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Abstract

This paper presents a new methodology for studying different accounts of project management practices based on network mapping and analysis. Drawing upon network mapping and visualization as an analytical strategy top-down and bottom-up accounts of project management practice are analysed and compared. The analysis initially reveals a substantial difference between the top-down and bottom-up accounts of practice. Furthermore it identifies a soft side of project management that is central in the bottom-up account but absent from the top-down. Finally, the study shows that network mapping is a promising strategy for visualizing and analysing different accounts of project management practices.

Keywords: project management, top-down, bottom-up, project as practice, reflective practice, standards, network visualization and analysis

Top-down vs. bottom-up accounts of project management practices

Project-based practices are witnessing an increasing popularity in today's society. This has led to an extensive work from practitioners and academics striving for identification and formulation of robust models and theories of project management practices. Whereas much of this research originally have been practitioner-focused, functionalist, instrumental and largely prescriptive and normative, researchers are now beginning to examine what is actually happening in projects (Morris 2013).

In order to understand and leverage this movement Blomquist *et al* (2010) introduce top-down and bottom-up thinking as point of departures in the theorization of practices of project management. They argue that the attention devoted to projects traditionally been organised into two approaches, a structural approach and process approach, both of which tend to adhere to a top-down perspective. Further, they call for empirical oriented studies based on bottom-up thinking.

It is widely acknowledge e.g. Cicmil & Hodgson (2006) and Blomquist *et al* (2010) that the structural approach traditionally has dominated research in project management. This is characterised by being structured, mechanistic, top-down, system-model-based approaches to project management that rely on systems design, tools, methods, and procedures (Blomquist *et al* 2010, pp.6). Furthermore this research tradition have been the primary resource for development of standards and models like PMI, IPMA, Prince2 and lately also within the International Standardization Organization (ISO).

Common to these standards is their ambition to identify and isolate best practices and guidelines by which organizations can design and implement optimal managerial practices. In this way, they seek to identify universal and generic principles within project management and from that create tools for governing the different project processes.

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As professional practitioners (PMI, IPMA, Prince2 and ISO) largely drive the development of these standards, the concept of practice naturally plays a central role. However, the focus on standardization reveals a certain underlying rationalistic and normative perspective on practice which

- views project management as a discipline with a well-defined body of knowledge and certification schemes for ensuring compliance to the standards.
- have a strong focus on tools and methods (representing Best practices) which are independent of context and thereby transferable from one setting to another.

In contrast to the structural perspective, a growing amount of research is focusing on understanding project organizing and management as situated and contextual practices. Initially the discussions were driven by a Scandinavian school of research into project management and temporary organizing (Morris 2013). This includes the special issue of Scandinavian Journal of Management from 1995 (Lundin 1995) with central contributions such as Kreiner (1995) reflections of the role of drifting environments, Packendorff (1995) request for more empirical oriented research and Lundin & Söderholms (1995) formulation of a theory of the temporary organization based on activity rather than organization.

These contributions have propelled a wider interest in understanding projects as processes rather than structures (Lindkvist *et al.* (1998); Legris and Collerette (2006); Sutterfield *et al.* (2006)). According to Engwall (2003) and Blomquist *et al* (2010) projects within this tradition are seen as a social and organized setting on which numerous conceptual organizational theories and organizational behaviour frameworks can be applied and developed. Furthermore, the process perspective has also come to include processes connecting projects to a wider context, thus emphasizing project contingencies and contextual dependencies.

All though the process approach successfully has challenged the structural approach, it is subject to criticism. Thus are Cicmil & Hodgson (2006) arguing that the process approach still tend to favour top-down theorization. In line with this critique Blomquist *et al* (2010) argues that process approaches are mostly concerned with processes defined by the structure, which results in a focus on projects as defined by these organizational structures. Consequently, a more fine-grained analysis of the micro activities upon which the processes are built is sacrificed (pp. 7.).

Following this critique Blomquist *et al* (2010) suggest a pure bottom-up research perspective focusing on what individual actors actually "do" when they work on projects - viewing project as practice.

This approach specifically addresses the previous call for more empirical studies (e.g in Packendorff 1995) believing that project theory would be served by a qualitative approach with a critical interpretive approach that might "generate alternative understandings of what goes on in project practice and how practitioners participate in and manage complex organizational arrangements." in (Cicmil *et al* 2006, p. 36)

Hällgren & Söderholm (2010) argues that this movement should be seen as a part of the wider "practice turn" in management and organizational studies (e.g., Schatzki *et al.* 2001, Nicolini 2012 & Gherardi 2013). These approaches emphasis understanding management and organizing through the unpredictable, embodied, and materially mediated, lifeworlds, of practitioners themselves, rather than through "Best practice" ideals, abstractions and rationalist models of human behaviour. Thereby is the project as practice approach fundamentally different from the structural and process approach (Blomquist *et al* 2010).

The challenges of practice based research is however the requirement for in-depth empirical material. Such studies relies on extensive empirical material usually gathered by participant observations and other ethnographic research strategies (Gherardi 2012).

The different accounts of practices in project management represented in the predominant rational conceptualization of best practice and in the project as practice perspective open an agenda for studying the mutual relations between different project management practices. What are the eventual connections and mutual exchanges of the different account of practices? This is exactly the ambition of this paper.

