Chapter 8
Assessing Team Coordination Potential

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Abstract Unlike previous chapters that offer measurement approaches for the process or outcome of coordination, this chapter addresses the context and organisational setting in which team coordination occurs. The organisational design presents both opportunities and constraints for teams to manage themselves. This chapter describes a methodological approach for analysing team coordination potential within the organisational context. Focussing on teams in product innovation, a set of five criteria has been developed: (1) autonomy and local control; (2) involvement in problem setting; (3) feedback; (4) team self-regulation; and (5) organisational support for innovation. The actual working conditions are assessed using semi-structured interviews and observations of teamwork.

8.1 Introduction

This chapter proposes a framework for analysing team coordination in terms of constraints and opportunities of the organisational setting. This means that the emphasis is on assessing the external conditions for team coordination rather than team cognition or behaviour. In this, the chapter follows the methodological approach of job analysis as it is used in work psychology for the assessment, evaluation, and design of jobs (Hacker 2003): An external specialist assesses to what extent a given job offers the potential for self-regulation and learning. While most job analysis methods focus on the individual, this approach specifically addresses the potential for team coordination. If the organisational context shows a high potential for team coordination, members are enabled and empowered to coordinate who does what

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among themselves, making it more likely that teams will engage in explicit and implicit coordination behaviour. If the organisational context for team coordination potential is low, team members may still try to liaise with others, but they are likely to encounter obstacles in making contact or will be told to mind their own business or follow instructions. In the following example, the organisational context offered high coordination potential for certain aspects: The team members worked co-located in one open-plan office, which enabled frequent interactions and easy access to the same information about their project. Roles and responsibilities were decided within the team with little interference from management. The team proposed solutions for the project and campaigned for a more appropriate software system. When the company initially purchased only one license, team members decided to implement shift work to make best use of it until eventually the company agreed to buy more licenses. Internally, this team managed to address the challenges quite well. However, for the strategic directions of the project, the team was not authorised to make decisions nor did it have access to relevant information. Instead, their task and information input was dependent upon other departments that placed contradictory requirements on their work. This made it virtually impossible for the team to coordinate the more strategic aspects of their work.

The method described in this chapter was developed for the domain of product development, in other words, a context in which 'innovation' is part of the primary task. This domain was chosen because today's complex products are rarely the outcome of individual efforts: Although great inventions are often associated with the names of individuals, innovating is typically a collective process (Hargadon and Bechky 2006). Therefore, innovating typically requires a substantial amount of team coordination and cross-functional collaboration (Edmondson and Nembhard 2009). Product development is also an open-ended task that involves uncertain processes and experimentation (Eisenhardt and Tabrizi 1995), which means that teams can shape the scope of their activity to a larger extent than in other domains such as aviation or medicine. This also means that if innovation teams are granted a high degree of decision latitude, the form of team coordination can largely depend upon the team itself. Figure 8.1 illustrates typical outcome variables for this domain: A high degree of team coordination in innovation projects should lead to better integration of different knowledge sources, improve feasibility and viability of the product, and reduce time to market.

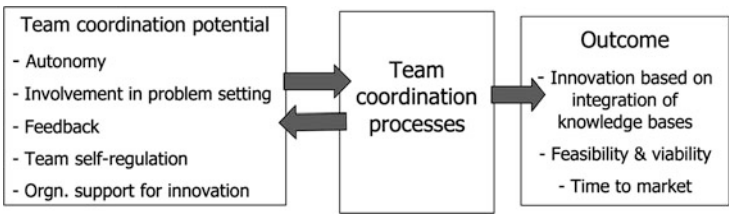

Fig. 8.1 Five criteria for team coordination potential

The chapter is structured as follows: Sect. 8.2 introduces five criteria that will be used to assess team coordination potential as it relates to organisational context and explains how these were derived from the innovation management literature and theoretical concepts in work psychology. Then the procedure for collecting and analysing data via interviews and observations is described in Sect. 8.3. The use of the method is illustrated in Sect. 8.4 with case descriptions from a field study. The chapter concludes with a discussion in Sect. 8.5 of the contribution and limitation of the method and possible transfer to other domains.

