

TRIZ-based Management Strategy in mainstream organizations [Extended version]

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Introduction

This paper describes a synthesis of business management models, that, by applying TRIZ methods, techniques and tools, could be made into an extremely effective generic Management Strategy. TRIZ is an extremely powerful instrument that enables organizations to innovate their products and service-offerings. Having been developed to solve inventive problems, TRIZ quickly took to engineering domains, but is slow to capture mainstream business. In production organizations, TRIZ is often used in conjunction with Six Sigma. Six Sigma started at Motorola [1] and has been adopted by many kinds of organizations. Having a production or manufacturing background, doubts about the generic applicability of Six Sigma as a Management Strategy are emerging [2]. From a completely different perspective, Pine in [3] and [4] provides us with a strategic blueprint, positioning four specific organizational paradigms. When combined with Christensen's theory on disruptive and sustaining innovations, these design paradigms may provide suitable starting points for the design of a Management Strategy.

Mass Customization

Introduction

Pine's starting point is the shortening life cycle of products and the increase of variability demanded by customers. This requires greater flexibility and responsiveness from the producers. He argues that in order to survive, organizations must cater to their customers' demands and must produce high quality, highly customized products and services for a reasonable price. Subsequently, he argues that existing organizational designs and management controls cannot cope with these demands. He then analyzes organizations that successfully navigate these market barriers, allowing them to cope with the demands of the changing market conditions. This results in the definitions of specific properties of the different paradigms of these organizations.

Six Sigma strengths and weaknesses

Six Sigma is primarily a quality management methodology, applying statistics to eliminate defects, where defects are defined as "anything that could lead to customer dissatisfaction". By this definition, Six Sigma focuses on efficiency. In practice, efficiency becomes the most important driving force for change. While efficiency is a necessary precondition to survival of a company, markets demand attractiveness and fitness for purpose of products and services, in other words effectiveness. An overriding focus on efficiency minimizes variety, and therefore attractiveness and fitness for purpose.

As Beer [5] shows, minimizing variety likewise minimizes organizational flexibility ("Standardization kills innovation"). Maximizing efficiency is not the road to effectiveness, as can be seen in Figure 1.

Doing things right might be very efficient, but is not necessarily very effective. Doing the right things, may not necessarily be efficient, but is more effective. Six

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Sigma by itself will help doing things the right way, while TRIZ will help doing the right things.

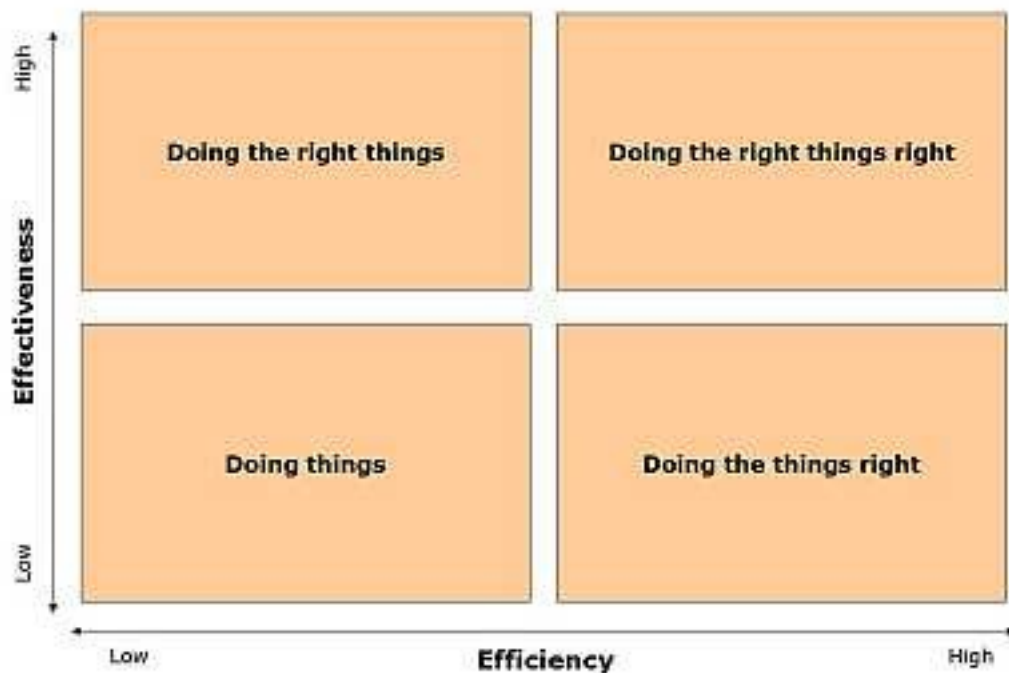


Figure 1: Effectiveness vs. Efficiency

Creating a methodology for doing the right things is more of a TRIZ 'inventive problem' than a Six Sigma process capability. How to approach this?

