

A Methodology for Electronic Business Initiatives Implementation in SME

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Abstract. The World Wide Web technology, supported on Internet, is transforming all business activities into information-based activities. As a result, one can see a radical change in the traditional theoretical models and organisation. The small and medium enterprises (SME) are the type of enterprises that can reap more advantages with the usage of Internet for electronic business. We found that current methodologies present gaps which make them inadequate and unable to help the small and medium enterprises define an effective strategy and follow an plausible implementation path. This being so, we propose a methodology to support the complete implementation lifecycle of electronic business in small and medium enterprises.

1 Introduction

The Internet had made and continues to make a great impact on society. The way it shapes and handles the business is no exception. The systematic usage of the Internet, World Wide Web (Web) and Systems and Information Technology (SIT) has revolutionized traditional markets and business. It is now in the midst of intense global competition, even in areas where Small and Medium Enterprises (SME) need to participate. Never before have companies, especially SME's, have had to face such global and open competition. It is these small firms who are required to meet the new demands of customers and business partners, which are putting enormous pressure on these organisations.

The environment for e-business has also offered many opportunities to improve and expand the internal processes and interactions and transactions between business-to-business (B2B), business-to-consumer (B2C) and business-to-administration (B2A), among others.

The business processes which have been e-enabled, supported by digital media, accelerate and facilitate the flow of information, allow the sharing of information and knowledge and thus create new opportunities for expansion and development of new connections between the various business partners around the globe (Ballou et al. 2000; Cross 2000). Those are the processes that allow the contribution of participants in a distributed business process: end users, suppliers, producers, responsible for marketing and others, from different geographical locations.

At the heart of the transformation process is the level of integration of electronic business (EB) and trade between external and internal processes and systems. These

enable enterprises develop successful and sustainable digital business models. Such companies are in a privileged position to digitize their processes, products and distribution agents (Choi et al. 1997). Apart from the perspective of the product or area of activity, the depth of the impact of electronic commerce and business, or conversion, the size of the impact of the transformation etc depends on several internal organisational factors, such as products, management, structure and employees, and the external environment, political, economic, social and technological. In addition to these there exist micro forces such as competition, suppliers, customers and technology suppliers (Al-Qirim and Corbitt 2002a; Al-Qirim and Corbitt 2002b).

SME are very susceptible to environmental forces (Blili and Raymond 1993). Consequently, the identification of contexts and significant factors for the success of digital initiatives and an explanation of their impact is crucial. However the representation of the two extremes in Figure 2-9, in an organisation purely physical versus purely virtual organisation does not imply that SMEs should elevate to the level of exclusive digital market, thus making it virtual. Rather, depending on certain contextual impacts, organisations can be represented along the continuous line that separates the two extremes. For example, Adam and Deans (Adam and Deans 2000) suggest that there is a tendency in organisations to migrate from both ends to a mixture of physical and virtual organisation, or bricks and clicks (Gulati and Garino 2000). Moreover, some organisations have started their existence only in digital markets, never having existed in the physical markets, whereas other companies may have decided to start simultaneously with presence in both types of market.

2 The Need for Methodological Support

Digital business has its own characteristics and it is accepted that their operations allow a greater level of efficiency than a traditional business. The introduction of electronic commerce and electronic business requires the company to rethink and redefine both the business strategy and the processes that exist, with the e-transformation in mind.

We made a literature review of the models and standards and other efforts made till date in a bid to help the organisations in this process. Following the decision of e-adoption, we concluded that there is an absence of a methodology that covers the entire cycle of development which would lend necessary support to the company that decides to follow the path of e-business (Mamede et al. 2007).

It is thus important to propose a methodology to support the adoption of such characteristics by an existing business, particularly in the case of an SME. Different companies have implemented various business processes and these are in some cases closer to the electronic business than others. Further, different companies have different levels of sophistication in terms of systems and technologies of information and internal knowledge in this field. The important question which rises is-what steps must be taken in addition to examining the current organisation and the subsequent development of a guiding plan so that the company might move in the direction of becoming an electronic business.

3 The MICEP Methodology

Due to the lack of methodologies to support the electronic business implementation in SME, we developed the “Metodologia para a Implementação de Comércio e Negócio Electrónico nas Pequenas e Médias Empresas” (MICEP).

