

TRANSFORMATION MODEL FOR SMALL AND MEDIUM ENTERPRISES PRODUCT DEVELOPMENT PROCESS

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Abstract

The small and medium enterprises (SME) administrators are searching for best practices and knowledge that may help them with growth on the competitive world. In this sense, the product development process (PDP) systematization and organization are largely diffused. Reference models, for instance, are graphical PDP representations including activities, tools, concepts and best practices that are not easily incorporated in the enterprise routine, viewing PDP organization or improvement. Therefore, a transition model from the real practice to the proposed literature reference model is needed. The development teams, especially of small and medium companies, do not consider easy to understand and implement the reference models. This work considered the Method Engineering applied to the Organizational Engineering dominium to compose the Transformation Model for Pharmaceutical SME's PDP. The model incorporated the literature intervention's best practices. The method and the PDP dominium were discussed. The review of SME's organizational structure characterized the intervention environment. Useful tools and practices for PDP and Intervention were identified from literature. The consideration of Change Management and Method Engineering theories led to the Preliminary Intervention Model elaboration. This model was evaluated by its application in a medium-sized pharmaceutical organization by action-research. The researcher's observation supported the model improvement. This improvement generated the Intervention Model. The Intervention Model considers the small and medium enterprises characteristics and may guide the SME PDP improvement. The Model presents the processes, practices, principles and tools for the intervention process.

Keywords: Transformation model, Product Development Process, Small and Medium Enterprises

1 INTRODUCTION

Generally the criteria for enterprise structure classification are size, employee number or the annual revenue. Traditionally, SME's are characterized by centralized management, low specialized work, and intuitive strategies. Nevertheless, other elements like culture, maturity level and environmental aspects define the enterprises management practices. Hunter [1] emphasizes the organizational structure role as strongly related to the enterprises innovation attitude. Torrès and Julien [2] say that the SME's specificity tends to disappear with the modern net working, the risk capital usage, and the global market. Those enterprises tend to have a bigger enterprise-like management structure since the latest serve as business models for the competitive environment. For this reason, in this paper, the expression "moderate maturity level company" will be used instead of SME.

The new management models have the following common characteristics: strong market and customer orientation and more participative culture. The functional and verticallyzed structure, supported by a control view, was replaced by result oriented horizontallyzed structure [1]. The new management models see the enterprise as common interest-integrated components. In this context, the information is an important factor [3].

In a similar way, the product development management has improved in time. The product definition was amplified and different knowledge fields were integrated in the product project effort, mainly marketing and business activities. Therefore, reference models were created to organize, generally in a graphical format, the product development involved distinct departments' multiple activities. This broader process is called PDP - Product Development Process. A significant number of reference models are available in literature and can show the different historical point of view of each development theory or approach. Some of such models include Hollins and Pugh[4], Pahl and Beitz[5], Roozenburg and Eekels[6], Copper[7], Crawford and Benedetto[8], Dickson[9], and Kotler[10] models. The modern PDP approach emphasizes the multidisciplinary organization with well defined information flow and the customer focus. Other success practices include process activities parallelism, short cycle developments, multifunctional development teams, and the use of statistical tools for product and process quality improvement. These views are contemplated in theories like Integrated Product Development (IPD), Product Life Cycle Management and in Product-Based-Business [11], [12].

Nevertheless, many low maturity enterprises realities are related to the product development initial evolution stages. They do not have a standardized process, and the PDP is sequential. The market reality is very competitive, and the companies need to develop products as fast and adapted to the customer requirements as possible. The technical activities centered development idea must be replaced by the concept of product development supported business [11].

The literature available reference models may help those product development teams to facilitate the enterprise structure evaluation, to adopt and to make the PDP best practices benchmarking. Generally, reference models present the following phases: the business opportunity recognition, the product concept, physical development, the market launch, and the product market performance assessment. Reference models serve as a guide to direct the product development decisions. The, models generally enclose the best development practices as management knowledge (multifunctional teams, concurrent engineering, and life cycle management) and tools (marketing, computer, statistical tools). The reference models may also be used to derive specific models inside the enterprise. The enterprise's adapted reference model offers a base for a common language. It helps managers to preview, plan and control the work of a product development team [13].

