Organizational Structures for an Implementation of Virtual Teamwork - A Case Study Analysis

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Abstract. In many successful companies, teams work together virtually instead of face to face. These teams are supported by technology, allowing effective virtual teamwork across the globe. Some companies are even successful in business without any offices at all. The ways of working in virtual teams appear to be ingrained in these companies' cultures. The paper at hand performs a case study analysis synthesizing individual patterns found in companies that are built on virtual teamwork to a generic organizational pattern. This generic pattern can be deployed to support changes due to virtuality and digitalization in more traditional companies. The case study analysis provides a holistic view on virtual teamwork and contributes to research on this evolution.

Keywords: Virtual team · Teamwork · Case study analysis

1 Introduction

Digitalization as a socio-technical phenomenon bears the potential to change how people live and work. The way people are socialized and decide to live and work impacts the development of new technological solutions as well as technological innovation enable certain ways of life. Megatrends, like globalization, urbanization, sustainability, and flexibilization, further drive the fundamental change in how we live and work. Companies that make use of virtual teams (VTs) working across the globe are one of the many manifestations of this development in society and organizational design. Obviously, these concepts introduce an advancing degree of virtuality. People spend time with their friends in virtual networks and introduce virtuality into their work life. Companies use virtual teamwork to acquire qualified employees and save costs on expenses or real estate.

Many different aspects of how and why VTs work successfully are addressed in scientific literature. Answers are e.g. sought on how "identification develops in hybrid and pure virtual settings" [1] or on "how communication with Millennials will affect organizations" [2]. For these very narrow aspects, guidance is derived that is also offered to practice. The case study analysis at hand seeks to provide further insights and a holistic view on organizational structures of companies deploying VTs in order to contribute to the body of knowledge. The research objective is thus to present a generic organizational pattern as synthesis of the identified individual patterns found in

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companies. This can be used to plan change for less virtualized companies, based on the analysis of enterprises that are mainly built of VTs.

A case study analysis is performed as this research approach allows identifying patterns while acknowledging the context [3]. The analyzed companies are chosen due to their high degree of virtuality. Virtuality in this context means that the companies consist of teams that work together asynchronously and geographically dispersed (see Sect. 2). The revealed patterns can in turn be used to derive hints for established traditional companies on how to adopt or intensify virtual teamwork.

The relevant concepts show how to define virtuality of teams and how to identify patterns in Sect. 2. Section 3 introduces the research method and provides details on how data was collected and analyzed. The context and findings of the case study analysis are shown in Sect. 4, closing with a discussion towards open research ideas in Sect. 5. [4] proposes five key components of case study design. These components are shown in Table 1 which also illustrates the approach of this paper.

Table 1. Key components and action plan [4]

Component of case study design	Implementation and section
1. Research question	What are patterns in organizational structure of companies with a high degree of virtuality in teamwork? Sect. 2
2. Theoretical propositions	The scope is limited to companies with a high degree of virtuality in teamwork. Concepts for virtuality and for patterns are derived in Sect. 2
3. Units of analysis and data	Questionnaires, websites of and articles about organizational structures of four companies are analyzed in Sect. 3
4. Linking data to propositions	The findings are mapped to an integrated framework in Sect. 4
5. Criteria for interpreting findings	Criteria and their manifestation are proposed in Sect. 3

2 Virtual Teams and Organizational Patterns in Work Settings

Research topics concerning many aspects of virtual teamwork have been and still are analyzed in scientific literature [5]. These works mostly focus rather narrow topics, as described above (e.g. [1, 2]). More holistic views on VTs, their processes, how they work and are embedded in companies are mostly built on practical experience and do not follow a scientific approach (e.g. [6]). The paper at hand contributes to the current aim [7] for substantial and more comprehensive scientific research on VTs by focusing on the organizational structures which enable VTs in successfully operating companies.

Companies with a high degree of virtuality in teamwork are to be chosen for this case study analysis as role model. Therefore, a concept for defining and comparing the degree of virtuality is needed in order to decide which companies fit into the sample. Yet, there is no consensus on how virtuality in teams is defined or even measured [8].

Typically, different aspects are in- or excluded in order to discriminate VTs from traditional teams [5]. Even though a common definition does not exist so far, current concepts tend to abandon the strictly dichotomous approach of virtual versus traditional team [8]. Teams are regarded to be located in between these two poles [8].

