AN EMPIRICAL STUDY OF THE TASK-TECHNOLOGY FIT OF CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS

By,

Mary Layfield Ledbetter

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Mary Layfield Ledbetter

We hereby certify that this Dissertation submitted by Mary Layfield Ledbetter conforms to acceptable standards, and as such is fully adequate in scope and quality. It is therefore approved as the fulfillment of the Dissertation requirements for the degree of Doctor of Business Administration.

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CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions or writings of another.

Signed: Mary Layfield Ledbetter

Mary Layfield Ledbetter

ABSTRACT

AN EMPIRICAL STUDY OF THE TASK-TECHNOLOGY FIT OF CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS

by

Mary Layfield Ledbetter

Customer relationship management (CRM) is one of the fastest-growing software market industries in the world. According to Gartner, the market for CRM software revenue totaled $5.7 billion in 2005. Although companies are making huge investments in technology, in practice most customer relationship management efforts fail leaving the companies' management struggling to understand why.

In 1995, Goodhue proposed task-technology fit (TTF) as an additional model of IS success. TTF is the measure of the match between the task requirements of the individual, the individual's abilities, and the functionality available in the system. TTF can be conceptualized as the degree that a technology helps individuals perform their portfolio of tasks. TTF is higher when the gap between the task need and the functionality of the technology is reduced. TTF is lower as tasks become more demanding or technologies offer less functionality.

This study examined the relationship between TTF and the performance impact of marketing managers who utilize a commercial CRM system. The results of this study provide insight into the success of CRM systems as used by marketing managers. This research complements prior studies by adding to the growing body of literature that measures the success of information systems using the task-technology fit model.

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To God Be the Glory – Great Things He Hath Done!

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CHAPTER I

INTRODUCTION

This chapter provides an overview of the dissertation. It begins by providing (a) the statement of the problem, (b) the background of the problem, (c) the purpose of the study, (d) the theoretical framework for the study, (e) the scope and limitations of the study, and concludes with (f) the summary.

This study investigated the 15 dimensions of task-technology fit applied to the domain of customer relationship management (CRM) systems. The dimensions of TTF have been measured using the task-technology fit instrument developed by Goodhue (1998). This study is important because it provides empirical measures of how effectively CRM systems support the job needs of marketing managers and the resultant individual performance impact.

Statement of the Problem

Although companies are making huge investments in technology, most customer relationship management efforts fail in practice (Bull, 2003; Croteau & Li, 2003; Rigby et al., 2002; Woodcock & Starkey, 2001). The ability to measure the success of technology efforts has been a long-standing problem. Objective measures of information technology success are difficult to achieve (Goodhue, 1995). Subjective measures exist, but most often they are not validated, and the relationship to system use is unknown (Davis, 1989). In spite of large investments and the reported high failure rate among CRM implementations, little empirical research has been conducted in this area.

Goodhue (1995) proposed the task-technology fit (TTF) model as an additional perspective of IS success that focuses on user outcomes of business productivity and efficiency (performance impact). According to Goodhue and Thompson (1995), TTF can be conceptualized as the degree that a technology helps individuals perform their portfolio of tasks. The TTF perspective of IS success has not been tested in the domain of customer relationship management and is the focus of this study.

Background of the Problem

Companies are spending millions of dollars on technology in an effort to understand more about their customers' needs and preferences. Research suggests that companies that build and sustain successful relationships with their customers are more profitable than those which do not (2000; Reichheld & Sasser, 1990). Companies' desires to find out as much information as possible about their customers' needs and preferences has sparked the modern marketing approach known as relationship marketing (Paas & Kuijlen, 2001).

Customer relationship management is one of the fastest-growing software market industries in the world (Chang, Yen, Young, & Ku, 2002). According to Gartner (as cited by Sims, 2006), the market for CRM software revenue totaled $5.7 billion in 2005. Although companies are making huge investments in technology, most customer relationship management efforts fail (Bull, 2003; Croteau & Li, 2003; Rigby et al., 2002; Woodcock & Starkey, 2001), leaving the companies' management struggling to understand why (Bull, 2003). Companies spend millions investing in new technology while the ability to measure the success of these technology efforts remains elusive

(Goodhue, 1995).

The ability to measure the success of technology efforts has been a long-standing problem and objective measures of information technology success are difficult to achieve (Goodhue, 1995). Many information systems researchers and practitioners utilize user evaluations as surrogates for information systems (IS) success (Goodhue, 1995). Other studies support system utilization, proposing that using information technology (IT) leads to positive performance results (Goodhue & Thompson, 1995).

Numerous methods have been tested to methodically measure the success of information systems. Davis (1986) proposed the technology acceptance model (TAM) as a method to measure IS success. TAM asserts that ease of use and perceived usefulness are primary determinants of system use (Garrity, Glassberg, Kim, Sanders, & Shin, 2005). DeLone and McLean's (1992) model of IS success advances that system quality and information quality lead to use and increased user satisfaction, resulting in better individual performance and in improved overall organizational performance. Bailey and Pearson's (1983) user information satisfaction instrument and Davis' (1989) perceived usefulness and perceived ease of use instrument are two well-known constructs for user evaluations.

Goodhue (1995) proposes the task-technology fit (TTF) model as an additional model of IS success. According to Goodhue and Thompson (1995), TTF can be conceptualized as the degree that a technology helps individuals perform their portfolio of tasks. TTF is the match between task requirements, the individual's abilities and the functionality available in the system. Since particular tasks require specific technological functionality, TTF is higher when the gap between the task need and the functionality of the technology is reduced. TTF is lower as tasks become more demanding or technologies offer less functionality. A higher TTF not only increases the possibility of a system's utilization, it also increases the system's performance impact. Since an effective system closely fits the requirements of the task the user is performing, a high TTF will lead to increased performance at any level of utilization.

Purpose of the Study

This study explores the relationship between task-technology fit of CRM systems and the performance impact realized by marketing managers. Task-technology fit as a measure of IS success is important because it takes the subjective measure of user evaluations and adds specific objective measurements to the equation. The results of this study provide insight into how effectively CRM systems handle the marketing managers' job needs. This research complements prior studies by adding to the growing body of literature that measures the success of IS systems using the task-technology fit theory. In addition, this study adds empirical data to the limited body of literature on CRM system success.

Theoretical Framework

Goodhue and Thompson (1995) posit that if the available technology meets the task requirements and if individuals have the skills to use the system, they will use it to perform their portfolio of tasks. The TTF model measures the degree to which a technology helps individuals perform their assortment of tasks. Essentially, TTF measures the match between the individuals' task requirements, the individuals' abilities and the system's functionality. TTF is high when the gap between the individuals' task needs and the technology's functionality is small. As tasks become more demanding or technologies offer less functionality, the gap widens and TTF is lower.

Goodhue and Thompson (1995) also postulate that technology will have a positive impact on performance if the technology is used and if the technology fits the tasks requirements of the user. They refer to this link as the technology-to-performance chain (TPC). The TPC is based on two complementary streams of research: Goodhue and Thompson's task-technology fit, and utilization. Utilization research has focused on users' attitudes and beliefs as predictors of system utilization, positing that increased use leads to increased performance (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989; Doll & Torkzadeh, 1991; Thompson, Higgins, & Howell, 1991).

Individual performance is linked to an individual's accomplishment of a series of tasks. Higher performance implies an improvement in efficiency and/or effectiveness. A higher TTF not only increases the possibility of utilization; it also increases the system's performance impact. Regardless of the level of utilization, a high TTF will lead to increased performance, since the system more closely fits the needs of the task the user is performing (Goodhue & Thompson, 1995).

The general model of TTF is based on the outcomes of user evaluations. A user evaluation is an assessment of an information system's various characteristics, as perceived by the user. These assessments generally ask users to rate the system on a continuum from positive to negative. If users give the system a positive evaluation, then it is assumed that the system is improving their performance (Goodhue, 1995). There are several dominant constructs for user evaluations, such as Bailey and Pearson's (1983) user information satisfaction instrument, Davis' (1989) perceived usefulness and perceived ease of use instrument, and Goodhue's (1998) task-technology fit instrument. Goodhue and Thompson (1995) suggest that if systems meet the users' needs, users will provide a more positive evaluation of the systems' characteristics.

In their 1995 article, Goodhue and Thompson confirmed 12 of the 16 dimensions of task-technology fit:

1. Lack of Confusion (confirmed),
2. Level of Detail (confirmed),
3. Locatability (confirmed),
4. Meaning (confirmed),
5. The Right Data,
6. Accessibility (confirmed),
7. Assistance (confirmed),
8. Authorization,
9. Ease of Use of Hardware and Software (confirmed),
10. Flexibility,
11. System Reliability (confirmed),
12. Training,
13. Accuracy (confirmed),
14. Compatibility (confirmed),
15. Currency (confirmed), and
16. Presentation (confirmed).

Goodhue (1995) tested user evaluations of TTF in the context of managerial decision-making. In this context, managers rely on quantitative information while gathering data to aid them in making decisions. Goodhue chose this task domain because information systems contain quantitative data, and because managers place unique task demands on information systems. In addition, managers often use quantitative data in problem solving.

Goodhue (1995) found empirical evidence supporting four propositions of task-technology fit. He found that user evaluations of task-technology fit are affected by:

1. The characteristics of information systems and services
2. Task characteristics
3. Individual skills and abilities and
4. Interaction between the task, the technology, and the individual.

Based on the empirical evidence, user evaluations of task-technology fit are appropriate because system, task, and users' personal characteristics all directly influence such evaluations. Based on Goodhue's research, the precision of user evaluations of TTF as a measure of IS success depends on how well the technology meets the task needs of the users and on how well users are able to evaluate the task-technology fit of their systems.

Later, Goodhue (1998) developed the TTF instrument as a multi-dimensional measure wherein each dimension is measured for internal and external consistency. He shows that the instrument demonstrated strong reliability and strong discriminate validity in 12 of the 16 dimensions of TTF. Goodhue designed the TTF instrument to measure

TTF across an entire organization rather than individual applications. However, the instrument has been used in a number of additional studies to measure TTF in specific application domains (Dishaw & Strong, 2003; Ferratt & Vlahos, 1998; Ioimo, 2000; McCarthy, 2002; Wells, Palmer, & Patterson, 2004; Wongpinunwatana, Ferguson, & Bowen, 2000).

The major research in task-technology fit to date has been conducted by Goodhue (1998), Goodhue and Thompson (1995), and Dishaw and Strong (1999). Building upon the foundations of prior research, McCarthy (2002), Ioimo (2000), Grossman (2003), and Ferratt and Vlahos (1998) have added significant empirical findings in this area. Dishaw, Strong, and Bandy (2004) propose the inclusion of task-technology fit into the Unified Theory of Acceptance and Use of Technology (UTAUT) model established by Venkatesh, Morris, Davis, and Davis (2003).

Scope and Limitations

This study is limited to measuring the TTF and the performance impact of commercial CRM systems as used by marketing managers. The results of this study cannot be generalized for all departments in a company. Further generalizability is limited.

Summary

This chapter provided an overview of the dissertation. The statement of the problem, the background of the problem and the purpose of the study were set forth. The theoretical framework of the task-technology fit model was described along with the scope and limitations of the study.

Chapter II provides a detailed review of the literature on customer relationship management (CRM). This begins with the marketing concept and follows through to the shift from a product centric environment to a customer centric era. As the concept and practical application of relationship marketing evolves, technology continues to break ground to assist companies with this customer centric approach. As CRM systems evolve, so does the need to measure the success of these systems. TTF is one such method that is investigated. In addition to CRM, a detailed review of the task-technology fit literature is conducted in Chapter II.

Chapter III defines the research design and methodology for this study. More specifically, it describes the sample and corresponding population, survey instruments and distribution, research variables and operational definitions, research questions with respective hypotheses and analyses, procedures, research and design, and an outline of data collection methods that were utilized.

Chapter IV presents the results of the data analysis. The data collected from the questionnaires were analyzed and the hypotheses were tested using statistical methods described in Chapter III.

Chapter V presents the discussion and the conclusions drawn from the results of the data. The implications of the study results and recommendations for further research are presented in addition to limitations found during the course of the study.

CHAPTER II

LITERATURE REVIEW

This chapter presents a review of literature on customer relationship management (CRM) and task-technology fit (TTF). It consists of three sections. The first section is an introduction and overview of CRM and measures for information systems (IS) success. The second section presents a review of the marketing literature pertinent to a discussion of CRM technology. The third section presents the task-technology fit model and supporting information.

Introduction

Peter Drucker (1954) states there is one, and only one, purpose for a business, and that is to create a satisfied customer. Keith (1960) strongly supports the customer centric-view of business when he declares that the customer "is at the absolute dead center of the business universe" (p. 35). Levitt (1960) states, "An industry begins with the customer and his needs, not with a patent, a raw material, or a selling skill" (p. 55).

Although Drucker (1958), Keith (1960) and Levitt (1960) contended that firms ought to put the customer at the center of the business over forty years ago, corporations continued to focus on products until the 1990s. According to Paas and Kuijlen (2001), company brainstorming sessions between functional departments of the business spent more time discussing their products than their customers. Marketing departments were concerned with selling products rather than ensuring they were creating satisfied customers. This product-centric stance continued until the 1990s when Reichheld and

Sasser (1990) published the results of a landmark study arguing that businesses that improved their customer retention by 5% could increase their profits by 25% to 85%. Swift (2001) observes that keeping an existing customer costs five times less than acquiring a new customer.

In their seminal 1990 article, Reichheld and Sasser emphasize the profitability of reducing customer defections and focus on the importance customers have for business. Reichheld and Sasser (1990) posited that customers have a monetary value that can be measured throughout the lifetime of the customers' relationship with the company. Their study examined nine industries, highlighting the potential profitability (net present value of profit streams the average customer generates over the average customer life of 10 years). Reichheld and Sasser demonstrated how, during the first year of business, a credit card company might incur a $51 loss for each new customer it acquires. The loss results from customer recruiting costs and from the expenses required to set up the new customer's account. However, as the customer becomes more comfortable with the company, profits generated from business with that customer rise very rapidly. Reichheld and Sasser discovered similar results in other industries.

Stone, Woodcock, and Wilson (1996) found that in many markets the 80:20 rule applies to customer profitability: 80% of the profits are based on 20% of the customers. However, particularly in commercial banks, the ratio can be far more disparate. Only 10% of the customers contribute to 90% of the profits. This translates to an overwhelming 90% of commercial bank customers who generate losses for the bank. Stone and his fellow researchers explain that these findings are prompting companies to investigate their customer portfolio and, in turn, to consider ridding themselves of customers who do not have the potential to be profitable. At the same time, companies are working to attract and retain those customers who do have that potential.

Companies are recognizing that pricing may draw customers to the company, but will not guarantee that the companies will retain them. Companies may offer an incentive to attract customers in hopes of *cross-selling* and *up-selling* products and services (Swift, 2001). According to Dyche (2002), cross-selling is the process of selling an additional product to a customer as the result of another purchase. Cross-selling leads to higher profits and increased customer retention (Turban, Aronson, & Liang, 2005). Dyche states that cross selling is lucrative to businesses because it increases customer revenue and costs less than acquiring new customers. Dyche defines up selling as the practice of offering customers a more profitable product than they originally requested. An example is the clerk offering the option to a customer to super-size an order at the local fast food window. Swift explains that after acquiring customers and learning their habits, actions, and desires, cross selling is an avenue for businesses to increase sales to the customers. Dyche concludes that cross-selling means understanding the customer's wants and needs and realizing that not every customer is as desirable to businesses as other customers are.

Customer Relationship Management

The main goal of *customer relationship management* (CRM) is to create opportunities to "communicate with the right customer, providing the right offer (product and price), through the right channel, at the right time to satisfy the customer's need or desire" (Swift, 2001, p. 14). In essence, CRM is intended to make it easier for customers to do business with the firm (Peppard, 2000).

There is no universal definition of CRM (Winer, 2001). Zablah, Bellenger and Johnston (2004) conducted a review of the available academic literature on CRM and found 45 distinct definitions. They propose that these definitions could be categorized into five major perspectives. Zablah et al. (2004) suggests that CRM can be viewed as a process, a strategy, a philosophy, a capability, and as a technological tool.

The process perspective views CRM as a collection of business processes (Zablah et al., 2004). CRM, as a process, includes all activities within a firm with the purpose of building durable, profitable, and mutually beneficial customer relationships. The business processes may be highly aggregated or sub-divided into numerous sub-processes down to the micro-level (Srivastava, Shervani, & Fahey, 1999). Swift (2001) states that CRM is a collection of processes covering the major process elements or groups of actions.

CRM as a strategy means that a firm has decided with which customers it wants to build relationships and with which it does not. A firm divides its customers into segments based on customers' current and potential value to the firm. The firm then creates a strategy to determine when and how many resources to invest into each customer, according to which strategic segment the customer is in (Rigby et al., 2002).

CRM as a capability means the firm has the ability to adapt and change its behavior towards individual customers based on changing circumstances derived from what the customer tells the firm and from what the firm knows about the customer (Zablah et al., 2004).

CRM constituted as a business philosophy focuses the firm's resources on creating customer value. More specifically, in order to build long-term, profitable relationships, a firm's day-to-day activities must be driven by an understanding of the customer's changing needs (Zablah et al., 2004).

CRM as a technology incorporates sales, marketing, and service information systems to create and maintain partnerships with customers (Zablah et al., 2004). Swift (2001) observes that CRM systems provide the technology to create an enterprise view of the customer through meaningful communications with the purpose of acquiring new customers, keeping the customers the firm already has, creating customer loyalty, and increasing customer profitability.

"A broader definition of CRM includes all activities that turn casual (seemingly one-time) consumers into loyal customers by satisfying or exceeding their requirements so that they will buy again" (Turban et al., 2005, p. 459).

Ryals and Knox (2001) propose the following key characteristics for CRM:

- A customer relationship-view directed towards customer retention and profitability;
- The process of gathering and incorporating information on customers and using specific software to analyze the data;
- The process of segmenting customers by their expected lifetime value;
- The process of further segmenting customers by their needs and wants;
- Improving customer-related processes to create customer value;
- Delivering value to the customer through services using detailed and integrated customer profiles;
- Changing from a product-based management strategy to customer-based management;
- Recognizing the customer throughout the company; and

- Sharing information accrued about the customer across the enterprise.

Information technology (IT) plays a key role in CRM. IT facilitates a comprehensive, unified view of the customer and enables companies to calculate the lifetime value of a customer more easily. IT also allows the integration of a multi-channel capability, supports product customization (Peppard, 2000), enables the company to increase access to the customer, provides greater insight into the customer's wants and needs, facilitates more effective interactions, and integrates all customer channels and back-office functions (Andrews et al., 2004).

While technology has amplified many companies' ability to become customer-centered (Bose, 2002), most CRM implementations fail (Bull, 2003; Croteau & Li, 2003; Rigby et al., 2002; Woodcock & Starkey, 2001). Despite the high failure rate, CRM is one of the fastest-growing software markets (Chang et al., 2002). According to Gartner research (2006), the market for CRM software revenue totaled $5.7 billion in 2005.

Information System Success

In spite of such multi-billion dollar investments and the reported high failure rate among CRM implementations, little empirical research has been conducted in this area (Bull, 2003). Companies spend millions investing in new technology while the ability to measure the success of these efforts remains elusive (Goodhue, 1995).

In his 1995 study, Goodhue posits that objective measures of information technology success are extremely difficult to ascertain. Subjective measures do exist, but most often they are not validated, and the relationship to system use is unknown (Davis, 1989). Goodhue and other information systems researchers agree that user evaluations are appropriate measures of *information systems* (IS) success (Goodhue, Klein, & March, 2000). Goodhue and others also propose that using *information technology* (IT) leads to positive performance results (Goodhue & Thompson, 1995).

Goodhue and Thompson (1995) posit that in order for technology to actually be used and for it to have a positive impact on a business' performance, it must fit the task needs of the user it supports. Goodhue and Thompson propose the *task-technology fit* (TTF) model as a perspective focusing on business productivity and efficiency. The task-technology fit model measures the match between the user's needs and the functionality of the information technology (Dishaw & Strong, 1999). Goodhue (1995) suggests that user evaluations of TTF are a measure of IS success, and his 1995 research supports the notion that users are capable of evaluating the TTF of their systems. If the systems meet the users' needs, the users will provide a more enthusiastic evaluation based on the characteristics of the system. A good fit increases the likelihood of system use and results in a positive performance impact, regardless of the reason the system is used. A higher TTF implies higher performance and is a combination of improved effectiveness, efficiency, and/or quality (Goodhue & Thompson, 1995).

The Marketing Concept and Market Orientation

The academic study of *marketing* began in the early 1900s at Midwestern land grant universities (Webster, 1992) as a branch of applied economics for the study of distribution channels (Kotler, 1972). Academics and practitioners alike were interested in how agricultural products were bought and sold and what determined their price

(Webster, 1992). Katsanis and Pitta (1995) chronicle how, during the period from 1870 to 1914, company owners managed their business and provided all the day-to-day direction for the products. During this period, improvements in telegraph, railroads, and mail delivery contributed to overwhelming economic growth. As a result of the improvements, consumer demand swelled and motivated an increase in advertising. The combination of changes in the economy and advertising led to increased sales and significant growth for businesses. Owners began delegating functional responsibilities such as sales and advertising to subordinates, and the generalist role of the owner as a manager for all functions in the company diminished.

The automobile industry is an example of a product development process that generally ignored the consumer's voice. Automobile makers were preoccupied with mass production and carried on its legacy of product-focused management. Detroit's automakers spent fortunes on consumer research but only asked questions regarding choice within the confines of their products. Detroit remained product-focused, not customer-focused (Levitt, 1960).

One example of this gradual transition is the history of Ford Motor Company. Despite the changes occurring in other industries, Henry Ford continued to assert tight control over his corporation (Drucker, 1954). He often joked that customers could have any color Ford they wanted as long as it was black. In truth, the Ford was advertised to be available in three colors: Brewster green, dull gray, and black. Despite the ability to manufacture cars in other colors, Ford produced only black cars because black paint dried the fastest (Dahlinger, 1978). In order to meet production, Henry Ford refused to give customers anything but a black car. Ford invented the assembly line to produce millions of cars for $500 each. However, the $500 car was not a result of the assembly line. The assembly line, rather, was invented to make the $500 car. Mass production was the result, not the cause, of Ford's low price (Levitt, 1960).

During the early twenties, Ford Motor Company held more than two thirds of the automobile market, but by the time World War II began Ford's share had dropped to 20% (Drucker, 1954). Despite the fall in market share, Ford continued to run his company as a proprietorship and maintained all decision-making authority of all decisions. Ford's rigid centralization and tight control almost destroyed the company (Drucker, 1954). In 1944, Henry Ford's grandson, Henry Ford II, took leadership of the company. As part of implementing a number of changes in leadership, young Henry won over several top managers from General Motors. Under the grandson's leadership, Ford Motor Company survived. Ford Motor Company had 15 autonomous divisions by 1954, each with full management and decision-making authority (Drucker, 1954).

Another industry that gradually transitioned from product-focused to customer-focused management is Procter and Gamble (P&G) (Katsanis & Pitta, 1995). In 1930, Richard Deupree was appointed as Procter and Gamble's Chief Executive Officer (CEO). He instituted the idea of "general managers" over individual products. These general managers became known as product managers and were responsible for pricing, packaging, promotion, and distribution in addition to developing and executing marketing plans. The brand management structure inside P&G was three to four layers deep. More than 14 brand managers worked in each division, and getting the attention of the brand chief was almost impossible for them. One brand manager recounted that it had taken more than a year to gain approval on a simple package design change. Products within

P&G were constantly competing with each other for customer demand. Coupons would be issued at the same time for similar products. Practices like these gave observers the impression that brand managers were sabotaging each other's promotions. Procter and Gamble inundated its retailers with salespersons pushing eleven different product lines. The retailers despised P&G's methods, but the company dominated the trade. The product management structure, instituted under Deupree in 1930, lasted for almost 60 years. As in P&G, the product manager structure was entrenched in most large businesses during the 1960s and 1970s (Katsanis & Pitta, 1995).

In 1989, Procter and Gamble announced that the company was shifting from product management to category-based management (Katsanis & Pitta, 1995). This structure puts the manager in charge of a group of related products, such as all laundry detergent. This specialized manager, along with a team of representatives from marketing, sales, production, finance, and research and development, runs each specialized part of the business as a profit center. Each team has the authority to make decisions and to spend money in hopes the investment will bring it closer to its customers (Katsanis & Pitta, 1995). In the 1980s, supermarket and drugstore chains underwent large-scale consolidation. As a result, 80% of P&G's business was now concentrated in the hands of 100 customers. P&G realized it had to start looking more closely after its customers. P&G assigned a cross-functional team of more than a dozen people solely to Wal-Mart. Wal-Mart in turn worked with the team from P&G to set up a just-in-time ordering and delivery system for Pampers and Luvs disposable diapers. This change resulted in lower costs for both P&G and Wal-Mart and represented a win-win situation that aligned the objectives of customer and supplier (Dumaine, 1989).

Pillsbury is a third example of a company that transitioned from a product-focus to a customer-focus. Charles A. Pillsbury established Pillsbury in 1869. Pillsbury had a vision of building a company to make flour products. He started the company not because the market needed better, lower cost, and more convenient flour products, but strictly because high quality wheat was readily available to him, and he had easy access to water power (Keith, 1960). Until the 1930s, Pillsbury was focused on products and all efforts converged on what the company could make. By 1960, Pillsbury had become a company that focused on the consumer. Pillsbury shifted from the confines of what the company could make to produce what their consumers needed. Keith (1960) proposed that Pillsbury was no longer a company with an idea that the customer should be central to the business (the so-called *marketing concept*), but had in fact become a marketing company.

J.B. McKitterick introduced the marketing concept at the 1957 conference of the American Marketing Association. McKitterick (1957) defined the marketing concept as a "customer-oriented, integrated, profit-oriented philosophy of business" (p. 71). He described four key tenets an organization should observe to implement the marketing concept: It must maintain a market focus, put the customer at the center of the organization, coordinate its marketing efforts, and have profitability as a goal.

Felton (1959) defined the marketing concept as a "state of mind" (p. 55) within an organization that integrates the marketing function into all other departments with the purpose of creating "maximum long range corporate profits" (p. 55).

McNamara (1972) defined the marketing concept as a business management philosophy recognizing the need for all functions in the organization to acknowledge and appreciate the importance of the needs of the customer and of profits, and to accept the importance of the role of marketing in conveying the needs of the market throughout the organization.

The marketing concept has always struggled for its acceptance (Webster, 1988) and is not always an optimal management philosophy (Houston, 1986; Luck, 1969). Hayes and Abernathy (1980) suggest that the marketing concept contributed to the deterioration of American business leading up to and into the 1980s. The emphasis on short-term financial measures (Hayes & Abernathy, 1980; Webster, 1988) and the lack of technological advancements gave European and Japanese companies the opportunity to gain business and resulted in a loss of world market share for U.S. based companies (Hayes & Abernathy, 1980).

As the marketing concept trickled through the industry, another marketing term began to take on a life of its own: *market orientation*. Market orientation can be described as the implementation of the marketing concept (Kohli & Jaworski, 1990; Wrenn, 1997).

Market-oriented companies are organizations that understand customers' needs and have the capabilities to satisfy them (Day, 1990). In 1990, Kohli and Jaworski published the results of a study they had conducted to clarify the domain of market orientation. In summary, they found that a company's customer-focus is central to being market-oriented. Being customer-focused includes both obtaining and acting on information regarding the needs and wants of the firm's customers. According to this school of thought, companies should strive to gain marketing intelligence and find out not just what the customer needs today, but also what the customer might need in the future. Moreover, they should consider exogenous market factors such as regulation and competition. Another indicator of market orientation is the degree to which market intelligence is disseminated throughout the organization. Ideally, all departments should be aware of the customers' wants and needs and must be responsive to them. In Kohli and Jaworski's (1990) study participants did not mention profitability, a key tenet of the marketing concept. The participants perceived profitability as a consequence of a market orientation rather than as an active function of market orientation.

Researchers' findings support the notion that market orientation is an important determinant of profitability for both commodity (Narver & Slater, 1990) and non-commodity (Gatignon & Xuereb, 1997; Narver & Slater, 1990) business. The degree of market orientation a company experiences is not a binary measure, but more of a state of continuous progression. The lowest point on the continuum would be little or no market orientation. The highest point would be a company-wide saturation with market orientation. Somewhere on the continuum the business would reach a state of equilibrium – a point where it would be in perfect balance based on the cost of resources applied and the maximum profits realized (Kohli & Jaworski, 1993; Narver & Slater, 1990). The results both of Narver and Slater's and of Kohli and Jaworski's work contradict Miles and Snow's (1978) position that in some environments a market orientation does not necessarily lead to increased profits.

Gatignon and Xuereb (1997) found that customer-oriented marketing activities are critical when introducing new products in highly uncertain environments. They posit that, as uncertainty diminishes, a high level of customer orientation detracts from performance. Gatignon and Xuereb propose that when demand is stable and well understood, all businesses have access to the same basic information, and a high level of customer orientation is unnecessary. They propose that, in this type of environment, a competitor orientation is more appropriate.

Han, Kim and Srivastava (1998) provide some evidence suggesting that innovation is a link between market orientation and increased performance. The results of their research support the notion that a market-oriented firm is more innovative.

Webster (1988) cites several barriers organizations may encounter when developing a marketing orientation. These include an incomplete understanding of the marketing concept, the inability to overcome conflicts between short-term and long-term sales and profit goals, having a short-run orientation, and the inability of top management to separate their own values and priorities from those required to act in the interest of customers and other stakeholders.

Relationship Marketing

L.L. Berry first coined the term relationship marketing at the 1983 meeting of the American Marketing Association. Berry (1983) defines relationship marketing as "attracting, maintaining and – in multi-service organizations – enhancing customer relationships" (p.25). A more recent definition states that relationship marketing is establishing and maintaining individual relationships with customers for the mutual benefit of both buyer and seller through an interactive, individual and value-added contact over a long period of time (Gronroos, 1990; Shani & Sujana, 1992). Parvatiyar and Sheth (2000) define relationship marketing as "the ongoing process of engaging in cooperative and collaborative activities and programs with end-user customers to create or enhance mutual economic value at a reduced cost" (p. 9).

Relationship marketing focuses on the relationship between the firm and its individual customers (Peterson, 1995) and it increases customer retention (Peppard, 2000). The ability to build and sustain successful relationships with customers is a means for a durable competitive advantage (Day, 2000) and is central to the marketing concept (Houston, 1986). Day (2000) proposes that customer relationships are very difficult to understand and therefore they are hard to simulate or replace.

"The success of corporate marketing programs has become directly proportional to a company's ability to capture and analyze the right data" (Dyche, 2002, p. 27). Marketing managers play a key role in the day-to-day operations of the marketing department in an organization. A marketing manager plans, directs, and coordinates the marketing of an organization's products and/or services and performs a number of duties either personally or through subordinate supervisors (*KnowledgePoint*, 2006). Marketing managers are generally responsible for the following activities:

1. Establishing marketing goals to ensure marketing share and profitability of products and services,
2. Developing and executing marketing plans and programs,
3. Researching, analyzing, and monitoring financial, technological, and demographic factors to capitalize on market opportunities and to minimize competitive activity,
4. Planning and overseeing the organization's advertising and promotion activities,
5. Communicating with advertising agencies on marketing campaigns,
6. Overseeing copywriting, design, layout, paste-up, and production of promotional materials,

7. Developing and recommending pricing strategies to maximize market share over the long run,
8. Ensuring satisfactory profit/loss ratio and share of market performance in relation to pre-set standards and to general and specific trends within the industry and the economy,
9. Ensuring effective control of marketing results through the achievement of marketing objectives,
10. Managing the marketing budget,
11. Evaluating market reactions to advertising programs, merchandising policy, and product packaging and formulation,
12. Adjusting marketing and strategy plans based on competitive conditions and feedback from advertising programs.
13. Conducting marketing surveys on current and new product concepts, and
14. Preparing marketing activity reports.

Customer Loyalty

U.S. corporations, on average, lose more than half of their customers within five years of establishing a business relationship (Reichheld, 1996). They lose half of their employees within four years of having hired them, and half of their investors within one year from the time they invested. Based on the numbers, it appears that loyalty is dead. In addition, customer, employee, and investor disloyalty stunts corporate performance by 25 to 50%. Companies that focus on keeping valuable customers, productive employees, and supportive investors produce superior results. Reichheld (1996) states that loyalty is not dead, but rather the driving force behind business success.

Customer loyalty is the primary purpose of relationship marketing (Crosby & Johnson, 2001). Loyal customers are more likely to continue to do business with a firm and provide a steady stream of sales throughout the lifetime of the relationship. This is especially applicable in financial services where the combination of product complexity and intangibility emphasizes the importance of the relationship between the customer and the service provider (Berry, 1996; Dibb & Meadows, 2004).