Joe Pine and Clayton Christensen

Pine's four paradigms

Pine's perspective can be shown using a two-dimensional matrix, comparing the dynamics (stability) of product versus process change. Four types of management paradigm emerge:

- Product and process change both being stable, leads to the typical Mass Production organization (lower-left).
- Product and process change both being dynamic, leads to the typical Invention (or Research) organization paradigm (upper-right).
- When product change is stable and process change is dynamic the Continuous Improvement paradigm is dominant (lower-right).
- Lastly, product change being dynamic and process change being stable, the Mass Customization paradigm emerges (upper-left).

Figure 2 describes the product-process change matrix. The Invention quadrant is the typical province of TRIZ. With its strong emphasis on process improvement, Six Sigma covers both Mass Production and Continuous Improvement quadrants. There is (yet) no management strategy that explicitly focuses on Mass Customization as it's primary paradigm.

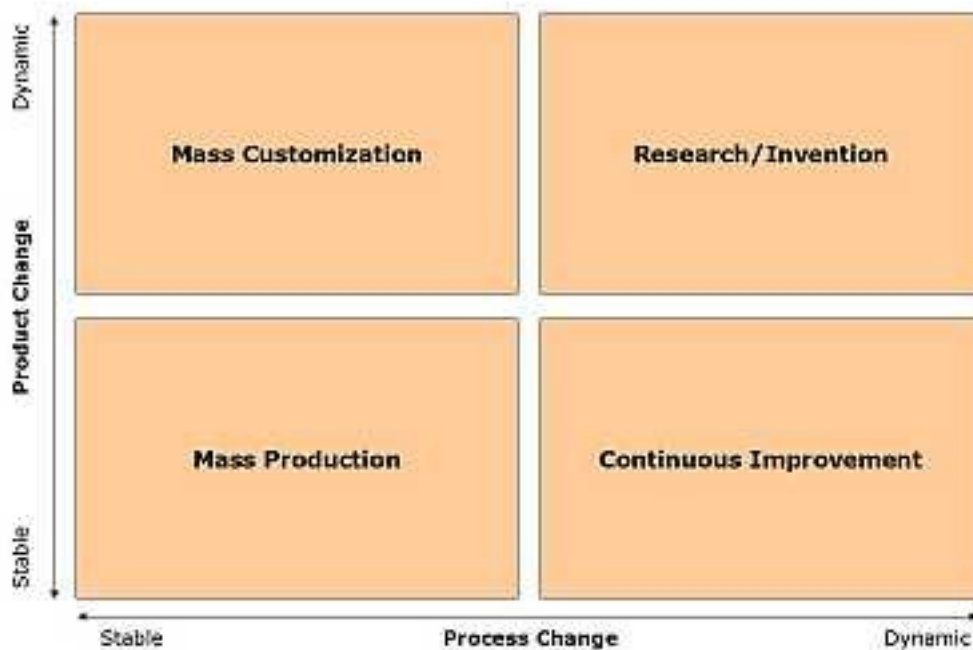


Figure 2: Product/Process Change Matrix

As Pine describes in [3] and [4], the axis of Mass Production and Invention describes the 'traditional' industrial organization. Invention produces a big-bang innovation (product) for which a production process is designed and implemented. In Mass Production, the processes are both highly efficient as well as tightly coupled to the products that are created and sold. Changing the stable process is expensive and time-consuming. Many organizations use Six Sigma to continuously improve their processes, stepping backward and forward between Mass Production and Continuous Improvement 'modes' and mind-sets. As such, the basic paradigm remains Mass Production. Excitingly, Pine finds new types of organizations that are aligned on a different axis, namely between Continuous Improvement and Mass Customization. Organizations that have a basis in Continuous Improvement still produce relatively stable products, but do so by using highly flexible and effective processes. Central to the processes in Mass Customization environments is that although the processes are stable, they are no longer tightly-coupled to individual products, but are capable of producing the product variety demanded by the market. As such, they are both stable and more generic than the processes in either Mass Production or Continuous Improvement.

