THE INTERACTIVE PROJECT

A MODEL FOR ANALYZING ENVIRONMENTAL UNCERTAINTY

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Abstract

Contemporary organization theory reminds us about the impact of the environment on what is going on in organizations and that neither permanent nor temporary organizations can be understood without taking their relations to other organizations into consideration. The aim of this article is to outline a model for analyzing fundamental relationships between projects and important actors in its environment. The model can be used for identifying determinants of uncertainty in the environment and how these influence project structures, processes and outcomes. The model enables us to contrast different ways in which relationships either constrain or enable projects to accomplish their tasks.

Keywords: Project Management, environment, uncertainty, interaction
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Introduction

Most early research on permanent organizations was done in order to understand how formal and informal aspects influence organizational behavior. The focus has then gradually shifted towards environmental factors. Research on temporary organizations seems to follow the same course. Several scholars have widened their perspectives on projects to include an interest in environmental factors and how these factors influence structures, processes and outcome of different kinds of projects [1]. Issues related to environmental uncertainty have thus been central in contemporary research on temporary organizations, and, as stated by Söderlund [2], there is a need for discussion about the environmental dimension of projects. Some scholars explain it as the institutional aspects that influence how we conceive projects and how institutionalized norms and values regulate and standardize project organizing [3]. Others refer to it as the local relationships that influence the organizing of projects [4]. There seems to be a lack of analytical tools for investigating environmental aspects more specifically, for example, how such aspects cause uncertainty that influences vital aspects of project management. The aim of this article is to outline a model for analyzing fundamental relationships between projects and important actors in its environment. The model can be used for identifying determinants of uncertainty in the environment and how these influence project structures, processes and outcomes. The outline of the article is guided by the following questions: (i) What is environmental uncertainty and what impact does it have on projects? (ii) What causes uncertainty in the interaction environment? (iii) What strategies do actors in different projects use to handle uncertainty in their interaction environment? (iv) What consequences do these strategies have on structures, processes and outcome of different kinds of projects?

The environmental perspective on projects

As said, the point of departure of this article is the notion of a project as a designed organization whose performance can not be distinguished from the environment in which it acts. A project is created in relationship to other actors and can only be understood if these are taken into consideration. Throughout its life cycle, every project becomes embedded in an environment comprised of other projects and permanent organizations [5]. Projects depend on different kinds of resources such as money, time, knowledge, reputation, trust, etc. They
require, and are thus heavily dependent on their environment. From this perspective, a project
is seen not only as a result of the project manager and his/her ability to plan and control, but
rather as created in close mutual relation with other actors in the environment that influence
the project in different ways.

Formerly, research has approached environmental aspects of projects, for example, by
departing from empirical observations such as multi-project firms and project network, or
from theoretical fields such as contingency theory or neo-institutional theory. The multi-
project phenomenon is regarded as an intra-organizational issue where projects are not
considered as a series of isolated activities but as embedded in a mutual resource dependence
system of more or less enduring social relationships [1, 6, 7]. Since no project is completely
self-contained, the key to survival is the ability to acquire resources. These environmental
settings are often described as highly political; the diversity of interest and competition gives
rise to “wheeling and dealing”, negotiation and other processes of coalition building [8].
These multi-project environments are characterized by a high degree of uncertainty since the
projects have to compete for scarce resources.

Other researchers have studied project networks as inter-organizational relationships,
emphasizing the fact that many “independent” projects are embedded in a large reciprocity-
based inter-organizational relationship [9]. Due to imbalances in the distribution of resources,
attention and authority, and because of the interdependencies among projects and
organizations, the environment in which project networks exist are described as uncertain
[10]. As a consequence, project managers must use different kinds of strategies to attract
attention, enroll stakeholders, and to mobilize support from more distant but powerful actors
[11]. Trust has also been identified as an important factor that shapes and stabilizes inter-
organizational relations [12]. Others have described these project networks as highly
dependent on supportive social and political institutions in their organizational fields [13].

Some researchers have acknowledged the impact of environment on projects by departing
from contingency theory. This perspective highlights the need for project managers to adapt
to critical contingent circumstances [14-16], implying that different kinds of projects cannot
be operated in the same way [17]. Projects are linked to their environment through different
types of relationships to gain information, knowledge and other resources. Christiansen &
Kreiner [18] elaborate the contingency approach in order to make a distinction between
operational and contextual uncertainty. Operational uncertainty here refers to the conditions
influencing the efficient solution of a task. Contextual uncertainty refers to turbulence in the environment, meaning that the relevance of a project can erode if the environment is drifting [19].