Stemming contradiction between top-down and bottom-up accounts of practice *the purpose of this paper is to present a new methodology for studying different accounts of project management practices based on network mapping, interpretation and analysis.*

The paper begins by describing the methodology for the study of project management practices. This includes an introduction to network mapping, its different areas of application and the specific analytical strategy for merging top-down and bottom-up accounts of practices. Subsequently two accounts of project management practices are analysed represented by a text analysis of the ISO 21500 standard (top-down) and empirical material from a deconstruction exercise at a workshop for experienced project managers (bottom-up). The analysis concludes with merging the two networks studying the mutual exchanges. Finally, the results of the analysis are discussed and the use of network mapping in the study of project management practices is evaluated.

Methodology: Network visualization and analysis

Network visualization and analysis original stems from math as a part of graph theory but has with the raise of computational power developed into a mature interdisciplinary academic field studying complex networks such as telecommunication networks, computer networks, biological networks, cognitive and semantic networks, and social networks.

According to Graph theory, networks are structures used to model pairwise relations between objects (e.g. Biggs *et al* 1986). A network consists of nodes (objects) and edges (relations). Every edge has two endpoints in the set of nodes, to connect or join these two nodes.

While originally developed within natural sciences network mapping is witnessing an increasing popularity in the fields of social sciences as a strategy and tool for grasping complex empirical phenomena. This is e.g. the case in the rise of social network analysis (e.g. Scot 2012) where focus have been on making invisible work visible paying attention to bottom-up theorization of practices (Cross *et al* 2002).

Even within more post-modern theories like Actor-Network Theory, network mapping and analysis have faced a rising popularity (Rogers and Marres 2002 and Sciences Po Medialab 2013). As Venturini & Guido (2012) puts it:*"Longing for an empirical grasp, but dissatisfied with both qualitative and quantitative approaches, actor‐network theorists searched for the grail of social sciences: the quali‐quantitative methods. In their quest, ANT scholars soon encountered network analysis and immediately recognized an elective affinity with a method that allows exploring millions of associations while keeping trace of each single data point"*(pp. 3).

What particular is interesting here are that these researchers sees network analysis as a strategy for bridging qualitative and quantitative research traditions. This is in line with our ambition of paper to merge top-down and bottom-up accounts of practices. Moreover, we want to take advantage of the statistical methodologies for analysing project practices while at the same time having a qualitative sensibility to practices of project management.

Although network mapping not yet have been applied in the study of "practice" it has proven a successful strategies for studying scientific domains and their development. It has been applied in the study of scientific domains (Boyack *et al* 2005 and Börner 2010) and the internal structures of an academic field as a knowledge domain by the use of references and citations (Chen & Poul 2001 and Raghuram *et al* 2010). Such studies like Raghuram *et al* (2010) aims at (a) understand the intellectual base from which the scientific field has emerged, (b) explore how this field has evolved over time, and (c) identify clusters of research themes that have emerged over time and the relationships between them. Following the line of these contributions, our research aims at studying different domains of practice within project management.

To visualize and analyse networks numerous software solutions are available. In this study, we have used Gephi, which is an interactive visualization and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs. Even though Gephi can handle large networks (i.e. over 20.000 nodes) it demands almost no computer power. Thus it is "like Photoshop but for data," where the user can, visualize networks and data in new and interactive way. It complements traditional statistic tools with the possibilities to discover patterns or isolate structures in new ways. (For more info visit "gephi.org")

In our project, Gephi is used to visualize and analyse the top-down and bottom-up accounts of project management practices in order to identify similarities, differences, and the mutual exchanges. In the development of the networks, we draw upon Hatch & Cunliffes (2006) classical model for understanding organizational theorizing – illustrated in the following figure.

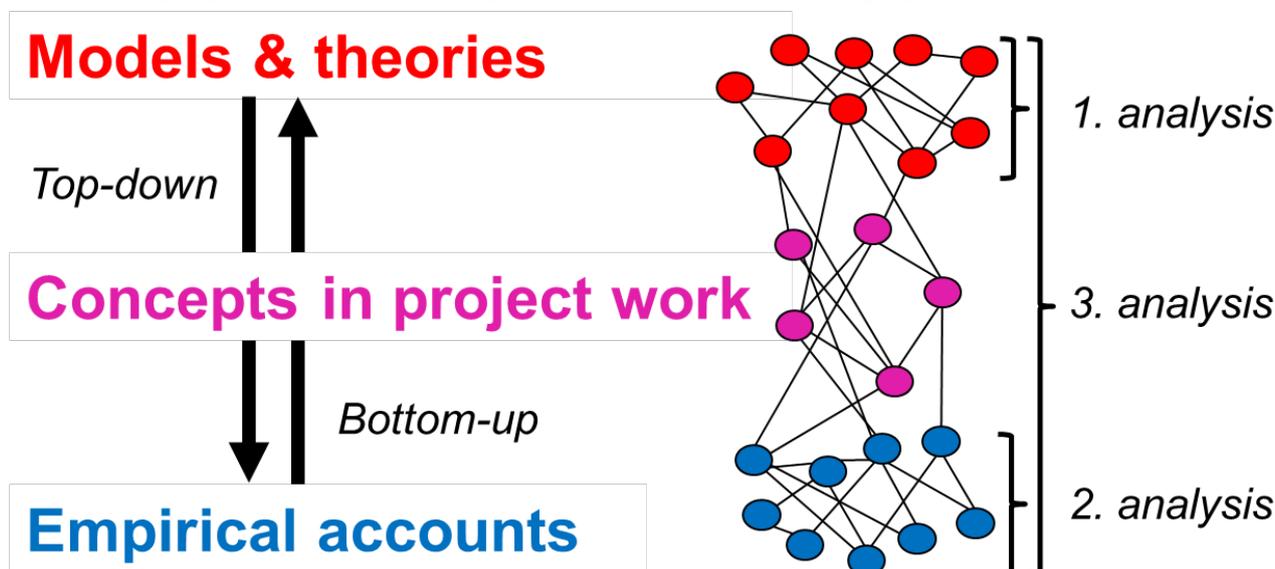Figure 1: Analytical strategy for merging top-down and bottom-up accounts of project management practices (Inspired by Hatch & Cunliffes 2006)

