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PROJECT AND PORTFOLIO MANAGEMENT TOOLS SELECTION
Case study from the telecom sector

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ABSTRACT:

Companies that are concerned about their sustainability in the market are entitled for a continuous product and service innovation task. New product and service development is not an easy one. As such it requires careful planning, organization and most of all financial and human resources commitment.

Resources are very limited. Therefore, resources spending should be planned based on the corporate vision and strategy. Resources control should be established in the project level and also the portfolio level. Via resource control, company management can decide which projects can be accelerated, put on hold or stopped. This is what portfolio management is about. The use of information technology softwares in this field would be indeed of a great help for decision makers to take such decisions efficiently.

The purpose of this thesis is to shed some light on how companies could manage their new product projects and portfolio via project and portfolio management tools. Through the case study, from the telecom sector, we are going to describe how companies are implementing their new product processes and portfolio management practices; moreover we are going to see how a company could choose an appropriate PPM tool. Finally, a shortlist of the different PPM tools that may satisfy the company needs in terms of project and portfolio management practices is presented.

KEYWORDS: stage-gate model, new product development, portfolio management, project and portfolio management tool (PPM), project management.

1. INTRODUCTION

New product development is in the heart of the company strategy. Sustainability and company positioning within a competitive market is strongly linked to how fast new product and services are released to the market.

There are practically two main issues that a company should focus on: reducing the time-to-market of products and services, and managing resources allocation through the company project portfolio.

Following a new product development or project management process would be a good approach to monitor the projects execution environment and ensuring therefore better control of the process performances indicators, inter alia, acting on the variables that influence the time to market. On the other hand applying a portfolio management approach would help the company to develop a methodology for resources allocation and utilization through all the projects, and also to develop the 'Big Picture' of which projects should be accelerated, stopped or put on standby status, that's in which projects the company should put more resources.

This concept would lead to the creation of methods to rank and classify projects based on several criteria. This methods can be either one-dimensional, relying on one category of criteria and models (Ex: Financial criteria) or multi dimensional, taking into account more than one category of criteria (Ex: Financial, strategy, Risk, etc). The methods and criteria used should indeed follow the company practices and policies.

Recently the utilization of Business Process management IT tools has increased tremendously. We are talking nowadays about ERPs that bring very good capabilities in terms of workflow management and business processes modeling. ERPs have also the

capacity to report conveniently the business status to high level management via dashboards and graphics that would allow them to take decisions in an efficient manner.

IT tools are also very useful in the field of project and portfolio management. They can help to track projects, report their progress status, resources utilization rate and can also help managers to rank and balance between projects. Acquiring these tools become no more an option for companies seeking efficiency in decision making and also better process monitoring and automation.

The purpose of this thesis is to report an insight about the market of project and portfolio management tools through a case study from the telecom sector. More precisely, how can companies choose suitable tools that can match its current new product projects process and portfolio management practices. First, we are going to present an overview about the new product process, second a description of the portfolio management techniques and tools and finally, through Meditel case study, a Telecommunications service provider, we are going to describe its current processes and practices, its need in terms of project and portfolio management tools and some practical recommendations for implementations.

2. THE NEW PRODUCT DEVELOPMENT PROCESS

2.1. Introduction

Undeniably, the focus on developing new products and services is a key element for sustainability and guaranteeing presence and identity in the targeted market, since naturally, those products aim to satisfy the evolving customers' needs. Considering moreover, the fierce competition that a company may have, another concern can be added which is the time required to launch the product or simply the time-to-market. Companies therefore try to implement processes that addresses those concerns and yet managing and controlling the innovation efforts.

The purpose of establishing a process for the new product development task could be summarized in the following arguments (Cooper, 2000: 96 – 101.)

- **Better quality of execution**
  By adopting a process approach for management of innovation, a company can apply process and quality management techniques. Once the details of the process are considered on the right way, high quality output should be expected.

- **Strong market orientation**
  By considering the marketing requirements within the process, this goal would be naturally a consequence. Cooper (2000) cited the following marketing tasks to be considered:

    - Preliminary market assessment,
    - Market research to determine user needs and wants,
    - Competitive analysis,

- Value-in-use analysis
- Concept testing
- Customer reaction and feedback during development,
- User tests and field trials
- Test market or Trial sell
- Market launch based on a solid marketing plan.

Cooper (2000) has emphasized the importance of including as much tasks as possible within the process and also making marketing resources available to project teams.

- **A better team organization**

  Since the new product process involves many disciplines in an organization, the need for a cross functional team is mandatory. This team should be supported by:

  - Committed team players
  - Team leader accountable for the project.
  - Flexible team structure, where team members can change eventually.
  - Small core group of accountable team players.

2.2. The stage-Gate Model

The stage-gate model is a new product concept that aims to drive a new product project from idea to launch. This method was empirically proven based on experiences, suggestions and observations over 60 companies (Cooper, 2000).

This model breaks the new product process into stages and gates. In each stage, informations and data are collected to advance the project to the next stage. Each stage involves parallel activities handled by people from different functional areas within the company, and is preceded by a gate or a check point where a GO/Kill and prioritization

decisions are made by cross-functional managers or 'gatekeepers' responsible for the resources needed by the project team.

The figure 1 gives a summary of the stage-gate structure, which I am going to analyze in the current paragraph.

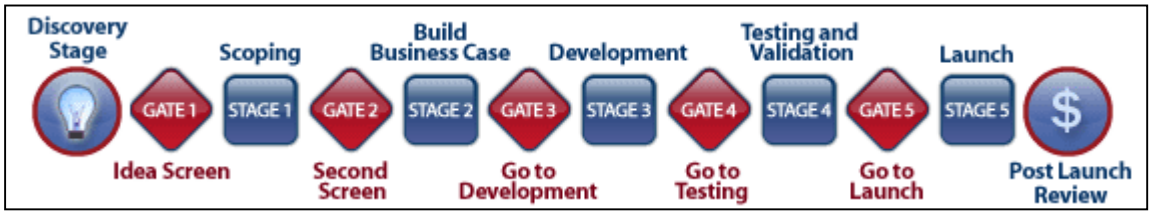

Figure 1. Overview of the stage-gate model.

In the discovery stage, the focus is on the formulation of a project idea. Cooper (2000) emphasized the importance of building a proactive idea generation and capture system which is based on four elements:

- Having a focal point responsible for stimulating, generating and handling new product ideas.
- Identifying the different possible sources of new ideas.
- Facilitating the flow of ideas from the identified sources.
- Setting up a handling system via IT support for example.

The screening of the project idea is the first gate of the process where the project is born and preliminary resources are assigned for further investigation. The project idea should be analyzed based on key must-meet and should-meet criteria related to strategic alignment, project feasibility, magnitude of opportunity etc and generally financial criteria do not figure among the above mentioned criteria (Cooper, 2001).

The stage 1 is dedicated for quick scoping of the project. This task is realized in less than one calendar month and involves generally few people from the marketing and technical teams. The main activities within this stage are:

- Preliminary market assessment, based on market size and market acceptance of the project.
- Preliminary technical assessment, a quick technical evaluation is made usually using in-house expertise.
- Preliminary market assessment where a basic financial assessment is made based on estimates of investment, costs and sales prospects.

In the second gate, the project is evaluated based on the collected data and the criteria used in Gate 1. Additional criteria could be considered such as the compliance with the legal and regulatory frameworks and rules.

The stage 2 aims at engaging in a detailed investigation of the project before the development stage and preparing consequently the project business case. The business case contains three main elements (Cooper, 2001):

- A detailed product definition which includes, besides the product concept and its benefits, a list of the product characteristics and specifications, the targeted market and positioning strategy.
- A thorough project justification where a detailed financial analysis is conducted, risk assessment and sensitivity analysis.
- A detailed project plan including the cost expenditure, the responsible team through development and launch and after launch eventually.

The decision regarding the business case is conducted on the gate 3, which concerns mainly the leadership management team. This gate is very critical since a GO decision means engaging with a heavier spending with the project in the development phase. The quality of execution and results in the previous stages are also revised within this gate (Cooper, 2001).

The must-meet and should-meet criteria are strictly reviewed at this gate, besides the results of the financial analysis.

Next stage is the development stage, through which the development team works on the product prototype. A development roadmap should be elaborated beforehand including a time schedule for different tasks and activities required, resources needed and expected milestones. Marketing and manufacturing activities take place as well in this phase. The purpose could be the preparation of the marketing launch plan and operations and production plan (Cooper, 2001).

The gate 4 concerns reviewing the development phase. Since this gate, the concern of the gatekeepers is more on controlling the progress and attractiveness of the project rather than checking its viability. The post-development review controls the quality of the development work and its conformity with the product definition made in gate 3. More accurate data are also provided in order to revise the financial analysis.
The stage 4 deals with the test and validation of the commercial viability of the project. More precisely, it encompasses the following steps (Cooper, 2001):

- Extensive product tests to verify its performances and quality. Field trials could also be envisaged to sense the customers' responses.

- Trial or limited pilot production. A mini launch for the product could be planned for the project. This is a test for the marketing mix and expected revenues.
- Revised financial analysis where economic viability is checked.

After the test and validation phase, a precommercialization business analysis is conducted in Gate 5. Generally, this gate checks the quality and results of the activities handled in the previous stage. The criteria considered focus on expected financial return, the operations plans and the product launch conditions.

The last stage in the stage-gate model is the stage 5, which is concentrated on the production process and market launch of the project. Other plans could be considered as well such as quality assurance and logistics and distribution. The post launch monitoring plan should also be implemented based on defined metrics in order to take necessary actions eventually early in the launch phase. Once the project becomes 'regular' within the product line, a post implementation review is generally engaged (Cooper, 2001).

During this review, the project's performances are reviewed and data regarding the revenues, costs, profits and timing are collected and compared to the planned projections. The project's strengths and weaknesses are assessed and lessons learned are listed for further projects.

2.3. The new product process organization

The new product process is based on cross-functional capabilities integration. A company engaging in a new product project tries to achieve this integration via a suitable and effective new product organization. We could distinguish between four types of

development teams structure: Functional, lightweight, heavyweight and autonomous (Clark et.al, 2001).

The functional team structure stipulates a serial work type where the new product project is handled by one functional department at the time. The responsibility for the project is passed from department to another. The project teams within each functional department are headed by a sub functional manager or the senior functional manager (Clark et.al, 2001).

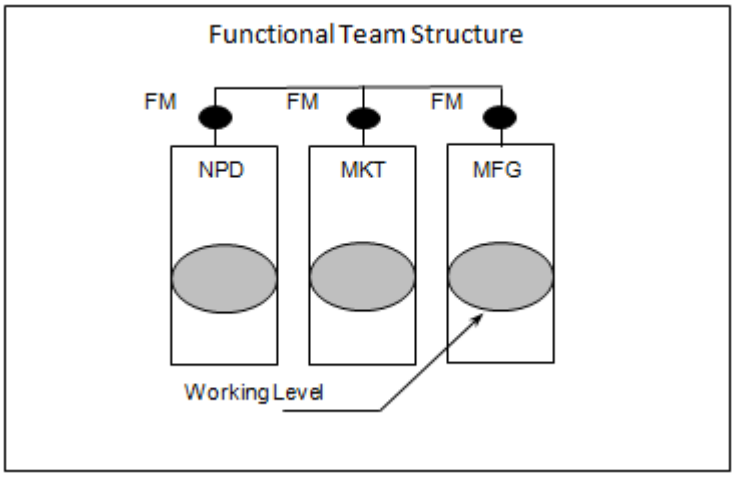

Figure 2. NPD Functional team structure.