8.2 Criteria for Team Coordination Potential in Innovation

The criteria for organisational context factors that support team coordination in innovation were developed on the basis of general models of human-centred job design, on a model of collective self-regulation in teams, and the organisational literature on structures that enhance innovation. While these are different streams of literature, they provide converging arguments for conditions under which team coordination should be both more likely and more effective.

The criteria for human-centred job design specify how tasks should be designed to promote both efficiency and human well-being at work (Hacker 1995; Warr 1994), originally on the individual level but more recently also on the team level (Weber 1997). The criteria are based on empirical studies (Patterson et al. 2004; Wall et al. 1990) and on action regulation theory (Frese and Zapf 1994; Hacker 1994, 2003). The underlying model is dialectical: It proposes that one's work environment provides affordances and constraints that influence what people perceive they can and should do, but people also shape and re-define constraints and opportunities (see Fig. 8.1). For an overview of methods, see Dunckel (1999).

In order to adapt the method to the domain of product development, the innovation management literature was consulted regarding appropriate organisational structures to enhance innovation (Brown and Eisenhardt 1995; Fagerberg et al. 2005). There are conflicting theories that depict innovation either as a chaotic process that requires creative freedom, or as an extraordinary phenomenon in otherwise inert organisations that requires managerial vision and intervention. This chapter draws on Dougherty (2008), who argued that from the perspective of structuration theory (Giddens 1982), these contradicting streams of literature are two incarnations of fundamental principles on how organisations function: social action and social constraint. Arguments from Dougherty's (2008) review and findings from interviews with product developers (Lauche 2001) were used to specify the generic criteria for team coordination potential for the domain of product innovation. This resulted in a set of five criteria for team coordination potential (see Fig. 8.1), which will be described in more detail in the following sections.

8.2.1 Autonomy

The first criterion and prerequisite for team coordination potential is autonomy or local control: being able to monitor and influence one's work process effectively. Autonomy has been conceptualised as an antecedent for accepting responsibility and ownership of the task (Frese and Zapf 1994; Hackman and Oldham 1974). More local control makes work systems more effective because problems can be remedied faster (Wall et al. 1990). In the innovation literature, the same idea is expressed as 'energising work by directly resourcing innovation' in terms of access to others' time and attention, control over application of one's own expertise, and access to multiple options for problems (Dougherty 2008). This means that designers can make or influence decisions on the innovation strategy and product portfolio, are involved in shaping the way innovation is managed, and are included in the selection of strategic partners.

8.2.2 Involvement in Problem Setting

This second criterion refers to involvement in identifying and defining which problems should be solved and which aims are to be achieved. This criterion appears as goal setting and planning in the action regulation literature (Frese and Zapf 1994; Hacker 2003) and is frequently addressed in job design assessments. In the product innovation domain, the notion of planning and goal setting has been further specified as involvement in problem setting for the context of product use and strategic intentions (Lauche 2005a, b). From a psychological perspective, this means that innovation teams can access or obtain information about the innovation task in order to generate an appropriate conceptual representation regarding the intended outcome (Oschanin 1976). This conceptual representation serves as a motivator (a 'vision' of the new product) and as a criterion against which the outcome is checked. The concept is similar to that of mental models, which has also been used to explain how design teams achieve coordination (Badke-Schaub et al. 2007). For innovation work, information about the object of innovation (e.g. market demands and the context of use, emerging technological options, the strategic direction of the company) is vital to avoid solving the wrong problem. Designers need to understand the context of use to make valid assumptions regarding how this context may change with the introduction of the product they are designing (Lauche 2005a, b; McCarthy 2000; Schmidt 2000). If the information that designers have access to is inappropriate or incomplete, this can result in product failures or product uses different than anticipated, as assumptions about the market and/or product were based on inappropriate or incomplete information. Very often, product developers only receive a design brief with second-hand information from marketing, which makes it difficult to empathise with the prospective user, as the findings from user studies are typically not communicated in a form that conveys the richness of data (Postma et al. 2009). Preferably, product developers should be in a position to actively obtain information by engaging in user observation, desk research, and negotiation about the innovation strategy.

