

## Taking the Leap to Agile Manufacturing: From Intention to a Successful Paradigm Shift

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**Abstract** – The paper presents the agile principles with the needs origin analysis for the definition and design of a new business management paradigm (convergent to a business model) combining two dimensions: (1) organizational behavior related to their competitiveness on the market and (2) the internal environment characteristics focused on human resources management. In addition, there are presented the implementation phases of the proposed business model (as strategic options at the organizational level) and challenges for the organization's project team, by underlining the leadership aspects as key issues in a successful implementation of agility throughout the company.

**Keywords:** agility, agile enterprise, leadership, people management, change management

### I. INTRODUCTION

As the business companies constantly develops strategies to dominate the existing markets and in the same time are looking forward for ways to approach the emergent markets, it becomes more and more clear that there is a need for methods and paradigms that will offer viable solutions to these complex business situations. In the last twenty years more and more companies looked forward for such a paradigm that initially emerged from the IT/programming area: The Agile Programming has been turned into The Agile Business, The Agile Enterprise or The Agile Manufacturing. The core of this new philosophy is summarized in Figure 1.

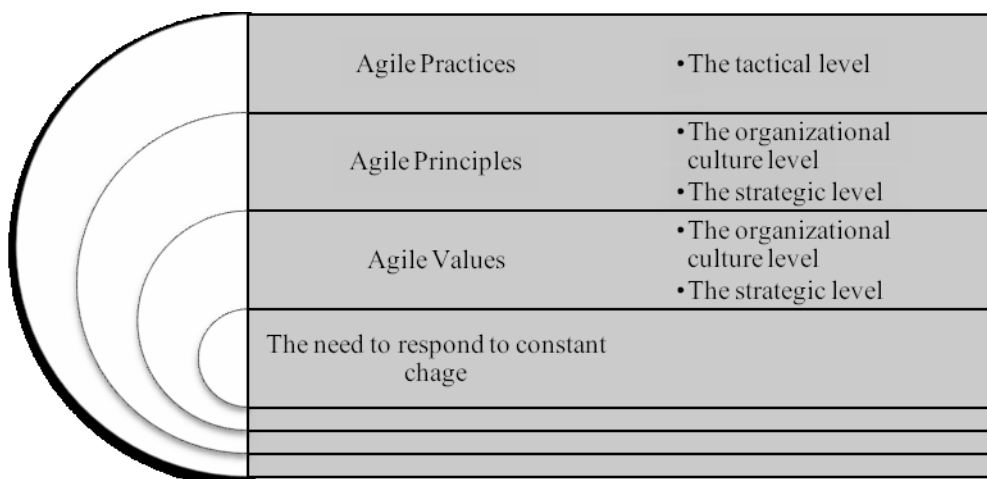


Fig. 1. The relationship between the agile values, principles and practices [22]

Beyond the changes coming from the different market rules and the increasing range of competitors, the companies must also take in consideration the ever-changing political scenes all over the world – targets of these changes are especially the western firms that are players on the global markets [6]. Even if the companies have already a background history for doing business abroad, they are now facing these

situations especially in the emerging markets and economies. Basically, they must face a strong competition from the existing companies on these emerging economies – companies from countries like China, India and Brazil. And these are competitors that have not only political support, but also have powerful resources (both in human resources and financial capital).

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In order to penetrate these markets and achieve success in profit, the companies must have in focus the fast response, growing the agility and a decreasing of internal bureaucracy [8]. Beyond this competition, social pressures and the fragmentation of mass markets, the firms must take into consideration the

constantly evolving customer expectations [9]. This new tendency and organizational behavior is shown in Figure 2 by the representation of the creating (or sometime the co-creating) of customer value.

