CI practitioners, responding to a call for more CI user-related research (Ganesh, Miree, & Prescott, 2004). This research is also unusual in that it does not rely on surveys as the data collection method, responding to calls for other research methods in CI (Hughes, 2005), thereby making a methodological contribution to this area of research.

Conceptual contributions of this research include the comparative analysis of unique CI conceptualizations and practices, and prescriptive measurements. The participants in the experts study supplied one of the first comparative discussions of intelligence measurement available in the literature. The evaluation framework developed as a result of the experts and the user studies provides a unique tool with opportunity to expand comparative discussions regarding measurement as a step to establishing standards and best practices.

In response to calls for CI measurement research that examines the role of CI in organizational decision-making, the CI-decision-strategy revised conceptual model generated by this research identifies the role of CI in organizational decision-making, the multiple anticipated benefits of CI, and their relationship to one another. The model, a significant conceptual contribution of this research to CI measurement literature, provides a tool with which discussions of CI value and measurement can be more clearly conceptualized and communicated.

Another contribution of this research to the literature that this study, courtesy of its methodology, studies a group of participants that are not typically captured in CI research, thereby providing a richer and broader view of CI practices than has been typically examined and making a contribution of empirical evidence regarding not only CI measurement, but CI outcomes and impact, including factors that affect the willingness of executives to implement CI

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measurement. The resulting typology of practices has implications for CI valuation and measurement, as do the findings related to CI use and value perspectives.

This research makes a contribution toward future research and examination of CI measurement in that it has provided insight into the rationale in organizations behind measurement choices, a broader description of CI practices than that currently available in the literature, and a critical examination of CI value in organizational decision-making. These findings collectively provide insight into the organizational constraints which any formulation of effective CI measurement must take into account.

For CI practitioners, the evaluation framework provides a tool for training CI practitioners, providing support for a critical evaluation of the prescriptive CI measurement models available to them. Additionally, use of the revised model may help practitioners in determining their key performance indicators (KPIs) and support the formulation of in-house narratives regarding value.

There are some unexpected findings, and some contradictions in the findings. Participants in the experts study refuted the connection between intelligence and strategy, while participants in the users study emphatically and unanimously asserted that relationship. More research to examine how intelligence is used in strategic planning, and fulfilment of strategic plans, is called for.

The need for measurement was another source of contradiction in both studies, with some participants asserting that measurement is essential to good management, while others questioned the value of measurement. 'Good enough' measurement was advocated by participants in both studies as a way to resolve the tensions between the perceived potential for high costs in the pursuit of accurate measurement, and the need for simplicity and cost-effectiveness. In light of the calls for improved measurement by CI practitioners, it is evident

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that more work needs to be done not only to develop measurement that is considered feasible for use, but to assert the value of monitoring CI performance.

The range of CI sourcing practices, and reports of organizational leaders supplementing CI with their own research indicate that we do not yet have in the literature of CI a full or accurate picture of CI activities within organizations. This merits more study, as does the claim by some participants in the users study that truly innovative companies do not require CI.

It is hoped this research will not only fill gaps in the CI literature as previously identified, but suggest additional research in this area. It is also hoped that this research will provide insight into valuation and benefits of CI, demonstrating how CI measurement practices may be improved within organizations.

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6.3 Limitations of study

This study is exploratory and qualitative, and its methodology was developed to try and address significant time constraints related to the availability of its target population, senior managers and executives. The study findings are drawn from the described experiences and opinions of the individual participants. As a result, the findings are subject to potential inaccuracies, biases, and the fragmentary representation inherent to this study design, as well as the potential for the researcher's own biases and preconceptions affecting the interpretation of the findings.

This research has been developed with two critical assumptions related to measurement informing the research design and the conceptual framework. One assumption of this study is intrinsic to measurement itself. As Viswanathan (2010) warns in his discussion of measuring intangibles for the social sciences, the assumption of measurement is "that a construct can be isolated and examined", yet "a complex network of constructs may influence a phenomenon and may not be separable into individual constructs for purposes of measurement" (p. 307). The exploratory nature of this research means that although the design of the study assumes that constructs such as CI value and CI outcomes potentially can be isolated sufficiently to indicate impact to an organization, findings by other researchers at a later date may indicate otherwise. In addition, the design of this research makes the fundamental assumption that good, effective CI measurement is possible, namely that a measure can be created that captures the intangibles related to organizational outcomes and impact in a reliable, valid, cost-effective way.

Biases may also be present in this research. The self-reporting required by the questions in the users study has implicitly been constructed with the expectation that participants will honestly evaluate and describe their organizational practices and use of CI (for which some

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participants have responsibility), yet there is a risk of inaccurate reporting from study participants due to problematic memory or efforts to protect reputation. Another potential factor for inaccurate reporting is bias toward or misunderstanding of one's own performance. For example, Paul, Saunders, and Haseman (2005) note as part of the research findings of their study into the timing of information during the decision-making process that decision makers' evaluations of decision quality can potentially be seriously flawed. Participants in either the user or the experts study may have presented their responses with some bias.

The researcher herself may have introduced biases into the findings of this research by unintentionally structuring the interviews in a way that reflects her own biases to her subject. The benefits of CI were not described, for the most part, as the measures of effectiveness (MOEs) identified in the literature such as time savings, costs avoided, etc. Rather, CI value was described by most participants as being related to decision-making and strategic planning, and these comments may have been influenced by previous questions in the course of the interview.

There are limitations associated with the researcher herself and the problems related to establishing a common understanding with participants in a very limited time frame. To try and address this problem, two things were done. First, the interviews were structured to allow for the researcher and participant to reach a mutual terminology and conceptual understanding of CI. Second, the research methodology provided an opportunity through the negotiated texts to ensure post-interview that the researcher accurately comprehended what had been communicated to her. Despite those steps, it should be recognized that the possibility exists of mis-communication and differing conceptions of terminology, even negotiated terminology or standard terms.

Finally, there are limitations associated with the research method. An exploratory and qualitative study with a small number of participants was chosen in order to allow the researcher to potentially capture aspects of CI practices, value, and measurement that have not been

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described in the larger-scale surveys which have been the default research method in competitive intelligence (Ganesh, Miree, & Prescott, 2004). The small size of the experts study may not provide the complete range of viewpoints and insight needed to fully describe conceptualizations of measurement in the intelligence literature, although saturation was accomplished in the users study (Guest, Bunce, & Johnson, 2006). It must be acknowledged as well that the small size of the four prescriptive models of CI measurement, while they were selected to be representative, has meant that the discussion is by no means exhaustive.

Finally, another potential limitation in the experts study is that the publication of participant names in conjunction with discussion of their publications may also have had a dampening effect on discussions.

6.4 Calls for research

The researcher has presented here a conceptual model of the relationship between CI and organizational decision-making. This model needs more research to test it, and to confirm the research findings upon which it has been based. The conceptualizations of value in that model may still be termed prescriptive rather than standardized; research is needed to verify its conceptualizations.

The researcher has also presented an evaluation framework by which prescriptive CI measurement may be assessed. More work is needed to test and refine this framework and to extend the comparative discussion begun here. For example, in this study CI and BI were considered to be interchangeable terms. Both the conceptual model and the evaluation framework would benefit by being tested in BI.

Investigation is needed to explore the relationship between organizational management and the realization of CI value. Some constraining factors for the realization of CI value have

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been presented here, along with a typology of CI sourcing practices. However the discussions of CI users have raised questions regarding how issues such as the integration of CI with business processes may affect the realization of CI value. For example, how do organizations vary the use of CI between strategic planning and strategic navigation? Why is one considered more valuable than the other, when they appear to be closely related business activities?