In the lightweight team structure, the different functional departments assign a liaison person or a team leader that coordinates the new product project with a project coordinator. The team leader is assigned on a part time basis to that project and the project coordinator is not accountable for the work done within the teams (Clark et.al, 2001).

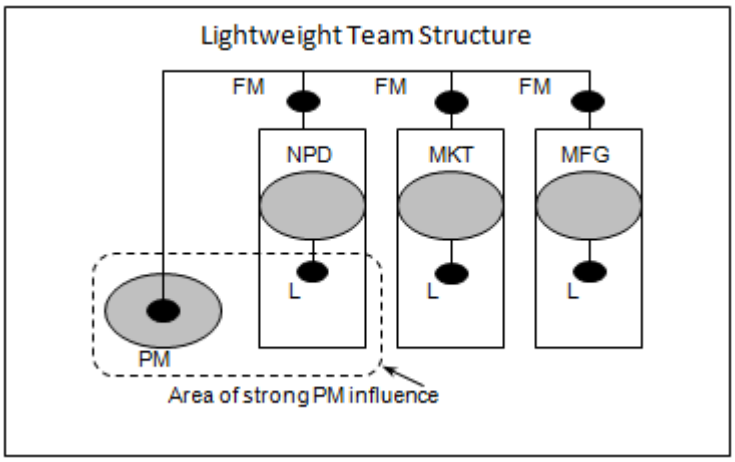

Figure 3. NPD lightweight team structure

The heavyweight team structure shares the same structure as the lightweight except that the project coordinator is responsible for the work done by the different functional teams (Clark et.al, 2001).

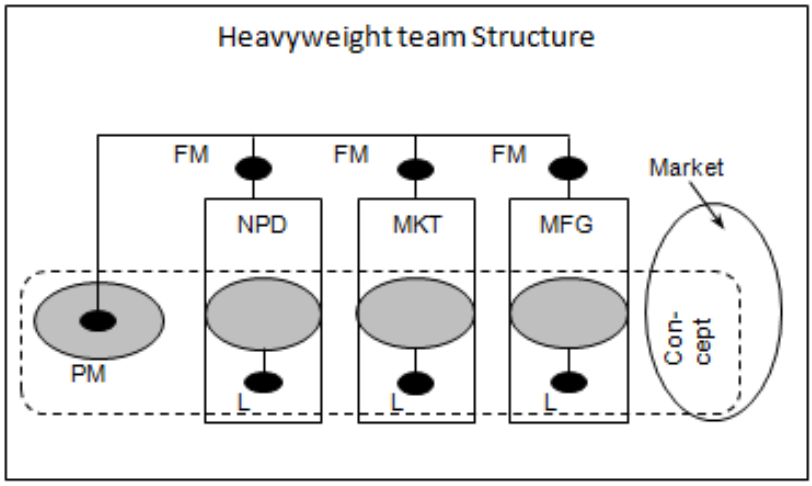

Figure 4. NPD heavyweight tem structure.

In the autonomous structure, the project team is assigned full time to the project and the project coordinator is responsible for the work done within the teams (Clark et.al, 2001).

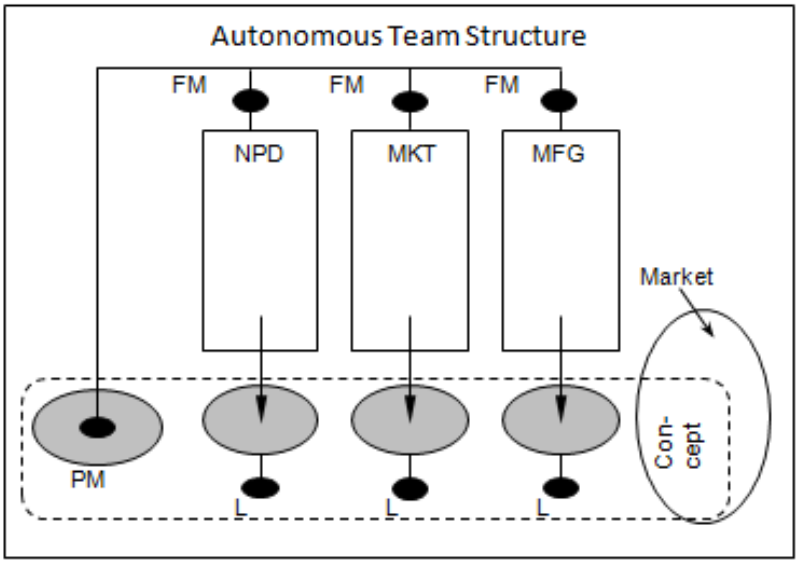

Figure 5. NPD autonomous team structure

2.4. The new product process metrics

"You cannot manage what you cannot measure" is the rationale behind establishing a process metrics (Cooper, 2000). During a stage-gate benchmarking session, the topic of metrics was of paramount importance. During this session attended y leaders companies in new product development, Cooper came with the following conclusions:

- There is no common view on what should be measured. The companies focused their measurement approaches on different areas. However, there were a set of metrics mostly used by the majority of them.

- The number of metrics used decreases with the course of business. The management could see clearly what the most useful parameters to the business are.

Short Term	
Category	Metric
Timeliness	Cycle time (months)
	On-time launch (Actual vs Scheduled)
	Actual time relative to fastest possible cycle time
Development & Capital costs	Budget Variance
Long Term	
Financial	- Profitability (NPV, IRR, Payback Period, Break even) - Sales (units, dollars, market share) - Manufacturing costs
Success rates	- Percent of projects that became commercial success - Attrition curves - Percent of sales coming from new products - Percent of growth (profits) generated by new products

Table 1. List of in-process metrics.

Cooper (2000) distinguished between two broad categories of metrics (also called key performance indicators (KPIs)): Post process and In-process metrics.

Post process metrics can be measured only after the launch of the product and can be split to short term metrics, those measurable after the launch, and long term metrics, measurable in a long period after the launch (See table 1).

Subjective	
Category	Metric
Quality of gate meetings & deliverables	- Rating cards filled out at gate meetings
Degree of deviation from New Product Process rules	- Degree of change in product specs after Gate 3 - Number of design change requests - Number of cancelled gate meeting due to 'no-shows' by gatekeepers.
Proportion of projects 'really in' the new product process	- A judgment call by the new product process manager
Objective	
Timeliness of projects reaching gates	- Profitability (NPV, IRR, Payback Period, Break even) - Sales (units, dollars, market share) - Manufacturing costs
On-budget performance	- Percent of projects that are on budget in each stage. - Mean variance in budgets, by stage (Pc)

Table 2. List of in-process metrics

The in-process metrics are measured during the execution of the process and usually reflect the quality of the project unfolding. Cooper made a distinction between a subjective and objective in-process metrics (See table 2).

3. PORTFOLIO MANAGEMENT

3.1. Introduction

The rapid change of technologies and shorter product lifecycles are, inter alia, influencing the management of the company project portfolio. Portfolio management reflects the company business strategy, as such; it has gained recently attention of most CTO's and become one of the most important senior management functions in this century (Cooper et.al, 2001).

This strategy dictates which projects should the company invest in? Which projects will be given top priority and be accelerated to the market? And what is the right mix between risk versus return, maintenance versus growth and short term versus long term new product projects? Not to mention maximizing the value of the portfolio this refers to maximizing the return on investment.

A general and more formal definition of portfolio management would be the following: '*A dynamic process where the entire set of a company new product projects is constantly reassessed, ranked and updated. Therefore, existing projects may be cancelled, de-prioritized or accelerated and resources are reallocated to the active projects. The decision process should take into account the changing information, dynamic opportunities, multiple goals, strategic orientations, interdependence between projects and multiple decision makers and locations*' (Cooper et. al, 2001). At this stage, we should ask ourselves why Portfolio management is so important.

Cooper et al. (2001) conducted a study in collaboration with thirty firms in order to identify the issues, goals, concerns, metrics and types of methods used by the CTO. The study targeted the North American market and was supported by experts from the IRI. According to this study, Senior management had emphasized eight reasons for the importance of such a topic for their businesses.

1. Financial: this is the most mentioned argument supporting the adoption of a portfolio management strategy. By doing so, managers expect maximizing the return, R&D productivity and achieving the financial targets.
2. Maintaining/improving the company competitive position by increasing the sales and market share.
3. Efficient allocation of scarce resources. Because of capital rationing, Portfolio management is very critical in order to orient resources on projects that matter most to the business.
4. Strategic issues or in other terms to strength the link between the business strategy and the projects included in the portfolio. In that sense, Portfolio management is necessary since it provide the basis for achieving business objectives.
5. Focus is also one of the critical reasons why portfolio management matters. The desire to concentrate on 'great' projects is of paramount importance for managers.
6. Achieving right balance between projects. Especially between those with short term and long term orientation and high and low risk.
7. Better communication within the company. Portfolio management was found very beneficial to improve the communication within the organization either horizontally, that is between executives and divisional managers and vertically that is across functions. As a consequence, Visibility and better understanding of some projects purpose is well shared in the organization.
8. Objectivity in including new projects within the portfolio, eliminating therefore projects that cannot be justified to enter the system.

3.2. Portfolio management purpose

Independently on the area where the firm is operating and the method used to manage its portfolio, companies share common 'macro goals' regarding portfolio management strategy.

- Value maximization: the goal of the firm is to allocate resources in away to increase the value of the portfolio. For instance, long term profitability or return on investment.
- Portfolio balance: making the right set between projects in order to reach a balanced portfolio, taking into account several parameters. For example balance between high risk and high return projects versus low risk and sure return, new product project versus Improvement/cost reduction initiatives.
- Strategic alignment: the third objective is to ensure that the chosen projects do reflect the business strategy.

It is worth mentioning that companies may face some conflict while trying to achieve all three objectives. A portfolio that may yield the highest return on investment may not be well balanced or a portfolio that may be well aligned with the company strategy may neglect other goals. The point is that firms should establish some ranking for these goals and the right portfolio then will be the one which satisfy the goal that management had been focusing on (Cooper et. al, 2001).

3.2.1. Maximizing the portfolio value

Maximizing the value of the portfolio is one of the 'macrogoals' that a company is striving for. The idea behind maximizing the portfolio value is to come up with a ranking list of potential projects; those that are at the top of the list are likely to reach the targeted objective(s). Therefore, the challenge consists in figuring out the right criteria/method for ranking the projects. There are plenty of methods used for that purpose varying between financial to scoring models. During this chapter we are going to address the Expected Commercial Value (ECV) only (Cooper et. al, 2001).

Considered as one of the most used financial models, the ECV tries to maximize the value of the portfolio by estimating the commercial worth of each project. This method is

based on a decision tree and takes into account the future cash flows from each project, the probability of both commercial and technical success and the development and commercialization costs. The figure 6 shows a basic model for the ECV method.