We consider the ISO21500 standard (top-down) as an account of "Models and theories" on project management practices, which by the formulation and organization of "Concepts in project work" (like stakeholders, risk, and goals) develop approaches for understanding and managing project

work. In contrast, the bottom-up account of practices is not considered as theories but as empirical accounts of project organizing and management.

The analysis is realised in three steps. We start out by visualizing and analysing two networks; the first analysis (red) of the top-down account of practice and the second analysis (blue) of the bottom-up account of practices. Subsequently the third analysis merges the two resulting networks enabling the juxtaposing of the different accounts of practices studying collective concepts (Purple) and the similarities, differences, and mutual exchanges.

Each of the networks is visualised using specific algorithms to ensure that the graphs are readable and analysable. Specifically two algorithms have been used. Firstly, the sizes and text of the nodes are determined by the degree of the node (the number connection/edges). Secondly are the network structured using the "Force Altas 2" algorithm, meaning that nodes with more in common are located closer together. Through the visualization process, insights of the relations between and organization of the concepts are created. The visualization are thus directly informing the analysis which falls in two steps. First, the size and centrality of the nodes (concepts) are presented and discussed. This detailed insight subsequently informs a more holistic interpretation of the network drawing forward more broad themes of the networks.

Analysis 1:Top-down accounts of project management practice

As a representation of top-down accounts of practice within project management numerous of standards exists each formulated in a specific institutionalized and cultural settings and with different aims. Some of the most prominent examples are PMI, Prince2, IPMA and ISO 21500.

PMI (Project Management Institute) is originally an American organisation behind The Project Management Body of Knowledge (PMBoK) which is one of the most celebrated project management models. PMBoK contains a description of processes, tools and techniques representing "Best practice" which will help to a successful completion of projects. The term "Best practice" by PMBoK does not mean that every tool and technique could be used in all projects. On the contrary the project manager must for every project evaluate the tools and techniques needed in the specific situation. The project management method of PMBoK consists of 5 process groups, 9 areas of knowledge and 42 processes.

PRINCE2 (Projects In Controlled Environments) was initially developed in 1989 as a UK Government standard for information systems and project management, and has developed to a generic project management method by 1996, and revised through the years to latest version of 2009. The governmental origin has influenced the scope of the standard. Thus PRINCE2 are focusing on documentation and flow of information as a way for controlling initially public and but increasingly also private projects.

IPMA (International Project Management Association) is a European organisation, which since 1999 has defined the IPMA Competence Baseline ICB setting the standards and guidelines for project management in relation to experience, knowledge on method and behaviour. The ICB provides an official definition of the competences expected from project management personnel by the IPMA for certification using a four-levelled certification system. Professional project management by IPMA is broken down into 46 competence elements, which covers 20 technical elements, 15 behavioural elements and 11 elements of contextual competence, within project, programme and portfolio management.

ISO 21500 - Guidance on Project Management, is the result of 31 countries' ISO boards common understanding of project management which were published in 2012 (ISO21500 2012). The ambition of the standard is to *"provide guidance on concepts and processes of project management that are important for, and have impact on, the performance of projects"* (pp. V). Furthermore, it represents a generic framework that can be *"used by any type of organization, including public, private or community organizations, and for any type of project, irrespective of complexity, size or duration"* (pp. 1). The audience of the standard is besides normal project participants and managers, *developers of national or organizational standards, for use in developing project management standards, which are consistent at a core level with those of others* (pp. V). It is thus an explicit ambition of the standard to act as a common platform for the other standards. This is seen in the international collaboration for developing the standard integrating elements and core concepts from all the major standards. Thus, ISO 21500 are drawing heavily on the PMBOKs framework for the internal project processes and knowledge areas. According to Labriet (2013) the ISO 21500 standard is sharing 32 of 39 processes of project management with the PMBoK Guide (PMBoK, 2013). ISO21500 further is inspired by PRINCE2 in the modelling of the organizational context of the project, and finally are the competencies described by IPMAs three categories – the technical, behavioural and contextual competences.

Given ISO21500s ambition of formulating a platform for the other standards, we have chosen this as the top-down account of practice in this study. Furthermore, it represents a condensed body of knowledge (44 pages), which makes the initial network mapping easier.

