WHEN SENSEMAKING MEETS RESOURCE ALLOCATION: AN EXPLORATORY STUDY OF AMBIGUOUS IDEAS IN PROJECT PORTFOLIO MANAGEMENT

Ernesto Gutiérrez
School of Industrial Engineering and Management, KTH Royal Institute of Technology, Sweden

ABSTRACT
Research in Project Portfolio Management (PPM) has proposed tools and models for evaluating, selecting and prioritizing ideas and projects in product development. However, empirical evidence indicates that most companies still experience problems when managing their portfolios. PPM literature has mainly focused on evaluation models in which clearly defined ideas are evaluated against predetermined decision criteria. It is considered that this approach is not suitable for ambiguous ideas, where people face difficulties in understanding or classifying an idea. In this article we explore the evaluation of ambiguous ideas in PPM. We found that when people experience ambiguity they take small steps in the further development of an idea for giving to it the clarity that it was lacking before. This process for making sense of the ambiguous situation is conditioned by the resource allocation process which has its own logic and dynamic. We discuss these findings for explaining why some ideas are not evaluated according to the evaluation models proposed in PPM literature; and why the resource allocation process within PPM does not work as management planned it to.

Keywords: Project portfolio management, idea evaluation, ambiguity, product development.

1 INTRODUCTION
In recent years, research on the management of product development has extended its focus, from the management of individual development projects, to also giving attention to the management of the whole group of projects that are carried out simultaneously in companies. The importance of investigating how companies select development projects, how they assure that both individual projects and the whole mix of projects are aligned with company strategies, and how they manage a limited budget that has to be shared by different and simultaneous projects, has been recognized [1], [2], [3], [4]. Project Portfolio Management (PPM), as a research and managerial area, focuses on the activities related to the evaluation and selection of project proposals, the prioritization of projects in the portfolio, and the allocation of resources to projects [5].
PPM research has focused on developing methods and tools for selection and prioritization of ideas and projects, and frameworks for organizing the different sub-processes and activities within PPM. A central element of PPM is providing a centralized view of all ideas and projects in an organization, for selecting the "right projects" [1], [4]. Decisions on selection, cancelation and prioritization of ideas and projects, feed a resource allocation process, in which people and other resources are distributed between projects. In that way, it is intended to achieve a group of projects that is of high value in terms of financial figures and qualitative criteria, minimizing risk by balancing the presence of different types of projects, and assuring alignment with strategies [1], [4], [5], [6], [7], [8].
However, there is empirical evidence that most companies, including those doing what PPM literature prescribes, experience problems when selecting and prioritizing ideas and projects [4], [5], [6], [7]. Companies experience that ideas are simply approved, and development projects started, without considering if there are available resources, or the balance of the whole portfolio of projects [6], [8]. Particularly, it has been observed that companies often have some projects that have not undergone the formal evaluation process and are not under consideration in the formal project portfolio meetings [5], [7]. Still these projects use a considerable amount of resources [5], [6]. This leads to a constant

reallocation of resources, portfolios having too many projects, projects being delayed, and companies failing to comply with schedules [4], [5], [6], [8]. It is considered as a chronic problem for companies, and a central aspect of PPM that needs further research [6].

This chronic problem has traditionally been discussed in PPM literature as a "bad practice", for example related to inadequate definition of ideas [9], poor project scheduling, and the presence of too many projects in the portfolio [6], [8]. Although empirical studies indicate that it is also influenced by other aspects that have not been widely discussed [6]; it has still been not sufficiently explored why some ideas and projects are in practice evaluated in a different ways than those proposed in PPM literature, and what are the consequences for the management of the whole portfolio.

Thus for achieving an understanding of the chronic problems affecting companies in PPM, the black box of the process in which ideas and projects are evaluated must be opened. This means exploring what people actually do, not only in the formal instances of evaluation and decision defined in the PPM literature, but also in all the situations in which people interact for performing activities that influence which ideas and projects are, in fact, chosen in an organization.

The purpose of this paper is to explore how ideas and projects are evaluated in PPM. The focus is on how situations of evaluation are experienced by those involved in them, how they proceed to make such evaluations, and the consequences of these evaluations for other processes encompassed in PPM. It aims to contribute to the need of descriptive studies in PPM research. Our research approach is based on an exploratory and empirical study in two companies, with semi structured interviews.