8.2.3 Feedback

Feedback as a criterion for team coordination potential is considered important in virtually all models of job design (Warr 2002). It is defined as knowledge about outcomes, which includes test results, performance indicators, and peer review. Feedback enables monitoring of achievements and adaptation of strategies and mental models (Hacker 2003; Hackman and Oldham 1974). For product innovation, early feedback can be used to mitigate the risk inherent to any innovation by testing the feasibility and viability of concepts. Feedback can help to define the scope of an innovation project and act as an opportunity for corrective action and learning. Limited testing facilities, late or insufficient critical review from colleagues and management, and slow feedback from production and sales can delay and hamper innovation projects. However, if product developers engage in field testing and are in a position to obtain feedback from marketing, production, and management during the innovation process, this should shorten the time to market and enable organisational learning within and beyond specific projects.

8.2.4 Potential for Team Self-Regulation

The fourth criterion explicitly refers to the potential to act and self-regulate as a team above and beyond individual autonomy. In action regulation theory, self-regulation in teams has been conceptualised as collective action regulation (Weber 1997), specifically referring to the need to connect individual autonomous agents. Zölch's (2001) concept of interlacing of actions addresses the coordination needs that arise between semi-autonomous teams, which should also be the responsibility of the teams if the company does not want to revert back to a hierarchical structure. Similar concepts for white-collar work can be found in the organisational literature under the concept of 'communities of practice' (Lave and Wenger 1991). Organisations that treat their members as a community of self-managed, competent practitioners can strengthen formal institutions of professional practice and create a basis on which teams can innovate (Dougherty 2008).

As a criterion for the assessment of the organisational context relative to how it either supports or hinders team coordination potential, this means that with a high degree of team self-regulation, members have the possibility and authority to collectively decide about the way they manage their work. This includes the planning and allocation of work, the selection of team members and decisions about roles, internal coordination and leadership functions, as well as boundary negotiations with other teams or management. Innovation is not treated as a sequential process with tasks carried out in isolation, as the high degree of self-regulation enables the team to address innovation from a cross-disciplinary perspective and to resolve technical problems or delays as they arise.

8.2.5 Organisational Support for Innovation

As technology and science studies have shown, the myth of the genius inventor is typically an insufficient explanation for innovation (Miettinen 1996). Product innovation cannot be achieved on an 'individual' basis if the organisational context is not supportive and there is insufficient interdisciplinary communication and understanding for design (Edmondson and Nembhard 2009; Lauche et al. 1999). The criterion of organisational support for innovation has been conceptualised as the commitment to and attributed importance of innovation that senior management show both in their interaction with product developers and in their allocation of resources (West 2002). A recent meta-analysis confirmed support for innovation as one of the strongest team-level predictors of innovation (Hülsheger et al. 2009). While most studies measure support for innovation as individual perceptions in a survey, here it is treated as an assessment of the objective context conditions in the organisation. Under high-support conditions, innovation projects are appropriately resourced and their strategic alignment and performance receive managerial attention. Under low-support conditions, developers will be fighting for resources, which means that they have to find time for innovation work amid their daily workload and may encounter interruptions, time pressure, and multi-tasking (Hacker 1995), which can be detrimental to good design practice.

8.2.6 Effect of Criteria on Coordination Processes

Ideally, teams should find themselves under supportive conditions for all five criteria in order to coordinate their innovation efforts successfully. For unfavourable conditions, there are specific detrimental effects; however, to a certain extent these can be compensated for by other criteria. For instance, a lack of organisational support can be compensated for by a high degree of autonomy, high involvement in problem setting, and sufficient feedback. In this case, teams should show a high degree of coordination within the team and limited coordination with the rest of the organisation, akin to the situation at most universities. A lack of team self-regulation tends to lead to less frequent team coordination, as this is either not possible or not considered necessary in the organisation. This condition of less frequent team coordination could still lead to acceptable outcomes in cases of low task interdependency but it will create problems and delays at the interfaces of more complex products. To some extent, involvement in problem setting and feedback can compensate for each other: If team members have access to a broad range of information sources in defining the scope of their task, they are less dependent on feedback; and if the sources of feedback are plentiful, the team can pursue a more exploratory approach and compensate for the lack of involvement in goal setting. A lack of involvement in problem setting has the tendency to reduce the scope and amount of coordination, as there are fewer issues that require coordination. A lack of feedback should not affect coordination as such but will make the team less

adaptive. A lack of autonomy should reduce team coordination quite drastically, as there is nothing to coordinate: Members simply await their respective orders.

