Organizational Performance Management Through ERP: Towards Greater Agility

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Introduction

The competitiveness of companies facing constant fluctuating economic, social and financial conditions is closely related to their ability for adaption and reaction. Moreover, the increased competition, the margins erosion, the retirement of key employees and economic growth at half-mast are all cyclical elements with which companies must deal.

To address these challenges, companies need to rely on agile and scalable information systems that address their business management issues. The ERP (Enterprise Resource Planning) systems bring different benefits to companies. O’Leary (2000) states that an ERP system provides real-time access to data and integrates various business processes. The ERP system provides further advantages to companies through improving the level of upstream workflow performance in the supply chain, since it can serve as a support for Supply Chain Management, or through improving the supplier selection process or by reducing the supply cycle time. On the other hand, the ERP enables companies to better manage customer relationship, minimise the costs and improve quality, rationalise resources information accuracy, something that can be developed into an improved decision-making (Gardiner et al., 2002, Boston Group, 2000).

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1. Background

1.1. Traditional approaches and their limitations

The Waterfall model was introduced in the 1970s by Winston Royce. It involves breaking down the project into different phases, each of which is performed by a different team: requirements, design, implementation, tests, integration, maintenance.

In this context, reference should also be made to the V-Model, a variant that involves adding a test phase to each downward phase. For example, the needs analysis is tested at the time of final acceptance. And if the need does not match the specifications? It is too late!
1.2. Limitations of classical models

The time factor, especially in terms of feedback, is mainly involved in these approaches. The teams spend a lot of effort before testing the working artefact, the customer has then to wait till end of the project to look and feel what has ordered (sometimes 6, 12 or 18 months). The lack of interaction with the customer can also lead to misinterpretation of needs; there is a real difference between the specification requirements and its interpretation by the different teams. Especially since at the time of delivery, the requirements have undergone many updates.

These models do not allow to anticipate problems or predict the evolution of requirements. But in today's fast moving environment, the customer must have the ability to ask some changes; and the project must be adapted to these changing needs. In a traditional approach, it would be required to pass through an extended specification phase in addition to the subsequence phases!

Behind all these pitfalls, the financial stakes are high. Delaying the testing phase will increase the budget cost: discovering bugs earlier in the development process costs much less than fixing it afterword. Thus, a bug discovered in the design phase will cost 5 times more fixing it than in the specification phase.

2. The Agile approaches

A panel of new approaches and practices enabling the company to circumvent these problems, and put the teams in a new dynamic. Agile approaches represent a new way that allows the company to adapt quickly to changes:

« It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is most adaptable to change». Charles Darwin

2.1. What is business agility?

Agility is synonymous with skill and vivacity. Two characteristics, often seen as beyond innovation that companies wish to integrate into their daily operations.

« Agility is the ability to both create and respond to change in order to profit in a turbulent business environment. Jim Highsmith

The concepts of agility have first introduced in software development. They are now even better matched for all type of business.

2.2. Agile Manifesto

The Agile methods uphold 4 core values (in brackets, the quotes of the manifesto). Three values relate to the human side and the team, and one value focuses on the result:

- The team (« individuals and their interactions, more than processes and tools »): For the Agile method, the team is much more important than the tools (structuring or monitoring tools) or operating procedures. It is preferable to have a team with communication skills rather than a team of experts working in isolation.
- Collaboration (« Collaboration with customers, more than contract negotiation»): The customer (or the user) should be involved in the development. We can not just negotiate a contract at the beginning of the project and then neglect the customer requirements.
- Acceptance of change (« adaptation to change, more than plan monitoring »): the initial planning and structure of the product or service should be flexible in order to allow the evolution of the client's request throughout the project cycle.
- The product or service (« Operational software, more than a comprehensive documentation »): it is vital that the product works! As for technical documentation, it should have a much less man-hour allowance.