2 THEORETICAL FRAMEWORK AND RESEARCH QUESTIONS

In this article, PPM literature is divided into two groups: dominant approach in PPM; and critical views on PPM. The dominant approach in PPM covers research of prescriptive character that proposes tools and models for managing PPM. It is considered as being widely applied by well performing companies that actively work with PPM [7], [8]. Critical views on PPM includes mainly empirical and descriptive research, aiming to explore how PPM is actually managed in practice, and to discuss its findings against the assumptions and proposals made in the dominant approach.

2.1 Dominant approach in PPM

PPM is view as a dynamic and complex decision-making process [8], [10], [11]. The dynamic is caused by the constant review and changes in the portfolio. The complexity is produced by the uncertainty in project information, projects at different stage of completion, and multiple and conflicting objectives. The main goals of PPM are to maximize the value of the portfolio, achieving balance and aligning the portfolio with strategies [1], [8]. Pre-conditions for PPM are clear business strategies, the involvement of top management, and formalized methods for the management of individual projects [1], [8], [10], [11]. In general terms, PPM is proposed as a sequence of decision moments in which all the ideas and projects are evaluated against a set of predefined decision criteria. As a result, it is decided which projects proposals are approved, which ongoing processes are cancelled, and a prioritization derived for the different projects. These decisions feed a resource allocation process, in which people and other resources are distributed between projects. Different tools and methods are proposed for supporting decision making according to the three main goals of PPM.

2.2 Critical views on PPM

Although still sparse, some empirical studies have looked at how companies manage their project portfolios, and the findings have been discussed alongside the assumptions made in the dominant approach in PPM literature. Christensen and Varnes [7] studied project portfolio meetings and observed that decision making is not performed in the rational manner assumed in the dominant approach. Just some projects in the portfolio are considered in the meetings and few decisions are made. Instead, decision meetings work as a forum for discussing the meaning and appropriateness of different decision criteria. The rules that guide how evaluations are made are chosen by people in a process influenced by interpretations of the situations faced and what should be considered important. Stilling and Eskerod [5] found that companies often have some projects that, despite not having undergone the formal evaluation process and not being under consideration in PPM, however, use a considerable amount of resources. This means that evaluations and allocation of resources might be carried out in ways that do not follow the assumptions made in the dominant approach in PPM.

Engwall and Jerbrandt [6] state that projects suffering cuts in resources because of constant reprioritizations and reallocations of resources, it is a problem inherent to organizations running several simultaneous projects. This problem has traditionally been discussed in PPM literature related to poor project scheduling and too many projects in the portfolio. However, they argue that it is also influenced by other aspects that have not been deeply discussed in PPM theory, such as: the political games for defending resources in which project leaders and units managers engage; and interpretations that people make about what is important or expected. Although these studies indicate that evaluations are actually made differently to the methods defined in PPM literature, it has still not been sufficiently explored the reason for that. Furthermore, according to [6], the way in which the evaluation process interplays with other process within PPM, such as the resource allocation process, might be more complex than assumed in PPM literature.

2.3 Ambiguity, interpretation and sensemaking

In PPM literature, ideas and projects are considered as inputs to the decision-making process, i.e. information able to be described and defined in documents [8], [10], [11]. However, it has been already stated that approaches that require accurate information, and a completely defined idea, are not suitable for handling ideas based on ambiguous information [12], [13], and that ambiguous ideas would be systematically rejected if they are evaluated by those approaches [14]. Brun et. al. [12] describes ambiguity in product development when people experience situations of confusions due to the existence of different interpretations of a piece of information, such as conflicting interpretations of a product idea or a market need. Engwall [14] asserts that sometimes people feel that they are not able to understand and formulate what an idea for a new product is about. According to Weick [15], ambiguity is subjective. Situations are experienced to be ambiguous if they seem to be unclear, highly complex or paradoxical. A state of confusion that is not necessarily related to the amount or quality of the information but rather to the way in which the information is interpreted. He argues that, unlike situations of uncertainty (where more information is required), to overcome ambiguity people need to construct a different kind of information through social interaction. This process, named sensemaking, is not only about interpretation, it is also about the construction of what is interpreted.