The ISO21500 has been subject to a textual analysis and modelled in Gephi showing the relations between the central concepts in the standard. The network of ISO 21500 has been developed from the standard: "Guidance in project management" (ISO21500, 2012). The nodes and edges have been chosen according to their perceived significance when reading the standard. The ISO 21500 map shown in figure 2 consists of 21 nodes and 64 edges, each node representing a key concept or process of project management. The graph is undirected and the average degree is 6,7 edges per node.
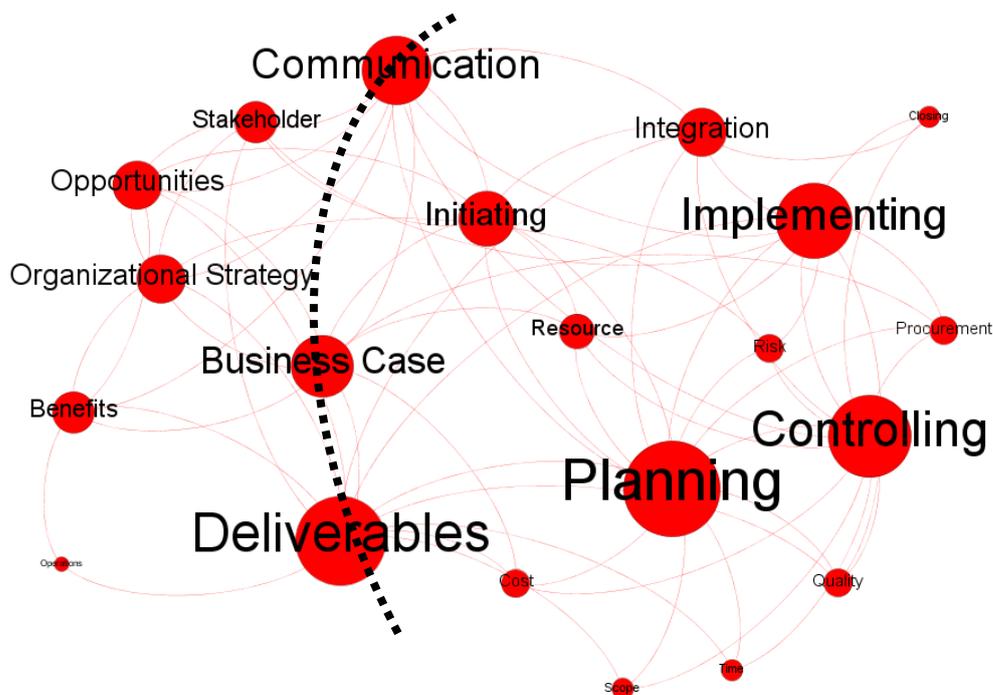

Figure 2: Network of the ISO 21500 standard (top-down account of practice)

The two largest nodes in the network are *Deliverables* and *Planning* both with 13 edges. The following central nodes are *Controlling*, *Implementing* and *Communication* with 12, 11 and 10 edges. This indicates that a project manager firstly has to have a strong focus on the *Deliverables* of the project and good competencies in the fields of *Planning*, Execution (*Implementing*), Monitoring (*Controlling*) and *Communication*. While *Planning, Implementing* and *Controlling* is being a more technical competency *Communication* might be interpreted as a more behavioural or personal competency. *Planning*, *Implementing* and *Controlling* are central concepts are they are core processes of project management according to the standard. The sixth largest node with 9 edges is *Business Case* which is more technical and contextual. The following largest node with 8 edges are *Initiating* which represent the start-up process of any activity in the project and the eight-ten largest nodes with each 7 edges are *Integration*, *Opportunities* and *Organisational Strategy*.

Studying the network, it becomes apparent that the ISO standard encompasses both the internal life of the project and the external organizational context of the project. This is seen in the visibility of the ISO concepts *Deliverables*, *Business case, Organizational strategy* and *Opportunities*. The boundary between the internal (organizational concepts) and external (project concepts) themes is illustrated in the figure by the dotted line placing *Communication*, *Business case* and *Deliverables* as core shared concepts. The centrality of *Communication* and *Deliverables* seems obvious as they represent links between the project and the organizational context where the *Deliverables* are the direct output of the project and *Communication* as the concept, which ensures the continuous coordination of the delivery process.

In other words, the ISO 21500 has a broad view on project management, which might have the potential for aligning different best practices standards. Thus are the organizational concepts addressing the focus of Prince2 while the internal processes are structured the same way as the PMBoK.

Analysis 2: Bottom-up accounts of project management practices

The case the bottom-up accounts of practices stems from a workshop where 18 project managers deconstructed their own project practices. The participating project managers came from various disciplines such as research institutions, creative and cultural intuitions, consultancies, construction companies, architects, transport organization, municipalities and governmental organizations…. a rather diverse collection of backgrounds with different levels of experience. Half of the participants were certified within some of the most popular certification schemes like PMI, IPMA and Prince2.

The workshop was organized based on the ideas of reflective practitioner (Schön 1983, Smith 2001, Crawford *et al* 2006). Where the participants initially were introduced to the model of reflective practices as a development strategy for their own personal practices in contrast to more discipline oriented (top-down) perspectives. In order to minimize the potential bias from existing models and methods of project management a continuum was established between Hard and Soft practices – inspired by Jensen (2009) notions of Discipline and Flip.

The workshop started with a collective brainstorm of the most important themes (concepts) within project management. The result was a list of the following 25 concepts. *Stakeholders*, *Facilitation*, *Planning*, *Communication*, *Role and responsibilities*, *Context*, *Cost*, *Documentation*, *Time*, *Pedagogics*, *Expectations*, *Meetings*, *Politics*, *Motivation*, *Conflicts*, *Risk*, *Implementation*, *Ideation*, *Goals*, *Culture*, *Intuition*, *Knowledge*, *Quality*, and *Sourcing*.