8.3 Description of the Methodological Approach

The following section explains the methodological approach for assessing the potential for team coordination as affected by the organisational setting. Similar to other instruments for assessing organisational conditions (Dunckel 1999), the approach consists of expert ratings based on a combination of observations and interviews with job holders. Observable behaviour and verbal statements from interviewees are treated as indicators for underlying conditions, and it remains the role of the researcher to make a judgement. The theoretical model is normative in the sense that it presupposes certain organisational conditions to be more favourable for team coordination and innovative outcomes. The assessment can therefore be expressed as an ordinal scale, but one should be aware that the data are essentially qualitative and refer to types of conditions.

What kind of data should be collected, and how should it be analysed?

8.3.1 Data Collection

As is the case for most job analysis methods, the assessment of team coordination potential requires the presence of the researcher during periods of normal work as a non-participating observer. The most suitable time samples are team meetings during which the team works on an innovation project, such as defining the scope, generating ideas, consolidating options, reviewing the progress of a project, and making decisions. The researcher should take notes on the five criteria (see Fig. 8.1) without interfering with what the team does.

If permission can be obtained, the ideal way is to capture the team interaction on video or audio to allow for a more detailed analysis and consolidation of coordination potential ratings within the research team. However, in the domain of new product development, negotiating access can often be a challenge in itself, as the content of the work is commercially sensitive. Field observations in this area therefore require rapport building and professional conduct on behalf of the researcher to establish trust. It is also advisable that the observers are sufficiently familiar with the domain to be able to understand and make sense of the technical discussions. We typically worked with interdisciplinary teams of one domain expert (designer or engineer) and one psychologist.

Since transcribing and analysing video or audio recordings is a very time-consuming process, it is useful to also take field notes to generate an overview of longer meetings and then decide which passages to analyse in more detail. It has proven useful to record notes on a standard form that tabled time, actors, and what they said or did, and also contained a separate free-form space for observer comments (Lauche et al. 2001) (see Fig. 8.2).

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Time	Who	Content, verbal interaction	Memos, meta-Observations

Fig. 8.2 Standard form for recording verbal team interaction and notes for further analysis

Observing overt behaviour typically provides some evidence for assessment, but other aspects may be difficult to observe or may not occur in a given situation. It is therefore common practice in job analysis to complement the observation with a semi-structured interview. Semi-structured interview guidelines with possible response categories can be found in Lauche (2001). The data can be further complemented by analysing documents and meeting minutes and by using questionnaire scales such as the scale for collective action regulation in innovation teams (Weber and Lauche 2010).

8.3.2 Data Analysis

As is typical for qualitative research, the analysis for team coordination potential is an iterative process of forming assumptions based on part of the material and consolidating these assumptions through a systematic analysis of the remaining material. The researcher's notes will form the starting point to determine which parts of a meeting should be analysed in more detail. The most efficient form is to first map out the overall process, decide which sections contain the most relevant information on team coordination (e.g. initiation for new phases, critical situations, allocation of tasks at the end), and then proceed with detailed analysis. The selected parts are then reviewed from the video recording, again taking notes for evidence of the five coordination potential criteria. If the coordination potential assessment forms part of a larger study that also addresses the content of team interaction, it is

advisable to transcribe all relevant video and audio recordings in order to make them more accessible for further analysis and discussions within the research team.

The transcripts are then coded using the five criteria for team coordination potential in innovation work (see Fig. 8.1). Each criterion is rated on a scale of 1–6 based on a description of three levels: impoverished, conventional, and expansive (see Table 8.1).

Impoverished conditions refer to organisational conditions that make it difficult for teams to coordinate their innovative activities due to lack of managerial support, unavailability of necessary information about threats and opportunities, or shortage of resources. Innovation is not valued, and product development is not an established organisational function. Anyone attempting to innovate under impoverished conditions will not be in a position to obtain an adequate picture of the requirements for a new product and its viability, and the impoverished nature of the organisational culture will also not be supportive of anyone spending time to interact with others to scope a project or generate ideas.

