

Knowledge Management Systems for Small Family-Owned Businesses—The Case of the English-speaking Caribbean

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ABSTRACT

Small family-owned businesses (FOBs) represent an important sector of the economy in the English-speaking Caribbean (ESC). But the generational transition and longevity of these businesses is threatened by the depletion of key areas of knowledge, due in part to inadequate knowledge management; and compounded by the unstructured and informal nature of these businesses.

Drawing on data from Barbados, Jamaica and Trinidad and Tobago, and using a Design Science approach, this article proposes a knowledge management system (KMS) framework that provides a structured and process-oriented approach in the management of knowledge across generations. Though the framework is informed by the data from the three countries referenced, the descriptive nature of the framework allows for adaptation to other jurisdictions; especially those with economies similar to those in the ESC.

Key Terms: family-owned businesses, design science, knowledge management system, English-speaking Caribbean

The economic benefits of family-owned businesses are well documented (Bertrand and Schoar 2006; Gersick et al. 1997; OHara 2004; Ward and Aronoff 1990; Ward 2004), but they continue to be plagued with the problem of transitioning from one generation to the next (Miller, Steier and Le-Breton-Miller 2003; Sharma, Chrisman and Chua 2003). This is often referenced by the much cited statistics that only 30% and 15% of FOBs transition to the second and third generations, respectively (Handler 1990; Ward 1997). Family business succession is said to be lower for small family-owned businesses (Perricone, Earle and Taplin 2001), and is thus a threat to their continuity, longevity and viability (Colli 2012; Williams and Jones 2010). In a study of FOBs in Jamaica, Williams and Jones (2010, 37) noted that the low survival rate in small family-

owned business “has to be reversed if small and family-owned firms are to live up to their expectation as the foundation for economic growth, job creation and wealth creation, especially in small, open developing economies”.

Among the challenges faced by small FOBs is the high dependence on the role of the founder-manager (Birley 2002; Feltham, Feltham and Barnett 2005; Ward 2004). In many cases, the founder-manager is the repository of business-related knowledge (Bracci and Vagnoni 2011; Cabrera-Suárez, Saá-Pérez and García-Almeida 2001); especially tacit knowledge, which can prove difficult to transfer (Bracci and Vagnoni 2011). Indeed, the dominance of founder-owner in small FOBs in the ESC is seen as a barrier to the transfer of knowledge. This gap must be addressed to facilitate a structured and process-oriented approach to the process of knowledge transfer in small FOBs.

Established knowledge management systems (KMS) can help to alleviate the loss of tacit knowledge by preserving key elements of organisational memory (Bracci and Vagnoni 2011). The transfer of knowledge in family business succession is arguably very difficult, due to its dependence on the compatibility of the incumbent, the successor and the dynamics of the business (Szulanski 2000). Part of this difficulty is related to the tacit knowledge embedded in the set of resources called *familiness* (Habbershon and Williams 1999). Familiness is the set of resources that are unique to the firm as a result of family involvement and interactions in the firm (Habbershon and Williams 1999; Sirmon and Hitt 2003). Additionally, in the case of small FOBs in the English-speaking Caribbean, the difficulty in the transfer of familiness from one generation to the next might be affected by the lack of a process-oriented approach to family business succession. The absence of a process-oriented approach to family business succession could lead to the further demise of small FOBs in the ESC. This concern leads to the research question: *is there a process-oriented approach that can be employed to facilitate the preservation and subsequent transfer of knowledge across generations in small FOBs in the English-speaking Caribbean?*

In answering this question, this article outlines a Knowledge Management System (KMS) framework that aims to address the knowledge transfer gap (Bracci and Vagnoni 2011) among small FOBs. This is based on the premise that small FOBs in the ESC can

benefit from a structured approach to knowledge transfer across generations. Indeed, a KMS is seen as one process-oriented framework that provides a structured approach for the transfer of knowledge across successive generations (Bracci and Vagnoni 2011; Cabrera-Suárez, Saá-Pérez and García-Almeida 2001). However, the non-homogeneous nature of family business (Westhead and Howorth 2006; Nicholson 2010) requires that an effective KMS for FOBs be context-specific. In this regard, in addition to the relevant literature (Bracci and Vagnoni 2011; Cabrera-Suárez, Saá-Pérez and García-Almeida 2001), the framework presented draws on empirical data from Barbados, Jamaica and Trinidad and Tobago, representing three of the major economies in the ESC. The Design Science approach is used to develop the KMS framework that is presented in the article.

The next section gives a review of the extant literature. This is followed by a background and method of the study, the proposed KMS framework, discussions and conclusions.

Literature

Family-owned Businesses

There is no consensus on a definition of a family-owned business. But for this article, the definition posited by Chua, Chrisman and Sharma (1999, 25) is adopted:

The family business is a business governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families.