The level of best practices implementation defines the enterprise PDP maturity level. However which step must be taken for the maturity level upstanding? Some idea is given by some maturity models, like Capability Maturity Level (CMM). The CMM is a reference maturity model for software development process. This model establishes the initial, repetitive, defined, managed and optimized as PDP maturity levels [14]. There are some other company maturity level models. Nevertheless, there is no consensus for the best practices selection to enable by implementation the maturity level upstanding. The reference model existence is not sufficient for its operational implementation. The companies need a tool that may help them to incorporate the model practices in their development process. The necessary tool is a transformation model that will allow the transition from the tactical (theoretical) level to the operational level.

The aim of this paper is to propose a low and moderate maturity level SME PDP transformation model. This model will help these companies to adopt the PDP best practices from a reference model. The transformation model proposed will enable the specific reference model implementation on SME intended to result in higher PDP maturity levels.

2 INTERVENTION MODEL DEVELOPMENT

The model was developed intending to include the fundamental attributes of the method referred by Braun et al. [31]. Those attributes are: goal orientation, systematic approach, defined principles, reproducibility.

For the definition of transformation method principles, effective transformation premises were identified and converted into principles. The literature transformation models and change cycle basic steps were used to define the transformation method steps. Afterwards, aiming the method formalization and reproducibility, documents and the method representation were elaborated.

The transformation model construction was conducted by the following steps: (1) a literature review was performed including change management, PDP, project management, method engineering; (2) premises were inferred from literature and converted in principles, which guided the development process transformation; (3) the principles allowed the transformation method steps and practices

establishment; (4) another view at the literature was useful for identifying business process assessment techniques and tools for the transformation method; (5) the method was applied in a SME by action research technique; (6) the transformation method was improved considering the experience at the SME; (7) document necessary for the transformation method performance were elaborated, based in project management control documents. A graphical representation of the method was created giving rise to a transformation model as presented in the figure 1.

2.1 Premise identification

Considering the low and moderate maturity level companies environment, the important elements and tendencies of the modern management and organizational structure views were identified [1]. The company maturity related literature, as the PDP dominium literature, indicates that the flexible organizational structure companies, which contain empowered employees, with decentralized management and systematized communication patterns, present a greater innovative capacity than their concurrent, in the instable environmental context. A high maturity level PDP tends to include the project management practices as a management tool. Under this focus, the PDP manages and coordinates a numerous projects [15] [16] [17] [18] [19] [20].

Considering the low and moderate maturity level company's reality, a question is presented: should low maturity level companies aim the most flexible model? The answer is no. There are some practices that can be implemented firstly, but the effort in implementing all the practices at once would not necessarily represent an improvement or maturity level advance.

The PDP management dominium was analyzed. Same keys to the PDP management transformation were identified. Those keys are (i) the process focused management, (ii) the planning and control notion, (iii) the pre-development stage, and (iv) the available information capture and use. One of the first principles to be implement would be the transformation of the functional structure into the process focused structure. The PDP must be conducted by activity oriented multidisciplinary teams throughout departments. In this sense, departments' staffs interact to develop a product, giving rise to a product development group or team.

Different maturity models [1] [15] [17] [18] indicate that a company process characterizes the company's maturity level. The maturity level is related to the process systematization level. Those models consider the PDP maturity level as higher as the process considers the use of the interdisciplinary teams, as it presents structured previous planning steps, and as it considers the customers point of view. It is also important the PDP's project management practices usage level. To work in the context of interdisciplinary teams and to maintain the reached improvement, it is important a very well defined decision taking and information flow definitions.

The literature review indicated that the company's internal transformation conduction way influence the innovative capacity of the transformed PDP. A possibility for the method construction is the situational method construction theory. On the situational method construction process, one initiates from the necessity. This motivation would interact with the related dominium (theory or knowledge) and with the effective ambient (culture and syntax). Considering the necessity and the desired benefit, the method conduction principles are identified. After this, the representation and the use components (tools, sub-methods and practices) are incorporated to the method [21] [22] [23]. In the context of situational method construction, there is a tool (or sub-method or practices) repository. The tools implementation must consider the process, the principles, and the culture. The implementation must not start focused just on the tools. The culture and principles must not be adjusted to the tool [23].