March [16] has considered the implications of ambiguity in the decision-making process. When making decisions, the alternatives of choice might be unclearly defined, or have multiple and opposing interpretations. Thus the decision-making process is not only understood as a base for action, but also as a process in which people engage in discovering and interpreting. Accordingly, Kijkuit and van den Ende [17] argue that in product development decision makers and other employees are in fact involved in a process in which the ideas are simultaneously generated, evaluated and developed.

Although the importance that ambiguity, interpretation and sensemaking have for the evaluation process, they have not been enough investigated neither in the evaluation of individual ideas and projects [12], [13], nor in the context of PPM [6].

2.4 Research questions

The theoretical framework indicates that some aspects of the evaluation process in PPM need a deeper description in order to understand how ideas and projects are evaluated in practice:

- Ambiguous situations, where people experience confusion or multiple, contradictory opinions.
- Situations of evaluations that occur informally and outside decision meetings.
- Interpretations that people make about what is important or what is expected from them.
- The mutual influence between the evaluation process and the resource allocation process.

We formulate the focus of this study in the following two research questions:

RQ1: How are ideas and projects evaluated when people experience ambiguity?

RQ2: What are the consequences of these evaluations for the resource allocation process within PPM?

3 METHODOLOGY

To answer the research questions, an exploratory and qualitative approach with data collected in interviews was chosen. This method is suitable for understanding organizational and social phenomena [18], [19]. Two researchers participated in the interviews and the analysis of data. 16 semi-structured interviews following Kvale's [20] methodology were conducted in two companies (10 interviews in Company A and 6 in Company B). Companies were chosen according to the following

criteria: they had a business strategy based on developing new products; and run development in a multi-project environment. A general description of the two companies is given in Table 1 below:

Table 1. General descriptions of the two companies in the study.

	Company A	**Company B**
Business	Products and processes for the medical and chemical industry.	Multimedia products, software and other solutions for the telecom sector.
Company size/ development	c. 2000/ c. 500 (employees)	c. 10000/ c. 2000 (employees)
Product complexity	Product development requires highly qualified personnel in several disciplines and technological areas.	Products might encompass diverse components requiring highly qualified personnel in several technological areas.
PPM organization	A matrix organization, divided in three business units (BUs), and five technical areas. Each BU manages its own project portfolio, and there is a forum in which the whole portfolio is discussed. A group for identifying, evaluating and selecting innovative ideas was recently created.	Several BUs that are responsible for their own portfolios. Development managers assign resources to the different projects and a Portfolio manager coordinates the resource allocation among all the BUs. There is a group for identifying, evaluating and selecting innovative ideas; and manages its own budget.

Respondents were selected from among those with an active role in PPM, either by being formal decision makers, influencing decisions (because of hierarchical position or technical competence), or being affected by decisions made by others. Among them were: portfolio managers, business unit managers, technical managers, experienced developers, and project leaders.
Interviews focused on what people did in several processes that are named in the literature as related to PPM [1], [4], [8], [9], [10], [11]: handling of ideas; evaluating and selecting ideas; starting and managing projects; prioritizing projects; and allocating resources among projects. Our questions focused on the details of the situations of evaluation, and their evolution, for example: with whom they talked about an idea; if it was difficult or conflictive to understand; if there were different opinions about its evaluation; what was their first impression about it; what did they say to the person who told them about the idea; what happened next, etc.
For analyzing the empirical material was used a combined approach with selective and open coding, following [18], [19]. In the selective coding, we sought situations in which respondents experienced ambiguity. Through the open coding we focused on what people did in those situations. We chose codes for labeling the different statements. Research notes were taken all the time, developing interpretations about how the codes could be classified in different categories. These results and analysis were further developed by relating tem to research literature; discussing them with other researchers; and discussing them within the companies, through presentations and workshops.

4 RESULTS AND ANALYSIS

Respondents consider that it depends on the individual, in which way ideas are presented for evaluation by others. Some prefer using formal channels, such as data bases, internal idea competitions, or formal meetings for idea generation; whilst others prefer to discuss their ideas in informal conversations. Regardless of the degree of formalization, in certain situations people are not able to build a judgment about the idea. Below, we describe these situations and how people felt about them. Then, we focus on describing what people do in those situations.