Succession is one of the main concerns facing FOBs (Chua, Chrisman, and Sharma 2003). It involves a deliberate and systematic effort to put plans in place to ensure continuity in leadership, and the retention and development of knowledge capital for the sake of the future development of the business (Rothwell 2001). But, there has been a demise of family businesses across successive generations (Janjuha-Jivraj and Woods 2002), with approximately 30% and 15% transferring to the second and third generations, respectively (Ward, 2004). This has resulted in the loss

of business-related knowledge, considered to be the most fundamental resource for economic growth (Drucker 1973), between generations (Feltham, Feltham and Barnett 2005). Bracci and Vagnoni (2011) expressed the view that while the FOB literature is replete with succession planning empirics (Handler 1994; Sharma et al. 2001; Venter, Boshoff, and Maas 2005), there is not an adequate assessment of knowledge and intellectual capital (IC). In the case of small FOBs, their peculiarities are yet to be thoroughly investigated (Venter, Boshoff, and Maas 2005). This is affected by the inability to transfer knowledge from the founder-owner to the successor (Feltham, Feltham, and Barnett 2005). This is compounded by the findings that showed that organisations may lose or forget knowledge (Darr, Argote, and Epple 1995); a reality that underlines the importance of the storage and retrieval of organisational memory (Stein and Zwass 1995; Walsh and Ungson 1991).

Part of the knowledge of the FOBs is captured in the level of family involvement (familiness), which is closely aligned to the Resource-Based View (RBV) perspective of the firm (Barney 1991; Berman, Down, and Hill 2002; Conner 1991). Familiness includes the tacit knowledge or the intangible resources of the firm (Chrisman, Chua, and Steier 2005; Habbershon, Williams, and MacMillan 2003), which can help to sustain competitive advantage (Cole 1998; Nonaka 1994; Spender 1996a and 1996b). But there seems to be a clear knowledge transfer gap among small FOBs (Bracci and Vagnoni 2011).

In addressing the knowledge transfer gap in family business, Bracci and Vagnoni (2011, 14) constructed a theoretical framework in helping to identify the critical factors to consider in succession planning. One of the major factors identified among small FOBs is their inability "to preserve, integrate and develop the stock of existing knowledge". They argue that many small FOBs suffer from a low level of education, inadequate finances for training and the lack of experts in knowledge management, which result in the depletion of key knowledge in these firms. They also argue that structural intellectual capital is the storage of technical information inclusive of routines, processes and trademarks, which can be shared in forms such as publications or culture. Structural intellectual capital of the firm is generally referred to as the organisation's ability to manage its stock of knowledge (Bracci and Vagnoni 2011).

Alavi and Leidner (2001) argue that firms can benefit from having KMS in helping to store, process and retrieve the information that can help in the transfer of this knowledge. Bracci and Vagnoni (2011) developed a theoretical model that can be used as a foundation for the development of such a KMS for family business succession. They argue that the characteristics of the incumbent, the successor, and the organisation represent three important components in the transfer of knowledge in FOBs. They argue that the incumbent represents the most relevant repository of knowledge in small firms. One of the reasons is that in small FOBs, most of the intellectual capital (IC) is stored as tacit knowledge by the owner-manager (Anderson, Mansi, and Reeb 2003; Kelly, Athanassiou, and Crittenden 2000), thus creating the challenges that accompany centralization of information. From the organization perspective, small FOBs also face the challenge of a lack of the structured approach required for effective knowledge management (Beaver and Jennings 2005; Spence 1999) and also a lack of financial and other resources (Beaver and Jennings 2005).

Knowledge Management System

Knowledge Management Systems (KMS) are systems which typically involve creating, generating, storing, accessing and disseminating knowledge (Alavi and Leidner 2001; Davenport and Prusak 2000). KMSs are generally defined as a class of information systems which are applied to managing knowledge (Alavi and Leidner 2001), and are seen as enabling technologies for effective and efficient knowledge management. The primary goal of these systems is to increase organisational effectiveness by using knowledge from the past to inform present activities (Stein and Zwass 1995). Organisations can have several knowledge management initiatives, therefore the focus of a KMS should be on providing an integrated technology environment (Maier and Hadrich 2006). Alavi and Leidner (2001) state that the role of a KMS includes: (1) provide access to the sources of knowledge rather than the knowledge itself; (2) provide a link among sources of knowledge to create a wider breadth and depth of knowledge flows; (3) enhance intellectual capital by supporting the development of individual and organisational competencies; (4) provide effective search and retrieval mechanisms for locating

relevant information; (5) gather, store and transfer knowledge; and (6) help in user assimilation of information. In constructing a KMS framework, one needs to consider the different types of knowledge within an organisation. These include the Know-Why, the Know-What, the Know-How and the Know-Who (Garud 1997). Knowing is defined as how knowledge works in a business system and is important in understanding how knowledge is used in the processes (Eppler 2001; Alvares and Leidner 2001; Powell and Swart 2005; Prusak 2001). The emphasis of this knowledge perspective is not just on processes but on system wide knowledge. Know-What is the knowledge about the facts in the domain and also the knowledge of what to do. This is embedded in the practices of an organisation. Know-How is the knowledge that is inherent in the chains of causality between processes. Know-Why is related to how goals interact with each other and thus focuses on knowing why certain things are done rather than how they are done. Know-Who is the knowledge about who knows what and is embedded in the interactions among actors, roles and social networks. Know-Where is related to the location of assets in the organisation. Having access to all these types of knowledge will help in the process of knowledge transfer for succession planning.