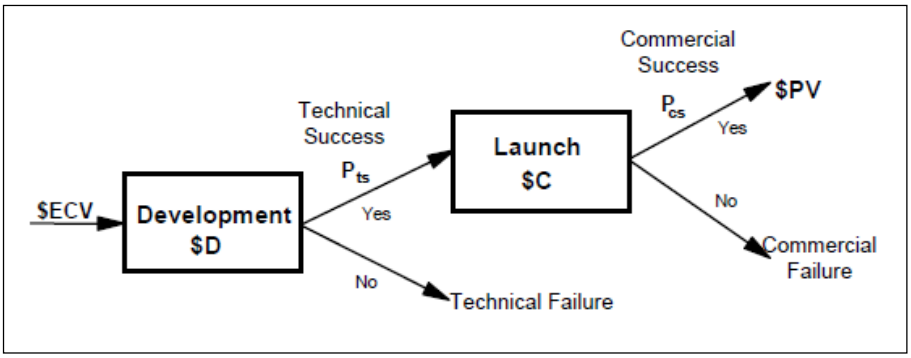

Figure 6. Expected Commercial Value Model for a project

The formula for the ECV is the following:

$$ECV = [(NPV \times P_{cs} - C) \times P_{ts} - D], \text{ where}$$

NPV: Net present Value

P_{ts}: Probability of technical success

P_{cs}: Probability of commercial success

C: Commercialization costs

D: Development costs

Table 1 presents an illustration of the ECV calculation.

The table shows clearly the difference between referring to the NPV or ECV as a criterion for ranking projects: if we refer to the project alpha, its value could be estimated to $22 million (retrieving the development and commercialization costs from its NPV). However its real value is only $5 million according to the ECV (Cooper et. al, 2001).

Project Name	NPV	Probability of Commercial Success	Commercialization Cost	Probability of Technical Success	Development Cost	ECV
Alpha	30	0.5	5	0.8	3	5.0
Beta	63.75	0.8	2	0.5	5	19.5
Echo	50	0.75	3	0.6	5	15.7
Gamma	8.62	0.75	1	0.75	2	2.1
Delta	3	1.00	0.5	1.00	1	1.5
Foxtrot	66.25	0.8	2	0.5	10	15.5

Table 3. ECV calculation Examples

Companies may use modified versions of this model and may therefore include additional variables as it is the case for ECC International Company[1]. Beside the variables mentioned above, ECC included a variable that reflects the strategic

importance of the project. This variable, Strategic Importance index (SI), has three levels: High, medium and low and take 3, 2 and 1 as possible values respectively. Moreover, the variables P_{ts} and P_{cs} range from 0.2 to 1 in increments of 0.2 based on established criteria. Therefore the new model is as follow:

$$ECV = [(NPV \times SI \times P_{cs} - C) \times P_{ts} - D],$$

ECC's project evaluation does go well beyond this stage. To reach a prioritized list of projects, the company takes into account scarce resources such as R&D human resources, R&D funds..etc. In their case the annual spending in R&D is considered. Projects are therefore ranked according to the ratio ECV divided by the R&D spending in each project. The table 4 demonstrates the ranking of the above mentioned projects.

[1] ECC International (English China Clay) is a U.S company based in Atlanta specialized in producing clay and clay related products.

Project Name	ECV	Development Cost	ECV/Dev	Sum of Development Cost
Beta	**19.5**	**5**	**3.90**	**5**
Echo	**15.7**	**5**	**3.14**	**10**
Alpha	**5.0**	**3**	**1.67**	**13**
Foxtrot	15.5	10	1.55	23
Delta	1.5	1	1.5	14
Gamma	2.1	2	1.05	15

Table 4. ECV model with resource constraint consideration

The point is that the two criteria (ECV & ECV/R&D ratio) may lead to different project set for a given R&D capital and therefore to different commercial portfolio values. If we suppose that ECC has settled a budget of $15 million for the R&D, than according to the ECV criterion, we will choose the projects Beta and Foxtrot since they represent the highest ECV respectively and the sum of their development costs is equal to $15 million. However, based on the ECV/R&D ratio criterion, the portfolio will be composed by the following projects: Beta, Echo, and Alpha (Cooper et. al, 2001).

The ECV model presents several advantages. Because it is based on a decision tree approach, it recognizes an incremental decision process where the decision to cancel or sustain the project can be made through the different steps of the project. This Go/Kill options along the way of the project reduce its risk. Second, the money spent during the life of the project is discounted to today, not only to the launch date. Penalizing therefore projects that are beyond the launch date. Finally, the method takes into account the strategic importance of the project and the constrained resources and tries to maximize the portfolio value in light of these two considerations (Cooper et. al, 2001).

On the other hand, the major weakness is related to the accuracy of the required quantitative data. Actually, the estimates for the future cash flows of the project,

probabilities of success and capital expenditures are usually unreliable or could not be available on an early phase of a project, bringing some doubts about the ranking method.

The third disadvantage is that the method does not consider the balance of the portfolio. That is a balance between high and low risk projects or also across market and technologies.

3.2.2. Balancing between portfolio projects

The second goal that firms are trying to achieve is a well balanced portfolio. The way to achieve this objective varies from company to another. During this chapter, we are going to address the following issues (Cooper et. al, 2001):

When calculating the NPV, remember to:

1. Consider only relevant cash flows or in a simple terms the difference between the cash in and cash out and not the accounting profits.
2. Estimate cash flow on incremental basis:
    a. Include the opportunity costs
    b. Remember the working capital requirement
    c. Forget sunk costs and consider only the remaining cash flows from a project.
    d. Consider overhead costs. That is the extra expanses that may result from the project.
3. Treat inflation consistently. This refers more particularly to discount rates, where we should use nominal discount rates for nominal cash flows and real discount rates for real cash flows. Remember that:

    1+ nominal rate = (1+ real rate) x (1+ inflation rate)

Source: theory of corporate finance, 6th edition.

- What do companies refer to by the term 'Balance'?
- Portfolio management tools that help managers to achieve this objective.

A balanced project portfolio could be seen as a set of projects that try to achieve the company objectives in terms of a certain number of criteria/parameters. One example could be the analogy that we may notice with the investment funds. Actually, the manager's purpose is to achieve a well balanced portfolio in terms of risk (high risk vs low risk stocks), domestic vs. international investments, and across several industries.

Experts suggest a list of parameters that companies may refer to, in order to consider portfolio balance (Cooper et. al, 2001):

- Congruence with business strategy (Low, medium, high)
- Strategic importance to the business (low, medium, high)
- Durability of competitive advantage (short-term, medium, long-term)
- Reward based on financial expectations (modest – excellent)
- Competitive impact of technologies (base, key, pacing, embryonic)
- Probabilities of success (technical and commercial as a percentage)
- R&D costs (dollar)
- Time-to-completion (years)
- Required investment (capital & marketing) to exploit (dollar)

Other parameters or descriptors could be used as well:

- Market segments (Market A, Market B, etc)
- Product lines (Product line C, Product line D...)
- Project types (new products, product improvements, fundamental research, extension and enhancement,....etc)
- Technology/platform types (technology X, Technology Y, ...etc)

One common way to display balance in projects portfolio is by using visual charts. On the contrary of methods already demonstrated in the previous chapter, the visual chapter displays the project's 'dimensions' referring to one or several parameters graphically. These graphical representations include the portfolio maps or bubble diagrams (because projects are represented as balloons and bubbles), which consist in adaptations of the well known BCG Model, made by McKinsey company and meant for product portfolio management. Not to mention, the traditional histograms, bar and pie charts (Cooper et. al, 2001).

One major advantage about bubble diagrams is that they can capture the resource requirement per project. Actually, the size of the circles displayed within the diagram represents the amount of resources for each project. Moreover, the diagram shows the product line to which each product belongs (by marking circles belonging to the same product line with the same sign: shading or cross hatching for instance) and finally the product timing (using different colours. Red for imminent launch for instance).

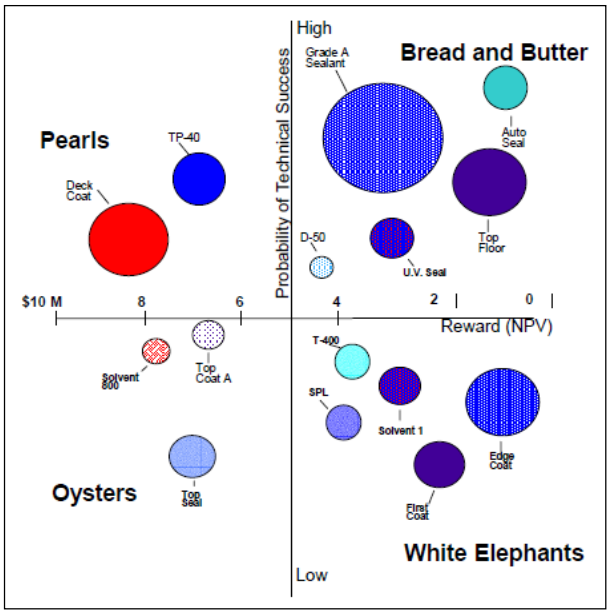

Figure 7. Bubble diagram example for a chemical company

Bubble diagrams templates:

Bubble diagram model is composed of four quadrants. Each quadrant represents a category of products/projects characterised by a certain probability of success and degree of expected return. The four categories are defined as follow (Cooper et. al, 2001):

- Pearls (upper left quadrant), which are considered as potential star products. That is, projects that have a high probability for success and with high expected returns.
- Oysters (lower left quadrant), which refer to projects with high return and low probability of success. These are generally new breakthrough projects
- Bread and Butter (upper right quadrant) are projects characterised with a high probability of success and low expected return. These kinds of projects represent generally update or modifications of existing ones.
- White elephants (lower right quadrant) with both low probability of success and low reward.

Source: Portfolio management for new products

3.2.3. Linking Strategy to the portfolio

When management starts implementing the corporate strategy, their focus becomes centralized on two directions, that is:

- The on-going projects are on-strategy
- Resource allocation does reflect the strategic direction of the business.

In order to align the corporate portfolio along with its strategy, two broad objectives must be considered:

- Strategic fit; in other terms: do all projects fit strategically?

- Strategic priorities which deal with the way how the money is spent on projects. The breakdown of money spending should reflect the strategic priorities.

There are three general approaches that companies may adopt to better align their portfolio with the stated strategy: The Top-Down approach and the bottom-up approach.

3.2.3.1. The top-down approach

Also named strategic buckets approach, the top down approach consist in assigning buckets or envelopes to a specific set of projects. The rationale behind this method is that strategy implementation is not real until the budget is spent on projects and activities. The model can be summarized in the above mentioned diagram (Cooper et. al, 2001):

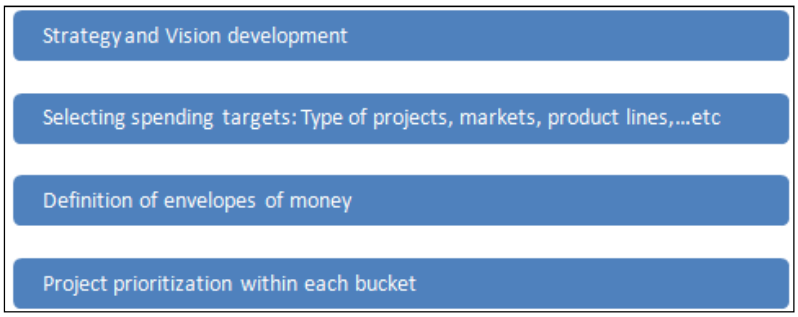

Figure 8. Top down approach roadmap

First, the leadership should identify the strategic areas where the company should invest in as well as new product goals. This is a standard strategy exercise. Second, choices are made regarding where the company should invest the designed budget. That is which type of projects the company should launch, which markets the company should target, what are the product lines and so on. Next, the amount that should be spent in each strategic direction is identified. For instance, x% of the budget is going to be spent in platform projects; y% is going to be spent in product line A. Finally, within each bucket or sub-portfolio projects are ranked using methods explained earlier (Scoring or financial models) and the list of projects within each bucket is determined based on the limit of the

assigned budget. The results would be multiple portfolios organized as one portfolio per bucket (Cooper et. al, 2001).