4.1 Difficulties in understanding ideas

Respondents told about situations in which it was difficult to understand what an idea was about. Some told about difficulties in understanding the technical aspects, and others told about not understanding the purpose of the product or, what value it could give to the customer. For example, it happened that a respondent was faced with evaluating an idea that was not within her technical area, and she considered herself as not able to evaluate whether the idea had potential or not: *"It's a bit depending on ... how much I know in the specific technology area. Some things I do not understand*

when people come and start to talk about something. They usually put a lot of paper in your hand that does not contain any pictures, just a lot of words. And other things I have easier to understand or see the direct benefit or value. So it's very different, I would say, from case to case." (Project Portfolio Manager).

This quotation also illustrates another aspect that respondents related to the difficulty of understanding ideas: the way in which the idea is communicated. For example, one respondent referred to an idea that had the potential to increase the efficiency of the chemical process of an industrial client. When explaining the idea to people that were not technical experts, instead of complicated chemical explanations, they just showed that several steps in the industrial process of the client could be eliminated. The respondent considered that having found a clear way of showing the benefit of the idea, made it possible for several persons to understand it when they might otherwise not have. Other aspects that respondents considered influential to understanding ideas were: drawings, plans or other visual means; prototypes; and information about tests results or market research.

4.2 Difficulties in classifying ideas

Another difficult situation, to which respondents referred, was the classification of an idea in accordance with certain criteria. They considered that some ideas fell in a grey zone, or that there were different opinions about how to classify them. For example, several respondents told stories about difficulties in classifying ideas according to the criterion "strategic alignment": *"I think everyone has an idea about what our core business is. Then you can probably get into discussion with individual project proposals, if it is within our core, or is in the boundaries, or if it is something completely new. This distinction is not always easy, very easy to make. It is not crystal clear." (Project Portfolio Manager).*

Other situations where respondents told about difficulties in making evaluations were related to the criterion "*innovation"*. Both companies had created groups for identifying, evaluating and assigning resources to the development of ideas considered to have a relative higher grade of newness. In Company A, this group is of recent creation and respondents considered that it would be difficult to judge if an idea is "innovative": *"I think we will have a lot of discussions about where things belong; they belong in the usual (portfolio) ... or belong in (the innovative portfolio)." (Project Portfolio Manager).*

In Company B, people have been working with the criterion "*innovation"* for several months, but respondents also told stories in which there were different opinions about an idea being considered innovative. For example, a developer told us about an idea that consisted of an already existing function that it would be provided to customers via a technology that had not been previously used for this function. A discussion arose as to whether the idea would be considered as "*improvement on an existing product"* or as "*new user experience"*. There were different opinions and it was not possible to reach a common judgment. The distinction would determine how the idea would be classified in an internal idea competition, and the respondent said that it would impact on its chances for being selected.

4.3 Difficulties in later stages of development

Situations where different opinions arise are also experienced in the later stages of product development. For example, a developer in Company B told us about a development project that started with a very well defined goal, but which included a technical solution (on which the product was supposed to be built) that the project team considered inappropriate: "*We did not understand how it was supposed to be used by the customer… from our point of view it was useless to work with this thing that the product manager was pushing us to do because we did not see any future in it."(Experienced Developer).* In this case it was a crucial discussion because the technical solution would determine the interface with the user, i.e. what the user was supposed to do when using the product.

Company A provided another example, where a project started with a product idea based on a new technology that was considered to have a great potential. Different opinions arose about what the product would do: *"(The project) had definitely a formal go-ahead, but its length in time and what it would lead to, had not yet been confirmed. It was not confirmed what the product would do. There was so much we could choose... It felt like there were as many stakeholders as employees here, who had an opinion on what we would actually do." (Project Manager).*

4.4 Facing ambiguity

Our exposition so far indicates that, in some evaluation situations, people experience difficulties in understanding or classifying an idea, or the existence of different opinions about how to do it. In the following part we change focus from how people experience these situations to what they actually do when faced with them.