Most companies invest up-front costs into customer acquisition efforts. The obvious costs generally include advertising directed at new customers, sales commissions paid for new customers, and standard sales overhead costs. However, there are many more hidden costs involved in marketing efforts where investments were made for customer prospects not resulting in acquiring a new customer (Reichheld, 1996). Loyal customers are more profitable because the acquisition costs have already been absorbed and with time these customers tend to buy more services from the company (Swift, 2001).

Relationship marketing is sometimes referred to as *one-to-one marketing* (Peppers, Rogers, & Dorf, 1999). One-to-one relationships are more than scripted interactions with the customers. Key is the ability to understand each customer's unique needs and preferences and to direct the conversation around those needs during each customer interaction. Customer-specific marketing will allow for the creation of special offers and pricing based on the loyalty and profitability of each individual customer (Swift, 2001). One-to-one marketing encompasses four key steps:

- Identifying who the customers are;
- Differentiating among the customers;
- Interacting directly with the most profitable customers, and
- Customizing products and services for them (Peppers et al., 1999).

The one-to-one approach in marketing supports the framework of strategic and tactical processes in relationship marketing (Swift, 2001). In one-to-one marketing, there is a shift from a product focus to a customer focus (Turban et al., 2005).

Cross-selling

Ragins and Greco (2003) assert that forging deep customer relationships may offer several advantages. Good relationships may result in more committed customers, and committed customers are more likely to buy additional products and services offered by the firm. Cross-selling (selling additional products and services offered by the firm) and up selling (selling higher quality substitutes) are two advantages that may be realized out of customer relationships. Swift (2001) explains that cross-selling is also a means to turn an unprofitable customer into a profitable one. Traditional insurance companies began offering savings accounts at 3% higher than the prime rate in hopes of attracting a large customer base willing to buy other financial planning products over time. In this case, cross selling becomes a new sales opportunity. Cross selling is more likely to be effective after companies learn a customer's habits, actions, and desires.

Successful relationship marketing manages interactions between the buyer and seller to generate market and service offerings that contribute to customer acquisition and retention (Berry, 1995; Gronroos, 1994). Gronroos (1996) purports that relationship marketing increases a firm's ability to build and sustain long-term, mutually profitable relationships. Reichheld (1993) posits that business profitability is linked with the duration of customer relationships with the firm. Companies who maintain the same customers for longer periods of time have increased business profitability than companies who experience customer turnover. Successful customer relationships benefit both the customer and the firm (Berry, 1995).

Customer Retention

Customers who do not have a relationship with the company are more likely to be lured away by the competition (Turban et al., 2005). Companies with a focus on customer retention report the ability to retain up to 35% of the customers who normally would have defected. Customer retention is more likely if companies recognize the signals of a possible defection and take action to keep the customer. A key part of a retention strategy includes the ability to assess customer profitability and recognizing that not all customers are worth retaining. Understanding the customer and using models to predict defectors may help achieve successful customer retention management. Companies that have a retention strategy and use profitability models can make carefully informed decisions to determine which customers they should attempt to keep (Swift, 2001).

According to Turban et al. (2005), the airline industry has recognized the importance of customer retention for decades. Airlines realized that customer incentives generated more purchases, and that more positive contact with customers resulted in long-term growth and long-term customer retention. Other travel firms, such as hotels and rental car agencies, have adopted similar methods. Mainstream industry segments such as retail, insurance and services are adopting these types of incentives.

Customer Satisfaction

Customer satisfaction is considered an indicator of customer loyalty (Gronroos, 1996). High levels of customer satisfaction are associated with increased customer retention (Peppard, 2000). Generally, customer satisfaction is associated with measurements of market share. In other words, sustaining or increasing market share may indicate high levels of customer satisfaction. Although market share is an important indicator, it can be a flawed one. Firms may be gaining and losing customers at a rate that sustains market share while the number of unhappy customers is constantly increasing. In reality, the number of ex-customers is growing as the firm's image deteriorates. Aggressive sales and marketing tactics may explain the constant flow of customers coming in and out of the firm (Gronroos, 1994).

Successful customer relationships require two-way communication between the buyer and the seller (Peppard, 2000) and must enable marketers to better understand and satisfy customer needs (Reichheld & Sasser, 1990). Creating ways for customers to interact with the organization provides the organization with the potential to learn from its customers (Peppard, 2000).

While relationship marketing seems to be the trend among many companies (Mattsson, 1997), some customers may be more profitable as transaction-based customers (Berry, 1995). In transaction-based marketing, the customer's primary source of benefit is the product. Transaction-based marketing involves three key parties: marketing and/or sales; the product; and the market. In companies utilizing transaction based marketing approaches the customers are not viewed individually, instead they are viewed as of a group of autonomous individuals or organizations (Gronroos, 1996). Transaction-based marketing includes little or no customer interaction outside the traditional marketing mix. The marketing mix includes four specific elements called the *4 Ps* of marketing: price, place, promotion, and product (Gronroos, 1994). The 4Ps became popularized by McCarthy during the 1960s and became the most widely used conceptual model in marketing (Hunt, 1976).

Walgreen's is an example of a company that may benefit from a dual marketing strategy implementing either transaction based or customer relationship marketing depending on the customer's buying habits (Berry, 1995). The transaction-based approach may be more effective for customers who generally purchase merchandise and relationship marketing may be more effective for customers who buy prescription medications (Berry, 1995). In relationship marketing the customer interface is much more expansive and the firm has opportunities to provide added value to the customer (Gronroos, 1994).

The level of dependency and interaction between functions and departments in a firm will be based upon the type of strategy the firm has chosen. Where the firm's strategy is based on transactions, marketing and sales experts are responsible for the entire marketing function. In firms choosing relationship marketing as their strategy, customer interaction takes place in numerous areas throughout the company. Companies successful in relationship marketing include all aspects and functions of the business in customer care. They work together to form a collaborative and supportive environment for customer care resulting in higher perceived quality and increased overall customer satisfaction (Gronroos, 1994).

Companies employing relationship-marketing principles tend to view many of their employees as adjunct marketers rather than just those in the professional sales and marketing departments. The term *part-time marketer* is sometimes used to describe employees of a firm who have interactions with customers but are not full-time sales and marketing professionals (Berry, 1995; Gronroos, 1994). It is important that these customer-facing individuals have a customer orientation so they can implement the strategies of relationship marketing (Berry, 1995). With a customer relationship strategy, every single employee in the firm may have some type of interaction with the customer, even if the firm serves a mass market (Gronroos, 1994).

By managing the customer base, the firm would have some kind of direct knowledge of how satisfied customers are rather than thinking in terms of a mass of customers or transactions. To implement relationship marketing a firm must have some way of gathering the customer feedback obtained daily through the interactions various employees may have with a large number of customers. Gathering this type of information in a transaction-based marketing situation is difficult and expensive. A system that focuses on gathering feedback from the customers can be a valuable source of information for decision-making. Integrated relationship marketing systems contain data that are continuously updated and used to determine the degree of customer satisfaction or dissatisfaction (Gronroos, 1994). The result is information that can be acted upon to improve customer relationships. As a company moves towards a one-on-one marketing environment, the need for large amounts of detailed customer information increases (Peppard, 2000).

Relationship marketing uses a variety of marketing, sales, communication, service, and customer care approaches to create relationships between a company and its customer that span numerous transactions. The purpose is to be able to identify a company's individual customers and manage the relationship to the benefit of both parties (Stone et al., 1996).

Customer Relationship Management

Customer relationship management (CRM) is a combination of people, process, and technology that helps companies understand their customers (Chen & Popovich, 2003). The underlying principles of relationship marketing are heavily linked with CRM (Dibb & Meadows, 2004; Ryals & Knox, 2001). Although CRM is a recent concept, its tenets have been around for some time. The main purpose of CRM is to maximize the value of a customer to an organization over the lifetime of the relationship (Peppard, 2000).

CRM Benefits

CRM tied in with other processes can help reduce customer defections (Peppard, 2000). Ragins and Greco (2003) demonstrate that effective customer management can decrease service costs and lower sales costs. CRM enables faster and more informed decision making, improves the availability of accurate information, enhances customer service, decreases the time needed to bring products to the market, and makes it easier for companies to move from a product-focus to a customer-focus (Swift, 2001). CRM helps firms accurately identify their customers and the customers' needs on the basis of past behaviors, which then facilitates targeting specific customers for cross-selling opportunities (Turban et al., 2005).

CRM Technology

According to Chen and Popovich (2003), CRM is often referred to as an information industry's term for the methodologies, software, and, in general, the Internet capabilities that help a company manage relationships with its customers in a well-organized way. Chen and Popovich state that CRM may also be defined as an approach that encompasses seamless integration of sales, customer service, marketing, field support and other functions that have customer touch points. CRM technology links front office (sales, marketing, and customer service) and back office (financial, operations, logistics, and human resources) functions with the customer touch points. CRM integrates the information from the various systems into a unified view of the customer.

Chen and Popovich (2003) further discuss CRM as an outgrowth of *sales force automation* (SFA). Sales force automation software supports sales forecasting and tracks customer contacts. The objective of SFA is to alleviate some of the burden from the sales force by reducing administrative tasks, allowing it to concentrate on selling.

According to Xu, Yen, Lin and Chou (2002), customer service software makes it possible for customer service personnel to solve problems efficiently through customer support. Effective customer support software provides customer service representatives with access to customer data and problem solving information. In addition, the company can track, monitor, and measure customer service responses through customer service software.

Xu et al. (2002) further explain that field service technology allows remote staff to communicate with customer service personnel, allowing both to gain access to information that will help the field service person resolve issues on the first service call. When customer calls are logged, the request is logged, assigned, monitored, and tracked to ensure the appropriate skilled personnel is quickly assigned to each problem.

The marketing department is a key user of CRM technology (Swift, 2001). Xu and his fellow researchers explain that CRM supports marketing automation by providing the most recent view of customer buying habits. CRM software identifies and targets the best customers based on customer purchasing patterns and monetary scoring. In addition, CRM software helps manage marketing campaigns and sales leads, and identifies opportunities for cross selling.

Information technology is adding to the practical advancement of relationship marketing (Berry, 1995) and information technology advancements are driving an increasing interest in relationship marketing. Companies are investing heavily into CRM technologies in an effort to build customer relationships and to increase, as a result, customer loyalty with the firm (Crosby & Johnson, 2001). Ryals and Knox (2001) stated that CRM technology affords management the opportunity to implement relationship management throughout the firm. According to their study, implementing customer relationship management software promises an improved ability to implement the principles of relationship marketing. According to Webster (1992), large investments in information technology may provide large firms an advantage in the quest for obtaining a customer focus.

CRM technology provides the automation of key tasks. Among these are (Berry, 1995):

- Tracking the buying patterns and overall relationship of existing customers;
- Customizing services, promotions, and pricing to customers' specific requirements;
- Coordinating or integrating the delivery of multiple services to the same customer;
- Providing two way communication channels – company to customer, customer to company;
- Minimizing the probability of service errors and breakdowns;
- Augmenting core service offerings with value extras;
- Personalizing service encounters as appropriate.

CRM Success

Most enterprises do not fully understand how CRM interventions influence their customer base, and in the past many CRM projects have failed to meet expectations (Baxter, Collings, & Adjali, 2003). CRM technology requires integrated data from a number of operational systems requiring planning and management across functional boundaries (Swift, 2001).

Customers should not feel that doing business with a company seems complex because the company's technology, processes, or structures are outdated (Peppard, 2000). Just as technology can enhance customer relationships, it also has the potential to push customers away from the company. For example, customers required to use an automated telephone system may feel that they have less personal contact with the company. To avoid forcing customers down the technology-path, companies should provide options for personal contact (Crosby & Johnson, 2001).

Crosby and Johnson (2001) observe that CRM technologies are primarily focused on automating business processes (operational CRM), automating business performance processes (analytical CRM), and automating communication and coordination processes (collaborative CRM). According to Dyche (2002), operational CRM is often referred to as "front-office" CRM and includes areas of the company where the company makes direct contact with the customer. Direct interactions with the customer are called "touch points" and include both inbound contacts (contact by the customer) and outbound contacts (contacting the customer from within the company). Dyche (2002) notes that most CRM products on the market today fall within the operational CRM category.

Dyche (2002) explains that analytical CRM requires understanding the customer-related activities occurring in operational CRM. The data gathered in the operational systems is often integrated into *a data warehouse*. According to Turban et al. (2005), "data warehouses can be described as subject-oriented, integrated, time-variant, non-normalized, non-volatile collections of data that support analytical decision-making" (p. 236). Dyche (2002) describes data warehouses as, generally, single repositories of enterprise-wide data collected from various sources to facilitate business analysis. A *data mart*, Turban and his colleagues specify, is a subset of a data warehouse and generally targets one particular area of the business, such as marketing or operations.

CRM and Data Warehouses

Due to cost constraints, the use of data warehouses is often limited to large companies. Because of the high expense, many firms use data marts, a scaled-down version of a data warehouse. Data marts are generally limited to departments or strategic business units but are not considered enterprise data warehouses. Data marts have a number of advantages over an enterprise data warehouse. The cost of a data mart is under $100,000, whereas an enterprise data warehouse can exceed $1,000,000. A data mart can be implemented in a shorter time frame; sometimes in as few as 90 days. Control of the data mart is often in the users' hands, and because a data mart contains less data than a data warehouse, users can understand and navigate it more easily. In addition, the business unit can build its own decision-support system from the data mart, eliminating any need to involve the Information Systems department. A data mart can serve as a proof of concept for an enterprise data warehouse, enabling a quicker return on investment (Turban et al., 2005).

A benefit of CRM is the ability to look at historical sales and predict future sales. It uses data mining methods to predict patterns among its customers. This is based on detailed information about the company's existing customer base. Not only can CRM provide detailed information to support marketing campaigns; it can provide information to create new products and services (Swift, 2001).

Product-based marketing targets a segment of customers but has little if any information available regarding the customers' needs and preferences. In contrast, customer-based marketing targets specific customers based on their needs and preferences. For example, in a mass marketing effort a mobile phone company might advertise the opportunity for all of its customers to try a second line free of charge for a month. The company would launch the marketing campaign and then monitor the responses. Although the company may make some sales, Swift points out that the campaign could result in damaged customer relationships: customers who already have a second line may be irritated that they had to pay for their second line while others were offered the service free of charge. In a CRM-based organization, the campaign would have identified customers who might want a second line and target only those customers in the campaign.

CRM and Marketing

> Intense global competition, emerging reservoirs of data, less loyal but more sophisticated customers demanding personalized, permission-based attention and service, and a growing corporate emphasis on customer relationship management (CRM) has given corporations the imperative to do marketing faster, cheaper and better (O'Halloran & Wagner, 2001, p. 29).

Marketing has transitioned through four phases: mass marketing, target marketing, customer marketing, and one-to-one marketing. With each phase, marketing has used technology to increase sales (Turban et al., 2005).

Cross (1997) claims, "the mass market, for all practical purposes, is dead" (p. 71). Millions of individual market segments now stand in its place. According to Chen and Popovich (2003), mass marketing has been successful only when customers were satisfied with standardized products. As competition increases, mass marketing begins to lose its effectiveness and target marketing begins to take shape. Target marketing adjusts the focus of the company to targeted populations of customers. The granularity of the customer segments becomes more refined as the customers' needs and preferences become clearer.

Dyche's (2002) seminal work on CRM provides pertinent information on the functionality and features provided by CRM systems to assist marketing departments in their tasks. Dyche explains the important aspects of CRM in campaign management, customer behavior prediction, channel optimization, personalization, and event-based marketing.

Campaign Management

Campaign management is the crux of CRM in the marketing organization. Traditionally, a marketing organization would decide to implement a marketing campaign because someone in management had an idea to launch a marketing campaign and see what happens. This was referred to as a *batch and blast strategy*. The idea was that if you made enough information available to a large enough group of customers, the campaign might yield positive results. A group of product managers would plan the marketing campaign according to assumptions of products that may be of interest to customers and potential customers. The campaign would be routed through advertising for final delivery to the target audience. After the launch of the campaign the marketing department may have to wait months to gather enough information to determine if the campaign was successful and, if the initial campaign was not successful, it would take longer to repair and re-launch the campaign (Dyche, 2002).

Dyche (2002) explains that the reason for this approach was the lack of detailed customer data. The effort to find, enter, store, and track individual customer information was beyond the abilities and budgets of companies. The larger the company, the more information it would have had to track, and the more funding would have been required to do so.

Dyche (2002) points out that another issue in managing marketing campaigns was the sheer labor required to launch a campaign. This became more and more difficult as marketing departments were creating more frequent and more targeted promotions. Marketing had to conceive and plan the campaign, define which customers would be targeted, decide how the promotions would be communicated, and then launch the promotion. Because of the complexity and volume of information required, the success of corporate marketing programs has become directly related to the company's ability to capture and analyze the right data.

Dyche (2002) observes that commercial software companies began selling products that covered the full campaign lifecycle. Offerings included campaign management, planning, customer segmentation, scheduling, and response management. Automated campaign management improves the traditional process because of the ability to target increasingly smaller customer segments. With the help of this technology, companies can increase the number of their campaigns and interact with as many customers as possible. Closed-loop campaign management uses the results of past campaigns to improve future campaigns by increasing the company's knowledge of the customer while improving campaign response rates over time. Closed-loop campaign management has become an acknowledged preferred CRM practice. However, campaign management is only one aspect of CRM. Most companies purchase CRM products to satisfy a fuller vision of tactics aimed at increasing customer value and loyalty.

Behavior Prediction

Dyche (2002) alleges that the desire for cross-selling and up-selling has contributed to the popularity of CRM marketing automation technologies. Another area of interest to marketing, he argues, is the analysis of customer attrition. Companies are using sophisticated predictive technologies that compare like attributes of similar customers to delineate customers who are likely to abandon their business relationship with the company. The results of the analysis provide personalized marketing programs that attempt to motivate these customers to stay in business with the company.

"Although not so much as a marketing practice as a marketing enabler, behavior prediction helps marketing departments determine what customers are likely to do in the future" (Dyche, 2002, p. 33). Behavior prediction uses historical customer information to estimate what a customer will do in the future. This includes several variations:

- Propensity to buy analysis – this produces information about which products a customer is likely to purchase;
- Next sequential purchase – this provides information as to which product the customer is likely to buy next;
- Product affinity analysis – this supports cross-selling by providing information as to which products will be purchased together, a prediction sometimes referred to as "market basket analysis;"
- Price elasticity modeling and dynamic pricing – this helps determine the optimal price for a product for a particular customer or customer segment (Dyche, 2002).

Dyche demonstrates that understanding how a customer might behave helps companies make a number of marketing decisions based on this knowledge. These decisions might include offering customer discounts and fee waivers to customers who may be likely to leave; refining target-marketing campaigns to fewer, more specialized target markets; or packaging certain products together to increase the profitability and likelihood of the sale.

Cross (1997) asserts that, similar to the objectives of CRM, revenue management is a disciplined process that creates information to sell the right product to the right customer at the right time for the right price, resulting in maximized revenue from a company's products. In contrast with CRM, revenue management focuses on customer buying patterns and on product availability with the aim to adjust prices in order to achieve significant revenue gains. Similar to CRM, revenue management depends on complex mathematical economic models on sophisticated computer systems with massive amounts of customer data to predict consumer behavior.

Channel Optimization

"The goal of marketing automation is to offer the right message to the right customer at the right time" (Dyche, 2002, p. 35). Firms should investigate alternatives for customers to use for interaction with the firm. Customers may prefer the Internet for certain transactions but another type of communication for other services. For example, customers may do online banking but prefer to get their bank statements in paper form. Understanding the channels customers prefer to use for interaction is only one aspect of channel management. Channel management involves optimizing both inbound communication channels and outbound communication channels, and determining how to choose the best approach for each.

Personalization

Dyche (2002) asserts that *personalization* involves the ability to tailor interactions based on the customer's preferences and behaviors at the time of the interaction. Tailored messages are one example. Personalization technologies available in CRM products allow analysis of each customer's interaction over time and responding in ways that encourage the customer to visit again.

Event-based Marketing

According to Dyche (2002), *event-based marketing* is time-sensitive marketing reacting to a specific customer event. The time sensitivity may apply to a single customer or a segment of customers. One such example is mailing an application for increased collision coverage to customers who have recently had a traffic accident. Many companies adopting CRM are striving for the ability to perform event-based marketing. They wish to schedule and choreograph marketing campaigns based on real-time, reactive customer communications rooted in information available in the customers' profile.

Companies adopting CRM technologies to automate marketing still struggle with basic questions about how to optimize their marketing expenditures. Questions management teams might ask themselves in this regard are:

- How do we focus our marketing campaign on those customers with whom we would like to continue business?

- How do we move customers to lower cost channels?
- Do other companies see their customer differently than we see our customers – and if so, how does that influence our campaigns?
- How can we anticipate what products our customers might want?
- What is the best method for communicating with our customers?
- How do we entice prospects to become customers?
- How do we use the information we have gathered about our customers to improve customer satisfaction?
- Why do our most loyal customers keep coming back?

Information Systems Success

Information systems are created to help users perform their work more efficiently and effectively (Mathieson & Keil, 1998). Researchers investigating information systems extensively use *user evaluations* (UE) to evaluate IS success. Goodhue (1992) lists user attitudes, information satisfaction, MIS (management information systems) appreciation, value, and usefulness as elements of user evaluations. Many IS researchers agree that user evaluations are appropriate measures of IS success, especially where system use is mandatory (Goodhue et al., 2000). Others support system utilization as the measure of success, proposing that information technology (IT) use leads to positive performance results (Goodhue & Thompson, 1995).

Utilization

Utilization is the behavior of employing technology to complete tasks (Ferratt & Vlahos, 1998). Goodhue and Thompson (1995) support the notion that IT use leads to positive individual performance results. They suggest that utilization alone may not be a predictor of increased performance. Other factors may influence use – such as social norms, availability, ignorance, and habits. Much of utilization research is based on theories of attitudes and behaviors (Ajzen & Fishbein, 1980; Bagozzi, 1982).

Goodhue and Thompson (1995) propose that, if technology is to have a positive impact on performance, it must be utilized, and it must fit the task needs of the user it supports. A good fit increases the likelihood of system use and increases performance impact regardless of the user's reason to be using the system. Individual performance relates to the accomplishment of a task or group of tasks by an individual user. Higher individual performance is a combination of improved effectiveness, efficiency, and/or quality.

The link between utilization of an IT and organizational performance has been linked in the literature (DeLone & McLean, 1992). Goodhue (1992) suggests that utilization is an intervening variable between system characteristics and individual performance. Use alone is not a good indicator alone for performance because it could be that prolonged system use is related to a less efficient system. Trice and Treacy (1988) conducted a review of utilization literature covering a ten-year period and argue that information systems utilization, as a measure for performance, is not a well-understood construct. DeLone and McLean (1992) points out that use is less effective as a measure of success unless such use is voluntary. Hartwick and Barki (1994) propose that subjective norms have a tremendous effect on intention to use a system in situations where use is mandatory. Often users are not willing to comply with organizational mandates to use a technology. However, when use is voluntary subjective norms did not apply and can be expected to affect productivity.

Utilization as the dependent variable may be affected by other variables (Trice & Treacy, 1988). It could be affected by a characteristic of the system or task, a characteristic of the individual user, or the interaction between the individual and the system. Because utilization may be affected by these factors, it is important to determine what aspects of utilization should be measured. This is largely determined based upon the independent variables in the study. Utilization should be measured in a way that best corresponds to the various types of independent variables used in the study.

Trice and Treacy (1988) found several reference theories that are useful for determining the types of independent variables appropriate for linking with utilization. Two of these will be examined, Fishbein's (1979) theory of reasoned action and Goodhue's (1988) theory of task-technology fit. Fishbein's (1979) theory of reasoned action links individual differences with MIS user attitudes and involvement and supports the notion that an individuals' intention to use the information system most effectively predicts its actual use (Trice & Treacy, 1988). The theory of task-technology fit (Goodhue, 1988) explains that use or non-use of a system results in performance improvements that can be explained by a number of intervening variables. Performance is impacted based upon how well the technology fits the underlying task that the system was designed to support (Trice & Treacy, 1988).

Self reported measures of utilization are often used where objective measures are not available (Igbaria, Guimaraes, & Davis, 1995). Self reported measures of time and frequency of use are often examined as surrogates for actual system use. Self reported usage is not precise as actual usage, but previous research suggests they are appropriate as relative measures (Igbaria et al., 1995).

Devaraj and Kohli (2003) assert that actual information technology usage has a positive effect on increasing revenue in hospitals. They conducted a three-year study of actual usage of a decision support system (DSS) by managers in a network of private hospitals. The hospitals were scattered across the United States, and each was an independent entity with its own financial statements. Combined, the hospitals had more than 4,000 beds, 20,000 employees, and generated operating revenue of approximately $1.5 billion. Actual technology usage measures were based on usage records generated from a log that was created by a utility program tracking user resource consumption. Net patient revenue per day, net patient revenue per admission, and mortality rates were the dependent variables in the study. The results of the study support the researchers' proposal that the greater the actual use of technology, the better the financial and quality performance of hospitals. Since Devaraj and Kohli's was a longitudinal study, they were able to detect significant effects on various measures of hospital performance. According to Devaraj and Kohli (2003), this study was one of the first examining actual usage of a specific technology in a detailed and longitudinal manner.

Perceived Ease of Use and Usefulness

Davis (1989) conducted two studies with the purpose of defining better measures for predicting and explaining system use. He examined two theoretical constructs: perceived usefulness and perceived ease of use. He theorized these constructs to be basic determinants of system use (Davis, 1989) and acceptance (Adams, Nelson, & Todd, 1992). Davis (1989) defines perceived usefulness, as "the degree to which a person believes that using a particular system would enhance his or her job performance" (p. 320). Davis (1989) defines perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (p. 320).

Davis' (1989) work produced a validated scale for each construct. The most significant findings were the relationship between usefulness and usage. Usefulness was more significant in relationship to usage than to ease of use. The practical implications were that users were more likely to adopt a system because it performs the functions they need. How easy or hard the system was to use to perform those functions was secondary. Davis' findings suggest that users are generally willing to cope with some level of difficulty in using a system that provides critically needed functionality, but ease of use does not compensate for a system that does not provide useful functionality. A limitation of Davis' study was that he relied on self-reported usage as opposed to objective measures. How accurately self-reports reflected actual usage was unknown at the time.

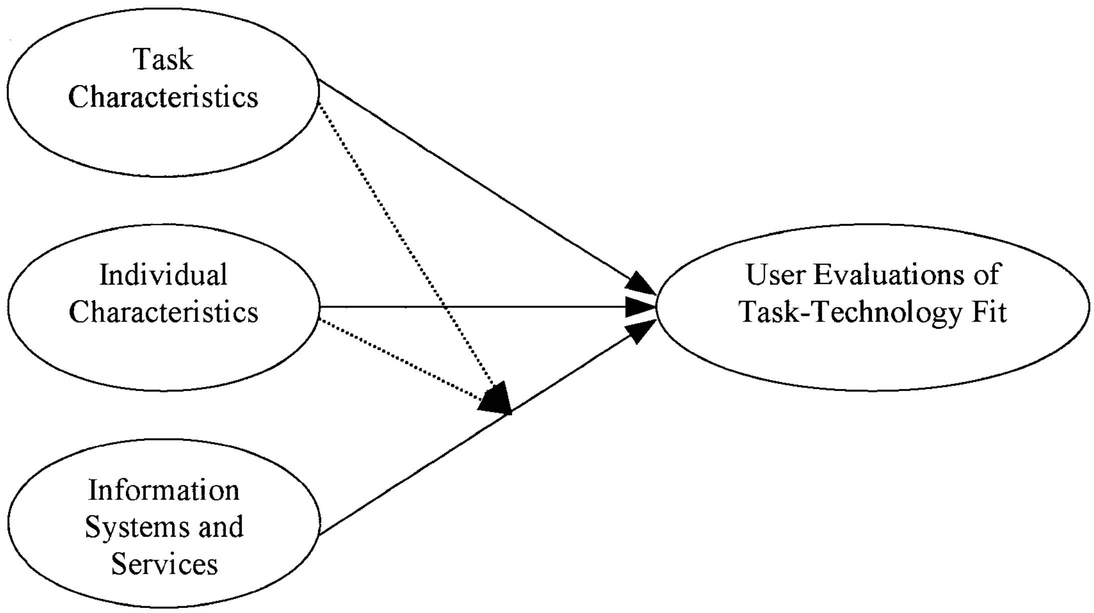
A number of subsequent studies re-examined and confirmed Davis' (1989) work (Adams et al., 1992; Segars & Grover, 1993). Adams, Nelson, and Todd (1992) replicated Davis' research utilizing two studies. The results of the first study supported Davis' findings of a link between utilization, perceived usefulness, and perceived ease of use. The second study had somewhat mixed results. They suggested the lack of clear utilization of the second study was related to the indiscrete nature of reporting usage, whereas in the first study utilization could more easily be measured.

Segars and Grover (1993) analyzed the Davis' (1989) and Adams et al. (1992) studies. They concluded that the correlations observed in the Adams study did not appear well-modeled on the two-factor structure articulated in Davis' (1989) study. Segars and Grover (1993) opined that no absolute measures exist for these constructs across the varying technological and organizational contexts used in the studies. However, they noted that their results did not diminish Davis' original work in any way, nor reduce the value of identifying measures that explain technology acceptance. Instead, they challenged information researchers to continue to explore the nature and influences of factors that may alter the theoretical validity of the user perception-usage equation.

Task-Technology Fit

Goodhue (1995) proposed the *task-technology fit* (TTF) model as a user evaluation construct "defined within a theoretical perspective that can usefully link underlying systems to their relevant impacts" (p. 1827). TTF is "the degree to which a technology assists an individual in performing their portfolio of tasks" (Goodhue & Thompson, 1995, p. 216). TTF measures the match between task requirements of the user, an individual's abilities, and the functionality of the system. TTF is higher when the task requirements of the individual and the functionality of the technology match. TTF decreases as tasks become more demanding or technologies offer less functionality to meet the task demands of the individual. Users are more likely to use technology to complete a task if the technology fits the task at hand and as such, TTF can be considered an antecedent to system utilization. Figure 2.1 depicts the relationship between task characteristics, individual characteristics, information systems and services and TTF.

Figure 2. 1 – The Basic Model of Task-technology Fit (Goodhue, 1998)



The model of task-technology fit suggests that various kinds of fit should contribute to performance (Dale L. Goodhue, personal communication, January 12, 2006). Although Goodhue refers to high and low measures of TTF, to date there is no "overall" measure of TTF in the literature. When contacted about an overall measure Goodhue stated,

> I never focused on determining an overall measure of TTF. Instead, I hypothesized a number of kinds of fit that should contribute to performance, and then tested the set of fits in terms predicting performance. The interest was in determining which kinds of fit seemed to have statistically significant links to performance, and whether the set of fits overall explained a significant amount of performance (Dale L. Goodhue, personal communication, January 12, 2006).

Individual performance is linked with the completion of tasks (Goodhue & Thompson, 1995). Higher individual performance implies improved efficiency and effectiveness and may result in higher quality. A higher TTF not only increases the possibility that a technology is used but it also increases the performance impact of the system. Goodhue and Thompson proposed that at any level of utilization, a high TTF would lead to increased performance since the system more closely fits the task needs of the user.

The general model of TTF is based on the outcomes of user evaluations. A user evaluation is an assessment of various characteristics of an information system as perceived by the user. These assessments generally rate the system on a continuum from a positive to a negative evaluation. If users give the system a positive evaluation, then the system presumably is improving their performance (Goodhue, 1995). There are several dominant constructs for user evaluations, including Bailey and Pearson's (1983) user information satisfaction instrument, Davis' (1989) perceived usefulness and perceived ease of use instrument, and Goodhue's (1998) task-technology fit instrument.

User evaluations of TTF must be linked to the characteristics of the system being evaluated to confidently apply the results for diagnostics or measures of success (Goodhue, 1995). In addition, UE of TTF must demonstrate a link to individual performance. In prior studies utilizing user evaluations, users were asked to rate the characteristics of systems for the entire organization. Goodhue (1995) asked the user to rate the fit of the system being used to the task the individual is performing. Goodhue strongly supported the proposal that the individual could accurately assess the fit of the system in relation to the tasks the individual performed.

Goodhue (1995) conducted a study to test UE of TTF using the task domain of managerial use of quantitative information. He selected this domain for several reasons, 1) information systems are very important in acquiring quantitative information, 2) managers frequently use quantitative information, and 3) there are a number of differences in the tasks that managers are required to perform. Goodhue proposed that the differences between the tasks that managers perform might affect the demands managers place on their information systems.

