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Author(s)	Cormican, Kathryn;Mulligan, David
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A Customer Centric Process Innovation Toolkit for SMEs

Mulligan, David, Kathryn Cormican²

*CIMRU, National University of Ireland, Galway, Nuns Island Galway
(david.mulligan@nuigalway.ie)*

²*Industrial Engineering Department, National University of Ireland, Galway, Nuns Island
Galway(kathryn.cormican@:nuigalway.ie)*

Abstract

The business environment is changing at an accelerated pace. Consequently, continuous systemic changes within companies are imperative. In light of this, we are witnessing a shift in the way organizations are designed, structured and organized. Contemporary organisations are reorganizing their processes and systems to be more responsive to the ever-changing needs of the customer. This move towards the customer focused enterprise can be facilitated by the use of methodologies and tools to ensure that the proposed new system will operate as planned. However, process innovation is a complex and difficult activity and often requires specialized support. The methods and tools available are not always suitable for small and medium size enterprises (SME). This paper identifies the support structures and dedicated tools required to facilitate customer focused process innovation in SMEs. A web enabled toolkit designed with these requirements in mind is presented. The toolkit supports all aspects of the process innovation life cycle namely; analysis and conception, specification and selection as well as roll out and implementation. It consists of a methodology repository, a description framework, a navigator as well as a performance measurement module. The toolkit has been implemented and validated in industry. From this procedure feedback and lessons learned have been captured and integrated to refine the product.

Keywords

Process innovation, customer driven enterprise, Small and Medium sized Enterprises (SME)

1 Introduction

In recent years, globalisation coupled with rapid developments in eBusiness technologies have radically changed the business landscape. Customers are becoming more discerning and sophisticated. They now have access to more information and are demanding superior product offerings tailored to their specific needs, wants and expectations. In order to survive in this new environment, companies must change the way they do business. They must move towards a more customer oriented business model. In other words, they must redesign their processes and systems in order to become more responsive to their customers and more efficient in their operations (Baker, 2002, Cox, 1997, Drucker, 1995, Boyett and Boyett, 1995). Astute organizations are attempting to capture the voice of the customer and leverage that value into their products and services. This move towards the customer focused enterprise can be facilitated by the use of process innovation frameworks and methodologies. Such methodologies can help analysts and decision makers to design, develop and deploy complex enterprise processes and systems. A carefully selected process innovation methodology can help improve every stage of the development life cycle i.e. from auditing the existing enterprise system to determining its strengths (to be exploited) and weaknesses (to be improved), through to requirement

specification, systems analysis, systems development and on to acceptance and implementation of the new enterprise system.

While many enabling approaches have been introduced in recent years to support process innovation, we have learned that Small to Medium Sized Enterprises (SMEs) are slow to implement them. There are a variety of reasons for this reluctance. For example, most of these methodologies address the needs of large organisations and are often either too complex or too abstract to be applied by SMEs. SMEs also find it difficult to select the appropriate methodology for their particular requirements. Furthermore, SMEs do not have the cash flow to invest large amounts of money from the outset nor can they take high investment risks. Moreover, they cannot commit a large group of company staff to work on the change process without causing a negative impact on their day-to-day operations and they often lack the skills and expertise to champion complex initiatives.

In order to address this deficit, a cross functional project team spanning five European countries have come together to identify and assess the needs of European SMEs and to help them become more customer focused and competitive. The findings of this study revealed that SMEs need specific support structures and dedicated tools in order to facilitate customer focused process innovation. We learned that a cost effective toolkit was required. The toolkit must be easy to use and must adopt a coaching oriented or self service approach to process improvement. In other words, end users must be able to undertake all aspects of the improvement efforts by themselves in their own time without help from professional trainers or consultants. We also learned that the toolkit must adopt a component based approach where specific weaknesses along a process can be isolated, analysed and improved rather than redesigning the entire process. From this analysis, a web enabled application was developed that met with SME requirements. The toolkit supports all aspects of the process innovation life cycle namely; analysis and conception, specification and selection as well as roll out and implementation and it consists of the following features:

- A methodology repository which incorporates process improvement methodologies that facilitate the weak point analysis and solution development.
- A description framework that allows users to compare and contrast different process improvement methodologies.
- A navigator that is designed to help the user to select the most appropriate methodology based on their unique needs.
- A performance measurement module that provides a series of tools to help the user to identify the benefits of each methodology in terms of financial criteria such as return on investment, payback period etc.