The change management, the situational method construction, and the action-research methodology converge considering the each company's person participation as elemental for the effective change. The change management and the learning related literature agree that the techniques, tools and systems considered technical or scientifically correct, if they do not result from the company learning, they do not bring proper innovation culture to generate knowledge. Those theories emphasize that just the knowledge dominium is not sufficient to new method modeling [26] [27] [28] [29] [30].

In this view, the transformation process must be conducted as Freire [27] says about learning process on Pedagogy area. The transformation process result – the PDP – must be constructed by the company in communion with the change agent or with the new theory. The role of the change agent, as a teacher, is to propitiate the condition to stimulate the experience of the individuals to assume as the change subject. The company must learn how to learn to become creative and innovative. The

transformation model approach must be, therefore, participative and based on the existing structure and culture.

The project management theory presents the tools, practices and documents useful for the transformation method operation.

The model was developed intending to contemplate the fundamental attributes of the method referred by Braun et al. [31]. Those attributes are: goal orientation, systematic approach, defined principles, and reproducibility.

The convergent items of the product development management, organizational structure, culture and management of the small and medium companies, change management, method engineering and project management themes were summarized as premises for the transformation model.

Those premises were: (1) the transformation model must conduct the sequential development process structure to the integrated product development process; (2) the transformation model must focus on the implementation of the information capture and exploitation; (3) the transformation model must contemplate the change management aspects; (4) the transformation model must propitiate the company maturing on the project management field.

2.2 Method step definition

The tools available in literature were selected to be incorporated in the steps of the transformation method. The swim-line process mapping tool was considered adequate to capture and visualize the product development process integration (premise 1) level in the company. This process mapping approach showed to the development team that the activities were centralized on some departments. The mapping results discussion would direct the visualization of the PDP steps anticipation by the departments co-working.

The business mapping [32] was incorporated as a way to show the company interaction with its environment. This practice would help the company product development team to better identify and define the company environment and stimulate the use to advantage the opportunities offered by science and technology politics (premise 2). The business mapping discussion must be performed as a way to help the PDP scope enlargement. The discussion must be related to the following topics: the company's environment, its interaction with supplier and with the customer; who are the competitors, how they act on the market; and which are the factors that influence the company's environment. The product concept must be enlarged. The product concept must incorporate the services to the customers, for example.

The information capture system must be discussed. How is the company's interaction with the universities, how the company use to advantage the opportunities offered by science and technology politics, for example? On the execution and PDP systematization step, this question – the information capture system must be emphasized. This information system consists in premise 2 in this model.

The change management approach (premise 3) is contemplated by the preparation and the sensitization and diagnosis steps. Those steps focused on the involved individuals' motivation. The transformation objectives and need for the change are well defined and communicated. The approach of this step must be the inspired in the action-research and situational method construction. The preparation step and the non-sophisticated documents incorporated contemplate the premise 4, introducing the project management context, if the company does not have the project management practices.

2.3 Model embodiment

For the transformation method conduction the project management revealed as a satisfactory tool.

Then, some documents were incorporated on the transformation method. Those documents must promote the company's maturity level improvement on the project management question (premise 4).

The project management structure was simplified to show that this matter does not must be complex. The transformation method has a diagnostic tool repository. The diagnostic tools must be selected by the company systematization level. The tools in the repository were selected by simplicity, considering the low maturity level of the companies. Companies of higher maturity level should need other tools for more detailed analysis. The selection of the systematic for the organizational evaluation must considerer the organizational structure and the maturity level [25]. The tools identified were incorporated as documents: formularies for business mapping, for swim line mapping tool, for process mapping, for maturity level evaluation and for selection of tools, for example.

2.4 Research-action for model improvement

The developed transformation model was applied on a previous selected company. The selection complied the intentional sampling with valorization of the representative criterions [28].

The theme of this work is a low maturity level companies' PDP improvement transformation model development. The selected main mechanism is the Integrated Product Development principles implementation represented by the PDP reference model. For this reason, it is critical a deep analysis of low maturity level company and the involved staff culture. Therefore, the sample selection for the model improvement and fine adjustment considered a low maturity level characteristic company. The maturity level characterization was performed by the company's initial evaluation (diagnostic).