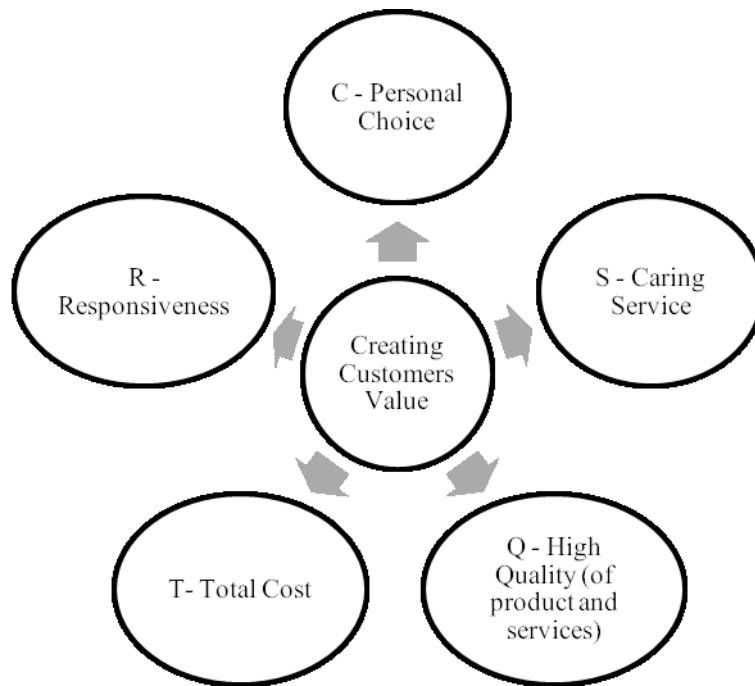


Fig. 2. World-Class Positioning (the competitive business edge - creating customer value) (adapted from [10])

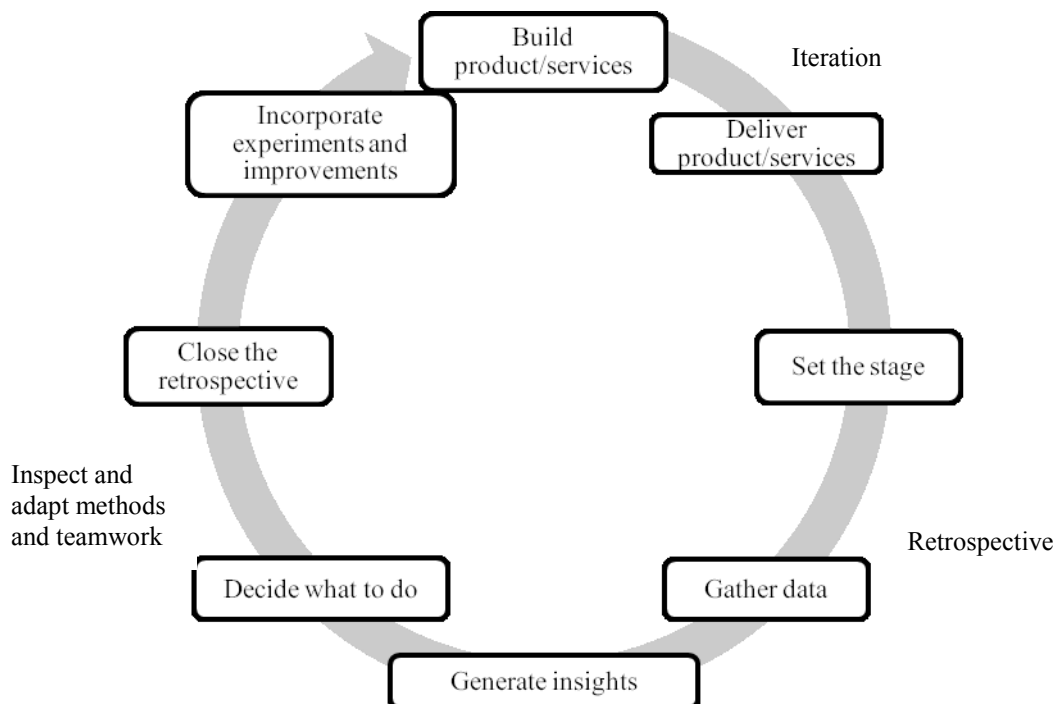


Fig. 3. Retrospective steps as part of an iterative life cycle (adapted from [4])

All this effort to face these changes must be allocated and assumed by the whole organization, so, agility is not only a strategy developed from a new paradigm, but it also includes the methods and tools applicable for each level of decision and action inside the company. Thus, the firms must find ways to anticipate or adapt to uncertain or changing environments [2] in order to achieve competitive advantage and, furthermore, to generate changes in the business environment (by high focus on innovation).

The company's board as well as all the management levels must place a higher focus on areas of expertise such as change and risk management, research and development, innovation, contingency (including uncertainty and complexity) management and leadership (including the implementing of AOC – Agile Orientated Culture – through all the organization).

## II. THE AGILE SUCCESS: TRANSFORMING FROM THE INSIDE OUT

There is no bulletproof or state of the art method that guarantees a successful implementation of the agile paradigm inside a company. Each firm, each area of business and each level of implementation represents a specific situation that will be treated related to the specific conditions. Thus, when a change or perturbation in the business environment occurs, the company will respond in a specific way by deploying its own agile characteristics [21].

The first step for such a large-scale project, that will have an effect on the whole organization, must be the constant support and reinforcement from the core management of the company. People must be made aware of this support from the management, but also, the management must have a constant review of the implementation status together with the agile champion (the manager – very important to be on executive level – responsible for triggering the implementation of the paradigm) and with each department leader.