In those situations of confusion, evaluators suggest that the person presenting the idea either contacts other people who might be better able to understand it or evaluate its value, or develops a way of describing the idea that makes it more understandable and supporting it with stronger arguments: *"In some way it must fit into the strategy…But even if it does not, and it is interesting enough, I as Technical Manager ... do not close the door too early… we let it in, for it to go one more turn. It can happen that it fits in somewhere else, although I do not see it just in the moment." (Technical Manager).*

Evaluators recommend telling the idea to a technical expert when they find that it contains a new technical solution, or if it is not clear its feasibility, or when it relates to a specific technical area. They suggest talking to someone from the marketing area, when they find it difficult to judge the value for the user. Sometimes the recommendation is to talk to several people in order to get the idea known within the organization. The most frequent specific recommendations are: carrying out tests, building prototypes, searching for information, or developing different ways of communicating the idea such as drawings, plans and presentations. When respondents talk about those actions, they refer to them as small efforts just as conversations or quick seeking of information.

A respondent told us when he presented an idea to a board of experts; who discovered a technical problem that was not solved in the proposal. They asked him to think about how to solve it and to come back some days after. When he came again, now with the technical solution of the specific problem, the board considered that the idea was still not good, but the technical solution was very interesting. So the solution became an idea that was further developed but not the whole idea itself.

4.5 Ambiguity leads to sensemaking

The first research question of this study was: how are ideas and projects evaluated, when people experience ambiguity? When evaluating an idea or project, people might face difficulties in understanding or classifying an idea, or have different opinions about how to do it. These situations might arise in informal conversations as well as in formal forums, and in different phases of development. Some aspects influencing the difficulty in evaluating ideas are: the technical knowledge of the evaluator; the arguments for explaining the idea; the utilization of physical and visual means for describing it; and the existence of information, such as, results of technical tests, or market research. In this state of confusion, evaluators are not able to judge if the idea is good or bad, has potential or not, falls inside strategies or outside them. They are not able to make a decision, and in those situations, evaluators often recommend, to the person presenting the idea, that they talk to other people or that they carry out some activities for further developing the idea. This can lead to a new understanding of a purpose, reveal benefits that have not been seen before or create benefits that did not exist in the first definition of the idea. This is a social activity that also allows many people knowing about the idea and developing a view on it. Thus the answer to the first research question is: if people experience ambiguity when evaluating an idea, then the idea is further developed making sense of the original situation of confusion and conflict.

4.5 Evaluation and resource allocation

For carrying out those activities in the further development of an idea, some people have to dedicate time to them, at expense of other activities. This process can vary in formality and might involve more than one person, depending on the amount of resources to be assigned: *"I can give permission for a few days extra work for proof of concept on the idea" (Technical manager).* In respondents descriptions, resources are mainly time that people dedicate to different activities. They also talked about the difficulties to get this time: *"To make drawings you can also get help from the colleagues who makes drawings. It is not always easy to make the time, that's the problem. "(Project Portfolio Manager).*

Regardless of the actual amount of time required, people must consider their participation in relation to the other activities that they are supposed to do: *"Then began this process to try to get the right*

people to start working on the project. Because all the people were already working in another project. There are no people sitting and waiting. It does not happen." (Project Leader).
This means that in some way a shared understanding must exist between certain people about the convenience of spending time in working with a particular idea. The resource allocation process has its own dynamic in which reprioritizations and changes are constantly under negotiation at different levels. In these negotiations people act with a logic whereby project leaders and business units managers defend the resources of their own projects: "*My task is to defend the team." (Project Leader).*
However, the priority that is given to a particular activity is influenced not only by official prioritizations and political games, but also by the subjective importance that people give to different activities and projects: *"And suddenly it was these images in different presentations. It gave the project a higher status than the one it formally had in the priority list." (Project Manager).* This subjective notion of the relative importance of different activities and projects might influence the willingness of people to spending time on a certain idea.
Furthermore, another aspect influencing the assignment of resources is the need to screen the high number of ideas that are presented, and the risk of developing an idea for too long, avoiding its rejection: *"And then one would think that it would be evident to cancel (a project proposal) if it did not work out. But it has opened for: we can do this instead, or we can steer ourselves against this application. And in that way we keep the project alive too long. And that's something we need to get away from." (Project Portfolio Manager).*