Goodhue (1995) divided the task of managerial decision-making into three subtasks: identification of the required data, acquisition of the data, and integration and interpretation of the data. Goodhue expanded the sub-tasks into 16 dimensions of TTF described below.

Subtask: Identification of the required data:

1. The system must contain the right data.
2. The system must contain the right level of detail.
3. The organization of the files must be clear.
4. The location of the data must be clear.
5. The meaning of the data elements must be clear.

Subtask: Acquisition of the data:

6. The data must be accessible.
7. The user must be able to get authorization to access the data.
8. The hardware and software tools must be easy to use.

9. Training must be sufficient.

10. The system must be reliable.

11. There must be sufficient assistance provided by support personnel.

12. The system must be flexible enough to meet the changing needs of the users.

Subtask: Integration and interpretation of the data:

13. The data must be accurate.

14. The data from different sources must be compatible.

15. The presentation of the data must be easy to interpret.

16. The data must be current enough to meet the user's needs.

The 16 dimensions of TTF each fall into one of three categories that result in the TTF measure; task characteristics, individual characteristics, and characteristics of information systems and services. Goodhue mapped the 16 dimensions of TTF into eight factors illustrated in Table 2.1.

Table 2.1 – 16 Original Task-technology Fit Dimensions and 8 Final Task-technology Fit Factors (Goodhue & Thompson, 1995)

16 Original Task-technology Fit Dimensions and 8 Final Task-technology Fit Factors		
8 Final TTF Factors	16 Original TTF Dimensions (After poor questions dropped)	Cronbach's Alpha
Quality	Currency of the data Right data is maintained Right level of detail	.84
Locatability	Locatability Meaning of data is easy to find out	.75
Authorization	Authorization for access to data	.60
Compatibility	Data compatibility	.70
Ease of Use/Training	Ease of use Training	.74
Production Timeliness	Production timeliness	.69
Systems Reliability	Systems reliability	.71
Relationship With Users	IS understanding of business IS interest and dedication Responsiveness Delivering agreed-upon solutions Technical and business planning assistance	.88

In addition, Goodhue (1995) proposed four propositions.

1. User evaluations of TTF will be affected by the characteristics of information systems and services.
2. User evaluations of TTF will be affected by the characteristics of the task.
3. User evaluations of TTF will be affected by the individual's skills and abilities.
4. User evaluations of TTF will be affected by the interaction between the task, the technology, and the individual.

Goodhue (1995) found support for each of the four propositions and 12 of the 16 dimensions. The central assertion of Goodhue's study was that task and individual characteristics moderate the relationship between technology and user evaluations.

Task-Technology Fit Instrument

For his 1998 study, Goodhue developed an instrument for measuring task-technology fit. At the time, Bailey and Pearson's (1983) user information satisfaction instrument was the dominant instrument for user evaluations of technology. Goodhue developed a new construct because of concern that user evaluations in general and Bailey and Pearson's instrument in particular lacked the theoretical underpinnings required for objective measures. Goodhue (1998) argues that the TTF model is based on the assumption that information systems provide value by being helpful in a task or portfolio of tasks, and that users will reflect this in their system evaluations.

Goodhue (1998) developed the task-technology fit instrument to conduct an assessment of information systems used for managerial decision-making. Prior work by Goodhue (1995) and Goodhue and Thompson (1995) provided the basis for the instrument. The instrument is a multi-dimensional measure wherein each dimension is measured for internal and external consistency. The instrument demonstrated strong reliability and strong discriminate validity in 12 of the 16 dimensions of TTF. The 16 dimensions are shown in Table 2.2 along with the final status.

Table 2.2 – Reliabilities and Final Status of Measures of Dimensions of Task-Technology Fit (Goodhue, 1998)

Reliabilities			
Dimension of Task-technology Fit	**Number of Questions**	**Cronbach's Alpha**	**Final Status**
Lack of Confusion	2	.73	Kept
Level of Detail	3	.85	Kept
Locatability	3	.77	Kept
Meaning	3(2)	.78(.77)	One Question Dropped (due to Discriminant Validity)
The Right Data	4	.83	Dropped (due to Discriminant Validity)
Accessibility	3	.84	Kept
Assistance	3	.87	Kept
Authorization	2	.58	Dropped (due to Reliability)
Ease of Use (Hardware/Software)	3	.77	Kept
Flexibility	4	.70	Dropped (due to Discriminant Validity)
System Reliability	3	.77	Kept
Training	2	.66	Dropped (due to Reliability)
Accuracy	3	.83	Kept
Compatibility	4(3)	.82(.80)	One Question Dropped (due to Discriminant Validity)
Currency	3(2)	.73(.78)	One Question Dropped (due to Reliability)
Presentation	2	.86	Kept

Goodhue (1998) compared the TTF instrument with Bailey and Pearson's (1983) user information satisfaction (UIS) instrument and Doll and Torkzadeh's (1991) end user computer satisfaction (EUCS) instrument. UIS measures mainframe applications across three constructs, whereas EUCS focuses on individual applications and measures five constructs. Goodhue intended TTF to measure networked-based applications across 12 constructs. The link between TTF and performance, Goodhue maintains, is strictly a theoretical link based on prior research.

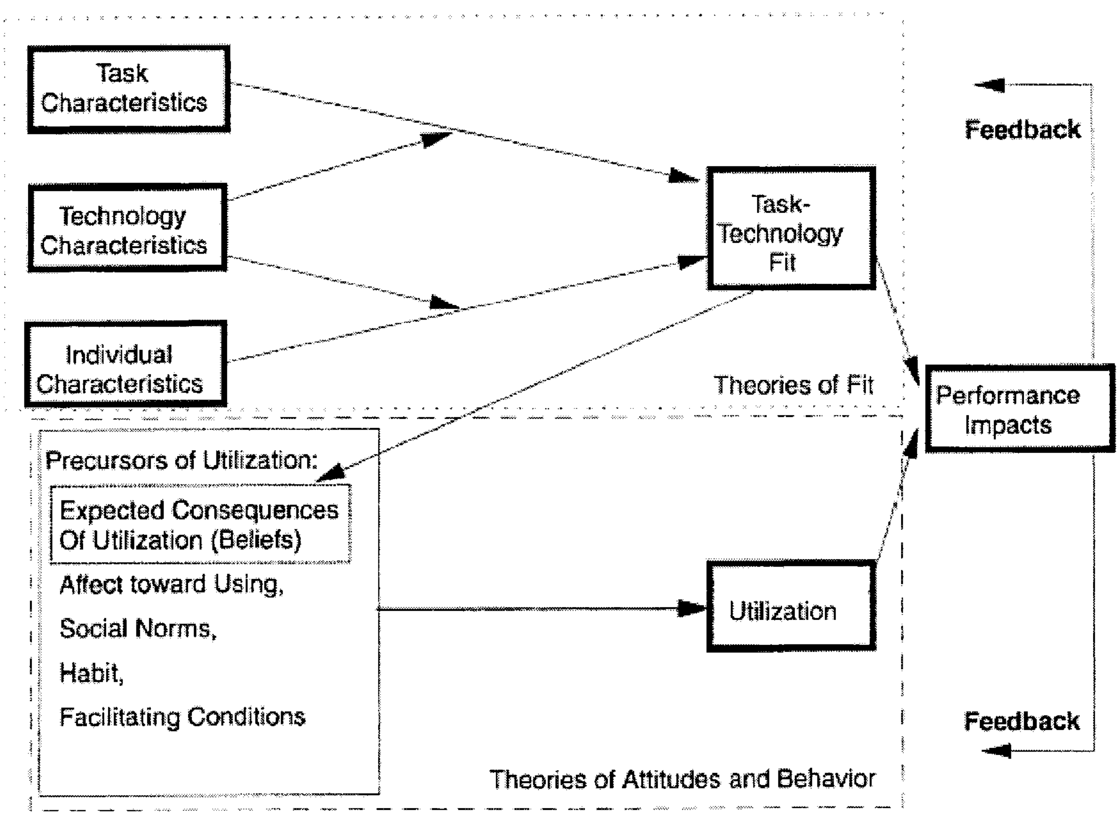
The TTF instrument Goodhue postulates is designed to measure TTF across an entire organization rather than individual applications. However, since the instrument's inception, it has been used in a number of additional studies to measure TTF in specific application domains (D'Ambra & Rice, 2001; D'Ambra & Wilson, 2004; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono, Fakun, Greenough, & Kay, 2001).

The Technology to Performance Chain

Additional research by Goodhue and Thompson (1995) presented a more comprehensive model, called the technology to performance chain (TPC). This model is based on two streams of research: TTF, and user attitudes as predictors of utilization. By examining both streams of research, TPC depicts a more accurate model in which technologies, user tasks, and utilization lead to changes in performance. TPC stresses that technology must be used and that it must fit the task needs of the user. Figure 2.2 depicts the TPC models demonstrating the TTF model and the utilization model leading to the individual performance impacts. The utilization stream is consistent with DeLone and

McLean's (1992) model of IS success which proposes that user attitudes and IT use impact individual performance.

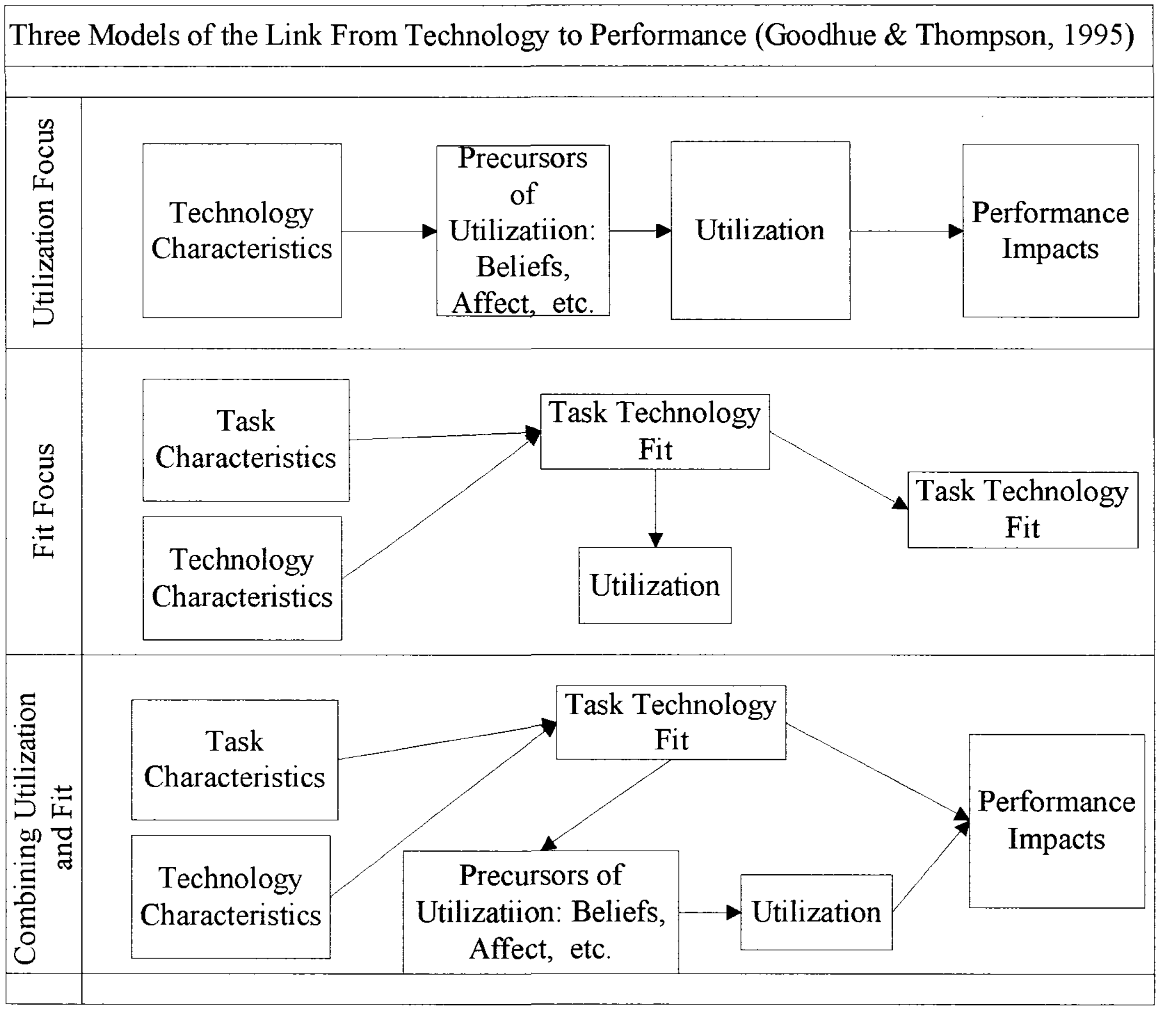
Figure 2.2 – The Technology-to-Performance Chain (Goodhue & Thompson, 1995)



Goodhue and Thompson (1995) generically define *tasks* as the actions carried out by individuals to turn inputs into outputs. Tasks of interest here would be tasks performed by individuals that might influence them to use information technology. For example, individuals may be using the technology to perform various tasks in their day-to-day jobs. User attributes – such as training, computer experience, and motivation – may affect how easy or difficult they find the technology to use, and may also influence how well they use the technology.

Goodhue and Thompson (1995) explain that utilization in the TPC model is binary: The system is either used, or it is not used. They chose to disregard length of use since it would depend on the size and complexity of the task being performed and thus would be relative. The TPC model covers both mandatory and voluntary use. Each component in the TPC has been tested in prior research. Goodhue (1998) tested the fit relationship and Vessey (1991) tested the link between TTF and performance. Adams, Nelson and Todd (1992) found support for the precursors of utilization. Goodhue and Thompson (1995) tested a reduced model of TPC focusing on the role of TTF. Figure 2.3 depicts utilization alone, fit alone, and the combination of utilization and fit leading to performance impacts.

Figure 2.3 – Three Models of the Link From Technology to Performance (Goodhue & Thompson, 1995)



The TPC study conducted by Goodhue and Thompson (1995) consisted of three propositions. Goodhue and Thompson (1995) proposed that user evaluations of TTF would be affected by task characteristics and technology characteristics. Secondly, they proposed that user evaluations of TTF would influence information systems usage. Thirdly, they assumed that user evaluations of TTF would have additional explanatory power in predicting perceived performance impacts going beyond the impacts of utilization alone.

Goodhue (1998) tested the TPC model using the TTF instrument. He expanded the task domain by adding two additional tasks: how new and modified systems respond to changing business requirements, and how well users executed day-to-day business transactions.

Goodhue and Thompson (1995) found that task characteristics most strongly affected non-routine tasks. Individuals engaged in non-routine tasks rated the system lower. Goodhue and Thompson also found that job-level affected users' perception of the system. This was consistent with prior research, which had shown that senior-level managers were estranged from the day-to-day difficulties of bringing information together from different data sources, as they only see the information after the difficulties have been addressed by lower-level staff. It is the lower and middle-level staff that experiences the frustration and effort involved in reconciling data incompatibilities. In addition, middle and lower-level staff experienced difficulty in getting authorization to access data. Senior management did not experience this problem. The empirical results did not support their second supposition: that TTF influenced utilization. Instead, the research revealed that individual performance impacts, the effect of technology on the individual's productivity, are a result of both TTF and utilization, not just utilization alone.

Task Complexity

Goodhue and Thompson (1995) illustrate that the impact of task characteristics on use of information systems has been studied by a great number of researchers. Task complexity is one such characteristic and relates to ambiguity and uncertainty relative to the user's work environment and the practices of the business (McKeen, Guimaraes, & Wetherbe, 1994). Task complexity has been studied in several different research areas, including information systems and decision-making, task and job design, and goal setting (D. J. Campbell, 1988). Campbell (1988) provides a simple classification scheme to categorize the various classifications of task complexity research. He breaks the research down into three distinct areas: (a) a psychological experience, (b) an interaction between the task-doer's personal characteristics and the task itself, and (c) simply as a function of the basic task characteristics. Goodhue and Thompson's (1995) study separates task characteristics into two different measures: task equivocality and task interdependence. Task equivocality includes asking users whether they deal on a frequent basis with ill-defined business problems, non-routine business problems, and variations in the way a business problem is stated. Task interdependence focuses on the user's dependence on frequently working with various business functions to resolve business problems.

Cognitive Fit

Task-technology fit is based on the concept of cognitive fit in strategic management (Vessey, 1991; Vessey & Galletta, 1991). The concept of cognitive fit is based on cognitive psychology literature and notions of cognitive effort and mental models. It attempts to explain how technology fits the needs of the tasks that individuals perform (Dishaw & Strong, 1998).

The concept of fit has served as an important building block for theory constructions in several areas of research, including strategic management (Miles & Snow, 1978). Vessey (1991) suggests a theory of cognitive fit based on the task of deriving a solution for a problem. In general, when individuals have a specific problem to solve, their ability to solve the problem improves when they are presented with the right information in the right format. Vessey's cognitive fit paradigm advances the concept that decision tasks are more easily performed when the necessary information is presented in a manner conducive to the problem domain.

To support the theory, Vessey conducted a study to compare two types of data representation (graphical and tabular) in well-differentiated problems. The study applied the cognitive fit paradigm to decision-making comparing the use of graphical and tabular data representations in problem solving processes. According to the paradigm of cognitive fit, graphical and tabular representations will each facilitate certain well-differentiated tasks. Spatial tasks are best supported by spatial representation i.e., graphical format. Exact individual data values are best supported by tabular reports, where individual data values are represented.

The results of Vessey's study indicate that decision-making improves when the data representation matches the type of cognitive task to be solved. Vessey warns that the cognitive fit presented in the study is useful mainly for examining simple decision-making tasks. Although the results of Vessey's study support the idea of a cognitive fit theory, Vessey argues that the theory should be tested explicitly and should be extended to other domains.

Task-technology fit has its roots in a number of streams of research including structural contingency theory, behavior decision theory, and work adjustment theory. In addition, TTF is also related to models of user attitudes and behaviors towards IT and its use including the *volitional behavior model* (Bagozzi, 1982), the *theory of reasoned action* (Ajzen & Fishbein, 1980), and the *technology acceptance model* (TAM) (Davis et al., 1989).

Structural Contingency Theory

"Though structural contingency theory is at the organizational level and task-technology fit is at the individual level, the logic of the two perspectives is quite similar" (Goodhue, 1995, p. 1831). *Organizational structural contingency theory* proposes that the better an organization's structure fits its organizational context, the higher the performance of the organization. Task-technology fit theory proposes the better that an information technology meets the task requirements of the individual, the higher the performance of the individual. Goodhue based some of his arguments of fit on Venkatraman's (1989) framework that identifies six perspectives of fit:

1. Fit as moderation,
2. Fit as mediation,
3. Fit as matching,
4. Fit as gestalts,
5. Fit as profile deviation, and

6. Fit as covariation.

Cognitive Cost/Benefit Framework

Goodhue (1995) goes on to state that task-technology fit is also related to the cost benefit paradigm in behavior decision theory. This framework suggests that individuals consider the costs and benefits before selecting a strategy for processing information in decision-making (Davis, 1989; Goodhue, 1995). Cost assessment in this context considers speed, correctness, and justifiability. The benefits refer to the mental effort required to make a decision. TTF suggests that an individual can evaluate and choose the technology that fits the task requirements. In cost benefit theory the individual has the option to choose a strategy, but in TTF voluntary use of IT is not assumed (Goodhue, 1995).

Work Adjustment Theory

Goodhue's task-technology fit model has similarities to work adjustment theory as outlined by Dishaw and Strong (1999). Work adjustment theory considers the link between the abilities of the individual and the requirements of the job to determine the individual's suitability for the job. The concept of fit is often referred to as "correspondence" or "matching" and is common in organizational theory. Goodhue (1992) notes that any measurements of information systems satisfactions are based on job satisfaction. However, there is some evidence that job satisfaction has a very weak link to performance. Because of this evidence, Goodhue claims that it is important that IS researchers understand the connection between user evaluations and job satisfaction.

Dawis, Lofquist, and Weiss (1968) separated job satisfaction and individual satisfactoriness. They defined job satisfaction as the degree to which a job meets an individual's personal needs and individual satisfactoriness is how well the individual's abilities meet the tasks required for the job.

Goodhue (1988) proposed distinguishing between IS satisfaction and IS satisfactoriness in much the same way as Dawis and his fellow researchers separated job satisfaction and individual satisfactoriness. He suggests that, to assess *IS satisfactoriness*, users would evaluate how well the system meets their task needs. To evaluate *IS satisfaction*, users would evaluate how well it meets their personal needs.

In the same study, Goodhue proposes that task-system fit be applied to cover the concept of IS satisfactoriness. The result would be the extent to which a system met the task needs of the individual. In considering the difference between the concept of job IS satisfaction, a user may be asked how well the system supported their sense of control or accomplishment. The task-system fit model, on the other hand, may be applied to inquire whether the database was appropriate for the job tasks assigned to the person.

Goodhue argues that many user evaluations do not separate the personal needs of the user from the task needs of the user. He suggests that the link to performance would be stronger if user evaluations focused more on how the system fits the required tasks. In his 1992 study, Goodhue further posits that fit should only be one of several constructs used to consider user system evaluations. TTF would be an objective measure that Goodhue likens to conducting an engineering analysis of tasks needs, system functionality, and the fit between them. He suggests that asking users to express their beliefs about task system fit would be an alternative to an engineering analysis.

Theory of Reasoned Action

Ajzen and Fishbein (1980) do not subscribe to the view that human social behavior is controlled by unconscious motives or overpowering desires, nor can it be characterized as capricious or thoughtless. Rather, they argue that people generally consider the implications of their actions before deciding to engage or not engage in a given behavior.

According to the theory of reasoned action, a person's intention to engage in a given behavior is based on two factors, the individual's evaluation of performing the behavior and the individual's perception of the social acceptance of the behavior. According to the theory of reasoned action, individual's attitudes are a function of their beliefs.

According to Trice and Treacy (1988), the *theory of reasoned action* (TRA) advanced by Ajzen and Fishbein (1980) is widely used in research to link beliefs and attitudes with behavior. Trice and Treacy explain that, according to the theory of reasoned action, individuals' intention to use the information system most effectively predicts its actual use. Individuals' beliefs about the potential benefits derived from using an information system influence their decision to use the system. Individual characteristics such as age, computer experience, or educational background may affect these beliefs, and may subsequently influence the users' decision whether or not to use the system.

Theory of Planned Behavior

The *theory of planned behavior* (TPB) is an extension of the theory of reasoned action (Ajzen, 1991) and according to D'Ambra and Rice (2001) was designed to explain specific human behavior. D'Ambra and Rice explained that TPB is the foundation of models examining people's intentions to use organizational systems. The most pertinent influence on behavior, they claim, is the individual's intention to perform an activity. This motivation in turn is influenced by the individual's attitude toward the results of performing the action, social pressure resulting from the individual's environment, and perceived behavioral control (the extent to which individuals believe they are in control of their behavior).

Technology Acceptance Model

Davis (1986) introduced the technology acceptance model (TAM) as an adaptation of TRA designed to explain computer usage behavior. Garrity et al. (2005) define TAM as a model of IS success that asserts ease of use and perceived usefulness as the primary determinants of system use. This model postulates that technology usage is determined by behavioral intention (BI) to use the technology. Both perceived usefulness of and attitude toward the technology determine behavioral intention.

Dishaw and Strong (1999) demonstrate how TAM and TRA differ in two primary ways. TAM specifies usefulness and ease of use as the two external variables (or beliefs) that influence user attitude toward an IT, intention to use an IT, and actual usage of an IT. In TRA, subjective norms and attitude explain the intention to perform a behavior. TAM does not include the subjective norm constructs present in TRA.

Davis, Bagozzi and Warshaw (1989) conducted a longitudinal study to empirically examine the ability of TRA and TAM to predict and explain user acceptance and user rejection of computer-based technology. The study measured the intentions of 107 full-time MBA students to use a word processing program during their first of four semesters. Usage of the word processing program was voluntary, although students would have the opportunity to use a word processing program for various assignments throughout their coursework. After a one-hour introduction, the students completed a questionnaire containing the TRA and TAM variables. A second questionnaire was administered 14 weeks later at the end of a semester. The second questionnaire contained measures of the TAM and TRA variables and a two-item measure of self-reported usage.

The results of the study (Davis et al., 1989) suggest that:

- An individual's computer use can be predicted reasonably well from their intentions;
- Perceived usefulness is a major determinant of an individual's intentions to use computers; and
- Perceived ease of use is a significant secondary determinant of an individual's intention to use computers.

Both TRA and TAM propose that behavioral intention is the major influence on usage behavior, and that behavior should be predictable based on measures of behavioral intention. Any other factors that sway user behavior do so only indirectly by influencing behavioral intention.

Task-Technology Fit and the Technology Acceptance Model (TAM)

The technology acceptance model (Davis, 1986) is a well known and a widely accepted model of IT utilization. Both TTF and TAM provide theoretical support for efforts to surface the factors explaining software use and its link with user performance. TTF focuses on matching task needs with technology while TAM focuses on user attitudes towards a technology and on the user's perception of ease of use and usefulness (Dishaw & Strong, 1999).

Dishaw and Strong (1999) explain that TAM is more likely to measure the user's intention of use in the early stages, whereas TTF focuses on the outcome of actual use. TAM's weakness is the lack of a task focus. Task focus is covered in TTF. TAM is based on the theory of reasoned action (TRA) specifically applied to the study of IT, whereas TTF is based on work adjustment theory. While TAM has strong backing in the literature, task-technology fit is still evolving as a theoretical and measurable construct.

Dishaw and Strong (1999) conclude that utilization as a dependent variable is supported by both TAM and TTF. They posit that combining the technology acceptance model (Davis, 1986) with the model of task-technology fit (Goodhue & Thompson, 1995) would provide a more useful model than using either one alone. To prove the hypothesis, they conducted a study of programmers' use of software maintenance tools. Dishaw and Strong (1999) examined survey results encompassing 60 projects in three Fortune 50 companies. At the beginning of the study, they surveyed programmers about their backgrounds, experience, and their expectations of the software maintenance tools' capabilities. In addition, they queried the programmers about their intentions to use the software maintenance tools during the project, and about the programmers' attitudes toward the ease of use and usefulness of the tools. After each project was completed, the programmers answered questions about actual tool usage and actual task characteristics. Dishaw and Strong (1999) analyzed the survey results for acceptable fit for TAM, TTF and the combined TAM/TTF models. A path analysis of each model reflects an acceptable fit for the data.

To reflect the tools being used, Dishaw and Strong (1999) employed the published questionnaire items for TAM (Davis, 1989) with only minor changes. They modified the TTF items (Goodhue, 1998) to include questions needed to educe the functionality programmers anticipate in a software maintenance project.

Dishaw and Strong (1999) first tested TAM and TTF separately, and then tested the combined TAM/TTF model. The path analysis of TAM found that the direct effect of ease of use on attitude was close to zero. However, a direct effect of perceived usefulness on utilization provided some explanatory power. They tested TAM using subjective norms from TRA, TPB and behavioral control used in TPB, but the results suggested that these variables did not provide an improvement over the basic TAM. The results provided evidence that subjective norms are not important in understanding individual choices about IT use.

Dishaw and Strong (1999) also found that a path analysis of the TTF model demonstrated effective fit to the data. The amount of variance in the dependent variable – utilization –explained by TTF was somewhat higher than the variance accounted for in TAM. Dishaw and Strong (1999) established a negative relationship between task complexity and TTF, confirming results from prior research conducted by Goodhue (1995) and Goodhue and Thompson (1995). As task requirements become more complex, fit decreases and tasks may become too large and complex for IT as the sole source of adequate support. As IT functionality increases, Dishaw and Strong conclude, fit increases.

Additionally, Dishaw and Strong (1999) assert that the strong direct effect of task characteristics on utilization contrasts with a lack of effect of tool functionality. They establish that the path from tool functionality to utilization is near zero. The stronger effect for task characteristics as compared to tool characteristics, too, is consistent with Goodhue's (1995) and Goodhue and Thompson's (1995) previous research. These results can be interpreted to mean that task requirements, together with the fit between the task requirements and the technology's functionality, drive IT utilization. As expected, Dishaw and Strong (1999) find that experience with IT is positively, and directly, associated with utilization.

The integrated path model of TAM and TTF showed an acceptable fit with the data. Dishaw and Strong (1999) argue that the amount of variance in the dependent variable – utilization – explained by the model is higher than the variance accounted for by either TAM or TTF alone. In the combined TAM/TTF model, the effects of TTF and task characteristics on utilization are about the same as reflected in the TTF model. As expected, the functionality of an IT tool and the experience of the individual using the IT tool affect the perceived ease of use of the tool. Increased experience is linked with higher ease of use, while more tool functionality is linked with lower ease of use. As tools include more functionality, they become more difficult to use.

Further, Dishaw and Strong (1999) find that experience with the tool is associated with perceived usefulness. Users with more experience more readily see the usefulness of the tool. TTF also affects perceived ease of use. When the fit between the task and the tool is higher, users perceive the tool to be easier to use for that task. Dishaw and Strong (1999) expected to find a strong link between TTF and perceived usefulness. However, the connection between TTF and perceived usefulness is mediated by perceived ease of use. In summary, the tool may be perceived as useful only if it is also perceived as easy to use.

The results of Dishaw and Strong's (1999) study indicate that the integrated model of TTF and TAM explains utilization more precisely than TTF or TAM alone. Consequently, Dishaw and Strong mention two practical limitations to Goodhue's (1995) TTF for studying IT use in organizations. First, TTF is created from individual-level theories and applies specifically to individual choices to use IT. New measures of fit must be constructed for each application to a different task or technology. Secondly, Dishaw and Strong (1999) suggest that Goodhue's (1995) questionnaire item "I can't get data that is current enough to meet my needs" (p. 1842) is limited to managerial decision-making. They argue that Goodhue's questions related to fit must be general enough to cover a number of technologies and tasks, and may limit the value of the measures for understanding IT utilization. Dishaw and Strong address this issue in their work using Venkatraman's (1989) idea of strategic fit.

Extended Models of TTF

The Unified Theory of Acceptance and Use of Technology

Recently, Venkatesh et al. (2003) conducted an empirical study of eight prominent user acceptance models and formulated an integrated model called the Unified Theory of Acceptance and Use of Technology (UTAUT). This study compared the models and, based on their similarities, constructed a new model. Venkatesh et al. (2003) claim that there is strong support for the new model within the constructs of intention to use and usage behavior. This research is an important step in studying acceptance and use of technology, but does not include any task-technology fit constructs. Dishaw, Strong, and Bandy (2004) are in the midst of a study revising the UTAUT model to include the TTF constructs. The UTAUT model generalizes the constructs into four generalized categories. These include a performance expectancy construct, an effort expectancy construct, a social influence construct, and a construct for facilitating conditions. TTF will fall within the performance expectancy category.

Modified TTF

Dishaw and Strong (1998) conducted a study to examine the utilization of software maintenance tools to perform maintenance on existing software systems. They constructed a TTF modified from that of Goodhue and Thompson (1995) in order to examine various dimensions of fit between the maintenance tasks required in software maintenance and the fit of the software tools. In essence, they examined the relationship between the needs of software developers to maintain the software, and the fit of the software maintenance tools to match those needs, resulting in utilization of the maintenance tool.

The results of Dishaw and Strong's (1998) study indicate that higher task-technology fit is associated with higher levels of use of the software maintenance tool. These results support the premise that programmers decide to use or not to use software maintenance tools for maintenance projects based on their assessment of the fit between the tools and the task activities to be performed. Programmers use software maintenance tools because they fit the task of the programmer rather than simply because they are available or have extensive functionality. Dishaw and Strong accordingly support the notion that TTF models are a useful way to consider IT utilization, and suggest further research in this area.

TTF Studies

Ferratt and Vlahos (1998) conducted a study, based on task-technology fit, of managerial tasks for decision-making and computer-based information systems (CBIS) used by U.S. and Greek managers. Based on their research, Ferratt and Vlahos (1998) suggest that user evaluations of CBIS were not related to the amount of use. Some managers who used the system in a very limited fashion received great value from it, and some who used the system extensively received great value from it. This supported Goodhue and Thompson's (1995) stance that utilization is arguably a construct that is not well understood. Trice and Treacy (1988) suggest that frequency and quality of use could be related to difficulties in using the system or, counter to that, could be related to the system's attractiveness – resulting in extended use in non-productive ways. Trice and

Treacy further propose that utilization could be viewed as an independent variable affecting performance rather than as an indicator of performance.

