Virtual Team Development Analysis and Optimization

Examination of a Change Process in an IT Company Based on Synergetics

Master's Thesis in the Major Subject:
Education Science with the Focus on Organizational Development

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List of Abbreviations

Abbreviation	Meaning
GPs	Generic Principles
ICT	Information and Communication Technology
S-BPM	Subject-oriented Business Process Management
SNS	Synergetic Navigation System
SPM	Synergetic Process Management
TCI	Team Climate Inventory
KPI	Key Performance Indicator

1. Introduction

1.1 Change Processes and Teamwork

Recent trends like globalization and individualization lead to an increased complexity for organizations[1] in general as well as for businesses in specific (cf. Eckert/Schiepek/Herse 2006, p. 25; Schiersmann/Thiel 2012, p. 14). New requirements to their management derive from coincidental fluctuations, non-linear dependencies and non-intended influences (cf. Eckert/Schiepek/Herse 2006, p. 47).
To ensure competitiveness, change processes need to be understood, supported and influenced deliberately (cf. Ellebracht/Lenz/Osterhold 2011, p. 80-81). In the last decades, virtual teamwork prevailed as a significant way of working in the free market economy and can be leveraged through facilitating innovation and continuous learning as central promoters of change (cf. Akin/Rumpf 2013, p. 376; Brodbeck/Anderson/West 2000, p. 7-8).

1.2 Subject of Research

In this master's thesis, a virtual team development process triggered by a change of management in a large-scale software company is to be analyzed. The object of study is a global virtual team in the product training area that was assigned a new manager in April 2015. The team consists of five women who are based in three different countries and four time zones. Since the researcher is also part of the team, the relevant sample consists of the other four team members.[2] After organizing their projects in standard processes for several years, the new manager starts to question accustomed approaches and to enrich or replace them with new ideas. Questioning and replacing existing work processes is assumed to trigger changes in team cooperation, communication and operations. For supporting organizational and operational change, the transitional phase following the change of management is accompanied and analyzed based on the theory of synergetics according to Haken/Schiepek (2010). Since implementing changed

[1] When dealing with organizations, a common distinction is to differentiate between social institutions and businesses in economy (cf. Schiersmann/Thiel 2011, p. 53-54). Since this thesis is about team development in a large-scale software company, the business area is implicitly referred to when speaking of organizations.
[2] Section 4.1.2 discusses the benefits and challenges in participating research.

structures in teams is considered to require innovation capability (cf. Brodbeck/Anderson/West 2000, p. 14-15), the four-factor theory of climate for innovation by West (1990) is adduced additionally as area-specific theory. A synergetic navigation system (SNS) serves as analysis and reflection instrument. For the questionnaire, the team climate inventory (TCI) by Brodbeck/Anderson/West (2000) is validated and reduced to subsequently include 39 of 44 TCI items into SNS. These items are assigned to the generic principles (GPs) according to synergetics (cf. Eckert/Schiepek/Herse 2006, p. 40-42; Haken/Schiepek 2010, p. 436-441). For real time monitoring, data is collected continuously every ten days from beginning of August 2015 to end of January 2016. This data is supplemented by documentation of team-internal meetings during the period of data collection. Since using SNS has an interventional effect, reflection interviews are conducted with the participants after three months in order to receive additional background data and to strengthen the participants' self-efficacy. Subsequently, the data is evaluated based on the GPs that are considered requirements for self-organized change processes (cf. Schiersmann/Thiel 2012, p. 207). Based on the questionnaire, the degree to which the GPs are implemented is to be illustrated and analyzed for individual points of time during the process. Subsequently, considering the specifics of virtual teamwork, recommendations for further team development related to change processes are to be given.

1.3 Thesis Structure

Chapter 2 represents the theoretical part of this thesis. After providing a theoretical foundation on virtual working environments and resulting implications for virtual team as well as leadership development in chapter 2.1, chapter 2.2 further explains synergetic change process management as a specific measure for developing virtual teams in transitional phases. The empirical part of this study is presented in chapter 3. Chapter 3.1 and 3.2 describe the processes of data collection and evaluation. On this basis, results are summarized and suggestions for further team development are deduced in chapter 3.3. Chapter 4 concludes with an outline of the challenges in data collection in this study, a validation of the research intention and success as well as an outlook on future research needs in the field of virtual team development and the applicability in other contexts.

2. Theoretical Part

Current and future developments in society can be categorized as so-called megatrends[3] like globalization, climate and demographic change, digitalization, individualization and technology convergence (cf. Akin/Rumpf 2013, p. 375-376). Organizations leverage teamwork as a key success factor for responding quickly to technical, social and political transformation (cf. Brodbeck/Anderson/West 2000, p. 7). Since complexity is rising globally, companies require diversely talented, multi-disciplinary teams to face new market challenges (cf. Tuffley 2011, p. 183). Virtual teams combine talent across geographical, organizational as well as time boundaries (cf. Lipnack/Stamps 1998, p. 31). The organizational transition from conventional to virtual teamwork often takes place seamlessly, although new ways of communicating imply critical consequences for group dynamics and leadership (cf. Steiger/Lippmann 2013, p. 342). Chapter 2.1 illustrates that virtual teams – like the one that is being examined in this study – require both adequate diagnosis and development methods (cf. Lipnack/Stamps 1998, p. 171; Kauffeld 2001). Since virtual teams can be described as non-linear and complex systems belonging to the fastest changing factors in management (cf. Stahl/Mayrhofer/Kühlmann 2005, p. 108), chapter 2.2 identifies and further explains synergetic change process management as an appropriate tool for virtual team development in the context of this study.

2.1 Virtual Team Development

This chapter initially builds a theoretical foundation for describing virtual teamwork pointing out the relevance of developing teams in general and, more specifically, virtual teams. Afterwards, particular challenges in virtual working environments are outlined to subsequently draw conclusions on resulting implications for virtual team as well as leadership development.

[3] Present literature provides numerous approaches defining and distinguishing different megatrends. In this context, they are only named exemplary in order to provide an idea of contemporary complex developments in society.

2.1.1 Theoretical Foundation for Virtual Team Development

Both in theory and practice, there are numerous attempts of defining virtual[4] teams[5] (cf. Hertel/Konradt 2007, p. 9). Most of these approaches are based on a definition by Lipnack/Stamps (1998) that characterizes virtual teams as work groups collaborating across geographical, time and organizational boundaries utilizing networks facilitated by communication technologies. In order to understand the essence of virtual teams, their attributes are often contrasted with those of conventional work groups.[6] Table 1 provides an overview of the main distinguishing characteristics of virtual versus conventional teams.

Conventional Teams	Virtual Teams
Same location	Different locations
Same time zone	Different time zones
Common native language	English as a foreign language
Face-to-face communication	Technology-based communication
High mutual predictability	Misunderstandings due to cultural differences
Professional, methodical, managerial, personality, social competencies	In addition: media, communication, diversity competencies

Table 1: Characteristics of Conventional vs. Virtual Teams

(Own presentation based on App 2013, p. 28-29; Steiger/Lippmann 2013, p. 343)

Even though key attributes of conventional teams are also constitutive for virtual teams, the latter heavily rely on information and communication technology (ICT) (cf. Berry 2011, p. 186-187; Hertel/Konradt 2007, p. 9). Differences in geography, time, language,

[4] The term 'virtual' originates from the Latin word 'virtus' for 'proficiency, manliness' and refers to being in essence or effect but not in fact or name (cf. Andriessen/Vartiainen 2006, p. 20-21; Bartsch-Beuerlein/Klee 2001, p. 7-9). With regards to teamwork, the degree of virtuality can be measured in the dimensions of space and time (cf. Krejci/Clement 2008, p. 38). In practice, a relative or partial virtuality is commonly observed (cf. Hertel/Konradt 2007, p. 9).

[5] A team can be defined as distinct local entity embedded in a larger organizational system consisting of a small number of individuals who collaborate closely through interdependent tasks with shared responsibility working toward a common goal (cf. Bartsch-Beuerlein/Klee 2001, p. 7-9; Wakefield/Leidner/Garrison 2008, p. 435; Yoon/Johnson 2008, p. 596). In this thesis, teams are considered self-organizing systems, which is further explained in chapter 2.2.

[6] Existing theoretical attempts of capturing virtual teams are criticized, since they can be seen as describing rather than as defining (cf. Wakefield/Leidner/Garrison 2008, p. 435).

culture, social interaction and technology shape a new form of media-based cooperation and communication (cf. Steiger/Lippmann 2013, p. 343), accompanied by additional challenges that require an extended skillset of both team members and leaders (cf. App 2013, p. 28-29). Apart from these challenges, organizations benefit from virtual teams through the ability to bridge space and time, increasing cost efficiency, combining diverse talent, the possibility of utilizing 24/7 work schedules, facilitating local knowledge and networks, simplified documentation and review of performance as well as from parallel participation in asynchronous processes (cf. Berry 2011, p. 194; Stöwe/Keromosemito 2013, p. 146). However, these and other benefits come into effect only when teams are consciously developed in an adequate way (cf. Berry 2011, p. 195). Virtual teams as living systems need even more time and external support to grow and develop than conventional teams (cf. Lipnack/Stamps 1998, p. 171). In this context, team development[7] has proven as an effective medium for enhancing cohesion, compliance of competencies and social support in work groups (cf. Hämmelmann/van Dick 2013, p. 236). After outlining specific challenges in virtual working environments in section 2.1.2, sections 2.1.3 and 2.1.4 explain how the development of team members and leaders can be appropriately supported.

2.1.2 Challenges in Virtual Working Environments

As opposed to conventional work groups, virtual team members are confronted with unprecedented types of working environments. Collaborating across time, space and cultures poses new challenges in communication, group dynamics, interculturality and conflict management for both team members and leaders.[8,9]

[7] Team development describes measures of personnel development contributing to the development of people who currently or in the future work on a joint task (cf. Hämmelmann/van Dick 2013, p. 222). Team development projects in general include phases of problem identification, data collection, diagnosis, planning of measures, implementation and evaluation (cf. Kauffeld 2001, p. 2).

[8] Challenges deriving from virtual working environments are numerous and exceed the four areas described in this section. However, these areas are chosen exemplarily for illustration purposes.

[9] Communication, group dynamics, interculturality and conflict management are not to be understood as distinctive, but rather as interdependent and blurred subject areas. Nevertheless, they are adduced in this context in order to reduce complexity.

Communication

Communication[10] as a necessary – but not sufficient – precondition for collaboration counts to the most investigated process characteristics in virtual cooperation forms (cf. Hertel/Konradt 2007, p. 75-76; Sarker/Sahay 2003, p. 29). Virtual team interactions are almost always assisted by some kind of computer-mediated communication technology (cf. Berry 2011, p. 186; Wastian/Braumandl/von Rosenstiel 2009, p. 332). Facilitated by ICT, communication can take place synchronously or asynchronously[11], which brings along numerous challenges (cf. Berry 2011, p. 193; Krejci 2009, p. 307; Montoya/Massey/Hung/Crisp 2009, p. 141; Stahl/Mayrhofer/Kühlmann 2005, p. 93-95). Possible disadvantages deriving from a restricted transmission of information and socio-emotional signals are constraints in understanding, slowed response times and the feeling of anonymity (cf. Berry 2011, p. 193; Hertel/Konradt 2007, p. 75-76). In addition, virtual teams have to deal with language barriers, cultural differences, a potential digital divide and media-specific problems in communication (cf. App 2013, p. 98). Media competence[12] and English language skills are therefore key success factors for collaboration in virtual teams (cf. App 2013, p. 31-33; Hertel/Konradt 2007, p. 308). Apart from that, communication through ICT also implies numerous benefits like time flexibility, the ability to overcome long distances quickly, exchanging information efficiently, better pre-structuring and documentation of discussions, improved decision-making as well as emotional distance in conflicts (cf. Hertel/Konradt 2007, p. 75-76; Wastian/Braumandl/von Rosenstiel 2009, p. 332). Furthermore, team members might feel less inhibited and thus share ideas and feedback more frankly, which possibly leads to higher equality within virtual teams (cf. Berry 2011, p. 193; Hertel/Konradt 2007, p. 75-76). However, these advantages only come into effect when ICT is utilized in an

[10] Communication can be generically defined as the process of transferring information, meaning and understanding between two or more parties (cf. Berry 2011, p. 192). There are different theoretical approaches describing levels of information transmitted in communication (cf. App 2013, p. 105-108; Krejci 2009, p. 308). Four broad categories of communication tasks to describe team functions are conveyance, convergence, project management and social/relational (cf. Montoya/Massey/Hung/Crisp 2009, p. 141). When communicating through ICT, not all of these information levels may be covered, which increases the risk of misunderstandings and conflicts (cf. App 2013, p. 105-108; Krejci 2009, p. 309).

[11] Even though virtual teams communicate asynchronously most of the time (cf. Berry 2011, p. 193), the relevance of synchronous communication for convergence and social/relational tasks needs to be recognized (cf. Montoya/Massey/Hung/Crisp 2009, p. 151).

[12] Media competence means the disposition to be able to choose, implement and utilize media appropriately, while being aware of their inherent logics and dynamics as well as behaving in an adequate way (cf. Herrmann/Hüneke/Rohrberg 2012, p. 35).

appropriate way (cf. Hertel/Konradt 2007, p. 75-76). Choosing the right communication tools is a complex process and depends on factors such as the team's nature and task, members' access to technology and experience with it as well as the communication content and goal (cf. Berry 2011, p. 189; Hertel/Konradt 2007, p. 80-83). A well-known method for choosing the right communication technology is the media richness model, which intends to compensate situational insecurity and ambiguity with media richness[13] (cf. Hertel/Konradt 2007, p. 80-83; Krejci 2009, p. 309; Wastian/Braumandl/von Rosenstiel 2009, p. 333). Additional general recommendations for virtual communication are to both communicate and document extensively, to create clear rules, expectations and structures, to plan predictively considering an appropriate timing as well as to consciously spend time on informal communication (cf. Berry 2011, p. 191; Hertel/Konradt 2007, p. 76-78; Montoya/Massey/Hung/Crisp 2009, p. 152; Wastian/Braumandl/von Rosenstiel 2009, p. 333-334). However, technology's significance should not be overestimated when dealing with virtual teamwork (cf. Berry 2011, p. 191). It is simply a medium; the main challenge lies within the complex interplay among content, context and individuals (cf. Montoya/Massey/Hung/Crisp 2009, p. 153).

Group Dynamics

Collaboration needs to be established systematically as a multi-faceted component of virtual team development (cf. Sarker/Sahay 2003, p. 29). Group dynamics[14] need to be analyzed and understood in order to identify supportive interventions in individual phases of team development. Due to a lack of co-presence, conventional approaches for explaining group dynamics apply to virtual teams only to a limited extent (cf. Wastian/Braumandl/von Rosenstiel 2009, p. 334).[15] Classic theories suggest breaking down group development into several fixed phases (cf. Berry 2011, p. 191). However,

[13] Media richness is determined by the amount of information transmitted per unit of time, the number of communication channels and the immediacy of feedback (cf. Wastian/Braumandl/von Rosenstiel 2009, p. 333).

[14] Group dynamics are part of group development and refer to the dynamic formation of group phenomena based on mutual influences between members of a distinct group deriving from interactions and joint activities (cf. Kölblinger 2004, p. 187). Theoretical approaches in group dynamics intend to make differences as well as common features visible and accessible for discussions (cf. Krejci/Clement 2008, p. 39). Examples for group phenomena are the feeling of cohesiveness, the emergence of roles and social distinctions as well as the differentiation against other groups (cf. Kölblinger 2004, p. 187).

[15] Because of geographical, time and organizational distance, a climate of trust and group identification takes longer to be developed (cf. Kölblinger 2004, p. 190).

since group development can be understood as bi-directional and non-linear process in a systemic sense, especially virtual team members are suggested to be trusted with their own independent decision-making (cf. Kölblinger 2004, p. 190; Yoon/Johnson 2008, p. 598). Self-organized group development phases include orientation, scheduling, exploration, work and decision, progress check and evaluation, refinements and putting together as well as termination (cf. Yoon/Johnson 2008, p. 613). Utilizing these phases as a theoretical foundation, both positive and negative virtual group development-shaping forces can be identified. On the one hand, shared goals and work procedures, team members' performing action items, a balanced and effective agenda, clarification and consensus, member support as well as an effective use of technology can facilitate group cohesion and thus a constructive environment for collaboration (cf. Kölblinger 2004, p. 190; Krejci 2009, p. 311; Yoon/Johnson 2008, p. 613). On the other hand, virtual group dynamics may be impeded by members' absence, difficulty in accessing information, lack of sharing, poor management of meetings, nonparticipation or topic digression and technology problems (cf. Yoon/Johnson 2008, p. 613). In general, building relationships in virtual teams requires a significantly higher level of attention than in conventional work groups, since developing group identity[16] and trust[17] is restricted in communication via ICT (cf. Stahl/Mayrhofer/Kühlmann 2005, p. 96-98). Through new ways of strengthening identity and trust like creating a group culture, informal communication channels and special incentives for extraordinary performance, motivation in virtual teams needs to be actively supported (cf. Kölblinger 2004, p. 200). Additionally, destructive power[18] differentials should be minimized through team building techniques and by promoting shared understandings (cf. Panteli/Tucker 2009,

[16] Group identity, meaning the identification of team members with their work group and its norms, is considered key requirement for good work relationships (cf. Kölblinger 2004, p. 198, Stahl/Mayrhofer/Kühlmann 2005, p. 96-98). In virtual teams, rare contact may cause an incomplete knowledge of the members' characters as well as cultural and language differences. To compensate this, individual personalities need to be understood and deliberately integrated (cf. Stöwe/Keromosemito 2013, p. 144).

[17] Trust refers to positive expectations of the behavior of another party and is seen as a main factor for cohesion and success of collaboration in virtual working environments (cf. Kölblinger 2004, p. 195; Krejci 2009, p. 311; Pinjani/Palvia 2013, p. 145; Stahl/Mayrhofer/Kühlmann 2006, p. 96-98). Since trust is very fragile and temporal, its development requires personal interaction and active relationship building (cf. App 2013, p. 33; Krejci 2009, p. 311; Pinjani/Palvia 2013, p. 145).

[18] Power can be described as the capability of one party to exert an influence on another to act in a prescribed manner (cf. Panteli/Tucker 2009, p. 113). Power differentials play a key role in virtual team dynamics (cf. ibid. ibid., p. 114).

p. 114). Considering group dynamics, virtual teams need to be well planned, prepared and built from the beginning (cf. Stöwe/Keromosemito 2013, p. 146).[19]

Interculturality

When people work together virtually, they often have different cultural[20] backgrounds (cf. App 2013, p. 216; Fain/Kline 2000, p. 276; Hertel/Konradt 2007, p. 44-45). In virtual teams, different opinions and perspectives are represented and expressed through varying communication and working styles (cf. Berry 2011, p. 189; Wastian/Braumandl/von Rosenstiel 2009, p. 312). Next to variations related to native languages, religions and weekly rhythms (cf. App 2013, p. 34-35), numerous dimensions of cultural differences in work-related behavior need to be considered, as shown in table 2.

Collectivism	vs.	Individualism
Importance of formal rules	vs.	Importance of contextual strategies
Hierarchy and authority	vs.	Participation and autonomy
Competition and assertiveness	vs.	Responsibility and caring
Pragmatic planning	vs.	Conceptual planning
Monochronic time orientation	vs.	Polychronic time orientation
Implicit communication	vs.	Explicit communication
Conflict orientation	vs.	Harmony orientation
Task orientation	vs.	Relationship orientation
Power distribution	vs.	Power concentration
Risk disposition	vs.	Orientation toward security

Table 2: Cultural Differences in Central Work-related Behavioral Dimensions[21]

(Own presentation based on Krejci/Clement 2008, p. 41;
Steiger/Lippmann 2013, p. 347-348; Wastian/Braumandl/von Rosenstiel 2009, p. 316-317)

[19] This statement may seem to contradict the idea of self-organized group development in virtual teams. In this context, constructive virtual group development is assumed to be about finding the right balance between self-dependence and support from the outside.

[20] Culture as a collective phenomenon refers to shared expectations toward values, behavior patterns, social ways of thinking, perceptions and beliefs in particular groups of people (cf. Fain/Kline 2000, p. 276; Steiger/Lippmann 2013, p. 347-348). Three relevant types of culture can be distinguished: national, organizational and functional culture (cf. Hertel/Konradt 2007, p. 44-45).

[21] When outlining differences in cultural values and norms, special attention should be paid to prevent the emergence of stereotypes (cf. Krejci/Clement 2008, p. 41).

Cultural diversity poses both opportunities and threats to virtual teamwork (cf. Pinjani/Palvia 2013, p. 145). Opportunities include both creative approaches due to different perspectives and competitive advantages like innovative solutions, increased effectiveness, team-internal knowledge transfer as well as greater organizational learning and operational synergy (cf. App 2013, p. 58-59; Berry 2011, p. 189; Fain/Kline 2000, p. 277; Pinjani/Palvia 2013, p. 145). Potential risks are linguistic and cultural misunderstandings, sensitivity in receiving feedback, the formation of cliques, interest conflicts as well as constraints in group identity and in the utilization of knowledge and creativity potentials (cf. App 2013, p. 56-57; Stöwe/Keromosemito 2013, p. 145; Wastian/Braumandl/von Rosenstiel 2009, p. 312).[22] For reducing these risks and leveraging potential opportunities, organizations need to understand cultural diversity and provide training to help relationship building and enhancing intercultural competencies[23] (cf. Krejci/Clement 2008, p. 47; Pinjani/Palvia 2013, p. 151; Wastian/Braumandl/von Rosenstiel 2009, p. 318).

Conflicts

In an environment where communication is severely restricted, conflicts[24] can arise quickly from misunderstandings that are fostered additionally by different cultural backgrounds (cf. Kölblinger 2004, p. 200; Wakefield/Leidner/Garrison 2008, p. 435). Three types of conflicts can be identified that have a significant influence on team performance: (1) task conflicts referring to work content, appropriate tasks and assignment of activities, (2) process conflicts dealing with disagreements on methods and processes required for task completion, as well as (3) relational conflicts including negative emotions and interpersonal disagreements (cf. Hertel/Konradt 2007, p. 99-100; Wakefield/Leidner/Garrison 2008, p. 435). Conflicts are not to be understood as negative by nature and should not in general be prevented (cf. Hertel/Konradt 2007, p.

[22] All of these risks can create impediments by intra-group conflicts (cf. Pinjani/Palvia 2013, p. 145). Dealing with conflicts is considered another major challenge in virtual teams and is further explained in the next subsection.

[23] There is no consistent definition of intercultural competence (cf. App 2013, p. 229). In general, it contains the development of a mindset (i.e. positive attitudes toward cultural differences), skillset (in terms of language, nonverbal behavior, communication style, cognitive processes and dealing with values) and sensitivity (i.e. experiencing, perceiving and sensing differences) in cultural concerns (cf. Ellebracht/Lenz/Osterhold 2011, p. 238-239; Krejci/Clement 2008, p. 40).

[24] Conflicts can be defined as differing perceptions of interests, needs and opinions, leading to impediments in their realization (cf. Hertel/Konradt 2007, p. 99-100).

99-100; Wakefield/Leidner/Garrison 2008, p. 436). Task and process conflicts may stimulate innovative processes and developments (cf. Hertel/Konradt 2007, p. 99-100). On the contrary, relational conflicts can strain collaboration in the long term (cf. Hertel/Konradt 2007, p. 99-100; Wakefield/Leidner/Garrison 2008, p. 449-450). Compared to conventional teams, virtual teams have to deal with higher risk and potentially faster escalation of conflicts and misunderstandings due to restrictions in communication, lacking context information and delays in feedback processes (cf. Steiger/Lippmann 2013, p. 343; Wastian/Braumandl/von Rosenstiel 2009, p. 337). Classical conflict management approaches are not directly applicable in a virtual context (cf. Kölblinger 2005, p. 200). Dealing with conflicts in virtual teams requires an even higher level of sensitivity for conflict signals and acting at an early stage as well as handling disagreements in a constructive way, agreeing on explicit methods of problem solving and conflict management plus considering the influence of computer-mediated communication on critical situations (cf. Hertel/Konradt 2007, p. 99-100; Kölblinger 2005, p. 200; Stöwe/Keromosemito 2013, p. 145; Wakefield/Leidner/Garrison 2008, p. 436; Wastian/Braumandl/von Rosenstiel 2009, p. 337).

After providing these brief insights to challenges in virtual working environments, sections 2.1.3 and 2.1.4 subsequently deduce implications for virtual team and leadership development.

2.1.3 Resulting Implications for Virtual Team Development

The previous section outlines that working in virtual environments – compared to traditional work groups – poses additional challenges to team members. This insight can lead to the conclusion that consciously developing virtual teams is vital, yet in general more difficult (cf. Akin/Rumpf 2013, p. 383; Pinjani/Palvia 2013, p. 144). Since virtual teams vary in aspects like scope, structure, spatial distribution and technical infrastructure, there is no definite blanket approach for developing them (cf. Stahl/Mayrhofer/Kühlmann 2005, p. 100-104). However, this section intends to summarize general strategies for a successful virtual team development on an abstract level. Figure 1 illustrates key success factors for virtual team development during their

process of self-organization[25], arranged within the triangular spectrum of connections, purpose and personality.[26]

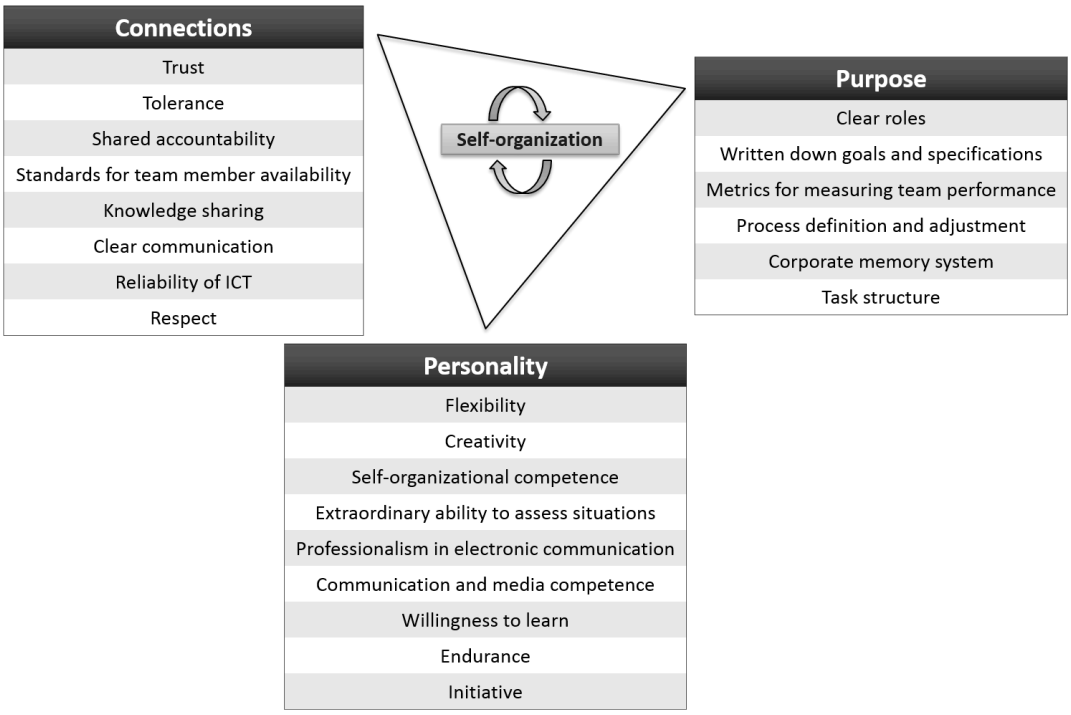

Figure 1: Key Success Factors for Virtual Team Development

(Own presentation based on Akin/Rumpf 2013, p. 380; Berry 2011, p. 196; Herrmann/Hüneke/Rohrberg 2012, p. 31; Hertel/Konradt 2007, p. 44-45; Kölblinger 2004, p. 202; Lipnack/Stamps 1998, p. 39; Pinjani/Palvia 2013, p. 144; Stahl/Mayrhofer/Kühlmann 2005, p. 105; Wastian/Braumandl/von Rosenstiel 2009, p. 338-340)

Virtual team development in terms of people starts with staffing, which means choosing members with the right competencies and states of minds (cf. Bartsch-Beuerlein/Klee 2001, p. 37-38; Wastian/Braumandl/von Rosenstiel 2009, p. 338). Next to common competencies for project work, virtual cooperation requires numerous additional skills like media, communication and self-organizational[27] competencies, willingness to learn, flexibility, creativity, affinity toward new technologies, initiative and endurance due to isolation, being able to build trust, a positive attitude toward cooperative work and

[25] This systematization refers to a systemic definition of teams in a procedural sense: during the process of self-organization, the system's elements (i.e. personalities) interact with each other (through connections) to move toward a certain goal (i.e. purpose). These three interdependent categories help to identify principles for planning, implementing and evaluating teamwork (cf. Lipnack/Stamps 1998, p. 245).

[26] Personality, purpose and connections are considered essential components for describing successful virtual teams (cf. Lipnack/Stamps 1998, p. 39).

[27] Self-organizational competence refers to skills and knowledge for organizing work both individually and independently as a team (cf. Herrmann/Hüneke/Rohrberg 2012, p. 31). Self-organization is explained in further detail in sections 2.2.2 and 2.2.3, when elucidating synergetic process management.

delegative leadership principles as well as tolerance in dealing with heterogeneity (cf. Herrmann/Hüneke/Rohrberg 2012, p. 31, 35; Wastian/Braumandl/von Rosenstiel 2009, p. 339-340). Virtual team development is nevertheless not only about choosing the right people, but also about supporting them from the beginning. Therefore, most resources should be invested in a virtual team's initial phase[28] to create a strong foundation in terms of connections (cf. Berry 2011, p. 201; Lipnack/Stamps 1998, p. 180). From the beginning and then continuously, information as a new source of power needs to be distributed to create shared responsibilities and to maximize participation (cf. Lipnack/Stamps 1998, p. 52-53; Panteli/Tucker 2009, p. 115; Stöwe/Keromosemito 2013, p. 149-151). Virtual working environments should be as friendly and as human as possible to support trust building, which is of high significance throughout a team's whole life cycle (cf. Akin/Rumpf 2013, p. 383-384; Berry 2011, p. 197; Lipnack/Stamps 1998, p. 265; Pinjani/Palvia 2013, p. 144). Ultimately, teams are bound by their purpose. Transparency and clarity in shared, cooperative goals are vital facilitators for enhancing motivation (cf. Lipnack/Stamps 1998, p. 183).

In order to support key success factors for virtual team development, measures of personnel development need to be conducted on a regular basis for employees, potential and actual managers as well as for teams as a whole (cf. Wastian/Braumandl/von Rosenstiel 2009, p. 344). Preferable training topics include conducting virtual meetings, remote coaching, sensitivity for undesirable developments, efficient application of ICT, trust and conflict management, intercultural and communication competencies, staffing as well as creating work plans and distributing roles (cf. ibid. ibid., p. 344). However, the training market is only slowly beginning to open up for these topics and needs to be further developed in that regard (cf. ibid. ibid., p. 344). Developing virtual teams is not only the duty of one central organizational unit, but also falls under the responsibility of team leaders (cf. Berry 2011, p. 199; Herrmann/Hüneke/Rohrberg 2012, p. 248). This is merely a single aspect showing their significance in virtual teams. How virtual team leaders can be specifically supported in their role is further explained in the next section.

[28] There are different opinions on the relevance of face-to-face kick-off events. Even though the formation process is particularly critical in virtual teams, there is no consensus on the question, if personal meetings are really essential (cf. Akin/Rumpf 2013, p. 383; Kölblinger 2004, p. 190; Krejci/Clement 2008, p. 47; Wastian/Braumandl/von Rosenstiel 2009, p. 343). A general recommendation is to mix both personal and media-based meetings (cf. Herrmann/Hüneke/Rohrberg 2012, p. 155-157).