Another criterion used to the company's selection was the accessibility and the high manager support. The transformation model takes into account the high managers conscience about improvement need and their support as a premise for the transformation affectivity.

The selected company is classified as a medium company (in accordance with size, number of employees criterion), has more than half a century of existence, a familiar origin and significant influence from the founder family managers culture. The majority of company products were developed on the founder management days.

The maturity level of the company is low to moderate taking into consideration the following aspects. They are complied about maintaining existing customers and gradually adding newer ones. They focus on risk transferring strategies as subcontracting. The director centralizes the decision. The strategic definitions are not diffused to the employees. The management system is based on the personal relationship. The company's culture is of the functional type. The work system is hierarchic. In production and control process, they present rigid activity control, they have some initial attitudes to problem prevention, but they do not use Statistic Process Control. They do not use and seam not to know about project management tools. Chronograms are some times elaborated, but not observed. The product development activities are recent. Nevertheless, the majority of product development projects are adaptation based on the legal requirement.

The main steps of the transformation model were applied to the company, using action research to model refining. The selected tools and practices were adapted.

The deep analysis was performed. The inferences were based in the theory. On organizational problem, like the company's environment, the system would not be understood by analysis, it will be necessary to consider the global context. The cyclic process of the action-research – planning – action – analysis – discussion – allowed a flexibility needed for the model improvement.

The researcher acted as facilitator, and the employees helped on the transformation model definition. The researcher, acting as an external agent, stimulated the experimentation method utilization to promote the learning process. This approach intended to help the collaboration. The model adjustment performed during and after the action-research was based on the researchers and employees observation.

3 TRANSFORMATION MODEL

A representation of the method was created as a support to the transformation model and it was also supported by change management and method engineering concepts. The model is presented in figure 1. The transformation tools include process mapping, maturity assessment and prioritization techniques. The model methodology steps are: (i) preparation for transformation project; (ii) sensitization and diagnosis; (iii) transformation project planning; (iv) execution; and (v) conclusion.