Ferratt and Vlahos (1998) limited the study to managers' decision-making tasks. Ferratt and Vlahos (1998) similarly used the concept of computer-based information systems, as outlined by Goodhue and Thompson (1995). Ferratt and Vlahos included hardware, software, and data, and employed four different views of managerial decision-making. They investigated the literature to determine what types of CBIS are needed to support managerial decision-making. They concluded that standard information reporting systems (IRS), flexible decision support systems (DSS), and executive information systems (EIS) have been especially developed for managers. They added office information systems and transaction processing systems (TPS) to the list of systems they were investigating.

Ferratt and Vlahos (1998) suggest that DSS and EIS will provide a better fit for managerial decision making than will TPS and IRS. The link between user evaluations and utilization in the TTF model imply a second hypothesis: Managerial use of CBIS is related to user evaluations of CBIS, i.e. TTF. For their study, Ferratt and Vlahos posited that the more managers value CBIS, the more they will use CBIS. They examined the utilization of CBIS, including hours or frequency of use, diversity of application employed, and the proportion of tasks for which an individual decided to use the system.

Ferratt and Vlahos (1998) asked the respondents to indicate how many hours per week they used various types of hardware. In addition, they asked the participants in the study to give weekly times for software use and total hours of use per week. The average of these three totals provides a reliable measure of use. Ferratt and Vlahos conclude that there was significant room for improving the overall level of TTF for Greek and U.S. managers' decision-making tasks and CBIS.

Goodhue and Thompson (1995) found only weak support for the link between user evaluation and utilization, even though theories and research on attitude leading to behavior provide the basis for this aspect of the TTF model. Goodhue and Thompson's TTF model also indicates that individual differences affect the fit between task and technology.

Other researchers have extended task-technology fit research in specific subject areas. McCarthy (2002) examined the validity of task-technology fit and knowledge management systems. The findings positively relate task-technology fit to utilization of knowledge management systems.

Ioimo (2000) examined the relationship between task-technology fit and field mobile computing for police officers. The study analyzed the relationship between field mobile computing and the job requirements of police officers in the field. Ioimo did not find supporting evidence that field computing improves productivity of the police officers; however, the results indicated that the technology and the data provided were useful to the officers.

Grossman (2003) examined the relationship of task-technology fit and the unified modeling language. The unified modeling language (UML) is a methodology for designing and developing application software. The results of the study suggest a positive relationship between task-technology fit and UML usage. In addition, the study establishes a baseline for empirical studies of UML usage.

Wells, Palmer and Patterson (2004) outlined an in progress study that applies task-technology fit theory to experiential consumer tasks. This study uses TTF to gain an understanding of how to support consumer task needs related to online searches. It focuses on whether it is better to provide consumers with a search-related interface or an experiential interface. The pilot study is complete, and the full study is in progress.

D'Ambra and Rice (2001) conducted an exploratory study to examine the extent that Internet services satisfy information needs posed outside of the traditional work domain. They developed a model and conceptually based scales to measure user satisfaction of the Internet-based service in respect to usage, Internet access, task-technology fit, and individual performance. The TTF dimensions used in D'Ambra and Rice's work include quality, locatability, compatibility, system reliability, and ease of use/training.

The results of the D'Ambra and Rice's (2001) study indicate that Internet usage as well as Internet expertise influence several TTF factors, and those factors, along with Internet usage, directly influence positive performance outcomes. D'Ambra and Rice explain that Internet-use, task-technology fit factors, and the number of hours per week spent using the Internet facilitate over 25% of the variance in reported performance.

In a subsequent study, D'Ambra and Wilson (2004) integrated the construct of uncertainty into the task-technology fit model to evaluate usage of the Internet as an information resource. They extended the original TTF construct as presented by Goodhue and Thompson (1995) to include additional dimensions of TTF specific to the usage of the Internet outside the work domain. D'Ambra and Wilson (2004) posit that, based on the significance of the TTF factors and utilization in explaining performance, the TTF model can be successfully applied to evaluate Internet usage in a broader context than the tightly defined concept of system usage in work environments. The results indicate that user experience increased perceived performance by using the Internet in the travel information domain. The results are significant in confirming the role use plays in information systems models, like TAM and TTF, which attempt to measure success.

CHAPTER III

RESEARCH METHODOLOGY

Chapter III defines the research design and methodology for this study. More specifically, it describes the sample and corresponding population, survey instruments and distribution, research variables and operational definitions, research questions with respective hypotheses and analyses, procedures, research and design, and an outline of data collection methods utilized.

Overview

This study investigates the relationship between task-technology fit and the performance impact of Customer Relationship Management systems. The theoretical framework for this study is the task-technology fit model (Goodhue & Thompson, 1995).

Task-technology fit has been empirically tested in a number of studies including knowledge management systems (McCarthy, 2002), police mobile computing (Ioimo, 2000), group support systems (Zigurs & Buckland, 1998), the unified modeling language (Grossman, 2003), software maintenance tools (Dishaw & Strong, 1998), and managerial decision making (Ferratt & Vlahos, 1998; Goodhue, 1998).

This present study expands the body of research by examining the relationship between task-technology fit and the performance impact of commercial CRM systems as used by marketing mangers. This area has not been evaluated using the TTF framework.

Research Methodology

The following steps have been completed as part of the research methodology. First, a preliminary literature review was conducted on CRM systems and TTF. Based on the preliminary literature review the research questions were formed. After completing the preliminary literature review, a more comprehensive review of the literature was completed documenting the background of customer relationship management and CRM systems. In addition, a review of the task-technology fit literature and related theories and extensions were addressed. The initial research questions and hypotheses were formalized based on the results of the comprehensive literature review.

The theoretical framework for this study, task-technology fit and the methodology, are derived from prior validated work by Goodhue (1995,1998) and Goodhue and Thompson (1995). Goodhue (1998) developed the task-technology fit instrument to measure user evaluations of information systems. The instrument is a multi-dimensional measure and each dimension has been validated for internal and external consistency (Goodhue, 1998). Task-technology fit has been successfully measured in prior research in a number of task domains (Ferratt & Vlahos, 1998; Goodhue, 1995,1998; Goodhue & Thompson, 1995; Ioimo, 2000; McCarthy, 2002).

Goodhue (1998) argued the importance of focusing on the extent that task needs are met by an information system. Further, he positioned that in general, performance measurements are usually unidimensional, and the high/low resulting indicator is not very helpful in providing diagnostics. The basic premise of the task-technology fit model is that an information system provides value by supporting a task or a group of tasks and that users of the system will reflect this in their evaluation of the system (Goodhue, 1998). Hence, the strongest link between information systems and performance impacts will be a correspondence between task needs and system functionality.

Population

The target population for this study is marketing managers that use a commercial CRM system to perform their job tasks.

Sample

Respondents are marketing managers in companies that utilize a commercial CRM system. Respondent contact information was downloaded from the American Marketing Association's online member database (*American Marketing Association member directory [online database]*, 2005). SPSS was used to generate a random sample of respondents who hold marketing management job titles.

Demographic information was gathered to provide a description of the sample population. The demographic descriptors are age, gender, number of years in marketing, number of years in current position, whether the firm is public or private, last year's company revenue, number of employees in the firm, current job title, education, industry type, CRM software being used, how long the CRM system has been operational in the company, whether the respondent considered the CRM system implementation a success, and the type of CRM training received.

Operational Definitions

Certain terms that are utilized in this work required further clarification as to their meaning and measurement.

A marketing manager is an employee or an agent of a company who plans, directs, and coordinates the marketing of an organization's products and/or services (*KnowledgePoint*, 2006). A list of the activities of a marketing manager is detailed in Appendix A.

Task-technology fit is "the degree to which a technology assists an individual in performing their portfolio of tasks" (Goodhue & Thompson, 1995, p. 216). The American Heritage Dictionary (2000) defines "degree" to describe a relative intensity or amount for a quality or an attribute. TTF measures the match between task requirements of the user, an individual's abilities, and the functionality of the system. The TTF instrument, discussed at length later in this chapter, uses two summated scales, individual characteristics, and task characteristics.

Individual characteristics measure the extent that the individual's skills and ability affect the fit of the system. Individual characteristics are measured using seven dimensions of TTF (accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training). The operational definition of each dimension is stated below:

1. Accessibility is the degree of ease the marketing manager has in accessing the CRM system.

2. Assistance is the degree of ease the marketing manager has in getting help accessing and understanding the information in the CRM system.
3. Authorization is the degree of ease the marketing manager has in getting permission to access the information within the CRM system.
4. Ease of use is the degree of ease the marketing manager has in using the CRM system.
5. Presentation is the how well the marketing manager finds the information to be displayed or printed in the CRM system.
6. The right level of detail is the degree the marketing manager finds the information in the CRM system to contain enough information at the appropriate level of detail.
7. Training is the degree of instruction available for learning how to use the CRM system.

Task characteristics measure the extent the CRM system fits the tasks required by marketing managers to carry out their job responsibilities. Within the task characteristics are eight dimensions of TTF (accuracy, compatibility, currency, flexibility, locatability, meaning, reliability, and the right data). The operational definition of each dimension is stated below:

1. Accuracy is defined as the degree of correctness of information in the CRM system.
2. Compatibility is defined as the degree to which information in the CRM system matches data from other sources.

3. Currency is defined as the degree the information in the CRM system is up to date enough for the purposes of the marketing manager.
4. Flexibility is the degree the CRM system's reports and data can be adapted to meet the changing business needs of marketing managers.
5. Locatability is the degree of ease the marketing manager has in finding information within the CRM system.
6. Meaning is the degree of ease the marketing manager has in understanding the data elements in the CRM system.
7. Reliability is the degree the CRM system is available when needed by the marketing manager.
8. The right data is the degree the CRM system contains the information needed by the marketing manager.

Performance impact in the context of this study is "the accomplishment of a portfolio of tasks by an individual" (D'Ambra & Wilson, 2004, p. 299) "leading to some mix of improved efficiency, improved effectiveness, and/or higher quality" (Goodhue & Thompson, 1995, p. 218).

Usage is the self-reported frequency and hours of use a marketing manager utilizes the CRM system.

Voluntariness is the extent the marketing manager perceives the use of the CRM system to be optional by his or her management.

Overall satisfaction is the extent the marketing manager is satisfied with the CRM system.

The Variables

The dependent variable for this study is performance impact. The independent variables consistent of two summated scales, the individual characteristics of TTF (a summated scale of multiple dimensions of TTF), task characteristics of TTF (a summated scale of multiple dimensions of TTF), and the variables training, accuracy, compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.

Performance Impact - Dependent Variable

The dependent variable is performance impact. Goodhue and his fellow researchers stated (2000) that when a technology has the specific functionality needed to perform a required set of tasks, better performance should result. Similarly, when an individual has the appropriate knowledge and experience required to use the technology, better performance should result. Performance impact in the context of this study is "the accomplishment of a portfolio of tasks by an individual" (D'Ambra & Wilson, 2004, p. 299) "leading to some mix of improved efficiency, improved effectiveness, and/or higher quality" (Goodhue & Thompson, 1995, p. 218).

Performance impact is measured using six questions taken from prior work by D'Ambra and Wilson (2004) as shown in Appendix B. Each question for the performance impact construct is measured using a 7-point scale and averaged.

Individual Characteristics of TTF – Independent Variables

Individual characteristics measure the extent that the individual's skills and ability affect the fit of the system. Individual characteristics of TTF is a summated scale that includes the TTF dimensions of accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training. Individual characteristics of TTF is measured by averaging the composite scores for each of the dimensions as show in Appendix C. Each task question is measured using a 7-point scale.

The training dimension of individual characteristics of TTF is an independent variable. Training is the average score for the questions that comprise the training dimension.

Task Characteristics of TTF – Independent Variables

Task characteristics measure how well the system meets a defined set of needs. The task characteristics dimensions were developed by Goodhue (1998). Task characteristics of TTF is a summated scale including the eight dimensions of TTF. Task characteristics of TTF is measured by averaging the composite scores for the eight dimensions of TTF (accuracy, compatibility, currency, flexibility, locatability, meaning, reliability, and the right data) as shown in Appendix D. Each task question is measured using a 7-point scale. Each of the eight dimensions of the task characteristics of TTF are independent variables. The score for each dimension is the average response for the questions that comprise the dimension.

Research Questions

1. Is there a relationship between individual characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?
2. Is there a relationship between task characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?
3. Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?
4. Is there a relationship between training and the performance impact of marketing managers who utilize a commercial CRM system?

Hypotheses

Based on the research questions and the literature review, the following hypotheses were tested. A matrix of the research questions, the dependent and independent variables, the hypotheses, and the measures can be found in Appendix E.

Hypothesis 1

$H1_0$: There is no relationship or a negative relationship between individual characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.

$H1_a$: There is a positive relationship between individual characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.

Hypothesis 2

$H2_o$: There is no relationship or a negative relationship between task characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.

$H2_a$: There is a positive relationship between task characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.

Hypothesis 3

$H3_0$: There is no relationship or a negative relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.

$H3_a$: There is a positive relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.

Hypothesis 4

$H4_o$: There is no relationship or a negative relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.

$H4_a$: There is a positive relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.

Hypothesis 5

$H5_0$: There is no relationship or a negative relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.

$H5_a$: There is a positive relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.

Hypothesis 6

$H6_0$: There is no relationship or a negative relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.

$H6_a$: There is a positive relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.

Hypothesis 7

$H7_0$: There is no relationship or a negative relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.

$H7_a$: There is a positive relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.

Hypothesis 8

$H8_0$: There is no relationship or a negative relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.

$H8_a$: There is a positive relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.

Hypothesis 9

$H9_0$: There is no relationship or a negative relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.

$H9_a$: There is a positive relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.

Hypothesis 10

$H10_0$: There is no relationship or a negative relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.

$H10_a$: There is a positive relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.

Hypothesis 11

$H11_0$: There is no relationship or a negative relationship between training and the performance impact of marketing managers who use a commercial CRM system.

$H11_a$: There is a positive relationship between training and the performance impact of marketing managers who use a commercial CRM system.

Power Analysis

A model will be examined using simultaneous multiple regression. The first model will determine the ability of certain variables (accuracy, compatibility, currency, flexibility, locatability, meaning, reliability and the right data, training) to predict performance impact. The α for the test of this model will be set at .05. To achieve power of .95 and a medium effect size (f^2=.20), a sample size of 127 is required to detect a significant model (F (9,117) = 1.96).

A second model will be examined using simultaneous multiple regression. The model will determine the ability of Individual characteristics of TTF to predict performance impact (criterion variable). The α for the test of this model will be set at .05. To achieve power of .95 and a medium effect size (f^2=.15), a sample size of 89 is required to detect a significant model (F (1,87) = 3.95). A third regression model will be examined to determine the ability of task characteristics to predict performance impact (criterion variable). The α for the test of this model will be set at .05. To achieve power of .95 and a medium effect size (f^2=.15), a sample size of 89 is required to detect a significant model (F (1,87) = 3.95).

Based on the power analysis, a minimum sample size of 127 was needed. The final sample included 129 completed surveys.

Surveys

"Survey research is perhaps the most frequently used mode of observation in the social sciences" (Babbie, 1998, p. 255). Surveys are used for descriptive, explanatory, and exploratory purposes and are typically used in studies where an individual person is the unit of analysis. Conceivably, surveys are the best method available to the social scientist to collect original data for describing a large population (Babbie, 1998).

The standardized questionnaire is the central element in survey research (Babbie, 1998). The standardized questionnaire insures that the same observation technique is used for every respondent in the study. There are three primary methods for administering survey questionnaires to a sample of respondents: self-administered questionnaires, face-to-face interviews, and telephone interviews. When self-administered questionnaires are employed, the respondent reads and marks the questionnaire. In face-to-face and telephone surveys, the interviewer reads the questions and records the response. The advantages of a self-administered survey over an interview survey are economy, speed, lack of interviewer bias, and the possibility of anonymity and privacy to encourage candid responses on sensitive issues (Babbie, 1998).

Mail surveys can be most effective when they are directed at a particular group such as a professional association (Scheuren, 2004). Baruch (1999) conducted a study to explore what might be a realistic response rate in academic studies. The study covered 141 papers and 175 studies. The studies were those published in the Academy of Management Journal, Human Relations Journal, Journal of Applied Psychology, Organizational Behavior and Human Decision Processes, and the Journal of International Business Studies in the years of 1975, 1985, and 1995 covering approximately 200,000 respondents. The average response rate was 55.6 with a standard deviation of 19.7 (Baruch, 1999).

Guidelines resulting from the study (Baruch, 1999) indicate that surveys directed towards top management and organizational representatives may produce a 35 percent response rate +/- 13 percent, whereas most other populations (employees, managers, or professionals) may produce a 60 percent response rate +/- 20 percent. Based on response rate figures from Baruch's research, 1200 surveys were mailed to respondents.

Three weeks after the initial distribution of the surveys, a follow up post card was sent to those who had not responded. Despite the utilization of follow up postcards, the first distribution did not provide adequate coverage to meet the minimum sample size of 127. A second sample of 500 surveys was mailed to additional respondents. This resulted in an adequate response of 140 surveys.

Goodhue's (1998) task-technology fit instrument was used. The TTF instrument provides a multi-dimensional assessment of the user's evaluation of how well the information system and services meet the needs of users. To be an effective diagnostic device, the instrument must provide a multi-dimensional assessment wherein each dimension is separately and validly measured. The following section of this research introduces the concepts of validating an instrument and then specifically how Goodhue tested the TTF instrument.

Reliability

Reliability concerns the extent to which measurements are repeatable (Nunnally & Durham, 1975), or have a relatively high component of true score and relatively low component of random error (Carmines & Zeller, 1979). Phrased another way, "Reliability is an assessment of the degree of consistency between multiple measurements of a variable" (Hair, Anderson, Tatham, & Black, 1998, p. 117). The reliability of a measure is important because it reflects the internal consistency of the survey questions in an instrument. The reliability coefficient assesses the consistency of the entire scale, with "Cronbach's alpha being the most widely used measure" (Hair et al., 1998, p. 118).

Cronbach (1951) suggested that the coefficient alpha can be used as a measure to ensure that there is internal validity of measures that are used within a survey instrument. Cronbach's alpha is a measure of reliability that ranges from 0 to 1. The lower limit of

.60 is the generally agreed lower bound of acceptability in exploratory research (Hair et al., 1998). Cronbach's alpha has been successfully used in prior studies utilizing the TTF instrument.

Validity

Having ensured the instrument meets the necessary levels of reliability, the researcher must prove the validity of the instrument (Hair et al., 1998). Validity is the extent which a measure or set of measures correctly represents the concept of study – the degree to which it is free from any systematic or non random error. Validity is concerned with how well the concept is represented by the measures, and reliability relates to the consistency of the measures. The three most widely accepted forms of validity are convergent, discriminant, and nomological validity. Goodhue tested the TTF instrument for discriminant and nomological validity.

Discriminant validity is concerned with the possibility that users respond similarly to questions on two different constructs and that there is no empirical evidence that two different things are being measured (Hair et al., 1998). The empirical test is the correlation among measures. The summated scale is correlated with a similar, but conceptually distinct measure. In this instance, the correlation between the variables should be low and will demonstrate that the summated scale is sufficiently different from the other similar concept (Hair et al., 1998).

> Nomological validity refers to the degree that the summated scale markets accurate predictions of other concepts in a theoretically based model. The researcher must identify theoretically supported relationships from prior research or accepted principles and then assess whether the scale has corresponding relationships. In summary, convergent validity confirms that the scale is correlated with other known measures of the concept, discriminant validity

ensures that the scale is sufficiently different from other similar concepts to be distinct, and nomological validity determines if the scale demonstrates the relationships shown to exist based on a theory and/or prior research (Hair et al., 1998, p. 118-119).

Reliability and Validity of the TTF Instrument

Goodhue (1998) purposed the task-technology fit instrument to measure the degree that information systems and services meet the task needs of managers. A distinctive feature of this instrument is that it is conceptually based on the theory of task-technology fit. Goodhue's (1998) work describes the conceptual development of the instrument and presents a detailed treatment of its measurement validity. As a result, Goodhue compares the TTF instrument to Bailey and Pearson's (1983) User Information Satisfaction instrument (UIS) and Doll and Torkzadeh's (1988) End User Computing Satisfaction (EUCS) instrument.

Goodhue (1998) used the framework suggested by Bagozzi (1979, 1980) to measure the validity of the TTF instrument as illustrated in Table 3.1.

Table 3.1 – Bagozzi's Six Components of Construct Validity

Concern	Bagozzi (1979, 1980)
Constructs Well-Defined, Making Theoretical Sense	Theoretical Meaningfulness
Measures Correspond to Theoretical Constructs	Observational Meaningfulness of Concepts
Maximally Similar Measures Agree	Internal Consistency
Different Constructs Can Be Distinguished	Discriminant Validity
Maximally Dissimilar Measurements Correlate	Convergent Validity
Making Sense in the Larger Theoretical Framework	Nomological Validity

Each of the components (Bagozzi, 1979,1980) form a logical sequence of concerns from initial definition of the theoretical construct, through instrument development and testing, to testing the instrument in a larger theoretical construct. A flowchart outlining Goodhue's (1998) process for validating the TTF instrument can be found in Appendix F.

Goodhue (1998) conducted a review of the literature to establish the theoretical definition of the TTF construct. Then he developed the instrument and pretested it with 360 individuals in nine companies. During the pretest, he conducted 100 interviews to identify problems or omissions in the instrument. After gathering feedback, he modified the instrument and conducted a second test with 500 individuals in 10 companies resulting in 357 usable questionnaires.

Goodhue (1998) tested the reliability of the instrument using Cronbach's alpha. Twelve of the sixteen dimensions reached alphas of .70 or higher as shown in Table 3.2. Training and authorization were dropped because of their low alphas.

Table 3.2 – Reliabilities and Final Status of Dimensions of Task-Technology Fit (Goodhue, 1998)

Reliabilities			
Dimension of Task-technology Fit	**Number of Questions**	**Cronbach's Alpha**	**Final Status**
Lack of Confusion	2	.73	Kept
Level of Detail	3	.85	Kept
Locatability	3	.77	Kept
Meaning	3(2)	.78(.77)	One Question Dropped (due to Discriminant Validity)
The Right Data	4	.83	Dropped (due to Discriminant Validity)
Accessibility	3	.84	Kept
Assistance	3	.87	Kept
Authorization	2	.58	Dropped (due to Reliability)
Ease of Use	3	.77	Kept
Flexibility	4	.70	Dropped (due to Discriminant Validity)
System Reliability	3	.77	Kept
Training	2	.66	Dropped (due to Reliability)
Accuracy	3	.83	Kept
Compatibility	4(3)	.82(.80)	One Question Dropped (due to Discriminant Validity)
Currency	3(2)	.73(.78)	One Question Dropped (due to Reliability)
Presentation	2	.86	Kept

A summated scale is a method of combining several variables that measure the same concept into a single variable. In most cases, the separate variables are summed and then their total or average score is used in the analysis (Hair et al., 1998). The conceptual definition of the summated scale specifies the theoretical basis and its application to the research context.

The task-technology fit instrument consists of two summated scales, individual characteristics and task characteristics (Goodhue, 1998). The conceptual definition of individual characteristics is the extent that the user's skills and abilities affect the fit of the system. Individual characteristics of TTF are a composite measure of seven of the dimensions of TTF (accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training). The conceptual definition of task characteristics is the extent the information system fits the tasks required by users to carry out their job responsibilities. Task characteristics are a composite measure of eight of the dimensions of TTF (accuracy, compatibility, currency, flexibility, locatability, meaning, reliability, and the right data).

Goodhue (1998) tested the discriminant validity of the TTF instrument using a variation of the "multitrait-multimethod" (MTMM) approach called "multiple trait, multiple item" (MTMI). MTMM was developed by Campbell and Fiske (1959) and is a method to assess the construct validity for a set of measures (Hair et al., 1998). Goodhue analyzed the 47 final questions and the 16-targeted dimensions. Based on the results from the MTMI analysis, flexibility was dropped. The right data and the right level of detail were two other constructs that were highly correlated. Goodhue utilized exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) as additional tests to confirm the validity of the instrument.

Factor analysis is a generic name given to a class of powerful multivariate statistical methods (Hair et al., 1998). Factor analysis is concerned with exploring the patterns of relationships among a number of variables. These patterns are represented by what are termed principal components or factors. The primary purpose of factor analysis is to define the underlying structure of data in a data matrix. Factor analysis solves the problem of analyzing interrelationships (correlations) between large numbers of variables by raising a set of common underlying dimensions known as factors. Two of the primary uses of factor analysis are summarization and reduction of the data, both of which are used in validating instruments (Hair et al., 1998).

Exploratory factor analysis is a technique that can be used to identify an underlying structure against a large set of variables (Grafarend, 2006). In EFA, the data decide which questions load on which factors. To prove a point of comparison, Goodhue (1998) analyzed the final 12 dimensions and 32 questions using EFA. The questions for 10 of the dimensions loaded strongly on their own single factor.

Confirmatory factor analysis provides a more precise assessment of the discriminant validity of the instrument than MTMI or EFA (Bagozzi & Phillips, 1982). In CFA, the researcher specifies the general structure of the loadings, and CFA tests the fit of that structure. CFA is a type of structural equation modeling (SEM). SEM techniques are distinguished by two principle characteristics. The first is the estimation of multiple and interrelated dependence relationships. The second is the ability of SEM to represent unobserved concepts in these relationships and account for measurement error in the estimation process (Hair et al., 1998).

With CFA, as variables load highly on a factor, they become descriptors of the underlying dimension. Only on examination of the loadings of the variables on the factors does the researcher identify the character of the underlying dimension.

Goodhue (1998) executed CFA on the dimensions that had Cronbach alphas of greater than .70 and that were not dropped (flexibility) based on the results of MTMI. Two of the dimensions that were suspect after MTMI analysis were "the right data" and the "right level of detail." Based on the results of CFA, both dimensions were dropped from the instrument.

For the final 12 dimensions tested using CFA, the results indicated that the estimated parameters were significantly different from zero at greater than the .001 level with the exception of some correlations between dimensions that were significant at the .05 level. Based on the results of CFA, 12 of the 16 dimensions and 32 out of 47 questions were kept in the final instrument.

In summary, Goodhue (1998) dropped authorization and training due to reliability issues and the right data and flexibility due to discriminant validity issues. The results of the discriminant validity tests revealed two important findings. First, the questions for the right data and the right level of detail did not appear to be distinguishable by the respondents. Second, the instrument measured strong discriminant validity in 12 of the 16 dimensions. Goodhue also conducted nomological testing and found the expected pattern of relationships between task-technology fit and tasks of individuals, in addition to the link with perceived performance impacts. Given the results of his work, it is appropriate to compare the validated TTF instrument against two other well known instruments in the field, Bailey and Pearson's (1983) User Information Satisfaction instrument and Doll and Torkzadeh's (1988) End User Computing Satisfaction instrument. The comparisons of these instruments are detailed in Appendix G.

The Questionnaire

We utilized Goodhue's (1998) task-technology fit instrument with additional measures for usage (Igbaria et al., 1995), overall satisfaction (Bailey & Pearson, 1983), voluntariness (Venkatesh & Davis, 2000), and performance impact (D'Ambra & Wilson, 2004).

The task-technology fit instrument consists of two summated scales, individual characteristics and task characteristics. Individual characteristics of TTF are a composite measure of seven of the dimensions of TTF (accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training). Task characteristics are a composite measure of eight of the dimensions of TTF (accuracy, compatibility, currency, flexibility, locatability, meaning, reliability, and the right data).

There are 45 questions in the instrument. There are 14 related to individual characteristics, 19 for task characteristics, six for performance impact, three for voluntariness, two for usage, and one for overall satisfaction.

Each dimension of TTF is measured with a 7-point scale using at least two parallel questions randomly ordered so no two questions are adjacent (Goodhue, 1998). The measure of each dimension is formed by averaging the responses to the relevant items in the questionnaires. See Appendix H for the questions associated with each variable.

Goodhue's (1998) instrument demonstrated strong reliability and strong discriminate validity in 12 of the 16 dimensions of TTF. Four of the dimensions were dropped by Goodhue (1998) due to reliability and validity issues. Items dropped were the right data, authorization, flexibility, and training. The dropped items are measured in our study as they are relevant to the topic and three of the items (the right data, flexibility, and training) have been successfully measured in prior studies (Grossman, 2003; Ioimo, 2000; McCarthy, 2002).

Goodhue and Thompson (1995) suggest a link between TTF and performance impact. Our study measured performance impact using six variables rather than two as used in Goodhue and Thompson's study. Performance impact was measured using a 7-point scale with six questions randomly ordered so no two questions were adjacent. Performance impact questions were taken from prior research by D'Ambra and Wilson (2004) and the wording was modified to fit the context of CRM.

Usage was measured using a 7-point scale utilizing two questions from prior research (Igbaria et al., 1995), self reported frequency and time used, common in MIS research (Bajaj & Nidumolu, 1998; Dishaw & Strong, 2003; Igbaria et al., 1995). The usage questions were adjacent in the questionnaire. Overall satisfaction was measured with a single question using a 7-point scale taken from prior research (Bailey & Pearson, 1983). Voluntariness was measured utilizing three questions taken from prior research (Venkatesh & Davis, 2000) using a 7-point scale. Each question was randomly ordered so no two questions were adjacent. See Appendix H for the questions associated with each variable in the final instrument.

The questionnaire is titled "Customer Relationship Management (CRM) Systems Survey" and is found in Appendix I. The questionnaire packet was eight pages in length and the questionnaire was stapled as a booklet. The packet contained the cover letter explaining the purpose of the research and requesting the respondent's assistance in completing the questionnaire. Page one provided an introduction, confidentiality guarantee, and instructions for completing the survey with an expected return date. Part one is contained in pages two through four and included the TTF questions, the performance impact questions, and the voluntariness questions. The questions in part one were randomly ordered so no two questions within the same dimension were adjacent. There were no references to questions by category.

Part two, located on page four, contained the questions for usage and overall satisfaction. Part three, pages five through six, contained the demographic questions. Demographic questions included questions regarding age, gender, number of years in marketing, number of years in current position, whether the firm was a private or public company, last year's company revenue, number of employees in the firm, the respondents current job title, the highest education level completed, the industry type, how long the CRM system has been operational in the company, the CRM systems being used, and the type of CRM training received. Page 7 contained part four of the survey. Respondents were asked to include their contact information to request a copy of the executive summary of the research.

The survey packet was mailed to the respondents via the United States Postal Service and included a prepaid, self-addressed return envelope.

Prior Studies Utilizing Similar Measures and Procedures

Since the inception of the TTF instrument, various dimensions of the instrument have been used in a number of studies to measure TTF in specific application domains (D'Ambra & Rice, 2001; D'Ambra & Wilson, 2004; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono et al., 2001).

It is common in studies using the TTF model to measure certain dimensions using the TTF instrument applicable to the domain under investigation. Perceived web performance in the travel domain (D'Ambra & Rice, 2001; D'Ambra & Wilson, 2004) was investigated using a combination of Goodhue's TTF factors and additional measures specific to web travel. The result of their study indicates that the TTF model is appropriate for use in the Web domain.

McCarthy (2002) used the TTF model and the instrument to measure the task-technology fit of knowledge management systems. McCarthy found strong support indicating that TTF is appropriate for measuring the fit of knowledge management systems. In addition, McCarthy used a self-administered paper based survey mailed to the respondents in the study. This same method was employed in the present study.

Ioimo (2000) used the TTF model and components of the TTF instrument to measure police mobile computing. Ioimo's results indicated that TTF could be successfully measured in the police domain.

Tjahjono et al. (2001) used the TTF model and components of the TTF instrument to evaluate a manufacturing task support system. The researchers utilized the averages of the composite score for the dimensions of TTF (accuracy, currency, ease of use, meaning, and reliability). The results of the study indicate support for the TTF model.

The majority of the previous studies used self-administered surveys (D'Ambra & Wilson, 2004; Goodhue, 1995,1998; Goodhue & Thompson, 1995; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono et al., 2001) and several noted the use of standard postal mail services (Goodhue, 1995, 1998; Goodhue & Thompson, 1995; McCarthy, 2002) although many did not specify the method of distribution and return.

Multiple linear regression was used in five of the studies (Goodhue, 1995; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono et al., 2001). The matrix of studies is included in Appendix J.

Data Collection

Questionnaires were sent to the respondents via standard mail. For the first distribution, each respondent was requested to complete and return the survey instrument by a specific due date. The data collected was analyzed, coded, and entered into SPSS. Responses were coded numerically 1 to 7 based on the selection of the 7-point scale. Where questions were worded in the negative (questions 3, 7, 9, 11, 13, 14, 15, 18, 19, 29, 30, 34, and 38) the coding was reversed in SPSS to normalize the responses. Each question in the survey was mapped to a variable in SPSS.

