PUMA *Architect of a generation of powerful companies*

Jean-Pierre Vickoff

PUMA Essential

An organization is functionally Agile when its operational components (human resources, operational processes, information and technological systems) collaborate in synergy (formalized and instrumented) anticipating or collecting change with the purpose of dynamically compensating for it, then integrating it. The Agile organization is thus a community which continuously regulates its processes.
In this context, Agility means efficiency for the immediate future on the basis of action led pragmatism pushed to the extreme. According to the Gartner Group, the Agile company must be "Real-time, service-oriented and event-controlled".

Essential PUMA

PUMA (Process Unifying Methods of Agility) is a toolbox dedicated to application development.

PUMA brings together the best practices of Agile methods to which it adds additional features that have been simplified and made agile. As the entirety may seem complex at first, a "light" version named Essential PUMA brings together a basic choice of practices around 4 agility "motors[1]":

§ facilitation of communications,

§ specification of the solution,

§ management of iteration,

§ implementation of functionalities.

These "motors" are used independently or together in function of the type of project and the type of organization.

The group of practices responds to the possibly substantial development needs in organizations that have a tendency to be complex.

The dynamic of global Agility

A global definition of organizational Agility could be as simple as "the aptitude for adaptation."

The high-performing enterprise is now "service-oriented." The source of its action finds itself in the *tracking* of "client" requirements.

The idea of Agility attaches itself to the group of values that optimizes the deployment of components that bring about a pro-active organizational dynamic.

The Agile enterprise is also a community that regulates its process continuously. This search for quality brings about an evolution based on three vectors that determine organizational performance:

§ The rational motivation of human resources allowing them to grasp environmental changes as soon as they emerge, and to immediately be able to manage their complexity of detail.

§ The intensive use of new technologies characterized by a constant projection into the future, imposing the obligation to perpetually innovate by adapting structures and processes to this innovation.

§ Processes reconfigured continuously with the goal of being able to dynamically adapt the organization and accelerate change.

To truly be Agile, the enterprise must also rationally anticipate and master continuously the entirety of its evolution dynamics. At this point, agility becomes the major component of a large managerial movement based on a truly collaborative vision. Agility asserts itself therefore as the dynamic of a reactive and learning organization.

At the highest level is found *hyper-agility,* which requires projection into the future, brought about through formal techniques like rational anticipation[2].

Providing the tools for this quest, PUMA offers a formal response to the fundamental question, "In function of what, and how, must we change the processes and the I.S., as well as the competencies of our human resources."

Currently, even at the level of organizational architectures, the approaches to modeling are terribly static and fixed in time. At the same time, the Agile enterprise must operationally combine the tensions created by the divergences between a present of constraints, a past of structures, and an emerging future.

In a simple and exhaustive response, PUMA makes the action space real, where these multiple tensions are expressed, managed, and anticipated (Figure 1).

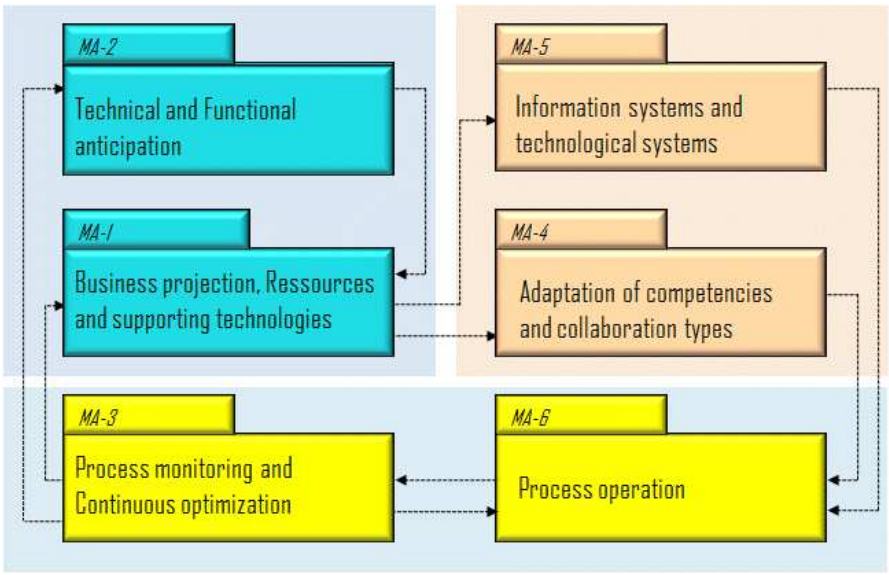

Figure 1. - Model of the Agile Enterprise

Understanding the enterprise architecture on the basis of a formal model is an indispensable prerequisite to any form of action in the process domain. On the other hand, it should be obvious that it is useless to search for the key to change in an approach based on the I.S. structure.