Conventional conditions refer to a traditional functional structure with a departmentalised, Tayloristic work organisation. The main focus of the organisation is on the production and reproduction of existing strengths. New products are developed as part of a strategy that is handed down to the designers without any involvement of their expertise. Marketing and production only become involved as part of codified procedures and a sequential execution of projects. This type of organisation can produce new products but is less likely to engage in radical innovation or expand its capability to innovate.

Expansive conditions are based on the ideas of integrated product development (Ehrlenspiel 1995) and support and empowerment for innovation (West and Farr 1990). They enable designers to expand and shape the innovation activity, resembling the idea of expansive learning (Engeström 1987). Designers and managers share a vision of expanding the scope of their business, and the product development process is managed as the trajectory for the future of the business. If required, new technology is developed in cooperation with a network of suppliers. Product developers closely interact with marketing and production specialists and are actively involved in strategic discussions to identify threats and opportunities for innovation. Expansive conditions have more potential for radical innovation, as the scope of innovation itself can be transformed.

8.4 Illustration of Method with Case Descriptions from a Field Study

The application of the proposed assessment methodology will be illustrated using three examples from a field study (Lauche and Erez 2009). The cases broadly represent the ‘impoverished’, ‘conventional’, and ‘expansive’ levels of team coordination potential explained in the category system in Sect. 8.3.

Table 8.1 Five criteria for coordination potential plus definitions of ratings

Autonomy and local control	1–2 Impoverished: lack of autonomy and control and undue dependence on other actors that result in slow progress and feelings of helplessness. 3–4 Conventional: control and decision latitude over one's own work but little influence on the overall project or strategy. 5–6 Expansive: control to make or influence decisions on innovation strategy and product portfolio, involved in selection of strategic partners, and required to shape the way innovation is managed.
Involvement in problem setting	1–2 Impoverished: no involvement in problem setting, information about requirements inappropriate or incomplete. 3–4 Conventional: designers receive a brief and work out detailed specifications from the information they are given. Information on the context of the product is handed down to them from other actors such as marketing representatives. 5–6 Expansive: designers involved in negotiation of innovation strategy; have access and time to gather or actively obtain information on user needs, market developments, strategic intentions, technological developments.
Feedback	1–2 Impoverished: limited testing facilities, late or insufficient critical review from colleagues and management, and slow feedback from production and sales. 3–4 Conventional: some information on the fulfilment of specifications as part of the design task (testing, simulation) but limited feedback after handover (production problems, sales figures, customer feedback). 5–6 Expansive: testing facilities and active involvement in field-testing, access to feedback from users, marketing, production and management during the innovation process.
Team self-regulation	1–2 Impoverished: teams do not have the opportunity to communicate or authority to decide on how they coordinate their work; problems such as role duplication and unclear responsibilities remain unresolved. 3–4 Conventional: teams work according to a waterfall model where they hand over the work sequentially. The organisational division of labour partly replaces the need for direct communication, yet it leaves little opportunity for an integrated product innovation approach and any delays cannot be compensated for. 5–6 Expansive: innovation seen as a task that necessitates team interaction for content of product and detailed planning of project; empowerment of teams to self-regulate and maintain a professional community.
Organisational support for innovation	1–2 Impoverished: New Product Development not established as a function, importance of product innovation not recognised. Designers have to find time for innovation work amidst their daily workload and constantly fight for resources. 3–4 Conventional: established product development function but no specific support for innovation and no involvement in company strategy on innovation. 5–6 Expansive: innovation seen as essential for company strategy, commitment from senior management, understanding for the needs of R&D; proactive investment of resources during the early stages of product innovation.

8.4.1 Example 1: Impoverished Innovation Coordination Opportunities

The company produced customised investment goods for the manufacturing industry, and a new generation of machines was developed about every 5 years. While the engineering work was carried out in-house, the sales organisation was located off-site in two different locations and the R&D of new machines was outsourced. As part of a strategy change, the company aimed to establish product innovation as an internal competence and head-hunted an R&D team from another company. As a result, the team members already knew each other but were new to the organisational task. Figure 8.3 shows the rating for all five coordination criteria: 1 is the lowest rating, and 6 is the highest.