In order to explain the increasing prevalence of projects and how different institutionalized norms and values regulate and standardize project organizing, some scholars have taken their departure from neo-institutional theory [20-24]. Sahlin-Andersson [22] describes how institutionalized conceptions of a unique (temporary) project legitimize a certain mode of action that would not have been accepted in other (permanent) organizations. Project organizing has often been understood as the norm for how to conduct change and development, but the idea of a project is quite different from its practice.

The institutionalized relation between temporary and permanent organizations has also been focused as both a constraining and facilitating factor for projects [4, 25-28]. In such analyses the environment consists of institutionalized norms and values in society, other projects, and relations between project and permanent organizations. Projects seem to compete or cooperate in order to attain resources, attention and commitment. Projects can thus gain legitimacy and reduce uncertainty by applying prevailing norms and conceptions about project management.

Previous research has thus stated that projects are not created independently of values, norms and relations to actors in the environment, and cannot be understood without taking these into consideration. Nevertheless, we argue that there is a need of a demarcation between uncertainty related to institutional norms and values on the one hand, and uncertainty related to relationships between involved actors on the other hand. We claim that the interaction part of the environment has a more direct impact on what is achieved in the project because it generates uncertainty for actors in the project regarding how they should accomplish their task. We want to contribute to a deeper understanding of the interactional part of the environment, that is, those actors to whom the project has to have some kind of relationship in order to fulfill its task, and its impact on the structure, processes and outcome of various kinds of projects. Accordingly, the advantage of the concept “interactional uncertainty” is that it takes account of environmental explanations necessary for understanding the circumstances of certain projects without including everything outside the project.

Figure 1 in here.
**Interactional uncertainty**

The relationship between the focal project and other actors is suggested to be analyzed as an inter-organizational phenomenon, although many projects are deeply embedded in a single separated formal organization. The relationship will be analyzed in two dimensions – one vertical and one horizontal. The former refers to the hierarchical conditions for the project assignment, that is, the conditions for funding, planning, control and evaluation of the project. The latter refers to the conditions for performing the work, that is, the type of cooperation or other kind of interaction the project has to develop in relation to actors in the environment. Both dimensions – the vertical and the horizontal – express the conditions for the project in terms of the uncertainty that project managers and other actors have to manage in order to perform their assignment.

**Vertical uncertainty**

All operations in organizational settings involve interactions and transactions. Some transactions occur between organizations, others within organizations. Williamson [29, 30], who has advanced much of the theory around transaction costs, emphasizes the importance of uncertainty and bounded rationality in the choice between markets and hierarchies. Transaction cost theory assumes that as uncertainty arises, the more likely it is that the transaction will be handled within a hierarchy. Vertical relations emerge in hierarchies and are, by definition, not reciprocal. The relation between the principal and the agent is the textbook case for vertical relations between two parties, and this kind of relationship is applicable for permanent as well as temporary organizations [31]. Although vertical relations are legitimate in most organizational settings, they cause uncertainty for many reasons. The vertical relation between the project and its principal/s consists of different aspects related to contractual arrangements and authority, but is also related to trust, image, knowledge, and similar aspects. Some projects have got a high degree of autonomy due to good image while others are constantly watched over and called into question.

According to transaction cost theory and principal-agent theory, uncertainty is caused by divergent objectives, interests, information and knowledge, that is, some kind of lack of trust. Transaction cost theory prescribes options to reducing uncertainty caused by divergent objectives. Pure relations on a (spot) market are reciprocal and not hierarchical. But as market mechanisms fail due to increased complexity in interaction, hierarchic organizations can evolve in order to mediate economic transactions. The first option is then to establish a
bureaucracy, adopt rules and establish some socialization in order to increase goal congruency [32]. If complexity in work process and performance measurement increases one step further, organizations can reduce uncertainty by developing common values and beliefs among their participants, that is, a clan organization. The clan displays a high degree of discipline and great regularity of relations. A variety of social mechanisms reduces differences between individual and organizational goals and produces a strong sense of community and a high degree of trust [32, 33].