The response is not in the structure but in the process dynamic. More precisely in a double dynamic:

§ the first, in the present, is an immediate reaction to operational adaptation;

§ the second, in the immediate future, is a rational anticipation of technical and functional changes.

It is only then that the notion of technical architecture appears, which applies to an information system or an industrial production system. On this last point, when it comes to the I.S., the two dominant technical changes are business process management (BPM) via a motor, or orchestrating independent services as well as the design architecture and the implementation of this service-oriented architecture (SOA). *PUMA* integrates these aspects and provides tools for them within specialized practices.

A holistic paradigm

In response to the problems evoked, Agility, paradigm of a new vision of the organization, presents itself as a tool of alignment and coherence between the internal forces and the external challenges that bring dynamism to the enterprise. In this spirit, here is what could be the values of the "Agile attitude." They come from a shared vision of the mission to complete, resting on real practices that are strongly linked to fundamental principles and values:

§ When it comes to processes, the philosophy of the Agile enterprise is "*The one best way*": the processes are modeled, simplified, and reconfigured continuously.

§ When it comes to human resources, the principle of the Agile enterprise is "*Empowerment*": the autonomy of work groups assures the global regulation of micro-changes.

§ When it comes to automation, the philosophy of the Agile enterprise is "*High-Tech, High-Touch"*: the rational use of emerging technologies is systematically anticipated.

PUMA the initial concept

The pre-existing approaches or methods that inspired PUMA have been the subject of numerous communications, so they will not be described in detail here. On the other hand, a reminder of the fundamentals can allow the project management section to be put into context:

§ In Agile mode, development project management that wishes to associate performance with quality leads to the simple phasing associated with an **iterative** cycle.

§ The need for a strong coupling between a form of Object modeling and the progressiveness of an **incremental** mode of development is also displayed.

§ When it comes to the **adaptive** aspect, the communication and the modes of working are collaborative and facilitate to the extreme the rational questioning of objectives and priorities.

The entirety leads to the assurance that each new functionality will be developed on a healthy code base, validated permanently by the user, integrated and tested continuously (which implies discipline, techniques and adapted tools). More generally, within an Agile approach, teamwork is naturally reactive to change, saving resources and continuously seeking efficiency (*Lean management*).

During Solution construction, systematic practices oriented towards "permanent validation" naturally avoid the concretization of traditional "project risks."

In summary, the communication, decision, and production processes are in perfect synergy and at the optimal level of granularity.

PUMA was conceived on the basis that Agile methods share a common group of practices and that only one or another complementary techniques or better adaptation to different project types and sizes differentiate them.

PUMA has grouped together common and differentiating practices to propose the optimal method in function of the type of project under consideration. PUMA project management therefore recommends using the entirety or a selection of common practices to which it is possible to judiciously add a specific practice or practices in function of the context.

The entirety of these aspects joins up with a methodological service-level that varies in function of the challenges of the project.

Certain practices are linked to **modes of collaboration**:

1. participation of the final user,
2. work groups with the power to make decisions,
3. team autonomy,
4. permanent specification and validation.

Other practices are part of **project management**:

1. managing by challenges and risks,
2. planning based on rapid iterations,
3. incremental development in error-free milestones,
4. improvement of practices.

Specific practices direct **functional quality**:

1. visual expression of the model,
2. technical excellence of the design,
3. necessary and sufficient documentation,
4. permanent user validation.

Finally, specific practices direct **application quality**:

1. optimal coding norms and techniques,
2. component-based architecture,
3. automated change management,
4. continuous tests and integration.