Moreover projects in different buckets do not compete against each other and resource spending does totally meet the desired target breakdown. The table 5 describes an example where four envelopes were defined. The first one is dedicated for developing new products for a product line 'A', the second envelope is meant for developing new products for a product line 'B', the third envelope concerns the maintenance of both product lines 'A' and 'B' and the fourth envelope is dedicated for cost reductions for all product lines (Cooper et. al, 2001).

Bucket #1: New Products for Product Line A Target Spend: $8.7M	Bucket #2: New Products for Product Line B Target Spend: $18.5M	Bucket # 3: Maintenance of Business for Product Lines A & B Target Spend: $10.8M	Bucket # 4: Cost Reductions for All Product Lines Target Spend: $7.8M
Project A 4.1	Project B 2.2	Project E 1.2	Project I 1.9
Project C 2.1	Project D 4.5	Project G 0.8	Project M 2.4
Project F 1.7	Project K 2.3	Project H 0.7	Project N 0.7
Project L 0.5	Project T 3.7	Project J 1.5	Project P 1.4
Project X 1.7	Gap = 5.8	Project Q 4.8	Project S 1.6
Project Y 2.9		Project R 1.5	Project U 1.0
Project Z 4.5		Project V 2.5	Project AA 1.2
Project BB 2.6		Project W 2.1	

Table 5. Illustration of the Top-down approach.

The projects defined within each bucket are evaluated via financial methods (numbers in the columns demonstrate the project value in millions). We can see easily that the first bucket has a lack of resources to handle all projects in the pipeline, therefore projects A, C, F and L cover the assigned budget. However, in the second bucket there are not enough projects to satisfy the budget. More projects are needed in the bucket.

One complaint about this method is that it remains very theoretical. This means that the splitting approach is meaningless without evaluating the opportunity behind each project within the buckets. The study of the opportunity and the degree of attractiveness of each project is a usual exercise for executives (Cooper et. al, 2001).

3.2.3.2. The bottom-up approach

On the contrary of the previous approach, the bottom-up method addresses the strategic alignment issues by incorporating strategic criteria into the project selection process. The scoring models in this case is the most appropriate tool for the following reasons: its simplicity, considering several objectives at the same time (ex: financial maximization and strategic fit) and its adaptability for the projects and portfolio gates review (Cooper et. al, 2001).

Hoechst Company has adopted this approach. 40% of the factors used and 6 criteria out of 19 in its scoring model addressed strategic issues. Therefore, it is most likely that the projects that are ranked on the top are the most aligned with the corporate strategy.

This method overcomes one of the shortcomings of the top down approach. Because the top down approach is difficult to apply and does not take into account what projects are available; the bottom up approach begins with studying the attractiveness of the projects and then inlude strategic criteria to yield the best set of aligned projects (Cooper et. al, 2001).

One weakness of the method is ignoring the spending breakdown in the portfolio. Projects can be on strategy but the spending structure can be wrong.

3.3. Portfolio Management Processes

The PMI has established a set of processes, agreed as accepted practices, which would guarantee better probability of success independently on the industry and type of the organization. These processes serve as guidelines for portfolio managers and their teams. Portfolio management processes are integrated into two main processes groups (PMI Standard, 2006):

- Aligning processes group that will determine how the portfolio components will be identified, categorized, evaluated and ranked.
- Monitoring and controlling processes group determining the portfolio performances review environment for strategic alignment.

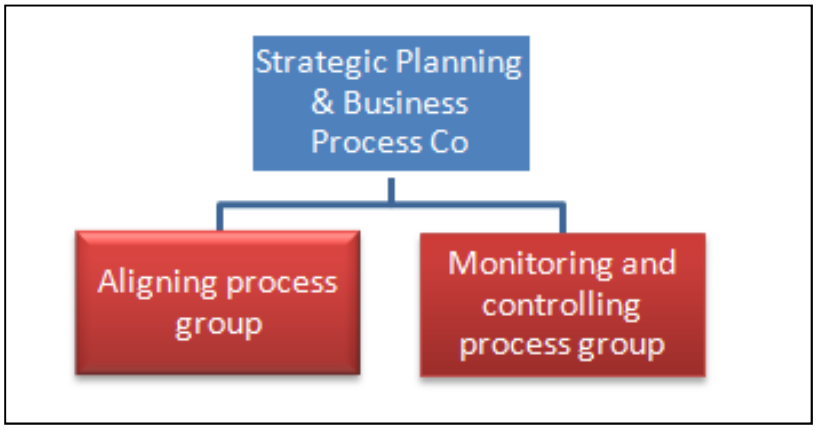

Figure 9. PMI portfolio management process groups

3.3.1. Aligning process group

3.3.1.1. Identification process

This process concerns the update of the list of components that will be managed through the portfolio lifecycle. Based on a standard component definition, new components will

be compared to existing ones. The identified components will be classified into classes of projects, programs or sub-portfolios (PMI Standard, 2006).

3.3.1.2. Categorization process

The aim of this process is to group the identified components into predetermined business groups to which the same decision filters and criteria for evaluation, selection and balancing can be applied. The business groups are identified jointly by the portfolio management team and the corporate executives based on the strategic plan (PMI Standard, 2006).

3.3.1.3. Evaluation process

In this process, all pertinent information that may help in component evaluation is identified. This information can be either qualitative or quantitative and the evaluation is conducted via a scoring model of weighted criteria (PMI Standard, 2006).

3.3.1.4. Selection process

After evaluating the overall components, each component will have total value score that will help to make a short list of components on the basis of the corporate selection criteria (PMI Standard, 2006).

3.3.1.5. Prioritization process

The prioritization process goal is to establish a component rank within each strategic category, thus supporting the portfolio balancing process (PMI Standard, 2006).

3.3.1.6. Balancing process

As emphasized earlier, achieving a balanced portfolio is one of the main goals of the portfolio management approach. This process is aimed at developing the right component mix that will allow the organization to maximize the returns and allocate resources effectively. The balancing act should consider the strategic objectives as well. Also,

considering synergies and similarities between the components would participate to generate greatest returns with a minimum investment (PMI Standard, 2006).

3.3.1.7. Authorization process

At this level, the management starts allocating suitable resources to execute the selected components. Thus, portfolio balancing decisions are communicated to the stakeholders (PMI Standard, 2006).

3.3.2. Monitoring and controlling processes group

3.3.2.1. Portfolio reporting and review

The objective of this process is to establish reports on the key performance indicators and review the overall portfolio components in order to guarantee their alignment with the corporate strategy and effective resources utilization. This process requires data gathering at different levels: component level, organizational level, portfolio level and strategy level (PMI Standard, 2006).

At the component level, informations about projects progress and resources consumption as well as KPIs are necessary. This data is updated through the different phases of the components. At the organizational level, data concerning the corporate policies and constraints about resources allocation and control are mandatory. The component evaluation and selection criteria and portfolio constraints are some elements that should be taken into consideration at the portfolio level. Strategic goals should always remain present during the review process as it presents the rationale behind resource allocation and component selection and prioritization.

As a result of the reporting and review process, and based on the report submitted to executives about the corporate objectives achievement, new business directives could result. The portfolio management conveys new directives to the affected components

managers. This could be a recommendation for component realignment, funding reallocation or component termination. Moreover, the review process could lead to a refining in the portfolio evaluation, selection and prioritization criteria based on the new business directives indeed. Reviewing and evaluating portfolio performances is supported by using the right metrics. Those metrics or KPIs can be refined eventually.

3.3.2.2. Strategic change

The aim of this process is to make sure that any changes in the corporate strategy are considered in the portfolio management process. Usually when small changes are reported, changes on the process are not required; otherwise the portfolio may need to be rebalanced.

Following a strategic change within the organization or change in the business environment, new criteria for the portfolio management could be redefined (PMI Standard, 2006).

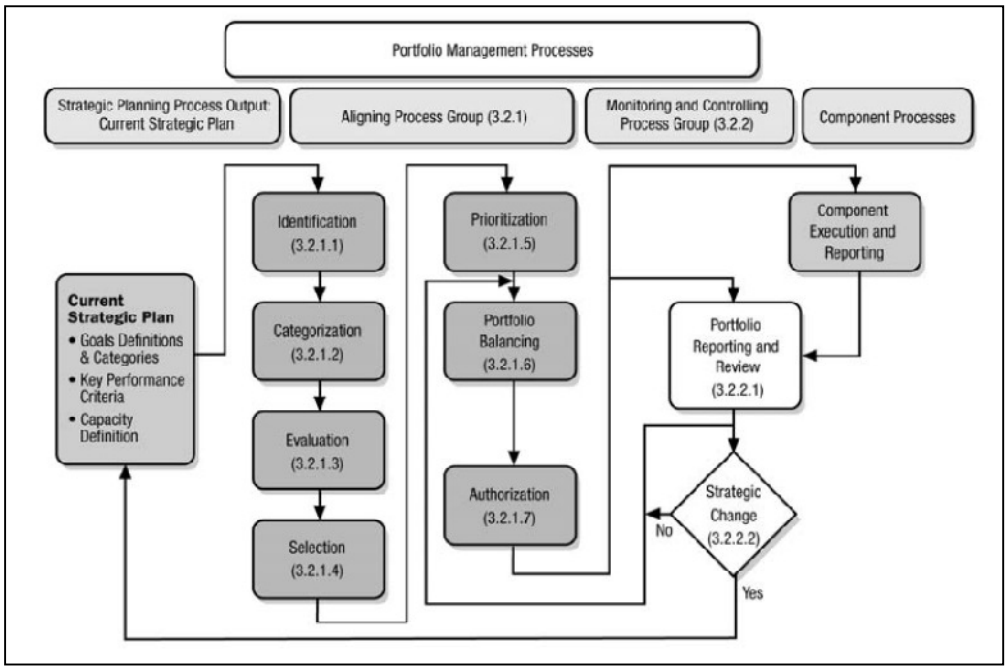

Figure 10. Summary of PMI portfolio management processes.

4. CASE STUDY: MEDITEL COMPANY

4.1. Company presentation

Meditel Company is a Telecommunication services provider created in 1999 via a consortium of five groups and companies[2]:

- **Telefonica:** A global telecom service provider based in Spain, with 200.000 million customers worldwide and present in Europe, Africa and Latin America.
- **Portugal Telecom:** A global telecom operator present in several countries such as Brazil, Kenya, Namibia and Mozambique.
- **HOLDCO:** The first Moroccan industrial Group constituted of Akwa Group and CDG.
- **RMA WATANIYA:** A Moroccan insurance company.
- **'Finance.com':** A Holding of companies operating in financial and insurance sector.