In principal-agent theory, uncertainty in vertical relations arises when the parties have divergent objectives, interests, information, or knowledge. This theory was initially developed with the aim of understanding and resolving dilemmas of incomplete information in the design of contracts. Agency problems arise in contracts when the parties have divergent objectives or interests, for example when the agent has an information advantage over the principal. A principal, who is aware of potential agency problems, wants to be protected against opportunistic agent behavior by employing an effective contracting process. Three problems emerge in this process. The first problem is the costs of obtaining the information needed to select an appropriate agent and to monitor and enforce the contract. The second is related to the production process and the ability to measure performance; the more difficult it is to gather information on outcomes, the more likely it is that the contract will be based on behavior. The third problem is related to the actors’ risk preferences. A risk-averse agent will probably not accept a performance-based contract if there is a high degree of uncertainty associated with the behavior outcome process, since such a contract shifts the risk from the principal to the agent.

Transaction cost theory and principal-agent theory are both applicable when it comes to understanding uncertainty related to the relationship between the project and its principal. The former theory predicts a high degree of goal congruency in clan organizations. Thus goal congruency will be highest in projects that are highly embedded in their parent organization. The actors could decrease uncertainty by developing and strengthening common values and beliefs among the participants. Goal congruency is probably lower in intra-organizational projects that are embedded in bureaucracies. However, the actors could decrease uncertainty by strengthening and reinforcing rules, plans and standards in order to establish predictability. Lundin & Söderholm [34] state that project plans could have such meaning; sometimes plans provide a general carte blanche for legitimating executions without interference from the outside.
The lowest degree of goal congruency prevails when projects and their principals belong to different organizations. Uncertainty could in these cases be handled by means of contractual arrangements. Obviously, the Project Management literature is influenced by principal-agent theory as a means of decreasing uncertainty, thus assuming a lack of goal congruency. It should be noted that co-funding of projects could demand contractual arrangements, but at the expense of decreased goal congruency. This could reduce the financial risk of the project, but also cause operational uncertainty due to decreased goal congruency [35].

**Horizontal uncertainty**

Horizontal relations - in an organizational setting - signify actors who interact with each other in operational work processes in order to perform an assigned task, that is, relations that do not include supervision, control, or evaluation. Uncertainty in horizontal relations arises when some of the actors find it difficult to predict the outcome of the interactions that are needed in order to perform activities in expected processes. This kind of uncertainty is frequent also in projects; some projects are highly dependent on cooperation, while others can be operated independently of other actors and organizations.

The research on inter-organizational relations is extensive and offers determinants and typologies of different kinds of relationships [36]. Resource dependence theory [37, 38] has contributed to this research offering valuable concepts for analysis of uncertainty in inter-organizational relations. The theory had its peak of popularity in the seventies and eighties. Lately, it has experienced a renaissance as neo-institutional theory has been criticized for being far too deterministic [39]. The main problem for every organization, according to resource dependence theory [37], is how to manage uncertainty and achieve freedom of action. As dependence and power are two aspects of the same issue, organizations have to act strategically in their environment to achieve freedom of action. Most organizations seek to buffer their core technology from environmental influences and choose between different interactive strategies to manage uncertainty in their task environment. Interactive strategies can be competitive or cooperative. Competitive strategies are directed towards other organizations and aimed towards obtaining strategic resources at the expense of their competitors. Thompson [37] distinguishes between three cooperative strategies that can be chosen by the involved actors: contracting, co-opting and coalescing, all representing different degrees of cooperation and commitment. Contracting refers to the negotiation of an agreement for the exchange of performances in the future. Co-opting refers to the process of
absorbing new elements into the leadership or policy-determining structure of an organization as a means of averting threats to its stability or existence. Coalescing goes one step further as it refers to a combination or joint venture with another organization/s in the environment. An increased degree of integration constrains freedom of action [37].

These strategies seem to be applicable to both permanent and temporary organizations. Projects which want to stay autonomous must choose buffering strategies, whereas those who want to expand their scope of action have to choose interactive strategies. Some projects are self-supporting and highly detached from other (permanent and temporary) organizations, while other projects have been established with the specific aim of attaining integration. Lundin & Söderholm [34] have suggested “planned isolation” as the third phase in the life cycle of a project. By isolating a project from disturbances in the environment, horizontal uncertainty will decrease and action be facilitated. All kinds of projects seem to need some isolation during certain phases of their life cycle. However, isolation can also be a more general strategy when managing a project throughout its entire life cycle. In a study on development projects in the social services [25], employing a high degree of detachment was a way to making the development work more visible for internal as well as external actors. This strategy seemed to make the project team more creative and innovative, albeit at the expense of effective implementation.