Design Science

The proposed KMS framework is developed using the Design Science Approach (Gregor and Hevner 2013; March and Smith 1995; Hevner et al. 2004). This approach provides a set of guidelines to be followed in the development and evaluation of an artefact. The artefact can be in the form of a construct, a model, a method, or an instantiation. In order to ensure that the design of the artefact is considered research as opposed to routine design, there must be a clear contribution to the knowledge base of foundations and methodologies (Hevner et al. 2004). In this research the artefact is the proposed framework; considered to be a contribution/extension to the literature related to succession planning for FOB. To ensure rigour (Hevner et al. 2004) the framework is informed by existing literature in the areas of knowledge management, knowledge management systems and family owned business. In addition, design science research requires the rigorous evaluation of the artefact using one of a number of proposed evaluation techniques.

The design evaluation for this research will be done using the descriptive method in which an informed argument will be presented using information from the existing body of related research.

As part of the design science process, relevant data covering the nuances and characteristics of FOBs in ESC were collected. The following section gives a background to the countries and the method used to collect this data.

Background and Method

Barbados, Jamaica, and Trinidad and Tobago formed the sample space for the collection of data for the current study. These countries represent three of the major economies in the English-speaking Caribbean;¹ representing about 10% of the population of the Caribbean region, 68% of the Commonwealth and account for 71.2% of total GDP of this block of countries.² They have a common history of enslavement of Africans by the British to support mostly sugar plantations across the British West Indies. Over time, each of the three countries have evolved into a rich racial/ethnic mix; including people of African, Chinese, East Indian, Europeans, Jewish and Syrian/Lebanese ancestries. Throughout the history of the three countries, each of the racial/ethnic groups has had different entrepreneurial experiences and approaches to business succession.

The English-speaking Caribbean region is known for its oral tradition (Méndez 2011; Hill 2007; Cooper 1995), where information is passed down through generations by word of mouth, and not necessarily in written form. This tradition has had an impact on the approach to family business succession, where values, mores and processes that form the core of family businesses are usually transmitted orally. One area of impact is the reluctance, and

1 The English-speaking Caribbean is the term used in this article to refer to the independent Anglophone Caribbean countries, formerly referred to as the British West Indies. This sub-region includes the following 12 nations: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, St. Kitts & Nevis, Saint Lucia, St. Vincent & the Grenadines, and Trinidad & Tobago <http://www.guardian.co.uk/world/datablog/2010/feb/01/united-nations-population-world-data>

2 <http://www.guardian.co.uk/world/datablog/2010/feb/01/united-nations-population-world-data>

sometimes, unwillingness to write wills, which, in some cases, has led to unstructured and contentious business succession.

Though the questions in each of the areas covered in the study were informed both by the relevant literature, the relevant characteristics of the ESC, as cited above, have helped to inform the method used in the data collection, for this study. Following the revision of the questionnaires, based on feedback from a pilot study, data was collected using interviewer-administered questionnaires, followed by focus group sessions in the three countries. The sample from Jamaica was drawn from a sample frame established in 2006 (Nicholson and Garvey 2006), while samples from Barbados and Trinidad and Tobago were drawn from the established pool of FOBs, as determined by local experts on FOBs in each of the two countries. A stratified sampling method was used, thus covering all major and most minor towns and a range of business sectors. Questionnaires were administered by residents from each of the countries and focus group sessions were facilitated by residents in each country, who were not linked with the research project, thus reducing researcher's bias. The study covered different areas of FOBs, including ownership and control, succession planning and governance. Of the 216 questionnaires administered, 192 were determined to be valid, while one focus group session was conducted in each of the three countries. Owners of family businesses were the targets for both formats.

The data was analysed, using SPSS and the Nvivo software. Quantitative analysis included descriptive statistics, cross-tabulations and factor analysis, while qualitative analysis employed the constant comparative method (Merriam 1998). With the constant comparative method, the analysis begins by constantly comparing the responses of each participant, each time seeking to extract meaningful units of data. The solution oriented KMS framework, as captured in the artefact presented, is informed by the findings from the succession planning section of the study.