2.3. Agility: differentiated meaning and unique content

- For Jérôme Barrand, Agility is clearly not a form of flexibility. Agility is the ability to move (not just innovate because old recipes can become relevant again) continuously, with good intensity, at...
To manage and develop, at best, its human capital, the agile company must master four priority areas:

a) the anticipation of breaks as consequences of our decisions,

b) « pro-operation » aimed at working for the other more than working with the other.

c) « Justinnovation » to change only what needs to be changed for the sole purpose of actually creating value,

d) The « effissens » (neologism of Karim Benameur) to mean effectiveness and efficiency through the sharing of meaning,

e) The aggregate supply means a range of products and services, but also the images, prescription, information and especially the relationship,

f) Customer reciprocity to express that the notion of supplier disappears in favor of a logic of bartering of the aggregate supply between the different stakeholders who are customerscients to each other and vice versa,

g) Reducing complexity to get back to a human complexity for each shareholder of the system, which thus can be able to take full responsibility.

h) And finally an agile culture of change to stop managing change, waste of time and money in an environment where change is omnipresent.

- For Microsoft: « Today, technology makes companies more agile.» Microsoft, always focuses on delivering solutions in line with market expectations, we are moving towards the "Agile Internet", publishing our own magazine Entreprises agiles on July 2007 - Microsoft releases tools to bring Agile development to the general public.

For Michel Guérin, associate professor at the University of Paris-Nord, «the Agile company is a development model where policy, strategy and operations are continuously monitored.».

- Bernard Galambaud Professor at ESCP Europe « To become flexible, to be flexible, such is the requirement of the present age. Flexibility is a requirement, and as such, it does not have to be discussed, it is obvious, it goes without saying. » For Frédéric Fréry, also Professor at ESCP Europe, « agility is the ability to maintain the competitiveness of companies while the turbulence of their environment exceeds their traditional speed of adaptation. ».

- Patrick Besson, also professor at ESCP Europe, states that: « In an uncertain, volatile or ambiguous situation, managing requires agility and attitudes in many respects that are at odds with those of the classic posture of the current leader. »

To sum up this way of thinking in four main points, the Agile management requires:

- Sense of ongoing self-assessment of external measures;
- Sense of dialogue in the search for a shared truth;
- Sense of cooperation and networking in collective actions;
- Sense of experimentation emphasizing progressive learning.

Allan Afuah, in the Innovation Management: Strategies, Implementation, and Profits «To manage and develop, at best, its human capital, the agile company must master four priority processes:

- Identification of gaps between strategic skills and the current state of its resources;
- Development of its current skills portfolio, through combining the various existing levels (training, knowledge management, coaching, etc.);
- Optimizing the use of resources and their mobilization within strong membership units;
- Use of tools for remuneration and preservation of critical resources.

3. Organizational agility Key Elements within businesses

Agile methods must now inspire the majority of projects carried out within the company. They share a number of characteristics that support the wider use of Agile manifesto than IT developments: the company’s stakeholders (state of mind, delegation process ...). These characteristics are as follows:

3.1.1. Promises

The concept of Agility is very trendy in companies as it seems to be a response to a whole range of issues raised by digital transformation, and to the greater quest for economic performance. It therefore holds promise for continued improvement:
Needs anticipation, reduce time to market, increase in perceived value, product quality improvement, client satisfaction, product flexibility and adaptation, production efficiency, opyimisation.

3.1.2. Organisation focused on joint value creation

As mentioned in the manifesto, agility is based primarily on the values of sharing. The company will improve performance and provide innovation to its customers through joint work between the various team members. For that purpose, several key features can be put forward: Collaboration mindset, transparency, information share, users/clients upfront in the process, bussiness alignement, team empowerment,…

3.1.3. Cultural maturity of the company and its individuals

The question of agility is also a cultural question. You need to know how to move from the traditional corporate culture to venture into this new field, through the following values: Risk taking, innovation culture, transparency, climate of respect, sense of belonging, motivation and pleasure, individual valuing.

3.1.4. Appropriate governance

Agility should not be confused with anarchy. The first mistake would be to consider that the Agile method is inexpensive. For sure that there is a promise for cost control, but it does not guarantee that the transformation required by the Agile method would not engender extra cost to the process. Moreover, like any process in the company, agility is based on a adabtive governance with the following characteristics:

Output assessment, progress visibility, deadlines management, added value assessment, priorities management, multi-disciplinary teams supervision.