Data Analysis and Strategy

Multivariate analysis requires that the assumptions that support the statistical methods be tested (Hair et al., 1998). Normality is the most fundamental assumption in multivariate analysis. Normality refers to the shape of the distribution for an individual metric and its correspondence to the normal distribution. The normal distribution is the benchmark for statistical methods. The simplest test for normality is a visual check of the histogram that compares data values with a distribution that approximates the normal distribution. Histograms for the respective variables are included in Appendix L.

Demographic information was gathered and the results were reported using descriptive statistics. Demographic data was not analyzed using any other statistical methods.

The reliability of the TTF instrument is important because it reflects the internal consistency of the survey. As previously stated, the reliability coefficient assesses the consistency of the entire scale, with "Cronbach's alpha being the most widely used measure" (Hair et al., 1998, p. 118). Cronbach's alpha is a measure of reliability that ranges from 0 to 1. The lower limit of .60 is the generally agreed lower bound of acceptability in exploratory research (Hair et al., 1998) and was used in this study. Cronbach's alpha was used to measure reliability in seven of the previous TTF studies (Goodhue, 1995,1998; Goodhue & Thompson, 1995; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono et al., 2001).

In confirmatory factor analysis, the researcher specifies the general structure of the loadings, and CFA tests the fit of that structure. With CFA, as variables load highly on a factor, they become descriptors of the underlying dimension. Only on examination of the loadings of the variables on the factors does the researcher identify the character of the underlying dimension. CFA was executed on the dimensions that had Cronbach alphas of greater than .60.

After confirming the reliability of the instrument, the association between the constructs was measured. Pearson's correlation coefficient was used to validate the direction of the relationship of the variables in the summated scales for individual characteristics and task characteristics. The range of the product correlation coefficient is from -1 to +1 (Bluman, 1998). If there is a strong positive linear relationship between the variables, the values will be above 0 and closer to 1. If there is no relationship between the variables, the values will be 0. If there is a negative relationship, the values will be less than 0 and closer to -1. Pearson's correlation coefficient was used in six of the previous TTF studies (D'Ambra & Rice, 2001; D'Ambra & Wilson, 2004; Goodhue, 1995; Grossman, 2003; Ioimo, 2000; McCarthy, 2002).

After confirming the reliability of the instrument and the association between the constructs, the hypotheses were tested using linear regression analysis. The purpose of simple regression analysis is to predict the outcome of a single dependent variable based on a single independent variable (Hair et al., 1998). Simple regression analysis was used to measure the relationship of the dimensions of fit for task characteristics against the dependent variable, performance impact. Again, simple regression analysis was used to measure the relationship of the dimension of fit for individual characteristics against the dependent variable, performance impact. Simple regression analysis was used to measure the relationship of the training variable against the dependent variable, performance impact.

Multiple linear regression analysis is appropriate when there is a single dependent variable and multiple independent variables. Multiple linear regression analysis was used to test the relationship of the independent variables (compatibility, currency, flexibility, locatability, meaning, reliability, and the right data) against the dependent variable, performance impact. The results were analyzed using SPSS statistical software.

Limitations

Certain limitations exist with any instrument. The relative age (Goodhue, 1998) of the TTF instrument should be considered since it is a construct for measuring fit of information technology. Due to the rapid pace of change within the field of technology, certain constructs in this instrument may become out of date.

Information technology changes rapidly and may have an affect on the results of the study. There is a possibility that one or more of the questions in the TTF instrument may no longer hold the degree of reliability or validity once held. Despite the relative age of the TTF instrument, it continues to be used in a number of recent studies (D'Ambra & Rice, 2001; D'Ambra & Wilson, 2004; Grossman, 2003; Ioimo, 2000; McCarthy, 2002; Tjahjono et al., 2001) providing evidence that although this is a risk, researchers continue to successfully use this instrument and the TTF model.

Another limitation to be considered is the failure rate of CRM implementations and the possible bias from marketing managers in completing the questionnaire as a result of a difficult implementation. As described in the literature review, CRM systems implementations are often considered a failure. What are not clear are the implications of CRM implementations failure. For example, do companies continue to use the CRM system despite labeling the implementation a failure? Will this influence the evaluations of TTF? To provide possible diagnostic information two questions were added to the demographic section of the survey, "How long has the CRM system been operational in your company?" and "Do you consider the CRM system implementation a success?" The responses to these questions were examined using descriptive statistics. See Appendix I to view the survey instrument.

Conclusion/Summary

Chapter III presented the research design and methodology for this study. The sample and corresponding population were identified. The survey instrument was described in detail along with the methods of the instrument's validation. The research variables and operational definitions, research questions and respective hypotheses were set forth. The procedures, research and design, and an outline of data collection methods utilized were presented.

Chapter IV presents the results of the data analysis and lead in to Chapter V. Chapter V encompasses the conclusions drawn from the results of the data analysis, the limitations of the study, the implications to researchers and practitioners, and possible avenues for future research.

CHAPTER IV

ANALYSIS AND PRESENTATION OF FINDINGS

Chapter IV presents the results of the statistical analysis methods described in Chapter III. It begins with the survey procedure and results, followed by the demographics of the respondents. Normality, outliers, factor analysis, Cronbach's alpha, Pearson's correlations, and multiple regression analysis of the data are described. An analysis of the hypothesis testing is conducted followed by an interpretation of the results. Discussion of the limitations of the study and the implications of the findings appear in Chapter V.

Survey Procedure

The TTF survey was mailed to a total of 1700 respondents in 1543 organizations. The sample was derived from the American Marketing Association's online member database. A random sample through SPSS was created for those members who had entered a marketing management job title into the online database.

The sample was mailed in two separate distributions. The first distribution consisted of 1200 surveys. Three weeks after the initial distribution of 1200, follow up postcards were mailed to the respondents. At the time of the postcard distribution, 65 valid surveys had been returned. After the postcards were mailed, another 23 surveys were returned from the initial distribution. Despite the utilization of follow up postcards, the response rate for the first distribution fell short of the minimum acceptable level. A second distribution was sent out to an additional 500 marketing managers. This resulted in an adequate response rate of 129 and allowed moving forward with the data analysis.

McCarthy (2002) conducted a similar study using the TTF instrument modified for knowledge management systems utilizing the same method of delivery. McCarthy's study resulted in an overall response rate of 38 percent; however, the McCarthy study consisted of 41 organizations that were contacted in advance. McCarthy partially attributed the high response rate to an opportunity for the respondents' to participate in a follow-up study.

In our study, of the first 1200 surveys mailed, 88 respondents completed and returned the survey. Thirty-seven were returned as undeliverable by the postal service. Twenty-one were returned incomplete with no specific comments. Sixty surveys were returned and marked by the respondent that the organization did not have a CRM system. Four respondents returned the survey and noted they were just beginning their CRM implementation.

The first survey distribution resulted in a response rate of 22 percent. However, the actual response rate of completed surveys was 7.25 percent. This number was not adequate and a second mailing was necessary.

The second sample was distributed to 500 respondents. Fifty-two respondents completed and returned the survey. Seventeen were returned as undeliverable by the postal service. Eight were returned incomplete without specific comments. Twelve responded that their organization did not have a CRM system and one respondent commented they were just beginning the CRM implementation. The total response rate from the second sample was 14.6 percent. The actual response rate for completed surveys was 10.4 percent.

In summary, 1700 surveys were mailed and 1023 postcards, 140 respondents completed and returned the survey. Fifty-four were returned as undeliverable by the postal service. Twenty-nine were incomplete without specific comment. Seventy-two returned the survey and marked on the survey that their organization did not have a CRM system. Five respondents returned the survey and noted they were just beginning their CRM implementation. The overall response rate was 14.5 percent with completed surveys at 8.2 percent. After removing incomplete surveys and those that did not fit the study criteria, the number of useable surveys was 129.

Demographics

The respondents were marketing managers who use a commercial CRM system. The age ranges of the respondents varied, with the majority (26.4 percent) between 36 and 40 years of age. The age range distribution is reflected in Table 4.1.

Table 4.1 Respondents by Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	21-25	2	1.6	1.6	1.6
	26-30	14	10.9	10.9	12.4
	31-35	23	17.8	17.8	30.2
	36-40	34	26.4	26.4	56.6
	41-46	18	14.0	14.0	70.5
	46-50	21	16.3	16.3	86.8
	51-55	12	9.3	9.3	96.1
	56-60	4	3.1	3.1	99.2
	Over 60	1	.8	.8	100.0
	Total	129	100.0	100.0	

There was a fairly even distribution of male and female respondents. Table 4.2 shows the distribution of respondents by gender.

Table 4.2 Respondents by Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	69	53.5	54.3	54.3
	Male	58	45.0	45.7	100.0
	Total	127	98.4	100.0	
Missing	No Response	2	1.6		
Total		129	100.0		

The majority of the respondents, 89 percent, had a bachelor's or a master's degree. The distribution is reflected in Table 4.3.

Table 4.3 Respondents Education Level

Highest Education Completed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HS Diploma or GED	1	.8	.8	.8
	Some College, but No Degree	6	4.7	4.7	5.5
	Associates Degree	3	2.3	2.3	7.8
	Bachelor's Degree	53	41.1	41.4	49.2
	Some Graduate School	9	7.0	7.0	56.3
	Masters Degree	53	41.1	41.4	97.7
	Ph.D.	2	1.6	1.6	99.2
	Ph.D.+(Add'l training, post doc, etc.)	1	.8	.8	100.0
	Total	128	99.2	100.0	
Missing	No Response	1	.8		
Total		129	100.0		

Respondents were requested to indicate their current job title. The majority of the respondents were managers or directors/senior managers in marketing. The job titles indicated by "other" were marketing specialists. Job titles are represented in Table 4.4.

Table 4.4 Respondents Job Titles

Current Job Title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chief Marketing Officer or VP of Marketing	19	14.7	14.7	14.7
	Director or Sr Manager of Marketing	47	36.4	36.4	49.6
	Marketing Manager	54	41.9	41.9	82.9
	Other	9	7.0	7.0	100
	Total	129	100.0	100.0	

Respondents were requested to indicate the number of years they had been in their current position. The majority, 85.3 percent, had been in their position less than six years. The distributions are reflected in Table 4.5.

Table 4.5 Number of Years in Current Position

Years in Current Position

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-2 Years	45	34.88	34.88	34.9
	3-4 Years	35	27.13	27.13	62.0
	5-6 Years	30	23.26	23.26	85.3
	7-8 Years	9	6.98	6.98	92.2
	9-10 Years	5	3.88	3.88	96.1
	11+ Years	5	3.88	3.88	100
	Total	129	100	100	

Respondents were asked to indicate the number of years they had been in marketing. The distribution of respondents by the number of years in marketing is reflected in Table 4.6.

Table 4.6 Respondents Number of Years in Marketing

Years in Marketing

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0-2 Years	7	5.4	5.5	5.5
	3-4 Years	15	11.6	11.8	17.3
	5-6 Years	11	8.5	8.7	26.0
	7-8 Years	12	9.3	9.4	35.4
	9-10 Years	15	11.6	11.8	47.2
	11-12 Years	18	14.0	14.2	61.4
	13-14 Years	5	3.9	3.9	65.4
	15 + Years	44	34.1	34.6	100.0
	Total	127	98.4	100.0	
Missing	No Response	2	1.6		
Total		129	100.0		

Respondents were asked to indicate whether the worked for a public company or a private company. They were provided an option to specify that the question did not apply to their situation. Fifty-nine percent of the companies were private organizations. The distribution is reflected in Table 4.7.

Table 4.7 Respondents by Organization Type

Public or Private Company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public	44	34.1	34.4	34.4
	Private	76	58.9	59.4	93.8
	Does Not apply	8	6.2	6.3	100.0
	Total	128	99.2	100.0	
Missing	No Response	1	.8		
Total		129	100.0		

Respondents were asked to indicate their organization's revenue for last year. The majority (55.8 percent) of the organizations had more than twenty million in revenue. Of these, 29 percent were public and 40 percent were private organizations. Last year's revenue is reflected in Table 4.8. Last year's revenue by organization type is reflected in Table 4.9.

Table 4.8 Last Year's Revenue

Last Year's Revenue

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	$100,000 - $249,999	1	.8	.8	.8
	$250,000 - $499,999	3	2.3	2.5	3.3
	$500,000 - $999,999	3	2.3	2.5	5.8
	$1,000,000 - $4,999,999	16	12.4	13.2	19.0
	$5,000,000 - $9,999,999	15	11.6	12.4	31.4
	$10,000,000 - $20,000,000	11	8.5	9.1	40.5
	More than $20,000,000	72	55.8	59.5	100.0
	Total	121	93.8	100.0	
Missing	No Response	8	6.2		
Total		129	100.0		

Table 4.9 Last Year's Revenue by Organization Type

Last Year's Revenue by Organization Type

		Public		Private	
		Frequency	Percent	Frequency	Percent
Last Year's Revenue	$100,000 - $249,999	1	0.8	0	0.0
	$250,000 - $499,999	3	2.5	0	0.0
	$500,000 - $999,999	0	0.0	3	2.5
	$1,000,000 - $4,999,999	1	0.8	12	10.0
	$5,000,000 - $9,999,999	6	5.0	7	5.8
	$10,000,000 - $20,000,000	3	2.5	8	6.7
	More than $20,000,000	29	24.2	40	33.3
	Total	43	35.8	70	58.3

Respondents were asked to indicate the number of employees in their organization. Fifty-five percent of the organizations had more than 500 employees. The distribution of respondents by number of employees is reflected in Table 4.10.

Table 4.10 Number of Employees in Organization

Number of Employees

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25	4	3.1	3.1	3.1
	25-49	13	10.1	10.2	13.3
	50-99	10	7.8	7.8	21.1
	100-199	16	12.4	12.5	33.6
	200-499	14	10.9	10.9	44.5
	500-999	12	9.3	9.4	53.9
	1000-4999	17	13.2	13.3	67.2
	5000 or More	42	32.6	32.8	100.0
	Total	128	99.2	100.0	
Missing	No Response	1	.8		
Total		129	100.0		

Respondents were asked to indicate the industry of their organization. They were requested to select all that applied to their situation. The majority of respondents selected industrial/manufacturing, information technology, banking/financial services and health care. Those who selected the "other" category did not select the standardized categories and made handwritten notes of their industry. The majority of those who selected the "other" category indicated they were non-profits, firms delivering professional services or firms in the entertainment industry. The industry distribution is reflected in Table 4.11 and the distribution of the "other" category for industry type is reflected in Table 4.12.

Table 4.11 Organizations by Industry

Industry

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Banking/Financial Services	18	11.46	11.61	11.61
	Consulting	7	4.46	4.52	16.13
	Education	7	4.46	4.52	20.65
	Government	2	1.27	1.29	21.94
	Health Care	16	10.19	10.32	32.26
	Transportation	3	1.91	1.94	34.19
	Information Technology	19	12.10	12.26	46.45
	Industrial/Manufacturing	28	17.83	18.06	64.52
	Insurance	8	5.10	5.16	69.68
	Wholesale/Retail	6	3.82	3.87	73.55
	Communications	9	5.73	5.81	79.35
	Other	32	20.38	20.65	100.00
	Total	155	98.73	100.00	
Missing	No Response	2	1.27		
Total		157	100.00		

Table 4.12 Organizations by Other Industry Type

Organizations Represented in the Other Industry Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Non Profit	10	31.25	31.25	31.25
	Professional Services	8	25.00	25.00	56.25
	Entertainment	5	15.63	15.63	71.88
	Legal	4	12.50	12.50	84.38
	Construction	2	6.25	6.25	90.63
	Aerospace	1	3.13	3.13	93.75
	Distribution	1	3.13	3.13	96.88
	Utilities	1	3.13	3.13	100.00
Total		32	100.00	100.00	

Respondents were asked to indicate the CRM systems they used in the organization. They were asked to mark all that apply. Siebel, Oracle, and Salesforce.com represented 33 percent of the systems. The distribution of CRM systems are represented in Table 4.13.

Table 4.13 CRM Systems Used by Respondents

CRM Systems Used

	Vendor	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Siebel	18	12.9	12.9	12.9
	Oracle	16	11.5	11.5	24.5
	Salesforce.com	12	8.6	8.6	33.1
	SAP	7	5.0	5.0	38.1
	Lexis Nexis Interaction	6	4.3	4.3	42.4
	Microsoft CRM	6	4.3	4.3	46.8
	PeopleSoft	5	3.6	3.6	50.4
	GoldMine	5	3.6	3.6	54.0
	ACT!	5	3.6	3.6	57.6
	SalesLogix	4	2.9	2.9	60.4
	REPS	3	2.2	2.2	62.6
	Chordiant	2	1.4	1.4	64.0
	Deltek	2	1.4	1.4	65.5
	NetSuite	2	1.4	1.4	66.9
	Raddon	2	1.4	1.4	68.3
	Raisers Edge	2	1.4	1.4	69.8
	Touche	2	1.4	1.4	71.2
	E-piphany	1	0.7	0.7	71.9
	Onyx	1	0.7	0.7	72.7
	Pivotal	1	0.7	0.7	73.4
	CATS	1	0.7	0.7	74.1
	Cognos	1	0.7	0.7	74.8
	Cosential	1	0.7	0.7	75.5
	Elite Apex	1	0.7	0.7	76.3
	EMT Connect	1	0.7	0.7	77.0
	FreeCRM.com	1	0.7	0.7	77.7
	iMIS CRM	1	0.7	0.7	78.4
	Integrasys	1	0.7	0.7	79.1
	Intelliworks	1	0.7	0.7	79.9
	Marquis Software Solution	1	0.7	0.7	80.6
	MARS CRM	1	0.7	0.7	81.3
	Salesjunction	1	0.7	0.7	82.0
	Saratoga	1	0.7	0.7	82.7
	SAS CRM	1	0.7	0.7	83.5
	SPSS	1	0.7	0.7	84.2
	SugarCRM	1	0.7	0.7	84.9
	Other Vendors	10	7.2	7.2	92.1
	Did Not Specify	11	7.9	7.9	100.0
Total		139	100.0	100.0	

Respondents were asked to indicate the type of training they had received for the CRM systems they use. The choices consisted of formal courses, mentoring, online tutorials, learning on their own, or other. The majority of the respondents marked mentoring, followed by formal courses and online tutorials. The distribution is reflected in Table 4.14.

Table 4.14 Type of Training

Type of Training Received

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Formal Course(s)	56	28.14	28.14	28.14
	Mentoring	61	30.65	30.65	58.79
	Online Tutorial	37	18.59	18.59	77.39
	None, I learned on my own	30	15.08	15.08	92.46
	Other (please specify)	15	7.54	7.54	100.00
	Total	199	100.00	100.00	
Missing	No Response	0	0.00		
Total		199	100.00		

Respondents were asked to indicate how frequently they used the CRM system. Thirty-eight percent use the CRM several times a day, where 26.4 percent use the system several times per week. Those who use the system less than once a month or only a few times a month totaled 21.7 percent. Those reporting that they use the system only once per day were the smallest category with 5.4 percent. The distribution is reflected in Table 4.15.

Table 4.15 Frequency of Use of the CRM System

Frequency of Use of the CRM System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than once a month	17	13.2	13.2	13.2
	A few times a month	11	8.5	8.5	21.7
	Once a week	11	8.5	8.5	30.2
	Several times a week	34	26.4	26.4	56.6
	Once a day	7	5.4	5.4	62.0
	Several times a day	49	38.0	38.0	100.0
	Total	129	100.0	100.0	

Respondents were asked to indicate how many hours per day they use the system. The distribution is reflected in Table 4.16.

Table 4.16 Hours per Day of Use

Hours Per Day Respondent's Use the CRM System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1/2 hour per day	43	33.3	34.1	34.1
	1/2 to 1 hour per day	34	26.4	27.0	61.1
	1-2 hours per day	20	15.5	15.9	77.0
	2-3 hours per day	9	7.0	7.1	84.1
	3-4 hours per day	11	8.5	8.7	92.9
	more than 4 hours per day	9	7.0	7.1	100.0
	Total	126	97.7	100.0	
Missing	No Response	3	2.3		
Total		129	100.0		

Respondents were asked to indicate how long the CRM had been operational. The majority of the respondents, 69.4 percent, indicated the system had been operational for more than two years. The distribution is reflected in Table 4.17.

Table 4.17 Timeframe CRM System has been Operational

Timeframe the CRM System has been Operational

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not fully implemented	5	3.9	3.9	3.9
	Less than 6 months	5	3.9	3.9	7.9
	6 months to 2 years	28	21.7	22.0	13.4
	More than 2 years	89	69.0	70.1	100
	Total	127	98.4	100	
Missing	No Response	2	1.6		
Total		129	100.0		

Respondents were asked to indicate if they thought the CRM implementation was a success. The majority, 62 percent, indicated that the implementation was successful. The distribution is reflected in Table 4.18.

Table 4.18 Was the CRM Implementation a Success?

Was the CRM Implementation a Success?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	80	62.0	62.5	62.5
	No	30	23.3	23.4	85.9
	I don't know	18	14.0	14.1	100.0
	Total	128	99.2	100.0	
Missing	No Response	1	.8		
Total		129	100.0		

Respondents were asked to rate their overall satisfaction of the CRM system using a 7 point scale. The majority of the respondents were satisfied (65.9 percent), while 26.7 percent were dissatisfied. The distribution is reflected in Table 4.19.

Table 4.19 Overall Satisfaction with the CRM System

Overall Satisfaction with the CRM System

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely Satisfied	7	5.4	5.4	5.4
	Quite Satisfied	50	38.8	38.8	44.2
	Slightly Satisfied	28	21.7	21.7	65.9
	Neither Satisfied or Dissatisfied	7	5.4	5.4	71.3
	Slightly dissatisfied	19	14.7	14.7	86.0
	Quite Dissatisfied	12	9.3	9.3	95.3
	Extremely Dissatisfie	6	4.7	4.7	100.0
	Total	129	100.0	100.0	

Voluntariness is the extent the marketing manager perceives the use of the CRM system to be optional by his or her management. Forty-two percent of the respondents indicated that use of the system was voluntary, while 71 percent indicated that it was compulsory. The distribution is reflected in Table 4.20.

Table 4.20 Use of the CRM System is Voluntary

Use of the CRM System is Voluntary

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	27	20.9	20.9	20.9
	Moderately Disagree	21	16.3	16.3	37.2
	Slightly Disagree	23	17.8	17.8	55.0
	Neither Agree nor Disagree	16	12.4	12.4	67.4
	Slightly Agree	21	16.3	16.3	83.7
	Moderately Agree	16	12.4	12.4	96.1
	Strongly Agree	5	3.9	3.9	100.0
	Total	129	100.0	100.0	

Respondents were asked to indicate the performance impact the CRM system has on various aspects of their job by rating six different criteria using a 7-point scale. Eighty-eight percent of the marketing managers who responded to the survey indicated that the CRM system had a positive impact on their ability to perform their jobs. Eighty-four percent of respondents indicated that they are better informed about their customers and 83 percent have increased knowledge about their customers because of using the CRM system. Seventy-five percent indicated they are making better marketing decisions due to the CRM system and 71 percent agree they can accomplish their marketing tasks more quickly. Sixty-nine percent agree the quality of their work has improved due to using the CRM system. Overall, marketing managers who participated in this research agree that the CRM system they use has increased their job performance. The distribution of each of the performance impact items are shown in Appendix K.

Missing Data

Missing data is common in multivariate analysis and must be dealt with to prevent hidden biases (Hair et al., 1998). Three of the 140 completed surveys had one or more responses missing from the TTF questions and were excluded from any further analysis.

Normality

Normality is the most fundamental assumption in multivariate analysis (Hair et al., 1998). Normality refers to the shape of the distribution for an individual metric and its correspondence to the normal distribution. The normal distribution is the benchmark for statistical methods. The simplest test for normality is a visual check of the histogram that compares data values with a distribution that approximates the normal distribution.

A bell-shaped curve or distribution indicating that observations or at or close to the mean occur with highest probability, and that the probability of occurrence progressively decreases as observations deviate from the mean.

Histograms for the respective variables are included in Appendix L.

Outliers

Outliers are data points that are distinctly different from the other observations. Outliers must be examined to determine their type of influence and to determine the types of information they may provide to the study (Hair et al., 1998).

Outliers were reviewed and no observations were found that should be eliminated. All observations are similar enough to the remaining observations and will be retained in the multivariate analysis.

Reliability

The reliability of a measure is important because it reflects the internal consistency of the survey questions in an instrument. The reliability coefficient assesses the consistency of the entire scale, with "Cronbach's alpha being the most widely used measure" (Hair et al., 1998, p. 118). Cronbach (1951) suggested that the coefficient alpha can be used as a measure to ensure that there is internal validity of measures that are used within a survey instrument. Cronbach's alpha is a measure of reliability that ranges from 0 to 1. In exploratory research the lower limit of .60 is the generally agreed lower bound of acceptability (Hair et al., 1998).

Reliability coefficients for the 15 dimensions of task-technology fit and the dimensions of performance and voluntariness were measured. The TTF dimension of currency fell below the .60 cut off a coefficient of .57. There were three questions for the dimension of current. One of the questions was dropped from the summated scale and the alpha was raised to .66 allowing for inclusion in the analysis. The independent variable for accuracy fell short of the .60 cut off with a coefficient of .52 and was dropped from further analysis. Goodhue and Thompson (1995) measured the reliability coefficients of the dimensions of task-technology fit. Goodhue and Thompson's results are compared against the results of this study in Table 4.21.

Table 4.21 Reliability Coefficients (Cronbach's Alpha)

Cronbach's Alphas			
Variable	**Items**	**Alphas**	**Goodhue and Thompson's (1995) Alphas**
Level of Detail	2	0.82	0.85
Locatability	2	0.78	0.77
Meaning	2	0.70	0.78
The Right Data	3	0.69	0.83
Accessibility	2	0.82	0.84
Assistance	2	0.77	0.87
Authorization	2	0.63	0.58
Ease of Use	2	0.93	0.77
Flexibility	3	0.68	0.7
System Reliability	2	0.81	0.77
Training	2	0.80	0.66
Accuracy	2	0.52	0.83
Compatibility	2	0.76	0.82
Currency	2	0.66	0.73
Presentation	2	0.89	0.86
Performance	6	0.90	Did not measure.
Voluntariness	3	0.83	Did not measure.

Validity

Having ensured the instrument meets the necessary levels of reliability, the next step is to prove the validity of the instrument (Hair et al., 1998). Validity is the extent which a measure or set of measures correctly represents the concept of study – the degree to which it is free from any systematic or non random error. Validity is concerned with how well the concept is represented by the measures, and reliability relates to the consistency of the measures.

Factor analysis is a generic name given to a class of powerful multivariate statistical methods (Hair et al., 1998). Factor analysis is concerned with exploring the patterns of relationships among a number of variables. These patterns are represented by what are termed principal components or factors. The primary purpose of factor analysis is to define the underlying structure of data in a data matrix. Factor analysis solves the problem of analyzing interrelationships (correlations) between large numbers of variables by raising a set of common underlying dimensions known as factors.

With CFA, as variables load highly on a factor, they become descriptors of the underlying dimension. Only on examination of the loadings of the variables on the factors does the researcher identify the character of the underlying dimension.

The independent variables of task-technology fit have been separated into individual characteristics (accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training) and task characteristics (compatibility, currency, flexibility, locatability, meaning, reliability, and the right data). Accuracy was excluded in the factor analysis due to low reliability.

A principal components confirmatory factor analysis was conducted to assess the structure of the individual characteristics, task characteristics and the performance impact subscales. The factor analysis revealed that all performance items loaded strongly on one factor. All items had eigenvalues greater than .50 and over 66 percent of the variance was accounted for by this single factor.

The factor analysis revealed that all individual characteristic items loaded strongly on one factor. All items had eigenvalues greater than .50. Roughly, 52 percent of the variance was accounted for by this single factor.

Finally, factor analysis revealed that all task items loaded strongly on one factor. All items had eigenvalues greater than .50. Roughly, 38 percent of the variance was accounted for by this single factor. All factor loadings are shown in Appendix M.

<u>Research Question 1</u>

Is there a relationship between individual characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?

Research question one is addressed by Hypothesis 1.

Individual characteristics measure the extent that the individual's skills and ability affect the fit of the system. Individual characteristics were measured using the following seven dimensions of TTF (accessibility, assistance, authorization, ease of use, presentation, the right level of detail, and training). The operational definition of each dimension is stated below:

1. Accessibility is the degree of ease the marketing manager has in accessing the CRM system.

2. Assistance is the degree of ease the marketing manager has in getting help accessing and understanding the information in the CRM system.
3. Authorization is the degree of ease the marketing manager has in getting permission to access the information within the CRM system.
4. Ease of use is the degree of ease the marketing manager has in using the CRM system.
5. Presentation is the how well the marketing manager finds the information to be displayed or printed in the CRM system.
6. The right level of detail is the degree the marketing manager finds the information in the CRM system to contain enough information at the appropriate level of detail.
7. Training is the degree of instruction available for learning how to use the CRM system.

Analysis of Hypothesis 1

$H1_0$: There is no relationship or a negative relationship between individual characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.

$H1_a$: There is a positive relationship between individual characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.

We hypothesized that there is a positive relationship between individual characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix N) revealed a moderate, statistically significant positive correlation between individual characteristics of task-technology fit and performance impact (r = .53, p =.00), as TTF increased performance increased. Additionally, a linear regression was conducted to test whether the individual characteristics of TTF would predict performance impact (see Table 4.22). The individual characteristics of TTF explained 28 percent of the total variance in performance impact ($R^2 = .287$, $p < .001$), $F(1, 128) = 51.09$, $p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 1 that there is a positive relationship between individual characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system. SPSS output is located in Appendix P.

Table 4.22 - Hypothesis 1

Regression Coefficients[a]

Variable	B	SEB	ß	p
Individual Characteristics of TTF	0.534	0.075	0.536	.00*

a. Dependent Variable: Performance Impact

Research Question 2

Is there a relationship between task characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?

Research question two is addressed by Hypothesis 2.

Task characteristics of TTF measure the extent the CRM system fits the tasks required by marketing managers to carry out their job responsibilities. Task characteristics were measured using the seven task dimensions of TTF (compatibility, currency, flexibility, locatability, meaning, reliability, and the right data). The operational definitions of the task characteristics TTF are stated below:

1. Compatibility is defined as the degree to which information in the CRM system matches data from other sources.
2. Currency is defined as the degree the information in the CRM system is up to date enough for the purposes of the marketing manager.
3. Flexibility is the degree the CRM system's reports and data can be adapted to meet the changing business needs of marketing managers.
4. Locatability is the degree of ease the marketing manager has in finding information within the CRM system.
5. Meaning is the degree of ease the marketing manager has in understanding the data elements in the CRM system.
6. Reliability is the degree the CRM system is available when needed by the marketing manager.
7. The right data is the degree the CRM system contains the information needed by the marketing manager.

Analysis of Hypothesis 2

$H2_o$: There is no relationship or a negative relationship between task characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.

$H2_a$: There is a positive relationship between task characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.

We hypothesized that there is a positive relationship between task characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a significant positive correlation between task characteristics of task-technology fit and performance impact ($r = .46, p = .00$), as task characteristics increased, performance increased. A linear regression was conducted to test whether the task characteristics of TTF would predict performance impact (see Table 4.23). There was a main effect for Task characteristics of TTF which explained 22 percent of the total variance in performance impact ($R^2 = .224, p < .001$), $F(1, 128) = 37.93, p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 2 that there is a positive relationship between task characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system. SPSS output is located in Appendix P.

Table 4.23 - Hypothesis 2

Regression Coefficients[a]

Variable	B	SEB	ß	p
Task Characteristics of TTF	0.545	0.089	0.480	.00*

a. Dependent Variable: Performance Impact

Research Question 3

Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?

Research question 3 is addressed by Hypotheses 3 through 10.

Analysis of Hypothesis 3

$H3_0$: There is no relationship or a negative relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.

$H3_a$: There is a positive relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.

We hypothesized that there is a positive relationship between accuracy of TTF and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data. However, Hypothesis 3 was dropped from the study because the Cronbach's alpha (.52) for accuracy was too far below the cutoff point (.60) for exploratory research.

Analysis of Hypothesis 4

$H4_o$: There is no relationship or a negative relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.

$H4_a$: There is a positive relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.

We hypothesized that there is a positive relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a low positive correlation between compatibility and performance impact (r = .23, p =.00), as compatibility increased, performance increased slightly. A linear regression was conducted to test whether compatibility would predict performance impact (see Table 4.24). Compatibility explained five percent of the total variance in performance impact (R^2 = .052, $\underline{p}$ < .001), $F(1, 128)$ =6.93, p <.01. The Null Hypothesis is rejected therefore there is support for Hypothesis 4 that there is a positive relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data. SPSS output is located in Appendix P.