VTs, communities, offshore development etc. are overlapping concepts derived in scientific discourse. [9] analyze criteria that are used in literature to define the virtuality of teams. Following the synthesis of this literature study, virtuality of teams is determined by the two criteria *asynchrony* and *geographic dispersion*. This concept of VTs is viable for the study at hand, as it focuses on the main properties analyzed here. VTs in this context use information and communication technology (ICT) for actually being able to work as a team. The deployed ICT include e.g. software solutions, such as project management tools, virtual meeting rooms and video call applications. However, this technology use can be regarded as a result of the need for virtual teamwork rather than as criterion for defining and measuring virtuality [9]. The concept of "asynchrony" is explained as teams which work at the same location with different schedules or at different locations with different time zones, both leading to mostly asynchronous communication. Geographic dispersion defines the actual distance of team members. Both criteria alone are sufficient to define a team as virtual and can be used to measure the degree of virtuality of a team according to [9]. Criteria such as cultural diversity and lifespan of the teamwork are also often used for defining the virtuality of teams, but as shown by [9] cannot alone define virtuality satisfactorily. The degree of virtuality can be located on a continuum between completely virtual and not virtual at all [9] as shown in Fig. 1.

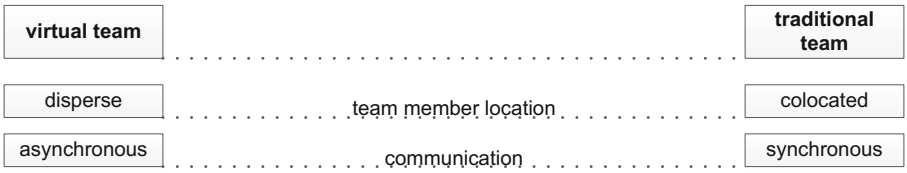

Fig. 1. Degree of virtuality

[9] propose to measure the degree based on the definition of virtuality as shown in Fig. 1 above, and additionally aim at teamwork time and team characteristics. Thus, in order to check the degree of a companies' teamwork virtuality, two questions are asked:

- What proportion of teamwork time is performed virtually?
- What proportion of team members work virtually?

Further dimensions that do not constitute, but are found to correlate with virtuality of teams (e.g. [5]) are shown in Fig. 2.

In order to identify patterns in enterprise structure and processes, a suitable framework has to be introduced. The framework (Fig. 3) allows creating a holistic overview of a company in its context. The existing conditions concerning the VTs are

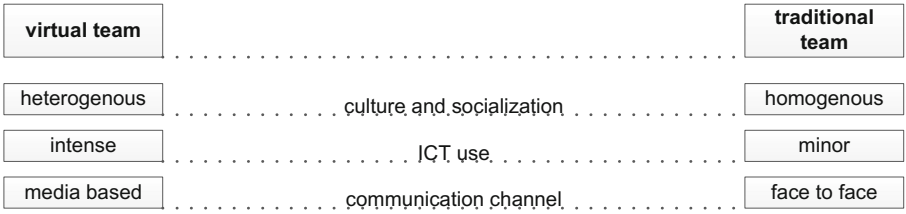

Fig. 2. Dimensions that correlate with team virtuality

analyzed based on this framework in order to derive similarities and differences. These serve to evolve patterns and create a generic model. As the goal of this study is create a single model of relevant patterns, this resulting generic model can in turn be used to plan possible paths of development for other companies, especially less virtualized ones (Sect. 4). The components of the different layers of the framework and their relations are shown in Fig. 3. The layers are described in the following and in further detail in [10, 11].