Many projects use interactive strategies in order to achieve strategic information to cope with uncertainty [19]. Projects in multi-project firms must compete with other projects in order to achieve legitimacy and other attractive resources [1]. Competition may also include legitimacy building, which is conceived as one of the major tasks for project managers [34]. Many projects also choose interactive strategies in order to obtain information from important actors in their environment [18] and in order to facilitate implementation [27].

Cooperation is another option for projects to take in order to cope with uncertainty. Most projects are dependent on resources from suppliers and subcontractors. Non-profit organizations often need some kind of approval from the government in order to run projects as well as permanent operations, and are thus dependent on special agreements of cooperation. Such agreements tie up the operations of many projects, but are often a prerequisite for governmental funding [40]. Projects could also use co-opting strategies as means of averting threats, or to achieve stability in their environment. Project managers could offer such strategic external actors posts in the project team or reference group. The purpose
could be to anchor the project and to facilitate implementation, or to gain other strategic resources [40].

Projects could also take integration one step further and build coalitions. Some projects are designed in order to achieve cooperation. In Johansson et al. [25] some development projects were described as being almost inseparable from their parent organization. These projects were deeply integrated with their parent organizations and consisted of the same management, the same team, and were housed in the same localities as the permanent organization was. However, the projects were not regarded as innovative. Management had chosen that mode of organization in order to avoid criticism from the permanent organization, thus facilitating its implementation. Priority had thus been given to implementation at the expense of innovation [25].

**A model for analyzing interactional uncertainty**

In the previous section we focused upon some conditions in the environment that could cause uncertainty for projects. We argued that it is possible to analyze uncertainty vertically as well as horizontally. In this section we will discuss the relationships between these two dimensions by developing a model for analyzing interactional uncertainty for projects. Combining the vertical and the horizontal dimension leads to four idealized types of environment that each implies a different problem for projects regarding structure, process and outcome. We have denominated them: The trustful environment, the monitoring environment, the negotiating environment and the circumscribed environment. (see figure 2)

Figure 2 in here.

**The trustful environment**

Low vertical and horizontal uncertainty creates a trustful environment. A project in this environment has both a confident and clear relation to its principal and a high degree of freedom of action in relation to permanent as well as temporary organizations in their environment. Good and long-lasting relations between different actors in combination with a good reputation create a trustful environment [12]. This kind of relationship provides good conditions of informality and flexibility in the project work regarding goal formulation, time planning, and division of labor. This kind of environment is implicit in the traditional
conception of projects as unique and isolated entities with the ability to shape their own futures.

Since neither principal nor organizations in the environment interfere with the performance of the project task, the project manager does not have to devote much time to political activities vis-à-vis the environment. Without the need to consider existing structures and institutions, the manager can instead act informally, making decisions and designing management systems with respect to what is perceived to be the best for the task. In such environments conditions are superior for projects to explore new fields of knowledge, to learn new roles during the project execution, and to create new practices. Hence, a trustful environment provides – *ceteris paribus* – good conditions for the project to be task-oriented and operating autonomously. Such an environment is favorable for renewal and innovation [41].

*Hypothesis A*: Projects that act in a trustful environment tend to be informally structured and able to fully devote their internal procedures to their task, which creates good conditions for renewal and innovation.

**The monitoring environment**

Projects which operate in environments characterized by low horizontal and high vertical uncertainty experience that they are situated in a monitoring environment. Low horizontal uncertainty implies that resources as staff, competence, finance etc. are well-defined and tied to the project, and for this reason the project is independent of other actors in fulfilling its task. However, a challenge for a project in this quadrant is to handle vertical uncertainty. Then, uncertainty could be caused by a lack of confidence between the assigner and the project. Even though much literature on project management emphasizes that project assigners should empower the project manager and strive to have a confident working relationship with them, information asymmetry imposes hierarchical supervision [31]. Another ground for high vertical uncertainty could be that the project has got more than one assigner. The presence of several principals increases the degree of goal incongruence. In these “multi-stakeholder environments” it is difficult to apply project management without flexible organizing [42]. In public sector organizations uncertainty can also be caused by different opinions in the political domain, where the project can be left without necessary political support and legitimacy [43].
It is important to stress that the degree of goal congruency can be difficult to notice in projects. In a study on a development project jointly assigned by some local Swedish social welfare agencies and a central governmental agency (the National Swedish Board of Health and Welfare), there were no differences in goal perceptions at first sight. The interviews, however, showed that municipality representatives had a far more pragmatic view of the expected outcome than did the governmental representatives. The former were pleased when the project had solved practical problems and were not willing to allocate more resources to the project in order to achieve the rather specific professional qualitative goals suggested by the governmental representatives. This ambiguity caused frustration in the project team and made it difficult for the project manager to uphold a high degree of motivation [35]. Vertical uncertainty thus seems to cause decoupled parallel processes. Operating processes could be pragmatic in order to solve certain tasks, while reporting procedures could be more formal in order to meet the expectations of the assigners. Some of the members of the team seem to be recruited to solve practical matters, while others seem to be specialized on fulfilling more formal tasks.