For PUMA men and women represent the major component of Agility:

1. The Agile mode implies a consensual engagement and a collective responsibility that lead to the appropriation of the project by all the actors.
2. The entire development cycle must be carried out by a team, integrating developers and users who are totally engaged in the project and in total accord with the method employed.
3. The resources must intervene simultaneously from the real beginning of the software project. This way, the formalization and the transfer of information are minimized along with the risk of errors inherent in these activities.
4. The base of the Agile team is a small group of experienced actors who must have a “sense of identity” whose key to productivity is the high-level designer-developer who knows how to integrate design and development in an “open” vision of solution achievement.

The PUMA toolbox

In its initial version, the project motor proposed by PUMA[3] is presented in the form of a toolbox composed of numerous Agile practices, as well as traditional but simplified practices. If the group, structured into three levels of mastery, does well at responding to the needs of large projects with particular needs, it can seem complex at first sight, in spite of its modularity:

§ The first level of mastery is essentially composed of practices that come from XP applied to the design-development of the application.

§ At the second level of mastery, the basic version is enriched with wider techniques for project management from RAD2[4] or from Scrum.

§ The third level of mastery proposes specific solutions to recurring organizational problems found in large projects (as in DSDM or RAD2).

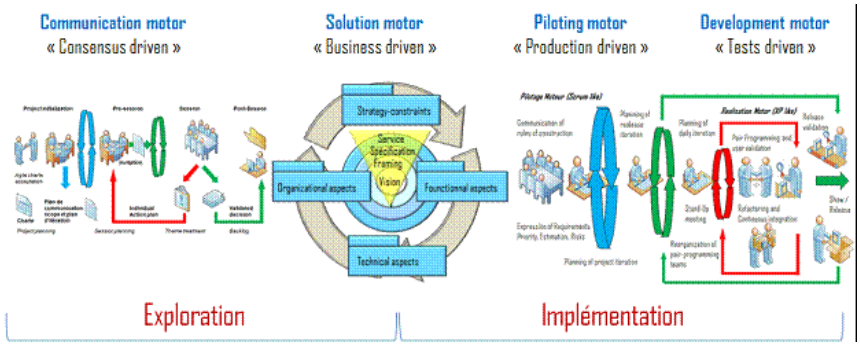

Figure 2. - The 4 “motors” of Essential PUMA (details on the following graphics)

Essential PUMA

Global Agility is a very large concept and can seem difficult to tackle on the first attempt. In order to facilitate putting Agility into place when it comes to I.S. project management and, more particularly to application development, a simplified implementation of the practices from the PUMA toolbox is proposed under the name *Essential PUMA*.

At its base: the pragmatic North American idea that calls the optimal solution applied to resolve a problem “*The one best way.”* Generally this way proves itself to be as powerful as it is elegant and represents at the same time a model of thought and of action. This philosophy, pragmatism, led to the proposal of “*Essential PUMA.”*

In its form: the simplicity of presentation of a method and its use is often determining for its acceptance. *Essential PUMA* has therefore been studied in order for its structure to naturally incite its adoption by limiting the number of elements to four.

To succeed with a project, as well as obtain the rational motivation of the people involved, it is necessary to unite four ingredients[5]: communication, structure, method and technique. It is on the basis of this simple statement that Essential PUMA proposes an elementary framework based on 4 Agile motors of reflection and action, each one brought to life by 4 Agile practices:

1. A Communications motor to facilitate engagement and consensus.
2. A Solutions motor to structure the requirements and solution expression.
3. A Project motor to manage the evolution of the performance and the engagement.
4. A Development motor to ensure the functional and technical quality of the solution.

Each of these motors simply depends on the 4 basic Agile practices to cover, within the framework of a development, the complete scope of the human, organizational, economic, and technical aspects.

It is not mandatory to use the four motors for each project :

1. The Development motor, based on practices of design-development (why not those of XP which are very powerful), will be used in the case of projects involving the development of an application. If the project is not a pure development (an ERP for example) another specialized process will be substituted for it.
2. The Solutions motor is characterized by a model used systematically and naturally by the users in mastering the concepts. On the other hand, its utility cannot be understood initially except when the challenge is complex enough to justify the initial learning and implementation efforts.
3. The Communications motor will be used systematically and naturally by the users to master the concepts. On the other hand, its utility cannot be understood initially except when the organizational environment is complex enough to justify the initial learning and implementation efforts.