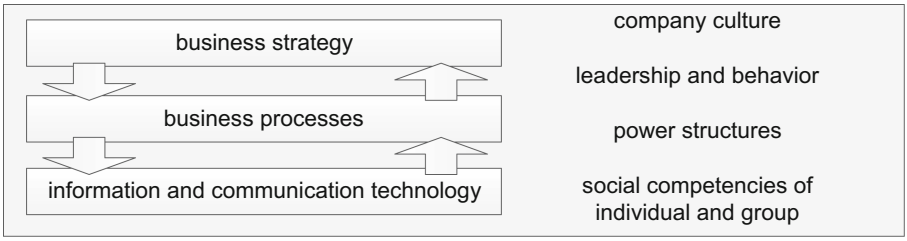

Fig. 3. Framework with functional and emotional-culturally-oriented layers

Business strategy, processes and deployed ICT are defined, as well as their interrelationship. These layers of the model can be regarded as functional layers [10]. Information on company culture, leadership and power structures are gathered and relevant social competencies compiled [11, 12]. These model layers are emotional-culturally-oriented. Perspectives on governance, context and external factors can be included in subsequent research. The functional layers are codependent. The strategy influences the processes, which influence the choice and use of ICT and vice versa. The emotional-culturally-oriented layers are also codependent [12] and are strongly related to the design of the functional layers. Thus the functional layers are represented to be embedded in the environment of the emotional-culturally-oriented layers [13] in Figs. 3 and 4.

The analyzed organizational patterns are based on these layers. The presented layers have been applied for change management in practice [14] and their validity is supported by case studies [12]. The framework presents a holistic view on the company and allows recognizing main structures and dependencies. Thus, these layers are used for analyzing the selected cases in Sects. 3 and 4. The layers show individual

manifestations in the analyzed companies along this framework. The identified manifestations are used to derive the final artefact, the generic organizational pattern (Sect. 4).

3 Analysis Design and Procedure

Case study analyses allow collecting rich data on current events and entities. The studies can be of explanatory, exploratory or descriptive type [4]. As the objective of this study is to reveal existing patterns, it can be regarded to be of exploratory type. The selection of more than one case results in a multiple-case design [3]. Thus the recognition of patterns is facilitated and theory building is enabled. Adapting the conceptualization of case studies by [3], Table 2 shows the characteristics of the case study analysis at hand.

Table 2. The analysis' characteristics and their implementation

Characteristics by [3]	Implementation
1. Phenomenon is examined in a natural setting	Organizational patterns of virtual teamwork are analyzed in companies
2. Data are collected by multiple means	Companies' websites, articles and questionnaires are used for data collection
3. One or few entities (person, group, or organization) are examined	Four companies are examined
4. The complexity of the unit is studied intensively	The complexity is structured into layers
5. Case studies are suitable for the exploration, classification and hypothesis development stages of the knowledge building process	The goal is to derive hypotheses on virtual teamwork based on explored patterns
6. No experimental controls or manipulations are involved	Data is collected following scientific standards for case study research
7. The investigator may not specify the set of independent and dependent variables in advance	The variables are not set, yet the hypothesis induces virtuality as context for the independent variables
8. The results derived depend heavily on the integrative powers of the investigator	The conceptualization of the topic and derived research process support the integrative potential
9. Changes in site selection and data collection methods could take place as the investigator develops new hypotheses	Changes in site selection or collection methods will be noted for future research
10. Case research is useful in the study of "why" and "how" questions because these deal with operational links to be traced over time rather than with frequency or incidence	"Why" and "how" questions are implemented in search for patterns. The synthesis of individual patterns found among the units of analysis supports the exclusion of arbitrariness
11. The focus in on contemporary events	The focus is on currently operating companies

3.1 Data Collection

For the case study analysis, Basecamp, Fire Engine RED, 10up, and Zapier were chosen as unit of analysis. All four analyzed companies have been operating successfully for several years. Following the definitions from above (Sect. 2), each company is characterized by a high degree of virtuality and the correlating dimensions. The companies are thus selected as patterns are predicted to exist among them [3, 4]. Due to the exploratory character of this case study analysis, a small set of cases is selected [3]. Many more companies exist that fit the profile for this study. These can be included in future research for validating the findings. The selection of the companies analyzed here and the exclusion of others is furthermore based on the availability of information documented on their websites.

Multiple data collection methods are used in order to provide a rich set of data. These include documentation (journalistic articles) and archival records (companies´ websites) [4]. The companies' websites were used as primary source for data collection. Especially the "about" - and the career-sections provided information for the model elements of the integrated framework. Additionally, online articles were used for data collection. These articles are mainly blog articles by founders or members of the companies, interviews with company founders or further material provided by the companies, such as the guidelines by [6]. Furthermore, the companies were contacted via email. The emails contained a short introduction into the topic and open questions, one regarding each layer of the framework and allowed short and precise answers. The set of questions and the answers received can be obtained from the authors.