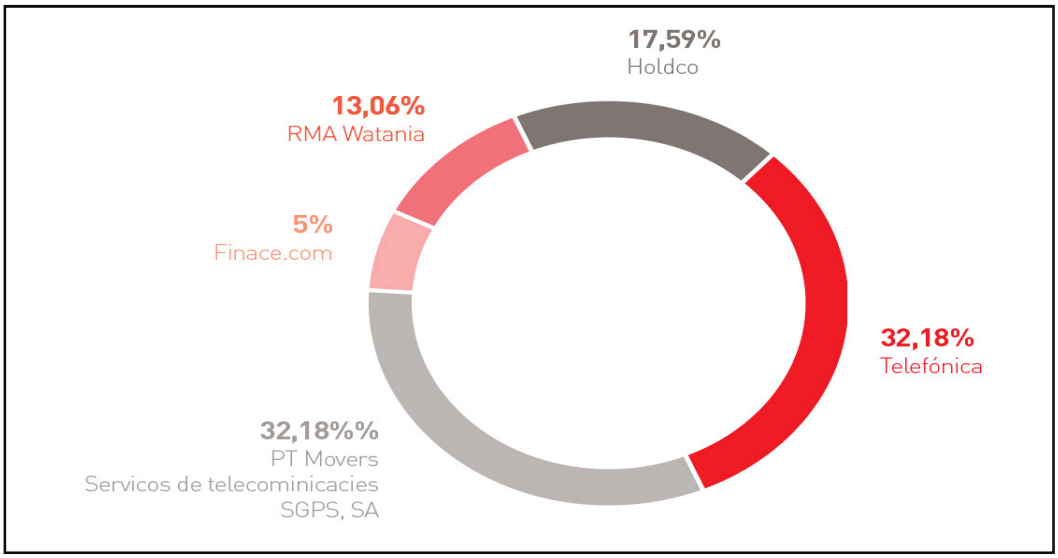

Figure 11. Capital structure of Meditel[3]

[2] Meditel's Communication Department, 2008.

By the end of 2008, Meditel has reached 7.9 million mobile customers, and a coverage of 93.6% of the overall territory.

In 2009, Telefonica and Portugal Telecom sold their shares to local investors. Finance.com and CDG both the two stakes and they own currently equal shares in Meditel Capital. Meditel became then the only telecom operator owned by Moroccan companies.

Meditel Company is organized as follows:

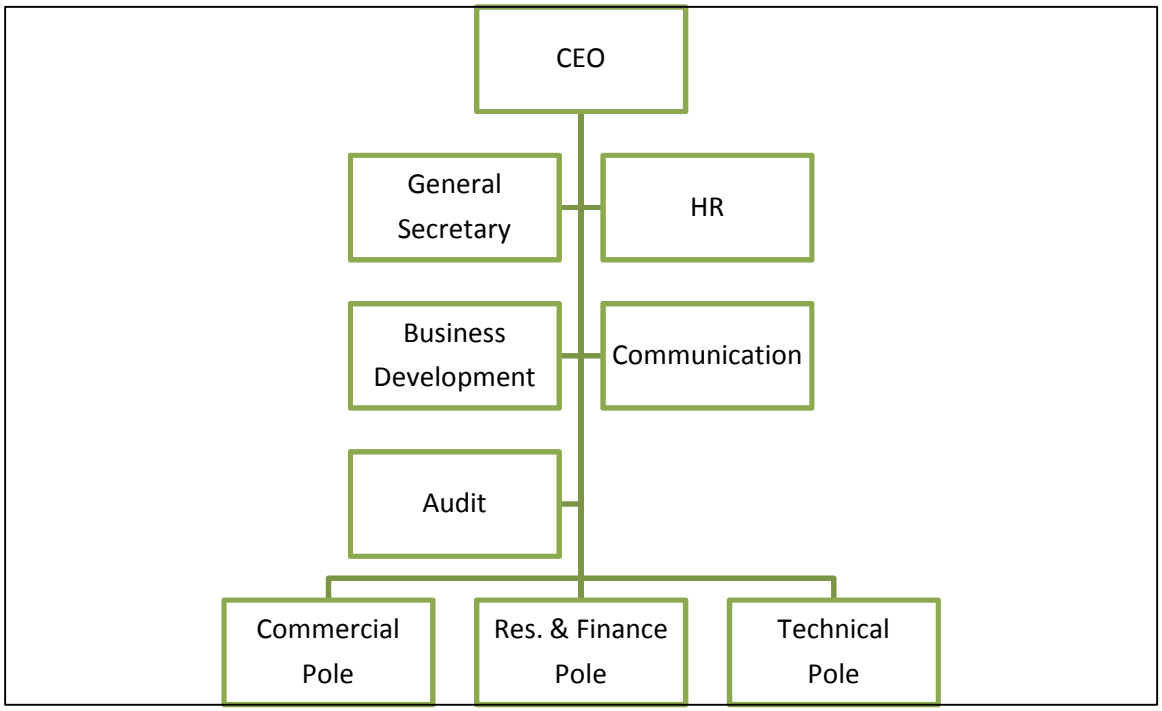

Figure 12. Meditel organization

4.2. Study Purpose & Methodology

The purpose of this study is to describe how companies could improve their new product development and portfolio management processes via PPM tools implementation. More

[3] Meditel Communication Department, 2008.

precisely, how a company could choose the right tool that would help her implementing, automating and monitoring their new product and portfolio processes.

The new product and services department in Meditel, which belongs to the technical pole, has two pimary goals:

- The automation of the NPD process in order to increase efficiency and decrease the time-to-market for products and services.
- Establish a portfolio management practices on a long term basis.

The tracking and coordination department (TCD), which is responsible for tracking the new product development projects and the coordination of their execution, plays a central role in the new product and services department. Its role can be assimilated to the Project Management Office (PMO). The TCD is trying to investigate how the acquisition of an IT tool would help to achieve the two mentioned objectives, and eventually which tool would fit those needs?

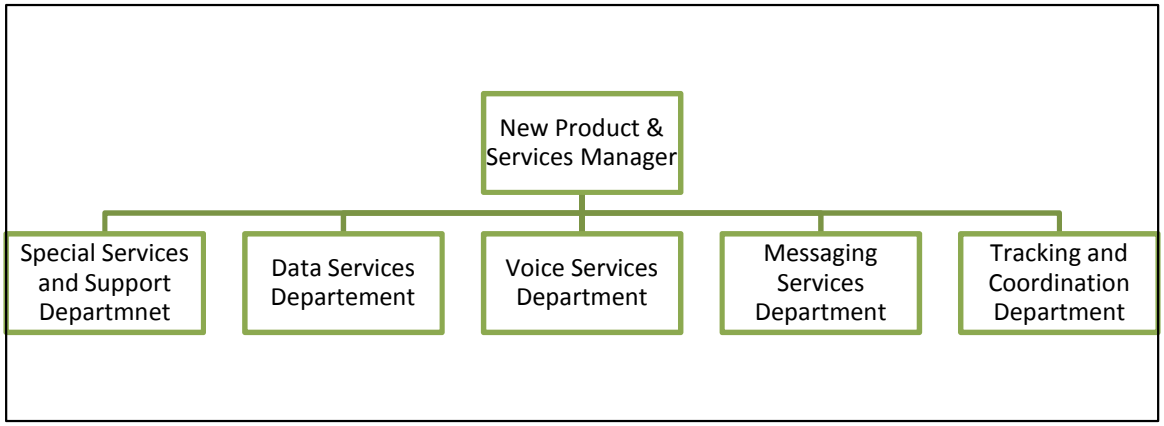

Figure 13. Meditel's New product development department

To answer the question, I made first of all a market research about the benefits of project and portfolio management tools. The results of this market research would shed some lights on the usefulness of an IT tool for the new product and services department of

Meditel. Second, a questionnaire was elaborated in order to gather the requirements of the new product and services teams regarding the IT tool. The results of the questionnaire will help in choosing the right tool that would match the staff needs.

Finally, a scoring model was established, based on the results of the questionnaire, to help in the assessment of some IT tools.

4.3. The New product process of Meditel

Considering the competitive environment in which Meditel is operating, and the degree of technical and organizational complexity required for new product and services projects, Meditel has defined a process that would respect the following principles:

- Involvement and synchronization of the project between the different stakeholders
- Project cost and time cycle reduction
- New product development project confidentiality[4]

The third version of the process, also referenced as 'procedure N24', came into force in September 2005, and concerns several departments within the technical and commercial poles in Meditel:

- Network Engineering and planning Department – Technical pole
- Information Technology Department – Technical pole.
- Network maintenance and operations department – Technical pole.
- Customer relationship Management department – Commercial pole
- Pricing Unit – Commercial pole.
- Business Units – Commercial Pole.
- Market intelligence department – Commercial pole

The structure of the process is represented in figure 14.

[4] Meditel's New product and Services Procedure, 2005.

The author of a new project idea should fill a document called ‘ISID’ (Idea Submission for Investigation and Development). The ISID document could be filled in a paper form or electronically. It describes the project idea, its source, the targeted market and the value added for Meditel.

The document is presented to the ‘Product and services Committee’ which is responsible for accepting or rejecting the idea. When the project idea is approved, a Business Unit within the commercial pole will be responsible for it. Otherwise the project idea is archived.

Once the project idea is accepted, the concerned Business Unit elaborates a document called ‘Service & Product Specification Document’ (SPSD). This document addresses the service/product use, the targeted customers, the tariffs, conditions and expected commercial launch. The document is handed to the new product and services department which will assign a project manager, responsible for the feasibility study of the project.

Within 10 days, the project manager should make the first version of the preliminary study document called ‘Technical and Functional Description of the Service’ (TFDS), which should follow an already established template and distributed to the concerned departments. The new product and services department requests the involved department to assign a project leader for the project. The project manager then, organizes meetings with the different team leaders in order to discuss the different issues related to the project.

Each team leader should study the project constraints and possible solutions to overcome them. The results are depicted in a document called DFA (Description by Functional Area). This document should be submitted within seven working days after the distribution of the TFDS document and no later than 14 working days, depending on the complexity of the project. In case the team leader didn’t send the DFA document, the

project manager may consider that the concerned department has no objection on the specifications mentioned in the first version of TFDS document, and could therefore proceed with the next step.