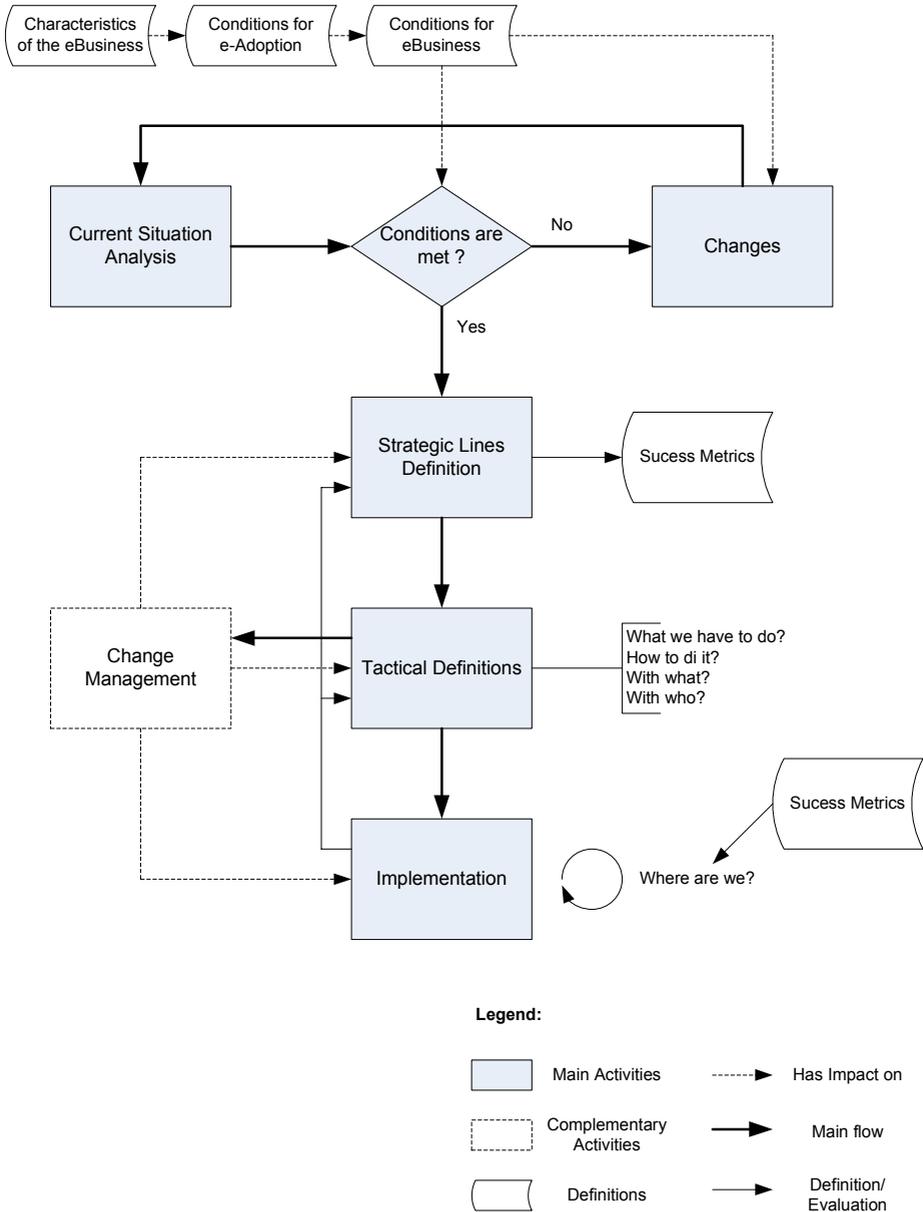


Fig. 1. The MICEP methodology

The methodology we are going to propose can be seen as a set of guidelines for organisational transformation. It provides a visual representation of the major steps needed to progress towards the transformation to electronic business. Each step represents a level of sophistication in particular. This allows a company to see its current position and plan its future path.

The methodology, shown in Fig. 1, consists of several stages and sets up its implementation in continuous cycles, following a spiral. The proposed methodology is made of activities which can be divided into two parts: first, a group of main activities (MA), which constitute the core of the methodology, prominently represented in figure 1; on the other hand, a set of complementary activities (CA), which support the realization of main activities.

One can look to MICEP as being made of two different parts, as shown in Fig. 2. Once the implementation stage, the last activity of the first part is finished, the second part of the methodology starts, with a full analysis of the work done and the results achieved in order to define future paths for improvement.