Findings on Family Business Succession

Most of the FOBs across the three countries can be considered small, with approximately 33% employing fewer than 5 people and 37.5% having between 5 and 15 employees. The results show that approximately 42% have identified a successor, but about 69% do

not have a plan for succession. The data further shows that only about 40% of the FOBs with a succession plan had a written plan. The oral transfer of knowledge on the business was shown to be the preferred mode, with minimum documentation. Further, “story telling” was shown to be one of the dominant modes of oral transition. Knowledge transfer also came through the experience of working in the business and learning the “ropes of the business”, without the benefit of any direct mentorship. In most of the businesses covered, there was no evidence of knowledge management processes or systems from which critical information about the business could be retrieved. This was compounded by the reality that most of the businesses adopted a “moment in time” approach, as opposed to a process oriented approach to family business succession. In many cases, transition from one generation to the next was through death of the incumbent or “forced” though illness or the “lack of capacity” to “carry on with the business”. In short, there was an absence of any formal structure to facilitate knowledge transfer in the succession planning process of small family businesses in the three countries covered in the study.

It was necessary to examine the factors that influence family business succession; especially those related to the incumbent, who is considered to be the most important factor in the transfer of knowledge in small FOBs (Bracci and Vagnoni 2011). A number of the factors identified matched those found in the literature. These include gender and age of children (Ayres 1990; Lee Jasper and Goebel 2003; Ward 2004); level of education of potential successor (Lee, Jasper, and Goebel 2003); level of interest shown by potential successor (Ward 1987); personal relationship among family members (Davis 1986; Morris, Williams, and Nel 1995), cultural and traditional beliefs of the family (Janjuha-Jivraj and Woods 2002) and attitude of family members (Birley 1986; Morris, Williams and Nel 1996). However, the critical factors that influence succession planning among FOBs in the ESC can be summarised under the headings of when, how, who, where, what and why (Nicholson and Lashley 2016). That is, family business succession or generation transition (GT) in the ESC has been found to be a function of factors that can be expressed as GT (when, how, who, where, what, why). Decisions are therefore driven by questions such as: when is the right time to involve children in the FOB? Who should be the successor to the FOB? What should be the area of responsibility for

the successor when he/she enters the business? A summary of the dominant views on each of the factors that influence the decision making process in the succession process is given in Table 1.

The critical gaps identified from the findings are (1) there is no set order in the transfer of knowledge in succession planning among small FOBs, and (2) the succession planning is dominated by a “moment-in-time” approach, and thus an absence of a process-oriented approach. These two gaps have resulted in an unstructured approach to family business succession among small FOBs in the ESC. This scenario is compounded by the dominance of the founder-owner (incumbent) in how information/ knowledge is transferred from one generation to the next. The proposed KMS framework presented in the ensuing section seeks to address these gaps.

Proposed Approach

This section describes the KMS for FOB architecture that was developed using the Design Science Approach (Hevner et al. 2004). The design-science guidelines were followed and are outlined in Table 2.

Proposed KMS Framework

The proposed KMS framework to address the gaps identified in the knowledge transfer of the succession process is informed by the theoretical framework presented by Bracci and Vagnoni (2011), the context of the ESC and the relevant findings delineated above. The framework presented is intended to facilitate the transition of tacit knowledge, using a process-oriented approach, rather than the dominant “moment-in-time” approach. The proposed framework for this KMS framework is shown in Figure 1, along with an explanation of each of the key components, clearly showing the relationship with the findings summarised in Table 1.

The framework presented has four major components, namely, the knowledge sources, the extraction subsystem, the knowledge repository and the knowledge analysis. These areas can be related to the findings summarised in Table 1. Discussion of these areas follow.

Table 1: Summary of the critical findings peculiar to the Generational Transition Function

Factor	Main Question(s)*	Dominant Options	Comments/Explanation**
When	<p>a. When is the best time for a generational transition?</p> <p>b. When is the best time to get the intended successor involved?</p>	<p>a. The growth or declined stage of the business. Preference for the growth stage</p> <p>b. Before the choice of career path is made. Two time nodes relevant to the ESC are (1) before entering Fourth Form (the stage at high school where students are required to state the courses they will pursue that help to determine their future career path), and (2) before entering college/ university</p>	<p>a. The overall thinking is that a "grace period" is needed for adaptation after the transition, and this is better absorbed during a (long) period of growth. The chance of abandoning the FOB increases if period of transition coincides with a period of business decline. This is compounded given the "moment in time" approach to family business succession in the ESC.</p> <p>b. Fourth Form represents a time when decisions are made regarding the subject areas that will be pursued that are usually indicative of future career path. Decision made at Fourth Form are believed to be sometimes delayed until just before entering college/university.</p>
Who	Who should be the successor?	The son as a successor is a popular choice, but the common choice can be summarised as the one who is available, willing and capable.	"Capable" is usually measured by educational attainment or the potential for such attainment. In many cases, those who are capable are neither available nor willing. The practical choice is usually the one who is available.
How	<p>a. Should entry be by edict (forced into the business) or by choice?</p> <p>b. Should the intended successor gain outside experience?</p>	<p>a. Entry must be voluntary for the purpose of sustainability and longevity of the business. Early entry into the business is preferred.</p> <p>b. This is dependent on the industry. There is a preference for overseas (outside the Caribbean) experience.</p>	<p>a. There was no consensus regarding the method that should be used to engage children or the successor generation into the family business. However, the "how" will "take care of itself" if the "when" falls into place.</p> <p>b. Outside experience is useful, but not critical; especially if the eventual successor is the one who is "capable, available and willing".</p>