4.6 When sensemaking meets resource allocation

The second research question was formulated as: what are the consequences of these evaluations for the resource allocation processes in PPM? In performing the activities that make sense of an idea, people have to dedicate time to allocate time away from other activities. This process varies in formality and may involve more than one person. Thus the need to overcome the state of confusion, meets the logic and dynamic of the resource allocation process in which reprioritizations and changes are constantly under negotiation at different levels. In these negotiations people act with the logic of defending the resources of their own projects, and are influenced by the need to screen a high number of proposals, and weigh up the risk of spending too long on an idea that should have been rejected before.
At the same time, people´s willingness to spending time in developing a certain idea is also influenced by the subjective importance that they give to it. Paradoxically, this notion depends on the grade of development of the idea, that is, how much they know about the idea, the arguments used for explaining its benefits, the utilization of physical and visual means for describing it, and the existence of information about results of technical tests, or market research. Thus the evaluation and the resource allocation processes display a mutual interaction, in which the ability to judge an idea depends on dedicating resources to further developing it, and the assignment of resources for this development depends on prior evaluations.
In this paradoxical situation, people take small steps in the further development of the idea. In the empirical material, the actions carried out; seem to be the minimum needed for giving the idea the clarity or arguments that it was lacking before. This allows making a new evaluation. If the confusion and conflict arise again, they are managed the same way, taking another small step in the development of the idea. Thus, ambiguous situations in the evaluation of ideas and projects are managed by recursive cycles of evaluation, resource allocation and development, in which the main goal is making sense of the unclear situation, and the actions taken are the minimum to allow a new cycle of evaluation, resource allocation and development. Thus, the answer to the second research questions is: ambiguous situations of evaluation mean a mutual interaction between the sensemaking process and the resource allocation process. The sensemaking process uses resources already assigned to other activities, and the resource allocation process, by its dynamic and logic, conditions the occurrence of the sensemaking process.

5 DISCUSSION

In PPM literature, an idea is considered as a finished entity that can be understood and classified according to certain criteria. "Picking the right projects" [8] is the expression used for illustrating an evaluation process, in which ideas are reduced to information that a person detached from its

development is able to understand and to judge, telling good ideas from bad ones. However, it has been already observed that not all decisions in PPM are made according to rational models [7], and that not all projects are evaluated through the formal evaluation process [5]. Our study asserts that there is a reason for some ideas not being considered in the formal evaluation process. In those situations it was not possible for people to consider if the idea was good or bad, or had potential or not. They were too ambiguous for being understood, or being judged according to certain criteria. Thus there might arise ideas in product development that, because of ambiguity, people are not able to make evaluations and decisions on them, in accordance with the evaluation models proposed in PPM literature.

Furthermore, it is unclear what the consequences would be, if ambiguous ideas are, anyway, evaluated by following the models proposed in PPM theory. Weick [15] states that if ambiguous situations are approached as if they were uncertain, by more information and formal information processing, the state of confusion could be prolonged and intensified. More specifically, Engwall [14] argues that good ideas for projects could be rejected just because they do not meet the requirements that allow them to be fully defined at the early stages of their handling. Stilling and Eskerod [5] considers that it would be dangerous to not allowing the existence of independent projects that bypass the formal evaluation process, because they are considered by management as a positive means of creativity and self-empowerment. Furthermore, Brun [12] asserts that ambiguous ideas could contain valuable creative solutions that are able to be used if they are, in some way, maintained for consideration. Thus ambiguous ideas that could potentially evolve into valuable insights could be rejected if they are forced to undergo a formal and rational evaluation process. At the same time, according to our results, there is a risk that these ideas do not become good ideas, and that people will only realize this after they have spent considerable time and resources.