Continued research is needed to investigate many aspects of CI measurement, with implications for the measurement of other information services. Establishing causal relationships between information use and decision outcomes has implications for the development of MOEs as indicators of performance. Questions regarding how to develop a financial representation of CI remain unanswered, although prescriptive measurement models call for the use of such measurement tools. Tradeoffs between utility and validity need to be investigated. Two study participants, Sheila Wright and Antti Lönnqvist, indicated that partial and inaccurate measurement can suffice, if it provides a simple and inexpensive method to obtain adequate understanding of the phenomenon measured. This concept of 'acceptable inaccuracy' may be worth exploring. Gorad (2010) states in his article on measurement in the social sciences that an inaccurate measurement tool is acceptable for use, if the margin of error is known to the user and the audience. Determining an acceptable margin of error would be useful to know in formulating intangibles measurement tools, and has not yet been explored in the intelligence literature.

More comparative discussion of measurement is needed generally to establish standards and best practices. This researcher believes the correspondence between the findings of this research and intangibles measurement research in library and information studies, business, and other intelligence fields, indicates that there is opportunity to do interdisciplinary work to address communal challenges related to information services metrics and intangibles measurement.

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6.5 Final comments

It is the hope of the researcher that in providing a starting point for conceptual comparisons, this study may prompt conversations between researchers, students, and practitioners in the field of CI measurement that may lead toward consensus of terminology and conceptualization, research to investigate what outcomes should be used to supply data for measurement of intelligence activities, and formulation of best practice through systematic testing of measurement models and recommendations in the literature. As previously indicated, much more work remains to be done to establish standards for CI measurement.

As described earlier, a significant number of executives participating in this research expressed a disinclination to change their CI measurement activities or even to measure CI at all, while in contrast CI practitioners have called for more and improved CI measurement practices (Fleischer & Blenkhorn, 2007; Marin & Poulter, 2004; Qingjiu & Prescott, 2000). The concerns of these executives regarding the potentially disproportionate costs of time and money, personal uncertainty of how to conduct CI measurement, and the belief that the measures will result in unnecessary findings superfluous to their own intuitive estimation of performance, would lead to the logical and reasonable conclusion that the status quo is sufficient. However, for executives and CI practitioners who are eager for their organizations to realize the full value of CI, measurement is needed not only to determine CI effectiveness and improve performance, but also to argue for investment in CI itself.

As of the conclusion of this research, this researcher has formed the personal belief that if measures could be developed that meet the criteria of the evaluation framework, CI measurement would be met with increased receptivity by organizations that rely heavily upon CI services, and that such measures have potential applicability for other types of information services such as

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special libraries. A common explanation to date for the lack of such measures has been that the methodological challenges have not been solved, particularly in relation to the intangibles of decision-making. It may be argued that until we get the conceptual issues out of the way first, and reach some common agreement regarding our terminology and constructs, we cannot determine if the methodological challenges are solvable, and they will remain in stasis.

The research findings confirmed the original conceptualization of this study, which is that CI value lies in its dynamic use, applied to organizational decision-making. Moving decision-making to the centre of the value discussion holds implications for the selection of measurement methods and tools in determining impact and performance. We can speculate that impact and performance metrics formulated in the future need to utilize effectiveness measures, which permit a combination of internal and external perspectives, as described in Cohen's model (2009). This requires a clearly articulated purpose for the CI unit that has been achieved through consensus and has been communicated with users and employees. Measures that indicate how effectively that purpose is met provide conceptual and practical scaffolding upon which performance and impact might then be assessed.

Measures comprising any performance or impact metric should ideally be simple, few in number, and require input from both sides of the service equation. Ideally they are supported by quantitative data, while using qualitative and anecdotal data to explore questions of service, use, and satisfaction in order to build upon success and rectify failure. Such performance measures would not only indicate the role of CI in relation to the organization's "bottom line", but aid employee training and improvements, providing a narrative to support conversations around value and implementation.

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Appendix A: Email Invitation for Experts Study

Dear ----,

My name is Rhiannon Gainor and I am a doctoral student at McGill's School of Information Studies, researching competitive intelligence, decision-making, and measurement under the supervision of Professor France Bouthillier.

In doing preliminary work for developing my thesis proposal, I became familiar with your article ------- and the work you have done in ------. As part of my research design, I intend to interview experts in intelligence measurement to understand current practices and models, particularly as they address outcomes and organizational impacts, rather than process. I would very much like to meet with you if I could and interview you for my study. I will come to your university in -----, and I anticipate that the interview will take less than two hours of your time.

My research problem is to try and develop a model of measurement for competitive intelligence that accounts for the longer-term outcomes and intangible impacts of CI, building upon previous studies in an attempt to provide further evidence of its value. Much of the literature regarding intelligence measurement incompletely describes outcome measurement, and does not describe how methods and tools of outcome measurement were developed and conceptualized. The information collected in this study about expert conceptualizations of intelligence measurement will be used to strengthen my doctoral research and inform my approach to developing a measurement model, as the second half of my research will be a case study of an organization with a CI unit. Another hoped-for end result is to publish an article with the findings of the interviews, comparing/ contrasting models and perspectives, thus giving a more complete picture of current measurement practices than that currently depicted in the literature for outcomes and impacts.

If you are willing for me to visit you and interview you later this summer, I will send you further information about the interview and the interview questions. Your participation can be confidential if you prefer.

I can be reached at my email address, rhiannon.gainor@mail.mcgill.ca, or on my cell at 250.857.4081. Professor Bouthillier can be reached at france.bouthillier@mcgill.ca or at her office telephone number, 514.398.3362. Your participation would be greatly appreciated.

Best regards,

Rhiannon Gainor

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Appendix B: Interview Guide for Experts Study

1. How do you conceptualize competitive intelligence (business intelligence, etc) outcomes?
2. How do you differentiate outcomes from outputs?
3. How do you conceptualize competitive intelligence impact(s)?
4. Do you see impact(s) as being tied to organizational strategy?
5. How do you (or would you) measure outcomes and impacts? What does this measurement approach/method/model look like?
6. Where does your approach/method/model of intelligence measurement come from? (development of model – history, perceived need, anticipated use)
7. How would you describe the methodological challenges related to CI and:
    a. Informed decision-making?
    b. Intangibles?
    c. Qualitative data?
    d. Time lag?
    e. Any methodological challenges you have found?
8. How would you characterize a robust and useful measure for competitive intelligence? What attributes would the perfect model possess?
9. Do you perceive your approach/method/model as having strengths and/or weaknesses not present in other approaches/methods/models of measurement?
10. Do you see your conceptualization as static or dynamic? Is there room for changes and edits going forward? If yes, what are they likely to be?
11. How do you share this approach/method/model with others?
12. Do you know of any other experts in this area which might be willing to participate in this study?

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Appendix C: Free and Informed Consent Form for Experts Study

School of Information Studies
McGill University
3661 Peel
Montréal QC, H3A 1X1
Canada

Tel: 514.398.4204

This interview is being conducted by Rhiannon Gainor, a doctoral candidate at the University of McGill's School of Information Studies (SIS), as part of her doctoral research under the supervision of Professor France Bouthillier (france.bouthillier@mcgill.ca). The research study is funded jointly by a travel award from SIS and an FQRSC grant provided by the Province of Quebec.

You are invited to participate in a research study examining how experts in intelligence measurement conceptualize outcomes and impacts, and how they perceive current intelligence measures to capture outcomes and impacts. All participation is voluntary and study participants may withdraw at any time without penalty.

The purpose of this research study, part of a doctoral research, is to obtain information about expert opinion and conceptualization and then compare and contrast those expert viewpoints in an effort to clarify needs in research and conceptualization for the field of intelligence measurement. Findings will be disseminated through the researcher's thesis, conference presentations, and journal articles, and may be used to inform future related research.

As a participant you are asked to meet with the researcher for an interview lasting approximately an hour. During this interview, an audio recording will be made and notes will be taken by the researcher. The recording will only be used to prompt and otherwise aid the researcher's memory and comprehension of the interview. If you are uncomfortable being audio recorded, you may notify the researcher and no recording will be made. If at any point any of the questions posed cause you any discomfort or for any reason you wish to either not respond to a specific question or cease the interview, you are under no obligation to continue and may either refuse to answer a question or withdraw from the study completely.

