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An Integrated Model for the Organization of Electronic Information/Knowledge in Small, Medium and Micro Enterprises (SMMEs) in South Africa

Abstract: The purpose of this paper is to explore the feasibility of using a business process model as a framework for the integrated organization of electronic information in the context of business enterprises in general, and more specifically in the SMME sector in South Africa. An SMME is defined as a separate and distinct business entity, managed by one owner or more, and having less than 100 employees. Information organization in the business environment is described within the framework of three contexts, namely (1) document creation, (2) collections of documents, and (3) information retrieval systems consisting of document surrogates. Internal and external information resources typically found in business enterprises are categorized according to their relationships with business processes. It is concluded that it is theoretically feasible to organize resources in SMMEs according to a business process model.

1. Introduction

The purpose of this paper is to explore the feasibility of using a business process model as a framework for the integrated organization of electronic information in the context of business enterprises in general, and more specifically in the SMME sector in South Africa. At the same time it is hoped that this approach of relating information organization to business processes will demonstrate the potential value of information organization in the business environment. It should be recognised from the outset that the owners and managers of enterprises are primarily interested in the survival and growth of their businesses. Therefore, if the information professional wants to prove the value of an activity such as information organization, that will require resources (human resources, finance, equipment) to be made available, it will be necessary to show that this activity supports business processes and strategic goals, and thereby contributes to the competitive advantage of the enterprise, even if only indirectly.

This paper reports on some of the work done during the first year of a larger project scheduled for at least three years, and covering all aspects of the organization of information in SMMEs in South Africa. The focus in the research project is on SMMEs because we think that the need for advice and assistance in organizing business information is the greatest in this sector. Many large corporations recognise the importance of information/knowledge as a resource, make provision for its efficient management by appointing professionally trained and dedicated people as information/knowledge managers, and use sophisticated, expensive corporate information systems. Medium, and especially small and micro enterprises, however, usually cannot afford such luxuries. In many cases there also seems to be a lack of awareness at management level of the importance of
information as a resource, and a lack of knowledge about the technology and procedures that can be used to organize it. This situation leads to the development of filing systems and databases according to the preferences of individual workers. Where formal information systems are used they are often developed in a piecemeal fashion for the purposes of individual business processes or units such as finance, customer relations management or human resources management. These unintegrated, decentralised and individualised systems (or lack of systems), are obviously not conducive to the full utilisation of information resources for the benefit of the company.

A further reason for focussing on SMMEs is that this sector plays an increasingly important role in the South African economy in general and in the developing communities in particular. In 1997 96.5% of all business enterprises in South Africa were located in the SMME sector, and these businesses contributed 32.7% to the GDP (Martins & Tustin, 1999, 47). This has now increased to 42% (SA: an overview, 2002). It is also generally acknowledged that SMMEs make an important contribution to job creation, the redistribution of wealth and improvement of the competitiveness of local industries in the global economy (e.g. Martins & Tustin, 1999, p. 1; Rogerson, 1997, pp. 5-7). It should also be noted that in the developing communities nearly all businesses fall in the SMME sector. If information can indeed be organized in a way that supports business processes it would indirectly contribute to the survival and success of SMMEs and to development in South Africa.

2. Research questions

To investigate the appropriateness of a business process model for information organization in SMMEs the following questions will be addressed in this paper:

- Which businesses should be regarded as SMMEs for the purposes of the investigation?
- What does information/knowledge organization in the business environment entail?
- What are the typical business processes described in the literature?
- Can the information/knowledge resources that businesses might want to organize be related to business processes?

Many more questions are being addressed in the larger research project, but these fall outside the scope of the present paper.

3. What are SMMEs?

A number of criteria to be used in defining SMMEs are suggested in the literature: number of employees, annual turnover, credit requested from banks, total value of assets and annual balance-sheet total. The most generally applied criteria seems to be the number of employees and annual turnover. The SMME sector in South Africa is defined by the National Small Business Act (Act 102 of 1996) in qualitative and quantitative terms. The qualitative criterium states that to qualify as an SMME the business must be "a separate and distinct business entity ... managed
by one owner or more ...". Therefore the business should not be a branch or part of a larger organization, but a business in its own right with elements such as customers, suppliers and products. On the basis of quantitative criteria (employees, turnover and total gross-asset value) the Act distinguishes four categories of enterprises, namely micro, very small, small and medium. Rogerson (1997, p. 2) and Martins and Tustin (1999, pp.26-27) add survivalist enterprises as a fifth category, hawking and subsistence farming being examples. It can be assumed that survivalist enterprises generate and acquire very few if any information resources that would need organizing.