This toolkit has been implemented and validated in industry. From this procedure feedback and lessons learned have been captured and integrated to refine the product. This paper presents findings from this study.

2 SME's in the customer driven enterprise

SME's are the main drivers of economic growth, product innovation and job creation in Europe. They form a dynamic and heterogeneous community, which is confronted by many challenges. These include increased competition resulting from the completion of the European internal market and the growing demands of larger companies for which they often work as sub-contractors, suppliers and partners. To meet these challenges and to remain competitive, SMEs must constantly innovate to add value. In other words, they must design, develop and deploy new product and service offerings that meet the needs of the marketplace. In order to do this they must become customer driven (Griffin, 2004; Zahay and Griffin, 2004; Cumming, 1999; Cooper et al, 1998). A clear understanding of user needs is critical to innovation and all operations must

be driven by these needs. Customer and supplier requirements are key imperatives for SMEs. Organisational staff members must be able to identify, understand and interpret customer expectations, voiced desires and as yet unperceived needs. Activities such as requirements engineering and customer relationship management enable organisations to be pro-active rather than reactive and they assure product quality as defined by the customer and/or end user. Furthermore adopting a “customer demand pull” strategy to direct all operations and business processes is essential. Small firms need to modify and sometimes transform, if necessary, their organizational structure to facilitate customer focus as illustrated in figure 1. Thus, a viable approach is critically needed to help SME’s initiate continuous process innovation so that they can deliver the products and services required by the market. However, process innovation is a complex and difficult activity and consequently companies are finding it hard to implement successful initiatives. Furthermore, there is little evidence (anecdotal, empirical or otherwise) to suggest that adequate provision is made for equipping workers with the appropriate methodologies, tools and techniques. This is particularly true for SMEs where their operational environment is often characterised by lack of financial and human capital to invest in effective process innovation initiatives. Furthermore SMEs must have access to and be able to implement the necessary and appropriate tools and techniques. The methods and tools must also provide the information and knowledge necessary to capture the customers requirements and place the customer at the forefront of the process improvement project.

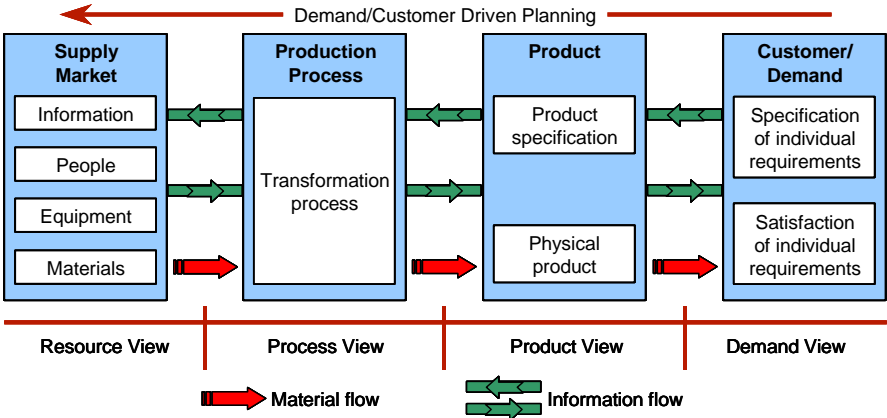


Figure 1: Customer Driven System

3 Process Innovation

Process innovation deals with analyzing, designing or implementing enterprise systems. By following a structured approach to process innovation, an organization increases the likelihood of success. If an organization has a clear understanding of what it is doing and why, and if it has an established mechanism in place to initiate and undertake change, development can happen quickly and predictably. Where such infrastructure is not in place, it has to be put in place for each initiative. This slows down the reaction time of individuals and organizations, and may limit the success of the project, as there is no pattern to follow and the process has to be re-invented each time, thereby the results are not always predictable. Therefore it is imperative to define and adopt an appropriate and effective process innovation plan and methodology.