Autonomy was rated as 2: The team had complete control regarding its internal organisation but could only attempt to influence decisions about the scope and timing of its project, requirements, budget, and support. It prepared 20 different concepts, but the choice was made by a review team on the management level. Team coordination was focussed on the technical aspects of the product.

Involvement in problem setting was rated as 1. The strategic aims were defined by the market organisation and the team was not in a position to question or amend the requirements because of a lack of information and power. The physical distance to the market organisations hindered coordination. As the lack of information was not something that the team itself could compensate for, it concentrated its coordination efforts on explicating open questions. However, some major issues were still left undefined by management at the end of the concept stage.

Feedback was rated as 3. The team received feedback from the management review and from semi-annual technical sales meetings. It also made obtaining feedback part of its own coordination efforts: Members were tasked to perform

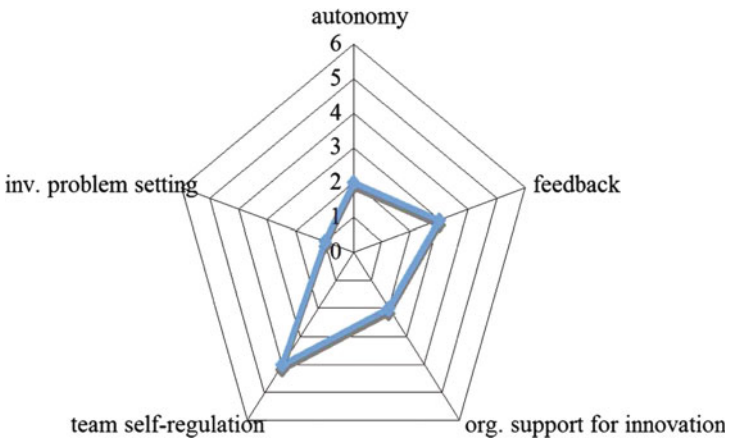

Fig. 8.3 Rating for team coordination potential for impoverished example

numerical simulations and tests of crucial components, which the company supported by allocating the required funds for a prototype.

Team self-regulation was rated as 4, as it was high within the newly recruited team but clearly restricted to internal task allocation. The team worked co-located in one room and resorted to the tried and tested roles it had acquired beforehand in order to meet the deadlines. Team members' interactions with other parts of the company were limited, and only the team leader took part in reviews with management. The company held infrequent meetings with the sales staff and engineers from all three locations, and when they did, the meetings mainly served coordination purposes.

Organisational support for innovation was rated as 2. This was the first attempt to establish new product development as a function. While managers were keen to see the project succeed, the team felt that its requests were not met with much understanding. As the lack of support was something the team could not compensate for with its own coordination efforts, it caused not only delays but also frustration.

8.4.2 Example 2: Conventional Innovation Coordination Opportunities

The company in the conventional example formed part of a larger holding. The task was to develop the next generation of automated special-purpose machines for high-volume manufacturing. Compared to the existing portfolio, the new machine would employ more technological sophistication and provide more flexibility. Also, the sales and engineering process of the new machine type was to be innovated by new tools for customer-driven design. After mainly relying on externals for the concept development, an R&D team was gradually established with newly recruited staff and delegates from other departments for cross-functional input (Fig. 8.4).

Autonomy was rated as 4: The project manager was given a lot of freedom to manage the project and managed any technical issues in liaison with an external design consultancy. The team members contributed to coordination by developing their own guidelines for project management and programming styles. However, for issues other than technology, the team could not coordinate resources and was dependent upon other functions in the company (such as, HR, Sales).

The involvement in problem setting was rated as 3, as it was high for the initial team of externals but restricted to requirement for subsystems for those who joined later. A market analysis and customer surveys were planned but were dropped due to time constraints. The core team was well informed about new technical developments and regularly attended training events, but the cross-functional members of the wider team were less clear about their task and back-delegated some of their tasks to management.