The agile project team must prepare in the beginning the knowledge data base for this project – this will be a central point for reference not only in the beginning of the project, but also during the implementation (as weekly action list with open/closed actions), at the end of the implementation (as retrospective) and also after the end of project (as lessons learned, helpful for other implementations in other departments /branches) (see Figure 3).

Through all this process of implementation, it must be kept in mind that the transformation of the company into an agile one is done in small steps, with functionality delivered in smaller, more frequent increments all the way through a project – all this project to be constantly evaluated for possible new directions [15]. In the same manner, the agile design must be continually verified [1] for the new implementations that will be performed in the

following time frames. Still, the implementation of new changes must not stop only at one project or one area, but it is essential for reorganization to become a routine [16] in order to achieve a specific mind set of the project team – the team that will eventually deliver the expected successful agile results.

As a basis, agile methods emphasize strong adaptability. Consider three main areas [17]:

- a. The market, which might demand different features today from those you're building;
- b. The technology, which makes new things possible by changing all the time but also sets limits that we might not discover until we're some way through the project; and
- c. The process itself.

Adaptability must become necessary; it has to be transformed into a skill throughout the organization and it must be implemented not only as an approach, but also as a mindset of the people (human resources). Thus, besides the fact that the change and the uncertainty will become a desirable situation, the constant flow of information and the ability to establish partnerships very quickly - and to break them just as quickly also [18] must develop into a real company culture.

As a practical implementation, these agile tools are applied in three steps [21]:

- a. Determining the drivers of agility for the company;
- b. Determining the required capabilities;
- c. Determining the practices and actions.

Even if during the implementation difficult or new situation will emerge, the project team must work to overcome these issues through synergy of all levels of decision and action. As well noticed by Christman and Frederick (1996), firms that try to become agile, and fail, have three things in common [3]:

- a. A short-term focus on cost;
- b. A lack of systemic approaches;
- c. Missing links with customers and markets.

The new agile paradigm must not be seen as a contradiction with the existing models or flows of information. Not only that the agile way must be implemented in steps, but there must be also a reconciliation between the agile methods and the existing architectural paradigms of the company [19] – basically, you will have a mix of tools and methods that are working together in order to achieve the same goal. The agile paradigm is not a tool itself, but an intelligent way to combine and feasible use the existing tools or the new – innovated ones.

For that matter, the research and development must be a central part of the organization, not only a supporting department, but one that has constant contacts with the productive departments and it is involved in all the steps of production for additional support or necessary modifications. To promote these innovations, IT environment is a powerful tool [9] that helps to spread efficiently the knowledge throughout the organization.

### III. THE AGILE LEADERSHIP: LEADING FOR CHANGE

From agile point of view, the leadership skills of the managers represent an important part needed for a successful implementation of the new paradigm. And this refers not only to the leadership of the champion/project manager that will lead the implementation team, but refers also to the leadership of the whole organization [13] and, more specific, of the management of each department/area.

Nowadays, there are more and more decentralized businesses, but there is also the same decentralization inside the organizations and even the departments. In order to manage this flexibility obtained through decentralization and empowering the people at the lower levels of decision, it emerges

the need for better equipped leaders [6] that are able to actively and effectively manage change.

An important side of this is the size of the team - larger teams tend to be less tolerant to change [19]. The same situation is observed at the organization level, with the observation that larger organizations are weighed down with people with different tacit knowledge, creating difficulties in working together [11]. One of the reason for this difficulties in collaboration is due to different description of the work on the organizational levels [14], thus bringing an additional role for the leader (especially for the agile champion/project manager): the role of creating inter-departmental synergy and to create the mind set within the members of the team towards synergy and collaboration. All of these have a common point in communication within the team and between related departments as it can be seen in Figure 4.