The two last motors can apply very well to organizational projects that do not have a software component.

“Motors in four times”

Each “motor” is systematically based on a group of four Agile practices. Here are the details of the practices recommended for each motor.

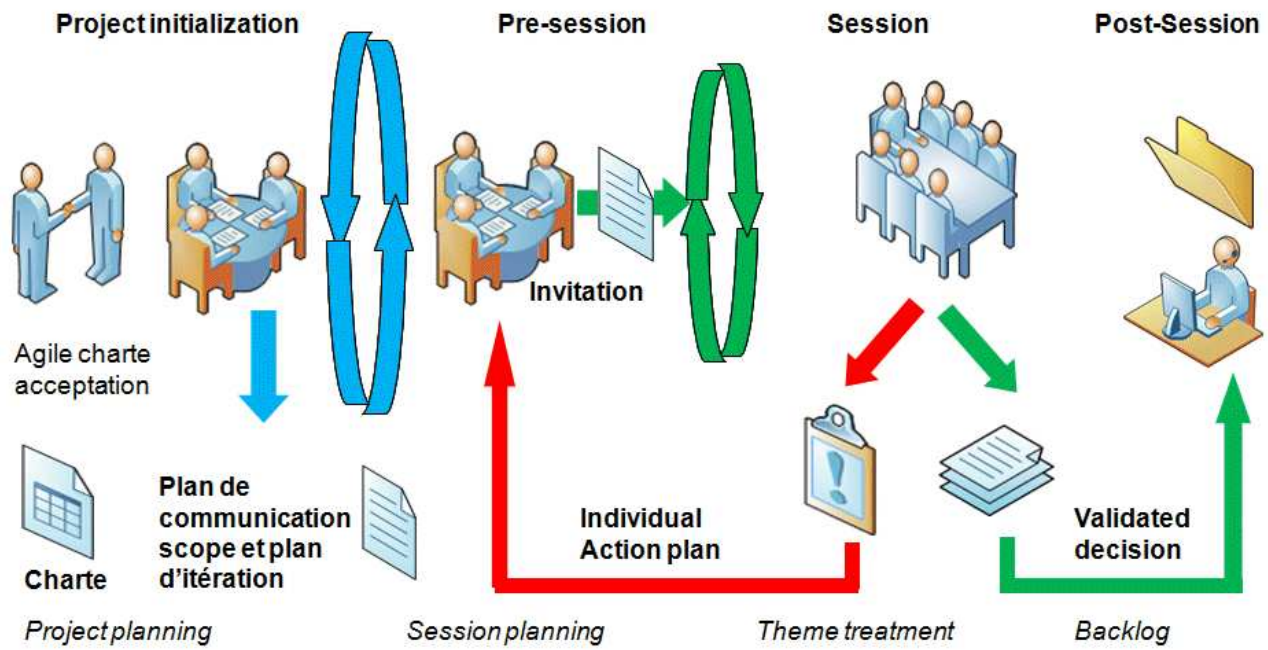

Figure 3. - Communications motor

The **Communications Motor** has as its goal to obtain a formal engagement of the diverse resources involved in the project. It also recommends techniques and a structure for organizing meetings:

1. Initialization of the Project (chart, iterations).
2. Pre-session (organization of a meeting).
3. Session (treatment of topics).
4. Post-session (filling in the PDL or backlog).

On the other hand, outside of the construction of the application, these are weakly structured relationships based more on regular availability and personal commitment, which are sought between development pairs and their representative users.

The **Solutions motor** is structured into four concerns classes that are now representative of the new Requirements Expression:

1. Strategy and Constraints aspects.
2. Functional aspects.
3. Technological aspects.
4. Organizational aspects.

These aspects should be approached in the fundamental order recommended. On the other hand, and all the complexity relative to the operation as well as its pertinence rests in this principle, they must, in order to take into account the entirety of the interrelations and the dependencies that come from them, must be understood in a global and iterative manner.