Table 1 Cont'd: Summary of the critical findings peculiar to the Generational Transition Function

Factor	Main Question(s)*	Dominant Options	Comments/Explanation**
Where [What]	<p>a. Where is the appropriate entry level for the intended successor?</p> <p>b. What should be the area of responsibility?</p>	<p>a. In general, the ideal point of entry is the "entry level", as defined by each FOB, but seems to be dependent on the level of education of the intended successor.</p> <p>b. The area of responsibility should not necessarily be determined by the point of entry, but by the level</p>	<p>a. of competence of the successor. The "entry level" differs from one family business to the next, but is usually defined as the level that will allow the successor to have a "hands on" experience for most or all the operations of the business. This approach is believed to reduce the show of nepotism.</p> <p>b. The scope of responsibility should be guided by factors such as (1) level of education; (2) prior experience; (3) level of maturity; (4) size of the family business.</p>
Why	Is there a need for a family business succession?	The "why factor" affects all the other factors ... That is, there is little relevance to exploring the "when", "who", "how" and "where [what]" factors if there is no plan to transition	to another generation. Greater chance of transition to next generation if family business started for wealth creation. No consensus on the reason for this conclusion, but the dominant view is that there are more opportunities for the successor if wealth creation is an

objective.

* These questions emerged as the main areas of concern by the respondents, and are not pre-prepared questions

Table 2: Design Science Guidelines

Guideline	Description	Relevant Project Activities
Guideline 1: Design as an Artefact	Design-science research must produce a viable artefact in the form of a construct, a model, a method or an instantiation.	The KMS framework for FOB is the artefact developed through this research.
Guideline 2: Problem Relevance	The objective of design science research is to develop technology-based solutions to important and relevant business problems.	The issue of succession planning and knowledge transfer for family-owned businesses is a very practical problem; especially given the role of FOBs in the English-speaking Caribbean (Nicholson and Lashley 2016).
Guideline 3: Design Evaluation	The utility, quality and efficacy of a design artefact must be rigorously demonstrated via well executed evaluation methods	Hevner et al. (2004) identifies a number of design evaluation methods. The two most suited for this research are descriptive and observational. <i>Informed argument</i> was used in this research. This is classified as a Descriptive Method and requires that information from the knowledge base (e.g. relevant research) is used to build a convincing argument for the artefact's utility. Future research could involve an evaluation of the proposed KMS framework using case study...an observational method where the artefact is studied in-depth in a business environment.
Guideline 4: Research Contribution	Effective design science must provide clear and verifiable contributions in the areas of the design artefact, design foundations, and or design methodologies.	This research extends the existing body of research both for family-owned businesses and for KMS. It clearly identifies the synergy between the two and provides a contribution in this regard. The framework provides an important contribution to the design artefact domain.
Guideline 5: Research Rigour	Design science research relies upon the application of rigorous methods in both the construction and evaluation of the design artefact.	This method has been developed through building on and synthesizing related research both from the family-owned business domain, as well as the knowledge management domain. The relevant literature has been covered in the Literature Review section above. The important relationships between these two domains has been strengthened through this research. The evaluation of the artefact was done using the well accepted <i>informed argument descriptive method</i> , and will be evaluated further through the use of a case study.