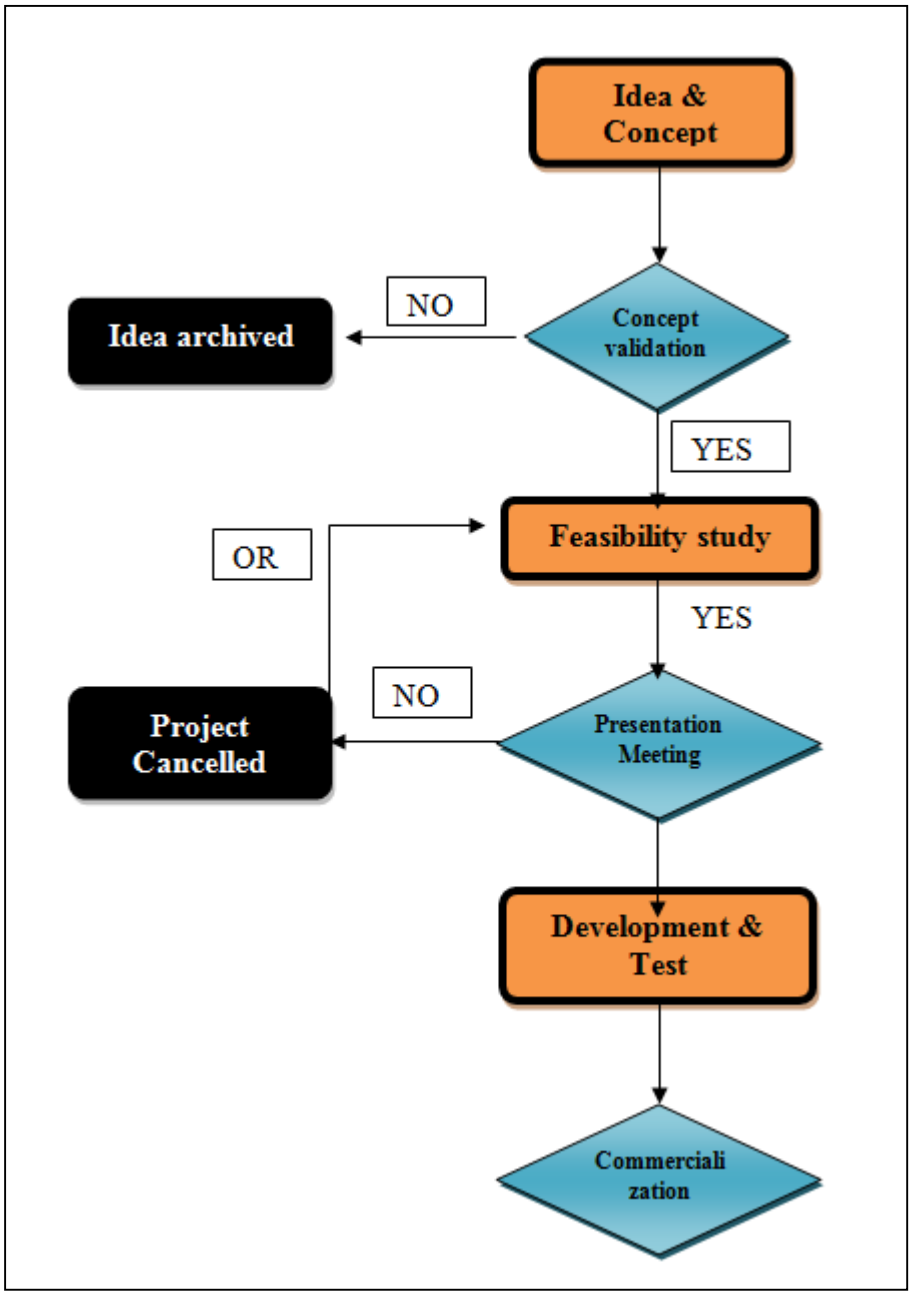

Figure 14. Meditel new product development process

After receiving the DFA documents from the different departments, and within 7 working days, the project manager makes a second version of the TFDS document in which he checks the compatibility between all the submitted proposals and the project scope in one hand and with the existing services and systems on the other hand. This new version is distributed to the different head of departments and team leaders.
The new product and services department organizes a presentation meeting restricted to the project team and head of departments as well as the business units in order to present the project. This meeting is considered as a general review for the project during which the deadlines and milestones are reviewed. The decision whether proceeding with the project to the next stage is also taken during this meeting. Once the technical and commercial assumptions are approved for the project, a final version of the TFDS document which includes all the modifications and decisions agreed on during the presentation is made, and the Development and Test phase is engaged. Otherwise, the project is either cancelled or returned to the project manager for further analysis.

The project manager is responsible for coordinating and planning the different actions related to the development phase. Moreover, he decides upon the necessity of a prototype or any other experimental realizations. Eventually, and after consultation with potential providers, the development planning may change and therefore the project manager establishes an updated plan and informs consequently the stakeholders.

The new product and services department set up a test document which explains the required tests for checking the product/service conformity with the agreed specifications. This document is sent to the Information Systems Department, the network maintenance and operation department for eventual comments. Once the development and the installation of the product/service platform are made, the tests start according to the test scenarios indicated in the test document and the results will help to decide upon the acceptance of the platform. Once the product tests are finished, the project is handed to

the commercial department in order to manage all the issues related to the product commercialization and launch.

4.4. The portfolio management practices in Meditel

A discussion with the senior manager of the Tracking and coordination department revealed that no formal portfolio management practices, on the light of what was presented in the first chapter, were in place. In fact, every month the new product and services manager and senior managers hold a meeting with the CEO in order to review the status of the current projects and the new project ideas. The TCD prepares a master plan, in coordination with the commercial department, for all the projects managed by the new product and services department beforehand.

During the meeting, which lasts generally between 4 to 7 hours, each project is reviewed independently and assessed basically upon financial criteria: the investment cost, the expected revenues and payback period. The project commercial and technical risks are also discussed but they are not institutionalized via indexes or variables.

5. MARKET RESEARCH STUDY

In this section we are going to present the study of Forrester Company. Forrester is an independent consulting firm specialized in studying the impact of technology change on business. Forrester services are meant for IT, marketing, strategy and technology industry professionals.

In the project and portfolio management (PPM) area, Forrester reported the importance that this field is gaining recently. This importance is witnessed by the growing number of PPM solutions vendors, the high adoption rate of PPM solutions and the positive results reported by companies that implemented PPM solutions.

Forrester (2007) outlined the benefits of PPM solutions, which could be summarized in the following key points:

- **Reporting the status of the investment** via dashboards, graphics and the ability to handle what-if analysis.
- **Enabling an easy allocation of financial and human resources** through the different projects, moreover the possibility of proposing other workable allocation scenarios.
- **More integral approach to business processes**. There is a tendency to extend the PPM process across other fields in business, and therefore more integral solutions would be needed.

To assess the potential of the project and portfolio management market, Forrester made an evaluation of the strengths and weaknesses of the top solutions vendors. The evaluation of the different tools was made based on 95 criteria, grouped within three categories: Current offering, Strategy and Market presence. Forrester has attributed a weighting to each criteria and sub-criteria (Forrester, 2007). The table 6 gives a summary of the criteria and sub-criteria choosen with corresponding weighting.

Current offering (50%)	**Strategy (50%)**	**Market presence (0%)**
- Demand management (5%) - Portfolio management (15%) - Project management (10%) - Resource management (10%) - Financial management (10%) - Methodology (15%) - Workflow (10%) - Reporting (5%) - Integrated IT management (15%) - Application technology (5%)	- Product strategy (40%) - Corporate strategy (20%) - Financial resources to support strategy (20%) - Cost (20%)	- Installed base (30%) - Revenue (20%) - Revenue Growth (20%) - International Presence (5%) - Systems Integrators (10%) - Services (10%) - Employees (5%) - Technology Partners (0%)

Table 6. Forrester's PPM scoring Model.

14 vendors took part in this evaluation. The vendor's selection was based on the availability of the product at the time of data collection with at least three references across different industries. Moreover, the tool capability of an entreprisewide deployment. The list of the selected vendors is depicted on the table 7.

Vendor	Product name
Artemis	Artemis 7
CA	Clarity PPM
Cardinis	CARDINIS Suite
Compuware	Changepoint
Daptiv	PPM
HP	PPM Center
IBM	RPM
ITM-Software	ITM PPM
Microsoft	EPM 2007
Oracle	Peolplesoft/E-Busines Suite PPM
Planview	Enterprise
Primavera	Evolve
SAP	xPRM
Serena	Mariner

Table 7. List of PPM solutions evaluated by Forrester

The results of the analysis lead Forrester to distinguish between four types of vendor profiles: Leaders, strong performers, Contenders and 'risky bets'. The figure 15 shows the classification of the 14 vendors according to those categories. It is worth mentioning that this study is intended as a starting point for companies that would like to engage in PPM acquisition project (Forrester 2007).

6. PPM TOOLS BENCHMARK

This part is intended to investigate the new product and services department teams need regarding the PPM tool. For this purpose, I made a customized questionnaire for different type of profiles: project managers, Area managers and senior managers. Based on the results of the questionnaire, a scoring model is elaborated in order to evaluate the different PPM tools.

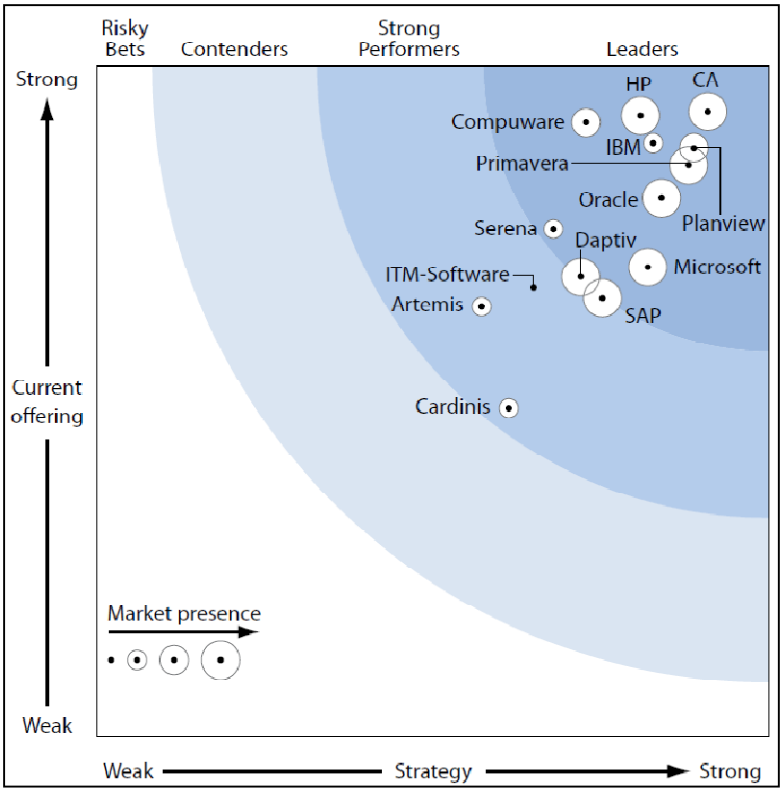

Figure 15. Forrester survey results

6.1. Meditel requirements study

The questionnaire targeted three departments within the new product and services entity: Voice services, Data services, and messaging services departments, since they are the

only departments concerned with the internal new product process which is the 'Procedure N24'. The focus of the questionnaire is to determine the following elements:

- The degree of need for a PPM tool within the new product and services department.
- Evaluating the current practices: Process, Communication & collaboration between stakeholders and activity reporting.
- The factors that would help the staff to develop a 'resistance' against the tool.

13 people took part in this survey: 3 senior managers, 5 area managers and 5 project managers. The answers were collected during a face-to-face interview which lasts between 15 – 30 minutes each, for a period of 17 days. The table 8 summarizes the scope of the questionnaire.

The different answers collected are summarized according to the different areas:

- **Communication & collaboration**

There is a good communication and collaboration between the project team members. The projects progress is reported via the TDFS documents, the project journal, via the internal workflow[5], or by email. Sometimes orally, especially when anomalies are detected in the project progress. Generally, during the different project milestones, the project team members are aligned with the project status and specifications.

- **The current new product development process**

There was a consensus on the positive aspects and shortcomings of the current new product development process between the different profiles.

[5] Meditel uses an application based on Lotus IBM to track the documents related to the NPD projects.