3.1.5. Means, tools, processes and methods

The implementation of Agile principles can begin with islets, in this case, it will require only limited means. But to be integrated in the company, a special effort needs to be made through implementing the appropriate tools and processes:

Process transformation, automatic process for release deployment, continuous integration, flexible enterprise architecture, iterative processes, short cycles, feedback sharing.

4. DIFFERENTIATING PRACTICES OF AGILE METHODS

This section presents the different Agile methods commonly used. Only some techniques that are complementary to each other or better suited to given typologies and project sizes, that distinguish the agile methods. The most significant differentiating practices are as follows:

- The RAD method (Rapid Application Development) recommends, during the building of the application, techniques similar to those of Extreme Programming but not extreme in their implementation: personal and collective code reviews and integration before each focus (or show). However, the RAD method limits the Pair programming to the most strategic parts. Any method of project management should include an operating mode for emergency stops (Go / NoGo). Among the strengths of the RAD method is the presence of a facilitator. This resource, preferably external facilitator, should be neutral with respect to other collaborators. He/she answers to upper management of the project. Thus, when the strategic, economic or technical context of a project evolves, or when the conditions of implementation deteriorate, the facilitator shall report the problem to the manager who has been mandated. The latter shall then take, as soon as possible, and with objective information the appropriate decisions

- The second version of the RAD method recommends size variability and maturity of the working groups according to the relevant phase of the project in order to maximize the commitment of the resources and to preserve their interest by a work adapted to their concerns. The most important contribution of the RAD2 method to the project communication and to the formalisation of the application requirements is the Animation and Reporting Group (GAR). The RAD 2 method guarantees a well-performing organisation of meetings, based on an operating mode of interviews and on permanent validation techniques. The RAD offers strategic management techniques such as
reduced functionality delivery or theme delivery.

- The DSDM method (name given to the consortium marketing the RAD method in England): all the project members are specialised in the notion of "roles". Thus, DSDM meetings will include executive sponsors, ambassadors, visionary and consultant users, as well as facilitator and rapporteurs.
- The Scrum method affirms its distinctiveness in the generalisation of a ceremonial based on the practices of short meetings at each stage of the project cycle (retrospective). These common working times are intended to enhance participants' motivation, to synchronise tasks, to unblock difficult situations and to increase knowledge sharing.
- For FDD (Feature Driven Development), the distinctive character of this method called Mission focused lies in a strong focus on a measurable immediate goal based on the concept of business value. It is the global ambition of an iteration that is thus reinforced. This aspect is also found in the RAD method in the form of focus objectives or in the Scrum method in the notion of sprint goals.
- XP (Extreme Programming): A method that is very much centred on the development of the application. One of its originalities lies in the planning approach that takes the form of a game called “Planning Game” which simultaneously involves users and developers. We also note the particular techniques related to code generation such as test driven development (TDD), pair programming, collective code appropriation, refactoring and continuous integration.

5. Role of ERP systems in the Agile Business Management

Until recently, employees had a strong corporate culture and knew the various management components of their organization. With the retirement of this generation of employees, companies are facing complex management challenges. In addition, all SMEs are currently facing increased competition and reduced margins. However, the ERP systems allow companies, through structuring their organization, to overcome this HR problem. It should also be noted that a number of companies are faced with problems related to their field of activity. For example, the trading industries are facing a triple challenge, that have to do with inventory management, reduction in margins and customer satisfaction. For their part, Production companies should manage planning issues. « In order to remain competitive and preserve their cash flow, companies need to improve the quality of their customer service and responsiveness while reducing their inventory. » In view of these different challenges, the evolution of information systems remains a crucial issue for middle market companies.