Because the purpose of this study is to compare and contrast expert opinion and practice, the researcher would like to be able to identify study participants when publishing the study findings. Please note that following the interview, the researcher will send you by email a summary of her notes and comprehension of your answers, and at that time you will be given the opportunity to adjust or correct the researcher's notes. If you are uncomfortable with being named as a study participant, you may notify the researcher and she will remove your name from identifying data in the publications resulting from the study, and in this case, only the researcher and her advisor will have access to the identifiable data.

Data from the study will be kept in on a password-protected computer and in a locked file cabinet for five years following the interview. No financial or compensatory incentive is being offered to study participants. If you have any questions or concerns regarding your rights or

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welfare as a participant in this research study, please contact the McGill Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca.

Permission to audio record the interview: Y / N
Permission to be identified as a study participant: Y / N

Signature of participant: _____ Date: _____

Name (printed) of participant: _____

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Appendix D: Recruitment Email to Users study Participants

Dear -----,

My name is Rhiannon Gainor and I am a doctoral student at McGill's School of Information Studies, researching competitive intelligence, decision-making, and measurement under the supervision of Professor France Bouthillier.

This study is an investigation into how competitive intelligence (also known as market research, business intelligence, etc.) has been used in the past five years for specific instances of decision-making at your organization, and how outcomes-based measures might be developed for your organization to quantify competitive intelligence outcomes and represent their organizational benefits in the future.

As part of my research design, I hope to interview a sample of people who receive competitive intelligence as part of their work, and ask them to describe how competitive intelligence is generated, disseminated, and ultimately used within their organization, including its role (if any) in organizational decision-making.

The information collected in this study about how your organization uses competitive intelligence and conceptualizes intelligence measurement will be used to strengthen my doctoral research and inform my approach to developing a measurement model. I anticipate using this research in my thesis, conference presentations, and journal articles about competitive intelligence measurement and value.

In these publications your participation in this study would be kept confidential and any identifying details will be removed. Any confidential or sensitive information would be kept confidential. You will have the opportunity after the interview to review my notes for accuracy, and to notify me of any concerns or sensitive material that should be removed.

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Please let me know if you have any questions. I can be reached at my email address, rhiannon.gainor@mail.mcgill.ca, or on my cell at 250.857.4081. Professor Bouthillier can be reached at france.bouthillier@mcgill.ca or at her office telephone number, 514.398.3362.

Best regards,

Rhiannon Gainor

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Appendix E: Interview Guide for Users study

[Interviewer to preface discussion and ensuing questions with a verbal explanation of the study and its purpose; interviewer will provide time to answer questions prior to signing of the written consent form; interviewer will describe 'CI' for study participant and adapt terminology if necessary]

1. Could you provide me with some background on the CI unit, and what it does?
    a. Could you describe for me the history of the CI unit, as you understand it?
    b. When was it established?
    c. Why was it established?
    d. How many full and part-time employees work for the unit?
    e. What sort of facilities and other infrastructure, such as database access, do you have?
    f. What training documents are used to formalize the role of CI in the organization? Are these accurate?
    g. Would you describe for me how you believe the CI unit functions within the organization? Any critical evaluation or anecdotal evidence is welcome.
    h. What deliverables are required of the CI unit?
    i. How are CI deliverables incorporated into the operations of the organization, such as use in specific departments for planning functions? Any critical evaluation or anecdotal evidence is welcome.
2. What are your observations about the role of CI in your organization?

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a. What would you consider to be the organization's strengths and weaknesses in the marketplace?

b. Does CI help the organization to navigate the marketplace strategically, or help in any way to identify opportunities of benefit to the organization?

c. Can you describe the organizational decision-making process at your organization, and how CI is related (if at all) to that process?

d. Do you believe that CI informs organizational decision-making in a useful way? Can you provide any examples?

i. Remind you of facts already known

ii. Help you feel more confident in making a choice

iii. Make you more informed about an issue

iv. Present a new dimension or new insight for consideration

v. Provide new information

vi. Confirm a choice you would have made anyway

vii. Other

e. What benefit and value, if any, do you consider the CI unit to provide? Any critical evaluation or anecdotal evidence is welcome where specific outputs and outcomes can be identified.

f. Generally speaking, do you believe CI to help with any of the following? Can you provide examples?:

i. enhancing managerial development

ii. predicting future trends

iii. short-term performance

iv. long-term performance

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v. gathering relevant information

vi. avoiding problem areas

vii. other

g. Where or when do you think CI is not useful?

3. How is CI measured in your organization?

a. What current CI performance measures are in use to evaluate the CI unit generally, its services, or its deliverables?

b. How useful and functional are do you consider those measures to be?

c. How would you improve those measures, if at all?

d. Do you consider measurement of CI performance to be, or potentially be, useful in assessing performance? Does measurement have value for CI?

e. Do you know of the existence of any strategic plan for the organization?

f. Do you feel that the CI unit, or its deliverables, have any connection or relationship to strategic planning at this organization?

g. Do you believe that CI should be involved in strategic planning for organizations? Or do you, for example, consider it to be more tactical in nature?

[Interviewer here will transition to asking for assistance in finding additional study participant]

4. I am looking for additional study participants. Do you know of anyone that works with competitive intelligence that might be a possible participant for the study? Would you be willing to put me in touch with this person?

[Interviewer here reminds the participant that once interviews and preliminary data analysis are completed that the participant will have the opportunity to review the researcher's notes and provide feedback to ensure accuracy and asks how and to what address this summary

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should be sent; researcher will repeat assurances regarding the confidentiality of the information for both participants and the organization as a whole].

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Appendix F: Free and Informed Consent Form for Users study

This interview is being conducted by Rhiannon Gainor, a doctoral candidate at the University of McGill's School of Information Studies (SIS), as part of her doctoral research under the supervision of Professor France Bouthillier (france.bouthillier@mcgill.ca). The research study has been funded by an FQRSC grant provided by the Province of Quebec, McGill University, and a J.W. McConnell fellowship.

You are invited to participate in a research study examining the role of competitive intelligence (CI) in organizational decision-making, and how organizations may measure the outcomes and impacts of CI to determine value. All participation is voluntary and study participants may withdraw at any time without penalty.

The purpose of this research study, part of a doctoral research, is to obtain information about how organizations use CI, how organizations measure it to determine value and performance, and then compare and contrast those practices with measurement recommendations made in the scholarly literature, benchmarking both against measurement theory, in an effort to clarify needs in research and conceptualization for the field of intelligence measurement. Findings will be disseminated through the researcher's thesis, conference presentations, and journal articles, and may be used to inform future related research.

As a participant you are asked to meet with the researcher for an interview lasting approximately half an hour. During this interview, an audio recording will be made and notes will be taken by the researcher. The recording will be used to prompt and otherwise aid the researcher's memory and comprehension of the interview. If you are uncomfortable being audio recorded, you may notify the researcher and no recording will be made. If at any point any of the questions posed cause you any discomfort or for any reason you wish to either not respond to a specific question or cease the interview, you are under no obligation to continue and may either refuse to answer a question or withdraw from the study completely.

The researcher will not publish the names of the participants, or any identifying details, in order to keep responses as confidential as they can be. The name of your organization will not be revealed in any publications resulting from this research.

Please note that following the interview, the researcher will provide you a summary of her understanding of procedures, measures, policy, etc. for your organization and your work experiences as you have described them, and at that time you will be given the opportunity to adjust or correct the researcher's notes. This summary can be sent by email or mail to an address you supply. If you are uncomfortable with being a study participant, you may notify the researcher and she will remove you from the study. Please note only the researcher and her advisor will have access to the raw data from this study and all identifiers such as your name will be removed from the data once it has been analyzed. Confidentiality cannot be guaranteed when information is sent over the internet e.g. email, Skype.