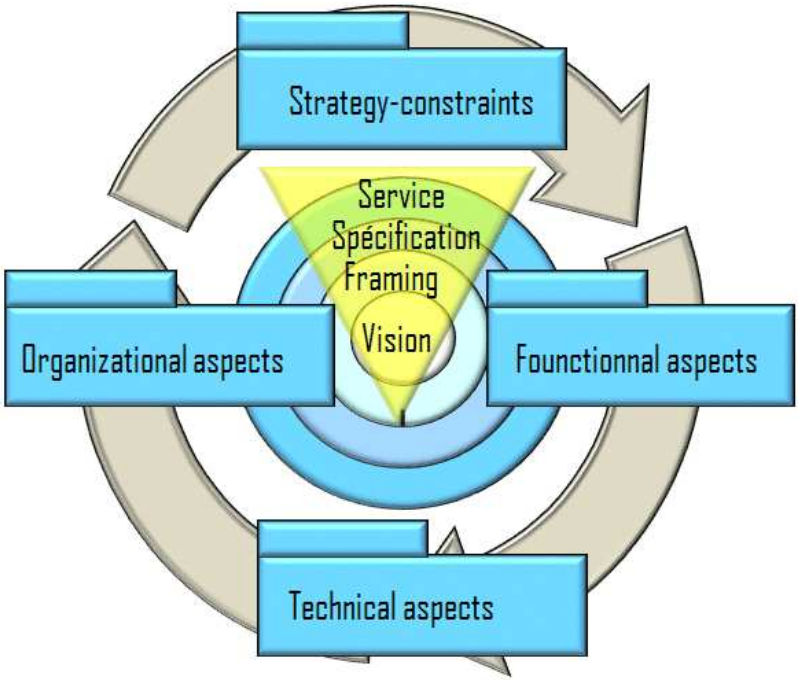

Figure 4. – Solutions motor

Generally, the "iterative depth" is limited[6] to four levels:

1. Vision.
2. Framework.
3. Specifications.
4. Services.

The Requirements are, at first, considered as "Visions," to become by refinement "Frameworks," then "Specifications" and finally "Services." This last aspect is a central point in terms of identification and granularity in the case of a service-oriented architecture (SOA).

Many other animation or facilitation techniques are available in the complete PUMA toolbox. One of them, the principle of documentation by "spaces," is cited within this document.

The **Piloting and Development motors** often represent by themselves a tool that is sufficient to respond to the reasonable application development requirements undertaken in a relatively light organizational context. The development is then made up of two groups of practices, one linked to the management of iterations and the other to the construction of the application.