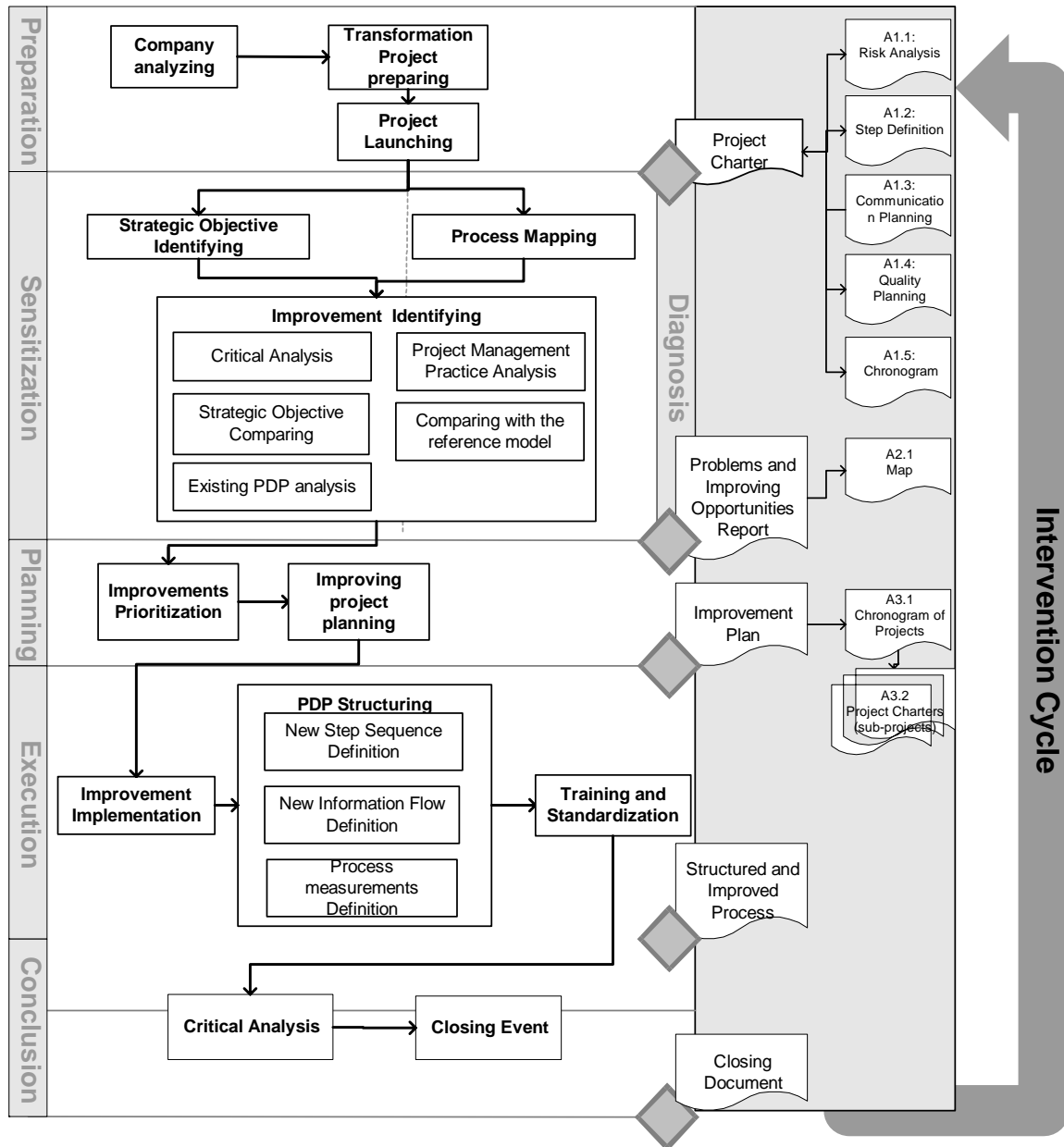


Figure 1. Transformation model

The model presents milestones and documents templates. The milestones represents the decision-taking moments. The documents templates help the company in the first context with the Project planning practices.

The first step of the transformation model is the preparation step.

3.1 Preparation

The preparation step consists in the company general characterization and the assessment tools selection. Tools and techniques are chosen from the transformation model tool repository to be used in next step. The transformation model resource usage level will depend on the company characteristics. This step results from the Bendell and Bolter [33] and Porter [34] description. Bendell and Bolter [33] reported that some quality maturity level defining aspects are supply chain or sector related. In the same way, Porter [34] describes how the cluster can influence the company organization system, culture, innovative capacity and competitiveness.

The preparation of the transformation project starts with the company's characterization. The characterization helps the researcher to evaluate what are the appropriate tools and to select the practices which are adjusted to the company reality. The steps to perform the project preparation were

influenced by project management theory. The risk analysis is conducted by the risks identified by Rentes [24]. These risks are focused on the individuals, on the company and on the change management theory. Afterwards, the diagnostic step evaluation tools are selected. The tools selection take into account that higher maturity level companies have more systematized PDP and need a deeper evaluation using sophisticated evaluation tools.

In this step it is very important to define clearly the transformation project objectives. The project leader and the transformation project (and model) have as objective to make questions that may conduct the team to a structured discussion about PDP. The project and the leader are not judging the individual aptitudes. Those aptitudes are considered as resultant from the organizational structure. In this step, the project scope is highlighted. The project may not lead to maxim process optimization, but to a start of PDP systematization and improvement. Further improvement must be generated by other projects afterward.

The steps of the transformation project are discussed and evaluated in a cost-benefit basis. The transformation project progress and quality measurements are defined. The necessary resources are identified. The responsibility matrix, the communication plan and risk control plan are defined. The decisions taken at this step are summarized on the project charter. This reference document summarizes the risk analysis, the steps selection, the quality plan, the communication plan, and chronogram definitions and activities.

3.2 Sensitization and Diagnosis

In the sensitization and diagnosis step, the transformation project kick off meeting establishes the project beginning. The step's main objective is to develop concern about the change need. This meeting must have all department representations. Some suggested discussion topics are (i) innovation, (ii) the need of the new products development, (iii) that development process is not a product development department exclusive task, and (iv) the company's future vision definitions. The PDP process mapping is performed for sequential process structure level evidencing. At this point it is possible for the team to discuss the PDP stages, searching for independent activities that may be performed in parallelism, and other PDP improvement possibilities. The discussion should come to an understanding that the product is not just the technical element or technology, but that the product is composed by all customers' perception. This perception is larger than the functional objective. The product is also the services involved, and the customer satisfaction is resultant from the all company departments, processes and activities. With this perception, the product develop is not just a product development department task, but it is resultant from the all departments, suppliers, distributors and service lenders coordinated action.