A similar outcome is not unusual when several permanent organizations jointly accomplish a project, a so called collaboration project [44]. Vertical uncertainty increases due to the fact that demands and expectations from different permanent organizations can be contradictory [45]. Such projects can decouple symbolic properties from informal work processes to respond to varying demands from different assigners [46]. Projects in these environments may therefore elaborate parallel processes with the intention to deliver different kinds of information about the project activities and outcomes depending on the expectations of the assigners [47].

**Hypothesis B:** Projects that act in a monitoring environment have on one hand all the requirements needed to develop new products and working methods, but are, on the other, exposed to control that restricts the options to act. As a consequence, such projects can develop parallel processes to fulfill different demands from their supervisor(s), which will lead to ambiguous outcomes of the projects.

**The negotiating environment**

The negotiating environment is characterized by low vertical and high horizontal uncertainty. Projects in this quadrant have a simple and trusting relation with its principal, which provides for an independent and flexible internal work flow, that is, structure, delegation of authority,
time planning, and so on. Such projects are, however, heavily dependent on organizations in their environment. In such negotiating environments, there is an ongoing competition for resources (money, time, knowledge, attention, legitimacy, etc.). In order to accomplish their tasks, the projects in this quadrant are dependent on resources that other organizations possess. Therefore, the projects have to act strategically in relation to actors in their environment - negotiating and collaborating - to attain the required resources [36, 37] and, in doing so creating and increasing their ability to take action.

One can distinguish different strategies to handle contextualized demands and expectations in this horizontal type of environment. Common to them all is a necessity to accept certain compromises. A frequent way to achieve co-operation in major reform programs in the welfare sector is to negotiate the operational aspects of the collaboration, not only in advance, but also throughout the program [48, 49]. Through this negotiation the involved actors try to clarify conditions, claims and expectations in order to minimize future obstacles, to get support, and to look after their interests. Meetings, in particular, take a lot of time and energy from operational activities in such projects, which in itself is a crucial indicator that the environment is of importance. To act towards one’s environment in order to secure resources takes both time and attention away from the project task, and it is therefore not unusual that project managers are recruited based on their social negotiation skills.

Another example of this negotiating environment are development projects, that is, projects aimed at accomplishing change in the permanent organization at the same time as it is detached from it [41]. If such projects are more dependent on the permanent organization than vice versa, the project team has to spend a lot of time on legitimacy-building and negotiation, at the expense of solving problems related to the assignment. Power struggles between project managers and line managers are also common in such projects. Many project managers try to solve such problems through cooperation, co-optation, or integration. These negotiating strategies could reduce conflicts and decrease uncertainty, but then often at the expense of creativity and innovation in the project team. This, in turn, frequently means delayed implementation and/or reduced result [25].

**Hypothesis C:** Projects that act in the negotiating environment are dependent on resources that others possess. In order to obtain the resources required such projects have to elaborate cross-boundary bargaining strategies. Such negotiations often imply compromises that affect the outcome of the project.
The circumscribed environment

The combination of a high vertical uncertainty and a high horizontal uncertainty generates a circumscribed environment. Projects that operate in this kind of environment face ambiguity and uncertainty about the intention behind the assignment and/or a conflict of interests between different stakeholders. Such projects, furthermore, have unclear relations to other organizations that the project depends on for its progression. Hence, projects in this quadrant are exposed to several factors of uncertainty.