2.1.4 Resulting Implications for Virtual Leadership Development

Due to their central position in a star-shaped team communication and as an interface between the team and their organization, virtual team leaders[29] play a key role for their team's success (cf. Akin/Rumpf 2013, p. 379; Bartsch-Beuerlein/Klee 2001, p. 37-38; Krejci 2009, p. 312; Panteli/Tucker 2009, p. 115; Snellman 2004, p. 1253; Steiger/Lippmann 2013, p. 344; Wakefield/Leidner/Garrison 2008, p. 436). Figure 2 represents the leadership role's complexity in the process of virtual teams' self-organization, embedded in the spectrum between connections, purpose and personality.

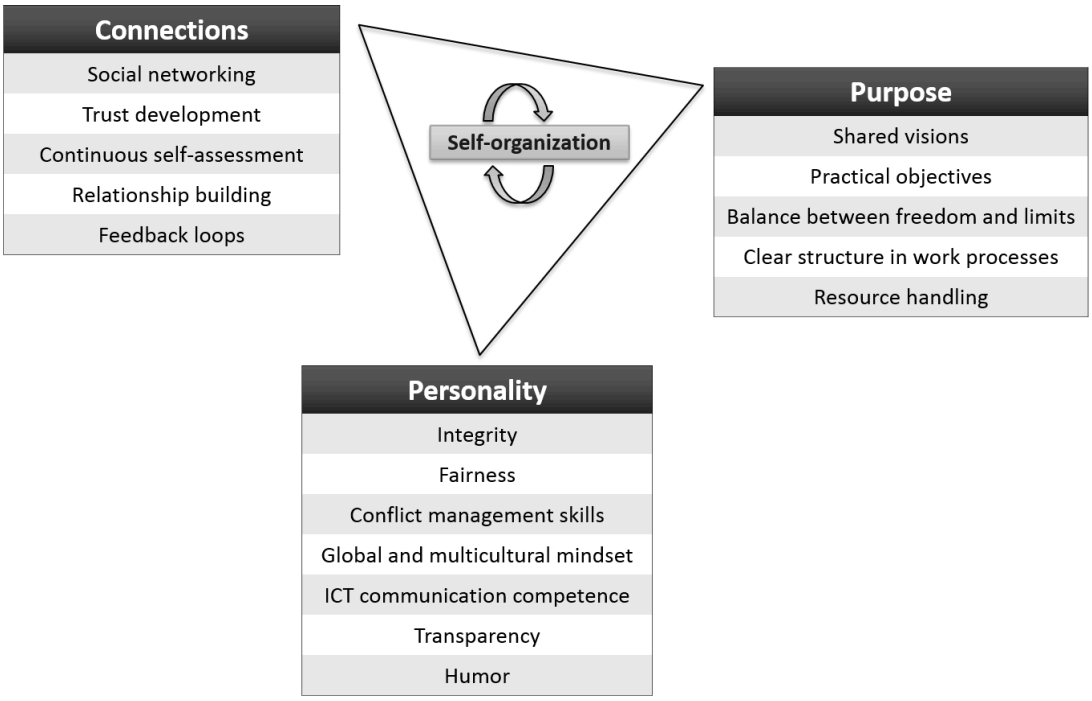

Figure 2: Virtual Team Leaders' Role in the Process of Self-Organization

(Own presentation based on Ellebracht/Lenz/Osterhold 2011, p. 219-220; Herrmann/Hüneke/Rohrberg 2012, p. 38-41; Snellmann 2004, p. 1256; Stahl/Mayrhofer/Kühlmann 2005, p. 98-100; Steiger/Lippmann 2013, p. 345; Stöwe/Keromosemito 2013, p. 152-153; Tuffley 2011, p. 179-182)

In general, the leadership role in a virtual context is less about direct supervision and more about providing services to subordinates than in conventional work groups (cf.

[29] Despite the longevity and diversity of existing literature, there is still little consensus on what constitutes true leadership (cf. Tuffley 2011, p. 176). Leadership and management in general include all measures for purposefully influencing other people's behavior and experience in an organization (cf. Hertel/Konradt 2007, p. 63-64). Leadership can be distinguished from management in being more risk-averse, tolerant toward chaos and intent in a deep understanding rather than control of situations (cf. Tuffley 2001, p. 177). Groups of leadership research include attribute-focused, relationship-focused and role-based approaches (cf. Wakefield/Leidner/Garrison 2008, p. 436).

Wakefield/Leidner/Garrison 2008, p. 436; Wastian/Braumandl/von Rosenstiel 2009, p. 335). Related to connections, virtual team leaders should maintain both a personal and a work-related dialogue facilitating relationship building through proactive, concise and multifaceted communication (cf. Herrmann/Hüneke/Rohrberg 2012, p. 40, 88; Snellmann 2004, p. 1258; Stahl/Mayrhofer/Kühlmann 2005, p. 98-100; Steiger/Lippmann 2013, p. 346). Virtual team leaders are key facilitators for developing trust and need to ensure fairness in work processes, transparency in decision making, an open communication culture in addressing negative developments as well as autonomy for team members (cf. Herrmann/Hüneke/Rohrberg 2012, p. 117; Snellmann 2004, p. 1257; Stahl/Mayrhofer/Kühlmann 2005, p. 98-100). Through self-assessments and feedback loops, they ideally make sure to continuously develop both teamwork and their own role (cf. Steiger/Lippmann 2013, p. 345; Stöwe/Keromosemito 2013, p. 152-153). In terms of personality, virtual team leaders should show integrity, transparency and fairness in their actions as well as a multicultural mindset and humor (cf. Herrmann/Hüneke/Rohrberg 2012, p. 255; Tuffley 2011, p. 179-182; Snellmann 2004, p. 1256; Stöwe/Keromosemito 2013, p. 152-153; Wakefield/Leidner/Garrison 2008, p. 436). They act as a role model in terms of communication competencies – especially when managing virtual meetings – and are thereby able to increase cohesion and motivation, to enhance trust as well as to lead to a successful team performance (cf. Herrmann/Hüneke/Rohrberg 2012, p. 152; Snellmann 2004, p. 1258; Steiger/Lippmann 2013, p. 346; Stöwe/Keromosemito 2013, p. 154-158). Virtual team leaders need strong conflict management skills, including sensitivity for conflict signals and the ability to hand over problem solving to team members (cf. Herrmann/Hüneke/Rohrberg 2012, p. 193; Stöwe/Keromosemito 2013, p. 159). With regards to the purpose, virtual team leaders can facilitate trust, motivation, autonomy and freedom of action through developing and sharing a convincing vision (cf. Ellebracht/Lenz/Osterhold 2011, p. 219-220; Stahl/Mayrhofer/Kühlmann 2005, p. 98-100). In this context, clear, understandable and viable tasks need to be defined and resources are to be utilized appropriately (cf. Ellebracht/Lenz/Osterhold 2011, p. 219-220). Ultimately, leading virtual teams is always about finding the right balance between giving freedom and setting clear limits (cf. ibid. ibid., p. 219-220).[30]

[30] In virtual teams, delegative leadership systems have proven empirically (cf. Wastian/Braumandl/von

Since this multifaceted role description is to be understood as an ideal concept that probably no real person will be able to fulfill, it should be utilized as an orientation for supporting team leadership development.[31] Virtual team leaders should be encouraged to participate in personnel development measures covering subject areas like sensitization for peculiarities in virtual cooperation, delegative leadership principles, controlling, leading without hierarchy, project management and remote management as well as self-marketing for creating visibility (cf. Herrmann/Hüneke/Rohrberg 2012, p. 248).

After explaining in detail challenges in virtual working environments and resulting implications for team as well as leadership development, chapter 2.2 further elucidates change process management as a specific measure for developing virtual teams.

2.2 Change Process Management in Teams

This chapter introduces process management as well as system theory and subsequently discusses the benefits of synergetic process management (Haken/Schiepek, 2010) compared to other process management approaches. Thereafter, synergetic process management is explained in detail with regards to change processes. In this context, the four-factor theory of climate for innovation (West, 1990) is explicated as area-specific theory complementing the synergetic approach. As a conclusion, the four factors of innovation and performance in groups are integrated with synergetic process management as a theory-based approach for managing change processes in teams.

2.2.1 Process Management and Systemic Approach

Starting in the 1980s, the concept of process management has continuously gained importance due to so-called megatrends in society and economy. Globalization and the emergence of ICT lead to an acceleration of production cycles and stronger customer

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Rosenstiel 2009, p. 335). In this context, approaches like ‘management by exception’ are assumed to empower members to act independently, to encourage object-achieving behavior and to correct non-object-achieving behavior (cf. Tuffley 2011, p. 179-182).

[31] Research shows that leadership can be learned and cultivated in order to be applied effectively (cf. Tuffley 2011, p. 183).

focus; organizations moved from functional orientation to process[32] orientation (cf. Becker 2012, p. 4-6; Eckert/Schiepek/Herse 2006, p. 25-26; Schiersmann/Thiel 2011, p. 51-52). Instead of considering single functions as per Taylorism, work processes are assumed to pass various workplaces. According to this holistic approach, organizations need to optimize process interfaces and communication as well as employee knowledge and competencies in order to enhance competitiveness (cf. Becker 2012, p. 4-6; Ellebracht/Lenz/Osterhold 2011, p. 179; Schiersmann/Thiel, p. 51-52). Taking into account organization-specific contexts[33], the operational structure is to be improved for increasing cost effectiveness, flexibility, security and sustainability (cf. Becker 2012, p. 4-6; Reinmuth/Voß 2009, p. 14-15). In general, process management is arranged in a phase model of analyzing the situation, identifying weak points, deducing respective measures and executing improvement activities (cf. Reinmuth/Voß 2009, p. 19). For reducing complexity and to be able to optimize and transform processes, they are typically visualized in reports and models like process chains (cf. Becker 2012, p. 165).

However, classic process management approaches are business-oriented and deal with reengineering rather than taking into account complexity and non-linearity, which can be seen as main characteristics of human systems and thus modern organizations (cf. Ellebracht/Lenz/Osterhold 2011, p. 14-15, 80-81; Schiersmann/Thiel 2011, p. 312). For dealing with insecurity, unpredictability, ambiguity, antinomy and the unknowing, an appropriate theoretical attempt can be found in the systemic approach[34] that intends to capture correlations, patterns, rules and circular causality (cf. Ellebracht/Lenz/Osterhold 2011, p. 14; Schiersmann/Thiel 2011, p. 55-56). Table 3 gives an overview of the main differences between the classic view on organizations and the systemic approach.

[32] In this classical sense, a work process can be defined as self-contained, chronological and logical sequence of activities necessary for working on a business-relevant object and for creating customer benefit. Processes typically consist of a starting point including input and an end point including output (cf. Becker 2012, p. 6-7; Reinmuth/Voß 2009, p. 13-14).

[33] Organization-specific contexts may include size, e.g. the difference between small and large organizations, or type, e.g. the difference between socio-economic organizations and commercial businesses (c.f. Schiersmann/Thiel 2011, p. 53-54).

[34] There is no consistent systemic theory as such. The term ‘systemic’ rather refers to a mindset that intends to deal with complexity in an adequate way in diverse disciplines giving different focal points (cf. Ellebracht/Lenz/Osterhold, p. 28; Schiersmann/Thiel 2011, p. 56).

Classic View	Systemic View
Structural, functional organizations	Procedural, relational organizations
Closed units	Open systems
Trivial, static	Complex, dynamic
Causal, linear	Unpredictable, non-linear
External instructions	Self-controlling
Controlled by people	Controlled by rules/patterns
External, objective assessment	Self-referential
Clear objectives	Unclear objectives
Focus on characteristics	Focus on relations and behavior

Table 3: Classic versus Synergetic View on Organizations

(Own presentation based on Beisel 1996, p. 327-328;
Ellebracht/Lenz/Osterhold 2011, p. 14-15; Schiersmann/Thiel 2011, p. 57-59)

The systemic approach as a meta-theory explains systems as an aggregate of elements and their relations to each other as well as to their environment and to other systems (cf. Ellebracht/Lenz/Osterhold 2011, p. 17-18; Schiersmann/Thiel 2011, p. 57-59).[35] Systemic theories aim at reducing complexity when dealing with organizations and specifically investigate structures, functions, relations, transaction patterns and rules as well as changes in system conditions (cf. Ellebracht/Lenz/Osterhold 2011, p, 14, 28; Schiersmann/Friesenhahn/Wahl 2015, p. 8). This means that the systemic approach is specifically valuable for handling change processes[36], which are considered to be essential for an organization's advancement (cf. Ellebracht/Lenz/Osterhold 2011, p. 13; Schiersmann/Friesenhahn/Wahl 2015, p. 8). Section 2.2.2 explains in detail two systemic process management approaches comparing their use for different types of processes.

2.2.2 Subject-oriented Business Process versus Synergetic Process Management

Section 2.2.1 outlines that organizations nowadays are confronted with tightened circumstances. Since the systemic approach acknowledges complexity and non-linear

[35] A system's central interdependent factors of influence may be subjective interpretation, context, rules and transactions (cf. Ellebracht/Lenz/Osterhold 2011, p. 17.18).
[36] A change process describes how a specific unit moves from condition A, i.e. status quo, to condition B (cf. Ellebracht/Lenz/Osterhold 2011, p. 27).

dynamics, it is considered to be appropriate for dealing with processes in modern organizations. This section compares two systemic process management procedures: subject-oriented business process management (S-BPM) and synergetic process management (SPM).

Subject-oriented Business Process Management (S-BPM)

In a classical sense, processes are defined as sequence of activities, neglecting the importance of subjects[37] that actually perform these activities. Fleischmann's S-BPM approach recognizes people as actors in self-regulated systems and takes into account their perspective as experts for their own processes (cf. Fleischmann 2011, p. 15). According to S-BPM, organizations as self-regulated, socio-technical systems are constituted by individual elements (subjects) and their relations to each other (communication) (cf. ibid. ibid., p. 18-19). Focusing on the collaboration of process participants and people in charge, S-BPM intends to validate and optimize work processes running through a closed loop of phases as shown in figure 3 (cf. ibid. ibid., p. 20).[38]

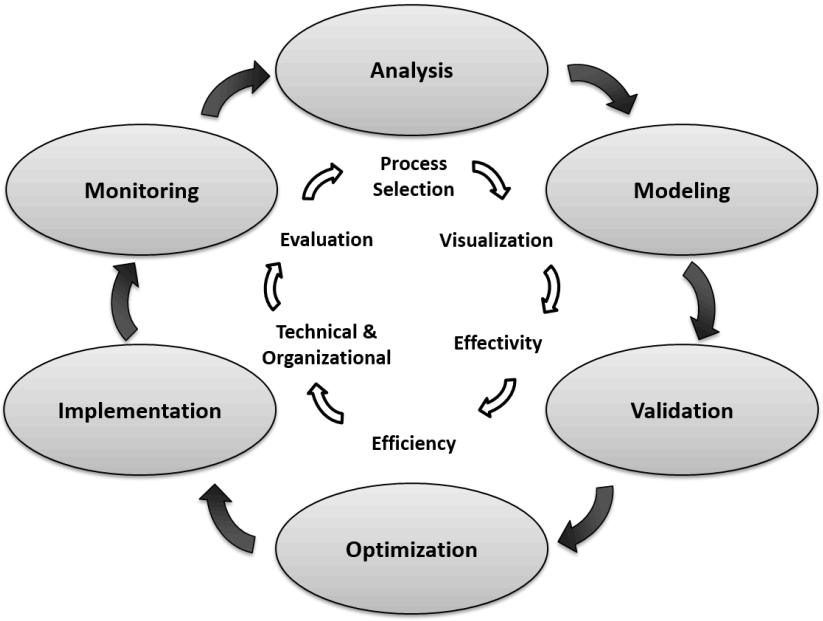

Figure 3: S-BPM Phase Model

(Own presentation based on Fleischmann 2011, p. 48)

[37] The term ‚subject' may refer to an individual, but also to objects, machines, software and supporting units (cf. Fleischmann 2011, p. 42).

[38] These phases are not to be seen as distinct. Also, some of them may be skipped whilst continuously running through this closed loop (cf. Fleischmann 2011, p. 48).

Compared to other process management approaches, specifics of this method are an integration of product, customer, and market orientation with a systemic view on organization complexity as well as subject orientation and the usage of natural language (cf. ibid. ibid., p. 18-19). The main goal of S-BPM is to continuously increase efficiency and effectiveness[39] of standard business processes.

Synergetic Process Management (SPM)

Since complexity and dynamics in changing organizations are neither foreseeable nor controllable, an orientation toward the science of self-organization[40] is recommended for professional learning and development processes (cf. Schiersmann/Thiel 2011, p. 11). The theory of synergetics explains self-regulated coaction referring to the emergence, preservation and alteration of macroscopic patterns deriving from activities in microscopic dynamics, embedded in environmental circumstances (cf. Beisel 1996, p. 76; Eckert/Schiepek/Herse 2006, p. 31; Haken 1985, p. 205; Weber 2013, p. 43).[41] SPM is a concept for integrative, interdisciplinary process management in the context of self-organization (cf. Schiepek/Eckert/Kravanja 2013, p. 32; Haken/Schiepek 2010, p. 436). Its synergetic theory core and mathematical formalism is to be enriched with additional assumptions, explication of specific terms and phenomenological references (Haken/Schiepek 2010, p. 442). Figure 4 illustrates how SPM combines a synergetic theoretical basis with area-specific theories to then empirically deduce suitable intervention methods.

[39] In this context, effectiveness refers to process expedience, whereas efficiency is related to a reduction of resources (cf. Fleischmann 2011, p. 48).
[40] Self-organization can be defined as a multicomponent system's ability to perform transitions between different system conditions (cf. Beisel 1996, p. 7). In opposition to self-control, there is no central control instance in self-organization (cf. Schiersmann/Thiel 2011, p.68).
[41] Synergetics and SPM are explained further in section 2.2.3.

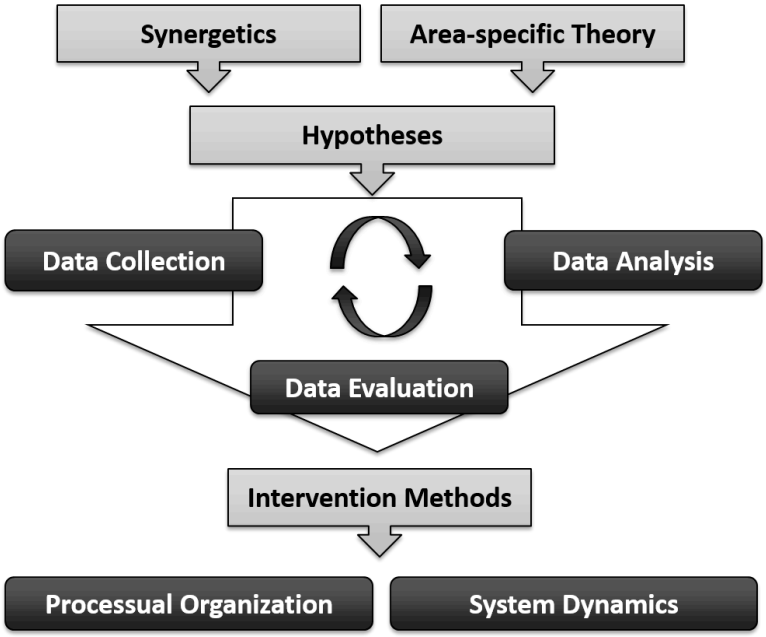

Figure 4: SPM Model

(Own presentation based on Haken/Schiepek 2010, p.440-441; Weber 2013, p. 67-69)

Specifics in SPM are the applicability in various disciplines (cf. Haken 1985, p. 205; Schiepek/Eckert/Kravanja 2013, p. 32), support of self-organized processes through deduced principles (Schiepek/Eckert/Kravanja 2013, p. 47), eclecticism on an interventional level (cf. Haken/Schiepek 2010, p. 444) and an emphasis on the socio-emotional dimension of development processes (cf. Schiersmann/Thiel 2011, p. 79). The main goal of this approach is to support self-organized processes and to improve information exchange by choosing adequate intervention methods (cf. Eckert/Schiepek/Herse 2006, p. 34; Schiersmann/Thiel 2011, p. 66, 69).

Comparison S-BPM versus SPM

This short outline of S-BPM and SPM illustrates two different systemic approaches for managing processes. Both of them are based on the consideration of organizational complexity and dynamics as well as the importance of individuals as part of an organization. With regards to the aspects of process understanding, functions of process management and instruments applied[42], there are major differences as shown in table 4.

[42] Remarkably, both S-BPM and SPM enrich quantitative data (process views, SNS) with additional qualitative data (interviews, reflection interviews). This can be interpreted as hint on the importance of individuals for organizations in systemic approaches. It also reflects the difficulty in capturing and systemizing human systems.

Aspect	S-BPM	SPM
Theory basis	System theory	
Process understanding	Standard business process	Change process
Intention	Analysis, optimization	Monitoring, reflection, intervention
Instruments	Process views, interviews	SNS, reflection interviews

Table 4: Comparison S-BPM and SPM

(Own presentation)

Both process management approaches include benefits as well as challenges. The main conclusion is that in general, a choice is to be made depending on the specific situation and research interest. SPM is considered to provide an interdisciplinary toolkit for monitoring, reflection and intervention in change processes. Since this study is dealing with team development related to a change of management, SPM is utilized for dealing with this kind of socio-emotional change process. Section 2.2.3 gives a detailed exposition on SPM related to change processes.

2.2.3 SPM and Change Processes

Since human beings – next to technology and formal processes – are a major factor of influence for systems, organizations are characterized by uncertainty and dynamic complexity, leading to a sensitive balance between stability and instability (cf. Eckert/Schiepek/Herse 2006, p. 36). As explained in section 2.2.2, the concept of synergetics is assumed to most adequately describe unstable processes in developing systems (cf. Yasinsky 2010, p. 314). In organizational development, change processes[43] are considered essential for achieving business objectives (cf. Ellebracht/Lenz/Osterhold 2011, p. 80-81). Change processes as a specific type of processes can be characterized as uninfluenceable as well as volatile, leading to an unpredictable outcome (cf. Schiepek/Eckert/Kravanja 2013, p. 30; Schiersmann/Friesenhahn/Wahl 2015, p. 7). Subject to SPM as a specific form of

[43] According to synergetics, a change process is defined as change of order, i.e. a transition from an old pattern to a new one (cf. Eckert/Schiepek/Herse 2006, p. 32).

change process management is creating ideal conditions for enabling self-organization (cf. Eckert/Schiepek/Herse 2006, p. 34).

In the 1960s, synergetics emerged as physical theory aiming to find common features of systems which acquire ordered states out of disordered states through the process of self-organization (cf. Haken 1985, p. 205; Sammet 2015, p. 19; Schiepek/Eckert/Kravanja 2013, p. 31). By analyzing examples for spontaneous formation in physics, chemistry and biology, basic concepts like instability, order parameters and slaving principle were deduced and can be applied to various kinds of complex systems (cf. Beisel 1996, p. 7; Ellebracht/Lenz/Osterhold 2011, p. 31; Haken 1985, p. 206, 211). Later on, SPM was developed for process reflection and control in psychotherapy (cf. Haken/Schiepek 2010, p. 441). With its interdisciplinary adaptability, the synergetic approach is assumed to include sufficient heuristic strength for facilitating also organizational development in theory and practice (cf. Beisel 1996, p. 6). Synergetics describe a basic structure for psychic and social systems consisting of alternating, circular interaction of various elements and processes (cf. Schiersmann/Thiel 2012, p. 37). The microscopic level consists of various elements and their relations (cf. Schiersmann/Thiel 2012, p. 37). With sufficient intrasystem connectedness, macroscopic patterns emerge and are connected with microscopic elements in a circular correlation[44] (cf. Schiepek/Eckert/Kravanja 2013, p. 33; Schiersmann/Thiel 2012, p.37-38). This alternation is modeled by control parameters[45] and boundary conditions, which requires a system's openness (cf. Beisel 1996, p. 76; Schiersmann/Thiel 2011, p. 68; Weber 2013, p. 44). Eventually, after unstable phases of critical fluctuations and symmetry breaking[46], coherent behaviors, so-called order parameters, are formed (cf. Beisel 1996, p. 77-78; Schiepek/Eckert/Kravanja 2013, p. 33; Schiersmann/Thiel 2012, p. 39). In this context, attractors are complex, dynamic patterns that act as focal points upon a system and cause the formation of stable structures (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 21; Weber 2013, p. 54).

[44] The macroscopic level emerges from microscopic interactions (bottom-up) and influences the individual elements through the slaving principle (top-down) (Schiepek/Eckert/Kravanja 2013, p. 33; Schiersmann/Thiel 2011, p. 69). This alternation between two levels is defined as self-organization (cf. Schiersmann/Thiel 2012, p. 38).

[45] Control parameters refer to environmental influencing variables that have an activating and modulating effect (Schiepek/Eckert/Kravanja 2013, p. 33; Schiersmann/Thiel 2012, p. 39).

[46] Symmetry breaking refers to decision making within two possibilities that both have the same advantages and disadvantages (cf. Sammet 2015, p. 29).

Regarding synergetics, human systems include some specific features: control parameters are unknown and may lie inside the system, micro- and macrolevels are relative to one another[47], coagulated system history[48] as well as boundary conditions have an influence and the systems interact with their environment (cf. Schiepek/Eckert/Kravanja 2013, p. 35-37; Schiersmann/Thiel 2012, p. 39-41). Synergetics as generic theoretical approach can be applied to various types of systems. To be able to apply it to organizations, it needs to be complemented by area-specific theories.[49] Figure 5 illustrates an extended synergetic scheme referring to human systems.

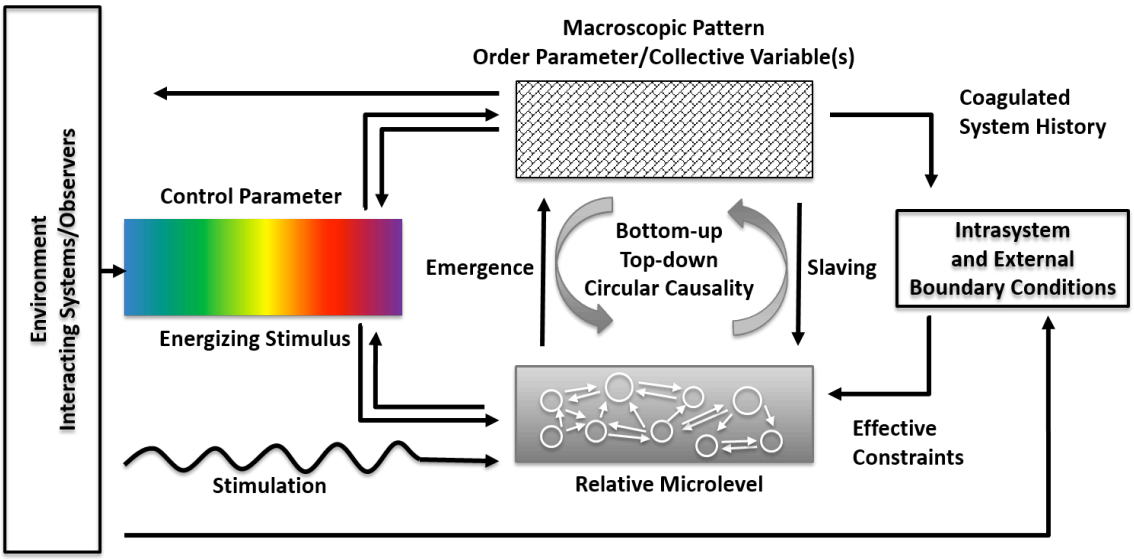

Figure 5: Extended Synergetic Scheme

(cf. Haken/Schiepek 2010, p. 246)

Deduced from the theory of self-organization, generic[50] principles (GPs)[51] provide general orientation for purposeful interventions influencing change processes and are considered requirements for self-regulated order alteration (cf. Haken/Schiepek 2010, p. 440; Schiersmann/Friesenhahn/Wahl 2015, p. 7; Schiersmann/Thiel 2011, p. 11).

[47] This means that an order parameter of one level can be part of microscopic interactions on a higher level (cf. Schiepek/Eckert/Kravanja 2013, p. 35-37).
[48] The system history as a learning history and interaction of subsystems forms the context for building new patterns and attractors (cf. Schiersmann/Thiel 2012, p. 40; Weber 2013, p. 47).
[49] Section 2.2.5 combines SPM with the the four-factor theory of climate for innovation (West, 1990) for applying it to team development processes. In addition, Chapter 2.1 covers theories on virtual team development specifics.
[50] Generic in the sense of generating (cf. Haken/Schiepek 2010, p. 436).
[51] The individual GPs are further explained and applied to team development processes in section 2.2.5.

Furthermore, SPM as a scientist-practitioner-model follows the idea of integrating practice and science (cf. Sammet 2015, p. 55). Its centerpiece, the synergetic navigation system (SNS)[52] is an instrument for real-time-monitoring and allows data-based assessment of self-organized development processes (cf. Haken/Schiepek 2010, p. 444).

2.2.4 Four Factors of Innovation and Performance in Groups

In a synergetic sense, organizational development and change processes require creativity and innovation[53] (cf. Brodbeck/Anderson/West 2000, p. 8; Ellebracht/Lenz/Osterhold 2011, p. 133). By actively involving system elements, i.e. individuals, innovation potential can be mobilized (cf. Beisel 1996, p. 6; Brodbeck/Anderson/West 2000, p. 8). In this context, openness and the development of new ideas facilitate change processes and a fresh start (cf. Ellebracht/Lenz/Osterhold 2011, p. 133). Participation, willingness to work hard, learning motivation, loyalty and employee creativity are central factors of innovativeness and are the result of a constructive team[54] climate (cf. Brodbeck/Anderson/West 2000, p. 8). Climate[55] as a construct originating from geography was applied to other scientific fields and in this context describes shared perceptions of organizational policies, practices and procedures (cf. Anderson/West 1998, p. 236; Brodbeck/Anderson/West 2000, p. 16). The following requirements are considered necessary – but not sufficient – for the existence of a socially shared climate: frequent interaction, a common goal or attainable outcome which predisposes toward collective action and sufficient task interdependence leading to shared understandings as well as expected patterns of behaviors (cf. Anderson/West 1998, p. 237; Brodbeck/Anderson/West 2000, p. 16). Since shared climates are assumed to likely exist in identifiable groups, the proximal work group, i.e. team, is identified as an appropriate level of analysis (cf. Anderson/West 1998, p. 236-237; Brodbeck/Anderson/West 2000, p. 17). The concept of climate is very generic and should always include a particular point of reference to be meaningful (cf.

[52] SNS is explained in detail in section 3.1.1.
[53] Innovation can be defined as generation and intentional implementation of new ideas, processes, products, procedures designed to create significant benefit for a role performance, group, organization or wider society while removing existing weak points and process losses (cf. Anderson/West 1998, p. 239; Brodbeck/Anderson/West 2000, p. 14-15).
[54] Chapter 2.1 explains in detail teamwork, team development and specifics in virtual team development.
[55] Difficulties in dealing with the construct of climate are defining its notion and measuring it at different levels (cf. Anderson/West 1998, p. 236).