Feedback was rated as 5, as it was available from extensive simulation and testing as well as the sales team and customers. The new process involved much iteration, which allowed for a learning process to happen, as well as provided built-in opportunities for course-correcting. This led to high coordination in the

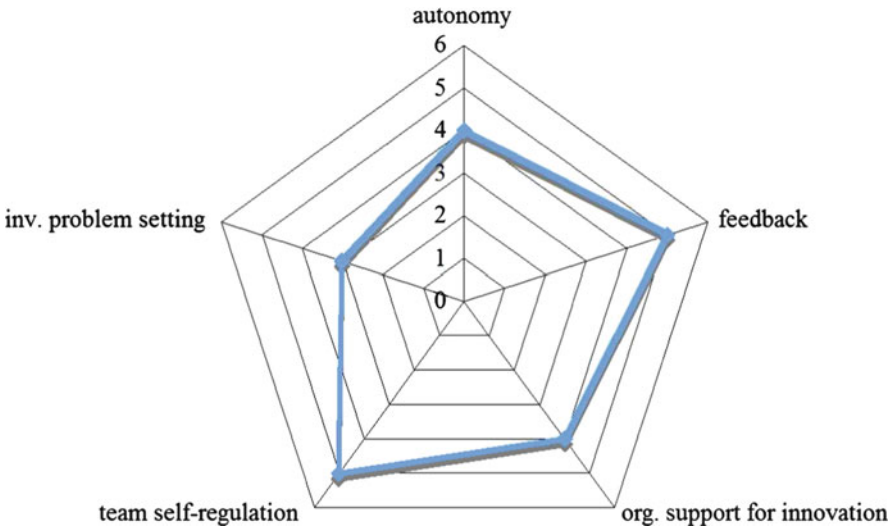

Fig. 8.4 Rating for team coordination potential for conventional example

cross-functional task force, as service staff returned customers' and operators' feedback, and assembly staff also readily returned any issues.

Team self-regulation was rated as 5. The project management involved a lot of coordination with other players inside and outside the company. A cross-functional task force was drawn in to help coordinate the project before the R&D team was fully established.

Organisational support for innovation was rated as 4. The project was clearly recognised as important, but the team was also confronted with doubts about its technical success and fears about the implications for the rest of the company. The lack of support was something that the team members could not compensate for with their own coordination efforts: They scheduled review meetings, but some failed to attend; as a result, important decisions could not be made. Team members supported each other but could not replace the practical resources such as of journal or Internet access.

8.4.3 Example 3: Expansive Innovation Coordination Conditions

The expansive example comes from a company with an established R&D function. Innovation was a managed process with a continuous stream of new products. The project addressed here was special in the sense that it was aimed at radical innovation with new customer benefits and new markets. This had implications for the underlying business model, which required additional persuasion to convince senior management (Fig. 8.5).

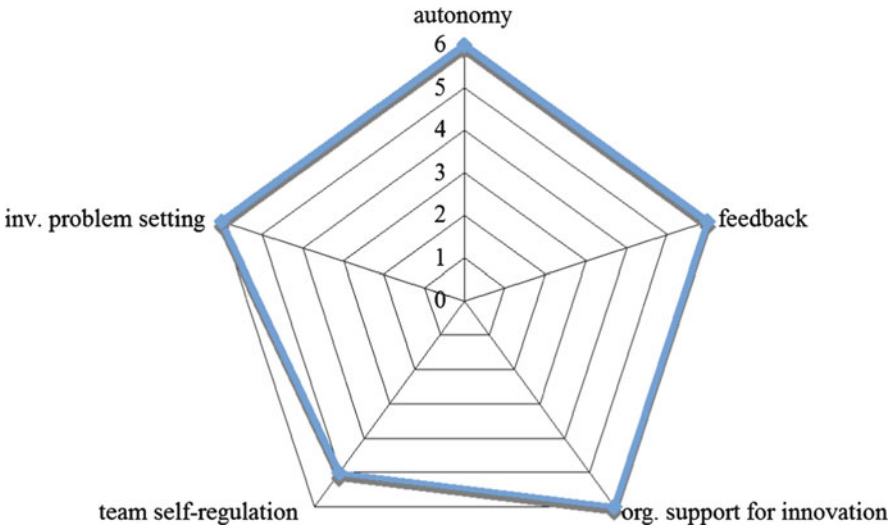

Fig. 8.5 Rating for team coordination potential for expansive example

The team was given a high degree of autonomy (rated as 6) as long as it managed to convince budget holders that the plans would be successful. The project was team members' own initiative – they were not given a brief. The team members coordinated the definition of the scope themselves and enlisted external facilitators as they saw fit.