For the purposes of this project enterprises will be categorised according to the number of employees as micro (including the category of very small) (1-9 employees), small (10-49 employees) and medium (50-99 employees). Taking one or more of the financial criteria mentioned above into account would complicate the categorisation of enterprises because a business might fall into one category according to the number of employees and into another according to annual turnover, for example. It can also be argued that the financial criteria are not very relevant with regard to a company's needs for information organization, although finances will of course determine the technology (hardware and software) that the company can afford. On the other hand, the number of employees can play a significant role in the amount and diversity of information resources that have to be organized, and in the need for centralised and integrated information systems.

4. Information/knowledge organization in the business environment

The Library of Congress Subject Headings defines information organization as "identifying, describing, and providing access to information-bearing entities in all kinds of environments, such as archives, libraries, museums, offices, and on the Internet, through the gathering of the entities into organized collections, and/or through the creation of retrieval tools, such as bibliographies, catalogs, indexes, finding aids, registers, search engines, etc." In terms of this definition the present paper deals with information organization in the office environment, more specifically offices in SMMEs. According to Taylor (1999, pp. 13-14) information organization in offices takes place in manual and electronic records management systems, and involves the organization of units such as directories (folders), data files, computer programs and fields in records. These units have to be organized at enterprise level as well as at personal level by individual staff members. At the enterprise level information has to be organized in systems such as folders on network servers, intranets and corporate portals, document management systems, electronic mail systems, transaction processing systems, management information systems, executive information systems, decision support systems and groupware systems. Many of these systems are extremely expensive and will usually be found only in large corporations, not in SMMEs.

Based on the LCSH definition and authoritative handbooks on information organization, such as Rowley and Farrow (2000) and Taylor (1999) one can say that information organization takes place in three contexts, namely (1) in the context of the creation of documents, source databases and other information-bearing entities, (2) in the context of forming collections of documents, and (3) in the context of constructing information retrieval systems consisting of document surrogates (bibliographic records).
At the time of the creation of information-bearing entities the following information organization activities can take place in a business enterprise: the provision and encoding of embedded metadata in documents published on the company intranet; the structuring of information elements on a corporate website or portal; the organization of data elements in tables and fields in a relational database, e.g. a customer or product database; the construction of a knowledge repository for capturing the knowledge assets of the company; the construction of an index to a document, e.g. a project report, annual report or staff manual.

Organizing collections such as corporate or personal libraries and archives of printed or digital information entities entails the process of classification (categorisation) for the purpose of physical storage and retrieval. Classification can be applied to the shelving or filing of printed documents according to a published or home-grown classification scheme, and to the storage of digital objects on disk in some kind of classified folder structure.

The creation and organizing of document surrogates in bibliographic retrieval systems include the processes of description, indexing, abstracting and classification of information entities, resulting in systems such as catalogues, search engines, directories and subject gateways. Various tools (system aids), such as retrieval system software, codes for document description, metadata formats, indexing languages and classification schemes are used in creating these systems. The construction of bibliographic retrieval systems is probably not a high priority in most SMMEs, especially those in the micro and small categories, although they might be a necessity in information-intensive enterprises such as law practices.

5. Business processes

Alter (1996, 60) provides a useful model of generic business processes, grouped into three categories (terminology used by other authors are added in brackets where appropriate):

A. Processes requiring coordinated work from many functional areas

These are processes that cross functional areas. Specific processes mentioned by Alter are the creation of a new product, creating a coordinated plan for an entire business and fulfilling customers’ orders.

B. Processes typically related to a specific functional area

- Production (Operations): purchasing materials, assembling or fabricating the product, delivering the product, servicing the product and supporting the customer.

- Sales and marketing: identifying potential customers, deciding what method customers really want, identifying market opportunities, making customers aware of the product, persuading customers to buy the product, performing the sales transaction.
• *Engineering (Research and Development):* performing research about new methods, determining how to produce products, determining how to improve production processes.

• *Accounting and finance:* performing financial transactions, creating financial statements, paying taxes, investing cash, financing operations.

• *Human resources:* determining hiring requirements, hiring people, introducing employees to the company operations, paying employees, administering employee benefits, administering disciplinary actions and terminations.

C. Subprocesses and activities occurring in all functional areas

These pervasive processes include communicating with other people, analyzing data, motivating employees, planning work to be done, keeping track of work being done and providing feedback to employees.

6. Information/knowledge resources and business processes

The busy manager of a small enterprise struggling to survive might not be easily convinced that it is necessary to spend a lot of time and money on the organization of the company's information assets. However, if it can be demonstrated clearly that organized information is critical to the operations of the enterprise and supports the business processes he/she might be more willing to invest in systems aimed at the capturing and organized storage of the information. It is therefore necessary to determine whether information resources can be directly related to business processes. In this discussion the information resources will be grouped in the two broad categories of internal and external information, a distinction used by several authors (e.g. Choo, 1998, p. 139; Pollard, 1999, p. 89).