Engwall and Jerbrandt [6] assert that reprioritizations often lead to some projects losing their resources. When the planned schedule is supposed to be activated, several projects are delayed and the whole planning fails. They argue that this "resource allocation syndrome" is a chronic problem of companies running several simultaneous projects. Accordingly, we found that when it is necessary to make sense of unclear ideas, people are already working on other projects. Thus for spending time working on a new idea, they have to stop doing other activities. This is the same pattern of resource allocation that was described in [6]. Thus our observation that people act in minimal recursive cycles of evaluation, resource allocation and development, contributes to the description of a mechanism by which the process of sensemaking and the resource allocation process influence each other. Thus, this mutual interaction between the sensemaking process (needed for overcoming an ambiguous situation), and the resource allocation process (in which the activities for sensemaking are made possible) is another cause of the resource allocation process not working as management planned it to.

Finally, Brun [12] found that ambiguity might be sustained in order to save resources e.g. performing tests is considered too costly, and experiments and market research take time. This is consistent with our observation that while the sensemaking process uses resources already assigned to other activities, the resource allocation process, by its dynamic and logic, conditions the occurrence of the sensemaking process. The difference is that in our empirical study, this handling of ambiguity and the interaction with the resource allocation process seems to be more informal and less controllable by management than the one discussed in [12]. Stilling and Eskerod [5] discuss that one alternative for managing informal activities carried out outside the official PPM could be having a special amount of resources that people could use for informal activities. Management should state which activities are managed within PPM and which ones carried out outside it [5]. However, we consider that, in some way, it implies making an evaluation, comparable to when the studied companies classified ideas according to the criterion "innovation" (see 4.2), and it is still unclear how this evaluation would be done in the presence of ambiguous ideas..

5.1 Research implications

Our study suggests that the existence of ambiguous situations in the evaluation of ideas, and how people make sense of them, is an important aspect of PPM that should be studied further. We consider that some of the properties in the sensemaking process, described in Weick [15], could guide this research suggesting some aspects to be investigated. For example, how people understand their own identity while evaluating ideas, which social norms influence who is involved in the sensemaking process, and which aspects of an idea are used to make sense of it. In addition, our study also indicates

that for understanding PPM is necessary to take into account the mutual interactions between the different processes involved in PPM, and especially the resource allocation process.

5.2 Managerial implications

Within PPM, people construct and interpret the decision criteria through which ideas and projects are evaluated. This sensemaking process should be supported by management, since it is fundamental to determine what ideas and projects are actually selected for development. However, many evaluation situations happen in an informal and spontaneous way, which makes it difficult to influence them at the time they occur. One way to support the process of sensemaking, could be through training sessions, in which people share with each other, how they interpret and give meaning to the decision criteria. In this way, people can experience different perspectives and ways of understanding the criteria in relation to different types of ideas and projects. This would contribute to developing a capacity to use different perspectives that can be used whenever an occasion for sensemaking arises.

5.3 Limitations of the study

The limited empirical base of this study does not allow us to assert that the findings exposed here would be valid in other companies. However, the results have a theoretical distance from the empirical data in the form of conceptual categories and their relationships. This implies that they are able to be used for guiding the study of the same phenomenon in other empirical settings, for example by a selective coding of data. Consequently, the results of this paper should be used as conceptual categories that build a description of the evaluation process within PPM.

6 CONCLUSIONS

In this article we explore the evaluation of ambiguous ideas in Project Portfolio Management (PPM). We found that, when people experience ambiguity, they are unable to judge whether an idea is good or bad. However, in order to make sense of the situation the idea is often developed further. At the same time, the willingness of people to spend time developing an idea is influenced by the subjective importance they give to it. In this situation, people take small steps in the idea development, usually the minimum needed for giving the idea the clarity or strength in its arguments that it lacked before. Thus ambiguous situations in the evaluation of ideas and projects in PPM are managed by recursive cycles of evaluation, resource allocation and development, in which the main goal is making sense of the ambiguous situation, and the actions taken are the minimum ones for allowing a new cycle of evaluation, resource allocation and development.

Thus there might arise ideas in product development that, because of ambiguity, people are not able to make evaluations and decisions on them, in accordance with the evaluation models proposed in PPM literature. However, it has still been not sufficiently explored the consequences of forcing ambiguous ideas to be handled inside the formal PPM process, or of developing them informally. Ambiguous ideas that could potentially evolve into valuable insights could be rejected if they are forced to undergo a formal and rational evaluation process. At the same time, there is a risk that these ideas do not become good ideas, and that people will only realize this after they have spent considerable time and resources.