Subsequently the participants brainstormed individually the and wrote Post-its containing words describing what tools, methods and strategies he/she found useful and important in their practice in engaging with projects. This resulted in that each participant had between 5-20 Post-its. The Post-its was subsequent subject to a collective organizing process including the 25 previous identified central concepts. Here the participants had to place each of their Post-it's on the most relevant concept as illustrated in the following picture of the concept (Goal/MÅL).

Figure 3: Illustration of the organisation of tools around the concept Goals (MÅL)

In this collective sense-making process, some of the original concepts were altered and merged and thus new concepts such as work environment emerged. Finally, the participants placed the concepts including Post-It a continuums from hard – soft practices (Discipline – Flip).

After the workshop the Post-its were translated to English and written into a spread-sheet. The notes were categorized in accordance to the original categorization and then reviewed. In total 342 words (Post-its/nodes) were registered. The excel sheet was subsequently imported in Gephi, where links between the central concepts and Post-its were established defining their mutual relationships. In the visualizing process, Force attraction was used, meaning that nodes with more in common are located closer together. The resulting map defines and visualizes the dependencies between all the concepts of project management and their individual importance to the case of the Reflective practice (bottom up).

The network arising from the deconstruction of the project managers' practices is far more complex consisting of more nodes and edges than the network of the ISO 21500 standard. The network, which is illustrated in Figure 4, consists of 362 nodes and 599 edges. Due to the vast number of nodes and edges the network is initially seems difficult to analyse visually, however a detailed examination reveals some interesting findings.
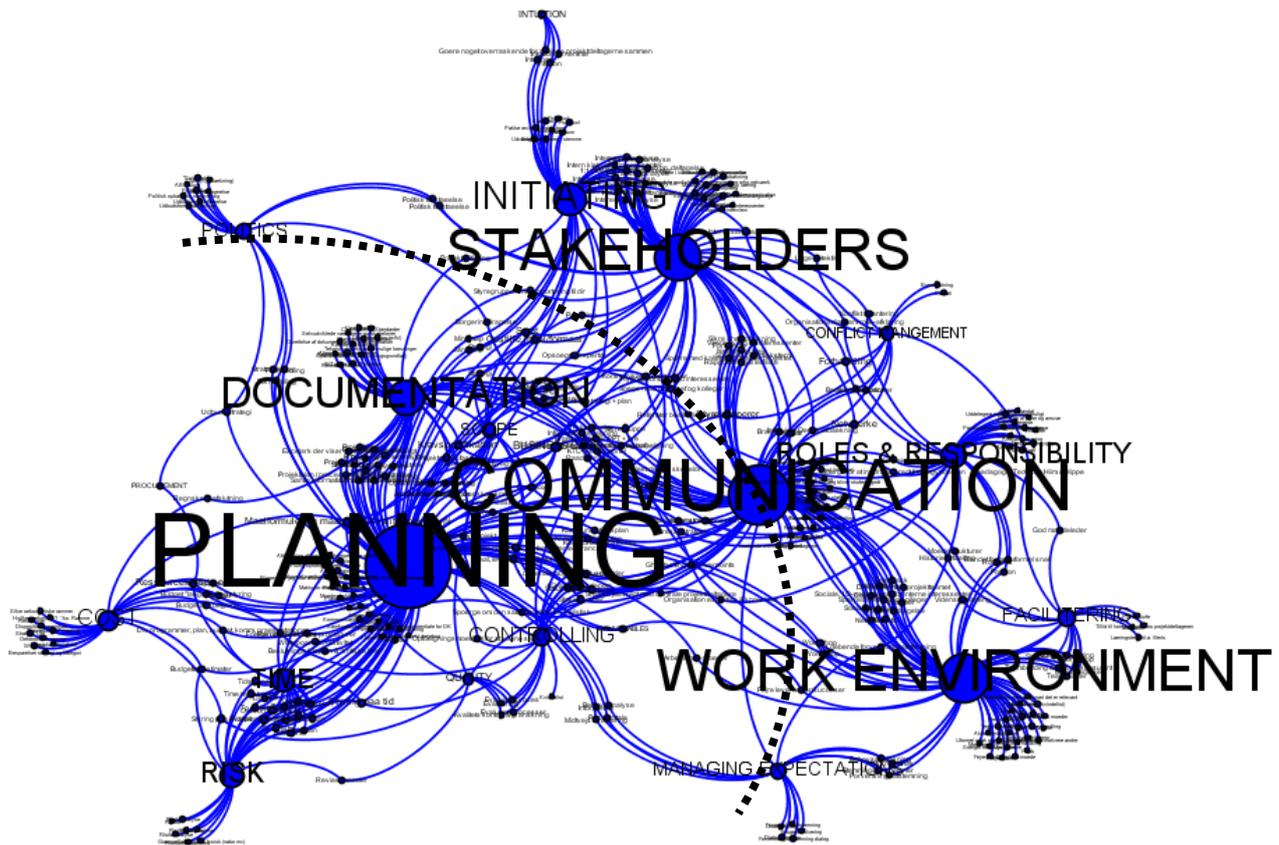
Figure 4: Network of reflective practices (bottom-up account of practice)

The initial analysis of the network shows that the central concepts in the map are *Planning*, *Communication*, *Stakeholders* and *Work environment* where the *Planning* and *Communication* is located close to the center of the network. These categories have the strongest relation to the Post-it's in the network. The next categories *Documentation*, *Scope, Controlling, Business Case, Quality* and *Time* are also very close to the core categories while the categories of *Cost*, *Risk*, *Politics*, *Initiating*, *Intuition*, *Stakeholders*, *Roles and responsibility*, *Facilitation* and *Work environment* are situated in the periphery. An interesting observation is that *Initiating* and *Stakeholders* are highly related.