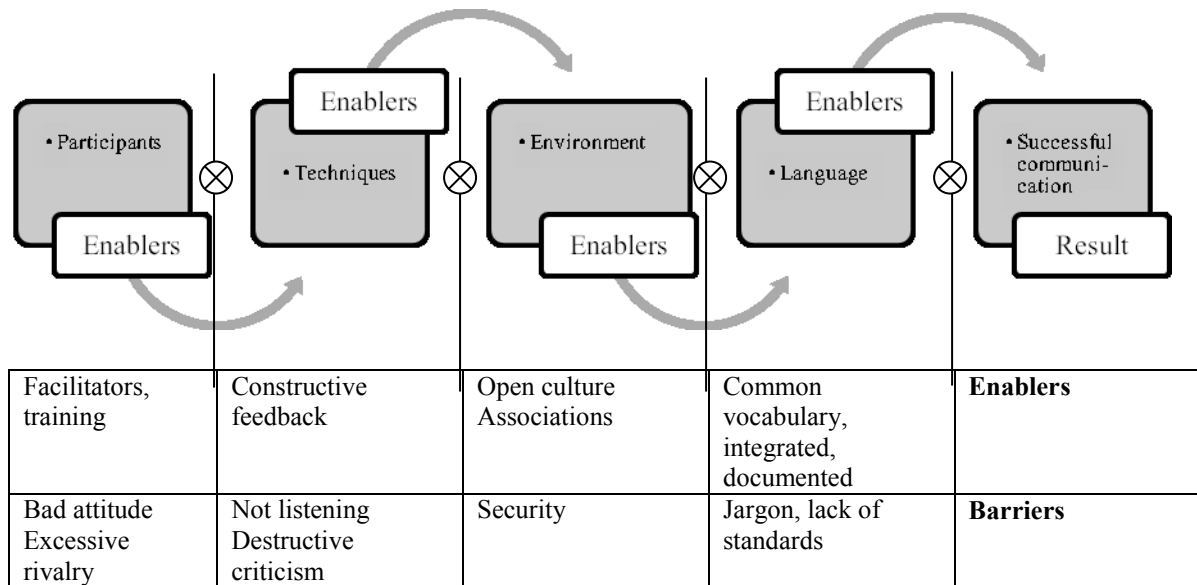


Fig. 4. The Project Management Communication model (developed from [7])



Fig. 5. Issues of developing a culture of organizational learning (developed from [20])

The key word in organizing the size of the team is flexibility – thus, it must be avoided fixed concepts of teams, that will lead only to shortages and resources will be wasted [12]. One important responsibility for this achievements of implementations are also at the

human resources departments and responsible – there must be a constant dialogue not only with the managers for the reported key performance indicators (KPIs) and/or special situation, but mainly with all the people involved in the company in order to have an

accurate barometer of the motivation level and the commitment of the people. The human resources (HR) responsible must work for growing the skills of the team by creating a culture of organizational learning (Figure 5).

To achieve higher levels of innovation and performance, the human resources professionals need to create competitive organizations [6], but also to

include a reward and motivation system that is based on the real needs of the people from the company. Thus the HR have a supporting role for both leadership and for the led people. In this case, a successful method that could be applied is shown in Figure 6, and it is related to the concurrent engineering basic principles.

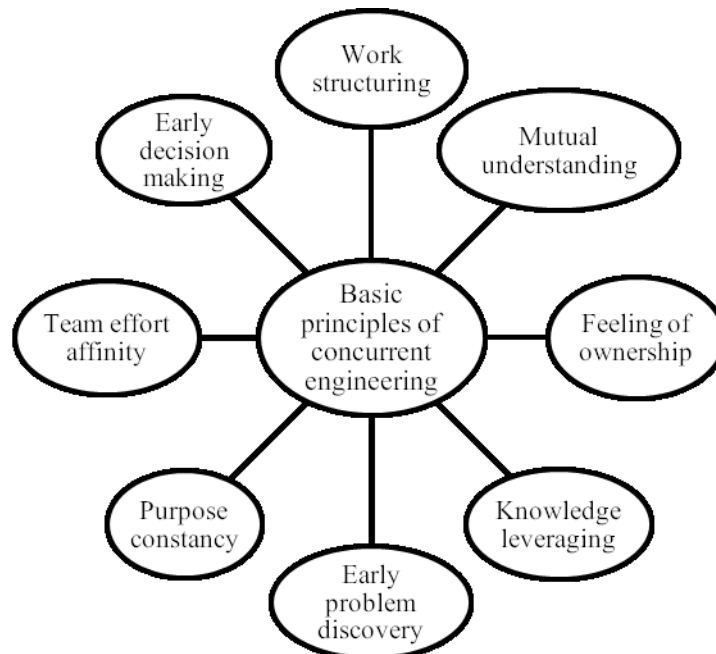


Fig. 6. Fundamental principles of concurrent engineering (developed from [5])

#### IV. CONCLUSIONS

Within the presented paper it was emphasized the need to transform the company from inside in order to achieve not only the teams agility, but also a strategic agility on the markets. In these conditions of unpredictability and constant change, the fight for profit and market positioning is not lead only by the company's board, but by each individual that is part of the firm.

People must be driven towards innovation and accepting the change as a normal process of a day-to-day business. Each team is an essential cell of this process of implementing the agile methods and mind sets.

One of the key roles in the organization is that of the agile leader – the one that will not only lead the people toward the goals, but also to constantly reinforce the agile principles to the people.

With proper tool and proper mind set, the agile manufacturing can be a successful implementation that will have satisfying results – both for the company as profit, but also for the people as benefits and motivation.

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