Apart from making a paradigm shift as such, re-orienting an organization from a Mass Production to a Mass Customization perspective is found to be extremely difficult, as this requires the advanced process capabilities that allow production of customized products using stable processes. In Pine's experience, the re-orientation using Continuous Improvement as an intermediate plateau is far more likely to succeed: stepping up instead of stepping back. This helps the management to re-orient the business focus, mind-set and paradigm from doing things right (efficiency, i.e. minimum cost) to doing the right things (effectiveness, i.e. maximum flexibility).

Sustaining and disruptive innovations

Clayton Christensen in [6] and subsequently [7] has presented research on how organizations have to deal with sustaining and disruptive innovations. In resolving how to deal with them, Christensen uses two dimensions, process conflict and values conflict. The former refers to the conflict regarding the production processes, technology and products of the current product types and the innovative product types. The latter refers to the cultural fit, the difference of fit between the current and innovative products regarding to the value network the organization operates in. In our opinion, this would also refer to the organizational paradigm.

This would make Christensen's models applicable to re-orient an organization to attain Mass Customization capabilities.



Figure 3: Christensen's simplified view on dealing with innovations

Mass Customization seen as innovation

If one were to view Mass Customization as an organizational innovation, it would depend on whether this innovation would be disruptive or sustaining for that specific organization. It would be sustaining when it would fit the basic values of the organization and the field the organization is active in (the value network); otherwise, it would be disruptive. According to Christensen, when being faced with a sustaining innovation, the development can be done in-company, within the existing organization. However, when dealing with a disruptive innovation (i.e. values conflict), in-company development is an option only when the process conflict is low. When having to deal with a disruptive innovation in combination with a process conflict, Christensen concludes that only a heavyweight team in a separate organization will be effective. When applying this to Pine's model, this means that only when an organization is already applying Continuous Improvement, the step towards Mass Customization is reality; in all other situations, the organization is un-

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likely to manage on it's own. In this sense, Christensen provides a confirmation of the conclusions of Pine.

Generic, systemic business perspective

Background

In 1999 and 2000, one of the authors participated in the Nolan Norton, Inc. (NNI) Multi-Client Study on Business Architecture. The study led to a publication, [8], for which the author developed a generic, systemic perspective on organizations. Between 2000 and the time of writing of this paper, this perspective has been extended to incorporate more domains, in particular knowledge management.

In this business architecture perspective, the generic organization is thought to have three layers. The first layer contains the processes that actually transform inputs into outputs. The second layer comprises the processes that monitor and manage those transformation processes and assure that the activities within the organization are in line with the top-level direction, the third layer.

So far, little news. The first layer is more or less equivalent to operational processes, the second comprises the tactical processes, while the third layer is equivalent to strategic decision making processes. Figure 4 shows the generic, systemic perspective, as extended in recent years.

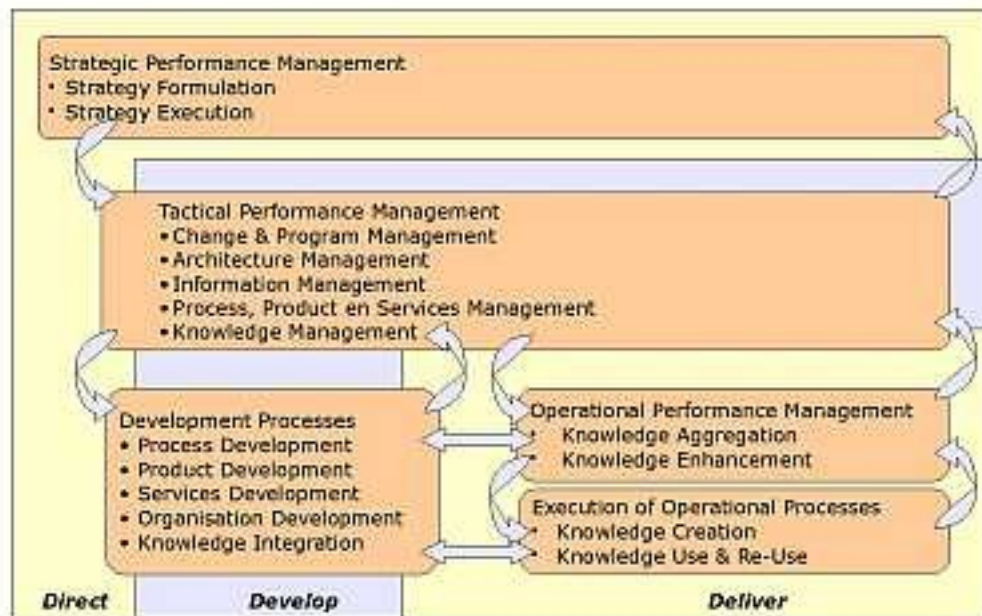


Figure 4: Generic, systemic perspective on organizations

When zooming in on the types of activities that are performed in each layer, subtle differences to the 'standard' perspective appear.