When significant conditions for the project are shaped in relations to actors in the environment it is neither appropriate nor practical to think and act as if the project was isolated from its surrounding. Instead, to carry out a project in this environment is deeply political as well as technical; resources are power, and talk and arguments matter. It is therefore not unusual that official project goals in this context are vague and politically correct in order to give legitimacy; to appeal to a common value can persuade different actors to contribute resources. Examples of “everlasting” projects have also been discerned [25] that are caused by hidden power struggles regarding resources in which assigners have different preferences or disagree as regards the direction of the project, although they are still willing to contribute to the project. A way to reduce this immense uncertainty is to have the parties concerned formalize the relation both vertically and horizontally, developing a structure for recurrent control. Formalization may reduce uncertainty, but at the same time it has a restraining influence on new ideas and innovation. When it comes to the vertical relation, the budgetary control for example, has a restricting impact on project performance [50] but the project may buffer such uncertainty by creating slack [51]. Great demand and expectations on horizontal co-operation seem to favor applications of technical tools of planning. When work processes become more standardized, the outcome of the project also tends to be more predictable.

In the Swedish welfare sector there are many kinds of organizations that operate in restricted environments. Several non-profit organizations, foundations and co-operatives are dependent on (project) financing from the public sector. They are so called assignment projects [40]. These assignment organizations carry out projects (both regular and unique ones) as their ordinary activity. Moreover, their assignments often constitute new challenges in society. But, like other operative adhocracies [52] and multi project firms [7], these projects can not carry out their tasks independently of each other. Similar to construction companies and
consultancy firms, they are expected to learn from past experiences to improve their methods, develop new competence and capacity for problem solving. This can be hazardous as it may be difficult to handle both vertical and horizontal demands, and thus to fulfill the market expectations on flexibility and client orientation the way these organizations promise. Circumscribed autonomy can instead lead to a highly standardized problem solving process.

**Hypothesis D:** Projects that act in circumscribed environments are involved in interest-driven communication and politics. Therefore, these projects devote their work mainly to reducing uncertainty. They tend to be organized according to a formal structure and hierarchy in which the continuous work is characterized by a high degree of standardization and has a predictable performance and outcome.

In table 1 we summarize our elaboration of the concept interactional uncertainty and relate it to different degrees of uncertainty and what implication that may have on structure, process and outcome of different projects.

Table 1 in here

**Concluding remarks**

In this article we have outlined a model for analyzing environmental uncertainty. With this model’s two dimensions, vertical and horizontal uncertainty, we have drawn attention to how different degrees of uncertainty affect the conditions of various projects and their accomplishments. Thus, the difference between more and less successful projects might be explained in terms of the projects’ interaction with the principal/s’ behavior and/or organizations that the project is dependent on in order to fulfill its task. The model elucidates that various strategies and the project structure, process and outcome are conditioned by the different relationships of the projects. With this model we can contribute to the growing discussion about the environments of projects and contextual uncertainty [2, 3, 28].

However, it is important to stress that uncertainty changes over time and that actors in different kinds of projects can influence uncertainty through their behavior. Hence, interactional uncertainty is not a static concept. If trust between principal and project improves, the image of the project will certainly also improve. This may lead to changing
conditions for and the position of the project. A project can also undertake the opposite journey. Different strategies of interaction can change the resource dependence between project and vital organizations in their environment and in a similar way change the conditions and position of the project. Thus, our model can be used to analyze the direction in which a project develops over time. In this article, we have, however, not proved this line of argument, but we believe it is needed in order to develop useful concepts and models. We would also like to point out that uncertainty can operate on many levels at the same time; interactional uncertainty goes together with both operational and institutional uncertainty. To develop concepts, models and theories that give the opportunity to understand the interplay between these different levels is an exciting challenge for researchers in project management and organizational theory.
References


Figure 1 Project and environment; a distinction of a distinction
Figure 2 A model for analyzing interaction-related uncertainty

Table: 1 The relation between the project’s uncertainty and its structure, process and outcome
The internal logic of project — Operational uncertainty

Environment

— Institutional uncertainty

— Interactional uncertainty

The internal logic of project — Operational uncertainty

Figure 1 Project and environment; a distinction of a distinction

Figure 2 A model for analyzing interaction-related uncertainty
<table>
<thead>
<tr>
<th>Relationship</th>
<th>Degree of uncertainty</th>
<th>Structure</th>
<th>Process</th>
<th>Outcome</th>
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<td>Informal</td>
<td>Task-oriented</td>
<td>Renewal</td>
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<td>High vertical and low horizontal</td>
<td>Decoupled</td>
<td>Paralleled</td>
<td>Ambiguous</td>
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<tr>
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<td>Cross-boundary</td>
<td>Compromise</td>
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<td>High</td>
<td>Formal</td>
<td>Standardized</td>
<td>Predictable</td>
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Table: 1 The relation between the project’s uncertainty and its structure, process and outcome
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