Data from the study will be kept in on a password-protected computer and in a locked file cabinet for seven years following the interview. A $10 Amazon gift card is being offered to study participants at the conclusion of the interview. The research is happy to share her research findings with you upon completion of the study. If you wish such a copy, please send a written request to the researcher. If you have any questions or concerns regarding your rights or welfare as a participant in this research study, please contact the McGill Ethics Officer at 514-398-6831 or lynda.mcneil@mcgill.ca.

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Permission to audio record the interview: Y / N

Name: _____

Signature: _____ Date:_____

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Appendix I: Negotiated Shared Texts from Users study

1. John: Software Development

Background on the CI unit

At the organization described, an educational software development firm, competitive intelligence is informal, collaborative, and done in response to a previously identified business opportunity. The company will assign a product developer to that opportunity, who in turn brings together a development team. Selection of team members is done by determination of skills required. The team flexibly shares responsibilities, including preliminary research into competitor offerings and industry gaps, to determine the best approach to developing the product.

The company does not recognize what it does as "competitive intelligence", instead calling it "research" or "data analysis". Employees are not trained to conduct such research, but are expected to figure out what needs to be done as they are assigned tasks. Research findings are single-use items shared in meetings.

The company is primarily interested in supplying unique software features to the market as quickly as possible, in order to secure users. Trying to duplicate what another company provides is not profitable. As a result, rapid innovation is the goal, using iterative stages and consultations with the client.

Research to determine gaps in service and possibilities for innovation is conducted in four ways:

1. Employees turn to the web to look at competitor product offerings, promotional materials, and industry news;
2. Employees purchase competitor offerings in order to examine them (but this is more rare);

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3. Clients inform the company what other vendors have offered, and what service standards are expected in their own industry (eg, universities) and ask for customized features; and
4. Company competitors work together to provide unique expertise in joint product offerings or complementary products.

Role of CI in the organization

The organization's strengths include its willingness to collaborate with other tech companies, and its dual internal expertise in both tech and content. Its weakness in the past has been its willingness to spread its resources thinly across projects.

The participant considers competitive intelligence to provide both strategic and tactical assistance to the organization in navigating the marketplace. The role of competitive intelligence is primarily to help ensure the distinctiveness or innovativeness of product offerings to the client/market.

At the organization, agile software development philosophy has infused many corporate activities. In this model, teams work in iterative feedback loops with the client, providing quick turnaround times and immediate responsiveness to direction changes mid-project. The organizational decision-making processes work in very much the same way: skill-based teams informally come together to collaboratively discuss business opportunities. Research assignments given to various team members to investigate the opportunity iteratively inform the decision-making process, as features, costs, feasibility, etc., are determined to inform a final decision whether to bring a specific product to market.

Participant believes that CI/research informs organizational decision-making in the following ways:

- ~~Remind you of facts already known~~
- Help you feel more confident in making a choice
- Make you more informed about an issue

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- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway
- Other: sometimes prevents action

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- predicting future trends ("rolling quarter" and one-year goals are set with such future predictions)
- ~~short-term performance~~
- long-term performance
- gathering relevant information
- avoiding problem areas

Participant is not sure if there is a time when this kind of market research is not useful.

Performance Measurement for CI

The participant has never seen any kind of performance evaluation done for competitive intelligence, although he believes that it may have been done in relation to other projects at the organization, on which he has not worked. As a result, he does not know what these measures of performance may have been.

Measures of potential value would be revenue generated, and benchmarking of past performance. He believes that performance measurement for competitive intelligence may have some limited use in identifying the value to the organization of future investment in competitive intelligence. He notes that such measures would need to be "fast" (meaning simple, quick, in keeping with short project horizons) in order to be useful, and it would bring limited value.

The organization does have a strategic plan, which has been informed by competitive intelligence. The participant believes that competitive intelligence should play a role in the strategic planning of organizations, and is of both strategic and tactical value.

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2. Sarah: Recycling

Background on the CI unit

At this small family-run business, competitive intelligence is sourced through no-fee resources provided to small businesses in the United States by the federal government: the Small Business Association's Business Development Centre. This service employs librarians and researchers who will conduct market research on behalf of small businesses. The research conducted by the Small Business Centre is complemented for this organization by other standard business reference resources, such as Dun & Bradstreet. Competitive intelligence activity is so new that the organization has no official term for it, referring to it only as marketing or strategy activities.

Competitive intelligence activities have been triggered by the return of a daughter in recent months to the family business. She was appointed Chief Operating Officer following her graduation from her MBA program. Since her return she has brought to the business a focus on strategic development, incorporating more strategic planning and business development activities, which in turn rely on finding inexpensive resources of competitive intelligence.

Role of CI in the organization

The role of competitive intelligence for the organization is the following:

1. Help the Chief Operating Officer forecast the value of identified business development opportunities;
2. Recognize potential future threats from competitors and city management; and
3. Identify potential strategic alliances with competitors and city management.

Organizational strengths include a reputation for excellent customer service, competitive prices, efficient processes, and a perception among customers that the company is trustworthy. Strategic weaknesses are a lack of strategic alliances (which have not been of interest to the

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business owners until recently), and its marketing. While competitive intelligence is still merging with strategic planning, it is believed that competitive intelligence is helping address competitive weaknesses and strengths by helping the organization navigate the marketplace and identify useful business opportunities.

Organizational decision-making is very flat. The company numbers 13 people in total, and most decisions are made by one of the two owners, sometimes in consultation with the warehouse manager and other family members.

Competitive intelligence is currently being incorporated into decisions regarding strategy, marketing, and new business development.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- enhancing managerial development (this can guide managers)
- predicting future trends
- short-term performance
- ~~long-term performance~~ (beyond one to two years loses its value)
- gathering relevant information
- avoiding problem areas

CI is potentially not useful when a company is an innovator and first in their market; however, competitive intelligence would still have value in identifying potential partnerships and incoming competitors for that innovator.

Performance Measurement for CI

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Because competitive intelligence is outsourced, there are no competitive intelligence performance measures in place at the organization. Participant does believe that performance measures would be useful, since purchasers of competitive intelligence may find assessments of its quality helpful.

The organization has some plans for the future, but not a strategic plan as described in business schools. Competitive intelligence is informing strategic planning at the organization, and has a role in developing a formal strategic plan as the organization goes forward.

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3. Patrick: Charitable Nonprofit

Background on the CI unit

This charitable non-profit organization conducts significant national fundraising activities, provides services, funds research, and engages in activities to raise social awareness regarding its cause. The relationship managers in the Resource Development unit spearhead activities to source information about the fundraising and lobbying environment. These research activities (called here 'competitive research' for ease of reference, although the organization just refers to them generally as 'research') are informal, loosely delegated, and without any standardized processes.

The non-profit sector is largely collegial and collaborative, since organizations recognize that they are joined in a social cause. Within the larger sector, complementary or divergent fundraising organizations, for example, may share information about or best practices in proposals to government funding agencies. However, there are instances where similar organizations addressing similar social issues may find themselves in conflict or competition for the same funding, facing an audience who asks why they are being given multiple proposals for similar projects.

As a result, this organization needs to be aware of competitor funding and lobbying activities, as well as new trends, developments, and legislation in their area of charitable work.

Information is gathered from multiple sources by all staff in the Resource Development unit. A representative sample of sources and materials includes:

1. Competing organization websites: where campaign materials, goals, and strategy are published
2. Media: established relationships, news stories, profiles, etc.
3. Other charitable organizations: conversations with contacts

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These information gathering activities provide basic information, which is used to identify opportunities or questions of interest. The findings are shared in general discussions and team meetings. If the preliminary findings look promising, additional research may be requested of employees by managers. For potentially large or significant projects, researchers are outsourced under contract to conduct more technical and extensive research, which typically results in a formal report to the organization. This report in turn informs the business proposal.