The sensitization and diagnosis steps occurs in parallel to emphasize the change management [24][30], research-action [28] [26] and pedagogy [27] theories as described previously. The participative approach is the basic premise of this step. More than a process and company diagnose, this step must create the team's process current state perception and knowledge. The Product Development Process Management dominium qualification must be conducted by referential model-based discussion and examples. The discussion focus must be the department and staff interaction, and the information needed for those interactions. The tools should be used just if considered appropriate for the company maturity level. The team is questioned about current PDP essential problems [12]. Afterwards, the process is mapped by different views and ways intending to represent the different point of views. The different mapping representations help the company team to think about how it works in the different aspects [35]: how is the department participation in PDP process; how the information is used in the process, for example.

It is suggested to initiate with the business and company macroprocess mapping [32]. This tool allows the team to evidence the company internal and external process interaction. The maturity level evaluation is indicated as a way of possible progress elucidating and an opportunity to think about a goal. The swim lanes chart based PDP mapping is important in low and medium maturity level companies. This tool allows showing how and when each department participates in the process. In higher maturity level companies, the information flux can be identified using IDEF (Integration Definition for Function Modeling) mapping, for example. For lower maturity level companies, an easier information mapping is suggested. For example, to drawing a simple flowchart should help a low maturity level company to discuss their information flow and find some improvement opportunities.

The strategic planning objectives are collected to define the directions to be taken in PDP. Whatever the detailed strategic planning is not performed in the company, the employees must be asked about what they understand as the companies' strategic objectives. This discussion should identify how the strategic planning is diffused. The strategic objectives related to the product development are deployed and analyzed in relation to the interaction they present with other strategic objectives.

Starting from the diagnosis results, a critical analysis is conducted evaluating the company organizational structure. A structured interview will help on this discussion. The main questions to be made are: (a) there is a previous planning on the product development process? (b) The steps and resources are previously identified? (c) The project financial viability is evaluated? (d) The project risks are previously evaluated? (e) Chronograms are defined? (f) Communication plan exist? (g) The project measurements are defined? (h) There is a continuous evaluation of the project from the start to the end? (i) There is a product life cycle evaluation after the product launching? (j) Is this evaluation related to the product development project?

This discussion must be conducted based on the company culture, capability, and potentials. From this discussion, an idea of the new PDP view may be possible. Subsequently, and just after the new PDP idea, should be performed a reference model based PDP benchmarking. The reference model should be analyzed to evaluate the suggested principles practices and tools advantages and compatibility to the company. This evaluation can be conducted by those questions: (1) which are the PDP steps? (2) Which departments participate in each step? (3) There are stop points to evaluate de project progress? (4) The team compare in a deeply way the resulting product with the planned, at the stop points? (5) Who conduct this evaluation? (6) This person has the power to interrupt the project? (7) What happens if this evaluation shows a not favorable project progress? (8) Which tools are used in the steps?

The relation diagram is used to identify the problems relations. Afterwards, the identified causes are ordered by occurrence and impact. The solutions for those problems are searched by the team in periodical meetings. Literature should be used to search for solutions, but the company culture and environment must be considered for the best tool and practices selection. It must be stimulated to generate tools by the process team.

The product of the Sensitization and Diagnostic step is the Problem and Improvements Opportunities' Report.

3.3 Planning

At the planning step, the improvement possibilities are ordered by priority and the implementation project is created. The considered criterions on the improvement possibilities selection are incidence probability, and impact on the process.

The low maturity level company generally does not present project management practices. This step emphasizes the project detailing to the project planning practice introduction in those companies. The model presents forms to guide those steps. Those forms are simplified because they were elaborated focused on the company's project planning first contact. This step may help the company's project management maturity level improving or this practice using habit creation. As the company becomes more mature, it must consider the creation of an own project management models, with own planning and control definitions and documents.