3.2 Data Analysis

The integrated framework was used to structure the data as described above (Sect. 2). The following Table 3 presents the central findings for the single layers of the framework. These are synthesized and dependencies between the layers are explained in Sect. 4. Table 3 contains summaries by the author and quotes from the websites, related articles and questionnaires sent via email.

Table 3. Patterns of companies based on virtual teamwork

Integrated framework	Basecamp[1, 2]	Fire engine RED[3]	10up[4]	Zapier[5]
Business strategy	One product, less is more, simplicity, clarity, ease-of-use, and honesty	Innovation, easily accessible software solution, four services provided	Customized web services, craftsmanship, innovation, openness, ownership	Create processes and systems that let computers do what they are best at doing and let humans do what they are best at doing
Business processes	Regular work/task cycles (6 weeks), emergent idea	Customer care, online meetings, face-to-face once a year, no	Weekly metric based reports, core sets of	Every employee works in customer support, weekly online meetings

(*continued*)

Table 3. (*continued*)

Integrated framework	Basecamp[1, 2]	Fire engine RED[3]	10up[4]	Zapier[5]
	development, big believers in asynchronous communication, no formal marketing role	micromanagement of employees	standards for each discipline	
ICT	Self-developed tool for unified documentation, communication, idea pitches	Variety of free and payed collaborative tools	Variety of free and payed collaborative tools	Variety of free and payed collaborative tools
Company culture	Sustainability, long-term growth	Employee retention first, client retention second	Equal perspective on clients, employees and community	Transparency (e.g. hiring process)
Leadership and behavior	Coworkers, company as a product, teams stay together for whole cycle, teams max. 3p, no project manager, no time tracking, strict deadline	Value employees by providing promotions and raises	Teams of 6–8p plus manager, serve team through encouragement and support	Small teams, supportive/positive/inclusive workplace (code of conduct), buddy system, regular structured feedback calls, weekly result update
Power structures	50 employees worldwide, headquarter	40 employees from US and Canada	120 + employees worldwide, headquarter	20 + worldwide, supervisor hierarchy
Social competencies of individual and group	"Treat people right"	Value and recognize employees	Culture built on empathy and teamwork, collaboration, self-management	Code of conduct promotes guidelines for communication, teamwork, face-to-face-meetings

[1] https://basecamp.com
[2] https://m.signalvnoise.com/how-we-set-up-our-work-cbce3d3d9cae#.bp3n8tjd1
[3] http://www.inc.com/winning-workplaces/articles/201105/where-virtual-is-the-best-policy.html
[4] https://10up.com/
[5] https://zapier.com/

4 Discussion

The results of the case study analysis allow identifying certain similar instantiations of the patterns and creating a generic model (see Fig. 4 below).

While researching the companies' websites, two main aspects were eminently prominent: the emphasis on selling one main product and the focus on the companies' employees. This impression is supported by the findings as shown in detail in Table 3 above. The generic pattern is outlined in Fig. 4 and explained below.

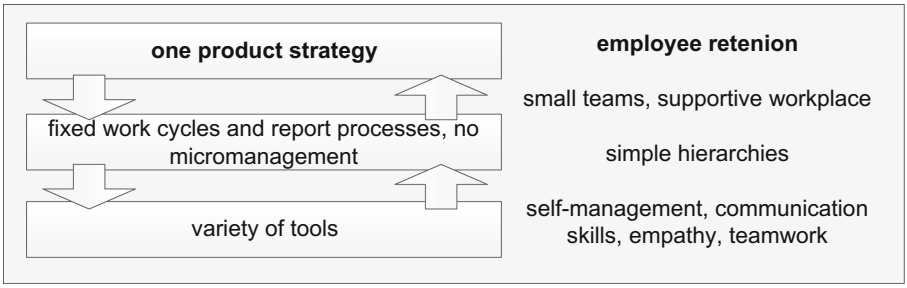

Fig. 4. Generic organizational pattern as synthesis of the identified individual instantiation