Table 2 (Cont'd): Design Science Guidelines

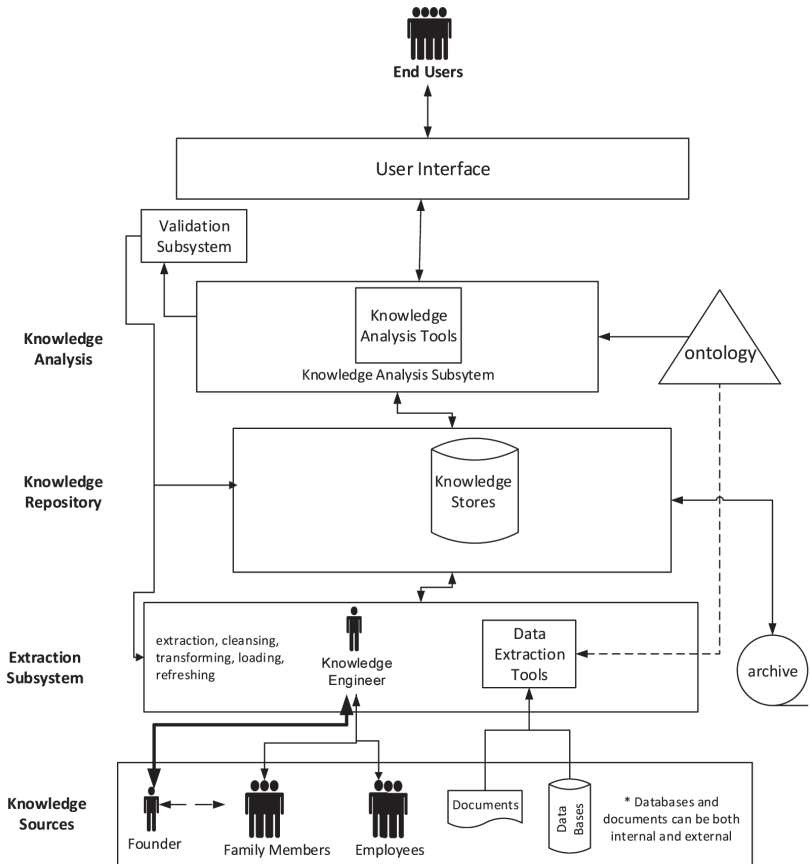
Guideline	Description	Relevant Project Activities
Guideline 6: Design as a Search Process	The search for an effective artefact requires utilizing available means to reach desired ends while satisfying laws in the problem environment	The suitability of the KMS framework and, more importantly, the relevance of the identified components for FOBs was identified after considering KMS frameworks and their components generally. Not all possible components would be relevant to FOBs due to their specific nuances and therefore these were considered in the design of the specific framework presented.
Guideline 7: Communication of Research	Design Science research must be presented effectively both to the technology- oriented as well as management-oriented audiences.	This research is being disseminated in different ways to both practitioners and academics (Hevner et al. 2004). A case study approach can be used for FOBs to understand the importance of the framework to their decision making. In the area of academic research, the KMS framework presented can be validated and extended by other researchers.

Discussion

Knowledge Sources

Knowledge sources represent the areas from which information on the FOBs can be extracted. Knowledge sources include those sources that contain both explicit and implicit knowledge, which, in the case of the small FOBs in the ESC, is dominated by the founder-owner. In many cases, the founder-owner is the only source of knowledge on the business. This untenable reality can lead to the demise of the business when the founder-owner is not available. Therefore, part of this strategic plan is the identification of the different knowledge sources in the KMS. These include the founder-owner, family members, employees (many of whom are family members), documentation on the FOBs and some form of databases. Data from the ESC shows that during the first few years, the founder-owner is usually the only knowledge source, with minimum or no documentation. The data from the three countries covered in the study shows a reliance on oral transfer of knowledge, with very little documentation; most of which is in response to the

Figure 1: A KMS framework for family business succession



requirements by law. This is consistent with the general characterisation of the ESC as a predominantly oral society (Cooper 1995; Hill 2007; Méndez 2011). Therefore, family “secrets”, mores, and values are usually communicated through music, storytelling and other forms of oral engagements. This reality of the ESC has implications for the extraction subsystem and is therefore captured in the proposed framework.

Although the ESC is a predominantly oral society, care must be given to create opportunities for the documentation of processes. In this regard, an important component of the proposed framework

is the creation of a new way of doing things; which can lead to the expansion of the knowledge source beyond the founder-owner. This will provide a basis for the early involvement of other family members in the business, thus establishing the platform to track the “when factor” (see Table 1). The expansion beyond the founder-owner will also help to force a deliberate approach to codify or document businesses processes, which should include all physical documents, such as contracts of various types, policies and procedures. All this should help to establish the foundation to take advantage of the strategic value, in terms of business analytics, that can be gained from proper management and use of these data sources (Davenport 2006). Notwithstanding the lack of financial resources among small FOBs, increasingly, there are more technologies that are affordable to them, including Open Source technology.

Extraction Subsystem

The extraction subsystem is used to gather information from the knowledge sources, periodically throughout the life of the FOBs. However, care must be taken to ensure that this periodic extraction process resolves inconsistencies in data and integrates the heterogeneous data, as is the case with the extraction, transformation and loading process in data warehousing (Nemati et al. 2002).

A number of extraction tools can be used, based on the type and format of the source. Examples include SQL querying and text and other mining analysis. An SQL query processor could be used to extract the data from the database, while text and other mining analysis (Chen 2001) can be used to extract data from scanned documents,³ which can then be loaded into the knowledge stores for further analysis and extraction. This extraction is necessary to facilitate the transfer of knowledge, which requires different approaches, depending on the type knowledge (explicit or tacit) (Polanyi 1966; Tsoukas 2002). Tsoukas (2002) argues that tacit and explicit knowledge need to be treated as different, rather than seeking to “convert” tacit to explicit knowledge. On the other hand, Sternberg and Hedlund (2002) expressed the view that tacit

3 Much of the data from small FOBs is likely to be in documents (physical).

knowledge is knowledge not yet converted to explicit knowledge, and therefore needs to be converted to explicit knowledge to be used in a KMS (Sternberg and Horvath 1999). Such conversion is not always an easy task or process, but given that most of the familiness of business is tacit (Cabrera-Suárez, Saá-Pérez, and García-Almeida 2001) an attempt should be made to convert as much as is possible to tacit and then other knowledge representation techniques (e.g. know-what maps) can be used when this is not possible.