Table 4.24 - Hypothesis 4

Regression Coefficients[a]

Variable	B	SEB	ß	p
Compatibility	0.182	0.069	0.227	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 5

$H5_0$: There is no relationship or a negative relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.

$H5_a$: There is a positive relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.

We hypothesized that there is a positive relationship between currency and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a low positive correlation between currency and performance impact (r = .389, p =.00), as currency increased, performance increased slightly. A linear regression was conducted to test whether currency would predict performance impact (see Table 4.25). Currency explained 14 percent of the total variance in performance impact ($R^2 = .145, p < .001$), $F(1, 128)$

=22.657, $p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 5 that there is a positive relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data. SPSS output is located in Appendix P.

Table 4.25 - Hypothesis 5

Regression Coefficients[a]

Variable	B	SEB	ß	p
Currency	0.319	0.067	0.389	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 6

$H6_0$: There is no relationship or a negative relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.

$H6_a$: There is a positive relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.

We hypothesized that there is a positive relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system.

Correlational analysis (as shown in Appendix O) revealed a low positive correlation between flexibility and performance impact (r = .359, p =.00), as flexibility increased, performance increased slightly. A linear regression was conducted to test whether flexibility would predict performance impact (see Table 4.26). Flexibility explained 12 percent of the total variance in performance impact ($R^2 = .122, p < .001$), $F(1, 128) = 18.847, p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 6 that there is a positive relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data. SPSS output is located in Appendix P.

Table 4.26 - Hypothesis 6

Regression Coefficients[a]

Variable	B	SEB	ß	p
Flexibility	0.303	0.070	0.359	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 7

$H7_0$: There is no relationship or a negative relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.

$H7_a$: There is a positive relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.

We hypothesized that there is a positive relationship between locatability and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a low positive correlation between locatability and performance impact (r = .355, p =.00), as locatability increased, performance increased slightly. A linear regression was conducted to test whether locatability would predict performance impact (see Table 4.27). Locatability explained 12 percent of the total variance in performance impact (R^2 = .119, p < .001), F(1, 128) =18.282, p <.01. The Null Hypothesis is rejected therefore there is support for Hypothesis 7 that there is a positive relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data. SPSS output is located in Appendix P.

Table 4.27 - Hypothesis 7

Regression Coefficients[a]

Variable	B	SEB	ß	p
Locatability	0.264	0.062	0.355	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 8

$H8_0$: There is no relationship or a negative relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.

$H8_a$: There is a positive relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.

We hypothesized that there is a positive relationship between meaning and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a low positive correlation between meaning and performance impact ($r = .398$, $p = .00$), as meaning increased, performance increased slightly. A linear regression was conducted to test whether meaning would predict performance impact (see Table 4.28). Meaning explained 16 percent of the total variance in performance impact ($R^2 = .159$, $p < .001$), $F(1, 128) = 23.944$, $p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 8 that there is a positive relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data. SPSS output is located in Appendix P.

Table 4.28 - Hypothesis 8

Regression Coefficients[a]

Variable	B	SEB	ß	p
Meaning	0.319	0.065	0.398	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 9

$H9_0$: There is no relationship or a negative relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.

$H9_a$: There is a positive relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.

We hypothesized that there is a positive relationship between reliability and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a low positive correlation between reliability and performance impact ($r = .307, p = .00$), as reliability increased, performance increased slightly. A linear regression was conducted to test whether reliability would predict performance impact (see Table 4.29). Reliability explained nine percent of the total variance in performance impact ($R^2 = .087, p < .001$), $F(1, 128)$

=13.224, p <.01. The Null Hypothesis is rejected therefore there is support for Hypothesis 9 that there is a positive relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data. SPSS output is located in Appendix P.

Table 4.29 - Hypothesis 9

Regression Coefficients[a]

Variable	B	SEB	ß	p
Reliability	0.258	0.071	0.307	.00*

a. Dependent Variable: Performance Impact

Analysis of Hypothesis 10

$H10_0$: There is no relationship or a negative relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.

$H10_a$: There is a positive relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.

We hypothesized that there is a positive relationship between the right data and the performance impact of marketing managers who use a commercial CRM system.

Correlational analysis (as shown in Appendix O) revealed a low positive correlation between the right data and performance impact (r = .365, p =.00), as the right data increased, performance increased slightly. A linear regression was conducted to test whether the right data would predict performance impact (see Table 4.30) The right data explained 13 percent of the total variance in performance impact ($R^2 = .126, p < .001$), $F(1, 128) = 19.488, p < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 10 that there is a positive relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability. SPSS output is located in Appendix P.

Table 4.30 - Hypothesis 10

Regression Coefficients[a]

Variable	B	SEB	ß	p
The Right Data	0.310	0.070	0.365	.00*

a. Dependent Variable: Performance Impact

A multiple linear regression was conducted to test the ability of compatibility, currency, flexibility, locatability, meaning, reliability and the right data to predict performance impact (see Table 4.31). This model explained 25 percent of the total variance in performance impact ($R^2 = .25, p < .001$). While the model as a whole was significant, $F(1, 128) = 5.776, p < .01$, there were no significant main effects for performance impact.

Table 4.31 - Subscales Research Question 3

Table 4.35 - Subscales - Research Question 3 - Regression Coefficient[a]

Variable	B	SEB	ß	p
Compatibility	.000	.077	.000	.584
Currency	.121	.088	.147	.175
Flexibility	.115	.086	.137	.182
Locatibility	.000	.087	.074	.527
Meaning	.151	.092	.189	.103
Reliability	.000	.078	.060	.523
The Right Data	.000	.095	.100	.373

a. Dependent Variable: Performance Impact

Research Question 4

Is there a relationship between training and the performance impact of marketing managers who utilize a commercial CRM system?

Training is a subscale of the individual characters of TTF. Training was singled out as it was thought to be an important attribute that may significantly affect the performance impact of marketing managers who use a CRM System. Training is the degree of instruction available for learning how to use the CRM system. Research question 4 is addressed by Hypothesis 11.

Analysis of Hypothesis 11

$H11_0$: There is no relationship or a negative relationship between training and the performance impact of marketing managers who use a commercial CRM system.

$H11_a$: There is a positive relationship between training and the performance impact of marketing managers who use a commercial CRM system.

We hypothesized that there is a positive relationship between training and the performance impact of marketing managers who use a commercial CRM system. Correlational analysis (as shown in Appendix O) revealed a positive correlation between training and performance impact (r = .366, p =.00), as training increased, performance increased. A linear regression was conducted to test whether training would predict performance impact (see Table 4.32). Training explained 13 percent of the total variance in performance impact ($\underline{R}^2 = .127$, $\underline{p} < .001$), $\underline{F}(1, 128) = 19.611$, $\underline{p} < .01$. The Null Hypothesis is rejected therefore there is support for Hypothesis 11 that there is a positive relationship between training and the performance impact of marketing managers who use a commercial CRM system. SPSS output is shown in Appendix P.

Table 4.32 - Hypothesis 11

Regression Coefficients[a]

Variable	B	SEB	ß	p
Training	0.252	0.570	0.366	.00*

a. Dependent Variable: Performance Impact

Conclusion

In this chapter, the survey procedure and results were described, followed by the presentation of the demographics of the respondents. The basis for determining the reliability and the validity of the instrument were described. An analysis of the hypotheses testing was conducted followed by an interpretation of the results. Hypotheses 1, 2, and 4 through 11 were supported, while Hypothesis 3 was dropped from the analysis because of the failure to demonstrate the reliability of the 'accuracy' variable. A discussion of the limitations of the study and the implications of the findings appears in Chapter 5.

CHAPTER V

SUMMARY AND CONCLUSIONS

Chapter V presents our summary and the conclusions of the study. The first section summarizes and interprets the results of the study. The second section presents the limitations of the study. The third section discusses the implications of the study. The final section discusses possible future research based on the results of this study.

Summary

The purpose of this study was to explore the task-technology fit of CRM systems and the resultant performance impact realized by marketing managers. Goodhue's (1995) model of task-technology fit was the theoretical foundation of this research. The study utilized Goodhue's (1998) TTF instrument with additional measures added for usage (Igbaria et al., 1995), overall satisfaction (Bailey & Pearson, 1983), voluntariness (Venkatesh & Davis, 2000), and performance impact (D'Ambra & Wilson, 2004).

The research questions answered were:

1. Is there a relationship between individual characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?
2. Is there a relationship between task characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?

3. Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?
4. Is there a relationship between training and the performance impact of marketing managers who utilize a commercial CRM system?

Seventeen hundred surveys were mailed to marketing managers in 1543 organizations. Out of the distribution, 201 were returned by the respondents resulting in a response rate of 12 percent. One hundred and forty of the returned forms were completed; three were eliminated due to missing data and eight were eliminated because the respondents did not use a commercial CRM system. This resulted in 129 surveys and a final response rate of 7.5 percent.

Demographic information was gathered and the results were reported using descriptive statistics. Demographic data was not analyzed using any other statistical methods.

Reliability of the instrument was measured using Cronbach's alpha (Hair et al., 1998). The lower bound of .60 was the cutoff point for usage of the TTF items. One independent variable (accuracy) was eliminated from final analysis due to the low Cronbach's alpha score.

Validity of the instrument was measured using principal components confirmatory factor analysis. The factor analysis revealed that all items for each scale (individual characteristics, task characteristics, and performance impact) loaded strongly on one factor. Pearson's correlation coefficient was used to validate the direction of the relationship of the variables in the summated scales for TTF and performance impact. All hypotheses were tested using linear regression analysis.

Conclusions

Goodhue and Thompson (1995) posited that if the available technology meets the task requirements and if individuals have the skills to use the system, they will use it to perform their portfolio of tasks. The TTF model measures the degree to which a technology helps individuals perform their assortment of tasks. Essentially, TTF measures the match between the individuals' task requirements, the individuals' abilities, and the system's functionality. TTF is high when the gap between the individuals' task needs and the technology's functionality is small. As tasks become more demanding or technologies offer less functionality, the gap widens and TTF is lower.

Goodhue and Thompson (1995) postulated that technology will have a positive impact on performance if the technology is used and if the technology fits the tasks requirements of the user.

This study supports the findings in prior work suggesting the positive link between TTF and performance impact (Vessey, 1991; Goodhue, 1995; Goodhue & Thompson, 1995). In addition, this research confirms that TTF can be utilized to measure the success of customer relationship management systems as they relate to performance impact as described in this study. Overall, our research indicates support for the TTF model.

Limitations of the Study

This study measured the TTF and the performance impact of commercial CRM systems used by marketing managers. The results of this study cannot be generalized for all departments in a company. Further generalizability is limited.

All measures in this study are based on the supposition that the respondents answered the questions honestly in the questionnaire.

We had no control over the CRM systems being utilized by the respondents. Therefore, the analysis of the results in this study covers a number of commercial CRM systems and cannot be generalized to any particular software package or vendor.

Implications for Research

Our research complements prior studies by adding to the growing body of literature that measures the success of information systems using the task-technology fit model. In addition, this is the first study to measure the TTF of commercial CRM systems.

Our study implemented a variant on the performance impact construct taken from prior work by D'Ambra and Wilson (2004). This was successfully measured and could be used in future studies to measure performance in other domains.

Our study has contributed to the research in the CRM domain by providing empirical data on the success of commercial CRM systems as used by marketing managers and finally, that IS success measures apply to CRM systems.

Implications for Practice

Marketing managers reported that their use of the CRM system has provided a positive impact on their ability to perform their jobs. In addition, they reported they were better informed about their customers and knew more about their customers because of the information in the CRM system. The use of the CRM system has led to better decisions by marketing managers as reported in the sample and the ability to perform their job functions more quickly. Our study indicates that CRM systems improve the performance of marketing managers.

Another consideration for practitioners is to consider the training the marketing managers receive for the CRM system. Our results indicate that the better marketing managers are trained (the higher the training), the higher the job performance (performance impact).

The compatibility variable captured the degree to which information in the CRM system matched the data from other sources. Our study indicated that the majority of the respondents (83 percent) reported it was difficult to compare or aggregate the data with other sources and it was inconsistent with information from other systems. This is an area that practitioners may want to consider.

Another area of interest to practitioners would be to examine the individual constructs as they may provide insight into overall satisfaction.

Prior research has indicated that most customer relationship management efforts fail (Bull, 2003; Croteau & Li, 2003; Rigby et al., 2002; Woodcock & Starkey, 2001). Our results indicate that the majority (62 percent) of marketing managers felt the CRM implementations in their organizations were a success and the majority was satisfied

(65.9 percent) with their CRM system.

Future Research

There have been very few empirical studies to date that measure the success of CRM systems. The lack of empirical data has highlighted a critical need for future research into this multi billion dollar business as this domain is growing every year. One specific avenue for future research is to expand the scope of this study to include other departments that use the CRM systems. Another possibility for future research is to modify the TTF questionnaire to target specific CRM modules used by marketing departments. A study of this specificity may provide insight into areas of strength and weaknesses in the CRM product offerings. Our study measured CRM systems as a whole from the marketing management point of view.

Concluding Remarks

Task-technology fit has been shown as an effective framework for many technology domains including managerial decision making (Ferratt & Vlahos, 1998; Goodhue, 1995; Goodhue & Thompson, 1995; Goodhue, 1998), software maintenance tool usage (Dishaw & Strong, 1998), group support systems (Zigurs & Buckland, 1998), police mobile computing (Ioimo, 2000), knowledge management systems (McCarthy, 2002), the unified modeling language (Grossman, 2003) and Internet usage outside the work domain (D'Ambra & Rice, 2001; D'Ambra & Wilson (2004). Our study adds customer relationship management to the list.

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APPENDIX A

MARKETING MANAGER JOB ACTIVITIES

APPENDIX A

MARKETING MANAGER JOB ACTIVITIES

A marketing manager plans, directs, and coordinates the marketing of an organization's products and/or services and performs a number of duties either personally or through subordinate supervisors (*KnowledgePoint*, 2006). Marketing managers are generally responsible for the following:

1. Establishing marketing goals to ensure marketing share and profitability of products and services,
2. Developing and executing marketing plans and programs,
3. Researching, analyzing, and monitoring financial, technological, and demographic factors to capitalize on market opportunities and to minimize competitive activity,
4. Planning and overseeing the organization's advertising and promotion activities,
5. Communicating with advertising agencies on marketing campaigns,
6. Overseeing copywriting, design, layout, paste-up, and production of promotional materials,
7. Developing and recommending pricing strategies to maximize market share over the long run,
8. Ensuring satisfactory profit/loss ratio and share of market performance in relation to pre-set standards and to general and specific trends within the industry and the economy,

9. Ensuring effective control of marketing results through the achievement of marketing objectives,
10. Managing the marketing budget,
11. Evaluating market reactions to advertising programs, merchandising policy, and product packaging and formulation,
12. Adjusting marketing and strategy plans based on competitive conditions and feedback from advertising programs.
13. Conducting marketing surveys on current and new product concepts, and
14. Preparing marketing activity reports (*KnowledgePoint*, 2006).

APPENDIX B

PERFORMANCE IMPACT CONSTRUCT

APPENDIX B

PERFORMANCE IMPACT CONSTRUCT

Construct	Measure	Variable Name	Question	Source
Performance Impact	Average score for all variables.	Perf1	I can accomplish marketing tasks more quickly because of my CRM system use.	(D'Ambra & Wilson, 2004)
		Perf2	I make better marketing decisions because of the information I get from the CRM system.	(D'Ambra & Wilson, 2004)
		Perf3	I have increased my knowledge about my customers because of my CRM system use.	(D'Ambra & Wilson, 2004)
		Perf4	Because of my CRM system use, I am better informed about my customers.	(D'Ambra & Wilson, 2004)
		Perf5	Using the CRM system has a positive impact on my ability to perform my job.	(D'Ambra & Wilson, 2004)
		Perf6	The quality of my work has improved because of using the CRM system.	(D'Ambra & Wilson, 2004)

APPENDIX C

INDIVIDUAL CHARACTERISTICS OF TTF

APPENDIX C

INDIVIDUAL CHARACTERISTICS OF TTF

Measure	Dimension	Meaning	Variable Name	Question	Source
Summated scale is the average of the composite scores for each dimension	Accessibility	Is it easy to access to the system?	Accs1	It is easy to get access to the information in the CRM system that I need.	(Goodhue, 1998)
			Accs2	I can get information quickly and easily from the CRM system when I need it.	(Goodhue, 1998)
	Assistance	Is it easy to get help accessing and understanding the information in the system?	Asst1	It is easy to get assistance when I am having trouble finding or using information from the CRM system.	(Goodhue, 1998)
			Asst2	I am getting the help I need in accessing and understanding the information in the CRM system.	(Goodhue, 1998)
	Authorization	Is it easy to get authorization to the information within the system?	Auth1	Information in the CRM system that would be useful to me is unavailable because I don't have the right authorization.	(Goodhue, 1998)
			Auth2	Getting authorization to access information in the CRM system that would be useful in my job is time consuming and difficult.	(Goodhue, 1998)
	Ease of use	Is the system easy to use?	Ease1	The CRM system is convenient and easy to use.	(Goodhue, 1998)
			Ease2	It is easy to learn how to use the CRM system.	(Goodhue, 1998)

APPENDIX C

INDIVIDUAL CHARACTERISTICS OF TTF

Measure	Dimension	Meaning	Variable Name	Question	Source
	Presentation	How well is the information presented within the system?	Pres1	The information in the CRM system that I need is displayed in a readable and understandable format.	(Goodhue, 1998)
			Pres2	The information in the CRM system is presented in a readable and useful format.	(Goodhue, 1998)
	The right level of detail	Is the information in the system at the appropriate level of detail?	Detl1	Sufficiently detailed information is maintained in the CRM system.	(Goodhue, 1998)
			Detl2	The information in the CRM system is at an appropriate level of detail for my purposes.	(Goodhue, 1998)
	Training	Is there sufficient training available on the system?	Trng1	There is not enough training on how to find, understand, access or use the CRM system.	(Goodhue, 1998)
			Trng2	I am getting the training I need to be able to use the CRM system effectively in my job.	(Goodhue, 1998)

APPENDIX D

TASK CHARACTERISTICS OF TTF

APPENDIX D

TASK CHARACTERISTICS OF TTF

Measure	Dimension	Meaning	Variable Name	Question	Source
Summated scale is the average of the composite scores for each dimension.	Accuracy	Is the information accurate in the CRM system?	Acry1	The information within the CRM system that I use or would like to use is accurate enough for my purposes.	(Goodhue, 1998)
			Acry2	There are accuracy problems in the information in the CRM system that I use or need.	(Goodhue, 1998)
	Compatibility	Does the information match the information from other sources?	Cmpt1	There are times when the information in the CRM system in inconsistent with information from other systems.	(Goodhue, 1998)
			Cmpt2	When it is necessary to compare or aggregate information from the CRM system with different sources, there may be unexpected or difficult inconsistencies.	(Goodhue, 1998)
	Currency	Is the information current enough?	Curr1	I can't get information from the CRM that is current enough to meet my needs.	(Goodhue, 1998)
			Curr2	The information in the CRM system is up-to-date enough for my purposes.	(Goodhue, 1998)
			Curr3	I need some information on the up-to-the-minute status of operations or events but cannot get it from the CRM system.	(Goodhue, 1998)

APPENDIX D

TASK CHARACTERISTICS OF TTF

Measure	Dimension	Meaning	Variable Name	Question	Source
	Flexibility	Is the system flexible enough when needs change?	Flex1	I am not getting as quick a turnaround as I need on requests for new reports or information from the CRM system.	(Goodhue, 1998)
			Flex2	When business requirements change it is easy to change the selection and format of information made available by our CRM system.	(Goodhue, 1998)
			Flex3	The CRM system is too inflexible to be able to respond to my changing needs for information.	(Goodhue, 1998)
	Locatability	Is it easy is it to locate information within the system?	Loct1	It is easy to locate information in the CRM system on a particular issue, even if I haven't used that information before.	(Goodhue, 1998)
			Loct2	It is easy to find out what information is contained in the CRM system.	(Goodhue, 1998)
	Meaning	Is it easy is it to understand the data elements?	Meng1	The exact meaning of data elements in the CRM system is either obvious, or easy to find out.	(Goodhue, 1998)
			Meng2	The exact definition of data fields in the CRM system relating to my tasks is easy to find out.	(Goodhue, 1998)
	Reliability	Is the system up and running when it is	Reli1	I can count on the CRM system to be "up" and available when I need it.	(Goodhue, 1998)

APPENDIX D

TASK CHARACTERISTICS OF TTF

Measure	Dimension	Meaning	Variable Name	Question	Source
		needed?	Reli2	The CRM system is subject to frequent system problems and crashes.	(Goodhue, 1998)
	The Right Data	Does the system contain the right information?	Data1	It is more difficult to do my job effectively because some of the information I need is not available in the CRM system.	(Goodhue, 1998)
			Data2	The information maintained in the CRM system is exactly what I need to carry out my tasks.	(Goodhue, 1998)
			Data3	The CRM system that is available to me is missing critical information that would be very useful to me in my job.	(Goodhue, 1998)

APPENDIX E

MATRIX OF RESEARCH QUESTIONS AND HYPOTHESES

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
1) Is there a relationship between individual characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Individual Characteristics of TTF	$H1_0$:	There is no relationship or a negative relationship between individual characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.	Simple linear regression
		$H1_a$:	There is a positive relationship between individual characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.	
2) Is there a relationship between task characteristics of TTF and the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Task Characteristics of TTF	$H2_o$:	There is no relationship or a negative relationship between task characteristics of task-technology fit and the performance impact of marketing managers who use a commercial CRM system.	Simple linear regression
		$H2_a$:	There is a positive relationship between task characteristics of task-technology fit and the performance of marketing managers who use a commercial CRM system.	

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Accuracy	$H3_o$:	There is no relationship or a negative relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.	Multiple linear regression
		$H3_a$:	There is a positive relationship between accuracy and the performance impact of marketing managers who use a commercial CRM system controlling for compatibility, currency, flexibility, locatability, meaning, reliability, and the right data.	
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Compatibility	$H4_o$:	There is no relationship or a negative relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.	Multiple linear regression
		$H4_a$:	There is a positive relationship between compatibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, currency, flexibility, locatability, meaning, reliability, and the right data.	

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Currency	$H5_o$:	There is no relationship or a negative relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.	Multiple linear regression
		$H5_a$:	There is a positive relationship between currency and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, flexibility, locatability, meaning, reliability, and the right data.	
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Flexibility	$H6_o$:	There is no relationship or a negative relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.	Multiple linear regression
		$H6_a$:	There is a positive relationship between flexibility and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, locatability, meaning, reliability, and the right data.	

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Locatability	$H7_o$:	There is no relationship or a negative relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.	Multiple linear regression
		$H7_a$:	There is a positive relationship between locatability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, meaning, reliability, and the right data.	
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Meaning	$H8_o$:	There is no relationship or a negative relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.	Multiple linear regression

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
		$H8_a$:	There is a positive relationship between meaning and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, reliability, and the right data.	
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Reliability	$H9_o$:	There is no relationship or a negative relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.	Multiple linear regression
		$H9_a$:	There is a positive relationship between reliability and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and the right data.	

APPENDIX E

MATRIX OF RESEARCH QUESTIONS

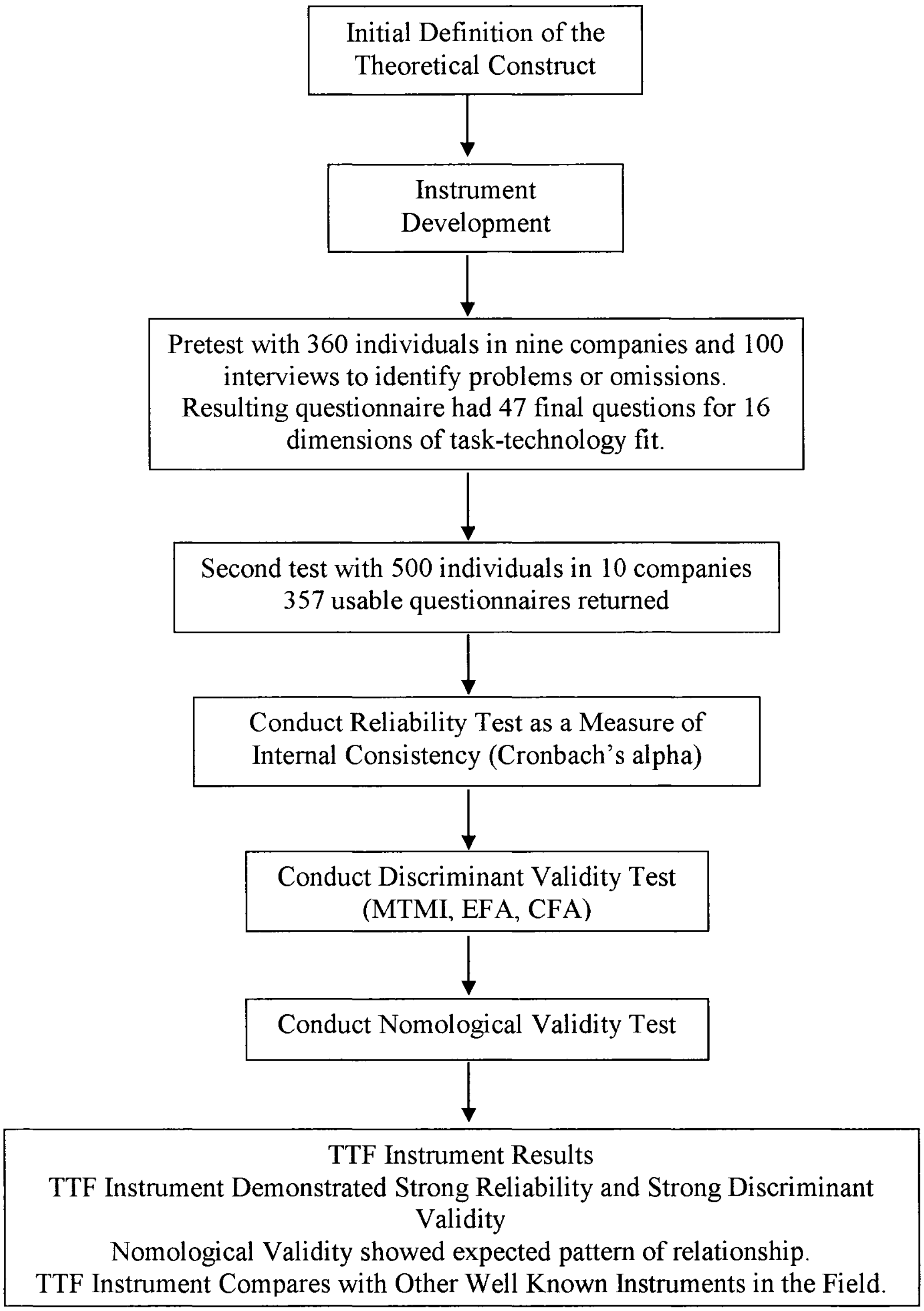
Research Question	Variables DV and IV	Hypothesis #	Hypothesis	Measure
3) Which task characteristics of TTF are related to the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: The right data	$H10_o$:	There is no relationship or a negative relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.	Multiple linear regression
		$H10_a$:	There is a positive relationship between the right data and the performance impact of marketing managers who use a commercial CRM system controlling for accuracy, compatibility, currency, flexibility, locatability, meaning, and reliability.	
4) Is there a relationship between training and the performance impact of marketing managers who utilize a commercial CRM system?	DV: Performance Impact IV: Training	$H11_o$:	There is no relationship or a negative relationship between training and the performance impact of marketing managers who use a commercial CRM system.	Simple linear regression
		$H11_a$:	There is a positive relationship between training and the performance impact of marketing managers who use a commercial CRM system.	

APPENDIX F

GOODHUE'S (1998) PROCESS FOR VALIDATION OF THE TTF INSTRUMENT

APPENDIX F

GOODHUE'S (1998) PROCESS FOR VALIDATION OF THE TTF INSTRUMENT



APPENDIX G

TTF COMPARISON WITH BAILEY AND PEARSON'S USER INFORMATION SATISFACTION (UIS) AND DOLL AND TORKZADEH'S END USER COMPUTER SATISFACTION (EUCS)

APPENDIX G

TTF COMPARISON WITH BAILEY AND PEARSON'S UIS AND DOLL AND TORKZADEH'S EUCS

	Bailey and Pearson (1983)	**Doll and Torkzadeh (1988)**	**Task-technology Fit instrument (1998)**
Conceptual Base	Job Satisfaction	UIS is Assumed Surrogate for Decision Utility	Task-Technology FIT
How Conceptual Base is Used	Identify Causes of overall user information satisfaction	Select subset of previous UIS dimensions applicable to EUC	Develop task model for managerial use of data, identify key dimensions of TTF
How Questions are Generated	Literature scan, interviews	Literature scan, interviews	Task model, literature scan, interviews
Scope	All systems & services; intended for mainframe	A specific EUC application (but no IS services, assistance, etc.); intended for EUC only	All systems & services (related to managerial use of data); intended for mainframe and EUC
Questions Elicit	Beliefs and/or feeling about individual and/or organizational experience	Beliefs about individual experience	Beliefs about individual experience
Number of Questions	39;33;13 (3 different versions)	12	32
Number of Valid Constructs	3 (discovered empirically)	5 (targeted)	12 (targeted)
Specific Constructs	EDP Staff and Services, Information Product, Knowledge or Involvement	Content, Accuracy, Timeliness, Ease of Use, Format	Level of Detail, Accuracy, Currency, Ease of Use of Hardware and Software, Presentation, Compatibility (across different sources), Meaning (of data items), Confusion (in file organization), Locatability (of needed data), Accessibility (of needed data), Assistance, Systems Reliability

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	22	Individual	Accs1	Accessibility	It is easy to get access to the information in the CRM system that I need.
(Goodhue, 1998)	41	Individual	Accs2	Accessibility	I can get information quickly and easily from the CRM system when I need it.
(Goodhue, 1998)	17	Individual	Asst1	Assistance	It is easy to get assistance when I am having trouble finding or using information from the CRM system.
(Goodhue, 1998)	27	Individual	Asst2	Assistance	I am getting the help I need in accessing and understanding the information in the CRM system.
(Goodhue, 1998)	18	Individual	Auth1	Authorization	Information in the CRM system that would be useful to me is unavailable because I don't have the right authorization.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	3	Individual	Auth2	Authorization	Getting authorization to access information in the CRM system that would be useful in my job is time consuming and difficult.
(Goodhue, 1998)	28	Individual	Detl1	The right level of detail	Sufficiently detailed information is maintained in the CRM system.
(Goodhue, 1998)	42	Individual	Detl2	The right level of detail	The information in the CRM system is at an appropriate level of detail for my purposes.
(Goodhue, 1998)	10	Individual	Ease1	Ease of use	The CRM system is convenient and easy to use.
(Goodhue, 1998)	5	Individual	Ease2	Ease of use	The CRM system is straightforward and easy to access and use.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	36	Individual	Pres1	Presentation	The information in the CRM system that I need is displayed in a readable and understandable format.
(Goodhue, 1998)	40	Individual	Pres2	Presentation	The information in the CRM system is presented in a readable and useful format.
(Goodhue, 1998)	14	Individual	Trng1	Training	There is not enough training on how to find, understand, access or use the CRM system.
(Goodhue, 1998)	2	Individual	Trng2	Training	I am getting the training I need to be able to use the CRM system effectively in my job.
(Bailey & Pearson, 1983)	45	Overall Satisfaction	Osat1	Overall Satisfaction	Please rate your overall satisfaction with the CRM system.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(D'Ambra & Wilson, 2004)	16	Performance	Perf1	Performance Impact	I can accomplish marketing tasks more quickly because of my CRM system use.
(D'Ambra & Wilson, 2004)	20	Performance	Perf2	Performance Impact	I make better marketing decisions because of the information I get from the CRM system.
(D'Ambra & Wilson, 2004)	33	Performance	Perf3	Performance Impact	I have increased my knowledge about my customers because of my CRM system use.
(D'Ambra & Wilson, 2004)	39	Performance	Perf4	Performance Impact	Because of my CRM system use, I am better informed about my customers.
(D'Ambra & Wilson, 2004)	4	Performance	Perf5	Performance Impact	Using the CRM system has a positive impact on my ability to perform my job.
(D'Ambra & Wilson, 2004)	8	Performance	Perf6	Performance Impact	The quality of my work has improved because of using the CRM system.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	37	Task	Acry1	Accuracy	The information within the CRM system that I use or would like to use is accurate enough for my purposes.
(Goodhue, 1998)	9	Task	Acry2	Accuracy	There are accuracy problems in the information in the CRM system that I use or need.
(Goodhue, 1998)	19	Task	Cmpt1	Compatibility	There are times when the information in the CRM system in inconsistent with information from other systems.
(Goodhue, 1998)	7	Task	Cmpt2	Compatibility	When it is necessary to compare or aggregate information from the CRM system with different sources, there may be unexpected or difficult inconsistencies.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	11	Task	Curr1	Currency	I can't get information from the CRM that is current enough to meet my needs.
(Goodhue, 1998)	23	Task	Curr2	Currency	The information in the CRM system is up-to-date enough for my purposes.
(Goodhue, 1998)	38	Task	Curr3	Currency	I need some information on the up-to-the-minute status of operations or events but cannot get it from the CRM system.
(Goodhue, 1998)	15	Task	Data1	The right data	It is more difficult to do my job effectively because some of the information I need is not available in the CRM system.
(Goodhue, 1998)	21	Task	Data2	The right data	The information maintained in the CRM system is exactly what I need to carry out my tasks.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	30	Task	Data3	The right data	The CRM system that is available to me is missing critical information that would be very useful to me in my job.
(Goodhue, 1998)	13	Task	Flex1	Flexibility	I am not getting as quick a turnaround as I need on requests for new reports or information from the CRM system.
(Goodhue, 1998)	26	Task	Flex2	Flexibility	When business requirements change it is easy to change the selection and format of information made available by our CRM system.
(Goodhue, 1998)	29	Task	Flex3	Flexibility	The CRM system is too inflexible to be able to respond to my changing needs for information.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	31	Task	Loct1	Locatability	It is easy to locate information in the CRM system on a particular issue, even if I haven't used that information before.
(Goodhue, 1998)	6	Task	Loct2	Locatability	It is easy to find out what information is contained in the CRM system.
(Goodhue, 1998)	1	Task	Meng1	Meaning	The exact meaning of data elements in the CRM system is either obvious, or easy to find out.
(Goodhue, 1998)	35	Task	Meng2	Meaning	The exact definition of data fields in the CRM system relating to my tasks is easy to find out.
(Goodhue, 1998)	25	Task	Reli1	Systems reliability	I can count on the CRM system to be "up" and available when I need it.