- All companies focus on *one main product*. Additional services are offered, but no company promotes a wide range of different products or services. Especially the characteristic to provide a simple and clear solution that fits the customers' individual needs was found on all sites.
- This strategy is mirrored in the *business processes*. Examples are fixed work cycles and report processes. The employees are not micromanaged. On the other hand, rather rigid framework conditions are set. As shared mental models are found to be essential for virtual team success [15], these set conditions can support the consistency of the team members' mental models.
- Three out of the four analyzed companies use a *variety of tools* for communication, documentation, project management, etc. The companies have established the use of a certain tool for each task. Thus, the tools are not selected based on the employee's individual preferences but mostly standardized across the company for each process. One exception with respect to the choice of tools is Basecamp. Basecamp develops the project management software of the same name and states to use its own software for all management and communication related processes.
- All companies show strong focus on *employee retention*, this can be regarded as a main finding concerning company culture. Some companies state that their employees' needs are in focus first and their clients' needs come only second. This can be regarded as major difference to traditional companies, at least the fact that this priority is stated in public.
- Characteristics regarding *leadership and behavior* are also employee-centered and serve the processes as described above. The teams are small and self-managed. A supportive workplace is regarded to enhance performance and employee retention. Guidelines for behavior are described on the companies' websites, in detail even as code of conduct.
- The *power structures* are also in line with the ideas about the product and processes. Hierarchies do exist but are structured to avoid confusion or complexity. Two or maximally three hierarchy levels are found in the analyzed companies. Roles and responsibilities for e.g. reporting are clearly defined.
- The last analyzed layer of the framework regards *social competencies of individual and group*. The companies focus on self-management, communication skills,

empathy, and teamwork. These competencies serve the characteristics described above. For example, self-management is crucial to avoid the need for micro-managing, communication skills are also required for a supportive atmosphere and sound reporting, empathy facilitates employee retention.

The idea of 'customer and product first' [16] might not be a standard anymore that leads to success. This approach regards the organizational structures, including the employees, as "barriers", as shown in Fig. 5 below [16]. This might be an explanation why in the past some organization could not successfully compete in the market.

Fig. 5. Organizational structures as barriers on the way to customer centricity [16]

However, the changes we found based on the analysis might change that. Factors such as competition for an adequate workforce and changes in the organizational culture are examples of dynamics that impact organizational structures in companies and might be the reasons for the observations of this study: the *one-product-strategy* and focus on *employee retention* (Fig. 6).

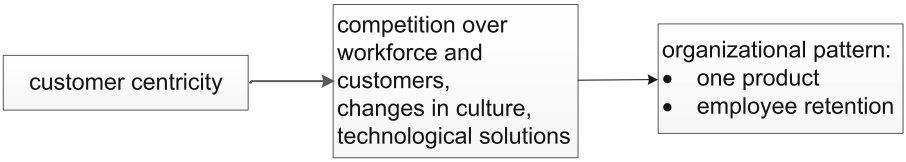

Fig. 6. From customer centricity to the new organizational pattern

Reviewing scientific literature shows that this employee-centric culture of virtual companies - and also currently active companies of less virtual degree - needs yet to be put in the focus of research.

There are some limitations concerning the interpretation of the results of the study at hand. The main sources of the gathered information about the companies are their websites. These are designed to promote the companies to clients and potential employees, as a consequence, these information probably have a bias with respect to an "over" positive presentation. In fact, less biased data would add to the validity of the results of this study. However, they nonetheless give some indications how the organizational structures of these companies are meant to be working and that allows for an interpretation not only of the intention, but also of the actual representation.

5 Conclusion

The impact virtualization has on people and companies introduces change in our everyday (work-)lives. The companies presented in this study are vivid examples of how to successfully live this change. This study contributes to scientific guidance for how to learn from these companies. Individual patterns of these companies that operate virtually to a high degree are extracted and synthesized to form a generic organizational pattern as shown in Sect. 4. This pattern can be applied to plan change for less virtualized companies that seek to establish the use of VTs. Noticeable shifts towards employees and a strategic focus on one main product are main findings that contribute to the insights on how virtuality changes individuals, companies and vice versa. These results are first steps to actually understand how companies work today and where an ongoing virtualization can lead us.

Subsequent empirical studies that include a higher number of companies with different degrees of virtuality could be used to validate the found patterns. Further data collection methods, such as direct observations and physical artefacts [3] could be included in future research for refining the revealed characteristics and define the patterns in further detail. The processes of companies deploying VTs will be mapped in detail in subsequent studies based on the insights of the study at hand.

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