The differences are related to both the types of activities as well as the interactions between those activities: the layers contain dissimilar activities. For this reason, different terminology was introduced.

Activities and their interactions

The delivery activities are part of those processes that are immediately concerned with the transformation of inputs to outputs. The delivery processes comprise the bulk of the activities of the organization, either directly (i.e. part of the internal organization) or indirectly (i.e. through the extended organization's value network). In a product organization, these processes would typically stretch from sourcing (raw) materials, production and/or assembly processes, sales, marketing to customer services.

In order to prepare the organization to deliver specific products or services, the products and services must be developed, the delivery processes must be defined and implemented and the monitoring and measurement functions must be installed. Even though these activities are on the operational layer of the generic organization, they are distinctly separate from the actual production-related activities. In fact, these activities can be thought to be preconditions to the actual delivery activities.

When a problem or exception occurs while executing delivery activities, at first, the exception is handled internally. In many cases, a solution will present itself. However, occasionally, a solution cannot be found within the mandate of the delivery activities, or no solution can be found at all. In these cases, the exception is escalated to the monitoring function of the delivery activities ("Operational Performance Management" (OPM) in figure 4). This function is responsible for handling all exceptions that cannot be handled internally by the operational activities. In many cases, as a result of one or more exceptions, OPM will initiate (small) changes, e.g. in the way the delivery processes are arranged, in sourcing of specific components, in the logistics, etc. OPM is the function that monitors relevant changes in the environment, both internally as well as externally.

However, when OPM cannot come to a proper solution, OPM may decide to escalate the issue(s) to the appropriate monitoring function ("Tactical Performance Management" (TPM) in figure 4). Likewise, TPM also receives all management reports about the delivery activities from OPM and may use this knowledge to initiate changes, without a direct relationship with specific issue(s). Changes initiated by TPM usually involve (re-)development of products or services, processes, information systems or organizations. TPM acts as the business owner of those developments and will facilitate implementation after the results have been accepted.

Should TPM not be able to define and implement a solution, TPM will need to bring the issues to the attention of the top management, i.e. provide escalation to the directional layer of the organization. Top management will decide to change either strategic direction or TPM's mandate. Based on the decision, TPM will usually initiate one or more change programs, usually performed by the development processes.

Efficiency vs Effectiveness

How does this tie in to the starting point of this paper? The paper started out discussing efficiency and effectiveness.

When looking at the generic, systemic perspective on organizations, the Tactical Performance Management function (TPM) becomes the nexus of change in the organization. TPM initiates changes within the organization, monitors and manages all (operational) delivery activities and directs all development activities. In many cases, this can be done within the top management's mandate. However, occasionally, TPM requires escalation of issues and clarification of the organization's strategic direction.

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Whereas OPM monitors and manages the majority of the day to day activities on operational level, TPM's focus has a longer term view.



Figure 5: Styles of performance management

All activities within the delivery and development domains are primarily measured, managed and monitored based on efficiency. However, whenever an issue pops up, the impact of both issue and solution must be evaluated. By definition, this is related to the effect of the issue on the organization and hence requires measurement and monitoring based on effectiveness. Performance management on strategic level is based on feed-back from the tactical layer, but is primarily concerned with long-term strategic direction of the organization.

Conclusions

Combining these design paradigms may provide suitable starting points for the design of a Management Strategy by applying TRIZ methods and techniques. This would allow TRIZ to become mainstream and become a dominant paradigm for Management Strategy as well as engineering and technological innovation. Having a unique, very effective and complete set of tools, techniques and methods, TRIZ is ideally and uniquely suited to synthesize these models into a coherent and generic Management Strategy. TRIZ would become mainstream, being applied to all types of inventive problems in businesses, not only inside the engineering and product development departments, but also in all other business domains.

How to approach this?

How to generate sufficient interest in the business community?

We would like to ask the TRIZ community to help apply TRIZ to generic business issues, such that TRIZ can be more easily applied to non-engineering innovations, and such that TRIZ-based engineering innovations can reach their full potential. UI-

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timately TRIZ-based Management Strategy should emerge and help organizations become both effective as well as efficient (doing the right things right).

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