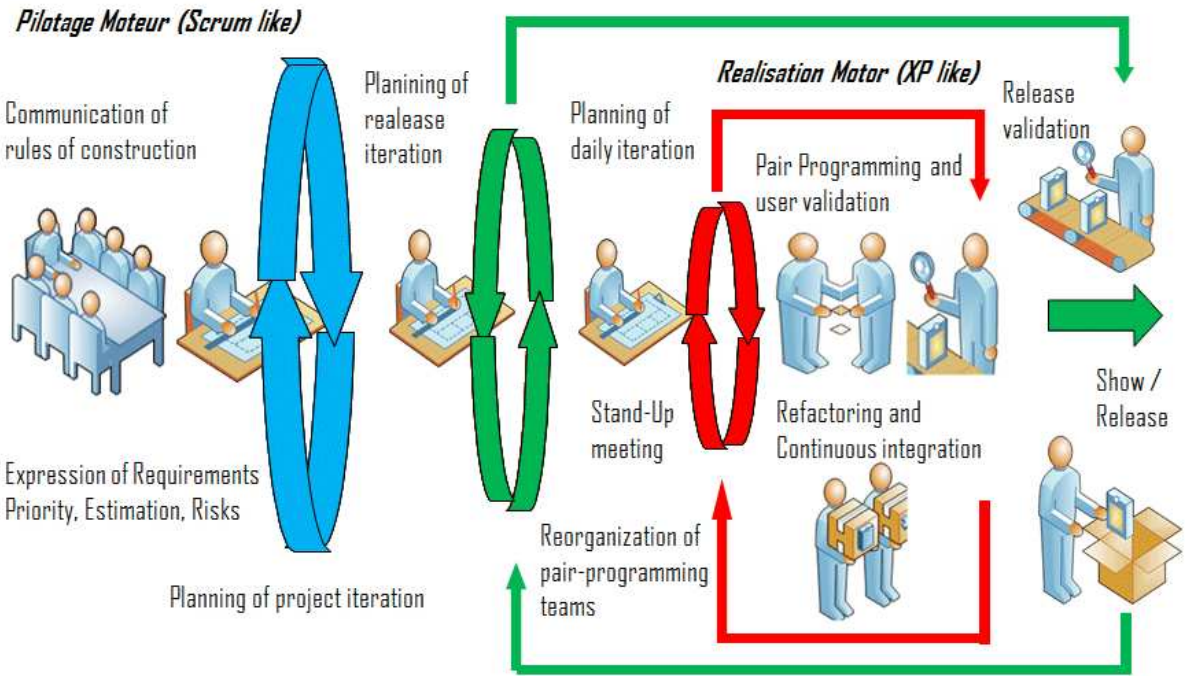

Figure 5. - Development Motors

Some essential basic practices allow for the management of iterations:

1. Expression of Requirements (*backlog*).
2. Planning (priority, estimation, risks).
3. Information radiator (*Burndown chart*).
4. Speed Mastery.

Some essential basic practices guarantee the performance and the quality of the design-development:

1. Management by tests.
2. Programming in teams and rotation
3. Refactoring.
4. Integration and continuous *build*

Coupling of motors

In the majority of organizations, the problem is not so much in the development or the technical project management as in the formalization of a consensual expression of requirements and responsibilities. These are most often shared by many participants. It is this challenge that the Communications and Solutions motors tackle.

The Communications and Solutions motors are in fact animation and facilitation models of interpersonal relations that position themselves at the convergence of the majority of challenges relating to change in an enterprise. Their organizational impacts notably exceed the simple production of a solution, as high-performing or as useful as it may be. They are, above all, powerful means of enriching work modes. They facilitate the fluidity of communications as well as the adoption of collaborative knowledge and well-being.

The Communications and Solutions Motors are therefore summed up, in terms of practices, into two distinct groups, treating the two most important aspects of the definition of a solution:

§ The communication and the management of interpersonal relationships.

§ The formalization of the application dynamic in an approach of managing “by value.”

7.1 Technique of interview facilitation

The most high-performing methodological approaches and the Agile methods have long required a working structure named Leading and Reporting Groups (LRG). The LRG is generally organized around a leader-facilitator whose mission is to obtain a formal and consensual expression of requirements by his knowledge of interviewing, forecasting and conflict management techniques.

During the expression of requirements, the leader will use the double competencies of his project experience and his talents as a mediator to transform what was a shock between two cultures or two powers into an enriching collaboration for the parties involved, and make it efficient for the project and the enterprise. If it is imperative that the leader be neutral, the reporters can, as for them, be among the participants involved in the project. The leader-facilitator is a complex and sensitive role. It is based on the mastery of human relations as much as on the modern techniques and tools of communication.

7.2 Engagement of resources

The principle of reactivity recommended by the Agile approach implies a concerted and simultaneous action of all the participants during the ensemble of the project phases. This point is crucial when the activities are linked to the expression of Requirements and the search for solutions. Most often, then, these two aspects of the problem fuse together naturally in a project managed in Agile mode. What is more, the cooperative mode is the only positive when it comes to building lasting relationships and mutual interests.

An Agile interview brings together simultaneously, following a previously agreed-upon communication plan, those who:

1. know what to do,
2. know how to do it,
3. decide to do it,
4. pass into action.

The user participants are chosen on the basis of:

1. the mastery of the business in its daily operational reality;
2. their projective vision of the foreseeable evolution of the context;
3. whether they are representative of other users;
4. their expressed interest in improving their working tools.

It is necessary to guarantee these “on the ground” professionals the organizational conditions that will allow for their full-time engagement if necessary. The quality and profitability of these projects come at this price.

7.3 Project management

In today's projects, the relations between development partners are becoming more complex to the point of invalidating traditional forms of management. What is more, the principles of openness and transparence, based on the simultaneous increase in communications and the engagement of all the resources involved in the project, are now indispensable to guarantee success.