Anderson/West 1998, p. 238). In addition, the construct of climate is very broad and difficult to capture. Particular sections of working atmosphere can be examined in an approach of facet-specific climate analysis (cf. Anderson/West 1998, p. 238; Brodbeck/Anderson/West 2000, p. 17). Thus, the four-factor theory of innovation and performance in groups is based on the concept of facet-specific climate for innovation (cf. Anderson/West 1998, p. 241). According to this theory, an innovation process cycle consists of four recurring phases (cf. Brodbeck/Anderson/West 2000, p. 14-15). For each phase, there is a major factor of influence, as shown in figure 6.[56]

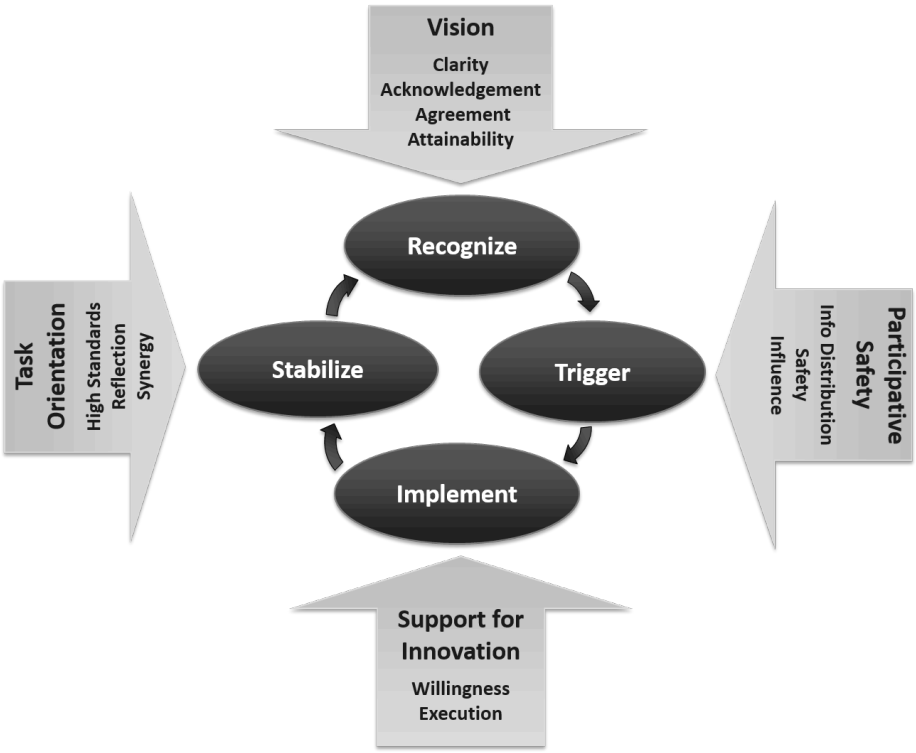

Figure 6: Four-factor Theory of Innovation and Performance in Groups[57]

(Own presentation based on Brodbeck/Anderson/West 2000, p. 9, 14-15; West 1990, p. 38, 310-313)

The four factors of a facet-specific climate of innovation are vision, participative safety, task orientation and support for innovation. Vision refers to the idea of a valued

[56] In this theory, continuous improvement of innovation processes is assumed to consist of an aggregate of multiple, synchronously proceeding innovation cycles while optimizing all four dimensions (cf. Brodbeck/Anderson/West 2000, p. 14-15).

[57] To be noted is that this phase model seems very ideal-typical. Following a synergetic view, phases are presumed to continuously influence each other rather than proceeding in cycles. Additionally, change processes in this thesis are defined according to synergetics. Therefore, this concept of innovation processes is not explained further under the assumption that an innovation process can as well be appropriately described as synergetic change process.

outcome representing higher order goals and motivating forces at work (cf. West 1990, p. 310). Goals should be clear, mutually agreed, visionary and attainable in order to focus and orientate individual forces (cf. Anderson/West 1998, p. 240; Brodbeck/Anderson/West 2000, p. 11). Participative safety refers to a psychological construct, in which contingencies motivate decision-making in an environment that is interpersonally non-threatening (cf. West 1990, p. 311). Commitment and involvement can be supported through participatory influence, information distribution, maintaining contacts and the absence of threats (cf. Anderson/West 1998, p. 240; Brodbeck/Anderson/West 2000, p. 12-13). Support for innovation is about the expectation, approval and practical support of attempts to introduce new and improved ways of work (West 1990, p. 38). This factor consists of articulating norms for innovation and implementing them (cf. Brodbeck/Anderson/West 2000, p.14). It differs across teams and can be influenced through personnel documents, policy statements and word of mouth (cf. Anderson/West 1998, p. 240). Task orientation indicates a shared concern with the excellence of quality in task performance (cf. West 1990, p. 313). In this context, reflection, performance standards, evaluation, control systems, constructive controversy and mutual support are important tools for ensuring a general commitment to excellence with a supporting climate (cf. Anderson/West 1998, p. 240; Brodbeck/Anderson/West 2000, p. 11-12).

Based on the four-factor theory of innovation and performance in groups, the team climate inventory (TCI) was developed.[58] This theory describes requirements for enabling change processes in terms of innovation in teams. It is therefore adduced as area-specific theory complementing SPM. In section 2.2.5, both approaches are integrated in order to be able to apply SPM to team development.

2.2.5 SPM in Team Development

As a basis for integrating the four-factor theory of innovation and performance in groups with SPM, change processes are considered changes of patterns according to synergetics (see also section 2.2.3). As explained in section 2.2.4, innovation is assumed to be key requirement for enabling organizational change in general and team

[58] The TCI is a widely used and acknowledged instrument for team diagnosis and is further described in section 3.1.1.

development in specific. To be able to apply SPM to team development, requirements for change processes from both theories are brought together in this section: synergetic GPs and the four factors of innovation. According to synergetics, the GPs are prerequisites for enabling as well as supporting change processes and can be utilized for choosing adequate intervention techniques and methods in a reasoned way (cf. Haken/Schiepek 2010, p. 436; Schiersmann 2013, p. 3-4).[59] Since these principles can only be effective when contextualized and applied appropriately (cf. Schiersmann 2013, p. 4; Schiersmann/Thiel 2012, p. 44), they are combined with the four factors of innovation and performance in groups. This combination is outlined in the following list:

a) **'Create stability conditions for change processes'** refers to stable circumstances for order alteration. The process of order alteration requires critical instability and the destabilization of attractors (cf. Haken/Schiepek 2010, p. 437). As a key prerequisite for destabilization stability needs to be created in terms of structure, emotions, relationships, trust and self-efficacy (cf. Haken/Schiepek 2010, p. 437; Schiersmann/Friesenhahn/Wahl 2015, p. 27-28). Since it is about enhancing transparency, trust, professionalism, empathy, appreciation and agreement, it is connected to the factors of vision and participative safety (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 27-28; Schiersmann/Thiel 2012, p. 45).

b) **'Identify the system and its patterns'** means determining cognitive, emotional and behavioral patterns and states of minds in the relevant system (cf. Haken/Schiepek 2010, p. 437). Analyzing the current situation and existing patterns to acquire starting points for appropriate change strategies and criteria for evaluating changes is closely related to the operational structure in a team and thus to the factor of task orientation (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 29; Schiersmann/Thiel 2012, p. 45).

c) **'Develop visions and goals, create connotation'** is about experiencing personal development processes as meaningful and relating them to central life concepts (cf. Haken/Schiepek 2010, p. 437). By creating connotation and developing

[59] The GPs are not to replace team development methods, but rather to enable understanding, safety and freedom for process design (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 26).

goals, willingness to change as well as performance are reinforced (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 30; Schiersmann/Thiel 2012, p. 46). This GP corresponds to the factor of vision.

d) **'Enable energizing, identify control parameters'** refers to an energetic activation of the system as requirement for self-organization (cf. Haken/Schiepek 2010, p. 438). Motivation, process involvedness and willingness to change are to be facilitated under the consideration of environmental circumstances (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 30; Schiersmann/Thiel 2012, p. 46). Since this is assumed to be closely related to developing goals and strategies, this GP is also assigned to the factor of vision.

e) **'Encourage destabilization, fluctuation increase'** describes opening up for new experiences through disrupting existing patterns (cf. Haken/Schiepek 2010, p. 438). This means enabling new perspectives, identifying external obstructive factors, supporting learning processes and providing relevant information, all of which corresponds to the factor of practical support for innovation (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 31; Schiersmann/Thiel 2012, p. 47).

f) **'Support symmetry break'** refers to a situation where two or more system attractors can be realized with the same probability (cf. Haken/Schiepek 2010, p. 439). This GP is about purposeful implementation of conditions and structure elements of a new order including respective emotions (cf. Schiersmann/Thiel 2012, p. 48). This can be done through performance standards and control systems and is therefore related to the factor of task orientation.

g) **'Ensure restabilization'** is about stabilizing, automating and making accessible cognitive, emotional and behavioral patterns that are perceived as positive (cf. Haken/Schiepek 2010, p. 440). The integration of new patterns into existing self-concepts can be supported through implementing them into everyday actions, transferring lessons learned to other areas, enabling identification with the new order under consideration of external factors (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 32; Schiersmann/Thiel 2012, p. 48). These measures correspond to articulating and implementing norms in relation to the factor of support for innovation.

h) **'Consider resonance, create synchronization'** describes taking into account the actual cognitive-emotional conditions when planning interventions (cf. Haken/Schiepek 2010, p. 439). It can also be seen as reflection on how successful all other GPs were implemented (cf. Schiersmann/Thiel 2012, p. 49-51). Adjusting measures to the team members' current states of minds is included in task orientation with reflections and evaluations.

Figure 7 illustrates this integration of requirements and factors of change processes[60] in teams resulting in a process model[61] supporting self-organization in team development and innovation:

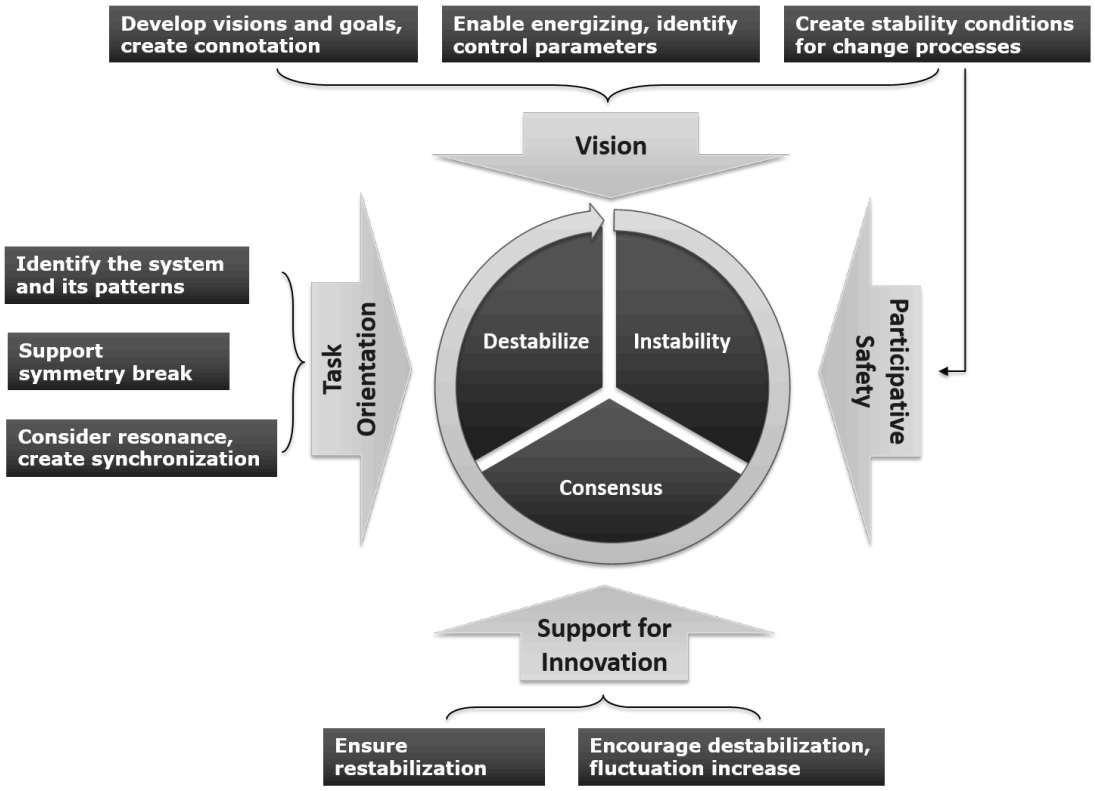

Figure 7: Requirements and Factors of Change Processes in Teams[62]

(Own presentation based on Eckert/Schiepek/Herse 2006, p. 33; Haken/Schiepek 2010, p. 437-440; West 1990, p. 38, 310-313)

[60] In this context, requirements and factors are assumed to influence change processes as a whole throughout all three phases of destabilization, instability and consensus. These phases are not to be seen as distinct and are not run through in an ordered or systematic way, but rather in a dynamic and systemic cycle including circular feedback loops (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 17).

[61] Presenting a process model may seem contradictory to the synergetic approach. This model is to reduce complexity in a non-normative way and provide stability when dealing with change, which is related to insecurities (cf. Haken/Schiepek 2010, p. 440; Schiersmann/Friesenhahn/Wahl 2015, p. 16-17).

[62] An equivocal relation between GPs and the four factors is to be emphasized: multiple principles are relevant for one single factor and vice versa.

This process model is utilized as theoretical basis for the operationalization and creation of an instrument for managing team development as a change process. Section 3.1.1 describes the development of a questionnaire based on the TCI for real-time-monitoring with SNS.

3. Empirical Part

Since virtual teams are continuously gaining in importance for organizations, efforts to make them more efficient are increasing in parallel (cf. Brodbeck/Anderson/West 2000, p. 7; Kauffeld 2001, p. 1). As explained in chapter 2, virtual team development can be seen as a potent tool for enhancing organizations, especially in the process of change (cf. Hämmelmann/van Dick 2013, p. 236; Kauffeld 2001, p. 32). This chapter illustrates how this theoretical basis related to virtual team development and change process management is applied in practice. In this thesis, a global virtual team is examined in the context of a change of management. The team consists of five women located in three different countries, working in four different time zones. They work on product training in a large-scale software enterprise. Chapter 3.1 describes how data was collected over the course of six months using an SNS questionnaire and team meeting documentation. After three months, intermediate reflection interviews were conducted related to SNS as an intervention and reflection instrument in order to strengthen the participants' self-efficacy as well as to obtain additional qualitative information. Chapter 3.2 explains how both qualitative and quantitative data was subsequently evaluated in order to deduct suggestions for further developing the team. These suggestions are presented in chapter 3.3.

3.1 Data Collection

This chapter describes in detail the theoretical concepts behind SNS and the TCI, both of which were utilized for developing the questionnaire that was used for continuous data collection in this study. After explaining the development and application of the questionnaire, team meeting documentation is described as an additional source of information. Finally, based on a theoretical foundation, preparing and conducting intermediate reflection interviews is illustrated.

3.1.1 SNS Questionnaire

Team diagnosis is an essential part of multi-phase team development projects (cf. Kauffeld 2001, p. 2). For diagnostic purposes and resulting from the concept of SPM in

team development (see section 2.2.5), TCI items were validated, reduced and partially amended to be subsequently included in a SNS questionnaire[63]. This questionnaire was utilized in this study for continuous data collection every ten days over a period of six months.

SNS

The theory of self-organization suggests to capture and analyze process dynamics over the course of time in a detailed way in order to draw conclusions for process organization (cf. Eckert/Schiepek/Herse 2006, p. 36). For this purpose, SNS is a web-based method for documenting, measuring, analyzing and shaping change processes in complex systems (cf. Center for Complex Systems 2007; Sammet 2015, p. 56) and is utilized as a technical framework for data collection and evaluation in this study. Originating from the field of psychotherapy, it enables patients to complete online surveys location-independently and in any desired frequency (cf. Sammet 2015, p. 56; Schiepek/Eckert/Kravanja 2013, p. 57). Other fields of application for SNS are vocational guidance and team development[64] (cf. Sammet 2015, p. 56; Schiersmann/Friesenhahn/Wahl 2015, p. 96-97). To meet the needs of an ambulatory assessment, SNS intends to fully collect data with dense measurement series including equidistant sequences and practicability (cf. Schiepek/Eckert/Kravanja 2013, p. 55-56). As a generic system, it allows implementing individual or standardized questionnaires as well as input of data through almost all web-enabled devices (cf. Sammet 2015, p. 56-57; Schiepek/Eckert/Kravanja 2013, p. 57). Through the completion of self-assessment surveys on a regular basis, SNS aims at monitoring and reflecting change processes including non-linear dynamics, instabilities and order transitions for navigating through the turbulences of self-organized processes (cf. Eckert/Schiepek/Herse 2006, p. 36). After establishing and configuring the questionnaire, the process of data collection is automated (cf. Sammet 205, p. 57; Schiepek/Eckert/Kravanja 2013, p. 57). As an instrument for scientific practitioners,

[63] Questionnaires in a scientific sense can be defined as more or less standardized sets of questions that are presented to people for answering in order to verify underlying theoretical concepts and contexts (cf. Porst 2014, p. 16). As key connecting piece between theory and analysis, questionnaires need to be theoretically established and systematically presented (cf. ibid. ibid., p. 16).

[64] Using a combination of standardized and team-specific items, conclusions can be drawn on the dynamics of team development processes (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 96-97). Subsequently, concrete team development measures can be developed and analyzed (cf. ibid. ibid. 2015, p. 96-97).

SNS combines both quantitative and qualitative data through questionnaire items and a comment[65] field at the end of each survey (cf. Center for Complex Systems 2007; Schiepek/Eckert/Kravanja 2013, p. 57; Schiersmann/Friesenhahn/Wahl 2015, p. 65-66). In addition, each participant's feedback should ideally be discussed individually in reflection interviews[66] (cf. Center for Complex Systems 2007). A key function of SNS is real-time monitoring enabling an immediate, evidence-based and data-supported reaction to various process phases (cf. Center for Complex Systems 2007; Eckert/Schiepek/Herse 2006, p. 46; Sammet 2015, p. 109). In this context, GPs serve as filters for continuous, adaptive decisions in terms of interventions (cf. Schiepek/Eckert/Kravanja 2013, p. 52-53). On participant side, real-time monitoring leads to better self-evaluation and transparency in habits and pattern changes (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 39). Participants become aware of their own contribution and are activated as process designers in a partnership-based cooperation (cf. Center for Complex Systems 2007; Eckert/Schiepek/Herse 2006, p. 45; Schiersmann 2013, p. 8). Additional positive effects of using SNS are an accompanying instead of retrospective data collection, the perception and activation of participants' resources, a positive influence on motivation to work, potential self-optimization of operative tasks and the possibility to prevent mismanagement (cf. Center for Complex Systems 2007; Eckert/Schiepek/Herse 2006, p. 46; Schiersmann/Friesenhahn/Wahl 2015, p. 98-99). Possible challenges in collecting data with SNS are interruptions in the periodic completion of the survey, boredom with repetitively answering the same questions as well as the need for collecting data over a long period and for high motivation on participant side (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 61, 100-101).

In order to apply SNS in the context of team development, it is combined with the TCI, as explained in the following subsections.

[65] Entries in the comment field depend both on the survey participant and on the instructions given by the researcher (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 65-66). There is no evaluation tool for comments within SNS. For data evaluation, comments can be transcribed and analyzed using qualitative content analysis. In this study, comments were merely utilized for preparing reflection interviews due to time and resource constraints.

[66] Section 3.1.3 further explains reflection interviews.

TCI

The TCI is a multi-dimensional measure of facet-specific climate for innovation within groups at work and is based on the four-factor theory by West (1990)[67] (cf. Anderson/West 1998; Kauffeld 2001, p. 93-103). The TCI questionnaire includes 44 items related to four dimensions of team climate – vision, task orientation, participative safety and support for innovation – as well as social desirability (cf. Brodbeck/Anderson/West 2000, p. 9; Kauffeld 2001, p. 93-103). The TCI intends to diagnose team development needs for enhancing innovation capability (cf. Brodbeck/Anderson/West 2000, p. 24; Kauffeld 2001, p. 93-103). Its items were generated based on an extensive review of published measures of work climate and their application to the four factors (cf. Anderson/West 1998, p. 241). Initially, 61 items were created and tested in pilot studies resulting in a reduction and adjustments (cf. Anderson/West 1998, p. 242; Brodbeck/Anderson/West 2000, p. 19). This makes the TCI one of few psychometric measures in the area of organizational development with validated quality criteria[68] and proven integration in team development measures (cf. Anderson/West 1998, p. 255; Kauffeld 2001, p. 93-103). It is an accessible, easily administered and quickly operable tool focusing on concrete aspects for improving the job situation and providing differentiated indications for team development measures (cf. Anderson/West 1998, p. 255; Brockbeck/Anderson/West 2000, p. 24; Kauffeld 2001, p. 93-103). Possible disadvantages derive from a big number of items with similar content, unverified universal applicability, questionable validity in individual dimensions, lacking interpretation of heterogeneous response behavior as well as missing suggestions for low values in multiple scales (cf. Kauffeld 2001, p. 93-103). To avoid downsides of the TCI, items were validated, reduced and amended before integrating them into SNS, as illustrated in the next subsection.

Questionnaire Development

From a cognitive psychological standpoint, questionnaires need to fulfill numerous requirements[69], which is why they should be developed based on theoretical preliminary

[67] The four-factor theory of innovation and performance in groups is explained in detail in section 2.2.4.
[68] Quality criteria for this study are discussed in section 4.2.1.
[69] Questionnaires need to be understood by participants and should make them recall relevant information, lead them to make a judgment and to adjust it to an answer format in order to ultimately edit and pass on their response (cf. Porst 2014, p. 19).

considerations (cf. Porst 2014, p. 19). The SNS questionnaire utilized in this study is a web-survey, which means that the questionnaire is stored as an application on a web server (cf. Schnell/Hill/Esser 2013, p. 373-375). Even though web-surveys bring along specific requirements[70] on participant side like technical equipment and previous knowledge of ICT, indications for designing classical paper-and-pencil interviews apply here as well (cf. ibid. ibid., p. 373-375). Substructure for the SNS questionnaire in this study is the TCI as explained in the previous subsection. As a first step, each of the existing TCI items was assigned to a GP.[71] Additionally, the TCI dimension of social aspects with questions on tendencies of social desirability was kept in order to enhance the questionnaire's psychometric quality (cf. Brockbeck/Anderson/West 2000, p. 19).[72] As a second step, all items were validated with regards to general guidelines for creating questionnaire items: items containing ambiguous terms, cumbersome phrasing or multiple statements were modified, items with similar content were combined and items irrelevant to the participants were eliminated (cf. Bühner 2006, p. 68-71; Porst 2014, p. 99-100). Due to the fact that TCI item types vary between questions and subjective statements, most of them were rephrased in order to ensure consistency and to make responding in SNS easier. For activating participants when completing the survey and to underline their significant role in the change process, subjective statements were used in this questionnaire. The synergetic approach recommends supplementing theory-based with area-specific items referring to the concrete working environment in order to raise the accuracy of the method's fit to its context (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 54). For this reason, four team-specific statements were added upon consultation with the participants. When phrasing these four statements, a balance between negative and positive wording was applied in order to minimize effects on response behavior (cf. Bühner 2006, p. 66). Finally, 43 questionnaire items were integrated into SNS.[73]

In general, a questionnaire's title page is designed for introducing the participants to the survey (cf. Porst 2014, p. 36). Since in this study each participant was given extensive

[70] In this study, these requirements are assumed to be met, since the participants collaborate through ICT on a regular basis and are considered specialists in this field. In addition, each participant was personally introduced to the questionnaire, as further explained in the next subsection.
[71] Section 2.2.5 provides a theoretical framework for combining TCI dimensions with the GPs.
[72] Questions on tendencies of social desirability contain implausibly positive statements that help in identifying abnormalities in response behavior (cf. Brockbeck/Anderson/West 2000, p. 19).
[73] Appendix I contains detailed documentation on the questionnaire development.

personal instructions on completing the survey in advance, the title page presented in figure 8 contains only a welcome text that is supposed to remind the participants of key guidelines when rating the statements.

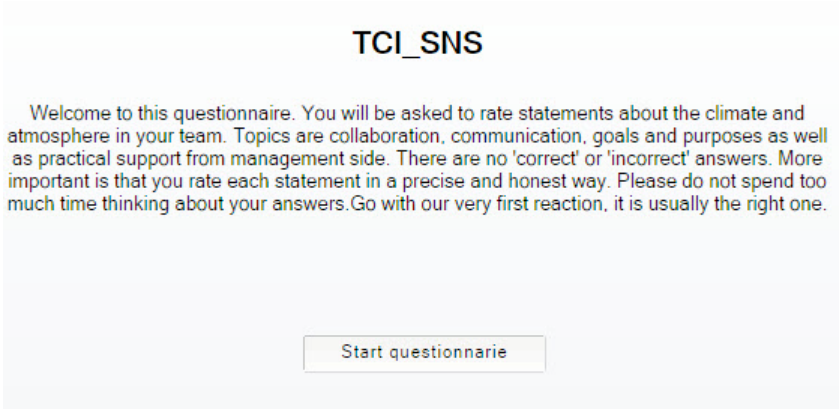

Figure 8: SNS Questionnaire Title Page

(cf. Synergetic Navigation System 2016)

These statements belong to the category of closed questions, which ensures quick processing both in the interview situation and in data handling (cf. Porst 2014, p. 53-55). A possible downside of closed questions is the risk that participants might not find their opinion reflected in the response categories provided (cf. Post 2014, p. 55). This risk is reduced in SNS through the possibility of rating each statement using a slide control within a continuum between strong agreement and strong disagreement, as shown in figure 9.

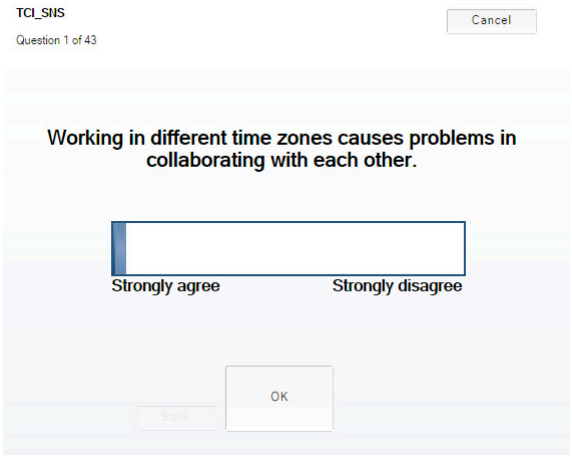

Figure 9: SNS Questionnaire Item Example

(cf. Synergetic Navigation System 2016)

The scale corresponds to an interval scale with endpoint-definition. When using this kind of scale, tasks are more clear and easier to solve (cf. Porst 2014, p. 82). Downsides are that response interpretation is very open and that the scale's midpoint might be used as escape category[74] (cf. ibid. ibid., p. 83-84). In conventional surveys, the item order is assumed to have significant influence on the response behavior (cf. Porst 2014, p. 138; Schnell/Hill/Esser 2013, p. 335). In SNS, this so-called halo-effect (cf. Schnell/Hill/Esser 2013, p. 335) can be disregarded as the survey items are displayed in a randomized order, which is assumed to additionally reduce the risk of boredom and routine on participant side. The functions of a survey's last page are to thank the participants and to give them room for comments (cf. Porst 2014, p. 161). Figure 10 illustrates that these functions are also realized in SNS.

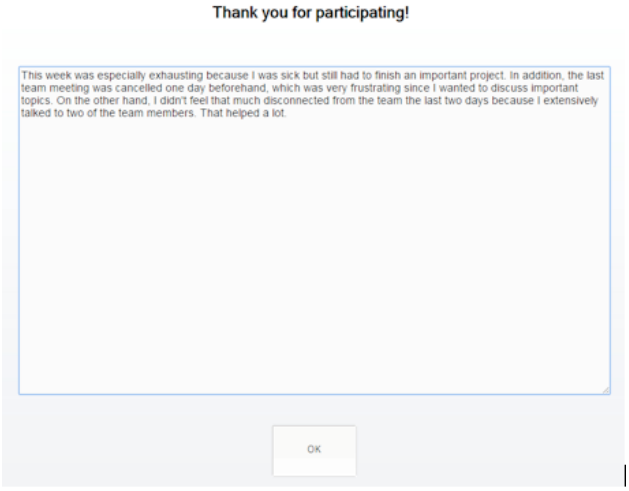

Figure 10: SNS Questionnaire Last Page with Comment Field

(cf. Synergetic Navigation System 2016)

In general, the time it takes to complete a survey should be kept as short as possible (cf. Schnell/Hill/Esser 2013, p. 339-341). This questionnaire with its 43 items is considered extensive compared to other surveys for real-time monitoring. However, an extraordinary survey length is assumed to be unproblematic when participants have an interest in it (cf. ibid. ibid., p. 339-341). In addition, every questionnaire has to be empirically pretested for validating response variety, difficulties in understanding the items, interest and attention, duration and the workload for participants (cf. Porst 2014, p. 190; Schnell/Hill/Esser 2013, p. 339-341). Due to resource constraints, the

[74] In literature, different opinions on escape categories can be found. For this study, no legitimate escape category is utilized, since it may tempt participants not to think about the statements thoroughly (cf. Porst 2014, p. 83-84).

questionnaire in this study could not be formally pretested, but giving personal and extensive instructions to each participant is assumed to compensate for this. The next subsection outlines how the process of data collection with the SNS questionnaire was organized.

Questionnaire Application

The SNS questionnaire developed on the basis of the TCI was utilized for data collection in this study. Since the questionnaire is relatively extensive, a compromise between not overwhelming the participants while at the same time obtaining enough information to deduct valid findings was found in having the survey completed every ten days over the course of six months. Guidelines for completing surveys are essential to make clear to participants what is actually expected from them (cf. Porst 2014, p. 47). In this context, clear instructions are even more important because the responsibility for completing the survey on a regular basis lies on participant side. To prepare the participants for filling out the questionnaire and to get initial feedback from them, each participant received individual instructions and an introduction to the SNS questionnaire in a virtual meeting.[75] Due to the fact that participants were assumed to complete the survey during their work hours, an appointment series was created for each of them as a reminder. Included in their Microsoft Outlook calendar that they use at work, they were automatically prompted to fill out the questionnaire every ten days. To simplify the process of accessing SNS, the instructions documents were included in the calendar items. The completing process was tracked manually and friendly reminders were sent out by email when participants missed their survey.[76]

3.1.2 Team Meeting Documentation

In order to supplement data collected with the SNS questionnaire and to be able to relate results with significant events and changes during the data collection period, bi-weekly

[75] Appendix II includes an exemplary document with instructions for filling out the SNS questionnaire.
[76] SNS provides a function to automatize the process of data collection. In this study however, the time intervals of completing the survey were customized, which is why the researcher had to follow up manually. A possible enhancement in the SNS system would be to automatically prompt participants in customized time intervals.

team meetings were documented by the researcher.[77] This documentation also served as an orientation for the intermediate reflection interviews.

3.1.3 Intermediate Reflection Interviews

The SPM concept implies to actively involve the participants in SNS data collection as process designers through feedback and evaluation (cf. Haken/Schiepek 2010, p. 445; Schiepek/Eckert/Kravanja 2013, p. 52-53). Reflection interviews[78] are therefore of high importance in change processes management and can be seen as an essential requirement for motivation and commitment in working with SNS (cf. Schiepek/Eckert/Kravanja 2013, p. 80; Schiersmann/Friesenhahn/Wahl 2015, p. 98-99). They help in making change processes more transparent and visible, in strengthening participants' self-efficacy and in fortifying participants in their actions (cf. Schiepek/Eckert/Kravanja 2013, p. 52-53; Schiersmann/Friesenhahn/Wahl 2015, p. 67, 98-99). Participants' self-perception is sharpened while reflecting on data conspicuities, verifying interpretive approaches and drawing concrete conclusions for next steps against the background of the GPs (cf. Haken/Schiepek 2010, p. 439; Schiersmann/Friesenhahn/Wahl 2015, p. 66). In each reflection interview, the data collected is reviewed and discussed together with the participants in order to confront them with their own thoughts and feelings, i.e. intraindividual synchronization, as well as to identify custom-fit interventions, i.e. interindividual synchronization (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 66). From a qualitative research standpoint, these reflection interviews can be categorized as a mixed form of guided[79] narrative[80] expert[81] interviews. In this study, the main idea was to let the participants as experts for

[77] Appendix III presents team meeting documentation. This documentation is to be seen as an informal collection of background information for the researcher rather than a formal scientific instrument.
[78] Interviews can be defined as appointed meetings where usually two people interact directly in the roles of interviewer and interviewee in order to collect information from the interviewee (cf. Friebertshäuser/Langer/Prengel 2013, p. 438).
[79] Guided interviews are based on a previously developed guide including questions or keywords for questions (cf. Helfferich 2001, p. 36-37; Schnell/Hill/Esser 2013, p. 378). This guide ensures that all relevant topics are addressed, while at the same time an open conversation style allows for capturing the participant's frame of reference (cf. Schnell/Hill/Esser 2013, p. 378).
[80] Narrative interviews are an extreme type of open interviews and are based on a roughly defined subject (cf. Schnell/Hill/Esser 2013, p. 379-380). The participants speak without interruption and are asked to repeat or further explain parts of their narration (cf. ibid. ibid., p. 379-380).
[81] Expert interviews do not refer to a specific survey procedure, but rather to the quality of the participant as an expert (cf. Bogner 2005, p. 209). In this context, an expert is considered a person to whom is attributed some kind of special knowledge that no one else has access to (cf. Przyborski 2010, p. 131).

the change process reflect on the first three months of data collection, while considering past developments, the present state and any future target condition (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 69). To provide an orientation, presentations[82] with diagrams illustrating the data collected and a guide[83] with questions for giving narrative incentives were prepared for the interviews. This way, the interviewer would be able to let the participants speak freely about their interpretation of the data like in a narrative interview. At the same time, the guide provided a flexible structure that was to be applied when the participants would lose their train of thought (cf. Przyborski 2010, p. 144). In preparation for the interviews, the data was reviewed by the researcher for each participant while collecting initial ideas for interpretation (cf. Schiepek/Eckert/Kravanja 2013, p. 82; Schiersmann/Friesenhahn/Wahl 2015, p. 66). Striking fluctuations and strong consistencies were identified and assembled in individual presentations for each interview as a basis for the participants' reflection (cf. Schiepek/Eckert/Kravanja 2013, p. 82; Schiersmann/Friesenhahn/Wahl 2015, p. 66). The presentations were not handed over before the interviews in order to avoid overwhelming the participants (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 66). They were instead sent to them afterwards for their reference and as a constructive reward (cf. Przyborski 2010, p. 91).