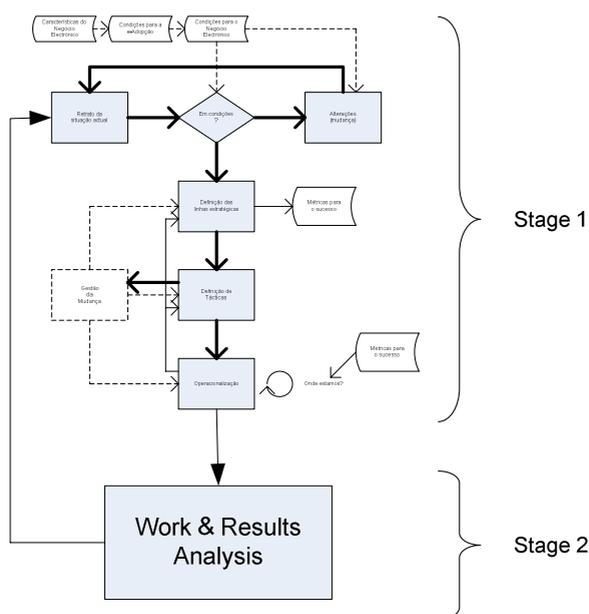


Fig. 2. The macro view of MICEP methodology

As main activities, we have the following:

MA 1. Current Situation Analysis

MA 2. Verification of the existence of conditions for the EB

MA 3. Amendments to the creation of conditions for the EB

MA 4. Strategic Definition

MA 5. Tactical Definitions

MA 6. Implementation

MA 7. Analysis of Results and Impacts

As complementary activities, we define the following ones:

CA1. Initial Settings (Characteristics of Electronic Business, Conditions for e-Adoption, Conditions for Electronic Business)

CA2. Change Management

CA3. Definition of Success Metrics

The main activities begin with the assessment of the initial situation, with the intent to determine whether the basic premises for the implementation of mechanisms for e-business and application of the methodology actually exist in the organisation.

The next step is to validate whether the conditions exist or if such changes are required and possible to realize. This initial step is crucial to the success of the whole project, because if the organisation has not met the basic premises, then never, or only with great difficulty, it will be possible to realize the implementation of e-business. If the conditions are not found, then a series of activities aimed at the creation of such conditions will have to be developed. In this situation, we may be facing a critical factor for the usage of the methodology, which is adopted to begin drafting the portrait of the current situation. On the other hand, if the conditions exist, then you can move to the next level, starting up the stage of strategic lines definition.

In the strategic definition, will be implemented internal and external reviews and reflections in order to create the strategic statement for the company's electronic business. Also as a result of this step, we have the definition of metrics that will allow the measuring of the extent of success and the identification of the critical success factors.

After the previous phase, takes place the formulation of tactics. In this phase will be obtained answers to what we need to do to achieve the strategic objectives, what actions to be undertaken, using what resources or assets and who, inside or outside the organisation. The answers to those questions will assume the form of deliverables like the integration architecture, the governance model and the implementation plan.

In the next phase, the implementation phase, will be applied all the knowledge already created around the theme, in the preliminary stages, in order to effectively implement the solutions that serve the strategic purposes of the company. As results we will have the set of business processes involved, the technological infrastructure to support those processes and the training of all users that will have to deal with the new tools.

When the implementation phase is finished, we consider the first stage of the methodology to have been achieved. The next stage means analysis of outcomes and impacts of all projects in order to influence improvements and help define future paths.

The complementary activities complement the nuclear activities, and the first of them begins by establishing the initial settings, CA1, where the characteristics for EB in the specific market are analyzed, and the conditions for e-adoption and implementation of EB in the company are evaluated. The CA2 is also very important,

and it has a development plan itself that is connected to the implementation plan that is set in MA5. Nevertheless, this sideline has an impact on virtually all the main activities.

The CA3 is developed in the same period of time as MA4 and establishes the conditions that will determine the success of the implementation of the remaining MA.

For each MA there are one or more tools that support the activities to be undertaken, like shown in table 1.

Table 1. Support tools used in MICEP

Activity	Tool
Current Situation Analysis (MA1)	Levels of Organisational Transformation Matrix for transformation opportunity analysis EB Opportunity/Threat indicator Nolan model (adapted) Matrix for modeling opportunities/capacities
Strategic Lines Definition (MA4)	EB initiatives modeling Critical Success Factors listing
Tactical Definition (MA5)	Integration architecture for infrastructure Implementation plan Governance model
Implementation (MA6)	Business Process description (BPMN) Process reengineering (Muthu, Whitman e Cheraghi (Muthu et al. 1999) methodology)
Change Management (CA2)	Frame model

4 Methodology Validation

For the validation of the methodology we decided to follow the application of a real-world case. This application was directed at reviewing the applicability and usefulness of the MICEP methodology as a tool to support the implementation of mechanisms for electronic business. Thus, a Portuguese SME which has evinced interest in this project has been selected and we were able to full apply MICEP.