The function of only one project manager then makes way for consensual action and collective responsibility. This fusion of relationships of various parties in a unique team (*The Team*) belongs to Agility, which revolutionizes at the same time the consensual vision of engagement and the collective responsibility that comes from it.

The most important point to consider is the real level of delegation that is available to the participants. The limits of this autonomy must be formalized in a document of the project contract type. It is generally signed during a preliminary meeting when the project is launched.

The simultaneous presence of representatives from software developers and users as well as the Agile collaborative mode allows for the realization of permanent validation operations. This validation will again be reinforced periodically via controls (*Shows),* with participation by the entirety of the actors, when the state of the solution is presented in detail during an operational demonstration.

7.4 Formalization of requirements

In the resolution of problems, even complex ones, a structurally simplified approach to the expression of requirements can resolve many difficulties of formalization.

It is on the basis of the dissociation between the "Requirements space" and the "Solutions space" which a *PUMA* project builds.

This dissociation of formalization spaces does not imply the separation of the involved resource - very much to the contrary. Agility in matters of development requires the permanent and active presence of the "client."

For *PUMA,* during a large project, the two workspaces are as simply structured as questions and answers (table 1). They correspond, in a single document:

§ on the "client" side to the expression of requirements

§ on the "technician" side to the expression of a solution.

At each iteration and for each topic of concern, a single structured document (based on 4 classes of requirements) is used for gathering information. The only distinctions can be noted by the importance taken by one or the other concern classes or their level of depth (Figure 6).

A PUMA project involves (at its root) a unique document respecting the order of the new expression of requirements recommended by the Solutions model.

The requirements are prioritized respecting an application dynamic imposed by the "Client" but integrating, with the collaboration of the technicians, the non-functional constraints.

Table 1. – One document, two spaces

Requirements space	Solutions space
Functional questions	Technical responses
Requirements expression folder	Project framing folder
Constraints expressed	Constraints accepted
Quality of the application (validation)	Performance of the project (monitoring)

One last Agile point to respect concerns the "non-redundancy" of information maintained by the documentation, just as much in one space as in the other.

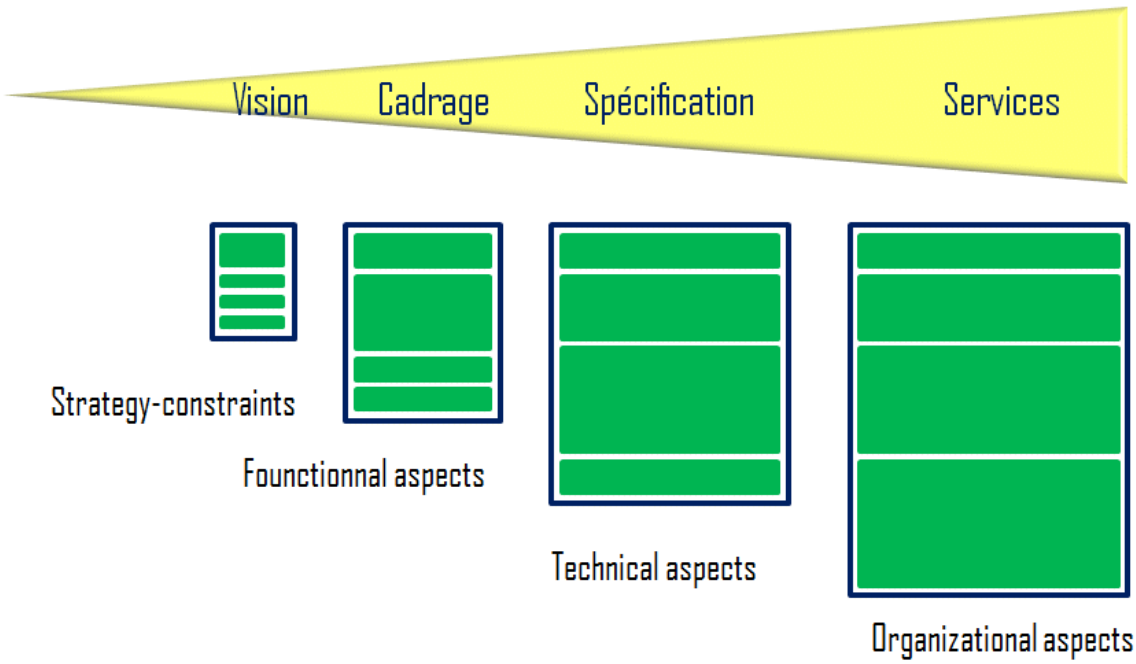

Figure 6. - A unique document

Simplification and purity of structures permit, in this way, the actors to situate themselves in order to understand their roles and their responsibilities in the