Role of CI in the organization

The organization's strengths include its brand, the technical excellence of its programs, and its competence in fundraising. Its weaknesses are its difficulty in building strategic relationships, the toll changes in strategic direction have taken upon the employees, and its slim staffing model, which leaves the organization short of manpower and skills.

Competitive research does not assist the organization to navigate its environment strategically. The value of competitive research is essentially contextual, and varies depending on the sector and organization. In the non-profit sector its value is awareness of the environment, and coordinating asks and value propositions to funders with competitors.

The organizational decision-making model is highly hierarchical and centred on the founder of the organization. As a result, decisions tend to be centralized, prolonged, and involve a great deal of consultation, first with the executive and then with external advisors by the founder.

Participant believes that competitive research informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration

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- Provide new information
- ~~Confirm a choice you would have made anyway~~

Participant believes competitive research to help with the following:

- enhancing managerial development
- predicting future trends
- short-term performance
- long-term performance
- gathering relevant information
- avoiding problem areas

Competitive research is not useful if the organization does not know its business and goals. In those instances, it can be disruptive noise causing the organization to lose focus.

Performance Measurement for CI

The organization does not use performance measures for the competitive research. Although the participant can visualize instances where the establishment of a causal relationship (research to outcomes) might be useful, the only measure that actually matters is the success of the project: did it work?

The organization does have a strategic plan. Competitive research is related to the strategic plan in a very limited way: during the process of formulating the strategic plan there is a place for SWOT and e-scan activities which provide awareness of broad market trends. The participant does believe that competitive research should be involved in the strategic planning for organizations, but recognizes that in the non-profit sector for the vast majority of small organizations it is not feasible, due to resource constraints.

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4. David: Pharmaceuticals

Background on the CI unit

At the national (US) level, the company has four or five data analytics teams dispersed about the country, totaling perhaps 20 people. Reports are generated on a weekly basis and stored in a database which can be accessed through the company intranet site. Employees are granted varying levels of access to these reports, according to their role in the company.

The company has a large number of employees with a dispersed workforce. Many employees work from home offices and telecommute. Employees are trained to seek out the data analytics reports and use the information products generated by the company and to piece together understandings of current problems and opportunities, and proactively use that understanding to further the interests of the company. However, this task can be highly time-consuming and implementation of the training is very much at the employee's discretion.

Regional data analytics teams (usually 3-4 people) send data reports to the headquarters of the company, where the head data analytics team is located. Final reports tailored to the needs of specific groups, such as sales groups, are generated at headquarters and entered into the company system. A feedback loop is an accepted part of regular routine at the company. Sales groups, for example, will communicate with data analytics teams to let them know what is accurate, helpful, lacking, etc., and the analytics team has partially built its reputation for valuable service by being responsive to such feedback, including requests for new or changed services.

At times local teams or individuals with no responsibility for data analytics will augment services with reports or develop new research not currently done by the data analytics team.

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Historically, upon proof that the report or type of research is in demand by more than one group, the data analytics team will take over and begin to produce the report and/or research content.

Role of CI in the organization

Data analytics are used to monitor the performance of specific business units, and to forecast short-term benchmarks of success, such as quarterly sales targets.

Organizational strengths of the company include the size of the organization and its resulting presence in the field (eg, sales force), and the diversity of its products and resulting audiences. It weakness is its slow response times in recognizing and adapting to opportunities in the market, perhaps an inevitable by-product of its size.

Organizational decision-making processes hinge on budget, time, and scale of project. Proposed projects involving small expenditures of a few thousand dollars are expedited within groups when the fiscal year is young, the group budget will absorb the cost, and the scale of the project is small. Regional approvals are made through the regional attorney and the regional manager.

Large decisions involving expenditure of tens of thousands of dollars and up have to make their way through a set pathway of checks, ascending through a hierarchy of approvals, before a penultimate legal test, followed by final budget approval. During this process the originally proposed project may be modified or watered down. In order to trigger such a process, a team must develop a strong project proposal that includes a description of the opportunity, anticipated profit, purpose, and how the purpose relates to long-term strategic value for the company.

The role of CI (data analytics) is threefold:

1. Help employees identify new business opportunities;

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2. Help employees justify opportunities by providing insight into the market. Extensive amounts of data are needed to justify new proposals; and
3. Provide evidence of success, including return on investment for the project if approved.

All departments and managers are expected to support their activities with data that reduces activities to evidence of financial profit and loss. The data analytics team is expected to help managers produce such evidence.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- enhancing managerial development
- predicting future trends ("rolling quarter" and one-year goals are set with such future predictions)
- short-term performance
- long-term performance (in that organizational changes are made upon predictions regarding market needs)
- gathering relevant information
- avoiding problem areas

CI is not useful when it is too granular. At a local level there is a danger of actions being dictated by those who do not have local market knowledge. The role of CI should be to support, not dictate, decision-making.

Performance Measurement for CI

Performance measurement in terms of benefit and accuracy of predictions and information supplied takes care of itself with immediate feedback from users. Occasional errors

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are made but for the most part they do exceptionally good work, "exceptionally good" meaning accurate and reliable. The performance of company initiatives identified and supported by data analytics is immediately assessed through their monetary value.

The company does have a strategic plan, which is not the diluted version given to stakeholders in the shareholders' annual report. Data analytics is used to support and inform the strategic planning of the company as the head of the data analytics team at corporate headquarters sits on the Executive Leadership team of the CEO. The participant believes that CI should be used in strategic and tactical activities.

To try and relate the relatively micro investment in data analytics to the outcomes of a project or a team would be nearly impossible and of little benefit. It might be feasible to show some causality between data analytics and decision results, but the objections are first, the cost of the analytics would be too minimal to be worth tracking, and second, that the benefits stretch in a "wide band" across various silos of the organization, with different involvement and benefits to each. The concept of "benefit" is aggregate across the organization and relates to the role and accuracy, not the outcomes or impact, of the data analytics in decision-making and planning.

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5. Geoff: Marketing

Background on the CI unit

The marketing firm is targeted to the financial industry and numbers approximately 225 employees. The internal marketing department of the firm numbers some 18-20 employees, with the head of the department reporting directly to the company president.

The marketing department holds responsibility for developing competitive analysis. Competitive analysis services are the following:

1. Annual updating and some infrequent maintenance of a large spreadsheet tracking value offerings by competitors;
2. Some training materials for sales, e.g., to help with developing sales pitches; and
3. Informal materials to support executive-level meetings, which materials are supplemented by executives' own knowledge of current conditions.

Sources of information for competitive analysis include competitor websites and promotional materials, and client discussions. Some 80% of information about competitor offerings is openly available and easily obtained in a small industry.

The annual activity of updating the sole formal deliverable, the spreadsheet of competitor offerings, plays a significant role within the organization. Annual departmental plans must be finished each September for the upcoming year, and departmental project sales, budget forecasts, etc., rely on information obtained from this document.

Role of CI in the organization

The organization's strengths in the marketplace include the wide variety of product offerings, and a reputation for excellent customer service. The weakness of the organization is ironically the poor quality of the marketing materials supplied to individual clients.

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Competitive analysis helps the organization navigate the marketplace strategically, capitalizing on its strengths and identifying opportunities to distinguish itself from its competitors. However, in the participant's view, the effectiveness of competitive analysis rests upon the receptivity of the audience receiving the competitive analysis.

It should be noted that there was some significant dissatisfaction in other departments with the services provided by the internal marketing team. It is possible that a larger scope of competitive analysis services could have been better provided with different leadership/impetus within that department.

The organizational decision-making process at the marketing firm was formal and hierarchical. Regular meetings were held with the executives and department heads to consider strategic decisions. Opportunity was given for debate and discussion, frequently supported by informal information received regarding competitor activities. This competitive analysis helped the organization to be responsive, not predictive. The president then informed those in attendance of his choice at the end of the discussion.