The interview guide was oriented toward the communication culture shared in the participants' team (cf. Helfferich 2011, p. 165) and developed based on a presumed duration of about one hour per interview, which corresponds to general guidelines for conducting interviews (cf. cf. Schnell/Hill/Esser 2013, p. 339-341). This duration is assumed to not overwhelm participants while at the same time giving them enough room to reflect thoroughly on their data. The guide starts with an introduction where the interviewer shows appreciation for the interviewee's participation, reminds her of the interview topic, explains data anonymization and asks for approval to record the conversation (cf. Przyborski 2010, p. 80). For warming up and stimulating the first narrative flow, the interviewer asks about feedback on the SNS questionnaire (cf. Helfferich 2011, p. 102-106). This way, the interviewee can arrive in the interview

[82] Appendix IX contains all presentations utilized in the interviews.
[83] Appendix IV reflects the interview guide.

situation with a concrete topic that she[84] has dealt with during the previous months (cf. Przyborski 2010, p. 87). The next step is to make the change process present and to give the interviewee room for addressing topics that she has on her mind. Subsequently, the interviewer explains the SNS diagrams[85] and has the interviewee reflect on the data without giving any presumptions (cf. Schiepek/Eckert/Kravanja 2013, p. 81; Schiersmann/Friesenhahn/Wahl 2015, p. 66). After reflecting on the diagrams, the interviewer provides assistance in evaluating and securing the participant's findings and helps her in identifying and transferring future strategies. The last question gives room for additional comments and feedback (cf. Helfferich 2010, p. 181; Przyborski 2010, p. 91). The interviewer concludes each interview thanking the participants for their time and concentration (cf. Przyborski 2010, p. 88). In general, the interview guide includes open questions for enabling extensive narrations and to ensure a natural flow of conversation (cf. Helfferich 2010, p. 108; Schiepek/Eckert/Kravanja 2013, p. 81). It is formally clear and easily applicable with comprehensible, nonjudgmental and answerable questions (cf. Helfferich 2010, p. 108, 180). Each interview was virtually conducted and recorded. The interviewer tried to give narrative stimuli and to follow up with maintaining, controlling, clarifying and suggestive questions as well as reflections, paraphrases and interpretations according to each situation (cf. Helfferich 2010, p. 102-106; Przyborski 2010, p. 87). The main goal was to have the flow of narration run by itself in a natural conversational environment of safety, appreciation and positivity (cf. Przyborski 2010, p. 87).

After explaining the different instruments for data collection in this study, the next chapter provides details on the process of data evaluation.

3.2 Data Evaluation

This chapter explains the process of evaluating data collected with the SNS questionnaire and in the reflection interviews. SNS provides automatic data evaluation

[84] Since all participants in this study are women, only the female form is used in this context.

[85] Originally, complexity resonance diagrams were planned to be used as a first overview. Due to technical issues in SNS as described in section 4.1.4, CRDs could not be provided at that time. Instead, raw data was used for visualizing movements in the course of time (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 66). Overview presentations were prepared in advance in order to compensate for the lack of CRDs.

in multiple forms, such as complexity resonance diagrams and time series diagrams. In order to evaluate the data collected in the reflection interviews, the recordings were transcribed. Subsequently, content analysis according to Mayring (2010) was applied.

3.2.1 Data Evaluation in SNS

SNS provides various types of automatic data evaluation matching the characteristics of self-organizational processes like dynamic complexity, permutation entropy, recurrence plots, synchronization patterns and correlation matrices (cf. Center for Complex Systems 2007; Sammet 2015, p. 58-62; Schiepek/Eckert/Kravanja 2013, p. 60-61). In this study, complexity resonance diagrams and time series diagrams are utilized to visualize changes, inclines, declines and continuities in self-assessments over time (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 62). By taking into consideration these two types of data evaluation, raw data and factors can be matched in order to deduct hints for order transitions (cf. ibid. ibid., p. 62).

Complexity Resonance Diagram (CRD)

CRDs[86] are color maps that visualize the development of complexity for all items over the course of time (cf. Sammet 2015, p. 59; Schiepek/Eckert/Kravanja 2013, p. 60; Schiersmann/Friesenhahn/Wahl 2015, p. 63). The x-axis reflects the course of time. The y-axis contains all underlying items for the self-assessments and the GPs they are assigned to (cf. Sammet 2015, p. 59; Schiersmann/Friesenhahn/Wahl 2015, p. 63).[87] Each colored square represents a complexity value that was calculated in the respective interval (cf. Sammet 2015, p. 59; Schiersmann/Friesenhahn/Wahl 2015, p. 63). In this context, a high complexity means that self-assessments show strong fluctuations in one interval (cf. Schiersmann/Friesenhahn/Wahl 2015, p. 63). The rainbow color scale can be customized in color selection as well as in the definition of maxima and visualizes the intensity of changes in an intuitive way: fluctuations are indicated by red coloring, continuities are marked in blue (cf. Sammet 2015, p. 59; Schiersmann/Friesenhahn/Wahl 2015, p. 63). Figure 11 illustrates an exemplary CRD of this study.

[86] All CRDs for this study can be found in appendix V.
[87] The GPs are represented by I to VIII. IX corresponds to the dimension of social aspects.

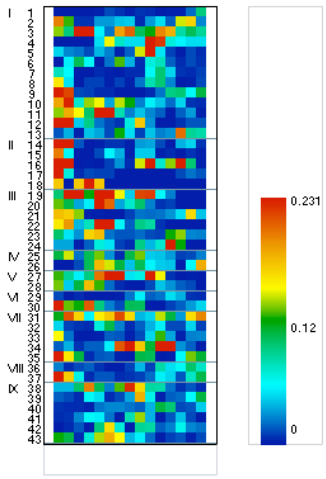

Figure 11: Exemplary CRD

(cf. Synergetic Navigation System 2016)

The CRDs help in visualizing order transitions and related organizational factors by identifying synchronous changes in multiple items (cf. Center for Complex Systems 2007; Schiepek/Eckert/Kravanja 2013, p. 60; Schiersmann/Friesenhahn/Wahl 2015, p. 64). In this study, they are used to display the system's dynamics in alternating between stability and instability (cf. Schiersmann/Friesenhahn/Wahl 2015).

Time Series Diagram

The time series diagrams[88] display process data per item over the course of time (cf. Sammet 2015, p. 57). While CRDs serve more as a tool for providing an overview of the system's dynamics and complexity, time series diagrams can be used to get a more detailed insight into each item. The x-axis reflects the points of time when the survey was completed. The y-axis visualizes to which extent the participant agreed with the statement.[89] Figure 12 presents a time series diagram for an exemplary item.

[88] All time series diagrams for this study are included in appendix VI.

[89] In this case, the value of '0' means strong agreement and '100' indicates strong disagreement. SNS is oriented toward the general recommendation of organizing the scale direction from left to right according to the reading direction in European and Anglo-American cultures (cf. Porst 2014, p. 90). In this study, the scale direction was unintentionally reversed– a fact that should be corrected in future research.

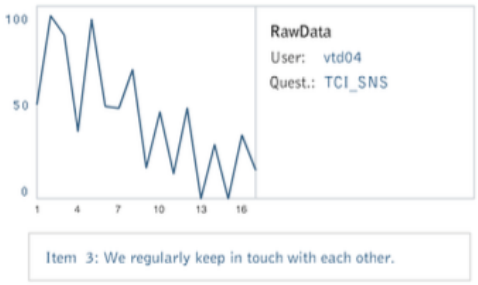

Figure 12: Exemplary Time Series Diagram

(cf. Synergetic Navigation System 2016)

Time series diagrams include primary data that can be used for identifying fluctuations and consistencies (cf. ibid. ibid., p. 58). Furthermore, they provide a functionality that displays comments related to certain points of time in a pop-up window (cf. ibid. ibid., p. 58). They are used in this study to drill down into single items of interest and collect further background information on the system dynamics.

3.2.2 Data Evaluation for Reflection Interviews

As explained in section 3.1.3, intermediate reflection interviews serve as an intervention and reflection instrument, but also as a source of additional qualitative information about each participant. In order to evaluate the interviews, the respective recordings were transcribed and analyzed according to Mayring's (2010) approach of content analysis.

Interview Transcription

In order to be able to analyze interviews, they need to be transcribed into a legible form. In this process, extensive audio material is typed out while trying to capture both spoken language and nonverbal behavior (cf. Friebertshäuser/Langer/Prengel 2013, p. 515-516; Lamnek 2010, p. 367). For systemization and simplification purposes, transcription guidelines are created and applied (cf. Friebertshäuser/Langer/Prengel 2013, p. 523). Table 5 includes the guidelines for interview transcription utilized in this study.

Symbols	Meaning
(.)	Very short break
(--)	Average pause (< 0,5 sec.)

(---)	Long pause (< 1 sec.)
(30s)	Very long pause (> 1 sec.) with indication of the approximate duration in seconds
EXAMPLE	Emphasis
A: text text [text overlap B: text overlap] text text.	Overlap due to speaking simultaneously
( )	Incomprehensible
(Example)	Suspected wording
(Example/Example2)	Alternatives of suspected wording
((laughing))	Nonverbal behavior
[telephone rings]	Interview-independent events
Mhm	Affirmation
Mhmh	Rejection
Uhm, uh etc.	Delay signal
<Name>	Anonymization

Table 5: Interview Transcription Guidelines

(Own presentation based on Friebertshäuser/Langer/Prengel 2013, p. 523; Linden 2007b)

The result of the transcription process were four transcript documents[90] that were used as a basis for content analysis, as explained in the next subsection.

Qualitative Content Analysis

Content analysis means analyzing communication in a fixed form[91] in a systematic, rule-governed and theory-driven way in order to draw conclusions on particular issues of this content (cf. Friebertshäuser/Langer/Prengel 2013, p. 325-326; Mayring 2010, p. 13). In this process, data material is classified by specific aspects that are considered theoretically and empirically useful while constructing descriptive systems for validating theories and hypotheses (cf. Mayring 2010, p. 24-25). There are different types of qualitative content analyses. In this study, a structuring qualitative content

[90] Appendix X includes all interview transcripts for this study.

[91] Communication in a fixed form refers to all kinds of texts, pictures and videos (cf. Friebertshäuser/Langer/Prengel 2013, p. 323).

analysis is applied where a category system[92] is predefined, including rules for ensuring distinct assignment in order to filter structure from the material (cf. Friebertshäuser/Langer/Prengel 2013, p. 327-328; Mayring 2010, p. 92). As a key instrument in this approach, the category system needs to be carefully developed and thoroughly explained to ensure intersubjective replicability (cf. Friebertshäuser/Langer/Prengel 2013, p. 327-328; Mayring 2010, p. 48-49). The GPs were used as categories for the content analysis in order to validate whether the requirements for change processes were met. Two additional categories were created: one for collecting feedback[93] on the process of data collection and another one for indicating delicate statements[94]. The systematization of content analysis is not only ensured through the category system, but also through an orientation toward a process model (cf. Friebertshäuser/Langer/Prengel 2013, p. 328; Mayring 2010, p. 48-49). The process model for this study is illustrated in figure 13.

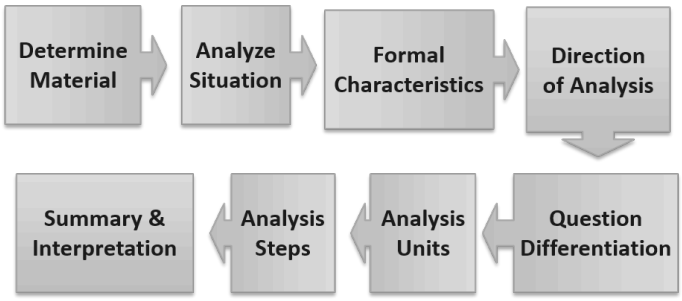

Figure 13: Process Model for Qualitative Content Analysis

(Own presentation based on Friebertshäuser/Langer/Prengel 2013, p. 329; Mayring 2010, p. 60)

As a first step, the four interview transcripts were determined as the text material for examination. The situations from which they originated were reflection interviews based on a data collection period with SNS of three months. In terms of formal characteristics, the interviews were recorded digitally and subsequently transcribed with a text processing program. Regarding the direction of analysis, insights into the participants' subjective perceptions of previous developments as well as the current

[92] The category system for this study can be found in appendix VIII.

[93] Study feedback is collected separately from results referring to this specific change process. It is used to draw conclusions on the research model on a meta level.

[94] In the context of this study on team development in a business environment, data needs to be handled in a sensitive way in order to avoid negative impacts on the participants' employment situation. Therefore, delicate statements are specifically tagged and filtered for the presentation of results. The category of social aspects serves only as a filtering tool for the researcher and is not summarized in this report.

state of the change process were to be gained. Differentiating the subject for analysis in a theory-driven way led to the following three principal questions: to which degree were individual GPs implemented in the past? What is the current state? Which background data can be collected in this context? The units for analysis were defined as follows: the coding unit consists of at least a whole sentence, the context unit should include a maximum of 500 words and the evaluation unit corresponds to the interview transcripts in a synchronous order. When performing the text analysis, the category system was applied in an interpretative way and validated simultaneously (cf. Friebertshäuser/Langer/Prengel 2013, p. 325-326). Ultimately, the results were summarized and interpreted toward the research question.
After explaining the process of data evaluation, results and conclusions are presented in the next chapter.

3.3 Results

This chapter presents resulting data from both the SNS questionnaire and the reflection interviews as well as consequential suggestions for further team development.

3.3.1 SNS Results

Each team member's CRD illustrates distinct ways of coping with the change process examined in this study and different effects that this change has on each individual. The resulting CRDs in this study differ strongly from each other – a fact that shows how handling change diverges within this team. The following summary elucidates the SNS results for each of the four participants.[95]

The 'Change Facilitator'

For this participant, a critical point of time can be identified, which shows strong fluctuations throughout all GPs. This point of time is located around the announcement of a new training strategy. The 'change facilitator' seems to have run relatively smoothly through the change process. Initial strong fluctuations minimize over time, which indicates that the system is brought in motion to then restabilize again. Strikingly,

[95] For simplification and anonymization purposes, the participants' SNS results are categorized. However, these categories are not assumed to appropriately reflect the complexity of individual personalities.

the GP of developing visions and goals and creating connotation (III) has barely any fluctuation; respective statements were mostly agreed with. This leads to the conclusion that this person was fully aligned with the team objectives throughout the whole process. At large, this participant seems to have played a key role in facilitating change.

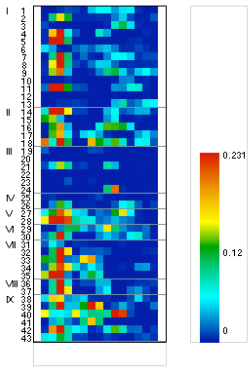

Figure 14: CRD for the 'Change Facilitator'

(cf. Synergetic Navigation System 2016)

The ‘Passive Optimist’

This participant demonstrates very high consistency and agreement with most of the questionnaire items. According to synergetics, change processes require fluctuations. Consequently, this person seems not to have actively participated in this change. However, a constant agreement with many items indicates a positive attitude toward the change process. Items which were rather disagreed with are related to the GP of developing visions and goals and creating connotation (III). Apparently, this person was not in agreement with the new vision and goals. Interestingly, a fluctuation point of time can be identified for multiple items directly after having the reflection interview, which leads to the conclusion that this interview had an interventional effect.

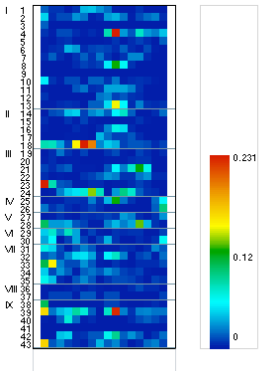

Figure 15: CRD for the 'Passive Optimist'

(cf. Synergetic Navigation System 2016)

The ‘Initial Struggler’

This person exhibits strong fluctuations throughout the GPs of creating stability conditions (I), identifying the system and its patterns (II) as well as developing visions and goals (III). These fluctuations are located mainly at the beginning and midway through the data collection period, which indicates that this person seems to have struggled with fundamental requirements for change processes. As opposed to the other two GPs (II and III), the GP for creating stability conditions (I) becomes consistent in disagreeing with the respective statements. Seemingly, this person found a way to familiarize with the system patterns and the new vision, but never felt stability. The fact that all other GPs include barely any fluctuation leads to the conclusion that the initial phases of destabilization and instability have yet to be transcended.

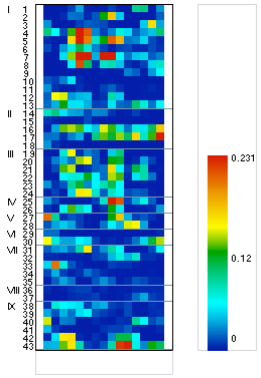

Figure 16: CRD for the 'Initial Struggler'

(cf. Synergetic Navigation System 2016)

The ‘Constant Struggler’

This team member shows strong fluctuations throughout all GPs and the whole data collection period, which leads to the conclusion that she seems to have had a hard time in coping with the change process. There is a tendency that the GPs are activated in the chronological order of destabilization, instability and then restabilization. However, ongoing fluctuations in the GPs of creating stability conditions, identifying the system and its patterns as well as creating visions and goals indicate that basic preconditions for the change processes were never really fulfilled. This person seems to have run through the change process in a constant struggle.

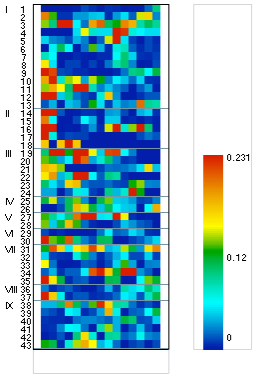

Figure 17: CRD for the 'Constant Struggler'

(cf. Synergetic Navigation System 2016)

Social Aspects

Questions belonging to the TCI dimension of social aspects were utilized to identify abnormalities in response behavior. Since none of the participants constantly agreed with these implausibly positive statements, all of them are assumed to have responded in a sincere and honest way.

3.3.2 Reflection Interview Results

Quantitative data collected with SNS is supplemented with qualitative background information deriving from the reflection interviews.[96,97] As part of the qualitative content analysis, the category system was applied to the interview transcripts.[98] Results were subsequently summarized for each GP. Study feedback[99] was collected in an additional category. This section presents the interview results for each category.

Create stability conditions for change processes

Even though team members emphasized that the team had a strong foundation based on past experiences and developments (Helen: 416-418; Linda: 584-586; Susan: 117-119), different levels of stability were observed for the participants: *'But gladly this (--), uh, manager change went very smooth for me. (2s) Uhm, maybe because I know <John>*

[96] At this point, it would be interesting to connect SNS results for each participant with results from the interviews. Due to the small sample size, this connection is not created in order to ensure the participants' anonymity.

[97] The reflection interviews prove to be an important source of information for deducing suggestions for further team development. Section 4.2.3 illustrates the relevance of combining quantitative and qualitative data in this study.

[98] Appendix IX includes a full list of codings for the qualitative content analysis.

[99] This feedback is utilized as a basis for identifying potential for study improvement in section 4.3.1.

from the past. (--) Maybe because we are aligned with our perspective on how things should go.' (Maria: 86); *'It gets harder and harder. And he, and when I'm confused, my opinion, so (---), uhm, (--) uhm, can change so much, because I'm not that certain of my opinion. Because we are in (.) in everything is so uncertain right now.'* (Linda: 88); *'Well, I have] to want to fix it, you know. They have to (.) you know, the management has to feel that it's not working. I'm not sure that the manager feels it's not working. (---) And until they feel it's not working, it's not going to get fixed.'* (Susan: 65). When the interviews were conducted, the current situation was characterized by confusion and uncertainty (Linda: 22-26, 102-104; Susan: 121; Helen: 77-78). However, the team did not appear to be generally resistant against change, since the absence of change was criticized and perceived as being 'stuck in a rut' (Susan: 191; Linda: 522). In addition, positive aspects about the change of management were mentioned, like an improvement in collaborating with other teams (Helen: 328-332).

Identify the system and its patterns

In the interviews, three different milestones were identified for this change process. Before the change of management (1) and the subsequent introduction of a new training strategy[100] (2), one of the team members was promoted to be the team lead (3). This promotion was seen as the starting point of the change process: *'So, for me it was, uhm, (--) double change. Because first I became a team lead, started to work with <David>. And then I got <John>. ((laughing))'* (Maria: 82); *'But, uh, (--) I don't think we're near the end of it. Because, uhm, (3s) we aren't (2s) I mean two, (---) two really big things happened. (2s) And we were not done with the first, before we got the second. (---) <David> put (2s), you know, a team leader in place on our team. […]And then, we got a new manager on top of that, who comes in and thinks that everything is hunky-dory and that's how the team operates and (--) and, you know, that we're, we're all adjusted to this and (.) and we're not.'* (Susan: 49). The fact that one of the team members was promoted without transparent reasoning led to an ongoing low acceptance of this new team lead (Linda: 622-628; Maria: 88-92; Susan: 49, 223). The absence of clear criteria, inconsistent communication by both the new manager and the team lead (Linda: 356-360, 548-550; Helen: 104; Susan: 49-53, 161-163) as well as a lack of trust within the

[100] This new strategy was decided on in a face-to-face meeting with only half of the team members. Due to budgetary reasons, two of them could not participate.

team (Susan: 50-53, 207; Helen: 80) eventually resulted in disagreement with the new training strategy (Maria: 98-104; Linda: 22-26; Susan: 55; Helen: 68-76, 104-108). When the interviews were conducted, the team members saw themselves in a serious conflict situation that was splitting the team in two parties (Helen: 110-112; Susan: 49; Linda: 46, 295; Maria: 295). This conflicted prevented them from performing (Maria: 122-124; Helen: 100-106; Linda: 80-86), even though the team was considered to usually work well together (Linda: 240-242; Susan: 67, 143-145; Helen: 100). Negative power differentials were perceived (Susan: 49; Linda: 622-628), facilitated by having to collaborate virtually and in different time zones (Linda: 235-236, Susan: 67; Helen: 293-320, 480-482).

Develop visions and goals, create connotation

When referring to goals, the participants distinguished between Key Performance Indicators (KPIs) defined by the higher management and informal objectives for actual training development: *'So, if I look at objectives in a narrow way, (---) uhm, (---) and maybe sometimes I look at it more narrowly than others depending on how I feel that day. (2s) Uhm, (---) you know, (2s) and so, so, I, yeah, I think, I think in item nineteen (---) I'm looking at, uh, objectives as in KPIs. […] In item twenty I am kind of looking at objectives as in (--) this training strategy that we are working on I think.'* (Helen 238-240); *'Uhm, if you mean the objectives that we got from, uh, the management at the beginning of the year.'* (Maria: 209). There was no consistency within the team in terms of agreement with KPIs and informal objectives (Maria: 211; Linda: 298, 302-306; Helen: 238-246; 261-263), which can be traced back to a lack of clarity in concrete objectives for part of the team (Linda: 42, 298, 366; Susan: 161-163). Other team members were clear about their objectives, but did not agree with them (Helen: 364; Linda: 332). In addition, team members were in general unconvinced of the importance of their objectives for the company and wider society (Linda: 444, 453-454, 528; Helen: 234-250).

Enable energizing, identify control parameters

Strong emotions were identified as main influencing factor for coping with change in this team: *'Uh, you, you cannot, (--) uhm, disconnect emotion (.) and personal, uh, views from professional, (---), uhm, you know, uh, (3s) thinking, let's say (.) or behavior.'*

(Linda: 36); *'And also I think that there are a lot of, uh, emotional (.) reasons there and, uhm, (---) yeah. You cannot fight emotions.'* (Maria: 173); *'Well that's definitely emotional. You can see where they, on, on thirty-nine that's definitely ( ) emotionally. And how, this is how I feel, this is, you know, my current state based on things that probably happened in the last (---) day or week.'* (Helen: 228). To constructively deal with these emotions, tolerance and transparency from management side were seen as main requirements (Susan: 79, 85-89; Linda: 140; Helen: 94-96). From a synergetic standpoint, emotions can be identified as a major control parameter setting the system in motion. However, they were mainly perceived as negative, which prevented the team from leveraging these energies in the change process.

Encourage destabilization, fluctuation increase

Team members felt that they were caught in a circle: *'Yeah. (--) Yeah. Because I, I feel like I, I, you know, it's, it starts to be that (.) I feel like the team starts to function better. They're listening, it seems like we're listening. And then (--) next thing I know (--), uhm, it's not, (---) I don't know. I don't, you know, and I, I've tried, around that time sometime I remember having a meeting, uh, (---) because I had a, a problem and. You know, we had a discussion. It seemed to go well. Then we changed and (.) things were (.) not going the direction I thought (2s), I was very confused […].'* (Susan: 89); *'Open and responsive to change. I mean we're going through a big change. […] I'm not sure we're responsive to it. […] Well, I think I think that we were at one point, I think we were in there. Right now, I feel we really regressed.'* (Helen: 338-342); *'I mean I feel it helps. (---) But then it seems like we always get ((laughing)) to the same starting point back. […] Like always go back to the same point. And, uh, it feels like the energies are, (---) yeah, kind of wasted, because we then go back to the same (---), uh, (.) baseline. And it's very frustrating.'* (Maria: 122-124). Fluctuation seems to have increased frequently in this change process, but it apparently always led to a regression toward the old pattern.

Support symmetry break

When it came to decision-making, team members were questioning but did not feel like they were being heard by the management: *'Well, I think we had as much a need to (---) to question (2s). And we both had a little bit of questioning. But (2s) people are REALLY*

questioning now.' (Susan: 151); *'And, and item twenty-nine is interesting, because (---), uh, we ARE prepared to question the basis of what the team is doing. I mean, (--) but that's only part of the story. The other part is that nobody is listening to us.'* (Helen: 216). Since participants did not feel like they had access to the reasons behind changes and therefore did not support them (Susan: 203; Helen: 194), the phase of symmetry break seems not to have been reached.

Ensure restabilization

When the interviews were conducted, the team did not seem to have reached the point of restabilization. Nevertheless, they showed a general openness for change and recognized the potential for innovation with a new strategy: *'Uh, the team is always moving toward the development of new answers, (3s) uhm, yeah. I mean we try. (2s) People in the team cooperate, I think people have good heart (--) for the practical support. I think people are very, I think it's a very supportive team in general (2s) at the team member level I feel very supported by my (.) my colleagues.'* (Susan: 153) *'Interviewer: Uhm, it seems in the beginning, (---) you didn't feel like, (--) uhm, (.) new ideas and new ways of looking at problems were, uhm. // Lina: Right. // Interviewer: Were developed. // Linda: Right. // Interviewer: And then it changed. Do you think this has to do with the new strategy? // Linda: Of course it has to do with the new stragedy, strategy.'* (Linda: 483-488); *'People in the team coordinate] in order to help develop and apply new ideas. (3s) So, ( ) I kind of abstract them in my mind (---) in order to answer them. (2s) And I say well, I guess generally (3s) looking, you know, on most (--) occasions in the past, we have cooperated.'* (Helen: 200).

Consider resonance, create synchronization

While reflecting on the current situation, the participants identified numerous improvement strategies. Emotions were suggested to be utilized as change facilitators: *'And, uhm, (2s) I think this is, uh, something that, uhm, (4s) is a challenge for (.) management and for (2s) the team, for the team also. […] How to (--) best, uhm, deal with emotions and how to, (3s) uhm, (--) yeah, how to cope with them and (2s) and maybe not neutralize them, but, you know, (---) uhm, use them (.) as a drive and not as a (3s) as a stopper.'* (Maria: 379-381); *'And there are emotions. There will always be emotions. And I think that <Susan> really really tried (.) to do it in a corrective way.*

But it wasn't, it, she really tried. And <Helen> didn't say anything, which is really (.) I really appreciate that. Because <Helen> can be very emotional. (---) And she, she didn't say anything. Because she didn't want it to become an emotional thing. I think so.' (Linda: 606); *'(--) BUT there still should be (--) a way of having somebody's opinions listened to within the team. (2s) I mean (.) there's a lot of online stuff that could be done. Like polling questions or surveys to (--) you know. (---) Really capture what we want to say.'* (Helen: 510). In this context, more attention should be paid on individual needs, so that people would feel free to state their opinion and increase their participation in both face-to-face and virtual meetings (Helen: 510-514, 523-526; Susan: 223; Linda: 136, 608-614). Ultimately, the manager as well as the team lead should be more clear and transparent in their roles and actions (Maria: 388-391; Linda: 136).

Study feedback

In general, the team members felt that filling out the SNS questionnaire had an effect on their thoughts and feelings: *'It is kind of making me aware of, oh yeah, the virtual team. And (2s) basically how difficult it is to communicate. Which I think is being compounded recently. (2s) Uhm, (2s) with the management changes. (2s) Uhm, (2s) so (3s) it's kind of made me think about the virtual team a lot more I think recently.'* (Helen: 18); *'Uh, but when I (.) filled the questionnaire, I sometimes, uh, thought about things that happened to me. […] So, it's not that this affected my work. But when I filled it, I thought about my work.'* (Maria: 56-60); *'Uhm, (3s) I will think on that. But no, I didn't, I didn't think it did. Well, maybe in a sense, because it (--), you know, (---) because when I would talk about negative things, maybe they either stay in my mind longer or they are allowed to escape.'* (Susan: 33). Even though the participants were positive about being asked about their opinion on a regular basis (Susan: 17; Helen: 54-56), there was also a concern that their thoughts and feelings might be revealed to the management (Susan: 25; Linda: 638-645). The questionnaire was perceived as having too many questions (Maria: 26; Susan: 23; Linda: 645-650), many of them being repetitive (Susan: 13; Maria: 28). Questions about both other teams (Helen: 28, 326; Linda: 251-258) and objectives (Linda: 306-308, 330; Susan: 37; Helen: 256-263) were unclear due to a different understanding of these terms. In addition, the scale direction was not intuitive for the participants (Linda: 182-188; Helen: 159-163; Maria: 10). Regarding the results, the participants were surprised because they had not expected any fluctuations (Linda:

163-168; Helen: 488). In terms of the study sample, the question was raised if it would make sense to include the manager and the team lead (Maria: 36-40; Helen: 184).

3.3.3 Suggestions for Further Team Development

Based on the results from both the SNS questionnaire and the reflection interviews, the following suggestions for further team development are made.

Stability Conditions as a Central Requirement for Change Processes

The results in this study show that stability conditions were not provided as a fundamental precondition for enabling change processes. Since this study is examining a virtual team, building trust through transparency and participation is strongly recommended to ensure the acceptance of new goals and visions in the future.

Transparency and Participation

Especially regarding goals and objectives, team members need transparency and the feeling that they are participating in decision-making in order to be motivated for changes. Information is seen as a new source of power and needs to be distributed to create shared accountability. Virtual team meetings should therefore include fixed time slots where every team member can address their thoughts and concerns. In addition, these meetings should be summarized and wrapped up at the end in order to double-check if all issues were resolved or to define next steps for solving them.