5.1. The ERP system: an essential decision-making tool

The ERP system is also designed to reduce decision-making time and to improve the control of operations and costs. In addition to the managerial and operational benefits of the ERP systems, they are considered as new technologies which meet the globalisation needs. In parallel to the business operations, companies prefer working with decision-making tools. Certainly, most of the ERP systems on the market integrate natively operational reporting tools to measure the effectiveness of processes. But companies now need easy-to-use solutions to perform true multidimensional analyses, have real-time indicators and optimise the management of their activity. These are the reasons why ERP publishers are strengthening their offer in this field.

5.2. An answer to the issues of mobility

Today, more and more mobile employees also wish to access ERP business applications remotely to modify or enrich the database in real time. For example, certain lines of business, such as those related to distribution, technical services or after-sales services, need to know immediately the availability of a part or a product, and thus, to access the data of their ERP or receive alerts. For this purpose, companies are currently using Internet portals connected to the ERP systems to enter or consult these data. Today, the development of cloud computing facilitates even more the provision of information, via mobile terminals, without requiring extensive deployment. Under increasing constraints, the integrated management solutions are constantly evolving to meet the various challenges of companies. They thus tend to become more agile and adapt to the new requirements of decision-makers, especially in terms of business issues ...

5.3. Benefits to the company
Several research studies have shown the benefits achieved by a company that invests in the ERP systems. We also identify the expected business advantages using a technology restructuring organizations.

- **Integrated process**

  In accordance with the definitions given in the previous paragraph, the added value of ERP systems is placed in its modular architecture. All functions are interconnected and configured to synchronise the smooth transfer of information. Except that the ERP systems bring us back to the principle of complementarity of the "all in one" for business management through regenerated integration around a single and common database.

Such integration facilitates the work of operators to plan the entire production process of a product and to follow all the steps of production through the internal team members of a company. This demonstrates that the combination of applications involves orders, stocks, the availability of vehicles and delivery team, billing ... Moreover, the planning of activities and resources of the entire company (people, machines, raw materials) is now an essential dimension and an integral part of the ERP systems.

This integrated planning statement is also called Supply Chain Management (SCM). It contributes to reducing operating costs (Communication between the various collaborators), minimising operational costs (inventory, transport, purchases), limiting cycle times and improving the company’s overall responsiveness to changes in its environment. This is done through replacing the physical flows of products by a virtual flow of information whose transfer is cheaper and faster. The ultimate goal is to move the right product, at the last moment, from the right place in the company to the right place at the client location.

- **Gain of inter and intra-organisational communication**

  The communication cost will be limited, through the connection interface between the different functions of the company; as long as the ERP system manages controls and ensures the transfer of information between the different modules taking part in a specific process.
Moreover, with the emergence of new technologies, the ERP Systems can expand to reach communication openings with other external partners (Suppliers, bank, customers, etc.). Here we explain the attached component of the business information system with an access order. In this latter context, the partners track, via the internet and using access limits, the data that the company wishes to continuously share.

- **Real-time update of information**

  The information source, in a single database, is unified and updated each time the information is processed by the ERP system. Reference is made here to the decreased risk of errors and information asymmetry within the company as the data are recorded only once and through the process path by transformation orders. The reliability of information can be viewed through the dashboards available at the request of the top management. This leads to a clear improvement in the quality of decision-making within the company.

- **Flexibility**

  The ERP system is a general and flexible product that enables companies to choose the tools they really need from a whole range of applications: they can choose to implement only the basic concepts or more comprehensive and complex software that will better meet their projects on the short, medium or long term.

**Conclusion**

The Agile project management can be seen as a holistic and humanistic approach based essentially on the rational motivation of human resources, since its emergence in the early 1990s, has been carried by the wave of new technologies (NICT).

Its values and principles combine sociological and technological aspects with an industrial approach. The Agile project management is opposed to the fundamentals of Taylorism: Compartmentalization of work, global disempowerment and other principles of individual productivity whose implementation becomes difficult to defend in industrialised countries, given the high costs of human resources.

The Agile management goes hand in hand with self-organisation that leads to the adaptability, resilience and teams autonomy. Hence the importance of criteria and patterns of work organisation that promotes the emergence and development of self-organisation and collective intelligence.

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