The picture shows that the largest node with 111edges is *Planning* showing that most of the tools and strategies are associated with the planning of the project and located closely to other the classical project management concepts like *Time*, *Cost*, *Quality* and *Scope*.

The second largest node in the network is *Communication* with 77 edges, meaning that the 18 project managers spend a considerable amount of time dealing with *Communication* in one way or the other.

Work environment covers the nursing of the project team. Examples could be; remember to bring cake to group meetings or buying ice on a particular hot day where the project team is forced to work late. It could also be to make sure, that one is able to leave early on the day of his daughters dance recital.

Top 10: *Planning* 111, *Communication* 77, *Work environment* 60, *Stakeholders* 58, *Initiating* 33, *Risk* 26, *Time* 24, *Cost* 21, *Roles & Responsibility* 19 and *Politics* 15

In a broader perspective, the map of the Reflective practices (bottom up) introduces and highlights a

substantial aspect: *The soft side of project management*. This is seen in the visibility of the concepts *Work environment*, *Management of expectations, Facilitation, Stakeholders, Initiation and Politics*. The boundary between the hard and the soft concepts is illustrated in figure by the dotted line placing *Communication* as the core shared concept. This also seems reasonable as *Communication* is essential for both classical reporting practices (hard) and motivational practices (soft).

Analysis 3: Merging top-down and bottom-up accounts of practice

After having analysed the top-down and bottom-up accounts of project management practices separately, we are now ready to merge the two networks. In order to ease the analysis we have merged the two maps in the following figure showing ISO standard (Red), Reflective practices (Blue) and shared concepts (Purple). Initially one might be struck by the high complexity of the map… but looking closer several interesting aspects arise.
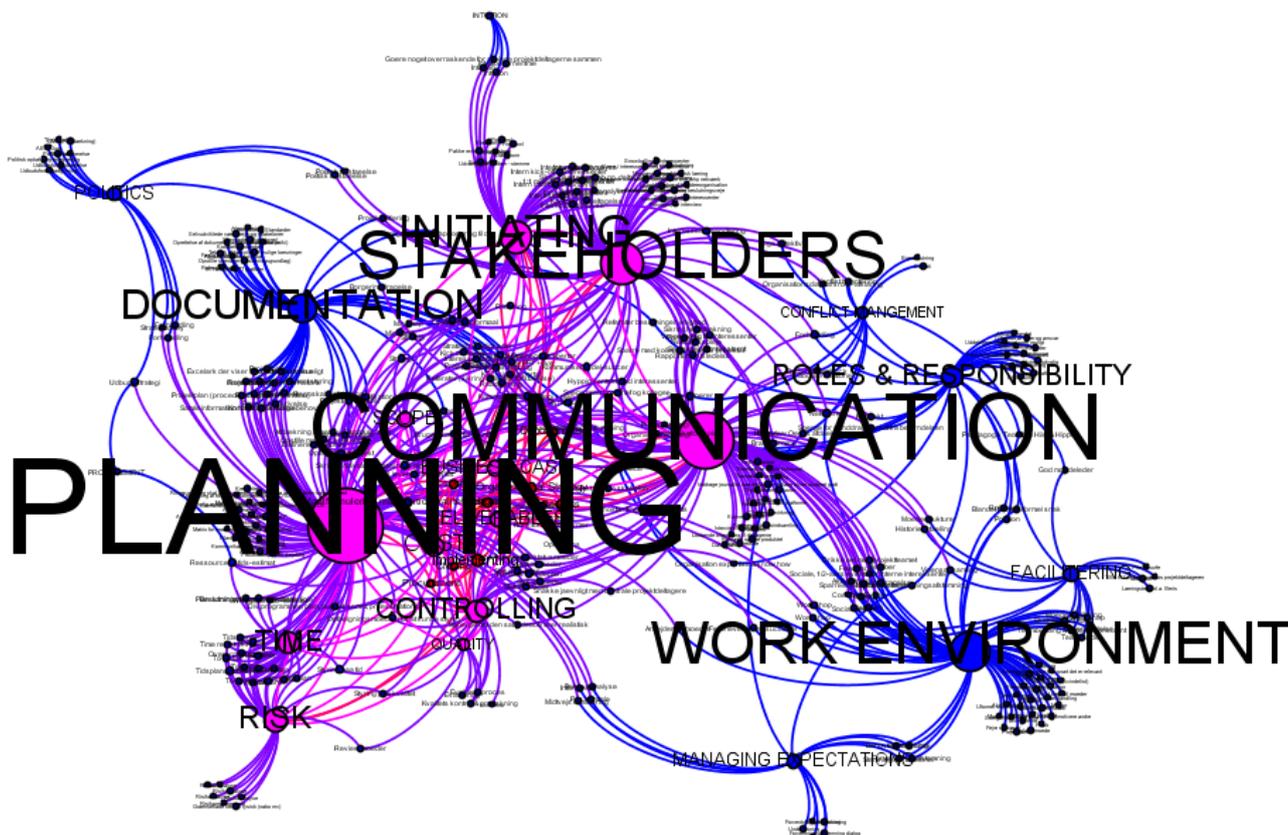

Figure 5: A merged map of ISO21500 (top-down) and reflective practice (bottom-up)

First, it is apparent that the ISO only partly is overlapping with the reflective practice this is seen in the shared (purple) concepts like *Communication*, *Planning, Initiating, Time*, *Cost, Quality*, *Risk* and *Stakeholders*. There might be several reasons for this one being that the maps represent different perspectives. As the map of the Reflective practices is formulated based on project managers own experiences it represents tools and practices for managing the internal life of projects. Compared to this the ISO standard extend the focus of the internal life of the project with an external focus highlighting the organizational context of the project.