Clear Roles and Relationship Building

Since the team lead's promotion led to ongoing conflicts within the team, this person should be supported by training and coaching her for her new role. As described in section 2.1.4, virtual team leaders are crucial contributors to their teams' success. Also this team lead should be prepared to facilitate trust development, to ensure transparency in decision-making and to grant autonomy to each team member. In addition, this role needs to be clearly defined in terms of responsibilities and authority. An official role definition can help in avoiding or in identifying inconsistencies in the management's communication. Relationship building with the entire team is also recommended, ideally in a face-to-face meeting including a workshop on role distribution and conflict management with an external trainer. Through both relationship building in the team

and strengthening the team lead in her role, her acceptance within the team can be significantly increased.

Individual Needs and Situations

Everyone deals with change in a different way. For some people, coping with new situations is easier than for others. A good understanding of individual needs and situations is therefore crucial for integrating every single team member in the change process. Focusing on individual team members also adds to a sensitivity for undesired developments and to the ability to react quickly.

Emotions as a Driving Force

Members of this team are passionate about their work. These strong emotions can be leveraged as a driving force to facilitate change and innovation. This subject could also be addressed in a face-to-face meeting in order to enable the team to deal with emotions in a more constructive way.

Virtuality and Time Zones

Team members vary in their perception of difficulties in working virtually and in different time zones. Since for part of the team this is a problematic issue, it should be addressed consciously. Availability and communication plans could be created for the team members and for members of the neighboring teams. This way, everyone knows when and whom to contact for which topics and 24/7 work schedules can be leveraged.

4. Conclusion

In conclusion of this thesis, this chapter outlines challenges in data collection, validates the success of this study and provides an outlook on future research.

4.1 Challenges in Data Collection

This study presented numerous challenges related to the sample, response rates and the SNS system. The following sections illustrate how these challenges were dealt with.

4.1.1 Sample Size

The sample in this study consists of four team members and is therefore relatively small. Since the research intention is to examine a change process for this particular team, the sample size is considered appropriate. Instead of collecting information on a large sample in order to generalize results for an entire population, both quantitative and qualitative data serve as a basis for gaining a full insight into the concrete change process investigated in this thesis and for deducing suggestions for further development of this specific team.

4.1.2 Participating Research

Researchers are assumed to have an interventional effect by participating[101] in the situations they are examining (cf. Bachmann 2009, p. 266; Linden 2007a). According to this idea, participation has mutual effects on both the researcher's perception and the situation itself (cf. Bachmann 2009). However, these effects are not only to be seen as possible confounding factors (cf. Bachmann 2009, p. 266; Linden 2007a). Instead, the researcher is able to access new aspects that are only approachable through immediate participation in the situation (cf. Bachmann 2009, p. 267; Linden 2007a). In order to ensure intersubjective reproducibility, the form of participation should be disclosed by the researcher (cf. Bachmann 2009, p. 267). In this study, the researcher was strongly involved in the research subject as a member of the team that is being examined. This

[101] Participation in this context can vary within the spectrum of mere physical presence and full interaction (cf. Linden 2007a).

allowed for a good understanding of the overall team's situation and for access to sensitive information in the reflection interviews. In order to increase objectivity[102], the researcher distanced herself from her job role during research activities and approached the situation in the role of a process consultant.

4.1.3 Survey Response Rates

The researcher was in close contact to the participants and was supported from management side, which ensured high response rates. The frequency of filling out the SNS questionnaire was tracked manually. In case a survey was missed, follow-up emails were sent to the respective participant. Since the survey was scheduled to be filled out every ten days, some of the dates fell on weekends, which was mostly problematic because the participants did not see the reminders. Ultimately, the survey response rate was approximately 90%.

4.1.4 Technical Issues with SNS

In the prearrangement phase of the reflection interviews, the researcher came across technical issues with data evaluation in SNS. For the CRDs, the output feature did not work properly. The issue was addressed with SNS support and solved only after conducting the interviews. In order to compensate for the absence of CRDs, which were meant to provide an overview of the data collected, interview presentations were prepared.

4.2 Validation of Study Success

In order to validate the success of this study, quality criteria and reactivity are evaluated. Additionally, the relevance of combining quantitative and qualitative data is explained and resource limitations are illustrated.

[102] In a systemic sense, observations always depend on the observers' perspective and are to be seen as subjective truths (cf. Ellebracht/Lenz/Osterhold 2011, p. 15). This means that objectivity can never be fully accomplished.

4.2.1 Quality Criteria

Quality criteria are important tools for measuring a study's scientificity. There are various quality criteria for different research areas and instruments. This section covers quality criteria for the SNS questionnaire and for data evaluation.

Quality Criteria in SNS Questionnaire

Quality criteria are an important indicator for every questionnaire's fineness (cf. Bühner 2006, p. 33).[103] The TCI, which is utilized as a basis for the SNS questionnaire in this study, has been extensively validated in terms of quality criteria (Anderson/West 1998, p. 255; Kauffeld 2001, p. 93-103). The TCI with its high psychometric quality is combined with SNS, which accomplishes high validity and reliability through ambulatory assessment (cf. Schiepek/Eckert/Kravanja 2013, p. 55-56). Based on these prerequisites, the SNS questionnaire in this study is expected to extensively meet quality criteria. However, since the TCI items were amended and the questionnaire was utilized for the first time in this form, it needs to be further tested in terms of quality criteria in future research. Furthermore, the TCI needs to be additionally revised in order to ensure validity in examining virtual teams.

Quality Criteria in Data Evaluation

In this study, both qualitative and quantitative data is evaluated according to the GPs. The GPs are considered requirements for change processes according to synergetics. However, their deduction is not replicable and they do not seem to be utterly distinct (cf. Schiersmann/Thiel 2012, p. 122; Weber 2013, p. 80-81), which compromises their validity as an instrument for data evaluation. In addition, theories in the field of organizational development suggest other operating principles and prerequisites for self-organized change processes (cf. Ellebracht/Lenz/Osterhold 2011, p. 83-86). Further research is required in order to evaluate the GPs validity in measuring change processes in the field of organizational development.

[103] Next to meeting the main quality criteria of objectivity, reliability and validity, a psychometric test should be normed, comparable, economic and useful (cf. Bühner 2006, p. 35-44).

4.2.2 Reactivity

The effect of reactivity describes an influence of participants in their response behavior due to a conscious perception of the survey situation, leading to the emergence of artifacts (cf. Schnell/Hill/Esser 2013, p. 345-348). Reactivity results from the social character of a survey situation and can never be entirely avoided, since participants are always actively reflecting individuals (cf. Schiepek/Eckert/Kravanja 2013, p. 84; Schnell/Hill/Esser 2013, p. 349). Especially when analysis and intervention are merged like in this study, the measurement itself can change the system behavior and the object that is being measured (cf. Schiepek/Eckert/Kravanja 2013, p. 84). Process data is nevertheless considered meaningful; its measurement can be seen as a catalyst for change processes that are about to happen anyway (cf. ibid. ibid., p. 84). However, this data needs to be supplemented with cross-comparisons with qualitative data, as explained in the following section.

4.2.3 Combination of Quantitative and Qualitative Data

Even though SNS proved to be a powerful monitoring and reflection instrument for this study, most of the suggestions for further team development were deduced from data resulting from the reflection interviews. However, the SNS questionnaire was an essential tool in this context for both accompanying the participants throughout the change process and for helping the researcher in preparing reflection interviews. This shows that the research instruments utilized in this study are especially effective in their combination. An additional valuable qualitative data source are the comments in SNS.[104] In this case, these comments were not analyzed due to resource limitations which are illustrated in section 4.2.4.

4.2.4 Resource Limitations

This study was confronted with various resource limitations. The team members had only limited capacity to participate in the survey and in the interviews next to their work duties, while at the same time going through an intense change process. In addition, this study was conducted by only one researcher. In terms of realizing suggestions that are

[104] Please refer to appendix VII for the SNS comments in this study.

made in section 3.3.3, the team's management is expected to have limited resources and might not be able to implement all of the recommendations.

Altogether, this study is considered to have succeeded in realizing the intention of examining a change process in a large-scale software company and of empirically deducing suggestions for further team development.

4.3 Outlook

In order to provide an outlook on future research and other research contexts, potential for study improvement is identified, the applicability of this research model in other contexts is validated and the state of research related to virtual teams is outlined.

4.3.1 Potential for Study Improvement

In the reflection interviews, study feedback was provided by the participants. This feedback is used as a basis for identifying potential for improving the study model. Since participants were concerned about their privacy, the guarantee of anonymizing their data should be emphasized and could be additionally handed to them in written form. The questionnaire was perceived as having too many and repetitive questions and should therefore be shortened further. When shortening the questionnaire, the intervals of survey completion might be increased in order to enhance the data density for real-time monitoring. Participants were confused about terms that were used in the questionnaire. A clear definition of terms like 'objectives' and 'other teams' should therefore be included in the written instructions for filling out the questionnaire. Additionally, the scale direction of SNS items should be adjusted to the reading direction in Western cultures in order to ensure intuitiveness in completing the survey. Ultimately, managers should also participate in studies on change processes in their teams if they are strongly involved in the daily operations. In this case, they are an essential part of the relevant system and can add to a more holistic view of the change process.

4.3.2 Applicability to Other Research Contexts

The study presented in this thesis was very complex and should therefore be simplified when applied to other contexts. The evaluation of the reflection interviews was very effortful for the researcher. Therefore, a general recommendation is to have more than one person for evaluating qualitative data. Since filling out the questionnaire was quite time-consuming for the participants, the survey should be shortened. Overall, this study model proved to effectively examine a change process in the area of organizational development and is therefore considered to be an adequate starting point for conducting further systemic research in this field.

4.3.3 Research on Virtual Teams

Current research on virtual teams is still fragmented and concentrates on comparing traditional with virtual teams rather than understanding various effects of this new form of collaboration (cf. Pinjani/Palvia 2013, p. 145-146). In order to create a strong basis for examining phenomena like change processes in this area, research on virtual teams needs to be further developed and expanded. Only this way the dynamics and specifics of this new and evolving form of work can be appropriately understood and supported in organizational development.

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Paper Appendix

Appendix I: SNS Questionnaire Development

GP	Dimension	Point of Reference	#	TCI Item	Final Statement	Comments
Create stability conditions for change processes	Participative safety	Information distribution, operational transparency, structural and emotional safety, maintaining contact, professional setting	1	1: We share information generally in the team rather than keeping it to ourselves.	We share information generally in the team rather than keeping it to ourselves.	
			2	3: We all influence each	We all influence each other.	
			3	5: We regularly keep in touch with each other.	We regularly keep in touch with each other.	Rephrased: we keep in regular contact with each other. (5) → combination: interaction implies flow of information rather than contact. Eliminated: we interact frequently. (14) → 'frequently' is judgmental, does not necessarily mean good or bad; interaction equal to contact. Eliminated: members of the team meet frequently to talk both formally and informally. (26) → no real meeting since virtual team; contact includes formal and informal → no gain of information
			4	7: People feel understood and accepted by each other.	People feel understood and accepted by each other.	

			5	8: Everyone's view is listened to even if it is in a minority.	Everyone's view is listened to even if it is in a minority.	
			6	16: People keep each other informed about work-related issues in the team.	People keep each other informed about work-related issues in the team.	
			7	19: There is a lot of give and take.	There is a lot of give and take.	
			8	20: We stick together as a team.	We stick together as a team.	Eliminated: we have a 'we are in it together' attitude. (13) → refers to cohesion, is a more striking statement; might not be understood in different cultures.
			9	23: There are real attempts to share information throughout the	There are real attempts to share information throughout the team.	
			10		We regularly exchange information with other teams.	Team-specific additional item: information exchange with other teams → for training developers necessary to get
			11		We productively collaborate with other teams.	Team-specific additional item: collaboration with other teams → further information on quality of inter-team exchange.
	Vision	Appreciation strengthen self-efficacy experience	12	27: How clear are you about what your team's objectives are?	I am clear about what my team's objectives are.	

			13	31: To what extent do you think your team's objectives are clearly understood by other members of the team?	My team's objectives are clearly understood by other members of the team.	
Identify the system and its patterns	Task orientation	High standards, identify the system and its behavioral patterns	14	39: Do you and your colleagues monitor each other so as to maintain a higher standard of work?	My colleagues and I monitor each other so as to maintain a higher standard of work.	
			15	43: Is there a real concern among team members that the team should achieve the highest standards of	There is a real concern among team members that the team should achieve the highest standards of performance.	
			16	44: Does the team have clear criteria which members try to meet in order to achieve excellence as a team?	There are clear criteria in the team which members try to meet in order to achieve excellence as a team.	
			17		The team is good at overcoming difficulties caused by working in a virtual environment.	Team-specific additional question: virtual working environment → positive phrasing.

			18		Working in different time zones causes problems in collaborating with each other.	Team-specific additional question: different time zones as special aspect in virtual working environment → negative phrasing.
Develop visions and goals, create connotation	Vision	Appreciation consensus, orientation on respective connotations	19	28: To what extent do you think they are useful objectives?	My team's objectives are useful.	Shortened: to what extent do you think they are useful and appropriate objectives? → 2 questions! Useful refers to relevance, but including valuation; appropriate refers to attainability (see 32).
			20	29: How far are you in agreement with these objectives?	I am in agreement with my team's objectives.	
			21	30: To what extent do you think other team members agree with these objectives?	Other team members agree with my team's objectives.	
			22	33: How worthwhile do you think these objectives are to you?	My team's objectives are worthwhile to myself.	
			23	34: How worthwhile do you think these objectives are to the organization?	My team's objectives are worthwhile to our company.	
			24	35: How worthwhile do you think these objectives are to the wider society?	My team's objectives are worthwhile to the wider society.	

Enable energizing, identify control parameters	Vision	Clarity, appreciation, consensus, attainability, motivating conditions	25	32: To what extent do you think your team's objectives can actually be achieved?	My team's objectives can actually be achieved.	Eliminated: to what extent do you think these objectives are realistic and can be attained? (36) → 2 questions! The same as 32, only asking about 'realistic' in addition → synonymous to attainable.
			26	37: To what extent do you think members of your team are committed to these objectives?	Members of my team are committed to the team's objectives.	
Encourage destabilization, fluctuation increase	Support for innovation	Willingness, identify external facilitative/ inhibiting factors of influence	27	2: Assistance in developing new ideas is readily available.	Assistance in developing new ideas is readily available.	
			28	10: This team is open and responsive to change.	This team is open and responsive to change.	
Support symmetry break	Task orientation	Reflection, transfer to other areas	29	40: Are team members prepared to question the basis of what the team is doing?	Team members are prepared to question the basis of what the team is doing.	
			30	41: Does the team critically appraise potential weaknesses in what it is doing in order to achieve the best possible outcome?	The team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome.	

Ensure restabili-zation	Support for innovation	Willingness, realization, identify with new order, external factors	31	42: In this team we take the time needed to develop new ideas.	In this team we take the time needed to develop new ideas.	
			32	11: People in the team cooperate in order to help develop and apply new ideas.	People in the team cooperate in order to help develop and apply new ideas.	Eliminated: members of the team provide and share resources to help in the application of new ideas. (17) → same as cooperation for realizing new ideas, worded more complex.
			33	21: People in this team are always searching for fresh, new ways of looking at problems.	People in this team are always searching for fresh, new ways of looking at problems.	
			34	24: This team is always moving toward the development of new answers.	This team is always moving toward the development of new answers.	
			35	25: Team members provide practical support for new ideas and their application.	Team members provide practical support for new ideas and their application.	
Consider resonance, create synchroni-zation	Task orientation	Synergy, methods should match current state of participants, reflection on previous	36	38: Do your team colleagues provide useful ideas and practical help to enable you to do the job to the best of your ability?	My team colleagues provide useful ideas and practical help to enable myself to do the job to the best of my ability.	

		7GPs	37	42: Do members of the team build on each other's ideas in order to achieve the best possible outcome?	Members of the team build on each other's ideas in order to achieve the best possible outcome.	
Psycho-metric validation	Social desirability	Social aspects	38	4: The team always succeeds in turning skills into performance.	The team always succeeds in turning skills into performance.	
			39	9: People in the team never experience tensions among each other.	People in the team never experience tensions among each other.	
			40	12: Being part of this team is the most important thing about work for the team members.	Being part of this team is the most important thing about work for the team members.	
			41	15: The team is significantly better than any other team in its area.	The team is significantly better than any other team in its area.	
			42	18: Relationships between people in the team are constantly harmonious.	Relationships between people in the team are constantly harmonious.	
			43	22: The team always achieves the highest goals easily.	The team always achieves the highest goals easily.	

Appendix II: SNS Instructions

Instructions for filling out SNS questionnaire

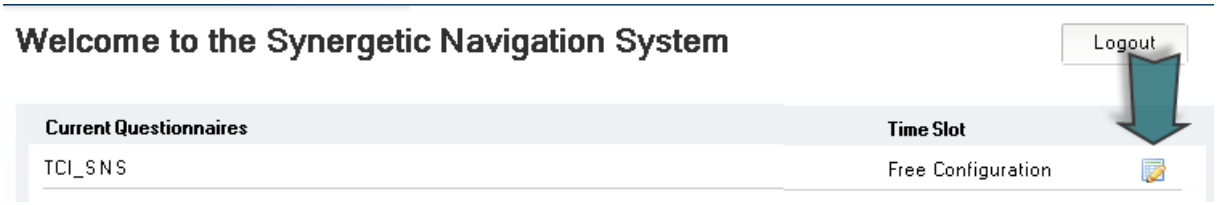
(SNS: synergetic navigation system)

1. Please try to fill out the questionnaire ~ every 10 days. I will set up a meeting series that will remind you.

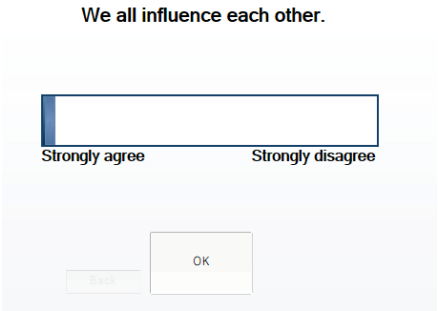
2. Go to web page: https://sns-ika.sns-live.de/index_standard.html
   ➔ *Sometimes there are connectivity problems with this server. Please let me know whenever you cannot access it.*

3. Log in using your personal credentials:
   Username: vtd01
   Password: training
   ➔ *You will be asked to change your password on the first logon.*

4. Choose button next to questionnaire: TCI_SNS

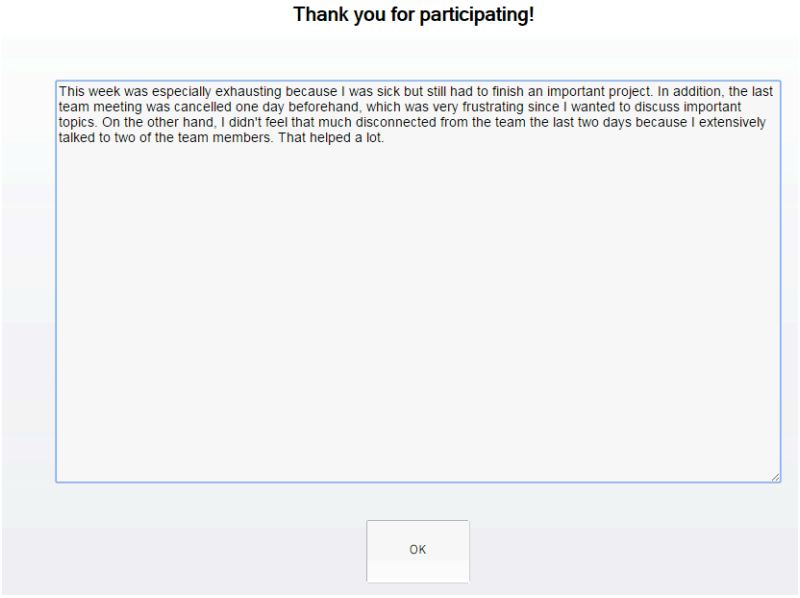


5. Start rating the statements. The questionnaire consists of 43 items you can agree/disagree with using the slider. The statements will remain the same throughout the whole data collection period – they will only appear in a different order each time. Please don't spend too much time thinking about your answers. Go with your very first reaction, it's usually the right one.



6. At the end of each questionnaire, there is a text field for your comments. Please describe special events in your professional and/or private life and thoughts and feelings that you are dealing with. Maybe thinking about the questions made you reflect on some things you want

to describe here. A few words will be enough to be able to reconstruct what had happened at each single point in time (of course you can write as much as you'd like).



7. You made it! ☺
   Now you just need to log out and that's it.

Appendix III: Team Meeting Documentation

Date	Notes
11.08.	- manager and team lead both on vacation - informal talk + discussions on training development in general - informal team meeting → positive for team
25.08.	On vacation! Did not attend
08.09.	- manager visiting 2 of the team members in <Sweden> - 1 team member on vacation - Presenting a new training strategy related to company announcement about product release - Old training strategy very static → new situation dynamic - Other team member has many concerns about new strategy → feels excluded from discussion
21.09.	- everyone was updated on the new strategy ideas in the meantime (irritation & resistance, then acceptance) → first team meeting with everyone to discuss the upcoming changes - Discussion: how to update/re-structure training → make small changes & then surveys with partners vs whole new structure - Identified next steps + found common ground
06.10.	- Status updates from everyone → manager informed about latest steps in revamping training strategy - Presented + discussed list with next to-dos, assigned tasks - 2,5 hours instead of 1,5
21.10.	- Manager on vacation, external people from certification department to clarify open questions about certification process - Discussing next steps
04.11.	- External attendee from neighboring team → presenting demo database he set up for developing the new training - Quick updates from everyone - Presentation of certification analysis → next steps to be decided based on results, waiting for budget approval (manager is taking care of it) - decision to have a weekly call during development phase
11.11.	did not attend - working on case study - announcement that demo db is to be used as training db → team members dissatisfied

18.11.	- manager has met with education leading managers to get approval and support for new strategy → positive + supportive reaction - next step: collaboration with supporting education teams - team member felt omitted → had created training structure, which is not to be discussed now (tried to talk about issues that came up in the interview) - presentation of how to estimate changes in training assets - question at the end: how to deal with disagreement in the team? Vote? → reaction of team lead: bring it up next meeting when manager is there
25.11.	- manager, team lead and team member give an update on meeting with education team → <Susan> included in collaboration → more collaborative, tries to clarify open questions without opposing - <Helen> being passive, raising concerns, it seems she doesn't want to collaborate - updates from everyone
02.12.	- <Linda> and <Maria> present new structure after meeting with education team - discussing concept with <Helen> - <Susan> not attending - <John> joining later - collected open questions to address with education person - <John> presenting survey to find out about actual training usage in different countries - identified next steps
09.12.	-education person joining team meeting and explaining his approach of structuring training - together with him, the team discusses options and tries to find an approach for their own new structure, clarifying open questions about certification (item writing) - <John> announced headcount approval for additional working student
16.12.	- didn't attend → travelling - discussed new structure - <Helen> brought up question, if estimation is really necessary → clarified
22.12.	- discussed application of new structure on <course> topics - next step: effort estimation → <Helen> concerned about giving time estimation → <Susan> helped to calm down situation - shared feedback results - <John> said some personal words + thanks as year-end wrap-up

07.01.	- discussed planning for 2016 - <Helen> brought up certification topic and concerns a lot - discussion helped <Susan> to lay aside worries about the planning - decision to go back to bi-weekly team meeting - talked about new PPT format

Appendix IV: Interview Guide

Reflection Interviews – November 2015

Duration: about 1 hour

Introduction

Thank you very much for taking the time for our call today. My intention is to reflect the changes that took place over the last 3 months together with you, based on the questionnaire you are filling out on a regular basis.
First of all, I would like to ask you for permission to record this conversation. This will make it easier for me to analyze what we talked about afterwards. I will make sure to anonymize all data and to not include critical information in my report. Do you agree to start the recording?

Warm-up question

How do you feel about filling out the questionnaire? What is positive/negative about it? Did filling out the questionnaire have an impact on your way of working? Are there any confusing questions?

Bring change process to their minds

To remind you of my master thesis' subject: I want to analyze the change process within the training team that is taking place since August.

First question: participants' own ideas and needs for discussion

If you think about this change process as a whole, at which point do you see yourself? How do you feel about it?
Can you describe a concrete situation that reflects it well? Is there a specific situation you would like to talk about in detail?
How do you feel about your relationship with other team members? Are there any conflicts you would like to talk about?

View and explain CRD

Let's look at the diagram reflecting your answers in the questionnaire (focus on high complexity/change of patterns and low complexity/standstill).

All statements that you rated were assigned to different categories. You can see here an overview of all categories. Green and red points mark movements and changes. That means you gave very different ratings for the same statement in that specific period. The blue color indicates phases of continuity.

Let the participants interpret the diagram

If you look at the diagram, where can you identify movements? Where standstills?
Do you have an idea what was going on there?
(Integrate comments and interviewer's interpretation)

Evaluation of these findings

Which consequences do you see for your own role, the team, your work in general, the company?

Secure findings/activity options

What did you learn throughout the last months? What did the team learn?
What were positive strategies of dealing with issues? For the future: What should be done in a different way?

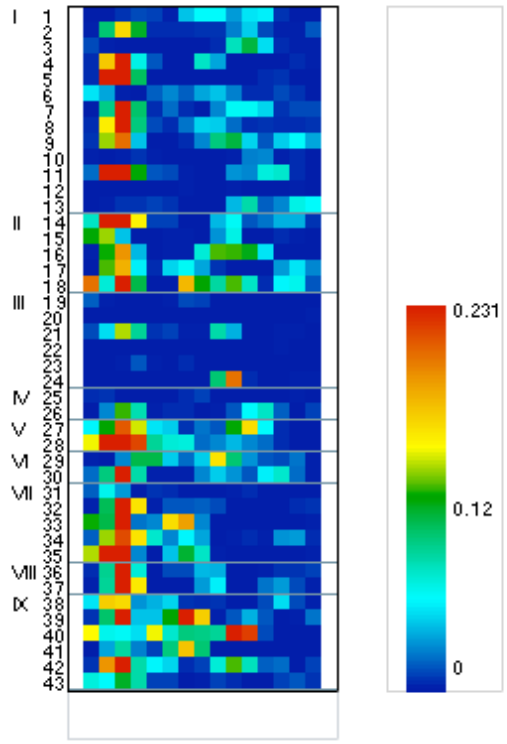
Activity/change strategies, sustainability and transfer

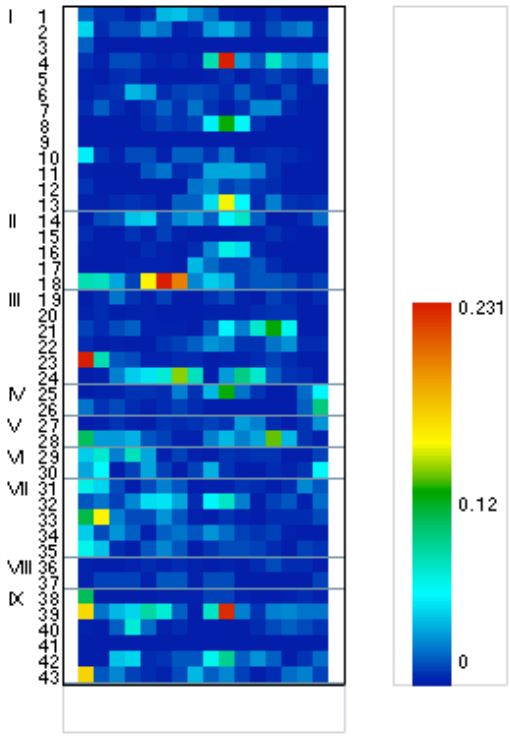
Based on what we talked about, what do you want to change about your own way of working?
What would you change about the way the team works?

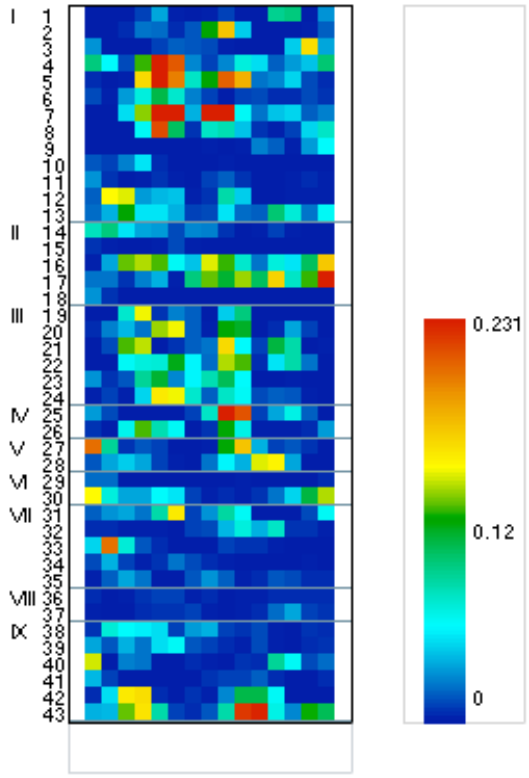
Concluding feedback

Now it's your turn: is there anything you want to add? Are there any open questions? Feedback?

Appendix V: Complexity Resonance Diagrams



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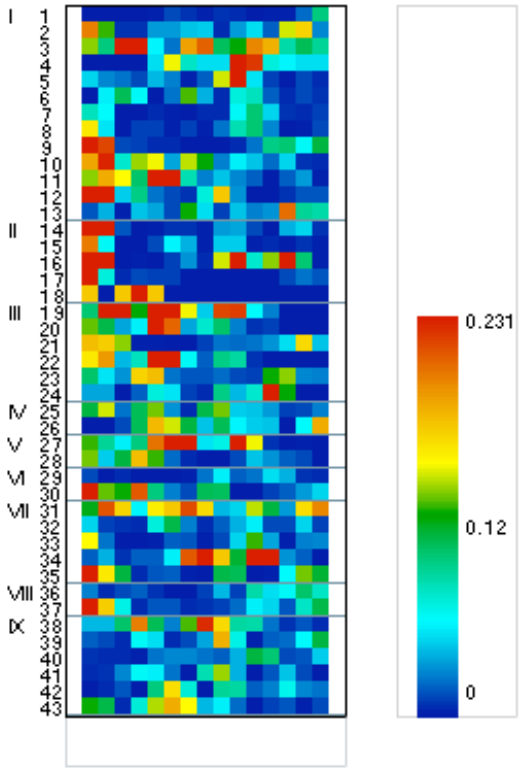
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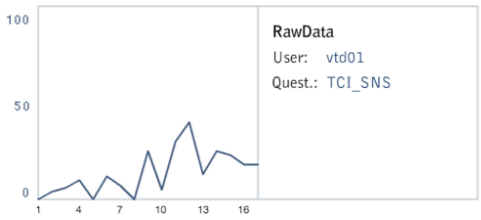
Appendix VI: Time Series Diagrams

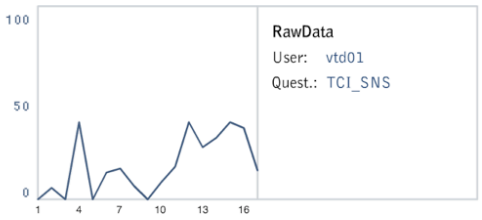
Dienstag Februar 2, 2016

SYNERGETIC NAVIGATION SYSTEM

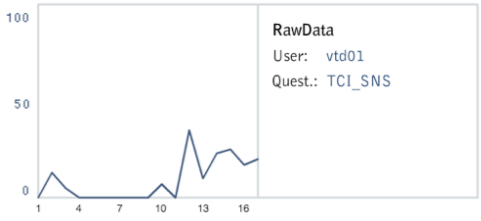
Zeitreihen / Dynamische Komplexität / Permutationsentropie



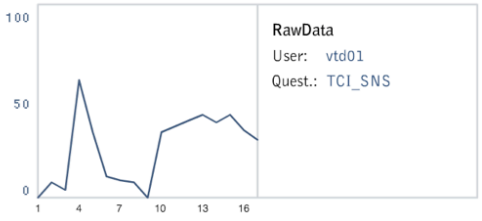
Item 1: We share information generally in the team rather than keeping it to ourselves.



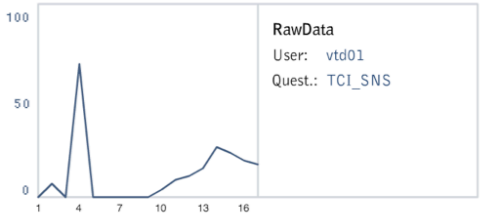
Item 2: We all influence each other.