Among the approaches that can be used to facilitate the explication of knowledge is the development of a “know-who” or “know-where” knowledge map (Rao, Mansingh, and Osei-Bryson 2012). The role of a knowledge engineer is crucial at this stage, hence creating the opportunity for the inclusion of family members who are technologically driven to be part of the FOB. Various knowledge elicitation techniques can be used, including interviews, observation and focus groups (Cooke 1994) to help in the articulation of tacit knowledge (Bolloju, Khalifa, and Turban 2002). Mentoring and storytelling are other knowledge elicitation techniques, and ones that are likely to be effective in the context of the oral tradition in the ESC. One advantage of storytelling is that a single story can communicate more than one component of a firm. But it must be concrete and can be readily identified for it to be effective (Swap et al. 2001). Mentoring, which covers both the socialisation (sharing experiences) and the internalisation (learning by doing) components of knowledge transfer, can prove useful in facilitating the extraction of knowledge. Mentoring takes time, but is necessary, since “novices cannot be expected to leap directly to becoming experts . . . All experts pass through levels of knowledge acquisition” (Swap et al. 2001, 101). Indeed, there is ample evidence from research that suggests that it takes approximately ten years to develop full expertise (Gladwell 2008; Simon and Chase 1973). This provides additional motivation for the inclusion of children in the FOBs at an early age; consistent with the findings on small FOBs in the ESC.

Knowledge Repository

Once extracted from the sources, the knowledge of the organisations will be stored in a number of repositories from which

the knowledge can then be used to do analysis. Two examples of these stores are knowledge maps and case bases. Knowledge Maps represent the underlying relationships of knowledge sources using a map metaphor for visualization (Ong et al. 2005). Eppler (2004) summarised the different types of knowledge maps and aspects of organisational knowledge they represent. For example, knowledge structure maps define the different roles which come together to perform a set of tasks which can be used to identify the *know-what* and *know-how* of the organisation. Knowledge maps can provide a number of benefits, including increased visibility of knowledge sources and interpreting and evaluating knowledge domains (Holsapple 2013). The visibility of knowledge sources can accelerate the process of locating relevant expertise and experience. This is essential for family business succession, because, in many cases, visibility of sources and expertise is lost due to the informal and unstructured mode of the FOB. This informal and unstructured approach in family business succession among small FOBs in the ESC is done primarily through verbal agreement; usually between the founder/owner and the intended successor. However, the use of the knowledge map will provide a tool for sustaining this knowledge overtime and it can then be referenced at various points in the development of the FOB. In other words this is not just a one-time knowledge transfer opportunity but the map becomes an available source that can be referenced whenever needed.

Another useful knowledge source is case bases (Richter and Weber 2013), which is analogous to a database from which data can be retrieved. Case based reasoning systems are able to solve new problems by retrieving and adapting solutions to previously solved problems that have been stored in a case-base. This is important for family business succession, as in many cases, the employees or family members who were involved in solving the initial problem or a similar problem are no longer in the business or available to the business, for various reasons, such as death or divorce. Therefore, this institutional knowledge would be lost if not captured otherwise. Case bases provide an opportunity to pass on these experiences through cases so the same mistakes/decisions do not have to be made from scratch.

Knowledge Analysis Tools

The appropriate knowledge analysis tools should be chosen based on the knowledge stores of the system. For example, an inference engine could be used on the knowledge maps for reasoning purposes, if the user is interested in identifying the employees or family members that know about a specific aspect of the business, then the knowledge map and inference engine can be used to discover this. Data mining can be used to identify previously unknown patterns and trends in the knowledge sources and this can be used for strategic decision making purposes. For example, the decision makers may want to take a more data-driven approach to decision making rather than an intuition-based approach. This is important in helping to facilitate a smooth transition, in an age where most of the successors would be more inclined to use computer technology in conducting business. Though the data on FOBs in the ESC did not explicitly capture the role of technology, discussions during the focus group sessions clearly showed a greater willingness of younger owners to use computer technology in the delivery of products and services.

Ontologies have been used for modelling the activities of the enterprise, processes, information, resources, behaviour, goals and constraints (Rao, Mansingh, and Osei-Bryson 2012). Noy and McGuinness (2001) also highlight several benefits of developing an ontology to make domain assumptions explicit, including: (1) facilitating the sharing of a common understanding of the structure of information among stakeholders in a domain (2) facilitating more effective communication and idea-sharing (3) assisting new entrants in a field to quickly assimilate important domain concepts and knowledge and (4) generally supporting the analysis of domain knowledge (Noy and McGuinness 2001). In the proposed KMS framework, the construction of an ontology is important in providing a glossary-like reference for the concepts of the FOBs' domain. For example, the FOB ontology can be used in the extraction of knowledge from various sources in the FOB. Therefore, modelling the family-owned business domain through an ontology will be important both for the extraction and knowledge analysis sub-systems.