A process innovation plan is a time based plan that defines where an organisation is, where it wants to go, and how it is going to get there. It incorporates visions, strategies, goals, “as-is” versus “to be” analysis, performance indicators, milestones and lists of tasks with associated timelines. It helps focus resources on the critical tasks that are needed to meet those objectives. Simply put, the goal of a process innovation plan is to identify and integrate the most valuable and successful ways to plan and implement effective change programmes.

A process innovation methodology provides a structured approach to help visualize, understand and evaluate activities and complex processes as well as business component interdependencies. Essentially, these methodologies support the user by building models representing an organization's existing system (as is) and the proposed system (to be). It ensures that an organization is focused on where it wants to be in the future. Process innovation methodologies normally incorporate three key phases: These include:

- **Analysis and Conception:** Organisations must understand where they are before they embark on any new initiative. This involves identifying strengths to be exploited and weak points in the processes to be addressed. To do this, they must determine and prioritise key stakeholder requirements and expectations and then develop key performance indicators to focus effort.
- **Selection and Specification:** Organisations must then specify and select the most appropriate framework or method for their specific needs. This involves identifying best practices in terms of activities, approaches and state of the art expertise. This also involves developing a plan for effective implementation and choosing the required supporting mechanisms.
- **Implementation:** This phase involves implementing and validating the proposed plan. Technology transfer and project management activities will take place here to ensure that the new state is effectively implemented. Guidelines are also developed to help sustain momentum and reinforce the desired behavior.

By implementing a proven methodology for process innovation it is intended that the key performance indicators listed in table 1 will be attained.

4 Research Methodology

Technology orientated researchers are calling for greater employment of field based research methods in order to cope with the growing frequency and magnitude of changes in science, technology and managerial methods. An example of field based research is case study analysis. Based on in-depth examinations of real-world operations, process and systems conditions, case study analysis can potentially improve the relevance and workability of resulting management theory (Yin, 2002; McCutcheon and Meredith, 1993). Consequently, this study uses case study analysis. It employs systematic iterations between literature review and case studies. The process is lauded to enhance theory, creativity, utility, and validity by deliberately increasing the diversity and quantity of literature reviewed, of cases found, and of conjectures examined (Lewis, 1998). Five distinct phases were used in order to conduct this investigation. Each phase was composed of a number of key steps. These are:

- **Phase 1: Foundation:** This phase incorporates defining the theoretical domain, targeting the research, identifying the problem and determining the scope of the study.
- **Phase 2: Induction:** This phase comprises analysing the data within and across organisations or cases, developing initial solution area and comparing the solution to the literature and cases.
- **Phase 3: Iteration:** This phase involves extending hypotheses and conjectures, reaching closure and refining the work.
- **Phase 4: Presentation:** This phase involves introducing, presenting and explaining the research findings namely the framework.
- **Phase 5: Testing:** The final phase incorporates evaluating and testing the framework against proven theoretical concepts and industrial practice.

The project team assessed the requirements of SMEs with respect to process innovation and designed a toolkit for their unique needs. From our investigations with SME owner/managers and key decision makers we learned that many of the process innovation methodologies and associated tools on offer address the needs of large organisations and are often either too complex or too abstract to be applied by SMEs. Furthermore, we found that many of these solutions are very expensive. Many SMEs do not have the cash flow to invest large amounts of money up front nor can they take high investment risks. We also learned that specific expertise and dedicated teams were necessary for the successful implementation of many current offerings. However SMEs cannot commit a large group of company staff to work on a change process without causing a negative impact on their day-to-day operations. Furthermore, SMEs often lack the skills and expertise to champion such complex initiatives.

MEASURE	DESCRIPTION
Time	By following a structured approach to development and growth, the reaction time of individuals and organisations will improve and the lead time from generating new ideas to their successful implementation will reduce
Cost	This process enables problems to be anticipated in advance thus non value added activities will be reduced or eliminated
Quality	Incorporating best practice techniques and learning from previous endeavours can dramatically increase the level of quality
Flexibility	By having a systematic process in place all stakeholders will be empowered and enabled to implement successful change initiatives. This will promote agility in organisations and groups
Innovation	A structured approach to development equips workers with the necessary tools and techniques in order to foster innovation, to fully participate in the migration process and to optimise their advantages from such participation.