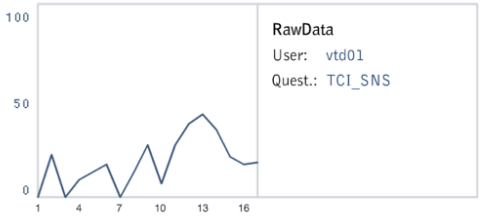
Item 3: We regularly keep in touch with each other.



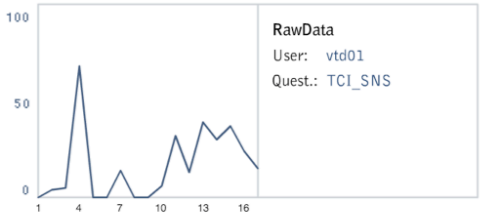
Item 4: People feel understood and accepted by each other.



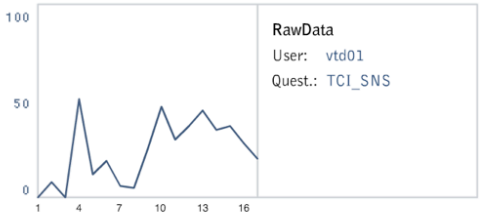
Item 5: Everyone's view is listened to even if it is in a minority.



Item 6: People keep each other informed about work-related issues in the team.



Item 7: There is a lot of give and take.



Item 8: We stick together as a team.

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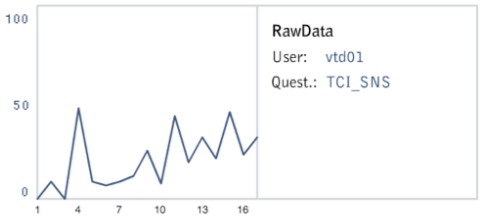
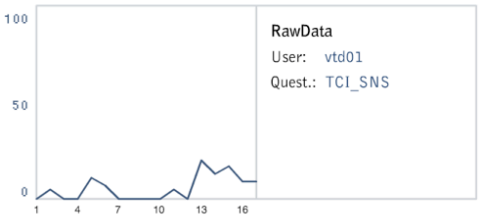
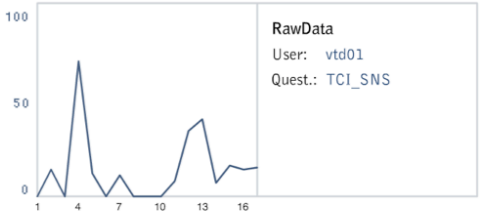


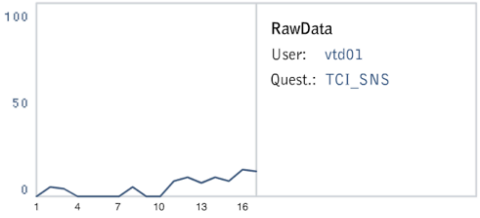
Item 9: There are real attempts to share information throughout the team.



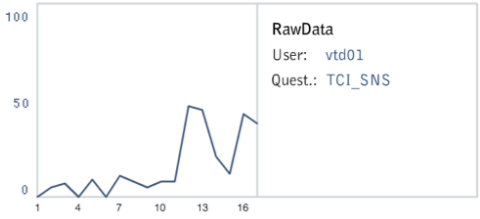
Item 10: We regularly exchange information with other teams.



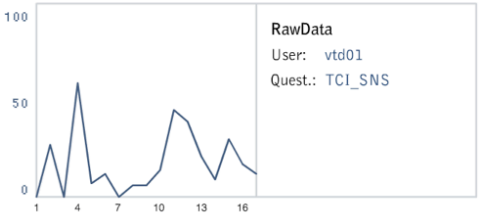
Item 11: We productively collaborate with other teams.



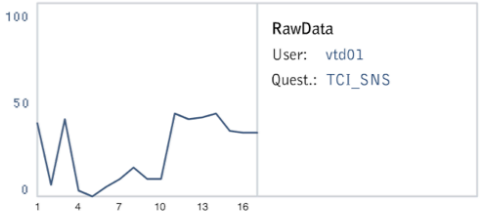
Item 12: I am clear about what my team's objectives are.



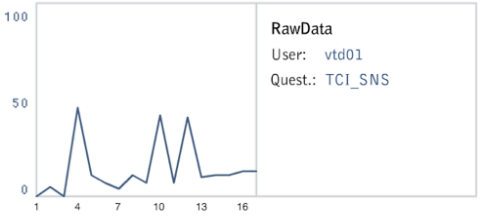
Item 13: My team's objectives are clearly undestood by other members of the team.



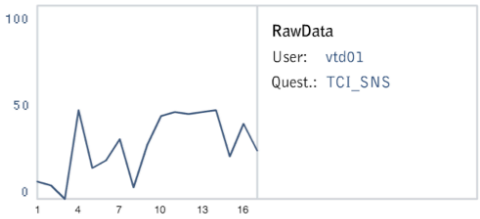
Item 14: My colleagues and I monitor each other so as to maintain a higher standard of work.



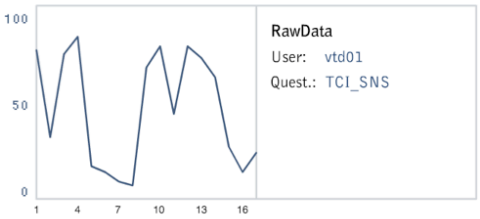
Item 15: There is a real concern among team members that the team should achieve the highest standards of performance.



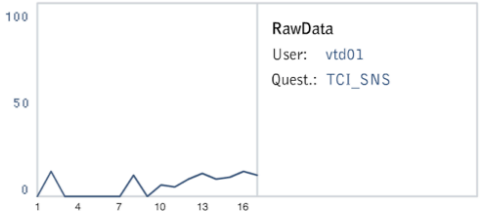
Item 16: There are clear criteria in the team which members try to meet in order to achieve excellence as a team.



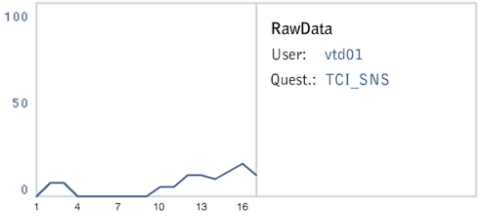
Item 17: The team is good at overcoming difficulties caused by working in a virtual environment.



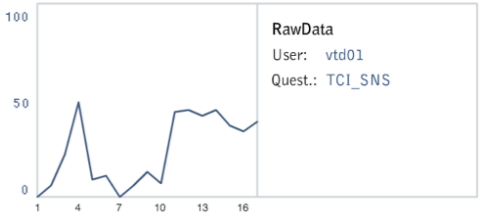
Item 18: Working in different time zones causes problems in collaborating with each other.



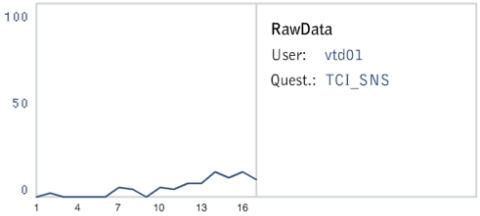
Item 19: My team's objectives are useful.



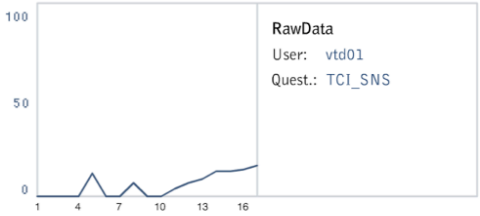
Item 20: I am in agreement with my team's objectives.



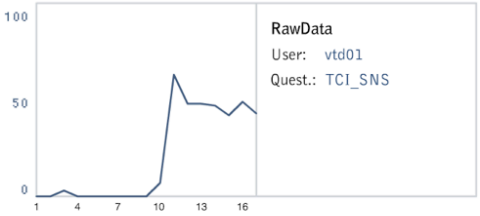
Item 21: Other team members agree with my team's objectives.



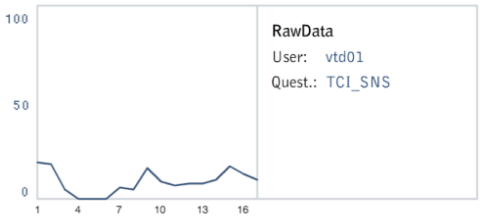
Item 22: My team's objectives are worthwhile to myself.



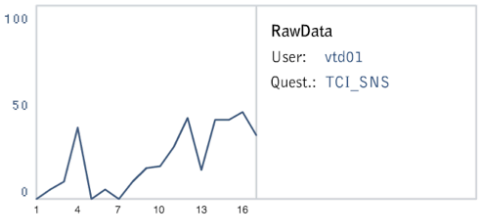
Item 23: My team's objectives are worthwhile to our company.



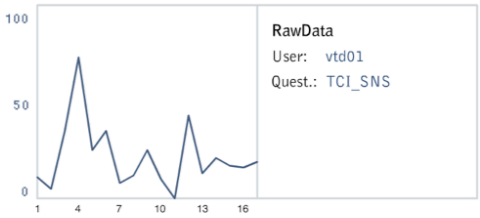
Item 24: My team's objectives are worthwhile to the wider society.



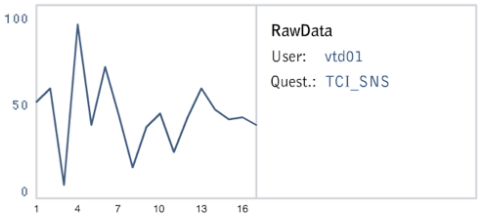
Item 25: My team's objectives can actually be achieved.



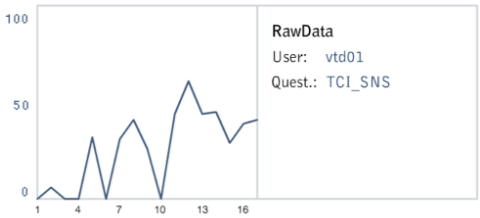
Item 26: Members of my team are committed to the team's objectives.



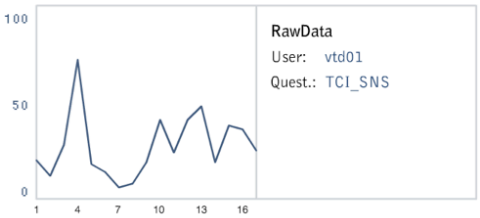
Item 27: Assistance in developing new ideas is readily available.



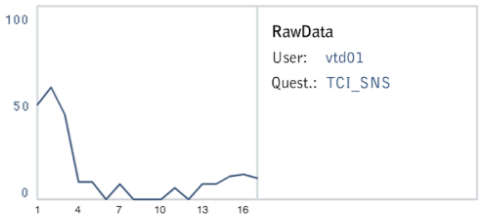
Item 28: This team is open and responsive to change.



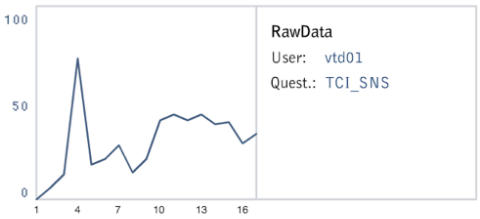
Item 29: Team members are prepared to question the basis of what the team is doing.



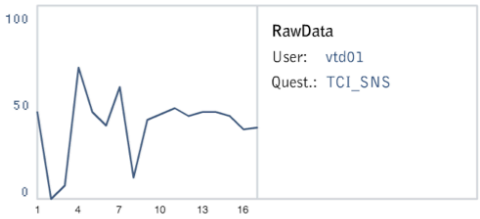
Item 30: The team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome.



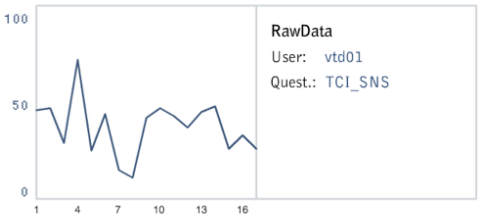
Item 31: In this team we take the time needed to develop new ideas.



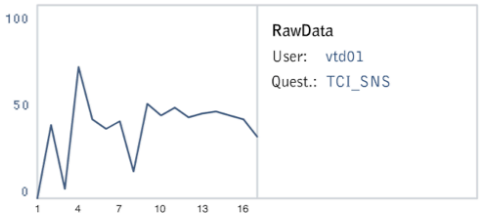
Item 32: People in the team cooperate in order to help develop and apply new ideas.



Item 33: People in this team are always searching for fresh, new ways of looking at problems.



Item 34: This team is always moving toward the development of new answers.



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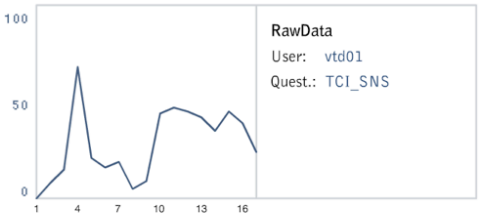

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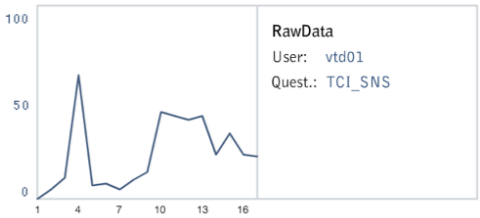

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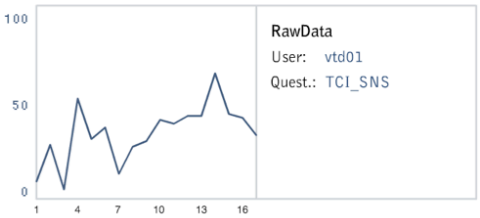

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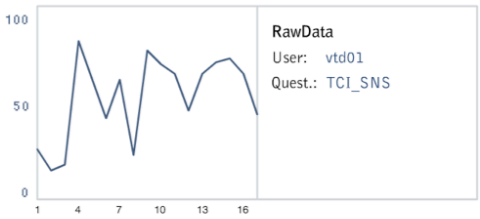

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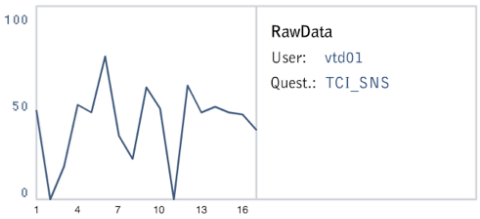

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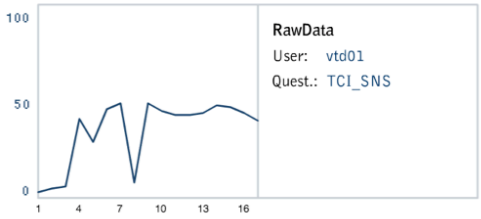

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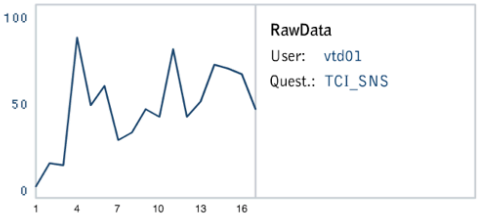

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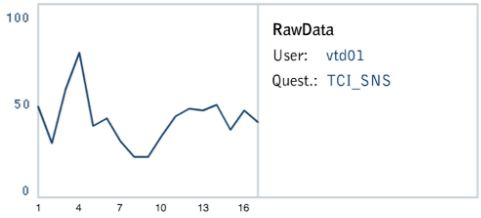

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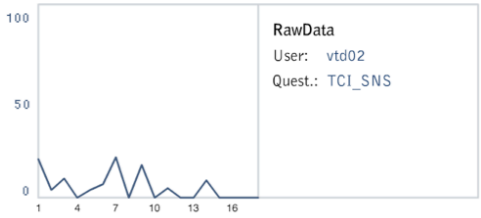

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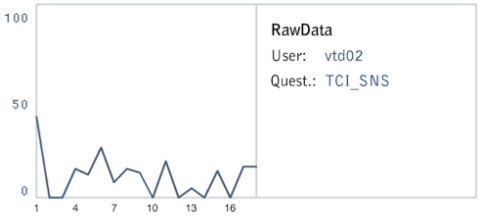

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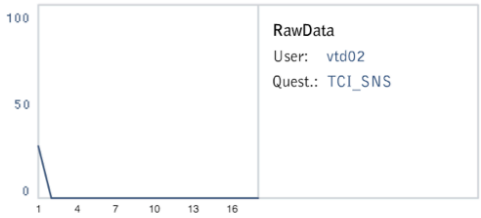

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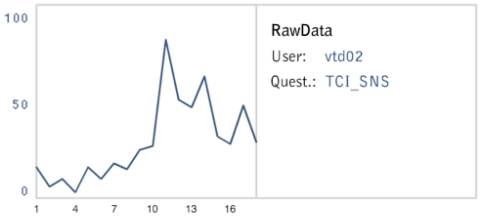

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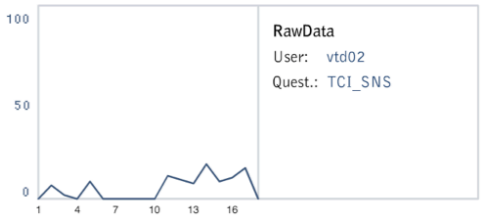
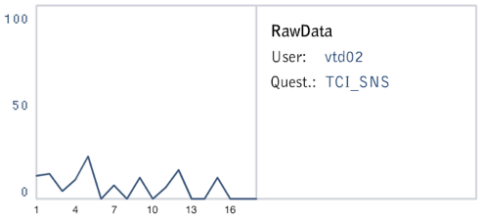
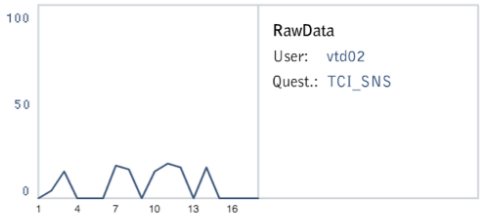


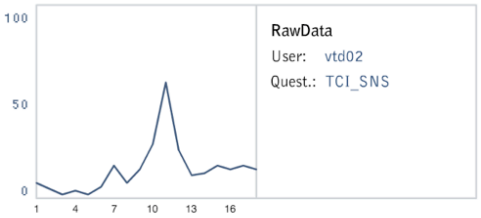
Item 5: Everyone's view is listened to even if it is in a minority.



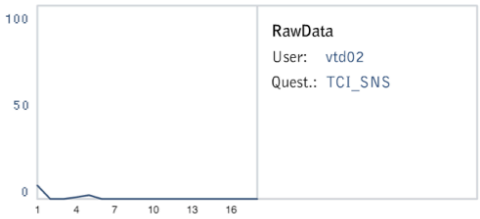
Item 6: People keep each other informed about work-related issues in the team.



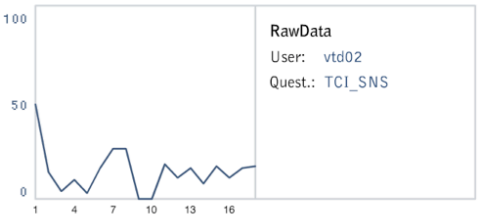
Item 7: There is a lot of give and take.



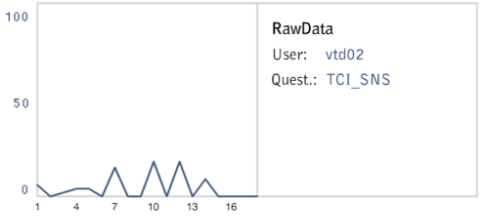
Item 8: We stick together as a team.



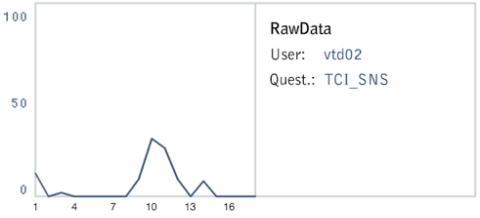
Item 9: There are real attempts to share information throughout the team.



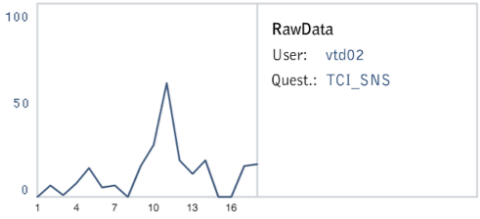
Item 10: We regularly exchange information with other teams.



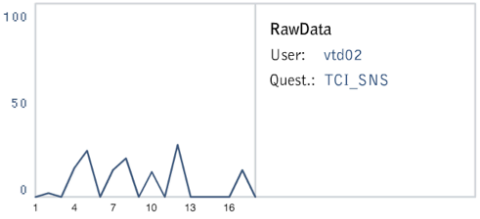
Item 11: We productively collaborate with other teams.



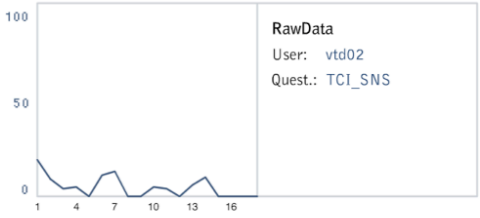
Item 12: I am clear about what my team's objectives are.



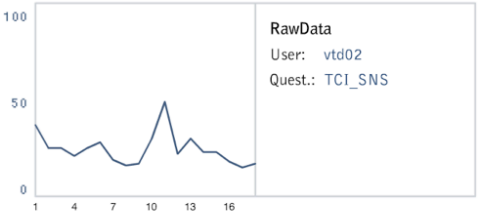
Item 13: My team's objectives are clearly undestood by other members of the team.



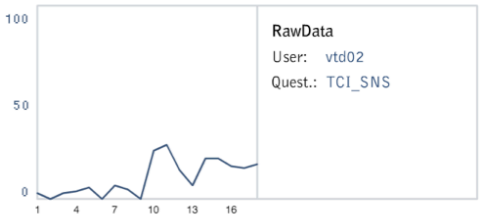
Item 14: My colleagues and I monitor each other so as to maintain a higher standard of work.



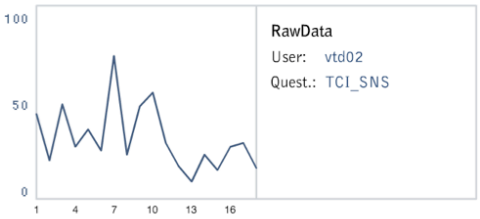
Item 15: There is a real concern among team members that the team should achieve the highest standards of performance.



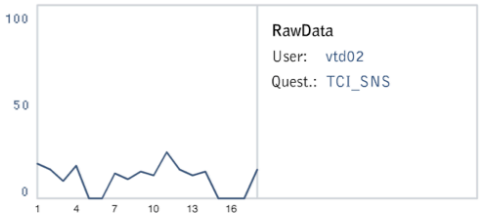
Item 16: There are clear criteria in the team which members try to meet in order to achieve excellence as a team.



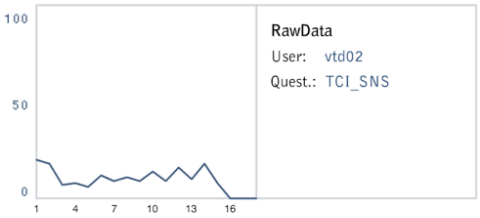
Item 17: The team is good at overcoming difficulties caused by working in a virtual environment.



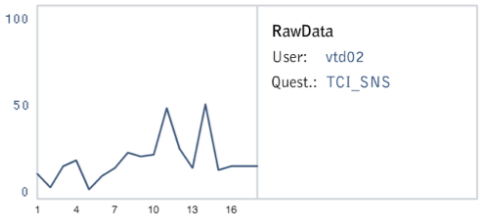
Item 18: Working in different time zones causes problems in collaborating with each other.



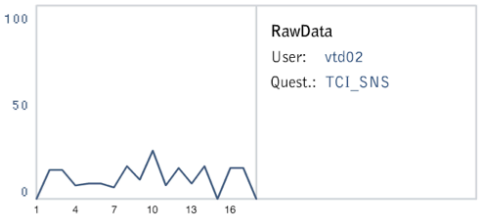
Item 19: My team's objectives are useful.



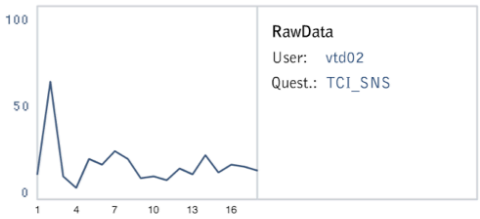
Item 20: I am in agreement with my team's objectives.



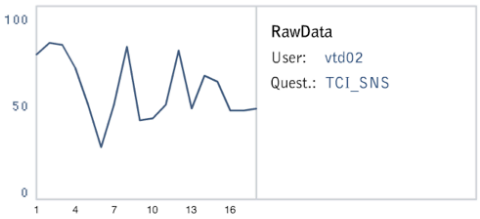
Item 21: Other team members agree with my team's objectives.



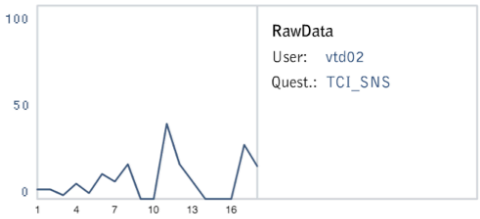
Item 22: My team's objectives are worthwhile to myself.



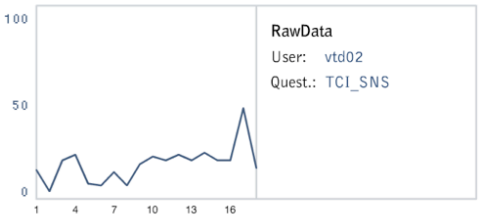
Item 23: My team's objectives are worthwhile to our company.



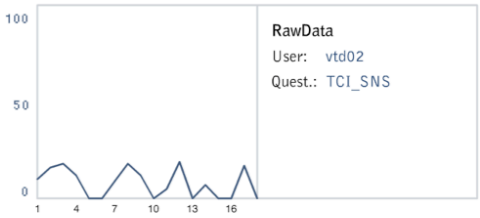
Item 24: My team's objectives are worthwhile to the wider society.



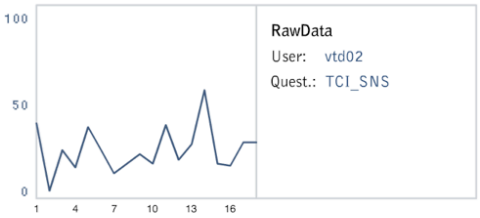
Item 25: My team's objectives can actually be achieved.



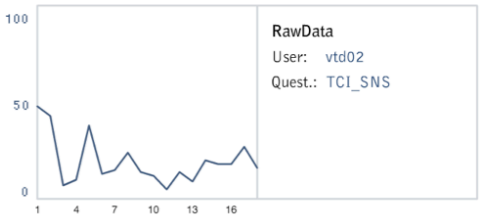
Item 26: Members of my team are committed to the team's objectives.



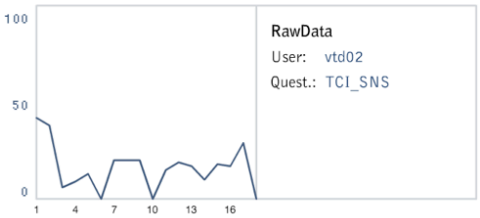
Item 27: Assistance in developing new ideas is readily available.



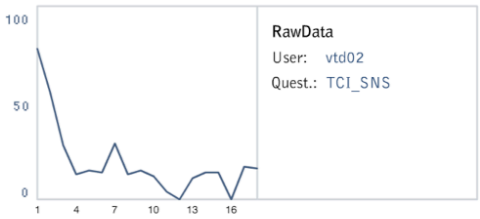
Item 28: This team is open and responsive to change.



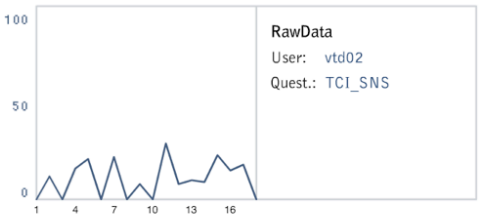
Item 29: Team members are prepared to question the basis of what the team is doing.



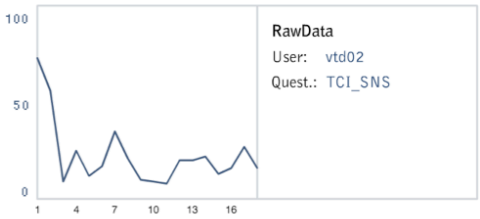
Item 30: The team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome.



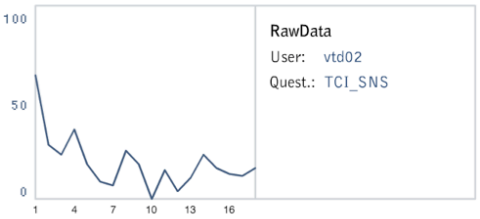
Item 31: In this team we take the time needed to develop new ideas.



Item 32: People in the team cooperate in order to help develop and apply new ideas.



Item 33: People in this team are always searching for fresh, new ways of looking at problems.