Involvement in problem setting was rated as 6, as the definition of the task was part of the project activity. The team scanned technological developments and conducted its own observations of end users before defining the scope of the project. Team members coordinated the project planning by spelling out implications of backward compatibility and software integration with other products.

Feedback was rated as 6, as the designers actively sought and had good means to obtain feedback through feasibility tests, prototyping, and presentations to sales staff. Team members gave feedback during meetings, and senior management regularly reviewed the project.

Team self-regulation was rated as 5. It was an explicit issue and the team always discussed allocation of tasks during its meetings. However, coordination was complicated by the fact that most team members were also assigned to other projects, which were given priority as they approached product launch.

Organisational support for innovation was rated as 6. There was good understanding of innovation management, professional practice was valued, and financial resources were available once a project had been approved. It was part of the organisational culture to embrace the uncertainty of innovation with the flow of idea generation as well as the drawbacks and long nights of detailed design. This enabled the team to focus its coordination efforts on the innovation itself rather than the necessary infrastructure.

8.5 Discussion

Unlike previous chapters that offer measurement approaches for the process or outcome of coordination, this chapter addresses the organisational setting in which team coordination occurs. While most research analyses the coordination processes as such in some sort of context, this approach zooms in on the context as a relevant independent variable that can affect the likelihood and form of the coordination processes. While the organisational context does not fully determine what people do, it provides parameters of opportunities or constraints for potential actions to either occur or be assuaged. This approach to team coordination assessment therefore broadens the scope of the coordination model introduced in this book in terms of organisational context as an input factor, and stipulates effects of better coordination on outcome variables such as successful implementation of innovation. The approach can also be complemented with other measures that more specifically address the *form* of coordination.

The model is not conceptualised as a deterministic relationship; instead, it assumes that constraints and opportunities afford certain behaviours and thus make them more *likely* to occur, but they do not directly determine occurrences of initiative, creativity, perseverance, or performance. All three examples, in fact, illustrate that innovators struggle with the circumstances they encounter and try to pursue an innovation that their company does not fully support. However, under low- or conventional innovation conditions, it is more difficult, and at times impossible, to achieve radical innovation.

The specific contribution of this assessment methodology lies in its focus on complex tasks in the workplace and that the assessment is contextualised in the domain of product innovation. Based on action regulation theory and innovation management literature, five criteria for coordination potential as it relates to the organisational context were formulated: autonomy, involvement in problem setting, feedback, team self-regulation, and support for innovation. Ideally, the organisational context should support coordination on all five aspects. However, a high degree of autonomy, involvement in problem setting, and feedback can compensate for a lack of support for innovation, and team self-regulation is less critical in projects with less task interdependency. The model also assumes that there cannot be too much coordination potential: More opportunities to engage in coordination when it is required should help the team to achieve its task. The effort involved in coordinating more complex projects may add to the workload, but should also enable the team to address the challenges that arise from these complex tasks (Edmondson and Nembhard 2009).

On the basis of field observation and interviews, each criterion is rated on a six-point scale by the researchers. The measure thus relies on an expert judgement rather than on self-reported data. This means that observers need to be trained in the methodology and become sufficiently knowledgeable about the content in order to be able to rate the potential for team coordination. The reliability and validity of the assessment should be confirmed in independent double-analysis, using different

investigators at different times, focussing on different subtasks of a job and different employees (Oesterreich and Bortz 1994).

The assessment approach presented here does not claim to offer a universal measure for coordination processes of humans and non-human primates. The methodology was developed for studying human activities in the workplace as an analytical tool for diagnosing the strengths and weaknesses of an organisation's ability to foster team coordination potential. If applied in a human sample, it can be combined with other measures that address team attitudes, cognition, and behaviour during the actual coordination processes. For research on non-human primates, the approach could potentially be applied to conditions of explorative and proactive behaviour, as it relies on an assessment of conditions and observations rather than on cognition. The definition of the five dimensions – autonomy, involvement in problem setting, feedback, team self-regulation, and support for innovation – could be adopted to describe to what extent the social organisation in non-human primate groups enables them to explore new territory, tools, food, or shelter.

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