Table 1: Key performance Indicators

5 Toolkit

Therefore, in order to meet the needs of our target market these issues were considered. A cost effective and easy to use solution was developed. This solution adopted a life cycle approach where all aspects of the process innovation life cycle were considered namely; analysis and conception, specification and selection as well as roll out and implementation. It also incorporated a navigator system that allows end users to select the most appropriate methodology taking into consideration their individual business context and specific requirements. The solution was specifically designed to be component based. This ensures that discrete activities are decoupled or modularised where possible. This allows the end user to isolate key activities that can be targeted and improved independently of all others. In other words, users have the ability to isolate specific issues in the process that can be improved and they are not obliged to focus on a complete end to end solution if desired. A coaching orientated facility was also incorporated. In other words, a series of methods and tools were designed for each key activity that helps the implementer to execute each work step or task without the need for external help or guidance. This eliminates the need and associated costs of hiring external help. Each of the key elements in the toolkit are presented below.

5.1 Methodology Repository

The methodology repository consists of process improvement methodologies that facilitate weak point analysis and solution development. Each methodology has three phases designed to address

the different decision points of the improvement life cycle. Each phase is split into a number of work steps that map directly to each of the key decision points.

5.2 Description Framework

Each of the methodologies in the toolkit are described according to the description framework. The description framework provides a template by which the key phases, decision points and work steps in a methodology are described (see figure 2). This is done by firstly identifying the set of **p**rocedures (SP) that are required to execute each work step, secondly is the set of **a**ppled **m**ethods and **t**ools (AMT) and finally is the set of **a**dditional **c**haracteristics (SAC) that captures the key indicators of performance for the application of the work steps such as execution time, level of documentation etc.

The description framework allows methodology developers to ensure that each of the methodologies in the toolbox is consistently described. The user interface of the description framework can be seen in figure 4. Each phase is populated with the key process innovation decision points that must be addressed. Finally, each sub decision point is populated with a number of worksteps that must be completed to answer each of these points.

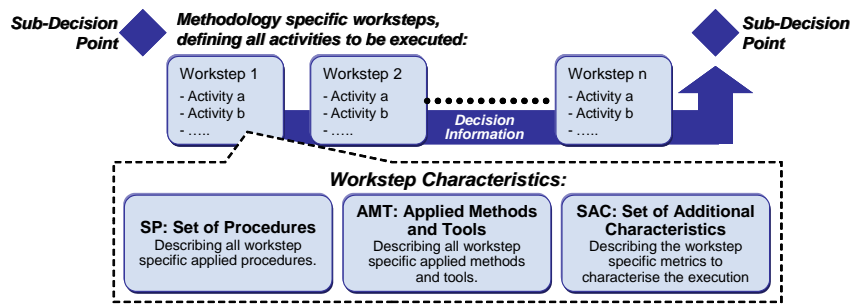


Figure 2: Description Framework

Populating or describing a methodology according to the description framework enables users to compare two methodologies side by side. The description framework captures information such as the level of detail of the documentation, the cost of execution of the work step, the management level responsible, level of external and internal information required etc. The methods and tools to support the SME to execute each of these work steps are also captured in the work step.