It is important to emphasize the project sequencing. The projects must be adequate to the company maturity level.

A tool for this step is the Matrix of change [36]. A change on a single process can impact on other processes. This tool helps to evaluate the interrelationship surrounding change process. But this tool may be more useful for higher maturity level companies.

The Improvement Plan results from the end of the planning step. This plan is a document that indicates the sequenced projects with an indication of who will be responsible for each project.

3.4 Execution

In the execution step, the plan is implemented changing the specific process in the context. The basic principle of this step is the projects participative conduction. All process related employees must be involved on the changing process. The transformation process must involve more people than the product development process team.

The new process steps must be documented represented graphically (suggestion), the metrics must be defined, as well the information flow focused on the decision-taking criterion must be mapped. The new PDP process is standardized through documentation and training.

The main focus of the transformation should be the information exchanging process. The level of systematization of the information system is must be company's culture adjusted. This systematization does not mean a software implementation, but a clear definition about who must be informed about which information at a specified time and about which information is needed to decision taking on the defined process steps.

At last, in the conclusion step, the transformation process critical analysis is performed and the lessons are registered for future transformation projects improvement.

The transformation process does not result on the perfect and immutable PDP. It is the initial step to the systematization. Improving process is endless and the company must continuously evaluate the environment and its internal structure to actively adapt to accomplish the customer needs. The product must be considered a manifestation of all the company efforts to costumer needs accomplishment, including other process than PDP. This continuous improvement generates the product perception enlargement and the PDP become more similar to the reference model. This is presented on the figure 2.