Participant believes that competitive analysis informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- ~~Present a new dimension or new insight for consideration~~
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- ~~predicting future trends ("rolling quarter" and one-year goals are set with such future predictions)~~
- short-term performance

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- long-term performance
- gathering relevant information
- ~~avoiding problem areas~~

When highly innovative companies such as Apple and Google are so far ahead of what everyone else is doing, competitive analysis is potentially of limited use.

Performance Measurement for CI

There are no performance measures in place to assess the value or functionality of competitive analysis. Performance measures would not be useful at the organization, as competitive analysis has too limited a function.

Performance measures would be of use in a larger company, with a more formal and extensive competitive analysis function. In that instance, performance measurement would help with management: monitor investment, effectiveness, etc.

The organization's strategic plan is revised each year for the upcoming year. Competitive analysis supports this strategic planning function and is integral to it.

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6. Hans: Software

Background on the CI unit

This software company has gone through recent explosive growth. In the past 4 years it has gone from 100 employees to 1,000. It fosters a team mentality with employees by adopting a highly transparent and communicative 'flat' organizational model, which also informs corporate communications policies and decision-making processes. Employees see themselves as joined in a common purpose, and are focused on being a source of disruptive innovation in their market.

Dedicated to the purpose of disruptive innovation, little heed is given as a result to market analysis (also called competitive analysis). Market analysis responsibilities are delegated to three departments, as follows:

1. The Product Management team produces product comparisons, feature by feature, including price.
2. The Marketing department tracks and reports on high-level industry trends.
3. The Sales department monitors not just successful sales, but also sales losses. Customers are asked for feedback regarding sales lost, and if a specific feature offered by a competitor is proving a significant repeat factor over time in sales loss, that information will be transmitted to the executive and product development teams.

The organization maintains a policy of using customer feedback to inform product and service development, and mindfully creates opportunities for all employees to be exposed to customer feedback. This is an additional and potent source of information and idea generation for the organization.

Competitive analysis is typically kept within the executive team. Announcements about competitor offerings, or information relevant to the development of new product features are emailed to managers and other interested parties. Some limited competitive analysis is available on the corporate intranet wiki, but employees know that if they have questions not answered on

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the wiki, they may freely approach anyone producing market analysis with any question, and have it answered.

The company tries to downplay market analysis and deliberately chooses to minimize its role in the company, believing that the company performs better by following its own mandate and vision, rather than monitoring and being perhaps inadvertently influenced by its competitors' activities.

Role of CI in the organization

The organization's strength in the marketplace is that it has provided a radically new business model in its field, providing small flexible do-it-yourself software solutions rather than consultant-heavy IT services with a high price tag. Its strength is also its weakness, in that there are potential clients who are doubtful about and potentially resistant to this new model.

Organizational decision-making is very open, collaborative, and transparent. Ideas are promoted both up and down the few levels of the organizational hierarchy, with opportunity for input from many internal stakeholders.

Because market analysis is deliberately minimized, this in turn means that it has a tangential role at best in organizational activities. As a result, the strategic plan of the organization is minimally informed by the market analysis – but that relationship does exist. The participant notes that in other software companies run upon more traditional models, competitive analysis can play a much larger role in (for example) setting pricing, or timing of product releases, where the corporate goal is to crush the competition, rather than innovate and disrupt the market.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- ~~Remind you of facts already known~~

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- ~~Help you feel more confident in making a choice~~
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- ~~Confirm a choice you would have made anyway~~

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- predicting future trends
- ~~short-term performance~~
- long-term performance
- gathering relevant information
- avoiding problem areas

All companies need to do market analysis to some extent. But market analysis can be a distraction and an active hindrance to organizations when they let the competition's activities influence and even dictate internal decisions.

Performance Measurement for CI

As far as the participant knows, performance measures are not in place for market analysis. Performance measures might be useful to organizations that follow a very competitor-conscious business model and as a result place a great deal of reliance upon it. For this organization, with its downplaying of market analysis, to measure performance would be to draw attention to it, and therefore in the participant's view would not be of value to the organization.

The organization does have a strategic plan, and the market analysis has a necessary, albeit distant, relationship to its formulation. This is a long-term, forecasting relationship, rather than a short-term tactical one.

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7. Spencer: Credit Union

Background on the CI unit

Within the credit union industry market research is often transparently shared between organizations. While the term 'competitive intelligence' denotes an aggressively competitive practice, 'market research' for credit unions describes collaborative and supportive practices in which industry information is freely shared, joint projects are conducted, organizations may be co-owned, and market insights and business practices are shared for the betterment of the industry through mutual evolution and survival.

At the credit union described in the interview, market research is obtained in two ways. First, through the hiring of 'industry experts' who provide reports and summaries of activities in the market; second, through informal and irregular research tasks assigned to employees as a needs arise.

Role of CI in the organization

The organization's strengths have been its brand, good staff who have retained a high degree of institutional knowledge (in large part due to a Baldridge Award application), and its lending practices. Due to the financial crisis of 2008 and resulting changes in legislation, the lending practices were no longer a strength. The organization was in dire straits following 2008 and was forced to drastically downsize, resulting in some weakness related to manpower and in-house skills.

Market intelligence would ideally help an organization with strategic planning. However, the reality was that market intelligence was of marginal assistance during the past few years, as the organization faced urgent and immediate problems that instead required the application of common sense and practical knowledge in very short horizons, to ensure survival.

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Executives may have two levels of vision: prophetic (rare, but aided by market research), or peripheral vision. Anyone can have peripheral vision, and it is required for any real level of competency. Market research is a part of both prophetic and peripheral vision. The functional role of market intelligence is distinct to the organizational situations: Strategic, Tactical, Actions in the trenches. In the trenches, it may have provided the training and basses for habits, and seeming instinctive actions.

Organizational decision-making is a collaborative and cooperative model, lacking formal processes (the organization had downsized to approx. 300 employees). Decisions for the organization were made at the executive level and then shared with the organization. Note that all employees were encouraged to work across teams and projects to avoid silos and foster collaborative work.

Participant believes that market intelligence informs organizational decision-making in the following ways:

- ~~Remind you of facts already known~~
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- enhancing managerial development
- predicting future trends
- short-term performance
- long-term performance (in that organizational changes are made upon predictions regarding market needs)
- gathering relevant information
- avoiding problem areas

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Participant believes that market research is always useful, although the value it may bring hinges on the time frames and planning involved: in his experiences described here, market research was of less value that its estimated potential.

Performance Measurement for CI

Market research performance or value was not measured or assessed at the organization. Performance measures would be beneficial however in assessing value because market research can be expensive in both money and employee time, and because the wrong information can lead an organization astray.

Tools to assess the value and the accuracy of the intelligence for post-mortems of decisions and products would be welcome, in order to avoid repeating mistakes.

A strategic plan for the organization did exist, however much of it was hastily put together under federal pressures and requirements which essentially dictated much of the content for the short-term. Ideally organizations would use market research to inform longer-term strategic planning.

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8. Helen: Manufacturing

Background on the CI unit

At this organization, a global food manufacturing company, competitive intelligence is called by many names depending on the unit and the purposes to which it is put. In the field finance unit, it is typically called data analytics but may also be called competitive analytics. Sales data is tracked on a daily, weekly, monthly, and yearly basis by outsourced companies, which provide reports to the company to help decision-makers and managers understand company actuals and forward-looking trends in the market.

These reports are available to managers and executives, however most rely on the reports developed internally by the Insights Group. The Insights Group takes the reports from the outsourced companies and customizes simplified reports for internal audiences. These reports are used to: set production, distribution, and sales targets; develop product lines; and inform strategic responses to customer demand.

Role of CI in the organization

The organization's strengths in the marketplace are its brand, its distribution network, and its solid middle-class customer base. Its weaknesses are its price point, its inability to address fringe markets, and its problems attracting diverse customer bases.