Scope	Question	Targeted profile
Communication & collaboration	- How do you communicate the project progress/any anomaly or change within the project?	Project manager
	- How many people do you collaborate with during a project?	Project Manager
	- Does the management communicate the objectives and scope of a NPD project?	Area Manager
	- How do you share informations with your team?	Senior manager
The current NPD process	- What do you think the advantages and shortcoming of the current NPD process?	All profiles
	- How many projects do you manage every year?	All profiles
The PPM tools	- Which tools do you use currently for managing the NPD projects?	All profiles
	- Do you know any tool that would match your needs?	All profiles
	- What is a good PPM tool for you?	All profiles
Adoption Resistance	- What are the elements that you would see as a hurdle, when using the PPM tool?	All profiles
Activity reporting	- How frequently do you provide reporting?	Senior and Area managers
	- How do you manage reporting?	
	- Which informations would like to have in the reporting provided to you?	

Table 8. Questionnaire summary

Concerning the positive aspects, all profiles were unanimous that the procedure gives a good framework of coordinating and executing a project. They see the procedure as matching the best practices in project management. Moreover, the procedure introduces a good communication environment between the different stakeholders.

Another point that was considered by some profiles as positive and others as negative is the fact that many people are involved in a single project. On one hand, this make the project very hard to achieve since there is a lot of stakeholders that should be satisfied with one way or another, on the other hand involving many people was seen as a positive element to address all the aspects of a new product project.

Concerning the shortcomings, one of the major ones is the conflict that exists between some departments in terms of projects priorities. Actually, a project that can gain priority in one department may not be for another. This causes generally delays in the project cycle. Another noticed shortcoming is that the procedure does not make distinction between high and low risk projects. Finally, the procedure does not also define common performance indicators for the projects or also any reporting template.

- **The PPM tool**

Almost all the profiles rely on the internal workflow and some Excel templates files to track the projects, even though Meditel acquired a Microsoft Project license. The project managers and Area managers found it useless to use MS Project since it is meant for a local and personal use and the project planning cannot be shared with all the stakeholders. Although MS project has many capabilities, it is mostly used to produce projects Gantt charts only. Some people doubt also on the usefulness of a project and portfolio management tool.

The main requirements in terms of PPM tool concerned mainly project tracking and reporting, collaboration and document management capabilities. Portfolio management

capabilities were seen as an option that would be good to have in the future, by senior managers.

Requirements	Senior Manager	Area manager	Project Manager
Involving the stakeholders	x	x	
Project tracking capability	x	x	x
Including purchasing process	x		
Collaboration capability	x	x	x
Document management	x		
Risk management		x	x
Resource management	x		
Access via Web	x		
Interoperability with the WorkFlow	x		
Reporting capability	x		

Table 9. Meditel staff requirement regarding the PPM tool

- **Adoption resistance**

The factors that would encourage a resistance against a PPM tool are:

- Not extending the tool to all the stakeholders involved in a project.

- Not communicating the plus-value to the people.
- The complexity of use.

- **Activity reporting**

The activity reporting is usually done via Excel files that are filled by project managers, completed by area managers and submitted to the senior managers. The senior manager should forward the reporting file to the tracking and coordination department.
The reporting is made on a ad-hoc or weekly basis.

6.2. PPM tool scoring model for Meditel

Based on the assessment of Meditel requirements, and after consultation with the senior manager of the tracking and coordination department, we decided that the evaluation of potential PPM tools should be based on weighted criteria, and based on the following capabilities:

- Project management and tracking
- Communication and collaboration
- supported project and portfolio management Methodology
- Portfolio management
- PPM solution capacity
- Deployment and administration mode
- Provider evaluation

The weight ratios are attributed in a way to reflect the priorities of Meditel. The elaborated scoring model with the choosen sub-criteria is depicted in the table 10.

6.3. PPM tools evaluation for Meditel

Our selection of potential PPM tools was based on the market research study stated previously, some local vendors and internet research. After a first screening, we decide to

proceed with the evaluation of the following solutions: PD-Track (PD-Track solutions), PSNext (Sciforma), Microsoft Office Project Servicer 2007 (Microsoft), GestiPro (Keys Engineering) and NQI Orchestra (NQI Corporation). For each solution, we are going to present a description of the main features and the final scoring attributed to the solution based on the elaborated scoring model.

	Weight (%)
Portfolio management (GPF)	10
Project management and tracking (GPR)	30
supported project and portfolio management Methodology (MTHD)	10
PPM solution capacity	10
Deployment and administration mode	15
Communication and collaboration	20
Provider evaluation	5

Table 10. Weighted scoring model for Meditel.

The evaluation was made on the basis of conference calls, product materials and presentation made by company's representatives.

6.3.1. GestiPro Solution

'Key engineering' proposes a solution that satisfies the criteria for the 'project management' module. It allows the user to manage the project planning, managing resources and documents for the project, the budget and reporting.

The solution does not offer any portfolio management component: the portfolio evaluation and tracking tools are absent; moreover, there is no flexibility in defining the KPIs.

'GestiPro' Solution is not useable via the web. It can be deployed using a client-server model, via an application server or an ad-hoc network. The company is based in Morocco and offers the possibility to develop and customize the modules on demand.

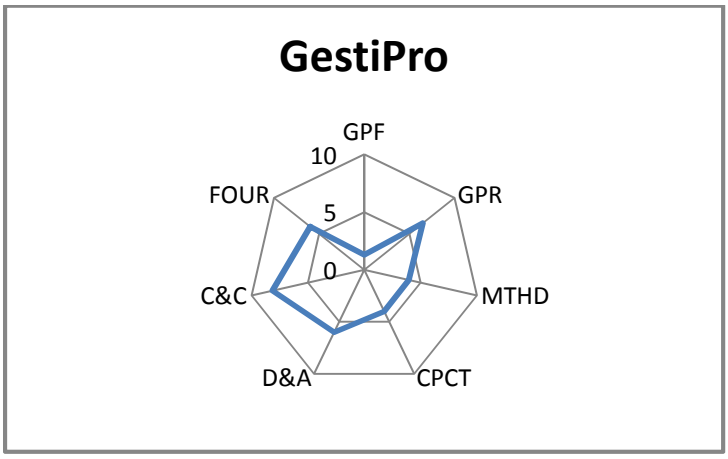

Figure 16. GestiPro evaluation results

6.3.2. PD-Trak Solution

PD-Trak Solution contains modules for NPD project management, portfolio and resources management. The project management is based on the stage-gate model; it allows the creation and tracking of new products projects based on stages and gates from the idea creation through the launch phase.

The portfolio module include the necessary tools for standard portfolio management: projects ranking based on several criteria, project balancing via the bubble diagrams and project roadmap are all incorporated tools that would help to guarantee a good portfolio management practice.

The solution is available in the English language only and can be deployed via a file server used in the Local Area Network (LAN) or via a Terminal Server for a Wide Area Access Network (WAN).

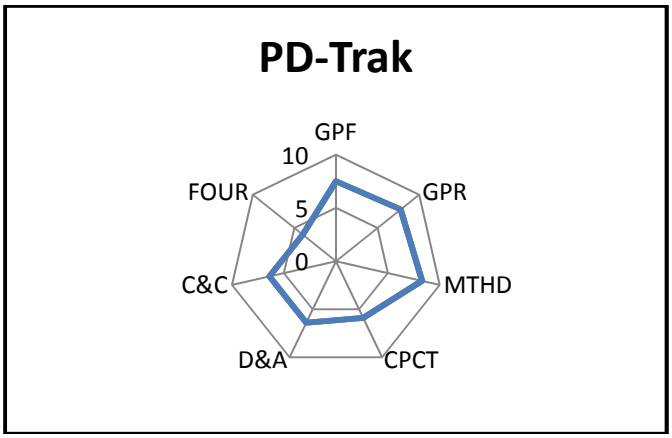

Figure 17. PD-Trak evaluation results

6.3.3. NQI Orchestra Solution

NQI orchestra is an intuitive web solution that has all the required functionalities for a collaborative project management.

The solution does not follow any specific methodology but gives the possibility to create easily the internal processes of the company via milestones and board meetings management functionalities.

The solution has standard project management functionalities and gives the possibility to create portfolios hierarchies. Project and portfolio documents' sharing is insured via the incorporated electronic documents management tool. The user can use the already defined key performance indicators or can define other KPIs via established formulas.

With the resource allocation module, the user could check the human and financial resources availability and consumption.

In terms of reporting, NQI Orchestra has the possibility to elaborate a standard and personalized reporting, supported by diagrams and figures.

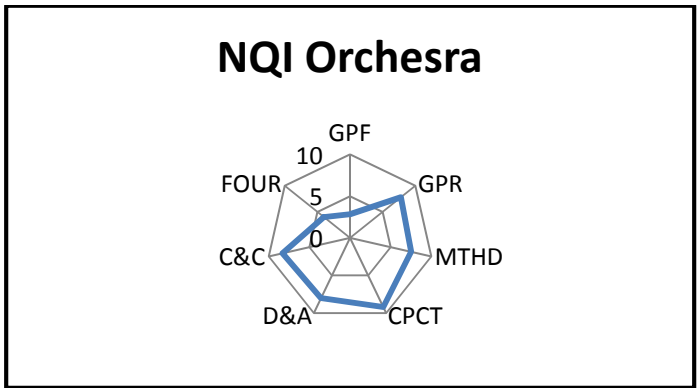

Figure 18. NQI Orchestra evaluation results.

6.3.4. PSNext Solution

PSNext solution integrates different modules that can be acquired separately such as project management, portfolio management and electronic document management.

The portfolio management module is very competitive and includes many tools for projects evaluation, balancing and ranking on the light of PMI standard. The criteria can be customized upon the company requirements.

The solution gives the possibility to make what-if scenarios and study consequently the impact of adding or retrieving a project from the portfolio. When a project planning is approved, it can be published to be communicated to the other stakeholders.

PSNext has a reporting editing functionality that allows the user to define a customized set of quantitative and qualitative KPIs. Formulas can also be defined for a automated KPIs, on the light of MS Excel formulas Model.

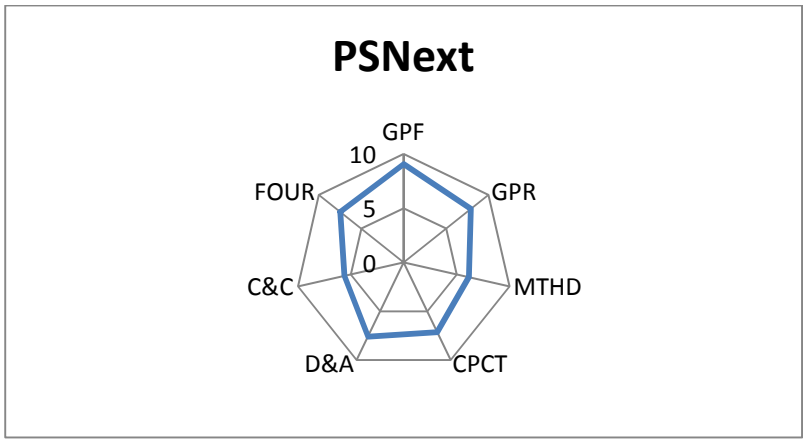

Figure 19. PSNext evaluation results

6.3.5. Microsoft Office Project Server (MOPS) Solution

MOPS solution is structured in different 'blocks': MS Project for project management tasks, SharePoint for a collaborative work between the different project stakeholder, the third block is MS Outlook which insure the synchronization of the calendars and To-Do lists as well as reporting the progress of the project and notification.