APPENDIX H

SURVEY INSTRUMENT CONSTRUCTS

Source	Question Number	Characteristic	Variable Name	Construct	Question
(Goodhue, 1998)	34	Task	Reli2	Systems reliability	The CRM system is subject to frequent system problems and crashes.
(Igbaria et al., 1995)	43	Usage	Usag1	Usage	How frequently do you use the CRM system?
(Igbaria et al., 1995)	44	Usage	Usag2	Usage	How many hours per day do you use the CRM system?
(Venkatesh & Davis, 2000)	24	Voluntariness	Voln1	Voluntariness	My management does not require me to use the CRM system.
(Venkatesh & Davis, 2000)	12	Voluntariness	Voln2	Voluntariness	My use of the CRM system is voluntary.
(Venkatesh & Davis, 2000)	32	Voluntariness	Voln3	Voluntariness	Although the CRM system might be helpful, using the system is not compulsory in my job.

APPENDIX I

LETTER TO RESPONDENTS AND SURVEY INSTRUMENT

Sample Letter

Mary Ledbetter
1206 Panorama Loop
Waxahachie, Texas 75165
Home telephone (972) 923-1990
Work telephone (214) 478-3860
Email: mledbett@nova.edu

Dear Marketing Professional:

I am a student at Nova Southeastern University in Ft. Lauderdale, FL working to complete a Doctorate of Business Administration with a specialization in Information Technology. As part of the dissertation process, I am conducting important research that investigates the use of customer relationship management systems by marketing managers. You were selected to participate in this survey because of your knowledge in this area. Participation in the study is voluntary.

I kindly request your assistance by completing the enclosed survey. It is important that you complete all questions and that you respond with only one answer per question unless otherwise noted. Please return the survey to me in the included pre-paid envelope. Thank you very much for your participation in this study.

Individual responses will be used only to form grouped summary result values and the individual responses will not be communicated in any way. The confidentiality of your responses will be strictly protected.

Please feel free to contact me if you have any questions.

Sincerely,

Mary Ledbetter

CUSTOMER RELATIONSHIP MANAGEMENT SYSTEMS
USER SURVEY

Introduction

This survey applies to marketing managers who are users of a Customer Relationship Management (CRM) system. This research is being conducted as part of the fulfillment of the requirements, by the researcher, for the Doctorate of Business Administration program at Nova Southeastern University, Fort Lauderdale, FL.

Responding to this survey will take no more than 15 minutes of your time. All of the information you provide will be kept confidential and the result will not disclose your identity.

If you have any questions regarding this research feel free to contact the researcher.

Mary Ledbetter
1206 Panorama Loop
Waxahachie, Texas 75165

Telephone: (972) 923-1990
Email: mledbett@nova.edu

Confidentiality Guarantee

Individual responses will be used only to form grouped summary result values and the individual responses will not be communicated in any way. The confidentiality of your responses will be strictly protected. At the end of this survey, you have the option of including your name, telephone number and/or email address. This is included only if you wish to have the researcher contact you for follow-up questions regarding this project. If you choose to participate, your individual confidentiality will be maintained, unless permission is granted otherwise.

Participation in this research is voluntary.

Instructions for Completing the Survey

Please respond to *all* questions, indicating the response that *best* reflects your answer to the question. Please select only one response unless the question explicitly states otherwise.

Please return the completed questionnaire by **DATE TBD** using the enclosed stamped enveloped.

CRM Systems User Survey

Part I - Customer Relationship Management (CRM) Systems User Survey

		Mark one per each line						
		Strongly Disagree	**Moderately Disagree**	**Slightly Disagree**	**Neither Agree nor**	**Slightly Agree**	**Moderately Agree**	**Strongly Agree**
1	The exact meaning of data elements in the CRM system is either obvious, or easy to find out.	1	2	3	4	5	6	7
2	I am getting the training I need to be able to use the CRM system effectively in my job.	1	2	3	4	5	6	7
3	Getting authorization to access information in the CRM system that would be useful in my job is time consuming and difficult.	1	2	3	4	5	6	7
4	Using the CRM system has a positive impact on my ability to perform my job.	1	2	3	4	5	6	7
5	The CRM system is straightforward and easy to access and use.	1	2	3	4	5	6	7
6	It is easy to find out what information is contained in the CRM system.	1	2	3	4	5	6	7
7	When it is necessary to compare or aggregate information from the CRM system with different sources, there may be unexpected or difficult inconsistencies.	1	2	3	4	5	6	7
8	The quality of my work has improved because of using the CRM system.	1	2	3	4	5	6	7
9	There are accuracy problems in the information in the CRM system that I use or need.	1	2	3	4	5	6	7
10	The CRM system is convenient and easy to use.	1	2	3	4	5	6	7
11	I can't get information from the CRM that is current enough to meet my needs.	1	2	3	4	5	6	7
12	My use of the CRM system is voluntary.	1	2	3	4	5	6	7
13	I am not getting as quick a turnaround as I need on requests for new reports or information from the CRM system.	1	2	3	4	5	6	7
14	There is not enough training on how to find, understand, access or use the CRM system.	1	2	3	4	5	6	7

		Mark one per each line						
		Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
15	It is more difficult to do my job effectively because some of the information I need is not available in the CRM system.	1	2	3	4	5	6	7
16	I can accomplish marketing tasks more quickly because of my CRM system use.	1	2	3	4	5	6	7
17	It is easy to get assistance when I am having trouble finding or using information from the CRM system.	1	2	3	4	5	6	7
18	Information in the CRM system that would be useful to me is unavailable because I don't have the right authorization.	1	2	3	4	5	6	7
19	There are times when the information in the CRM system in inconsistent with information from other systems.	1	2	3	4	5	6	7
20	I make better marketing decisions because of the information I get from the CRM system.	1	2	3	4	5	6	7
21	The information maintained in the CRM system is exactly what I need to carry out my tasks.	1	2	3	4	5	6	7
22	It is easy to get access to the information in the CRM system that I need.	1	2	3	4	5	6	7
23	The information in the CRM system is up-to-date enough for my purposes.	1	2	3	4	5	6	7
24	My management does not require me to use the CRM system.	1	2	3	4	5	6	7
25	I can count on the CRM system to be "up" and available when I need it.	1	2	3	4	5	6	7
26	When business requirements change it is easy to change the selection and format of information made available by our CRM system.	1	2	3	4	5	6	7
27	I am getting the help I need in accessing and understanding the information in the CRM system.	1	2	3	4	5	6	7
28	Sufficiently detailed information is maintained in the CRM system.	1	2	3	4	5	6	7

		Mark one per each line						
		Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
29	The CRM system is too inflexible to be able to respond to my changing needs for information.	1	2	3	4	5	6	7
30	The CRM system that is available to me is missing critical information that would be very useful to me in my job.	1	2	3	4	5	6	7
31	It is easy to locate information in the CRM system on a particular issue, even if I haven't used that information before.	1	2	3	4	5	6	7
32	Although the CRM system might be helpful, using the system is not compulsory in my job.	1	2	3	4	5	6	7
33	I have increased my knowledge about my customers because of my CRM system use.	1	2	3	4	5	6	7
34	The CRM system is subject to frequent system problems and crashes.	1	2	3	4	5	6	7
35	The exact definition of data fields in the CRM system relating to my tasks is easy to find out.	1	2	3	4	5	6	7
36	The information in the CRM system that I need is displayed in a readable and understandable format.	1	2	3	4	5	6	7
37	The information within the CRM system that I use or would like to use is accurate enough for my purposes.	1	2	3	4	5	6	7
38	I need some information on the up-to-the-minute status of operations or events but cannot get it from the CRM system.	1	2	3	4	5	6	7
39	Because of my CRM system use, I am better informed about my customers.	1	2	3	4	5	6	7
40	The information in the CRM system is presented in a readable and useful format.	1	2	3	4	5	6	7
41	I can get information quickly and easily from the CRM system when I need it.	1	2	3	4	5	6	7
42	The information in the CRM system is at an appropriate level of detail for my purposes.	1	2	3	4	5	6	7

Part II - Usage and Overall Satisfaction

		Never	Less than once a month	A few times a month	Once a week	Several times a week	Once a day	Several times a day
43	How frequently do you use the CRM system?	1	2	3	4	5	6	7
		Never	Less than 1/2 hour per day	1/2 to 1 hour per day	1-2 hours per day	2-3 hours per day	3-4 hours per day	More than 4 hours per day
44	How many hours per day do you use the CRM system?	1	2	3	4	5	6	7
		Extremely Satisfied	Quite Satisfied	Slightly Satisfied	Neither Satisfied nor Dissatisfied	Slightly Dissatisfied	Quite Dissatisfied	Extremely Dissatisfied
45	Please rate your overall satisfaction with the CRM system.	1	2	3	4	5	6	7

Part III - Demographic Information

Age:

18-20 21-25 26-30 31-35 36-40

41-45 46-50 51-55 56-60 Over 60

Gender:

Female Male

Number of years in marketing:

0-2 years 3-4 years 5-6 years 7-8 years

9-10 years 11-12 years 13-14 years 15+ years

Number of years in current position:

0-2 years | 3-4 years | 5-6 years | 7-8 years
9-10 years | 11-12 years | 13-14 years | 15+ years

Private or public company:

Public Company — Sells stock to the public and the stock is traded on an exchange.

Private Company — Does not sell stock to the public, and the stock is not traded on an exchange.

Does Not Apply

Last year's company revenue:

Less than $100,000 | $100,000 -$249,999 | $250,000-$499,999
$500,000-$999,999 | $1,000,000-$4,999,999 | $5,000,000-$9,999,999
$10,000,000-$20,000,000 | More than $20,000,000

Number of employees in your firm:

Less than 25 | 25-49 | 50-99 | 100-199
200-499 | 500-999 | 1000-4999 | 5000 or more

Current Job Title:

Chief Marketing Officer | Exec VP of Marketing | VP of Marketing
Exec / Sr .Director of Marketing | Director / Sr. Manager of Marketing | Marketing Manager
Other (Please Specify)

Highest Education Level Completed:

Less than HS diploma | HS Diploma or GED | • Some College, but no degree
Associates Degree | Bachelor's Degree | Some graduate school
Masters Degree | Ph.D. | Ph.D.+(add'l training, post doc, etc.)

Industry Type: (Please check all that apply to your current situation)

- ☐ Banking/Financial Services
- ☐ Consulting
- ☐ Education
- ☐ Government
- ☐ Health Care
- ☐ Transportation
- ☐ Information Technology
- ☐ Industrial/Manufacturing
- ☐ Insurance
- ☐ Wholesale/Retail
- ☐ Communications
- ☐ Other

Company Location:

Country:

State:

How long has the CRM system been operational in your company?

Not fully implemented | Less than six months | 6 months to 1 year | 1 to 2 years | More than 2 years

Comments

Do you consider the CRM system implementation a success?

Yes | No | I don't know

Why?

Please select the CRM system(s) you are using (check all that apply to your present situation):

- ☐ Amdocs
- ☐ Chordiant
- ☐ E.piphany
- ☐ Oracle
- ☐ Onyx
- ☐ PeopleSoft
- ☐ Pivotal
- ☐ SAP
- ☐ Siebel
- ☐ Other (Please Specify)

What type of CRM training have you received (check all that apply)?

- ☐ Formal
- ☐ Mentoring
- ☐ Online Tutorial
- ☐ None, I learned on my own
- ☐ Other (Please Specify)

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	Model and Independent Variables (IVs)	Dependent Variables	Instrument and Statistical Methods	Survey Method, Sample Size and Results
D'Ambra & Rice (2001) Emerging factors in user evaluation of the World Wide web	TTF Model and Theory of Planned Behavior IV - TTF dimensions specific to the Web	Performance impact	Instrument: TTF dimensions related to the Web Statistical Method 1) Principal component factor analysis 2) Correlation analysis 3) Multiple regression analysis	Survey method: Interviews at Sydney Airport Sample size: 295 Results: Support for using TTF model for the Web
D'Ambra & Wilson (2004) Explaining perceived performance of the World Wide Web: Uncertainty and the task-technology fit model	TTF Model IV 1) Technology characteristics 2) Individual characteristics 3) Social norms 4) Uncertainty 5) Task-technology fit factors	Performance impact and utilization	Instrument: TTF Dimensions related to the Web Statistical Method: 1) Principal component factor analysis 2) Correlation analysis 3) Confirmatory factor analysis	Survey method: Self administered to college freshmen Sample size: 217 Results: Supported the TTF model

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	Model and Independent Variables (IVs)	Dependent Variables	Instrument and Statistical Methods	Survey Method, Sample Size and Results
Tjahjono, Fakun, Greenough & Kay (2001) Evaluation of a manufacturing task support system using the task-technology fit model	Model TTF IVs: 1) Accuracy 2) Currency 3) Ease of Use 4) Meaning 5) System Reliability	TTF - summated scale of the five dimensions	Instrument: TTF (five dimensions) with Web usage Statistical Method: 1) Cronbach's alpha 2) Mean and Std Deviation	Survey method: Self administered questionnaire to shop floor workers and technicians Sample size: 200 Results: Supported the TTF model
McCarthy (2002) Measuring the validity of task-technology fit for Knowledge Management (KM) Systems	Model: TTF IVs 1) Individual Characteristics 2) Task Characteristics 3) Reliability 4) Accessibility 5) Right Knowledge 6) Compatibility 7) Ease of Use 8) Training 9) Usefulness of the Knowledge 10) Right Level of Knowledge	TTF	Instrument: TTF Statistical Method: 1) Cronbach's alpha 2) Pearson's correlation coefficient 3) Multiple linear regression	Survey method: Self administered mail survey Sample size: 81 Results: Supported the TTF model for KM

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	**Model and Independent Variables (IVs)**	**Dependent Variables**	**Instrument and Statistical Methods**	**Survey Method, Sample Size and Results**
Ioimo (2000) Applying the theory of task-technology fit in assessing police use of field mobile computing	Model: TTF IVs 1) Number of stolen vehicles 2) Officer unobligated patrol time 3) Time officer writes reports 4) Officer arrests by crime type 5) Officer arrests by location 6) Traffic citations by location 7) Traffic accidents by location 8) Crimes cleared by field officers 9) Vehicle theft recoveries 10) Citizen contacts or community policing activities	1) Right level of detail 2) Locatability 3) Compatibility 4) Reliability 5) Ease of Use 6) Task complexity and uncertainty 7) Task interdependence 8) Performance impact 9) Individual performance impact	Instrument: TTF Statistical Method: 1) Cronbach's alpha 2) Principal Component Analysis 3) T-Test	Survey method: Self administered survey. Did not specify mail or other method. Sample size: Not specified Results: Support for the TTF model

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	**Model and Independent Variables (IVs)**	**Dependent Variables**	**Instrument and Statistical Methods**	**Survey Method, Sample Size and Results**
Grossman (2003) The effect of individual and task characteristics on unified modeling language use: A task-technology fit perspective	Model: TTF IVs 1) The right data 2) Accuracy 3) Compatibility 4) Flexibility 5) Understandability 6)Level of detail 7)Training 8)Ambiguity	1) Right level of detail 2) Locatability 3) Compatibility 4) Reliability 5) Ease of Use 6) Task complexity and uncertainty 7) Task interdependence 8) Performance impact 9) Individual performance impact	Instrument: TTF Statistical Method: 1) Cronbach's alpha 2) Pearson's correlation coefficient 3) Multiple linear regression analysis 4) Distribution of TTF indices (N, Min, Max, Mean, Std Deviation)	Survey method: Self administered web survey Sample size: 150 Results: Support of TTF model for Unified Modeling Language

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	**Model and Independent Variables (IVs)**	**Dependent Variables**	**Instrument and Statistical Methods**	**Survey Method, Sample Size and Results**
Goodhue & Thompson (1995) Task-technology fit and individual performance	Model: TTF IVs 1) Currency of the data 2) The right data 3) Right level of detail 4) Locatability 5) Meaning 6) Authorization 7) Data compatibility 8) Ease of use/training 9) Production timeliness 10) Systems reliability 11) IS understanding of business 12) IS interest and dedication 13) Responsiveness 14) Delivering agreed-upon solutions 15) Technical and business planning assistance	Performance Impact	Instrument: TTF Statistical Method: 1) Cronbach's Alpha 2) Pearson's correlation coefficient 3) Multiple linear regression analysis	Survey method: Self administered survey. Did not specify method of delivery. Sample size: 600 Results: Strong support of TTF

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	**Model and Independent Variables (IVs)**	**Dependent Variables**	**Instrument and Statistical Methods**	**Survey Method, Sample Size and Results**
Goodhue (1998) Development and measurement validity of a task-technology fit instrument for user evaluations of information systems	Model: TTF IVs 1) Confusion 2) Level of detail 3) Locatability 4) Meaning 5) The right data 6) Accessibility 7) Assistance 8) Authorization 9) Ease of Use 10) Flexibility 11) System Reliability 12) Training 13) Accuracy 14) Compatibility 15) Currency 16) Presentation	None - measured correlations of variables.	Instrument: TTF Statistical Method: 1) Cronbach's Alpha 2) Multiple trait, Multiple item (MTMI) Analysis 3) Confirmatory Factor Analysis (CFA) 4) Exploratory Factor Analysis (EFA)	Survey method: Self administered mail survey Sample size: 357 Results: Instrument had strong reliability and strong validity

APPENDIX J

MATRIX OF TASK-TECHNOLOGY FIT STUDIES

Author, Year and Title	**Model and Independent Variables (IVs)**	**Dependent Variables**	**Instrument and Statistical Methods**	**Survey Method, Sample Size and Results**
Goodhue (1995) Understanding user evaluations of Information Systems	Model: TTF IVs 1) Lack of confusion 2) Level of detail 3) Locatability 4) Meaning 5) Accessibility 6) Assistance 7) Ease of Use (HW/SW) 8) System Reliability 9) Accuracy 10) Compatibility 11) Currency 12) Presentation	None	Instrument: TTF Statistical Method: 1) Cronbach's Alpha 2) Confirmatory Factor Analysis 3) Multiple Regression Analysis	Survey method: Self administered mail survey Sample size: 357 Results: User evaluations of TTF can be used as a measure of IS success

APPENDIX K

DISTRIBUTION OF PERFORMANCE IMPACT ITEMS

APPENDIX K
DISTRIBUTION OF PERFORMANCE IMPACT ITEMS

Perf5 - Using the CRM system has a positive impact on my ability to perform my job.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.3	2.3	2.3
	Moderately Disagree	3	2.3	2.3	4.7
	Slightly Disagree	3	2.3	2.3	7.0
	Neither Agree nor Disagree	6	4.7	4.7	11.6
	Slightly Agree	25	19.4	19.4	31.0
	Moderately Agree	32	24.8	24.8	55.8
	Strongly Agree	57	44.2	44.2	100.0
	Total	129	100.0	100.0	

Perf4 - Because of my CRM system use, I am better informed about my customers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.6	1.6	1.6
	Moderately Disagree	2	1.6	1.6	3.1
	Slightly Disagree	9	7.0	7.0	10.1
	Neither Agree nor Disagree	8	6.2	6.2	16.3
	Slightly Agree	33	25.6	25.6	41.9
	Moderately Agree	38	29.5	29.5	71.3
	Strongly Agree	37	28.7	28.7	100.0
	Total	129	100.0	100.0	

Perf3 - I have increased my knowledge about my customers because of my CRM system use.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.3	2.3	2.3
	Moderately Disagree	6	4.7	4.7	7.0
	Slightly Disagree	6	4.7	4.7	11.6
	Neither Agree nor Disagree	7	5.4	5.4	17.1
	Slightly Agree	28	21.7	21.7	38.8
	Moderately Agree	44	34.1	34.1	72.9
	Strongly Agree	35	27.1	27.1	100.0
	Total	129	100.0	100.0	

Perf2 - I make better marketing decisions because of the information I get from the CRM system.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	2.3	2.3	2.3
	Moderately Disagree	4	3.1	3.1	5.4
	Slightly Disagree	6	4.7	4.7	10.1
	Neither Agree nor Disagree	19	14.7	14.7	24.8
	Slightly Agree	34	26.4	26.4	51.2
	Moderately Agree	35	27.1	27.1	78.3
	Strongly Agree	28	21.7	21.7	100.0
	Total	129	100.0	100.0	

Perf1 - I can accomplish marketing tasks more quickly because of my CRM system use.

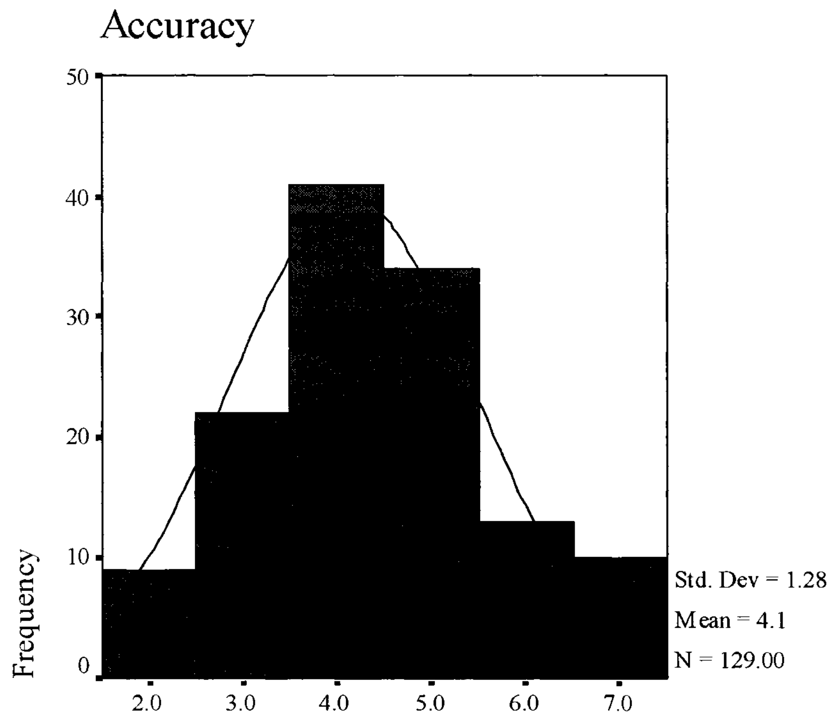
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	1.6	1.6	1.6
	Moderately Disagree	9	7.0	7.0	8.5
	Slightly Disagree	9	7.0	7.0	15.5
	Neither Agree nor Disagree	18	14.0	14.0	29.5
	Slightly Agree	24	18.6	18.6	48.1
	Moderately Agree	44	34.1	34.1	82.2
	Strongly Agree	23	17.8	17.8	100.0
	Total	129	100.0	100.0	

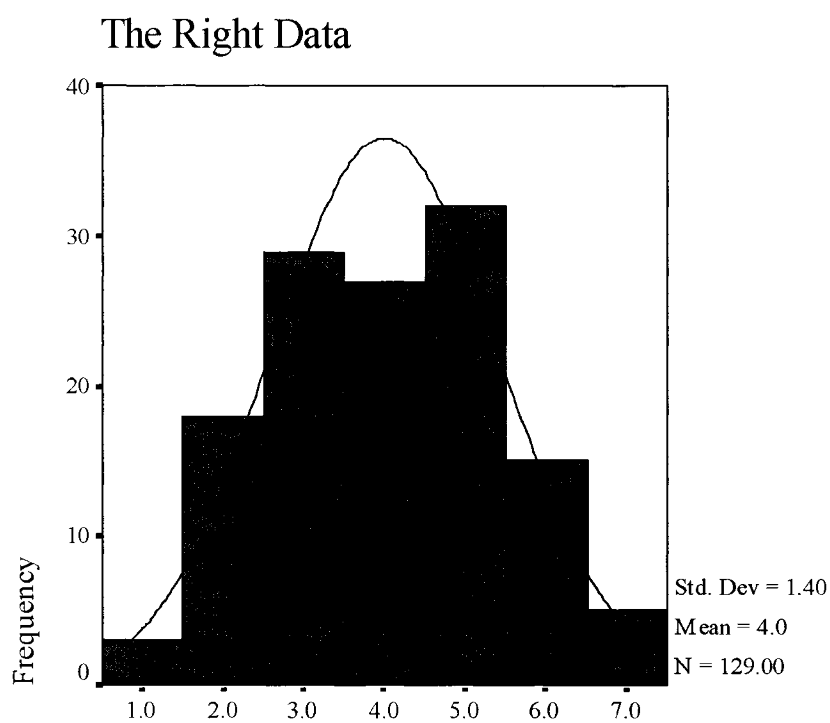
Perf6 - The quality of my work has improved because of using the CRM system.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	4.7	4.7	4.7
	Moderately Disagree	3	2.3	2.3	7.0
	Slightly Disagree	5	3.9	3.9	10.9
	Neither Agree nor Disagree	26	20.2	20.2	31.0
	Slightly Agree	26	20.2	20.2	51.2
	Moderately Agree	31	24.0	24.0	75.2
	Strongly Agree	32	24.8	24.8	100.0
	Total	129	100.0	100.0	

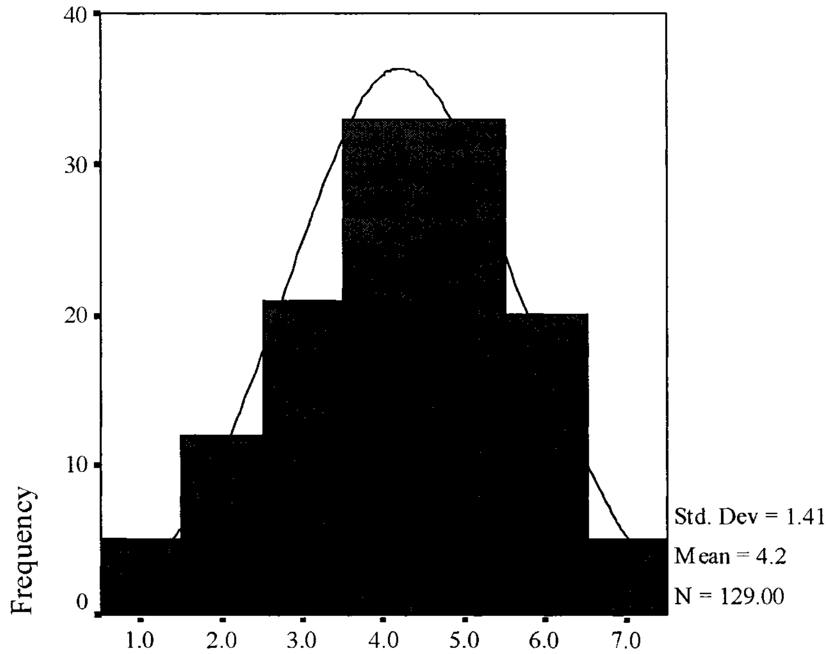
APPENDIX L

HISTOGRAMS OF VARIABLES

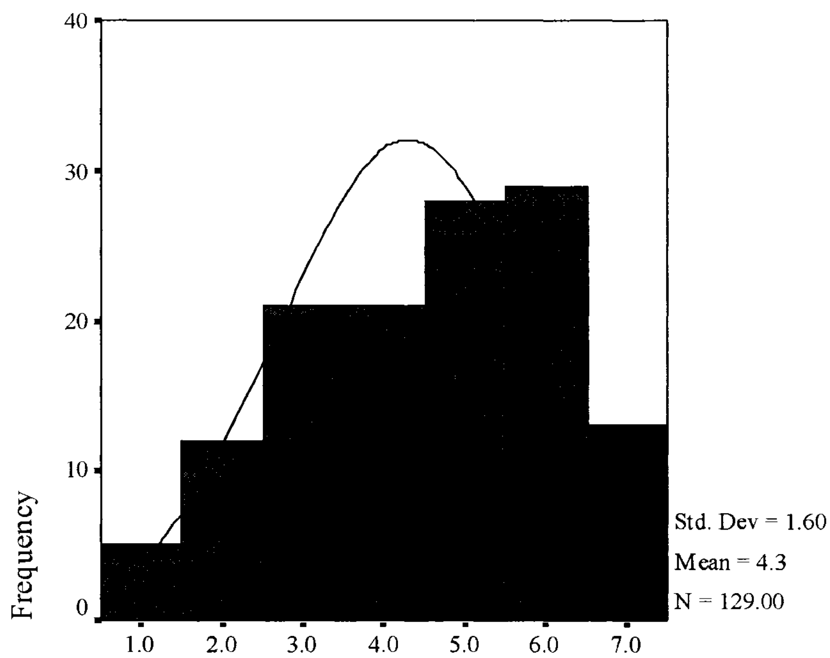

Accuracy
50
40
30
20
10
0
Frequency
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.28
Mean = 4.1
N = 129.00

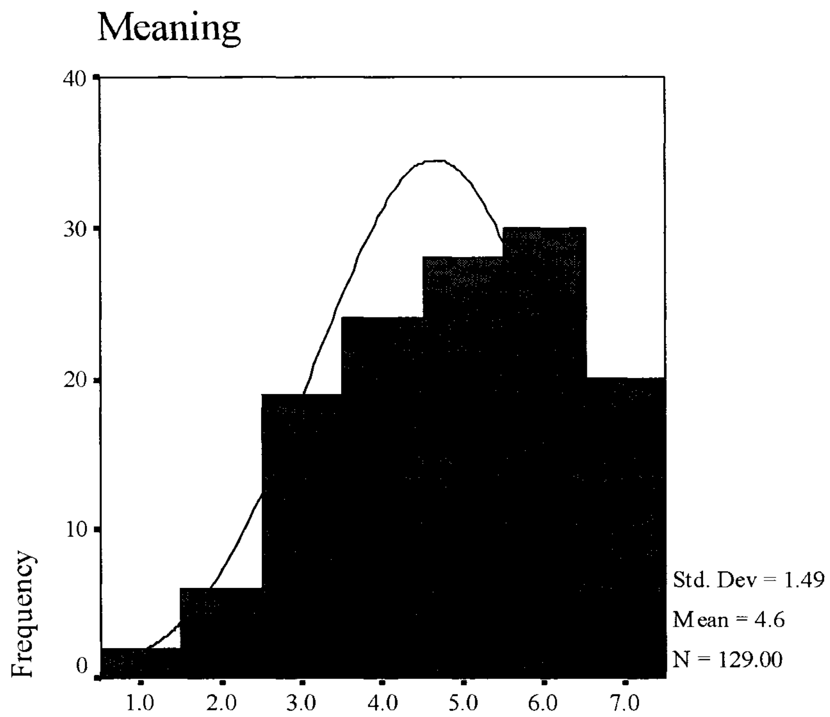

The Right Data
40
30
20
10
0
Frequency
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.40
Mean = 4.0
N = 129.00