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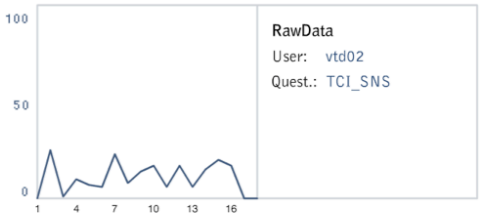

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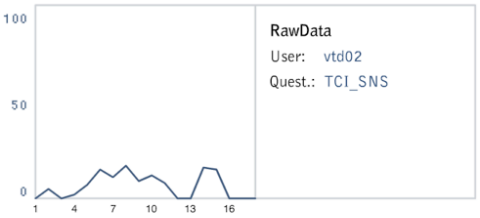

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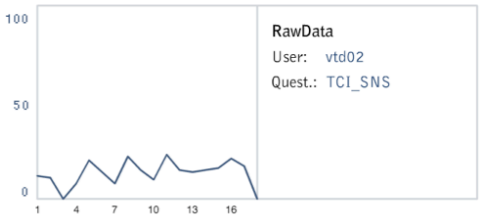

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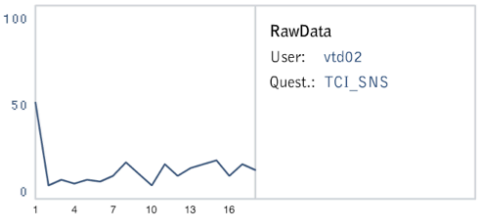

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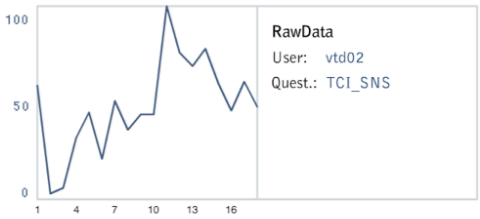

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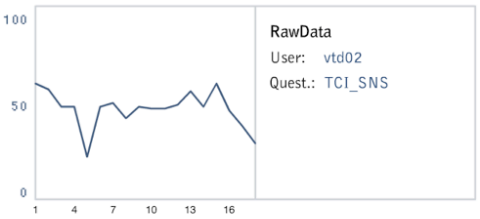

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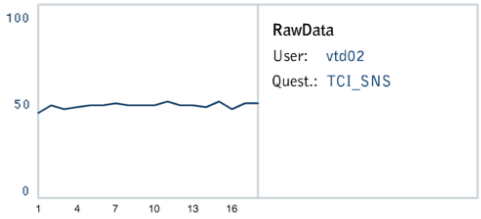

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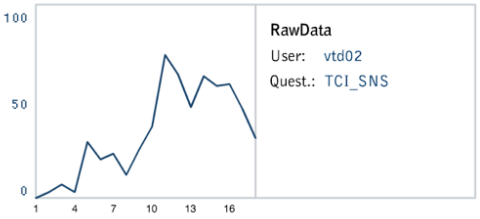

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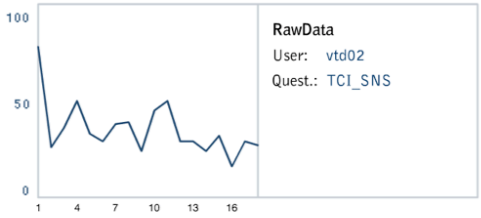

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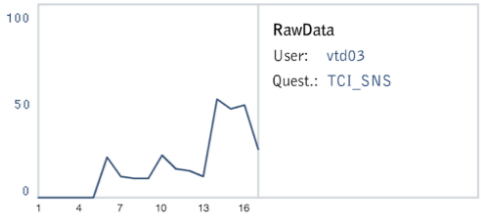

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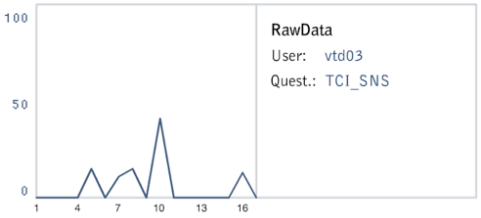

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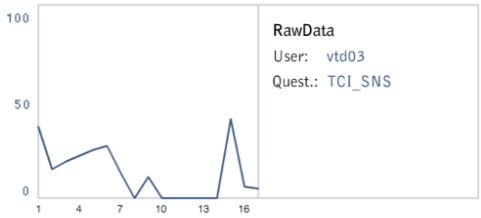

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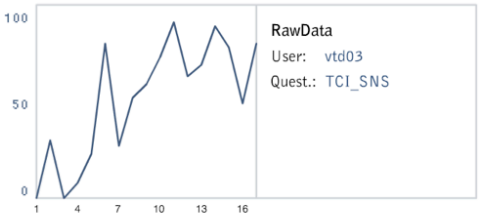

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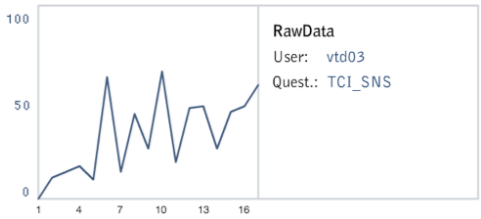

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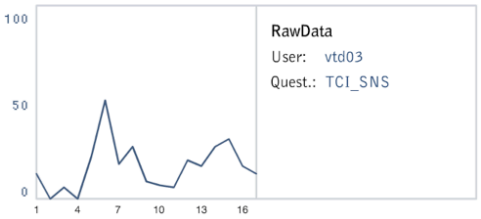

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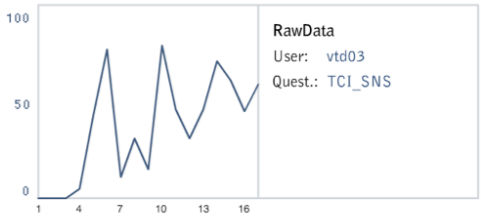

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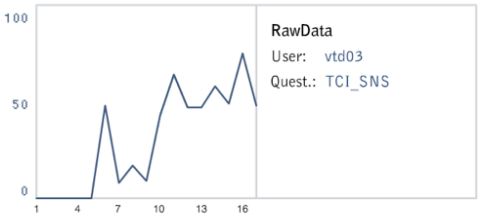

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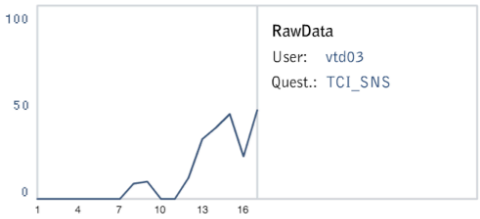

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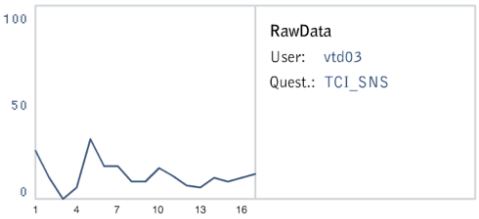

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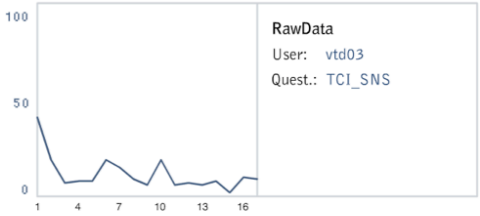

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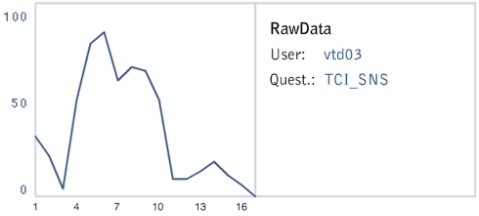

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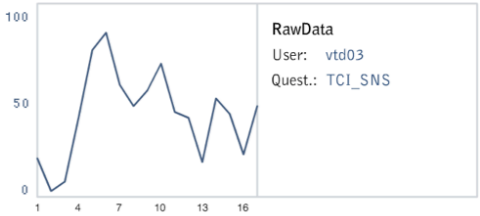

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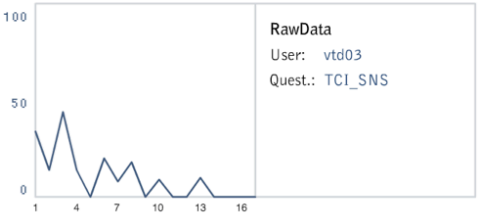

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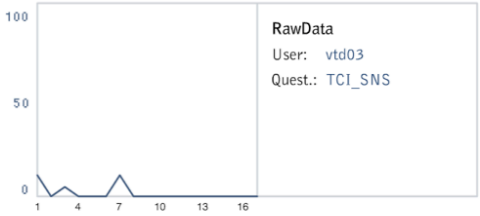

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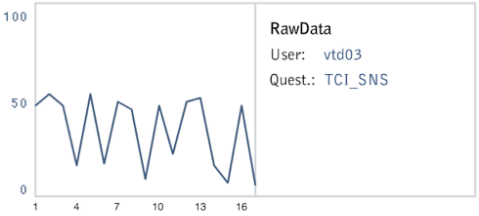

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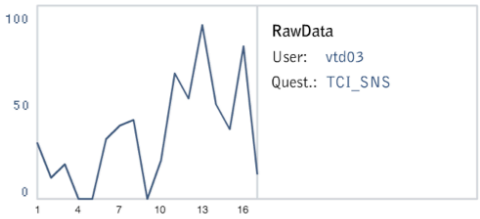

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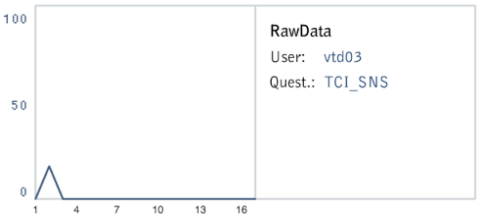
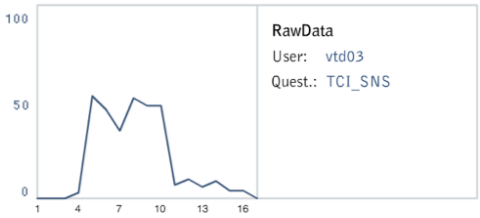
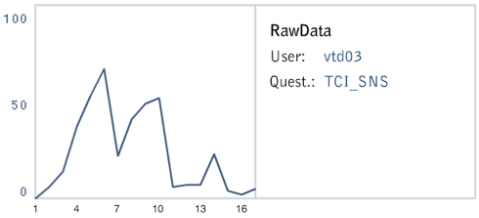


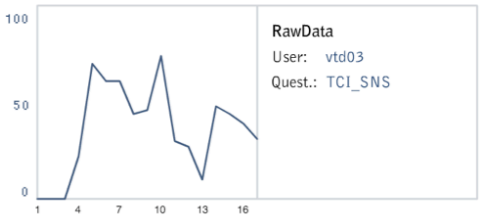
Item 18: Working in different time zones causes problems in collaborating with each other.



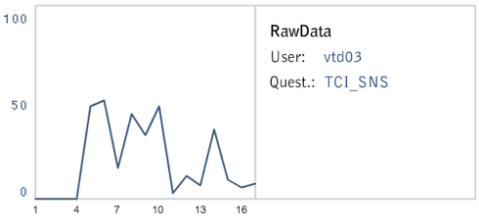
Item 19: My team's objectives are useful.



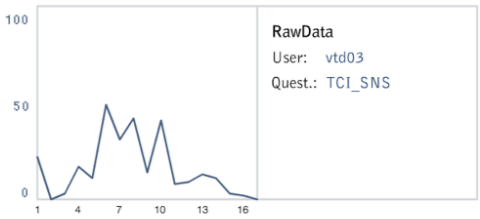
Item 20: I am in agreement with my team's objectives.



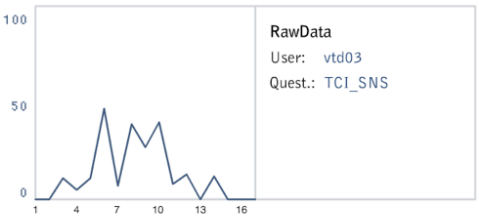
Item 21: Other team members agree with my team's objectives.



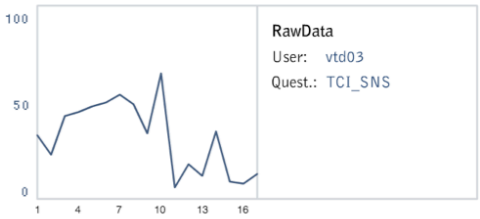
Item 22: My team's objectives are worthwhile to myself.



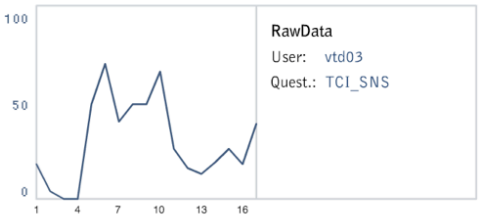
Item 23: My team's objectives are worthwhile to our company.



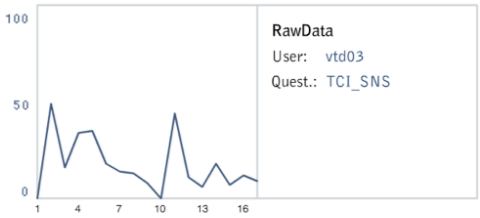
Item 24: My team's objectives are worthwhile to the wider society.



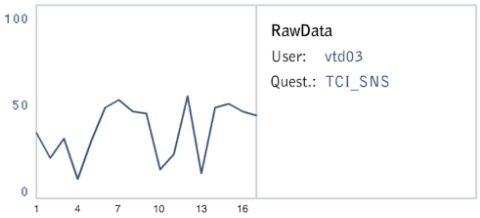
Item 25: My team's objectives can actually be achieved.



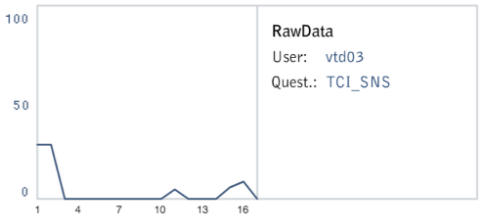
Item 26: Members of my team are committed to the team's objectives.



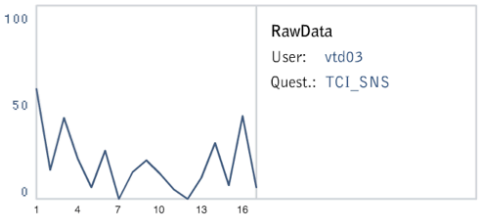
Item 27: Assistance in developing new ideas is readily available.



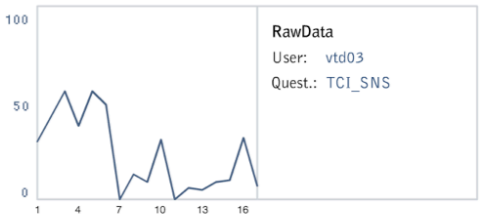
Item 28: This team is open and responsive to change.



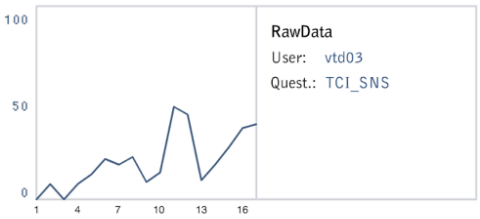
Item 29: Team members are prepared to question the basis of what the team is doing.



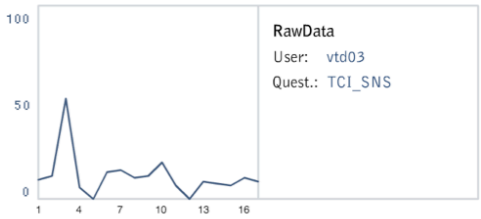
Item 30: The team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome.



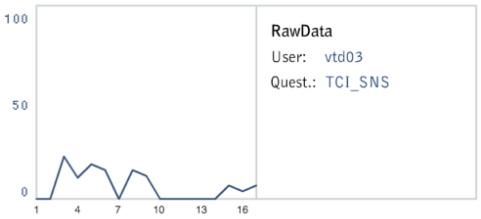
Item 31: In this team we take the time needed to develop new ideas.



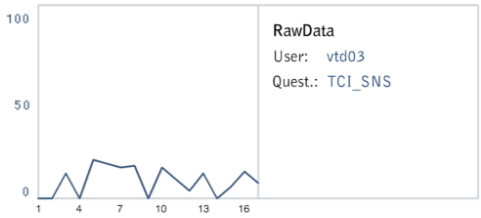
Item 32: People in the team cooperate in order to help develop and apply new ideas.



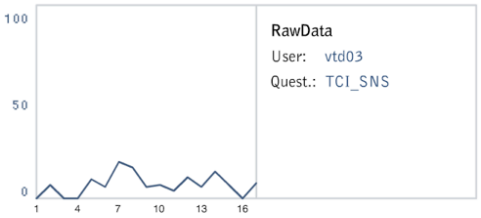
Item 33: People in this team are always searching for fresh, new ways of looking at problems.



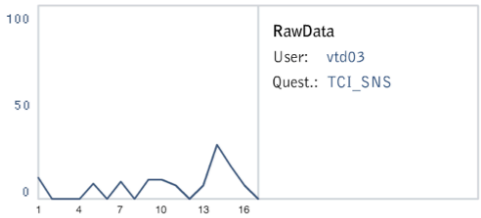
Item 34: This team is always moving toward the development of new answers.



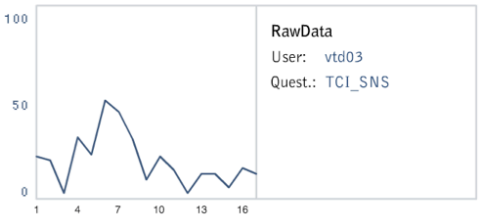
Item 35: Team members provide practical support for new ideas and their application.



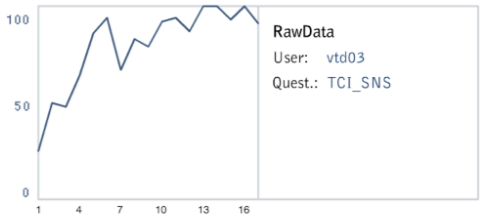
Item 36: My team colleagues provide useful ideas and practical help to enable myself to do the job to the best of my ability.



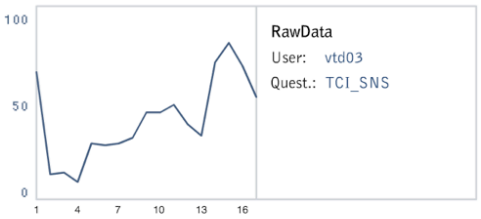
Item 37: Members of the team build on each other's ideas in order to achieve the best possible outcome.



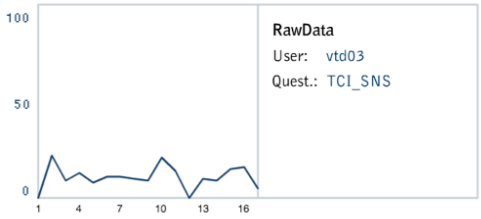
Item 38: The team always succeeds in turning skills into performance.



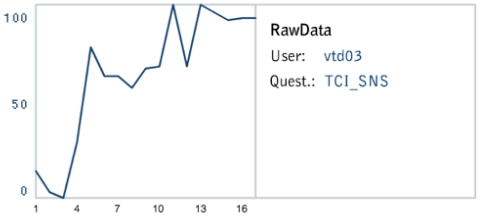
Item 39: People in the team never experience tensions among each other.



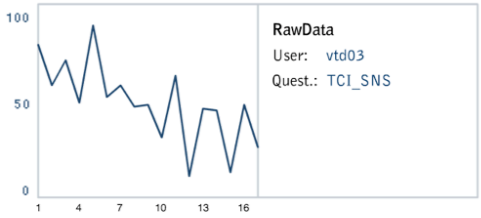
Item 40: Being part of this team is the most important thing about work for the team members.



Item 41: The team is significantly better than any other team in its area.

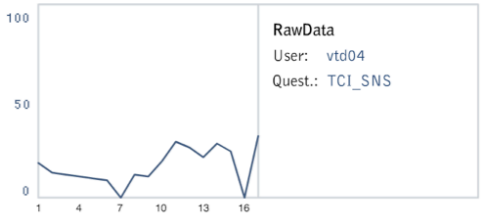


Item 42: Relationships between people in the team are constantly harmonious.

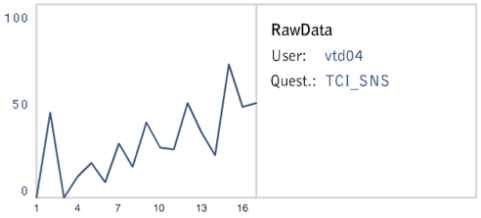


Item 43: The team always achieves the highest goals easily.

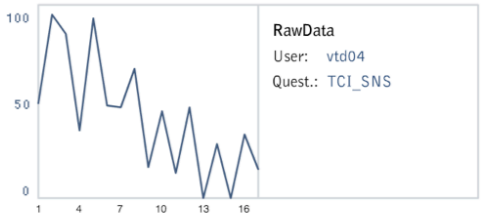
Zeitreihen / Dynamische Komplexität / Permutationsentropie



Item 1: We share information generally in the team rather than keeping it to ourselves.



Item 2: We all influence each other.



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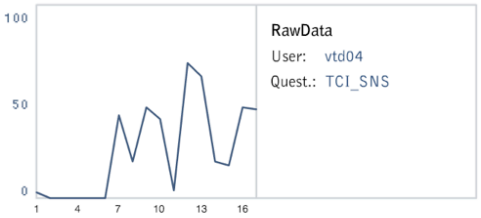

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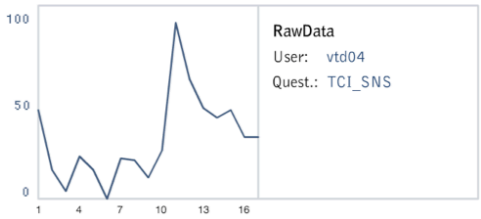

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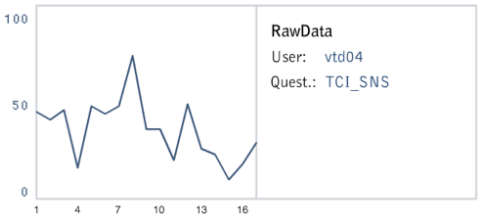

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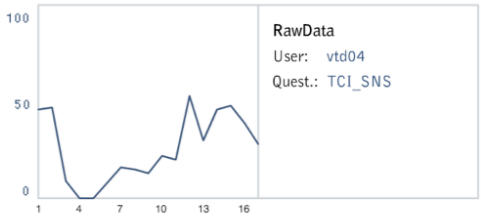

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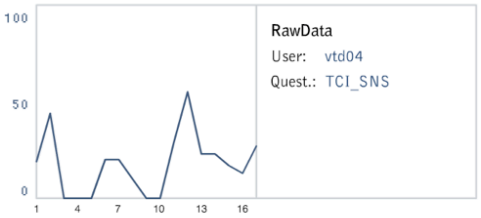

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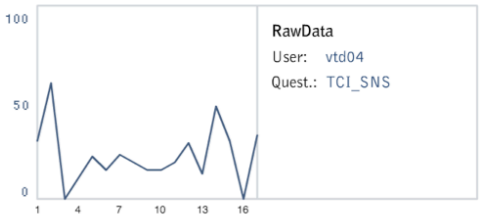

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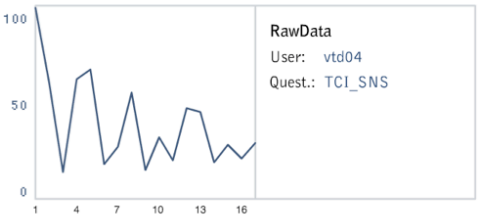

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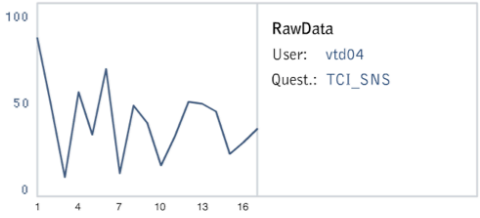

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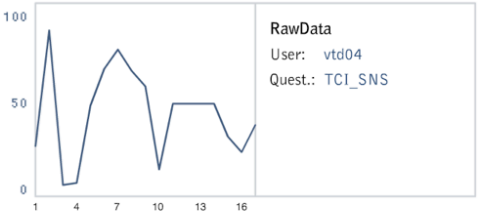

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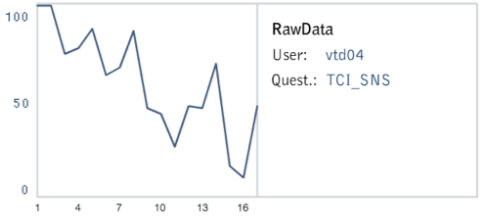

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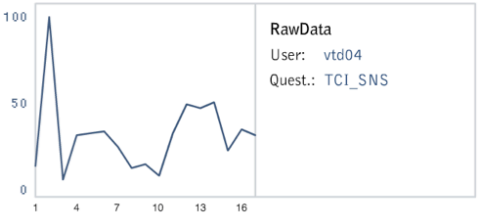

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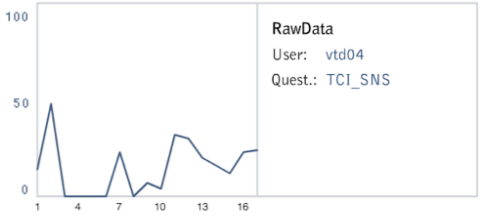

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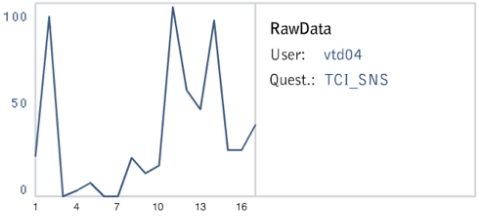

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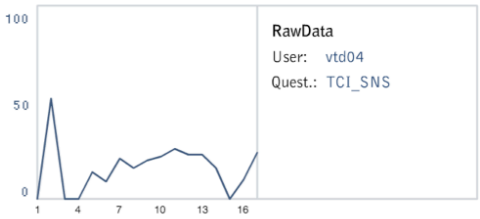
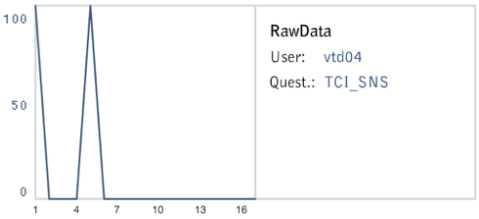
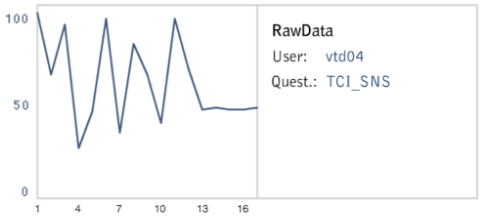


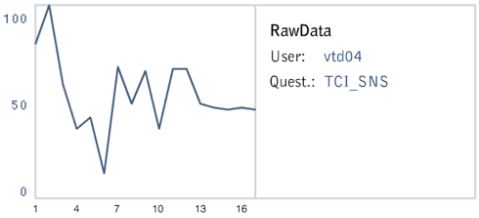
Item 17: The team is good at overcoming difficulties caused by working in a virtual environment.



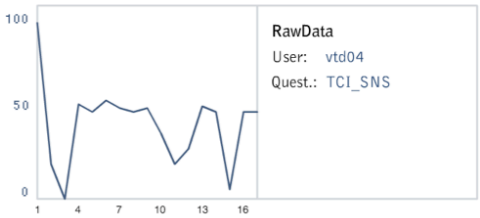
Item 18: Working in different time zones causes problems in collaborating with each other.



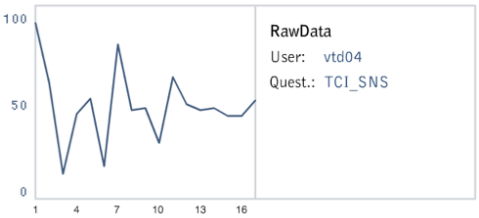
Item 19: My team's objectives are useful.



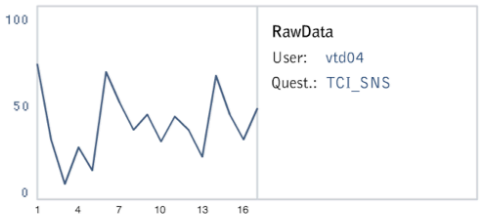
Item 20: I am in agreement with my team's objectives.



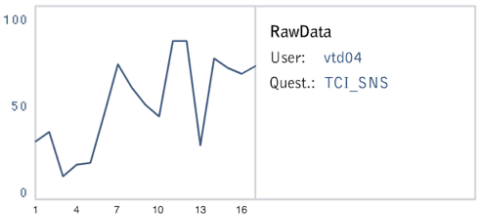
Item 21: Other team members agree with my team's objectives.



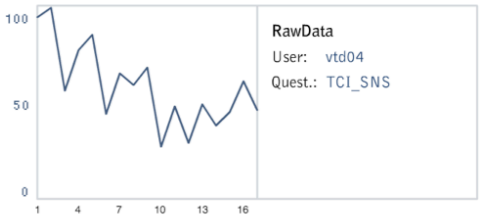
Item 22: My team's objectives are worthwhile to myself.



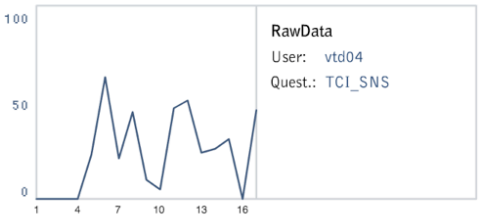
Item 23: My team's objectives are worthwhile to our company.



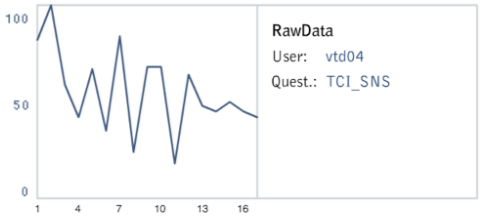
Item 24: My team's objectives are worthwhile to the wider society.



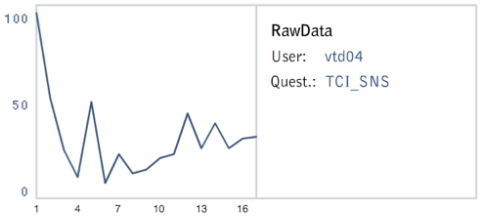
Item 25: My team's objectives can actually be achieved.



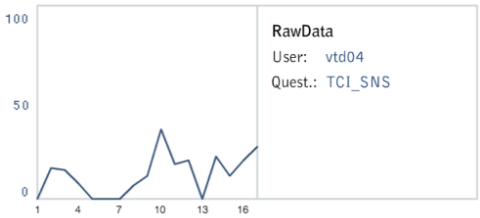
Item 26: Members of my team are committed to the team's objectives.



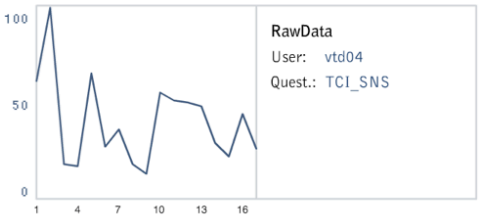
Item 27: Assistance in developing new ideas is readily available.



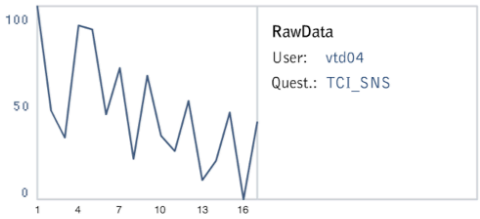
Item 28: This team is open and responsive to change.



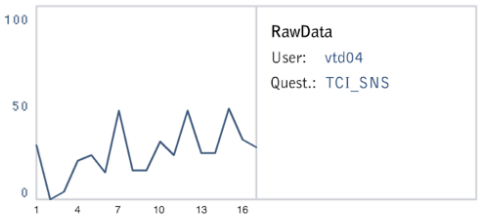
Item 29: Team members are prepared to question the basis of what the team is doing.



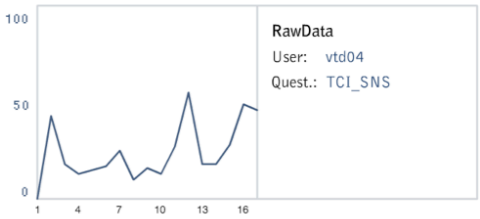
Item 30: The team critically appraises potential weaknesses in what it is doing in order to achieve the best possible outcome.



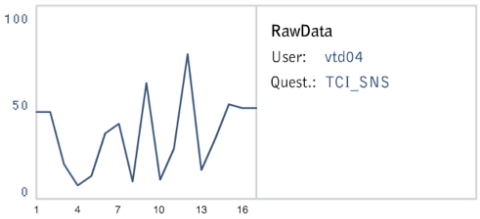
Item 31: In this team we take the time needed to develop new ideas.



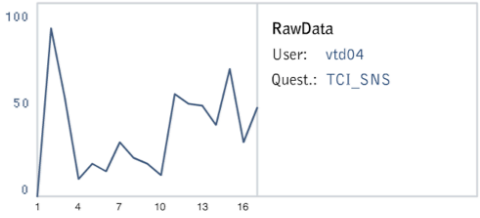
Item 32: People in the team cooperate in order to help develop and apply new ideas.



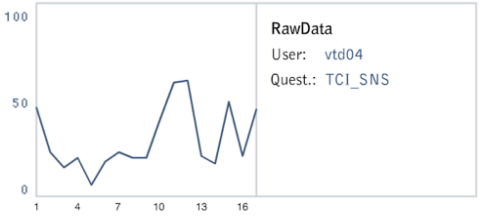
Item 33: People in this team are always searching for fresh, new ways of looking at problems.



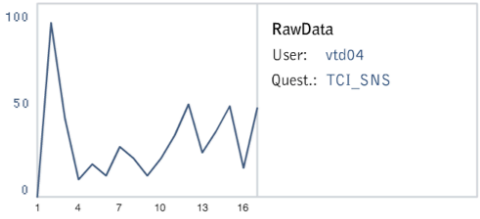
Item 34: This team is always moving toward the development of new answers.



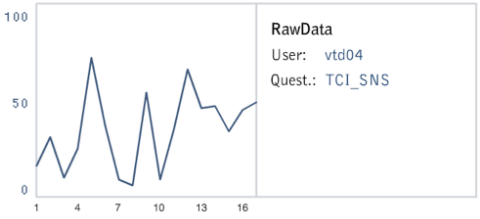
Item 35: Team members provide practical support for new ideas and their application.



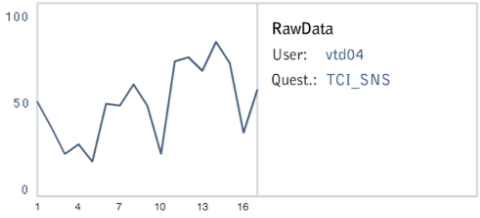
Item 36: My team colleagues provide useful ideas and practical help to enable myself to do the job to the best of my ability.