Our observation that ambiguous situations are managed through minimal recursive cycles of evaluation, resource allocation and development, contributes to understanding and describing a mechanism by which the process of sensemaking (needed for overcoming an ambiguous situation) and the resource allocation process (in which the activities for sensemaking are made possible) influence to each other. Furthermore, the mutual interaction that occurs when people spend time in activities for making sense of an ambiguous situation contributes to the chronic reallocation of resources between projects and is another cause of the resource allocation process within PPM not working as management planned it to.

Thus the evaluation of ambiguous ideas, and the process in which people make sense of them, is a relevant aspect of PPM that should be studied further. However, our study suggests that, due to the subjectivity of ambiguity and the social aspects influencing the interaction of people in a sensemaking process, the management of ambiguous ideas in PPM would require new approaches for supporting managers. Theories regarding how people make sense of ambiguous situations, such as Weick's [15] sensemaking in organizations, would provide a conceptual framework for building an understanding

of different aspects of PPM and for contributing to explain the chronic problems affecting companies in the management of their project portfolio.

ACKNOWLEGMENTS

The Product Innovation Engineering program (www.piep.se), a Swedish research and development program for increased innovation capability in organizations, has contributed to this work.

REFERENCES

[1] Reyck B. D., et al. The impact of project portfolio management on information technology projects. *International Journal of Project Management*, 2005.

[2] Jonas D., Empowering project portfolio managers: How management involvement impacts project portfolio management performance. *International Journal of Project Management*, 2010.

[3] Aubry M., Hobbs B., Thuillier D. A new framework for understanding organizational project management through the PMO. *International Journal of Project Management*, 2007.

[4] Dawidson O. *Project portfolio management - An organizing perspective*, 2006 (Ph.D. dissertation, Chalmers University of Technology, Sweden).

[5] Stillin Blichfeldt, B. and Eskerod, P., Project Portfolio Management-There's more in it than what management enacts. *International Journal of Project Management*, 2008.

[6] Engwall M. and Jerbrant A., The resource allocation syndrome: the prime challenge of multi-project management. *International Journal of Project Management*, 2003.

[7] Christiansen J.K. and Varnes C., From models to practice: decision making at portfolio meetings. *International Journal of Quality & Reliability Management*, 2008.

[8] Cooper R. G., Edgett S. J, Kleinschmidt E., *Portfolio management for new products*, 1998 (Perseus Books, Reading, USA).

[9] Elonen S., Artto K.A., Problems in managing internal development projects in multi-project environments, *International Journal of Project Management*,2003.

[10] Archer N. and Ghasemzadeh F., An integrated framework for project portfolio selection, *International Journal of Project Management*,1999.

[11] Ghasemzadeh F., Archer N.P., Project portfolio selection through decision support, *Decision Support Systems*, 2000.

[12] Brun E., Steinar A., Gjelvsik M., Benefits of ambiguity in new product development. *International Journal of Innovation and Technology Management*, 2008.

[13] Brun E., Steinar A., Gjelvsik M., Classification of ambiguity in new product development projects. *European Journal of Innovation Management*, 2009.

[14] Engwall M., *Produktutveckling bortom kunskapens gränser, mot en osäkerhetens grammatik*, (in Swedish), 2003 (Studentlitteratur, Lund).

[15] Weick K.E., *Sensemkaing in organizations*. 1995 (Sage Publications, California).

[16] March J.G., *A primer on decision making: How decisions happen*, 1994 (The Free Press, NY).

[17] Kijkuit B. and van den Ende J. The organizational life of an idea: Integrating social network, creativity and decision-making perspectives. *Journal of Management Studies*, 2007.

[18] Gustavsson B. *Metod: Grundad Teori för ekonomer-Att navigera i empirins farvatten*. (in Swedish) 1998 (Academia Adacta AB, Lund).

[19] Hartman J. *Grundad Teori, Teorigenerering på empirisk grund*. (in Swedish) 2001 (Studentlitteratur, Lund).

[20] Kvale S. *The qualitative research interview*. (in Swedish) 1997 (Studentlitteratur, Lund).