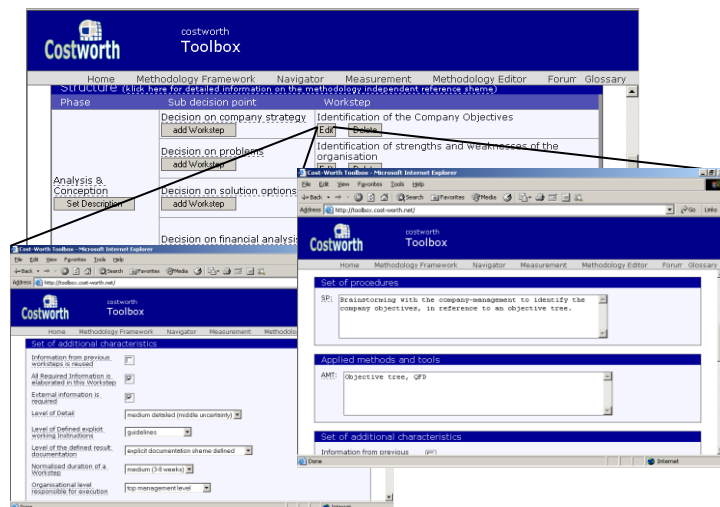
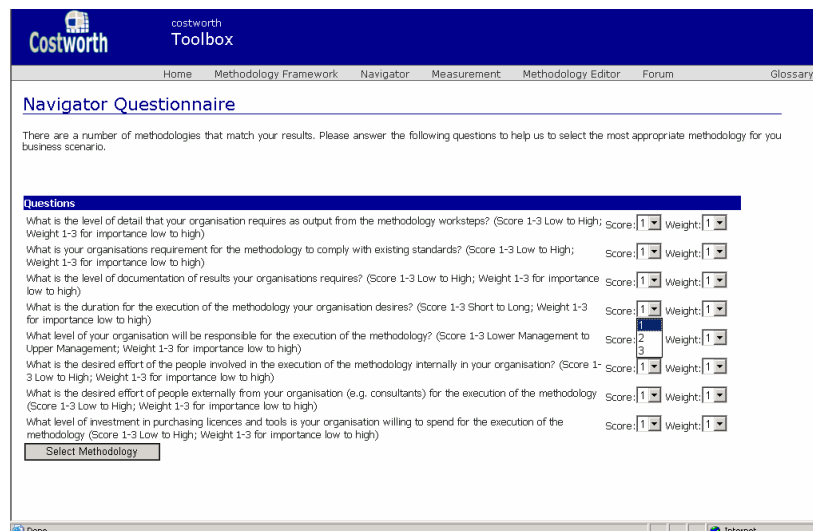


Figure 4: Description Framework Interface

5.3 Navigator

The Navigator helps the user to select the most appropriate methodology based on their unique needs (see figure 5). It identifies generic performance indicators such as time, cost, quality, flexibility. Users are required to rate the relative importance of each performance indicator and consequently the most appropriate methodology is highlighted. In order to select the most appropriate methodology the navigator goes through a number of steps:

- Step 1: the navigator computes the difference between the score entered by the user and the corresponding score in the set of additional characteristics in the description framework.
- Step 2: The difference is then multiplied by the weight that the user selected (e.g. $2 \times 1 = 2$).
- Step 3: Step 2 is repeated for each characteristic and for each work step in the methodology
- Step 4: The sum of the differences is totaled for each methodology
- Step 5: The methodology with the lowest score is the selected and the link is outputted to the user



The screenshot shows the 'Navigator Questionnaire' interface within the 'Costworth Toolbox'. The page has a blue header with the 'Costworth Toolbox' logo and a navigation menu with links for Home, Methodology Framework, Navigator, Measurement, Methodology Editor, Forum, and Glossary. Below the header, the title 'Navigator Questionnaire' is displayed. A brief instruction states: 'There are a number of methodologies that match your results. Please answer the following questions to help us to select the most appropriate methodology for your business scenario.' The main content area is titled 'Questions' and contains ten questions, each with a 'Score' and 'Weight' dropdown menu. The questions are: 1. 'What is the level of detail that your organisation requires as output from the methodology worksteps? (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. 2. 'What is your organisations requirement for the methodology to comply with existing standards? (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. 3. 'What is the level of documentation of results your organisations requires? (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. 4. 'What is the duration for the execution of the methodology your organisation desires? (Score 1-3 Short to Long; Weight 1-3 for importance low to high)'. 5. 'What level of your organisation will be responsible for the execution of the methodology? (Score 1-3 Lower Management to Upper Management; Weight 1-3 for importance low to high)'. 6. 'What is the desired effort of the people involved in the execution of the methodology internally in your organisation? (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. 7. 'What is the desired effort of people externally from your organisation (e.g. consultants) for the execution of the methodology (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. 8. 'What level of investment in purchasing licences and tools is your organisation willing to spend for the execution of the methodology (Score 1-3 Low to High; Weight 1-3 for importance low to high)'. At the bottom of the questionnaire, there is a 'Select Methodology' button. The browser's status bar at the bottom shows 'Done' and 'Internet'.

