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# Requirements Development and Management: Supporting the Business Objective

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## Abstract

*The complexities and competitiveness of today's business environment are forcing hard assessments of the return on investment for information technology expenditures. The process of developing system and software requirements is still one of the hardest tasks an IS organization performs. The infusion of technology into business has changed the way business is conducted. When there is a substantive change in the technology, the business is again changed. This paper presents the IS organization as a sponsor of business process innovation. The requirements development and management processes should be conducted as a collaborative effort, linking system and software requirements to business performance improvement.*

## Introduction

Many commercial and governmental service providers have taken the challenge to implement practices that will lead their company to compliance with the Software Engineering Institute (SEI), Capability Maturity Model (CMM). There is no secret to why we do this; it is to improve the competitive position of the business. Each business entity bases its software process improvement (SPI) activities and processes on their core methodology and the requirements of their market segment.

Over the past several months, as a member of a project team within Computer Sciences Corporation, I have been involved in the analysis of Requirements Management processes and systems development methodology. Experience indicates that organizations functioning at Level 2 and below focus in a consuming way on their internal processes. One of the questions asked is whether or not a mature organization, operating at Level 3 and above, can meet the intent of the CMM without conducting a realistic examination of the customer's business processes that we are being asked to support.

## The Case for Action

Today, our customers (internal and external) expect that dollars spent on information technology (IT) improvements will improve their ability to respond to their customers' needs, help them accomplish business objectives, and contribute to the bottom line. Additionally, our customers are becoming more sophisticated, both in their understanding of technology and in their expectations of how that technology can be applied. These conditions force the question of whether the CMMs requirements centric approach to software development will facilitate the business objectives.

The Software CMM (SW/CMM) does not link the process of delivering quality software products directly to the goals of the business. Instead, there is an indirect link via the Requirements Management (RM) process. Even in SW/CMM Version 2, the RM effort is tied back to the Systems Engineering CMM (SE/CMM) v1.1, Process 06: Understand Customer Needs and Expectations. However, links to business goals and strategy are not directly mentioned but implied. The SE/CMM acknowledges the increasing rate of change in the business world but leaves the practitioner to develop processes to account for it.

Capers Jones established that requirements creep in excess of 30% generally resulted in an unsuccessful project. Jones also points out that most of the blocks to successful delivery of software systems are management related not technical. The implication is that once the requirements are specified, the system can be developed to meet the requirements but we may not be able to successfully manage the development. Brynjolfsson (among others) has detailed the issues surrounding the Productivity Paradox, which causes customers to question the validity of the investment in software and whether it will attain the expected return on investment. The fact that most software development activities in the industry take place in a CMM Level 1 environment does little to reassure our customers that steps are being taken to improve in these areas.

## Becoming Involved

There are several ways to approach this condition. One extreme is to lock the business process during the development cycle to ensure that the requirements baseline is accurate and the delivered product will provide the functionality as intended. While this may be possible in some industries, it is equally unrealistic for organizations facing global competition where new competitive products and services are offered everyday. Business cannot stop while software is developed.

Another technique is reducing the development cycle time by delivering incremental increases in functionality or capability. This requires a full understanding of not only the current state of the process but close coordination with process evolution. This approach offers a great deal of flexibility to the business but presents substantial technical challenges regarding data structures, module or object reuse, configuration management, integration, testing, etc. Regardless of the approach, coupling requirements development and management to the business processes and objectives is and will be difficult.

Each KPA in the CMM references the principles of Total Quality Management (TQM) to guide our internal and external customer relationships. In implementing this philosophy, a mature organization can begin to demonstrate its value to their customers by directly supporting the development of the business strategy, objectives, and goals. "A credibility Equation for IT Specialists" (Sloan Management Review) presents a compelling case for IT involvement in, and understanding of the business

needs. Particularly, “Managers were impressed with IT specialists abilities to *see the whole picture*, not just the IT piece.” This is indicative of the methods practiced in the requirements definition activity. Whether using a process oriented approach, a data oriented approach, or a proprietary methodology, all of these techniques support the IT specialists evaluation of the process.

That is not to say that requirement definition processes will suffice as process reengineering methodologies. Demonstrated understanding of the business process leads to greater customer confidence. Donahoo points out that every major process improvement methodology consists of three interdependent architectural views: Functional Architecture, Technical Architecture, and Information Architecture. In order for each of these views to be understood and acted upon all parties must share a common vocabulary. The communications required to be successful comes from trust. Action comes from credibility. Confidence comes from both.

### A Leap of Faith

Davenport states that “Managers seeking returns on IT investments must ensure that process changes are realized.” A more recent Gartner Group study indicates that process intervention is a fundamental necessity for successful *large-scale* application development. “Enterprises using Application Development (AD) methodologies that address only IT issues should consider switching to an integrated BPR/AD methodology.” As an organization matures, as part of the requirements development/management process, a metric, or trigger should be developed to indicate that process intervention might be required. The fact that the organization is implementing a software (or technology based) solution can at least act as the prompt to ask – How will the solution influence the process? Davenport lists the key activities in understanding and improving existing processes:

- *Describe the current process flow*
- *Measure the process in terms of the new process objectives*
- *Assess the process in terms of the new process attributes*
- *Identify problems with or shortcoming of the process*
- *Identify short-term improvements in the process*
- *Assess current information technology and organization*

All requirements development processes require some understanding of the customer environment. Mature organizations have the understanding of process analysis and redesign, and they can point to themselves as examples of the benefits of process improvement. Also, the IS organizations’ approach to process improvement can serve as the initial process for the business unit since the steps are known and the results somewhat predictable.

Not every software project will or should translate to a process reengineering activity. Introducing this capability to our customer supports the TQM vision of the CMM. Process analysis also forces the IT organization to become an integral part of the business. Some customers (and practitioners) will ask whether or not business process improvement is one of the roles of the IT community. While business process improvement may not be a core competency for an IT organization - the lack of measurable business improvement in so many implementations indicates the we have a vested interest in ensuring that we help our customers use the services we provide wisely.

### Conclusion

The requirements development and management processes should be conducted as a collaborative effort, linking system and software requirements to business performance improvement. This positions the IS/IT organization as a fully responsible partner rather than service provider. As a result, systems and software can be developed that deliver more than a new interface or TCP/IP protocol. This involvement with the customer leads to improved communications, increased trust and confidence, better understanding of capabilities, and balanced expectations of success. Ignoring that partnership responsibility places us in the position of advocating technology for the sake of technology – not the benefits derived from it.

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