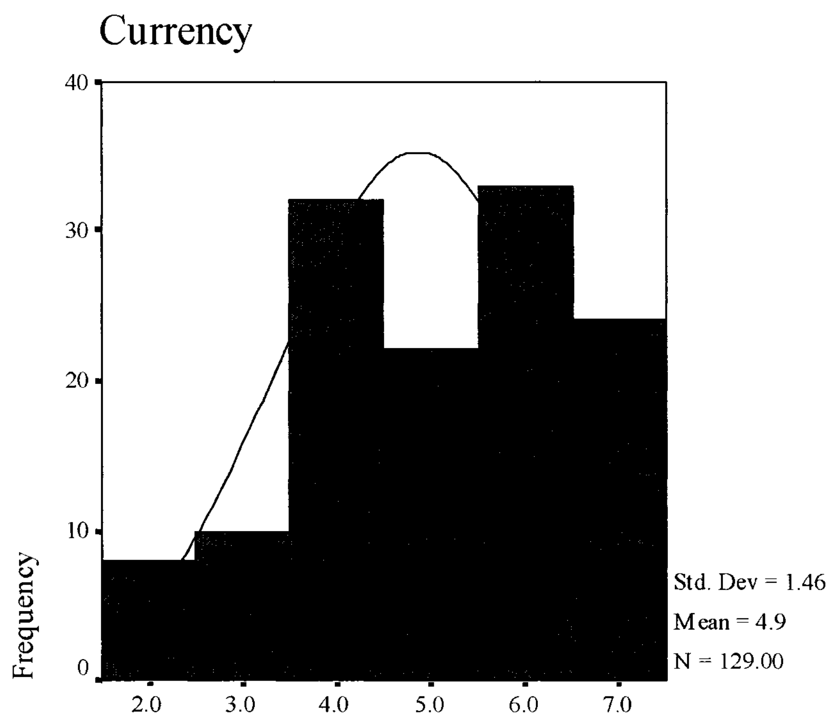
Flexibility



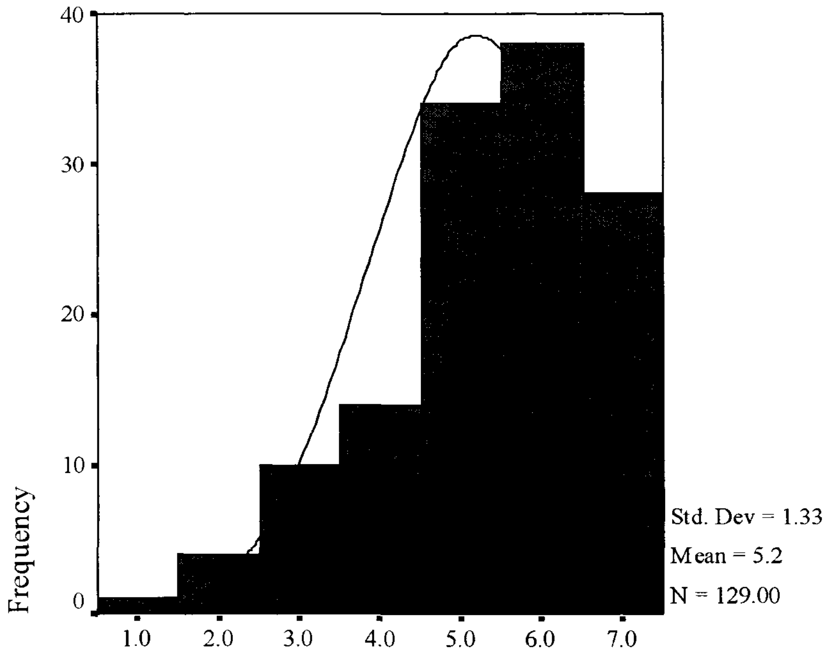
Locatability



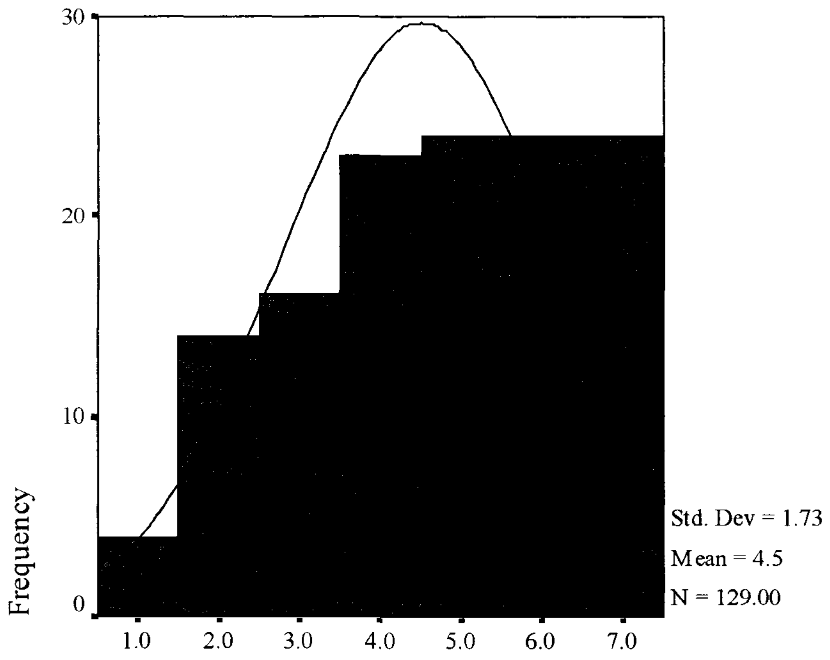

Meaning
40
30
20
10
0
Frequency
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.49
Mean = 4.6
N = 129.00

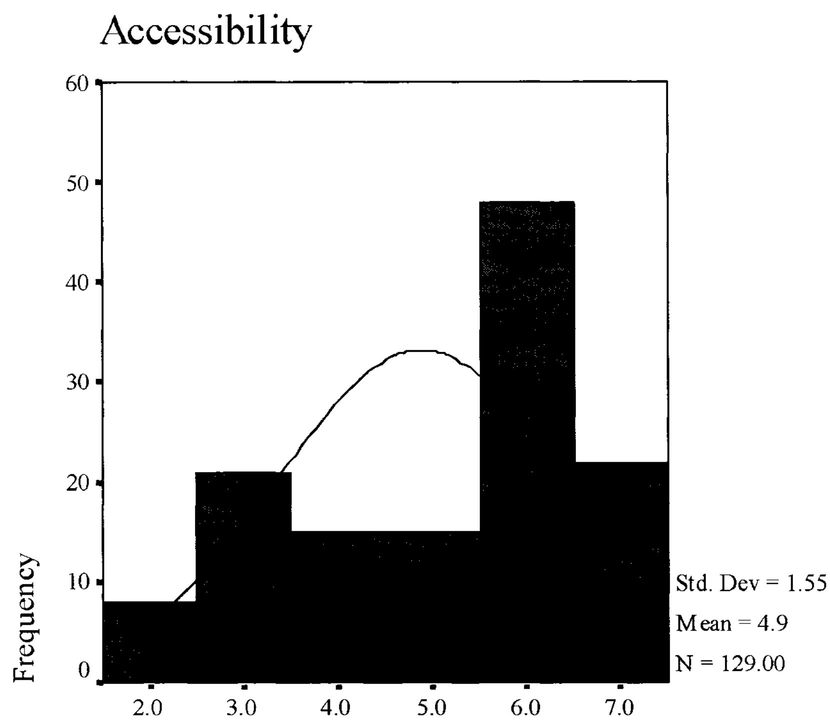

Currency
40
30
20
10
0
Frequency
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.46
Mean = 4.9
N = 129.00

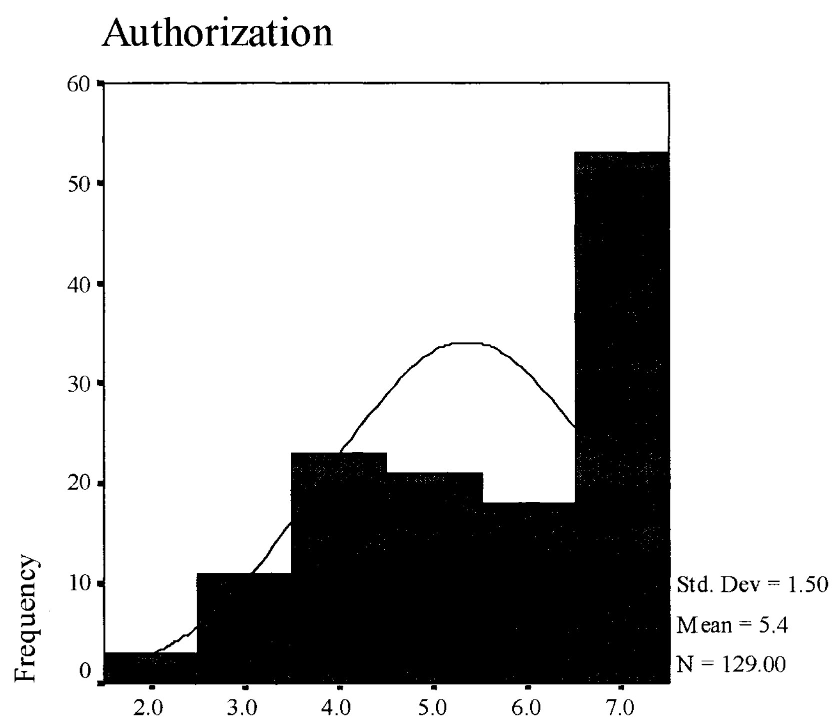
Presentation

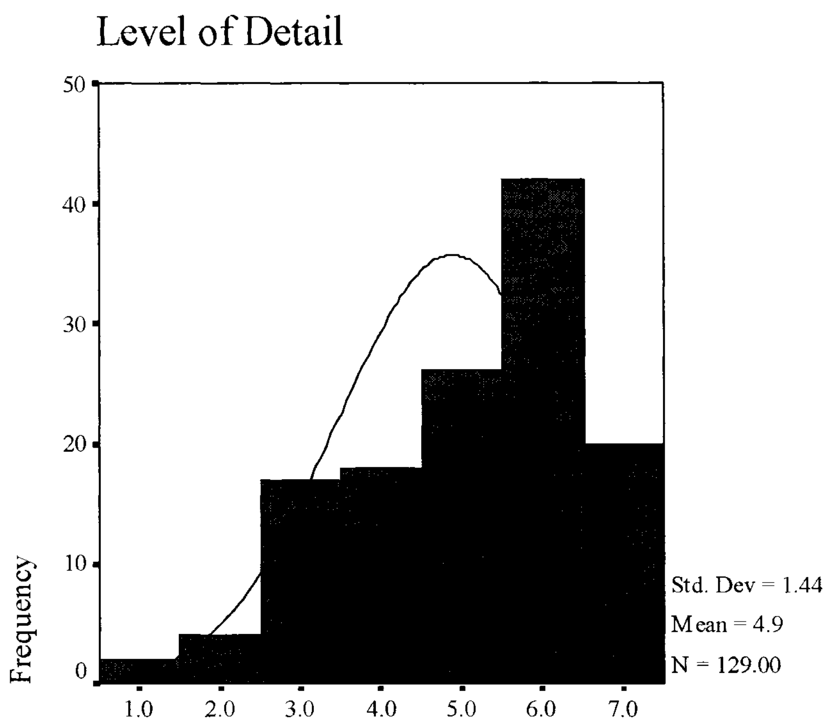


Training

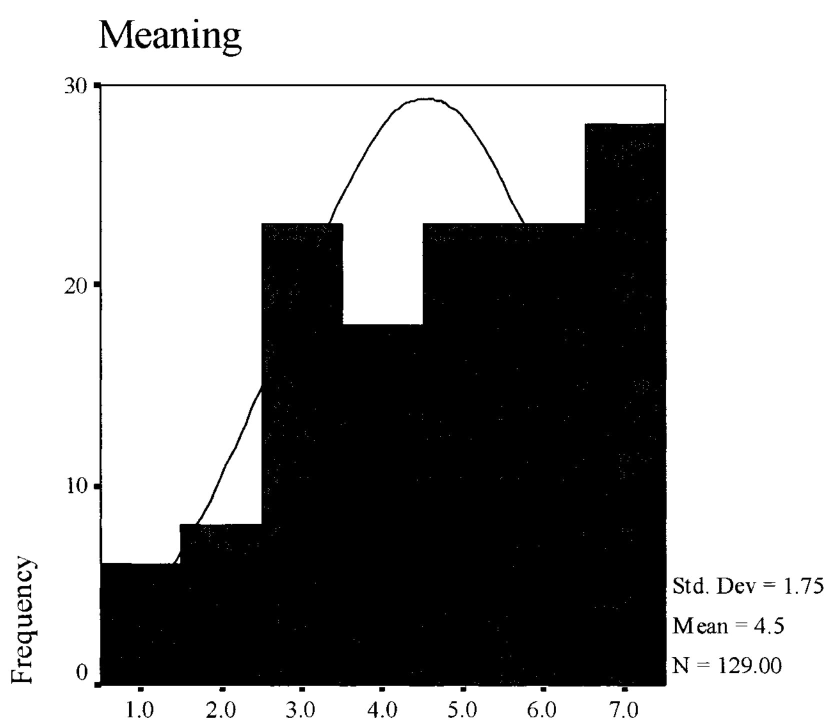



Accessibility
60
50
40
30
20
10
0
Frequency
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.55
Mean = 4.9
N = 129.00


Authorization
60
50
40
30
20
10
0
Frequency
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.50
Mean = 5.4
N = 129.00

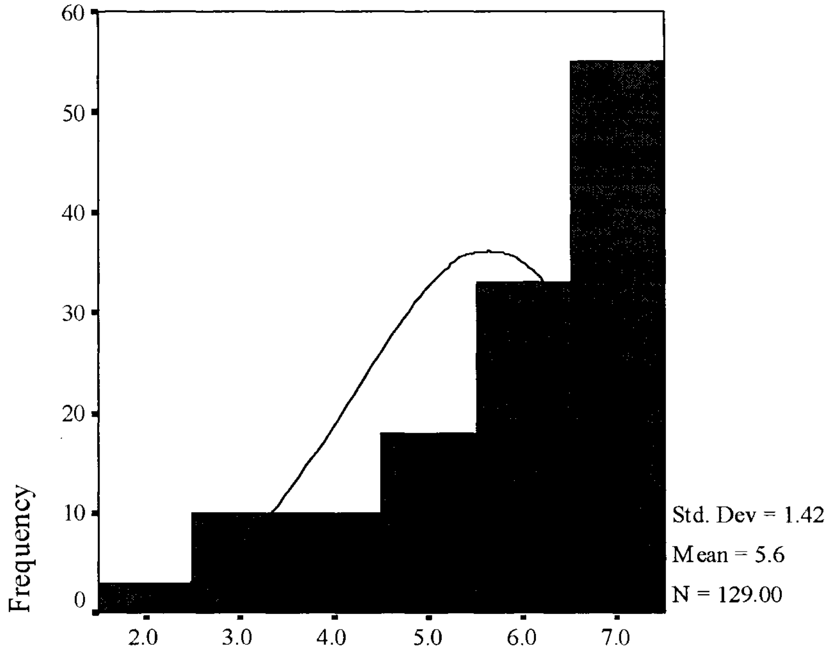


Level of Detail
50
40
30
20
10
0
Frequency
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.44
Mean = 4.9
N = 129.00

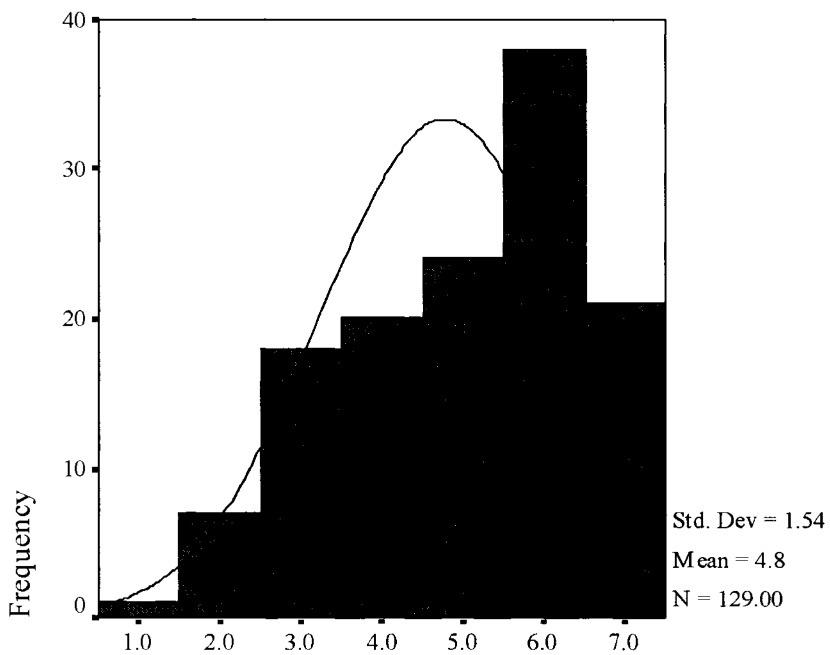


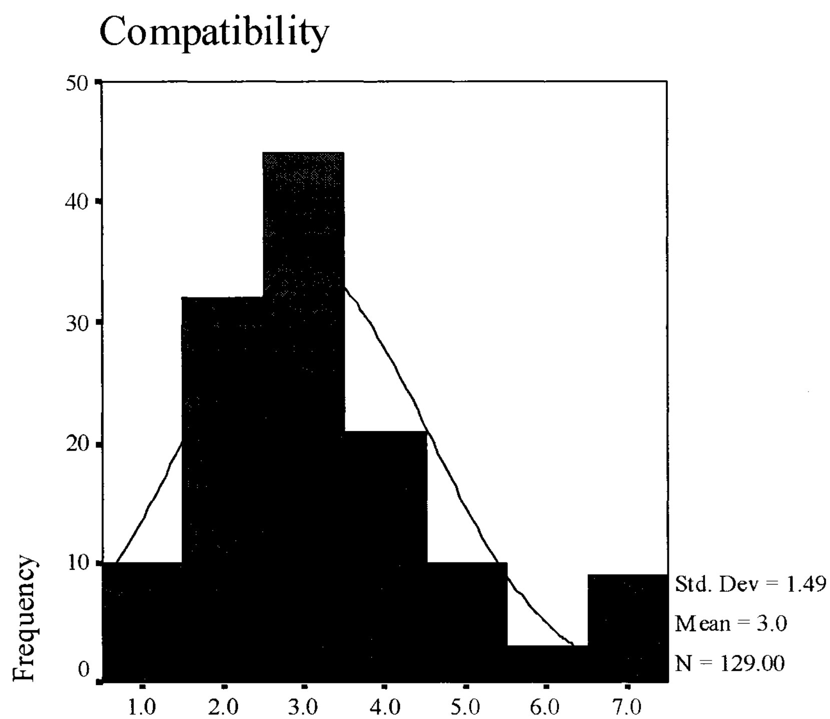
Meaning
30
20
10
0
Frequency
1.0
2.0
3.0
4.0
5.0
6.0
7.0
Std. Dev = 1.75
Mean = 4.5
N = 129.00

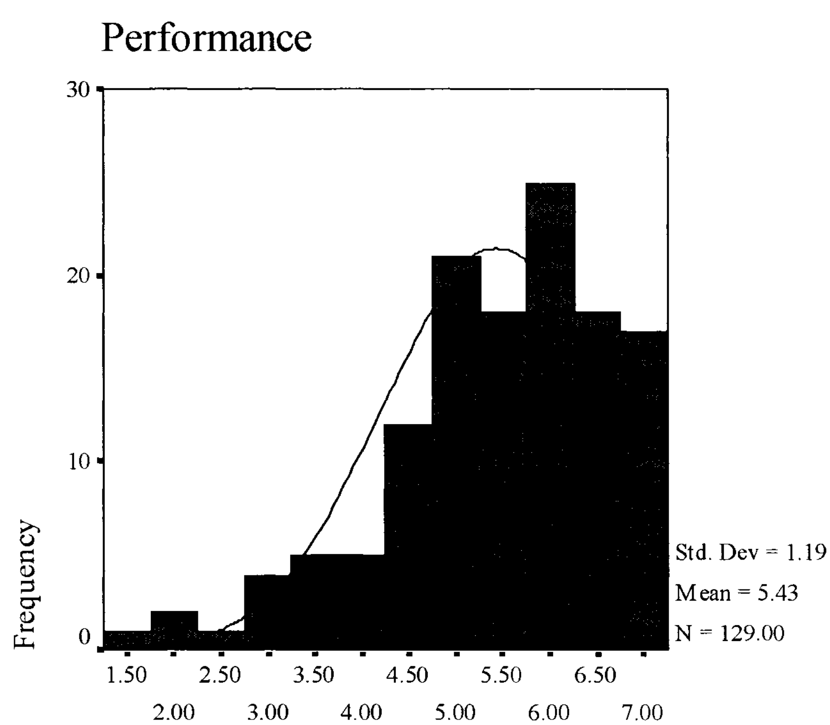
Systems Reliability



Assistance




Compatibility
50
40
30
20
10
0
Frequency
1.0 2.0 3.0 4.0 5.0 6.0 7.0
Std. Dev = 1.49
Mean = 3.0
N = 129.00


Performance
30
20
10
0
Frequency
1.50 2.50 3.50 4.50 5.50 6.50
2.00 3.00 4.00 5.00 6.00 7.00
Std. Dev = 1.19
Mean = 5.43
N = 129.00

APPENDIX M

FACTOR LOADINGS OF DEPENDENT AND INDEPENDENT VARIABLES

Factor loadings (principal components analysis) for Performance Items

Performance Impact Items	Component
	1
Perf5	0.788
Perf6	0.787
Perf1	0.770
Perf2	0.867
Perf3	0.785
Perf4	0.876

Extraction Method: Principal Component Analysis.
a 1 components extracted.

Factor loadings (principal components analysis) for Individual Items

	Component
	1
Accs1	0.830
Accs2	0.811
Asst1	0.640
Asst2	0.754
rcauth1	0.390
rcauth2	0.353
Detl1	0.688
Detl2	0.730
Ease1	0.837
Ease2	0.841
Pres1	0.791
Pres2	0.782
Trng2	0.742
rctrng1	0.733

Extraction Method: Principal Component Analysis.
a 1 components extracted.

Factor loadings (principal components analysis) for Task Items

Task Characteristics of TTF Items	Component 1
rccmpt1	0.594
rccmpt2	0.589
rccurr1	0.598
Curr2	0.721
rcdata1	0.641
rcdata3	0.579
Data2	0.596
Flex2	0.651
rcflex1	0.521
rcflex3	0.565
Loct1	0.606
Loct2	0.690
Meng1	0.559
Meng2	0.698
Reli1	0.570
Reli2	0.592

Extraction Method: Principal Component Analysis.
a 1 components extracted.

APPENDIX N

PEARSON'S CORRELATION ANALYSIS OF THE INDIVIDUAL CHARACTERISTICS OF TTF AND PERFORMANCE IMPACT

PEARSON'S CORRELATION OF THE INDIVIDUAL CHARACTERISTICS OF TTF AND PERFORMANCE IMPACT

Correlations

		Variables								
Variables	Statistics	**Accessibility**	**Assistance**	**Authorization**	**Level of Detail**	**Ease of Use**	**Presentation**	**Training**	**Performance Impact**	**Individual Characteristics of TTF**
Accessibility	Pearson Correlation	1	.574**	.404**	.655**	.788*	.712**	.610**	.481**	.879**
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Assistance	Pearson Correlation	.574**	1	.282**	.541**	.555*	.510**	.714**	.384**	.778**
	Sig. (2-tailed)	.000	.	.001	.000	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Authorization	Pearson Correlation	.404**	.282**	1	.283**	.227*	.227**	.377**	.139	.516**
	Sig. (2-tailed)	.000	.001	.	.001	.010	.010	.000	.117	.000
	N	129	129	129	129	129	129	129	129	129
Level of Detail	Pearson Correlation	.655**	.541**	.283**	1	.603*	.576**	.486**	.507**	.761**
	Sig. (2-tailed)	.000	.000	.001	.	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Ease of Use	Pearson Correlation	.788**	.555**	.227**	.603**	1	.723**	.616**	.572**	.843**
	Sig. (2-tailed)	.000	.000	.010	.000	.	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Presentation	Pearson Correlation	.712**	.510**	.227**	.576**	.723*	1	.571**	.436**	.793**
	Sig. (2-tailed)	.000	.000	.010	.000	.000	.	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Training	Pearson Correlation	.610**	.714**	.377**	.486**	.616*	.571**	1	.366**	.821**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.	.000	.000
	N	129	129	129	129	129	129	129	129	129
Performance Impact	Pearson Correlation	.481**	.384**	.139	.507**	.572*	.436**	.366**	1	.536**
	Sig. (2-tailed)	.000	.000	.117	.000	.000	.000	.000	.	.000
	N	129	129	129	129	129	129	129	129	129
Individual Characteristics of TTF	Pearson Correlation	.879**	.778**	.516**	.761**	.843*	.793**	.821**	.536**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
	N	129	129	129	129	129	129	129	129	129

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX O

PEARSON'S CORRELATION ANALYSIS OF THE TASK CHARACTERISTICS OF TTF AND PERFORMANCE IMPACT

PEARSON'S CORRELATION OF THE TASK CHARACTERISITCS OF TTF AND PERFORMANCE IMPACT

		Compatibility	Currency	The Right Data	Flexibility	Locatability	Meaning	Reliability	Performance Impact	Task Characteristics of TTF
Compatibility	Pearson Correlation	1	.408*	.471*	.446*	.418*	.349*	.257*	.227*	.671*
	Sig. (2-tailed)	.	.000	.000	.000	.000	.000	.003	.010	.000
	N	129	129	129	129	129	129	129	129	129
Currency	Pearson Correlation	.408*	1	.596*	.486*	.448*	.414*	.443*	.389*	.756*
	Sig. (2-tailed)	.000	.	.000	.000	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
The Right Data	Pearson Correlation	.471*	.596*	1	.528*	.321*	.439*	.392*	.365*	.741*
	Sig. (2-tailed)	.000	.000	.	.000	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Flexibility	Pearson Correlation	.446*	.486*	.528*	1	.409*	.358*	.407*	.359*	.721*
	Sig. (2-tailed)	.000	.000	.000	.	.000	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Locatability	Pearson Correlation	.418*	.448*	.321*	.409*	1	.680*	.346*	.355*	.736*
	Sig. (2-tailed)	.000	.000	.000	.000	.	.000	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Meaning	Pearson Correlation	.349*	.414*	.439*	.358*	.680*	1	.400*	.398*	.734*
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.	.000	.000	.000
	N	129	129	129	129	129	129	129	129	129
Reliability	Pearson Correlation	.257*	.443*	.392*	.407*	.346*	.400*	1	.307*	.643*
	Sig. (2-tailed)	.003	.000	.000	.000	.000	.000	.	.000	.000
	N	129	129	129	129	129	129	129	129	129
Performance Impact	Pearson Correlation	.227*	.389*	.365*	.359*	.355*	.398*	.307*	1	.480*
	Sig. (2-tailed)	.010	.000	.000	.000	.000	.000	.000	.	.000
	N	129	129	129	129	129	129	129	129	129
Task Characteristics of TTF	Pearson Correlation	.671*	.756*	.741*	.721*	.736*	.734*	.643*	.480*	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.
	N	129	129	129	129	129	129	129	129	129

**. Correlation is significant at the 0.01 level (2-tailed).

APPENDIX P

SPSS OUTPUT OF HYPOTHESES

HYPOTHESIS 1

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.536[a]	.287	.281	1.0113365	.287	51.097	1	127	.000

a. Predictors: (Constant), Individual Characteristics of TTF

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	52.262	1	52.262	51.097	.000[a]
	Residual	129.896	127	1.023		
	Total	182.158	128			

a. Predictors: (Constant), Individual Characterstics of TTF

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.826	.375		7.545	.000
	Individual Characteristics of TTF	.534	.075	.536	7.148	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 2

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.480[a]	.230	.224	1.0509166	.230	37.935	1	127	.000

a. Predictors: (Constant), Task Characteristics of TTF

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.896	1	41.896	37.935	.000[a]
	Residual	140.262	127	1.104		
	Total	182.158	128			

a. Predictors: (Constant), Task Characteristics of TTF

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.037	.399		7.611	.000
	Task Characteristics of TTF	.545	.089	.480	6.159	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 4

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.227[a]	.052	.044	1.1662430	.052	6.928	1	127	.010

a. Predictors: (Constant), Performance Impact

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9.422	1	9.422	6.928	.010[a]
	Residual	172.736	127	1.360		
	Total	182.158	128			

a. Predictors: (Constant), Compatibility

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.873	.234		20.804	.000
	Compatibility	.182	.069	.227	2.632	.010

a. Dependent Variable: Performance Impact

HYPOTHESIS 5

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.389[a]	.151	.145	1.1032539	.151	22.657	1	127	.000

a. Predictors: (Constant), Currency

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	27.578	1	27.578	22.657	.000[a]
	Residual	154.580	127	1.217		
	Total	182.158	128			

a. Predictors: (Constant), Currency

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.877	.340		11.406	.000
	COMPUTE avgcurr = Mean(rccurr1,curr2) (COMPUTE)	.319	.067	.389	4.760	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 6

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.359[a]	.129	.122	1.1175735	.129	18.847	1	127	.000

a. Predictors: (Constant), Flexibility

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.539	1	23.539	18.847	.000[a]
	Residual	158.619	127	1.249		
	Total	182.158	128			

a. Predictors: (Constant), Flexibility

b. Dependent Variable: Performance Impact

Regression Analysis – Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.148	.311		13.350	.000
	Flexibility	.303	.070	.359	4.341	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 7

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.355[a]	.126	.119	1.1197441	.126	18.282	1	127	.000

a. Predictors: (Constant), Locatability

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	22.922	1	22.922	18.282	.000[a]
	Residual	159.236	127	1.254		
	Total	182.158	128			

a. Predictors: (Constant), Locatability

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.293	.283		15.163	.000
	Locatability	.264	.062	.355	4.276	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 8

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.398[a]	.159	.152	1.0985403	.159	23.944	1	127	.000

a. Predictors: (Constant), Meaning

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	28.896	1	28.896	23.944	.000[a]
	Residual	153.262	127	1.207		
	Total	182.158	128			

a. Predictors: (Constant), Meaning

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.944	.318		12.398	.000
	Meaning	.319	.065	.398	4.893	.000

a. Dependent Variable: Performanct Impact

HYPOTHESIS 9

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.307[a]	.094	.087	1.1397595	.094	13.224	1	127	.000

a. Predictors: (Constant), Reliability

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	17.178	1	17.178	13.224	.000[a]
	Residual	164.980	127	1.299		
	Total	182.158	128			

a. Predictors: (Constant), Reliability

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.974	.412		9.646	.000
	Reliability	.258	.071	.307	3.636	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 10

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.365[a]	.133	.126	1.1151229	.133	19.488	1	127	.000

a. Predictors: (Constant), The Right Data

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.234	1	24.234	19.488	.000[a]
	Residual	157.924	127	1.243		
	Total	182.158	128			

a. Predictors: (Constant), The Right Data

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	4.189	.297		14.090	.000
	The Right Data	.310	.070	.365	4.415	.000

a. Dependent Variable: Performance Impact

HYPOTHESIS 11

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change
1	.366[a]	.134	.127	1.1146548	.134	19.611	1	127	.000

a. Predictors: (Constant), Training

ANOVA

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24.366	1	24.366	19.611	.000[a]
	Residual	157.792	127	1.242		
	Total	182.158	128			

a. Predictors: (Constant), Training

b. Dependent Variable: Performance Impact

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients: B	Unstandardized Coefficients: Std. Error	Standardized Coefficients: Beta	t	Sig.
1	(Constant)	4.293	.274		15.652	.000
	Training	.252	.057	.366	4.428	.000

a. Dependent Variable: Performance Impact

RESEARCH QUESTION 3 - SUBSCALES

Regression Analysis – Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.500[a]	.250	.207	1.0622488	.250	5.776	7	121	.000

a. Predictors: (Constant), Reliabiity, Compatibility, Meaning, Flexibility, Currency, The Right Data and Loca

Regression Analysis - Coefficients

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.923	.439		6.654	.000
	Compatibility	-4.225E-02	.077	-.053	-.549	.584
	Currency	.121	.088	.147	1.363	.175
	The Right Data	8.485E-02	.095	.100	.895	.373
	Flexibility	.115	.086	.137	1.343	.182
	Locatability	5.508E-02	.087	.074	.634	.527
	Meaning	.151	.092	.189	1.642	.103
	Reliability	5.022E-02	.078	.060	.641	.523

a. Dependent Variable: Performance Impact