From the point of view of information organization an important question is whether external information resources should be organized as a separate collection or integrated with internal information. If the organization of both broad categories could be based on business processes, it might be feasible to create a single integrated system for all resources. In the following brief overview of internal and external resources an attempt is made to relate these resources to Alter's model of business processes.

6.1. Internal information resources:

This expression refers to all information relating to the internal environment of the company. Most of these resources are produced by company employees, and emanates from the business processes outlined above. Some resources originating outside the company, e.g. bank statements, accounts and receipts from suppliers, orders from customers, tax assessments, auditor's reports, etc. should perhaps also be regarded as internal information because of their direct relationship with the internal environment.

Many types of resources can be identified by simply analysing the list of business processes compiled by Alter and by consulting other handbooks on information systems. Cross-functional processes produce information resources such as product development reports, business plans and competitive intelligence reports. The production/operation process involves documentation on the
purchasing of materials and equipment (information sheets from suppliers, orders, bills, etc.), records of quality control, delivery notes, guarantee cards received from customers, servicing records and customer records. The sales and marketing function produces market research reports, product brochures and information sheets, advertisements, press releases, orders from customers, records of sales transactions. Internal information resources related to the engineering (or research and development) process include project planning documentation, laboratory notes and project reports. Accounting and finance give rise to budgets, regular financial reports on income and expenditure, documentation relating to taxes, records of investments and assets, etc. Information resources produced in human resources management include job descriptions, advertisements for vacancies, documents relating to employee benefits, employment contracts, training manuals and other training materials, employee records, including records of payment, leave and disciplinary hearings. In the course of the subprocesses and activities occurring in all functional areas information resources such as letters, memorandums, email messages, results of data analyses, schedules of tasks and project documentation are produced.

6.2. **External information resources:**

This category of resources include all information entities originating outside the enterprise and containing information about the external environment. There is general agreement in the literature on competitive intelligence (business intelligence, environmental scanning) (e.g. Choo, 1998; Pollard, 1999, Vine, 2000) that in gathering information for intelligence the focus should be on customers, suppliers, competitors, competing products and services, government policies and regulating instruments, and political, economic, social, demographic and technological trends.

Many information items gathered for the purposes of competitive intelligence support the cross-functional business processes, especially strategic planning and decision-making. In the creation of a business plan, which can include processes such as the setting of strategic goals, determining niche market segments and deciding about mergers with or acquisitions of competitors, the top management of a company have to rely heavily on external information resources. These include resources such as general news and economic journals, cuttings from national and local newspapers, trade journals, annual reports, planning documents and environmental filings of competitors, reports on court cases against competitors, publicity materials of competitors collected at conferences and trade exhibitions and land registry documents. In the production/operations process there seems to be heavy reliance on internal information and little need for external information, except perhaps descriptions of competitors’ processes as a source for benchmarking and improving the company’s own processes, and documentation from suppliers of materials and technology. External sources needed for sales and marketing include market reports by market research companies and academic research units, geographic information (e.g. maps), directories for information about potential customers and evaluations of CRM software. In research and development the creation of a new product or the improvement of an existing product or manufacturing process involves extensive use of external information such as research reports, conference papers and patent literature. For accounting and finance external information is needed about tax law changes, sources of external finance (e.g. a small business development corporation or government funding), investment
opportunities, financial software, etc. Human resources management is dependent on a variety of external information sources such as labour legislation, trade union documentation, sources about industry trends in salaries and employee benefits, guidelines for performance measurement and video and audio tapes for training.

7. Discussion of implications for information organization

The categorisation of typical business information resources according to a business process model above suggests that it is theoretically feasible to organize resources in small, medium and micro enterprises (and larger enterprises as well) according to such a framework. These processes can for instance be used as the basis of a classified system of folders on a network server or on the hard disk of a personal computer, categories in a directory of resources on a company intranet, the structure of a corporate portal, etc. They can also provide the terminology for an in-house thesaurus for indexing to be used in a metadata system.

It is not suggested that the model of business processes used for analysis here, or any other theoretical model, be applied rigidly in the development of a system for classification or categorisation. The current trend is to move away from a strictly functional division of business activities and apply other approaches such as organizing around customer-oriented processes, geographic regions or product groups (Alter, 1996, 59). In a specific enterprise one should therefore analyse the actual structuring of business processes and use that as a model for organizing the information resources of the company. Such an approach that aligns the systems for information organization with the company's business processes should ensure the best chance of convincing the managers that information organization can support these processes, and thereby contribute to the strategic goals and competitiveness of the company.

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References