Summary and Concluding Remarks

The article underlined the importance of FOBs in the English-speaking Caribbean, with particular focus on the challenges they face in knowledge transfer across generations. The discourse pointed out that these challenges are compounded in small family-owned businesses, because of the tendency of the founder/owner being the sole or main repository of the business-related knowledge. This has led to the lack of a structured and process-oriented approach in the transfer of knowledge among small FOBs, thus threatening their sustainability and longevity. The current research therefore set out to answer the research question: *is there a process-oriented approach that can be employed in helping to facilitate the preservation and subsequent transfer of knowledge across generations in small FOBs in the English-speaking Caribbean?*

In answering this question, a proposed knowledge management system (KMS) framework has been presented, that can be adopted or adapted in helping to facilitate the transfer of knowledge across generations in the family business succession process. The proposed KMS framework is informed by data from Barbados, Jamaica and Trinidad and Tobago, three major economies in the ESC, and the relevant literature; particularly insights gleaned from research done by Bracci and Vagnoni (2011) and Cabrera-Suárez, Saá-Pérez, and García-Almeida (2001) on family business and knowledge management. The proposed framework not only incorporates the theoretical construct of knowledge management, but some of the nuances and peculiarities of family business succession in the ESC. However, the framework can be adapted to suit the realities of FOBs in other economies, especially those that are dominated by small FOBs.

Family-owned businesses may be hesitant to accept technologies as there may be a perception that they neither have the required resources or expertise to adapt and benefit from some of these technologies (e.g. data mining). However, whereas once this may have been true the availability of new technologies (e.g. maturing Open Source technologies and Cloud computing services) has made techniques, such as data mining, accessible and affordable to even the smallest organisation. FOBs can therefore access even advanced technologies for modest monthly fees. Further, some of these technologies are a necessity for FOBs if they

are to give themselves a fighting chance in the increasingly global competitive landscape. FOBs, like other small businesses may even be able to gain a competitive advantage through the use of these technologies as they typically have the benefit of being more agile than their larger competitors and can therefore make strategic decisions at a much faster rate.⁴

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Sistemas de gestión de Conocimiento para las Pequeñas Empresas de Propiedad Familiar—El Caso del Caribe Anglófono

Lawrence Nicholson y Lila Rao-Graham

Las pequeñas empresas de propiedad familiar representan un importante sector de la economía en el Caribe anglófono. No obstante, la transición generacional y la longevidad de estos negocios han sido amenazados por el agotamiento de áreas claves del conocimiento, debido en parte a la inadecuada gestión de conocimiento; y compuesta por la naturaleza no estructurada e informal de estos negocios.

Basándose en los datos de Barbados, Jamaica y Trinidad y Tobago y utilizando un enfoque de ciencia del diseño, este artículo propone un marco de sistema de gestión de conocimiento que proporciona un enfoque estructurado y orientado a los procesos en la gestión del conocimiento a través de las generaciones. Aunque el marco esté informado por los datos de los tres países referenciados, el carácter descriptivo del marco permite la adaptación a otras jurisdicciones; sobre todo aquellos con economías similares a las del Caribe anglófono.

Términos clave: empresas de propiedad familiar, ciencia del diseño, sistema de gestión de conocimiento, Caribe anglófono

Systèmes de Gestion des Savoirs pour les Petites Entreprises Familiales—le Cas de la Caraïbe anglophone

Les petites entreprises familiales (PEF) représentent un important secteur de l'économie dans la Caraïbe anglophone (CA). Cependant la transition générationnelle et la longévité de ces entreprises est menacée par l'appauvrissement de domaines clés de savoir, phénomène en partie dû à une gestion inappropriée des savoirs et aggravé par la nature informelle et non-structurée de ces entreprises.

S'appuyant sur des données de la Barbade, la Jamaïque et la Trinité et Tobago et utilisant une approche empruntée aux sciences de la conception, cet article propose un cadre pour système de gestion des savoirs qui fournit une approche structurée et orientée vers les processus pour la gestion des savoir d'une génération à l'autre. Bien que le cadre soit informé par les données des trois pays

de référence, sa nature descriptive permet son adaptation à d'autres juridictions, et tout particulièrement celles dont les économies ressemblent à celles de la Caraïbe anglophone (CA).

Mots-clés: Entreprises familiales; Sciences de la création; Système de gestion des savoirs, Caraïbe anglophone.

consultancies span areas of diasporas, entrepreneurship, public policy, ICTs, and their intersection.

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