Secondly, it is noticeable that the ISO standard is overlapping with the hard side of the reflective practices. This is not surprising since the basic idea of standards is to provide generic tools and

strategies for managing projects. However, since the ISO standard only is a framework and thereby doesn't provide more detailed tools and methods the overlap becomes limited. If we had chosen, some of the other standards like PMI or IPMA the overlap might have been wider.

The most interesting finding is thought not concerned with the hard concepts, but the soft. While the soft side represents a substantial part of the Reflective practices of project management it is absent in ISOs representation of Best practices of project management. This suggests that the Reflective practices are influenced by more than just Best practices.

Discussion

Understanding top-down and bottom-up accounts of practices

While other researchers have studied the relationship between formalized and situated practices of project management e.g. Zwikael & Globerson (2004), Ibbs and Kwak (2000) and Papke-Shields *et al* (2009) the offset of the studies usually is rooted in top-down accounts of practices. Consequently, the studies are potentially failing to grasp the complexity and diversity of bottom-up accounts of practices as highlighted by this study.

The discrepancies between the ISO standard and the Reflective practices suggest that the top-down perspective on practice has its limitations. We cannot reduce project management to simple straightforward guidelines as the Reflective practices seems highly context dependent, dynamic and with a substantial element of improvisation. In order to understand this process and frame the findings of the paper we suggest a re-reading of the figure provided by Christensen & Kreiner (1991).
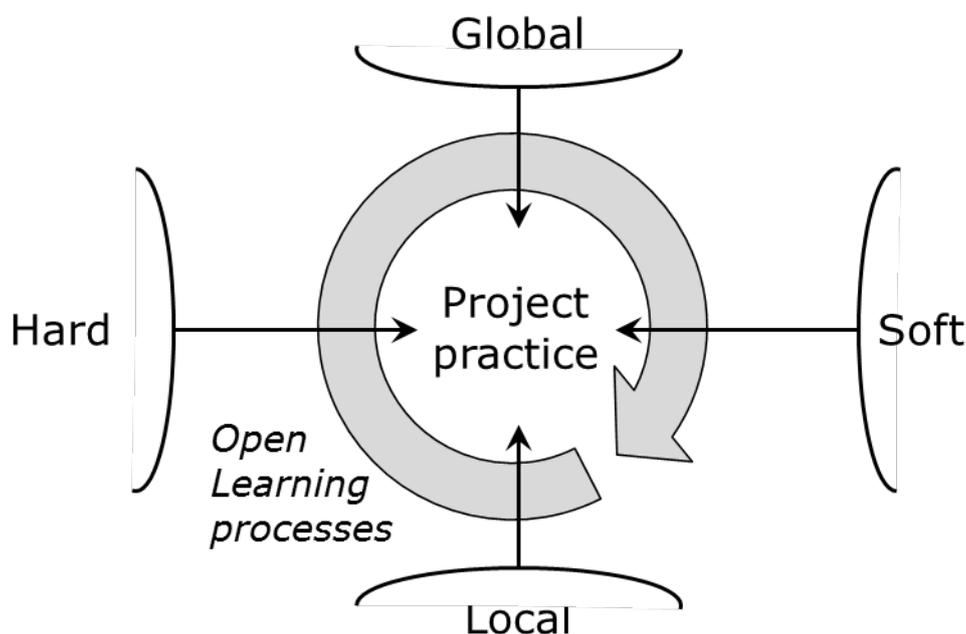

Figure 5: The influences of project management practices (Inspired by Christensen & Kreiner 1991)

In the original figure, the practices of project work (at the center) should be found in the intersection

between Rational planning and control (left), Open Learning processes (right), Institutional influences (top) and Context (bottom).

The figure helps us to shed light on the background for the discrepancies between the Standard and Reflective practices. The global and local context of the projects influences the selection of strategies for managing the projects. Compared to the local context of the project the global context represents the broader societal setting represented by the institutional influences. The developed strategies might draw upon Hard methods and tools as represented in the different standards and included in the original figure through the perspective of "Rational planning and controlling", but these do not represent the only source. This become especially apparent in the Soft concepts where "Women's charm", "Persuasion", "Beer drinking" and "Cake baking" are applied in the process of managing the projects. In fact, the diversity of the group encompassing both certified and self-thought project managers suggests that some of them did not even use some of the basic classical project management tools. Moreover, with some of the strategies it appears that the practice of project management requires the investment of the personality of each individual project manager. Thus, a project management practice might be described as an improvisation where project manager invest his/her competences and personality in the situated performance of the project. This improvisation adds a learning dimension to development of the practices. Through improvisation, the project manager will experience what works and does not work in the specific contexts. These experiences will not take the form of formal learning processes, but will be an embodied and tacit dimension of the practice. This is represented in the original figure by the Open learning processes, which we have integrated in the center of the figure, as it constitutes the core principle by which project work is practiced. Thus is our study suggesting going along with Christensen and Kreiner (1991) and Kreiner (2012), that actual project practice is better understood as a learning process, and in this sense, knowledge about the project emerges during the project – it is never perfect.