3.5 Conclusion

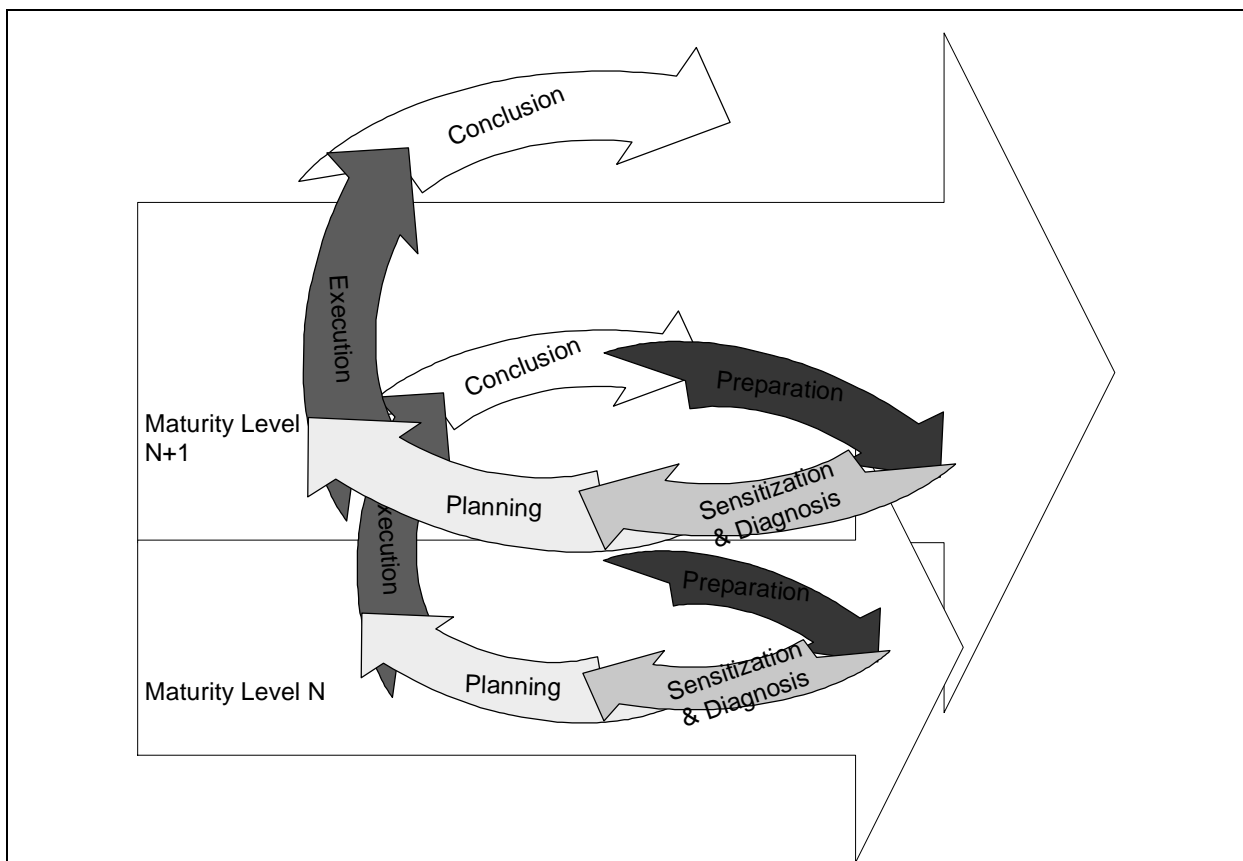


Figure 2: The Intervention Cycle

4 DISCUSSION

The transformation model is a transformation method representation. The method/ model includes the fundamental attributes of the method [31]. The model has a goal orientation. On the transformation project starting, the launching event, it is emphasized the intended goal. The model has systematic approach, with defined steps, practices, tools and documents. The principles are well defined. The principles are the premises identified from the literature review. The model reproducibility is obtained

by two ways: the method representation as a model, and the tools and documents incorporated to conduct the application.

An important point is related to the transformation process conductor. On the action research, the researcher performed this role without any relationship with the company. This was beneficial to the interviewees because they have guaranteed the exemption and anonymity. This helps the company in a way that the manager can more easily accept the report.

It is important to the transformation process conductor to have the PDP dominium theory. But on the general way, it is difficult on the low maturity level companies have such specialized professional. The conductor must be aware of the maturity level the companies present. An internal conductor could have some difficulties on obtaining the necessary exemption to analyze the process and to report problems and suggestions.

Those considerations must be considered on the conductor selection. The conductor can be an external person, but is very important the internal persons active participation as owners of the project. The active participation will guarantee the organizational memory about the transformation process that will help on the future improvements. The intended change is not just structural, but cultural. Then, the all related employees' involvement is essential.

It is possible that there is not an availability to have an external conductor or that the company has available a person with the needed know-how. In this case, it is essential to establish mechanisms to guarantee exemption of this person and of the company to this person, as a confidentiality, anonymity and exemption term. It is essential to have a guarantee that no one will be misunderstood by any opinion or suggestion. And primarily, the conductor must be empowered to freely take decisions and give opinions.

5 CONCLUSION

Summarizing, the transformation model developed presents principles (guidelines), steps and tools for the transformation process. The transformation model was developed to help low and moderate maturity companies to improve their development processes. The transformation model is a suggestion to a learning process for Integrated Development Process philosophy and for project management practices on a low maturity level company. In this way, the low and moderate maturity level PDP could be improved based on the following principles defended by the transformation models: (1) the change from the sequential development process structure to the integrated product development process; (2) the implementation of the information capture and exploitation; (3) the change management aspects and empowerment considerations; (4) the company maturing on the project management field.

The model presented was applied in a medium-sized pharmaceutical Brazilian company, as presented on Gusberti [37]. The transformation model presented in this paper helped the mentioned enterprise to improve its PDP. The purpose here was not to emphasize these changes, but the transformation conceptual model. Actually some enterprise product developed team experienced changes were: the experience of analyzing the PDP process in group; a PDP common view; the group PDP change prioritization practice and decision making. In relation to the enterprise new PDP model, the changes were of managerial character, since the development team considered them easier to be implemented and of broader impact. The managerial changes include: the effective constitution of a development multidisciplinary team (there was not a formal development group in the company); the enterprise PDP mapping and phasing; the phase control documentation; and mainly, the team concern about marketing assessment along all PDP. These benefits are consequence of the adopted reference model. However these practices would not be a reality in the company without the role played by the transformation model: it allowed the transition from the tactical (theoretical) level to the operational level.

Finally, the transformation model is indicated for companies of all maturity levels. In this case, it is suggested to analyze, previously, the company's project management practices and documents in order to adapt the transformation model to the documents already in use in the company.

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