In reviewing the work done, two main observations can be forwarded: first, we saw the usefulness and support that the use of methodology provides to a company that has determined its strategic objective as the desire to be electronically linked with the entities to which it relates; second, we noted that the methodology covers the whole cycle concerning the implementation of mechanisms for electronic business, from the strategic assessment till the evaluation of what is implemented and the impact that such projects may have on the strategic review of the organisation. The use of MICEP was important to successfully implement the initiatives of EB in an SME. As the methodology goes from strategic planning to implementation itself, including change management, this makes the decision of e-adoption and its consequences directly linked to the business strategy, which involves the management of the organisation. Moreover, completing all the steps foreseen in MICEP, all ideas and all aspects related to the EB initiatives are compiled and sorted, helping to determine what may indeed be implemented. Thus, it is fair to say that MICEP is a contributor to change, which ensures that all EB related aspects are well covered, leading to success in such projects.

Therefore, we can conclude from this case study that the proposed methodology allows organisations to successfully complete all activities related to the e-adoption decision. Any future refinement in the methodology, which could be achieved through the study of more application cases, will result in improvement of efficiency.

5 Conclusion

How should the organisation change and the methodologies and standards that partially support the move towards the implementation of e-business be adopted was presented and discussed in previous work by Mamede, Amaral and Coelho (Mamede et al. 2007). It was the absence of a methodology that could support the development of EB initiatives, leading to the definition and automation of business processes, and their implementation that motivated the development of a proposal translated in the form of the MICEP methodology.

The MICEP methodology is comprehensive and complex. It is complete because it covers the entire cycle from the analysis of the situation of the company, to the definition of initiatives, which must be selected and implemented in the initial stage itself. Peripheral issues such as change management and reassessment of all the work done to serve as inputs for a new cycle, also lies in the scope. But the methodology is complex because it incorporates a relatively wide range of tools, fitting them in some other form of meshing. This is also a strong point of MICEP, as a tool can always be replaced by another identical one, provided that they both accept the same inputs and

produce the same kind of results, so as to continue to function in coordination with the others. Thus, as the methodology matures, we can come to the conclusion that there is a need to use other tools to the detriment of some of the existing ones, and perform this simple amendment.

References

- Adam, S., Deans, K.: Online business in Australia and New Zealand: Crossing a chasm. In: Proceedings of AusWeb2k – The Sixth Australian World Wide Web Conference, Rihga Colonial Club Resort, Cairns (2000)
- Al-Qirim, N., Corbitt, B.: Critical factors for electronic commerce success in small business: A meta study. In: 2002 Information Resources Management Association (IRMA) International Conference, Seattle, pp. 798–202 (2002a)
- Al-Qirim, N., Corbitt, B.: An empirical investigation of an e-commerce adoption model in small to medium-sized enterprises in New Zealand. In: 6th Pacific Asia Conference on Information Systems (PACIS 2002): The Next e-What? For Business and Communities, Tokyo, pp. 343–362 (2002b)
- Ballou, R.H., Gilbert, S.M., et al.: New Managerial Challenges From Supply Chain Opportunities. *Industrial Marketing Management* 29, 7–18 (2000)
- Blili, S., Raymond, L.: Information technology: Threats and opportunities for small and medium-sized enterprises. *International Journal of Information Management* 13(6), 439–448 (1993)
- Choi, S.Y., Whinston, A.B., et al.: *The Economics of Electronic Commerce*. Macmillan Technical Publications, Indianapolis (1997)
- Cross, G.J.: How E-Business is Transforming Supply Chain Management. *The Journal of Business Strategy* 21(2), 36–39 (2000)
- Gulati, R., Garino, J.: Get the right mix of bricks & clicks. *Harvard Business Review* 78(3), 107–114 (2000)
- Mamede, H.S., Amaral, L., et al.: A Necessidade de uma Metodologia para a Definição Estratégica da Digitalização do Negócio das PME. *Revista de Ciências da Computação da Universidade Aberta II* 2, 65–84 (2007)
- Muthu, S., Whitman, L., et al.: Business Process Reengineering: A Consolidated Methodology. In: 4th Annual International Conference on Industrial Engineering Theory, Applications and Practice, San Antonio, Texas, USA (1999)