performance of a project and the quality of an application.

The Implementation of Essential PUMA

Implementing Agile practices in an organization requires a plan of action that is as simple as it is rigorous:

1. Evaluate the current state and describe the desired objectives.
2. Anticipate the direct and cumulative effects of change.
3. Elaborate and obtain a consensus on a plan of action.
4. Implement Agile practices and measure the effects.

In summary, after diagnosing the real practices, the Agile techniques sought (*QuickWins)* give way to training that is implemented by coaching. The efficacy obtained is then measured via monitoring.

Epilogue: the energy of rhythm

The emergence of a global and computerized economy positions the temporal dimension of performance as the vector that determines the search for strategic differentiation. In consequence, the reaction times expected from IT management are getting shorter and they must become Agile in order to fulfill their missions.

Equal to the Taylorism of the industrial revolution, agility is proving itself as the organizational way of thinking of the immediate future. Its emergence comes from the largest movement of deregulated exchange ever begun: globalization.

Companies that ensure they master the Agile operational paradigm at the level of their global organization will win the battle of IT systems and, at the same time, the economic war.

The first practical responses to have emerged from the Agile movement are the application development methods. They recommend an adaptive development characterized by a style of iterative and incremental project management. The aspects of management are centered on the autonomy of human resources involved in the specification, the production, and the validation of an application integrated and tested continuously.

PUMA is supported on the foundations of the Agile movement and on the best practices, common or differentiating, of the most well known methods that it strengthens and completes.

Because of its large perimeter, *PUMA* offers these methods, initially limited to application development, access to the higher levels of the organization when it comes to the evolution of the Agility of enterprises.

PUMA is therefore a guide to the implementation of global Agility and offers a response to the question: in function of what and how must we change the processes, the IS, as well as the competencies of the human resources.

The implementation of *Essential PUMA* corresponds to the search for an equilibrium between rigor and flexibility, leaving space for creativity, adaptation to the unexpected, and continuous improvement. In this spirit, *Essential PUMA* gives the project a group of direction lines that guide the engagement of human resources and favorizes development excellence. It is according to this philosophy that it is necessary to interpret and use *Essential PUMA*.

Conclusion

No miracles but a formalization of techniques leading to a dynamic of change:

1. Improvement of modes de communication.
2. Adaptation of project management practices.
3. Perfection of the techniques of design.
4. Optimization of development conditions.

No miracle, but a progression of the State of the Art leading to a rhythm of change:

1. Rhythm of the engagement of users.
2. Rhythm of interview modes.
3. Rhythm of the temporal dimension.
4. Rhythm of delivery *Shows*.

Between dynamism and communications, the energy of the Agile rhythm can be found!

Since 1996, these two paragraphs have concluded my conferences. But, as Thierry Cross, the founder and first president of XP France, has written, paraphrasing a citation of an artist on the subject of Samba, “more than a rhythm, it’s a state of mind.”

I think that from now on it would not be exaggerating to say: a culture.

Contents

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[1] The metaphor of the “motor” refers as much to the dynamism that it inspires as to the fact that it uses groups of four practices (like the timing of a traditional motor).

[2] This practice allows for understanding the size of emerging technical or functional evolutions and their foreseeable impacts on the components of the organization.

[3] PUMA is presented on AgileAlliance.org, Entreprise-Agile.com and MyMethode.com

[4] Published in 1999 by the Gartner Group France

[5] In the daily life of enterprises, this simultaneous presence of minimal conditions for success is very rarely observed.

[6] In small projects, only one level of the XP exploration step type may prove sufficient.


PUMA