MOPS solution allows a centralized access to the different templates used during the project phases and gives the possibility to create a project based on an archived one by a copy-paste operation.

The portfolio management functionalities are absent from the software, there is however the possibility to publish project inventory with the progress status of each project.

Good reporting capabilities are present via OLAP tool which can handle multi-dimensional and personalized queries

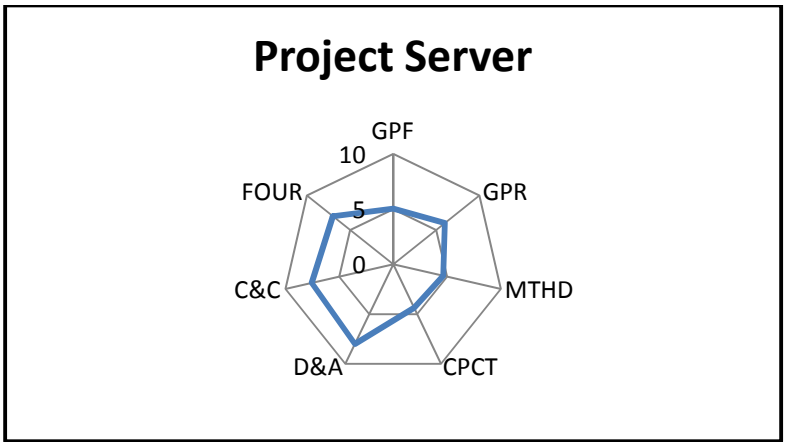

Figure 20. MOPS evaluation results

A summary of the evaluation of the different tools is presented in the following table:

		PD-Trak Solutions	NQI Orchestra	MOPS	PSNext	GestioPro
	Weight (%)	**Score**	**Score**	**Score**	**Score**	**Score**
Portfolio Management (GPF)	**10**	7.5	2.8	5.1	9.1	1.3
Project Management (GPR)	**30**	7.8	7.8	6	7.9	6.5
Methodology (MTHD)	**10**	8.3	7.5	4.7	6.2	4
PPM tool capacity (CPCT)	**10**	5.9	9.2	4.4	7.2	4
Deployment & Administration (D&A)	**15**	6.4	8	8	7.6	6
Communication & Collaboration(C&C)	**20**	6.4	8.3	7.6	5.6	8.2
Provider Evaluation (FOUR)	**5**	4	4	7	7.5	6
Total Score		**7**	**7.4**	**6.3**	**7.2**	**5.7**

Table 11. Evaluation summary of the PPM tools

7. DISCUSSION AND CONCLUSION

In this section, we are going to analyze:

- The current processes of Meditel and compare them with the literature overview
- The PPM evaluation results and which tool would be convenient to answer Meditel concern
- The case study limitations
- Practical recommendations for the company to improve the existing practices.

7.1. Meditel Processes analysis

The section 3 describes the Meditel's new product development process. Based on figure 14 and referring to the Stage-Gate model, we can see clearly a matching between the two processes. Meditel process follows a shorter version of the stage-gate approach which consists in:

- Idea creation stage,
- Feasibility study stage, and
- Development and testing stage

These stages are supported by three main gates:

- Gate 1, where the project idea is either rejected or accepted
- Gate 2, where the project business case is validated, rejected or returned for modification and review.
- Gate 3, where the product is developed and tested. The commercial department is generally responsible for the launch phase.

However, while interviewing the project teams, no one had insight or awareness about the stage-gate model.

Project teams, including senior managers, identify the current process as a project management process rather than new product development process, ignoring consequently the role of senior managers as gatekeepers and the importance of the gates in a new product development project.

Although literature didn't emphasize much on the relationship between project management process and a stage-gate process, we could think about a matching between the two processes based on the deliverables, as shown in figure 21.

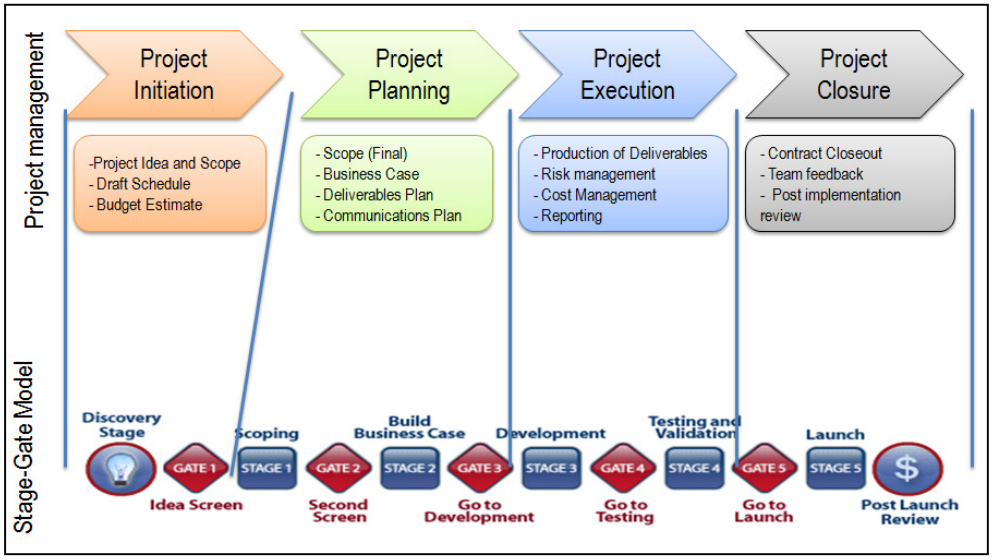

Figure 21. Correspondence between project management and stage Gate processes

Regarding portfolio management process, the senior managers didn't show any specific knowledge about portfolio management practices. That is, project ranking, scoring and portfolio balancing. Their main role was to track projects budget and technical feasibility. There was no formal approach to quantify the technical or commercial risk for projects; no financial model was applied to rank different projects. Besides, no project categorization was established, projects were treated individually and no distinction between the project types was made.

The strategic alignment of the projects was ensured via brainstorming between the head of the new product department and senior managers.

7.2. PPM tools evaluation analysis

The evaluation of the shortlisted PPM tools was based on a weighted scoring model. The weights and criteria for the evaluation were elaborated based on the results of the interview engaged with the different new product team staff.

Five tools were evaluated: GestiPro, PD-Trak Solutions, MOPS, NQI Orchestra and PSNext.

The table 11 shows that NQI Orchestra leads the pack with a score of 7.4/10. NQI Orchestra has all the required features to handle project management capabilities. Moreover, it allows the user a complete freedom to define any type of methodology: internal or standard. The tool provides many portfolio assessment tools and reporting capabilities that would allow managers to have an idea about the status of their projects and resources and take decisions consequently

NQI Corporation has two partnerships with two IT companies based in Morocco. This is very crucial in order to ensure maintenance and after sales services. The tool is also available in French language which would be very convenient for Meditel staff.

Although PD-trak solution was seen as a very complete tool, we had some difficulties to coordinate a demonstration with them due to the time zone differences, more over the provider didn’t have any representation in the country and proposed a remote after sales services which was seen as not practical by Meditel.

Through the different presentations and tools demonstration we were able to see to which extent we could have an integrated approach for portfolio management and new product development processes. Acquiring a tool would definitely help to bring the two processes together in a coherent whole, based on the company practices. A well documented process with different milestones and deliverables and stakeholders roles and responsibilities should be established beforehand.

7.3. Case study limitations

The aim of Meditel Case study was to show whether a PPM tool is capable to provide an integral approach for new product process and portfolio management practices. The questionnaire helped us to sort out Meditel requirements in terms of a PPM tool.

Some limitations are to be noticed for the study, the study didn't involve the other stakeholders from other departments such as the Business Units and Maintenance and operation Department, considering that they are involved in all the new product projects.

The size of the interviewees could be considered as another limitation. For practical consideration, related more to the availability of the staff, there was no possibility to include other departments within the new product & services entity.

7.4. Practical recommendations

In this section, we are going to propose some recommendations for Meditel, regarding the new product process, portfolio management process and tools implementation based on the literature and industry best practices.

For the new product process, Meditel should formalize the gates in order to reduce the number of change requests and resolving the projects priority conflicts between the

different departments. By formalizing the gates we mean, inform the senior managers of their roles as a gatekeepers, responsible for defining the gates criteria upon which projects should be evaluated and facilitating therefore the rapid evaluation and commercialization of the NPD projects (Cooper 2000).

The management team should also focus on defining appropriate key performance indicators in order to monitor the execution of process. So far, Meditel rely only one KPI which is the mean time of project conception.

Defining the KPIs should be regarded as a process per se and the list of metrics should be updated till the company could find out a list of suitable KPIs that capture the management needs. A KPI should be well defined and communicated to the concerned parties.

Meditel should also think about implementing a post execution review of the new product projects. After commercialization, each project should be reviewed against its expected objectives. The variances in terms of budget or cycle time should be analyzed with the senior managers and actions should be taken in order to avoid mistakes in future projects.

Another element consists in setting up communication and information sessions, through which the purpose of the process and the roles to the different stakeholders are communicated, results and expected performances are presented.

Concerning the portfolio management process, Meditel should think about setting up the basis for projects evaluation first. A good start would be to categorize projects according to what was mentioned in the PMI standard. This would help the company to think about common ranking criteria for each category. Then, thinking about defining criteria for project evaluation and ranking in each category. The criteria should emphasize on

financial aspect, risk and strategic alignment which are used currently but not institutionalized by the company.

Meditel should then start by setting up effective dashboards for the management. The EPMC[6] pointed out the importance of starting with simple dashboards that can spot the trends easily to the management. An example of dashboards could provide the number of projects by projects phase; spend of active projects against budget; resources allocation

by project and resources by project type. Dashboards could be extended to include further analytics based on the ongoing demand of management.

Another improvement path could be to investigate the process maturity models. Understanding the company processes maturity will definitely help to identify the efforts needed to rise to higher levels. There are five levels of process maturity:

- Level 1: Ad-hoc
- Level 2: repeatable
- Level 3 : Defined
- Level 4 : Managed
- Level 4: Optimized.

The EPMC proposed the following areas in which maturity can be enhanced:

- Resource allocation: are budget and human resources allocated to the right projects?
- Visibility into projects spends: are we respecting the planned budget?
- Balanced portfolio: does the sum of all projects support business objectives?

Concerning the PPM tool, Joan Knutson (2001) has pointed out some pitfalls that companies should be aware of before engaging in Project management tools

[6] Enterprise Portfolio Management Council

implementation. Those recommendations can be extended to PPM tools implementation as well:

- Not substituting processes for tools, Joan Knutson (2001) indicated that many companies, involuntarily, put the tool above the process. That is because, generally, the tool starts to gain the interest of the user progressively and the importance of processes is quickly ignored.

- Lack of design and implementation strategy; for some companies, the implementation of a IT tool ends when the stakeholders are trained.

- Building the process capabilities based on the tool capabilities is another mistake that companies fall in. When the tool is unable to answer the process requirements, companies may try to adjust the process to fit the tool.

- Forgetting that these are only tools. Tools are generally created to support the process. One question that we should think about after the implementation: Does the tool assist in decision making? In project success? Or did we add another layer of bureaucracy?

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