Data analytics does help the organization navigate strategically in some instances. Data analytics are used in different ways by different groups within the organization, and so its strategic usefulness is contextual.

The organizational decision-making processes vary depending on the department and the decision involved. For example, a decision to pull a product is both hierarchical and collaborative: executives need to sign off on it, yet at the same time many people need to be

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canvassed for input since it is a significant decision that resonates across the company. In contrast, a single department might have decisions that are nimble and entrepreneurial, yet involving large sums of money, if an employee comes up with an innovative idea that meets with an immediate supervisor's favour.

The value of data analytics to the organization, and to the decision-making process, is twofold:

1. It brings an objective, fact-based perspective to a given situation; and
2. It establishes an objective baseline for performance that can then be used to inform planning.

Participant believes that data analytics informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway
- Other: it reminds the decision-makers of organizational objectives.

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- predicting future trends
- ~~short-term performance~~
- long-term performance
- gathering relevant information
- avoiding problem areas

Data analytics are not useful when they are used to the exclusion of other sources of information. Sometimes the numbers may obscure useful insights. It is important, for example, that data analytics are supplemented with subjective information about customer relationships from the sales team.

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Performance Measurement for CI

There are not any performance measures in use to evaluate the data analytics. The participant does not see much value for such performance measures. Since the data is mostly historical, and since the outsourced functions cost millions of dollars, it should be tested within the data analytics service to ensure it is both accurate and complete. A potential value measure of a deliverable such as a report for the executive might be simply, "does it offer insight?"

There is a strategic plan for the organization. Data analytics help the executive understand the base figures (baseline) upon which the strategy for the organization is then built. The participant sees the role of data analytics as being both strategic and tactical for the organization, and argues that if it is not being used strategically, the organization is not receiving full value for its investment in data analytics.

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9. Brian: Healthcare

Background on the CI unit

The organization is a public non-profit, owned by the federal government, and is mandated to provide non-medical employees to a network of hospitals. The portfolio of the participant includes five hospital locations plus community health care services, totaling some 2,000 employees.

Data is collected internally for 1) benchmarking activities; and 2) intelligence gathering.

1. Benchmarking

Data for benchmarking activities are gathered by employees on an hourly basis. On personal digital devices supplied by a private contractor, patient identification bar codes are scanned, and employees enter the treatment given to the patient, time consumed, and other relevant details. The private contractor makes the raw data available to the organization, and provides analysed data to the organization every six months in the form of reports. These reports are stored on the organization's server, with access restricted to managers.

This data is used in two ways. Internally, managers share the reports every six months with their teams and account to upper management for performance shortfalls, budget issues, etc. Externally, the performance of a given hospital or hospital team is shared within a network of 45 hospitals. This transparent and collaborative network allows the hospital to benchmark performance and through discussion with similar organizations determine best practices in care, cost saving measures, and better management techniques. This also allows the organization to demonstrate value for money in their public reporting. However, the data itself cannot be published or its findings shared outside the network.

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The use of the technology to enable this benchmarking is a relatively new innovation for the organization. Benchmarking data collection began three years ago, with the first report arriving two and a half years ago. Although some employees were already attending national meetings for training on the devices, data, and reports, a need was identified earlier this year for more employee training on how to understand and use the data. The first employee workshop was offered two months ago.

2. Intelligence Gathering

Surveys are used at regular intervals to identify problems and rate the satisfaction of stakeholders with the services provided. These intervals vary, depending on the service, from one to five years. Surveys are administered to employees, clients, and referrers (those who provide referrals to the services the organization provides).

In addition, employees of the organization monitor practices and innovations in similar organizations and similar services through attendance at conferences and monitoring the research literature.

Role of CI in the organization

The strengths of the organization in the marketplace are:

1. Its ability to provide care across the health care continuum, from primary and acute care to rehabilitative care;
2. Services are more cost effective than traditional medical staff; and
3. The organization's ability to provide specialized services as required by clients.

The participant cannot think of any organizational weaknesses, but does feel that the benchmarking and intelligence gathering activities are helpful to the organization in navigating the marketplace strategically.

Benchmarking has helped the organization navigate a recent challenge. Six months ago the federal government suggested that services provided by the organization could potentially be

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privatized at a lower cost to the taxpayer. The organization was able to contest the government's assumptions about the benefits of privatization with their benchmarking data. In addition, it has helped the organization in its sustainability planning for the future.

Intelligence gathering has helped the organization to identify gaps in service, and employee needs, and innovate. For example, staff surveys indicated that support for research activities at work would improve employee retention and satisfaction. The organization then implemented a change and increased capacity for employee-initiated research activities.

The organizational decision-making process at the organization varies at lower management levels depending on the unit's hosting hospital. The decision-making at the highest executive level within the organization is highly bureaucratic in nature.

The primary purpose of benchmarking is to monitor, and help improve where necessary, efficiency in service. The primary purpose of the intelligence gathering, a management tool, is to ensure that stakeholders are happy and satisfied and if not, identify areas for improvement. Within these roles, benchmarking and intelligence gathering support organizational decision-making.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- ~~Remind you of facts already known~~
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway
- Other: it sometimes helps you make the opposite choice, or to know what not to do.

Participant believes CI to help with the following:

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- enhancing managerial development
- predicting future trends
- short-term performance
- long-term performance
- gathering relevant information
- ~~avoiding problem areas~~
- Other: identify problem areas, which it is then up to management to fix.

Benchmarking and intelligence activities are not useful when the manager does not use the information, when the work environment causes employees to disregard information provided, and/or external factors corrupt the data. An example of such an external factor would be an industrial action which asks employees to provide no data, or false data, in the course of their workday.

Performance Measurement for CI

The organization does not use any performance measures to assess the value of the benchmarking or intelligence activities. The participant cannot visualize a likely or useful performance measure; he goes by his gut feeling whether the data is used, useful, and beneficial to the organization as a whole.

The organization does have a strategic plan. While the benchmarking and intelligence activities have informed tactical planning, the participant does not believe that they have a role in strategic planning unless it is tangentially. These services may provide an enhanced awareness of internal issues or market issues that generally inform his contributions to strategic planning generally, and they may provide data to support a strategic position, but they are not directly or causally linked to the strategic plan.

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10. Pierre: Government Banking

Background on the CI unit

This government organization solicits investment and provides financing for business concerns. Within the organization there is a department, the Strategic Information Department, that supplies the organization with what they call business intelligence and "competitive watch". This group numbers seven people, plus two support staff.

Deliverables of the group are formal and informal. Formal strategic research reports and recommended performance targets are supplied to each planning sector (6-7 sectors exist) within the organization to support annual strategic planning activities. Informal materials are requested of the team on a daily ad-hoc basis and are reactive in nature. Materials produced are archived in a corporate database, and are not accessible to all employees.

The chief mandate of the Strategic Information Department is to support the business development group. Other teams and departments are supported as time and resources are available.

A complementary function is provided by the Marketing and Communication department. They conduct research on corporate image, customer satisfaction, etc., and provide the executive team with corporate support such as advertising strategy.

Role of CI in the organization

The organization's strengths are first, its dual role in soliciting investment and providing banking services; second, its numerous overseas offices. Its weaknesses are related to its government function: it has slow responsiveness, and is sometimes subject to political pressures.

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The business intelligence helps the organization to navigate the marketplace strategically. It does so by providing guidelines for specifically targeted sectors of interest for investment. It also provides some tactical support by occasionally identifying leads for business development.

The decision-making process at the organization is a mixture of formal and informal processes. While the organization is quite flat, there are many inflexible rules to be followed. A group receives a mandate from the executive team, which has its own strategic plan. The group, under the direction of a vice-president responsible for the group, works collaboratively to decide how they will meet targets. Groups are given quite a lot of leeway in their approach, strategy, etc. Within the group they develop and follow a separate strategic plan unique to their group, which is related to the executive plan. Despite this autonomy in planning, there is a significant amount of paperwork that must be navigated by the group in order to act.