Figure 5: Navigator Interface

5.4 Measurement Module

The measurement module provides a series of tools to help the user to identify the benefits of each methodology in terms of financial criteria such as return on investment, payback period etc. It contains detailed guidelines regarding the application of the tools presented in the methodology toolbox. The key stages where these tools are employed are: after the analysis and conception phase; after the selection and specification phase; and at periodic intervals after the implementation phase. The measurement module adds additional value to the toolbox by enabling the user to identify the actual costs and margins of error as a result of the use of the methodology.

The toolbox has a number of key modules in it that are interrelated functionality and conceptually. This provides a holistic approach to the selection and application of process innovation methodologies suitable for SMEs. The key modules that facilitate this are the methodology repository which contains a number of individual methodologies that have been developed using a coaching orientated approach to process innovation; the description framework that enables the methodologies to be consistently described and constructed to facilitate comparison; the navigator module that facilitates the selection of the methodology and

finally the measurement module that helps to measure the impact of the initiative at critical intervals. In order to test the appropriateness and effectiveness of this solution, the toolbox was deployed into a number of test sites.

6 Case Study

Six European SME's participated in the design, development and validation stages of the project. Two were Spanish, two German, one was from Greece and one came from Austria. Each of these SMEs operate in the manufacturing domain and produce products in the information technology, automotive, steel and toolware manufacturing sectors. A series of interviews and workshops were held in order to identify the key requirements and problems in relation to the selection and use of methodologies to support process innovation projects in their organisation. From this, explicit user requirements were identified. These requirements were used in order to develop the initial framework of the overall solution. Critical elements of this framework were then codified into a web enabled software system. The resulting toolkit was tested in each of the six companies that were involved in the requirements gathering phase.

The toolkit was measured according to the rationality of the toolkit as well as the overall usability of the toolkit. In order to test these criteria a number of statements regarding best practice deployment were developed for each individual element of the toolkit. These statements were presented to each user and the user was asked to rate the statement on a scale of one to five.

The methodologies were the first element of the toolbox to be tested. The methodologies were executed by the respective owner managers of the organisation and were found to be easy to use and self sufficient and required minimal external help. The solutions developed were found to be successful in targeting the key problem areas along a process and providing solutions that were effective in supporting the weak points along the process. The resulting solutions did not demand total end to end redesign or implementation. Furthermore these solutions were found to be successful in identifying and capturing critical customer information in the initial design and development phase of the process innovation project. The remainder of the toolbox namely the software as described above was also tested and was found to be easy to use and well understood. Initial findings however did yield areas of confusion in relation to the transparency of operationality of the end product. This information was then used to refine the framework.

The overall solution proved to provide a cost effective approach to business process innovation with minimal resources needed to identify, develop and deploy process solutions in a customer driven enterprise. This approach was also found to be suitable to the needs of the SME that were identified above. End users have revealed that the toolkit has helped them to do the following:

- Analyse the business from a holistic perspective
- Identify constraints and bottlenecks within the process or system
- Capture the voice of the customer and translate it into all aspects of the process or system
- Forecast the effects of planned changes
- Enhance communication and decision making capability
- Increase efficiency and effectiveness and reduce cost

7 Conclusions

In order to survive in this new environment, companies can no longer compete based on their traditional business models and structures, they need to redesign their structures to optimize market and collaboration opportunities to be more responsive to their customers and more efficient in their operations. They must change the way they operate in order to improve their capabilities, reduce lead time and provide more personalized products and services. In this view,

progressive organizations are moving towards a more customer oriented business model. This paper introduced the concept of the customer focused enterprise. Critical success factors that affect the successful implementation of a customer focused strategy are identified and discussed. Specific re-engineering requirements for SMEs are identified and discussed. The remainder of the paper presents the integrated toolkit designed specifically to support European SMEs in their quest to become more customer focused.

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