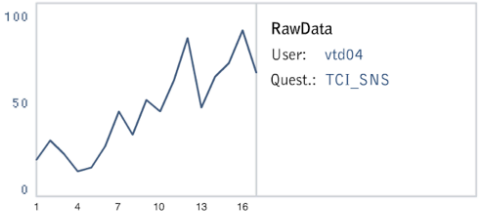
Item 37: Members of the team build on each other's ideas in order to achieve the best possible outcome.



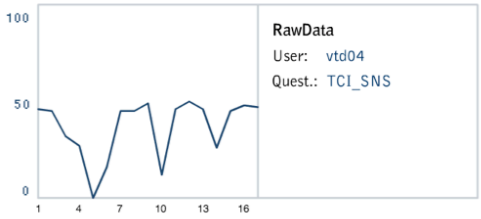
Item 38: The team always succeeds in turning skills into performance.



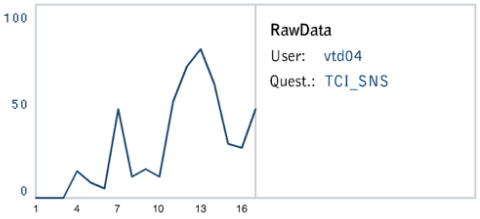
Item 39: People in the team never experience tensions among each other.



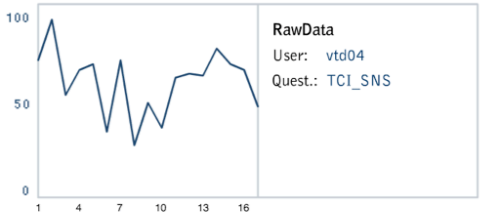
Item 40: Being part of this team is the most important thing about work for the team members.



Item 41: The team is significantly better than any other team in its area.



Item 42: Relationships between people in the team are constantly harmonious.



Item 43: The team always achieves the highest goals easily.

Appendix VII: SNS Comments

Dienstag Februar 2, 2016

SYNERGETIC NAVIGATION SYSTEM

Printed Comments

7.9.15: I came back from vacation last week and this week I attend meeting with my manager.
I work intensively but happy about the results so far.

28.10.15: We are in a process of change in strategy and our deliverable accordingly.
It is interesting :-)

16.9.15: Last week<John>visited us <here> so this was most my focus.
The meeting went well.
Also, this week I had 3 days off due to national holdiay.
It was great to have this break,

5.8.15: This week is my last week before going to a long vacation.
I did my best to close all open tasks before I go and to make sure people in the team have enough information to reply in case questions will come up.
I got very good cooperation from the team.
I am very excited before my trip:-)

7.10.15: This week started later for me as we had national holdiay. This was nice :-)
We started to plan according to the new strategy and it feels good to start working especially after the emotional responses we had.
I am glad that we had a chance to assign each team member a task.

Printed Comments

17.8.15 <John> and <Maria> Were on vacation and my self and the rest of the team members took days of as well

Printed Comments

24.9.15: Some of the questions in this survey ask about objectives for the team. I do not think our team spends enough time defining team objectives. We use only objectives that cascade down from management and these are not really suited to the work we do.

Like most aspects of the team work, we do not do enough of the organizational stuff. it is hard to spend time on stuff that is not the top priority due to the limited communication time we have as a team due to the virtual locations across big timezone differences.

13.11.15: As of this instance (13th November 2015) I am interpreting the "team" as the "<our product> training development team".

24.8.15: Regarding questions 18, 23, 28 and 39:

It is very hard to achieve these goals while working in a virtual team with no overlap in time. There is just no time for the amount of collaboration and communication that is required for these goals.

14.10.15: I had a new insight into working on a virtual team this week. My colleague used to work in the next cube to me and when we needed to collaborate we would do this over coffee or at our desks for 15-20 minutes. Now she has moved to a remote location we now have decided to have a 1hour conference call each week to collaborate.

Is it the same? No. Because when we sat together if we needed to collaborate we could do so immediately, while the idea was still fresh. Now we are apart we have to schedule the time, and make a list of things to collaborate on in the one hour time slot.

3.12.15: Questions 39 and 40 about objectives. When I answered them today I had the thought that as a team we have never talked about the team's objectives.

3.11.15: Regarding questions 19 and 29:

Working in a virtual team means that only the most important topics are discussed amongst the team. This is due to a limitation in the time available for joint team meetings due to the different time zones.
There is no opportunity to "appraise critical areas" or the listen to everyone's view.

I think there are two separate issues: working in a virtual team on the SAME time zone and working in a virtual team on different time zones.

Printed Comments

14.8.15: This is the first survey - I hope I am conveying everything correctly.
I have just moved to <Paris> and only just refocusing on work - looking at the topics to research for <the new release> and making plans to meet with the <neighboring> team.
I'm missing the close collaboration available by being in the same office with<Helen>and finding it distracting to work in the unfamiliar and close environment of the temporary lodging.
There is some uncertainty as to whether our team members' understanding of our objectives are totally aligned with our new manager's understanding of our objectives. This will undoubtedly be resolved by time, but it makes some of those objective-related questions more difficult to answer.
Re working with other teams, I am just starting to set up meetings with <members of the neighboring team> about <new> topics and am unsure exactly how the collaboration with them will work. I am looking forward to being in a closer time zone and appreciate that meetings are later in the day.

25.8.15: I have just returned from a vacation so that may have affected my responses. I am more tired than usual and just sat through a team meeting with <John> and 2 other team members. We discussed making changes in how the delta training is developed. He is looking at avoiding duplication - perhaps if<others are>doing level 3 for delta then we shouldn't do it. Also disappointed to learn that we will not be meeting in person this year. Seems like a mistake to me. <John> mentioned that other solutions don't develop as many assets as we do, I found this surprising. He was really only talking about<F01>and I think that is not necessarily the right benchmark especially since he mentioned that they have some issues with it. There are many questions, not yet the answers and no chance to meet in person to discuss directions/objectives. I think I am clear on the objectives we have, but as I filled in the questionnaire, I began to question myself whether the objectives are changing and if I really do understand them. Anyway, all of this is probably affecting my responses today.

4.9.15: Still very much in the turmoil of moving. Feeling rather isolated and missing the energy of an office. The <Paris> office is still under construction so I work from home. Just contacted someone in the <nearby town> office for <another company> and will go by there on Tuesday after the Monday holiday. Also just asked for my 3 boxes in the office to be sent there. Hopefully I will get them soon. I need to print out materials so I can read them better than I can online. Hope I can print things out in that office easily. I am told they have some guest cubes.

Took possession of my new rental home but furniture will not arrive until later in next week. I need to move out of the temporary apartment this Sunday. Will stay in hotel for 5 nights. It is unsettling. I feel like it's hard to relax with so much to always do.

I am starting a new project and have been contacting people. Meetings are set up and then cancelled. I think we're moving along but not as fast as I like.

There's an issue from partners on<a specific> training. They find it difficult to pass one of the web assessments so I will add some courses to the learning map. Need to determine which ones. Annoying that this project seems to always be a problem.

Feel like I would like to try some new things - feel like we never have opportunity to learn new instructional design techniques and use them. Maybe I could try a few new things but feel the pressure - it's hard to try new things when so much energy is going to personal life outside of work - but also feel like management not encouraging new things - actually more drive towards uniformity - levels 1,2,3 and all that - seem to want less materials not more. In other thoughts - Sad that I've missed the conference that happened last week but no way I could go in the midst of the move. Wish I had an office space. Miss collaborating with colleagues in person. Not as happy as I would like to be right now with work. Probably can tell in my responses.

16.9.15: We are in a time of transition and my answers reflect this. Since the last survey,<Maria> and <John> presented their idea for changing our training goals - this makes the objectives less clear at the moment. I think also that there are translation issues occurring in their presentation of their idea. They used the work "principles" to talk about the underlying assumptions that they have made. Principles are not open to discussion whereas assumptions are. I disagreed strongly with one of the assumptions because I felt it did not take into account our obligations for training new partners to a basic level that allows them to be certified and do good work at a customer site. The discussion was awkward. I believe they felt I was being defensive when I brought out my objections and I felt they were feeling attacked for their idea and they were being defensive. This is of course a much harder discussion to do over the internet - it would have been much easier to do this in person as one could gauge the effect of words and modify them based on facial expressions and other body languages. Meeting where we talk about changing the objectives, the deliverables and the method of work are not easy to do online. It is generally a mistake to do this without visuals of the people involved - or perhaps it would be better to do one-one and not in a "presentation" style. I also am beginning to wonder if I am communicating clearly with<John>. I think there may be points where we are using words in English but we don't mean the same thing. I never felt this way working with<David> but I think perhaps <John's> command of English is not as strong. I don't mean to be critical of him when I say this - after all it's not like I am speaking his native language. In any case, we are in a tough time for the team and working virtually is exacerbating the issues - we are understaffed for making large changes to the team. The objectives are becoming less clear to me as they are being redefined - I don't know if I am really able to be part of the discussion of shaping them or if our manager will really be the key decision maker. I think he is open, but I am not clearly understanding his vision yet - and I feel like there is some awkwardness when I ask questions to clarify - I think I am being seen as defending the status quo and that is not my intention. I think we need to survey our partners - clearly a lot of what is happening comes from partner comments - but it's not clear to me if they are international complains or regional complaints. It is clear we need to update the certification to be current. I agree with that. I think we need to ask partners what they want included as the basics a new partner needs to be qualified to be on a project. Ask what needs to be taught at a high level, what business processes need to be included at a user level, and what configuration choices need to be taught, how long a training session can last, what delivery method they prefer and so on. Only when we really understand the partners' needs and what they feel is missing/needs to be changed, can we address things appropriately. Otherwise we are just guessing that we understand them and that we know what's best.
On the personal side - I have just received furniture for my new home, I've been unpacking for the last 3 days and have taken time off work, so that may also be affecting some of my answers.

24.9.15: This is a trying time for the team. We are discussing some big changes to how we do our development for training and certification. Since we are in the middle of it, objectives are less clear - even more so our methodology is called into question. A couple of us are very concerned with the limitations we've had in the past that made it difficult to change how we did certifications and training - I don't feel like these limitations are fully taken into account yet by those who are driving change. The message is that the changes are not concrete or fully thought out at this point so we shouldn't object - but it's hard for me to accept that the new plan will work until I am certain that the obstacles we've had in the past are being considered fully. The last meeting we had went much better and I felt like our worries were taken more seriously and being considered going forward. I put forward a plan to take actions to immediately update certification and training to take care of concerns from partners and then to do a full survey of our partners before making larger changes. It seemed to be taken seriously by the manager and it looked like there was mostly agreement - but then it seemed like issues arose that I didn't expect. It seems very clear to me what needs to change in the area I work with but I am hearing from others that their areas are not as clear as to what needs to change and will take more time to research the changes before update. That surprised me. I have a good idea of what changed in<3> and we did some investigation of <4> so it seemed pretty clear to me that not much changes in<my area> as a long as we don't expand the topics covered. But perhaps<the other area> ismuch different and I'm not really listening well to<Maria>. I do worry that I could be guilty of dismissing concerns when I am very concerned with making sure my own concerns aren't dismissed. In other matters - I'm frustrated with my local internet provider not yet hooking up my internet. I can't easily work at home and the only office open is 40 minutes to an hour away depending on traffic. I did have a day off for religious reasons yesterday and the sermon was on avoiding blame and realizing that everyone is doing the best they can in the moment they interact with you. This is a good lesson for life and especially useful to remember when working in a team. I miss my regular yoga practice - I think I am less grounded now and more prone to frustration and worry.

2.11.15: I wish that things were smoother with the team. It creates a lot of stress with the uncertainty right now. It's distracting. I believe everyone has the best intentions. I think it would resolve if we weren't in a virtual environment. Not seeing each other face-to-face and having the time to discuss new ideas is what's causing the problem.

13.11.15: There is a definite crisis in the team. The objectives seem even less clear than before. People are not feeling listened to by management. Ideas that are not instructionally sound are being proposed and objections are not being heard. I am wondering if it makes sense to stay on this team as much as I like them and usually like the work. There is way too much stress in trying to explain why my opinions are valid. I was very disturbed to find out that the term "instructional designer" was unknown by our manager - I imagine some of this may be language barriers, but it did make me wonder if there was any understanding of what we do and how we come up with our way of doing things.

4.12.15: Sorry about missing the previous survey. Fortunately, you have some data from that turbulent time. After the mid-survey review I had tried to raise issues about communication and decision-making during a team meeting where the team lead was present and not the manager. The team lead became quite upset and defensive in the meeting. Our manager called me directly the next day because to say I was not supporting his objectives. I have always felt that his plans are vague but I do support the overall goal of improving our training and I will support him in the building of an e-respository, updating training to current releases, and all the other goals of making our training better for the partners. I told him that mainly my issues were with the team lead - I didn't feel I was being heard, I felt I was not being respected. It seemed like when I made suggestions to him and they were accepted, later they were dismissed after he spoke with the team lead. After that call in which I reassured him of my support, I had a one-one with the team lead. At the beginning when she asked if I had additional items to discuss, I told her I wanted to discuss our prior meeting. She wasn't pleased, but I told her about the manager's call and said I was sure it was because she had communicated with him. The team lead maintains that she doesn't report negatively on me to the manager and that when I raise that issue or any issue of separate decisionmaking or communication that I am unjustly accusing her. During our talk, I learned that she feels threatened by me. Any time I raise issues about communication and trace them back to the time of her promotion, she seems to feel that I am questioning the promotion. I feel she is overwhelmed and insecure. She told me that she "won" the promotion and that I should "get over it". I told her she needed to respect me and she said "it's a two way street". However, it did seem to help to clear the air even though it was a highly unpleasant conversation. I have resolved since to be more verbally supportive of the team lead and manager in all situations. I think much of the problem arising from being virtual, never meeting face to face and also to language barriers. I am always very careful of how I craft my statements but the softeners I use in speech are probably lost. Also I think that is why I feel the manager's objectives are vague - I suspect that if he could speak to me about them in a common native language, I would probably understand better what he wants to do - I believe he may not have the right words in English for his vision. In any case, I have decided to interpret the word "objective" in this survey at a higher level - because in the highest sense I do believe in his objectives and any time I do offer critical feedback it is in order to make his objectives work in a way that benefits our partners and makes him and our team look good. So, I will focus on that and try to preface future communications with that goal each time so that it is understood that I am working for him and the team and not against him. The team lead has been much more respectful since that discussion with me and other team members, and she has been solicitous of my feedback on phrasing communications to others, so I think the manager may have spoken with her as well. I think she can be an excellent team lead in the long run. I used to like her very much as a friend and I hope that we can regain that in the future. It may take me moving to another team before that can happen though. All in all, writing this makes me sad. So, if you see a shift in results of agreeing with objectives that is why - I think (but am not sure) that I will be more positive on questions about objectives and perhaps more negative about agreement within the team.

5.10.15: Still in the midst of a trying time. Many things are unclear. Team members don't always feel listened to. I don't feel like our objectives/strategy for the team is clear yet. There is always some of this turmoil with a new manager but it seems like we are throwing everything open and we have no chance to meet face-to-face. Sometimes I feel like I'm being heard, but then the next time I talk with the manager or team, things have changed. In one meeting, an idea I have will be accepted. In the next discussion, I'm told we aren't going to do what I suggested. It seems like crucial information is not being shared because decisions are made and I don't get information on why unless I take action to ask<Maria> or <John> individually. They are meeting separately and making changes and what's involved isn't clear. Perhaps they feel like it's transparent but it isn't. It causes me to second-guess meeting invitations and comments in a way that causes stress unnecessarily. Their motives aren't nefarious. Just hidden from me until I ask. This is definitely stemming from being in a virtual team and being on a different timezone. I can tell I'm also still angry about the decision<David> made to make <Maria> a team lead. This means that information is shared and decisions are made with <Maria> alone. If we hadn't had a team lead, a manager would have to communicate with the whole team. We are too small a team really for a team lead and it just adds a layer that acts as a barrier for communication to the whole team. I believe that <John> does respect our expertise but I don't always feel that way - I think it is due to the distance and lack of constant communication. Too many things are changing without clarity. Definitely a stressful time. When I answer about the usefulness of objectives - I can't give definitive answers because I'm still not clear what they are now. I know the big objective - making excellent training - but the details are still too hazy. I'm feeling under a lot of pressure to finish up what I'm doing but I'm not sure really what will happen next because it's still too vague.

13.10.15: I am feeling more positive than previously about the changes in the team. There is still uncertainty but it is better. I recently spoke with the manager 1-1 and felt we were more aligned and open to each other. He encouraged me to continue to challenge ideas. I worry that sometimes there is a language barrier in the team - something that I did not notice previously - sometimes I am unclear on what our manager or other team members mean when they describe their vision. I think this will hopefully clear up over time. I am making myself ask questions for clarity rather than assuming I understand what is said.

In personal life, things are somewhat smoother now after the move - though there is still a lot of frustration continuing errands related to having moved and not having access to a permanent office space. I think it makes me more quick to irritability.

I do not enjoy having change happening on all fronts of my life: work and home at the same time.

22.10.15: Still some lack of clarity about objectives - things seem to always be in flux. I know my immediate tasks but the future is less clear. At a recent meeting we learned from members of another team that our manager was meeting with someone in a third team about the third team taking over an area of our responsibility. That's not the way I like to hear about things. I don't know if the info is accurate but the team we were meeting with seemed to think it was true. I'm not sure what it means when I hear something like that. It adds more uncertainty in a team that seems to have a lot of uncertainty lately. I get frustrated - we meet as a team - suggestions are brought up and seemingly accepted, then the next time I talk with team members, things have changed and we are going a different way. It makes it hard to concentrate on the work we're doing because I begin to worry that bigger changes are coming. Are we going to give over responsibility for certain courses and certifications <them>? Is this just a shift back to our old way of working with them or does it mean something different? Is there a chance that my whole team might be given away - not just our tasks? Our new manager seems to want a different focus and it seems to be tied to a change of focus at a higher level. Benchmarking with other teams seems to lead in directions that are not promising - when asked about instructional design in other teams, the psychometrician seemed to indicate that there was a lack of design and shift toward "quick and dirty" work and he didn't seem pleased with the direction either. I begin to wonder if I need to quickly get a new job - perhaps my skills aren't wanted any more. It's very stressful being in a new location, working in a new office, having a new manager and a team in flux. There was also an upsetting moment in the recent meeting of the larger team when our "team lead" was praised as a leader who "bridges" between the groups. I am sure our manager did not mean to denigrate our other team members but it did sound a bit like she was the only one who really was helping him and that he needed help in getting our team turned around. Perhaps he feels that we are well adjusted to having a team lead between us and a manager - but we aren't. Our team lead is not yet fully comfortable in the position and does not have the skills for leading - I'm sure she can grow into it, but she doesn't yet have the experience and no training. It's frustrating because I used to be an "unofficial" leader in our group (at least according to our old boss) and my suggestions were more accepted. Now suggestions are seemingly accepted in a meeting then they are rejected when the team lead and manager talk separately. I want to be supportive but it's getting more and more stressful. Also feel like our team is not respected - I can't believe they had a section at the boss's meeting on training and personal development and no one from the training group was asked to speak. It's like they think we know nothing about training in general - only know about product training - yet here we have two team members with degrees in instructional design (not me) and lots of experience but no respect. I don't think I can keep working like this. Meanwhile, my work is not finishing as fast as I would like. I feel like the manager must think I'm an idiot or a slacker - it stresses me and at the same time because I'm stressed I think I must be working less efficiently. I'm not getting enough exercise - not meditating - just stressed dealing with moves and change at work. Gaining weight. Just moved into a new office building too as of 2 days ago - trying to get my cube set up and that of course is slowing down the work more. And now I'm hearing they want to trade out my computer! Will rapid changes never end! I need a break here. Sorry to go on and on - but hopefully this will help your project because you certainly will have a lot of context!

15.12.15: It seems like the team is rebounding from its crisis of communication. Perhaps it was good that I raised issues previously because now things seem smoother than before. I don't think the level of trust is very high yet, but it is getting better. It doesn't seem quite as urgent for me to get a new job and leave this team - although in the long run I think it will be necessary. I'm glad that decisions are finally getting made on a new training structure - it is not good to have things so undecided for so long. I'd really like to get to work updating or creating training as opposed to continuing to think about changing everything. I'm still having trouble looking forward to each working day, but hopefully it will keep improving.

21.12.15: My frustration level with the team goes up and down. Things seem a bit smoother in terms of interpersonal relationships, but I am frustrated with the fuzzy direction. I feel like the team is stuck and decisions aren't being made. Previously I felt that decisions were being made without my input, now it feels like no decisions are being made. We are filling out a spreadsheet with our course materials and potential materials structured down to the topic level, and I was hoping that would lead us to being able to make decisions about what was in/out of the certification and how case studies would be mapped. But now I'm hearing that we should perhaps take the details on the spreadsheet even lower to include the demos/sims and I don't understand why we would need that level. I try to be conciliatory to the group as a whole and argue on behalf of the requests - but I'm getting to the point where I don't understand why we're spending the time here instead of making decisions. I'm beginning to feel like I would prefer they make decisions without me just to have the decisions made - though I suspect it's not really the case.
I got so mad about it the other day that I kicked the wall and landed on the ground on my back and now I'm in misery from a strained back! And I have only my own temper to blame. And of course that means that I'm even less happy and more depressed about the whole thing. Will this endless "planning" ever produce anything? I just want to create training - I know I will have to do it eventually and it will probably be a pressured time frame since we've wasted months. There's no word on what the respository of the training will be yet and so much would depend on it. I'm getting worried that we won't find one and that the manager will look bad and then who will be to blame? I've already been blamed for being "too slow" on putting together a structure. I suspect it will be me.
BTW on other thoughts - I think the manager was trying to be nice by praising <Linda> in the team meeting last week. I think he was trying to find someone else on the team to praise besides <Maria>. But I couldn't really see anything special that she had done - not like the <experts> who get praised for something significant that increases sales or deals with escalations. It made me feel a bit odd about the whole thing - I did send her a nice email to congratulate her on being mentioned - because I do like her. Still, I did feel like somehow it is a criticism when a fellow teammate is praised for being consistently supportive of a manager/team lead and not for substantive achievements. Is that what they value most - just saying yes to anything they propose? I constantly feel like I have to speak out to drive the team towards a successful outcome - but perhaps that is foolish. Still what if we can't show anything new after all this planning - I don't see anything significant happening...no new repository yet, no big change in the structure...what will they point to as the big change? I think I need to get out of here fast before it all collapses. In the meanwhile, I will try to be supportive - and sneak in some real work now and then where I actually develop some course materials. But of course, I managed to make myself in pain while I do it and so I'm even less productive. What a mess. Wish me some luck here.

4.1.16: Having had some holidays off in the past two weeks has been very good. I worked on the days between the holidays and found that I was highly productive because there weren't any interruptions and no meetings. I feel much more positive when I actually manage to develop training rather than spend lots of time on filling out planning spreadsheets.

Also I find that my level of frustration depends on who I'm talking to within the team. Since some team members are unhappier - it often brings me down after talking with them. Not good because I like everybody on the team and want to talk with them frequently.

It was nice to get away from everybody and just get some work done!

11.1.16: Feeling somewhat more positive due a good discussion with my manager where he thanked me for my support in 2015. He praised my work as a senior member of the team and a very good training development person. He said that I play a critical and important role and that people listen to me within the team. It's good to hear positive feedback. It seems like our relationship has greatly improved. In terms of our team generally, I have concerns about our planning timelines and scheduling- we need more clarity on exactly what deliverables are due on what dates, but things are becoming more concrete. I am not sure we can achieve the full scope of what has been discussed within 3 or 4 months - so it would be good to set priorities for what needs to be achieved first. Any case, I will attempt to keep this positive forward-looking attitude here at the beginning of the year, especially since it seems like my valuable contributions are being recognized.

21.1.16: I am glad to be working on concrete tasks now - it is a pleasure to be creating course material. It seems like the endless planning phase is moving into a working phase and that is much better. It seems like finally priorities are being set rather than hearing that everything must be done and it's all equally important. This is a step in a good direction. I am still feeling good from a good performance review. That is always helpful to attitude. It makes one feel more appreciated. Things seem more harmonious within the team. I still have a fear that we cannot achieve everything in the time mandated. I am concerned about making sure our team delivers something with a "wow factor" at the end of ramp up. I've been told by colleagues that it isn't our job to make sure that we do - that it is in the hands of the management - but I feel like a lot of the pressure within the team comes from the need to make our manager's vision a reality since he has shared the vision so widely. I am committed now to making him look good and not lose face after sharing what seem to me to be ambitious goals. At the same time, I continue to look for another position within <the company> that will suit me and help me grow in new directions. I do worry about the team achieving the goals if they lose a person and worry that if I get a new position, they may block my leaving this team. However, it is better to work towards my personal goals than not - it gives me a sense of momentum and occasionally when I get an interview, a sense of being highly valued.

1.2.16: It seems like the team is working somewhat more harmoniously at this point. Tensions are downplayed and mostly we focus on areas of agreement and maintain positive attitudes. We have been working well together to come up with objectives/tasks for the certification. The team has begun to narrow the goal on what to achieve by end of ramp up. I think we have more realistic objectives for that time period, but I worry that we will not have anything that has a "wow" factor. It is important to me that we make our new manager look good to his management and since he has promised changes, I would like to see us deliver something that looks different than what we have delivered in the past. It seems like we spent a long time discussing things but not much has changed. I wish we could have just done what we're doing 3 months ago. At this point, I think we will only basically deliver certification relevant and updated materials and not be able to deliver anything really new. It saddens me that we've gone through so much tension and angst only to do the same stuff we've always done. I feel like we wasted so much time. I think it would have not been this way if we could only have met together physically as a team in the late spring or summer. Although it would have been difficult for me due to my move, I think it would have helped the team gel around common goals. In all the years I have worked in this team, I have never felt the disadvantages of a virtual team as strongly as I have this year.

Appendix VIII: Category System for Qualitative Content Analysis

Category	Text Examples	Coding Rules
Create stability conditions for change processes	'It gets harder and harder. And he, and when I'm confused, my opinion, so (---), uhm, (--) uhm, can change so much, because I'm not that certain of my opinion. Because we are in (.) in everything is so uncertain right now.' (Linda: 88) 'But gladly this (--), uh, manager changes went very smooth for me. (2s) Uhm, maybe because I know <John> from the past. (--) Maybe because we are aligned with our perspective on how things should go.' (Maria: 86)	Structural and emotional safety on participant side, self-efficacy, professional setting and transparency, empathy, appreciation, congruence
Identify the system and its patterns	'(3s) Uh, I, I mean well I like the team members. And I feel pretty good about (.) you know, talking with them. Uhm, (3s) uhm, I mean I think they're all, (.) I think everybody on the team is a very competent individual. And they're all very sharp. (2s) Uhm, (--) so I, I generally get along pretty well with everybody. I mean, part of it is, you know, we're virtual. And that's always very, uh, (2s) difficult.' (Susan: 67) '(2s) And I really try to go along (---) with <John>, with <Maria>, not to upset anyone, (---) uhm, (2s) uh, but it makes me (.) confused and uncomfortable (.) and I don't want to take sides.' (Linda: 46)	Relevant system and patterns for evaluation of changes, consider past developments and boundary conditions
Develop visions and goals, create connotation	'So (---) I am clear about what (---) my team's objectives are. (2s) Yeah, I'd say in general I am. (---) Even though I disagree with them.' (Helen: 364) 'Uh, so, yes, I'm, I'm (--) not that clear anymore about my team's objectives.' (Linda: 366)	Visions, goals, orientation toward respective connotation in order to strengthen performance
Enable energizing, identify control parameters	'The ability to accept, uh, changes and to, (.) which is, you know, at the beginning it makes sense to, to resist. But, uhm, (2s) yeah, it's of course understood that people were not (.) fully aligned.' (Maria: 261) 'Yeah. (--) Yeah. Because I, I feel like I, I, you know, it's, it starts to be that (.) I feel like the team starts to function better. They're listening, it seems like we're listening. And then (--) next thing I know (--), uhm, it's not, (---) I don't know. I don't, you know, and I, I've tried, around that time sometime I remember having a meeting, uh, (---) because I had a, a problem and. You know, we had a discussion. It seemed to go well. Then we changed and (.) things were (.) not going the direction I thought (2s), I was very confused by why a sudden change was.' (Susan: 207)	Energetic activation of the system; relevant control parameters for creating new patterns → motivational requirements and environments
Encourage destabilization, fluctuation increase	'I don't know that it's, I, I can't trust and this is terrible. Not to be able to trust. I cannot trust (.) that (.) they are understanding the needs of our (.) participants, (---) our learners. I don't, I don't trust that they are making decisions that are based on what our learners really need. (2s) And that's one reason that I'm (.) I'm being very negative.' (Susan: 207) '(2s) So I try to (--), you know, to, uh, explain the benefits and to give, uh, examples and to (.) to give a self-example like how do I work, how do I do with that and to talk a lot and to (.), you know, calm and to give, uh, all the information I can and all the support.' (Maria: 118)	New perspectives and initial system movements; important: information distribution, identification of external facilitating/inhibiting influences

Support symmetry break	‘Well, I think, I am, all this change you see is dedicating time to discuss it. Even though I disagree and I feel I’m not being heard (--) time is being dedicated to (--) discussing, discussing. To (--) work through it.‘ (Helen: 354) ‘But yeah, it was very frustrating. Because you feel like you get to move ahead, then you start moving ahead, then you stop. And I feel like (--) it’s, you know, it’s fine to make big changes. (---) But I feel like they are being made without consult.’ (Susan: 203)	Purposeful realization of new order’s structural elements including respective emotions
Ensure restabilization	‘Okay. So, (2s) hm, (2s) What I learned. (5s) I learned that, uhm, (---) what (.) what we do or (2s) a lot of, uh, things that people think are (---) or they (3s), uhm, (---) and I also, yeah, for, for everybody, also for myself, that people (.) define as (---) professional (---) decisions and professional behavior. A lot of it is, uh, emotional (.) related. And, uh, (--) yeah and it’s sometimes hard to differentiate between the two.’ (Maria: 377) ‘(3s) To me, uh, I don’t know. You mean, should I be less emotional? Uhm, (---) as I say, that’s (.) it’s, it’s because a thing can be resolved by a five minute cup of coffee. You know. Let’s go talk this thing from you and me, face to face. (--) And so things tend to (--) simmer (2s) until the next meeting. Which might be a week, it might be two weeks. It might be a month. And so that’s a lot of emotional simmering going on.’ (Helen: 504)	Translation of positive patterns into daily actions; identification with new order; transfer to other areas
Consider resonance, create synchronization	‘(--) BUT there still should be (--) a way of having somebody’s opinions listened to within the team. (2s) I mean (.) there’s a lot of online stuff that could be done. Like polling questions or surveys to (--) you know. (---) Really capture what we want to say.’ (Helen: 482) ‘(2s) I think that, a positive strategy is being more, uhm, (3s) detached of (.) emotionally from what you do and, uh, and get, you know, some (2s) some, uh, perspective. Because what we do with all the respect is not (---) life-saving. It’s (---) work.’ (Maria: 383)	Fit of methods and procedures with cognitive-emotional conditions; reflections and evaluations
Study feedback	‘I’m really happy to help, you know. Uhm, (---) so it’s, I do something that is helpful to someone else, so it, it is a good thing. Uhm, (3s) my problem is that it’s long, that’s my problem. But I (---) I go along with it, you know. It’s okay.’ (Linda: 49) ‘(2s) Uhm, I mean, I really like the questions. I like this, you know, ongoing pulse that’s just catching you at a random moment. And, and how you feel that day. (---) Uhm, so I really like that. (--) And, uhm, (3s) you know, it’s going to be interesting looking at the results.’ (Helen: 54)	Feedback on the process of data collection in this study
Social aspects	‘(3s) Uhm, (6s) it’s funny (.) because I thought that relationships between the team are constantly harmonious (--) I always rated it that I disagree. Because it’s not constantly harmonious. I mean it could be sometimes harmonious, but not constantly.’ (Maria: 229) ‘Yes, it may. (2s) Uh, it may (2s), uhm, (3s) I, I, there’s something I really cannot say because, uh, (2s) I think the person who told me that, uh, (2s) expect me to keep it (.), I don’t know, to myself.’ (Linda: 582)	Sensitive social statements