Business intelligence informs each stage of the decision-making process: the strategic plan, the targets, the approach. Business intelligence gives companies corporate knowledge, meaning, the knowledge that provides an edge on competitors, and the ability to knowledgeably speak the language of the businesses engaged in very specific activities.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- predicting future trends

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- short-term performance
- long-term performance
- gathering relevant information
- avoiding problem areas

Participant cannot think of an instance where business intelligence may not be useful, but notes that it may not be a feasible investment for small businesses.

Performance Measurement for CI

At the organization, performance measures used for the business intelligence function include process measures such as quantity of reports produced, and requests for clients' feedback and satisfaction. No targets are set, since much work is reactive rather than proactive, other than the annual strategic planning support, which is proactive and a valuable and essential contribution to the organization's strategic planning.

Participant is not sure how the outcomes or value of business intelligence could be assessed, and acknowledges this would be extremely difficult. There is value in performance measurement as a general principle, however the question has to be if the value returned (ROI) would be worth the time and effort involved to track business intelligence outcomes and benefits.

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11. Tony: Energy

Background on the CI unit

The North American subsidiary of the parent European company has a small internal data analytics team of 3-4 people that is dispersed around the US. Market intelligence reports are sourced outside the company and typically purchased on an ad-hoc basis. Suppliers of market intelligence include IHS Research, which claims an energy industry expertise.

The vendor sends email alerts directly to organization employees when new materials are ready for viewing. Materials such as reports and recorded webcasts are posted on the vendor site, and employees of the organization log in to the vendor site to view them. It is at individual employee discretion whether or not to peruse the materials. These materials (usually reports) are not systematically used and are regarded with some skepticism. The participant says that perhaps one-tenth of the materials purchased are of value to him, and that employees do not value them. He suggests that if focused, targeted research were to be produced in response to employee needs in a systematic and organized way, that market research would have increased value and would be accorded much more respect.

Role of CI in the organization

Outsourced reports in the past have been condemned as 'fluff', or at best containing only 50% new insights. Reports that confirm what is already known are considered a waste of money, and due to the cost of the reports ($3,000 for a report is an accepted cost) the company relies more on the common sense and suggestions of employees in the field, than ideas from research. If a report is purchased, the expectation is that it will provide significant new insight or new information not otherwise available. Confirmation of existing knowledge is not valued.

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The strategic strengths of the company lie in its broad experience, large portfolio, and deep pockets. Weaknesses at the moment are related to the considerable growth the organization has experienced over the past 10 years, and continues to experience. Internal processes and procedures are being developed on a reactive basis. In this environment, market intelligence as it is currently provided at the organization is considered to be of marginal assistance. The participant agrees that market intelligence should help identify new opportunities for the organization in the marketplace, but states that as practiced now it is only providing very general information about industry trends, rather than the targeted individual company profiles that are actually needed.

Organizational decision-making processes at the company are top-down and hierarchical. If a business opportunity is identified within the field of renewable energy, a trial/pilot is conducted with the first contract secured. If it proves profitable, the service is expanded and added to the company's client offerings. Decision-making is therefore exploratory and experimental, with informal processes that require executive sponsorship (informal agreement, sign off).

The participant states that in his view, market intelligence is not informing decision-making at the organization, and providing little value, although it could be useful if it were better developed and some value for it had been previously established with the managers who currently regard it with skepticism, believing their own knowledge to be superior to that which is produced and presented by the contracted firm of researchers.

Participant believes that market intelligence informs organizational decision-making in the following ways:

- ~~Remind you of facts already known~~
- Help you feel more confident in making a choice

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- **Make you more informed about an issue**
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- ~~enhancing managerial development~~
- predicting future trends
- ~~short-term performance~~
- ~~long-term performance (in that organizational changes are made upon predictions regarding market needs)~~
- gathering relevant information
- ~~avoiding problem areas~~

In the participant's view, CI is only useful if the organization perceives it as useful and is willing to invest in it.

Performance Measurement for CI

CI performance is not measured at the organization, and there are no feedback mechanisms by which the data analytics team can be informed about information needs of departments and employees. The usage of the purchased reports may be the single measure of value to the organization.

If participant were to improve these measures, he would include something that demonstrated value to managers, which in turn fostered adoption of market intelligence. Such performance measures would have value in improving quality of the service and related usage.

There may be a strategic plan in existence for the organization. If so, employees are not aware of it. Market intelligence appears to have no connection to the strategic planning at the organization. The participant states that if it were practiced properly, market intelligence would be of use in strategic planning, not in tactical use.

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12. Tom: Mining

Background on the CI unit

At the mining corporation, competitive intelligence is called business analysis or industry analysis. The organization has five company segments or product groups, with the headquarters for each variously located around the globe. Each of the five product groups has its own industry analysis team, as does the corporate headquarters. In each product group, as for corporate headquarters, industry analysis teams report to the Chief Financial Officer (CFO) who oversees the product group and its subsidiary businesses.

Most industry analysis teams are small, numbering 3-5 people, and include people with economics backgrounds as well as business intelligence backgrounds. The product group described here has one of these average, small teams. Work is requested on an as-needed basis and is not archived in any location accessible to anyone outside the analysis team.

Communication flows are continuing and adaptable to the needs of the senior leadership team, and department heads, who rely on this service to inform and support their strategic planning. These teams are expected to not only respond to requests, but also to proactively work to anticipate information needs and bring forward new items of relevance and interest.

The industry analysis supports executive-level business functioning and strategic planning from an industry forecasting/ competitor activity/ economics viewpoint. It does not investigate technology or technological developments that may inform operational changes to the company; that work is done by other departments that deal with technology and have better access to and understanding of those issues.

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Role of CI in the organization

The organizational strengths in the marketplace are its operational expertise, its environmental/sustainability practices, and its attention to stakeholders. Its weakness is its ability to read the market, and the negative effect this has on its pricing and on some acquisition decisions.

Industry analysis helps the organization navigate the marketplace strategically, and is in fact a bedrock element of the annual strategic planning exercises. The organization has one-year, three-year, and five-year strategic plans that are reviewed and informed based on the industry analysis provided to the executive team.

Organizational decision-making has been dictated by the CEO's personal style. The current CEO of the product group has a very centralized, hierarchical decision-making process that involves little discussion with the executive team.

Participant believes that CI/data analytics informs organizational decision-making in the following ways:

- Remind you of facts already known
- Help you feel more confident in making a choice
- Make you more informed about an issue
- Present a new dimension or new insight for consideration
- Provide new information
- Confirm a choice you would have made anyway

Participant believes CI to help with the following:

- enhancing managerial development
- predicting future trends
- ~~short-term performance~~
- long-term performance
- gathering relevant information
- avoiding problem areas

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Industry analysis is not useful in improving short-term performance, as that is the responsibility of the financial group. Industry analysis is about longer-term time horizons necessary in the mining industry for strategic planning and performance. Industry analysis is also not useful to operations, and addressing operational issues. That is the province of the technological departments who track things like innovations in mining machinery.

Performance Measurement for CI

Each business unit within the organization is expected to set and achieve key performance indicators (KPIs). These are used to assess performance of the unit. What those indicators might be for the industry analysis team is unknown.

In the participant's view, performance measures would be worthwhile for assessing the value of industry analysis to the organization, but anecdotal or otherwise highly subjective evidence would not be sufficient. Rather, these measures would need to indicate cost savings, strategic leverage achieved, decisions supported, and retrospective accuracy in forecasting.

A causal relationship between industry analysis and the outcomes of a specific decision could be established. However it would need to account for the quality of the information, the 'salesmanship' of the communicator, and the receptivity of the audience, as all three are factors in determining the role industry analysis plays in decision-making.

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