The role and relevance of standards

This questions the role and relevance of the project management standards. On the platform of scientific management standards originally has been instrumentalised ways of working – omitting the role of context. This all for good reasons since the context here was stable, well-known and thereby un-influential and irrelevant. However, the role context has in postmodern societies changed dramatically. Thus, project managers today are faced with a substantial amount of uncertainty, complexity and ambiguity (Kreiner 2012).

This has influenced the way standards of project management are articulated. Thus, standards are today acknowledging the role of the context (Morris 2013). As an example, PMI and ISO are specifically mentioning that the processes of project management should be tailored to each individual project. Another example is IPMAs specification of a set of project management competences related to the management of context of the project.

Latest the importance by context have been acknowledge in the traditional Project Management community like Besner (2012) and Besner & Hobbs (2008). They set out to investigate whether project management practices is generic or contextual. Based on responses from 750 experienced project managers on a questionnaire, and a categorization of the projects into IT, engineering and construction, and business services projects, they identified a common pattern of practice across the project management community. The most often and the least often used tools are almost invariably the same regardless of project characteristics and contexts. They thus find that project management practice, therefore, has a strong generic component (pp. 31).

The limitation to their study is that they identify themselves 70 tools and techniques. This research setup has not been able to capture strategies that are more personal. In a way you could argue that they just studied well-established tools from the best practices repertoire and thereby un-intently reproduced top-down approaches failing to embrace more local and personal oriented tools and techniques (bottom-up).

The discrepancies further question the effect and relevance of the standards. This particular seems important given the wide variety of soft management tools and strategies which are a part of the repertoire of the Reflective practices but absent from the ISO Standard. One could argue that the reason why the soft concepts not are integrated in the standard is that it relates to the cultural context of the project. Even though this is a valid interpretation, it might be unfruitful just to categories the differences as contextual bias since some of differences also have the possibility of informing future practices of project management. In this way network mapping highlights potential areas of upcoming novel theories of project management.

The relevancy of network mapping

The overall purpose of the paper has been to introduce network mapping as a method for studying different accounts of project management practices. After having finalised the analysis of the ISO standard (top-down) and the reflective practice of a group of project managers (bottom-up), we will discuss the relevancy and challenges of network mapping.

The findings of the analysis are in line already existing research. The partly overlapping networks of the ISO standard and the Reflective practices shows that there exist a common structure within project management practices. E.g. Besner & Hobbs (2008) also identify this. Furthermore, Besner & Hobbs (2008), Christensen & Kreiner 1991, Engwall (2003), Morris (2013), identify the important role of the context – just to mention a few.

Usually it is disappointing to discover that other researchers already have published the findings of one's research. However, the similarities suggest that network mapping works as an analytical strategy for studying different accounts of practices.

The experiences of working with network mapping of the present research cover both benefits and challenges. Concerning the benefits, network mapping
- is visual. Whereby it becomes easier to analyse and communicate the practices of project management.
- is relational, is allowing to work with complex relations between concepts of project work potentially escaping the classical dualisms.
- can be used for studying relations between components of practices. Relations that might be acknowledged by either practice or theory.
- opens a new repertoire of research methods combing the benefits of both qualitative and quantitative research traditions. One example could be the use of Modularization as a methodology for identifying areas of the network with a more dense structure and thereby illuminating areas of a practice with more in common.
- Have a strong community to support the development and application of the tools like Gephi.

Concerning the challenges, network mapping

- require experiences in handling, presenting and analysing data. Competences within these areas are not easily developed but entails hours of working with data and tools like Gephi.
- is seducing. The nice looking figures do not guarantee that the data have been collected and handled in an ethical and rigorous way.

Conclusion and perspectives

The purpose of this preliminary research has been to develop a new methodology for studying different accounts of project management practices based on network mapping and analysis. In order to test, the methodology and the same time provide insight in project management practices two different accounts of practice have been analysed in order to study the similarities, differences and mutual exchanges. The first account representing top-down approaches for understanding project practices was represented by the newly published ISO 21500 standard. The second account representing bottom-up approaches, was based on the deconstruction of the practices by 18 experienced project managers drawing upon the concept of the reflective practitioner. The result show:

- There are substantial differences between the ISO standard and Reflective practices
- Planning and Communication where in both cases placed in the center of the maps illustrating the centrality of the concepts in project management.
- A soft side of project management is further revealed as central in the Reflective practice but absent from the Standard. Although the soft side might be interpreted as contextual bias, it also represents avenues of further development of new Best practices.

Reflecting on the developed methodology in this paper, the perspectives of using network analytical tools in the study of project management are numerous:

1. First of all, the analysis shows that it is possible to visualize practices of project management in a way which can be subject to close examinations abstracting central concepts of project management and their internal relations.
2. Secondly, it is applicable in the study of best practices like the ISO 21500, PMBoK, PRINCE2 and IPMA, potentially identifying overlap (similarities and differences) between standards.
3. Furthermore, it might be used as a strategy for identifying overlap (similarities and differences) between the standards and actual practices.
4. Finally, it might be used for identifying new areas of research, mapping current and past research.

Beside these applications, the proposed approach also enables researchers to establish dynamic maps by the use of web-crawlers. Thus, an application could be to analyse the discourses of project management around different central organizations like Prince2, PMI, IMPA and ISO. Such analysis could also illustrate the historical development of these organizations and their relations.

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