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Exploration of Challenges in Team Management Faced by Managers in an IT Company

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Abstract: The purpose of this research was the exploration of the challenges in team management faced by managers in an IT company. The company being the subject of this study provides solutions in Software as a Service model. It uses an agile approach, and like many other IT organizations, it faces challenges related to scaling it to the level of many teams. The company uses the idea of reverse Conway manoeuvre, the strategy in which organizations focus on organizing team structures to match the architecture they want the system to exhibit. This research tries to answer the question of how to use the topology of development teams and their environment to optimise delivery of value to customers and prevent creation of team silos. To accomplish exploration of the problem analysed, a series of individual in-depth interviews was conducted. The research presents an analysis of issues being addressed in the interviews, as well as recommendations on selected subjects.

Keywords: teams management, scaled agile, silo mentality, virtual teams, Conway’s law

1. Introduction

Agile approach in software engineering today can be taken for granted, but this was not always the case for this relatively young industry. Since the creation of the Agile Manifesto in 2001 (Beck et al., 2001) a lot of attention has been devoted to this subject. Much focus was put on how small, co-located, and self-organizing teams should function to provide business value in close collaboration with stakeholders and to adapt quickly to changing conditions. A question arises, how to scale the agile approach in larger projects or organizations. If agile methods are meant to optimise the way teams generate value in a changing environment, why not scale this optimisation at a higher level and answer the question how teams can behave in a similar manner. Thus, the aim of this paper is to explore how to use the topology of development teams to optimise delivery of value to customers and prevent creation of ‘team silos’.

This paper presents a case study of the organization referred to as ComPlatform supported by a series of individual in-depth interviews. Like many companies in the Information Technology industry, it applies the agile approach to developing software and faces challenges related to scaling of agile teams. The way the teams have been structured at ComPlatform relies on Conway's Law and elements described in Team Topologies (Skelton & Pais, 2019). Team structure follows the idea of the reverse Conway manoeuvre, the strategy in which organization focuses on organizing team structures to match the architecture they want the system to exhibit rather than expecting teams to follow a mandated architecture design.

The system in which each team is focused on a distinct area of the developed solution, referred to as technology domain, comes with both advantages and challenges. A model, where a cross-functional team owns a part of the solution end-to-end is meant to accelerate delivery of value and break functional silos. The question is whether such teams focused on technology domains do not become new silos. This question is even more important in the world of the new normal after the COVID-19 pandemics, as the work continuous in so-called hybrid environments, where the teams co-located in the past became virtual at present, and it looks like such a situation is not going to change soon.

Section 2 provides the literature overview and theoretical background regarding scaling of agile, organizational silos and management of dispersed teams. Section 3 describes research methods. The description of the research context and the analysed company can be found in Section 4. Further sections provide results and conclusions.

2. Theoretical Background

The Reason to Scale the Agile Approach

Initially the agile methods were designed for small, co-located, and self-organizing teams that develop software in close collaboration with business customers using short iterations (Agile Alliance, 2024) to adapt quickly to changing conditions. The question is how to coordinate a large project requiring involvement of many agile teams.

Many scholars have been describing how to deal with projects within the so-called agile sweet spot, i.e. small and collocated teams of less than 50 people with easy access to business and customers. The findings of 2013 IT Projects Success Rates Survey Results indicate the advantage of use of Agile methods as far as effectiveness and success rate are concerned compared to so-called traditional methods (Ambler, 2014). However, the question of how to scale the agile methods in larger projects and/or organizations remains difficult to answer even if there are many reasons behind the creation and scaling agile tams (KPMG, 2019; Uludağ et al., 2021). The so-called bitter spot conditions for agile methods are large number of teams, geographical distribution, entrenched culture, and formal governance structures (Agile Alliance, 2024). In such environments there is still a need for teams to place more value on adapting to change than on sticking to the plan (Rigby et al., 2018). This paper describes a case of use elements of Team Topologies (Skelton & Pais, 2019) but the question which arises with this approach is if it does not lead to creation of 'team silos'.

Organizational Silos and Silo Mentality

Organizations are divided into smaller units. They are aimed to maintain focus and distribute responsibilities with clarity (Sobande, 2020), shield the unit members from interference and distractions. Well-defined boundaries of these units have a clear purpose; together with the growth of an organization there is a need to facilitate its functioning. This need comes from the complexity of communication between people forming a unit due to the increasing number of communication channels. From the studies on complexity, it is known that people cooperating will create social networks and form clusters, so it is natural that organizations arrange people into smaller groups to enforce close collaboration and teamwork. More recent research in network analysis has provided indications of the importance of network clusters as spaces of social reinforcement necessary for the spread of complex information and behaviour change in organizations (Bento et al., 2020).

Even if according to studies on complexity, forming clusters is an evolving and emergent process in social networks, creating close collaborating units in organizations may have also negative effect: forming of organizational silos.

The term 'silo' comes from agriculture, where it defines storage towers separating different grains from each other (Bento et al., 2020). In the context of organizations, those isolated materials can be understood as interactions and knowledge. Within organizations silos mean the presence of barriers to communication and exchange (Bento et al., 2020). There is nothing wrong with empowering teams and enforcing their identity and autonomy, but it cannot be disconnected from the overall organization's goals.

Silo mentality can be defined as reluctance to share information with members of other teams or departments of the same organization and cooperate across departments. It is a mindset against information flow within the same organization, which, by definition, should allow all the organization members to align towards common goals (Bento et al., 2020; McPherson, 2018). The silo mentality is seen as an issue often related to competition between senior managers or employees of competing departments. It is defined as the absence of Systems Thinking and vision of the overall organization (Bento et al., 2020). As a result, an organization becomes fragmented and individual departments or teams become islands of knowledge.

Management of Dispersed Teams

Virtual teams can be defined as groups of people who share common goals and who collaborate on inter-dependent tasks across distance and time (Eisenberg et al., 2019). Virtual teams rely on technology to communicate and cooperate (Morrison--Smith & Ruiz, 2020).

There are many reasons why virtual teams are formed, which give benefits to organizations (Hansen et al., 2012; Morrison-Smith & Ruiz, 2020), such as easier access to key specialists and talent, reduction of travel cost, or answering increasing demand of better work-life balance.

However, forming virtual teams does not come without a cost. Collaboration in any type of team refers to synchronous and asynchronous interactions to achieve common goals (Morrison-Smith & Ruiz, 2020). Boundaries of any kind limit the possibilities of quality interactions and make it difficult to cultivate inter-personal relationships. Teams' dispersion creates several unique challenges that hinder their performance, among which communication seems to be one of the most important factors (Eisenberg et al., 2019).

Virtual teams are affected by physical factors, such as geographic distance, which are tightly coupled with social and emotional factors. Morrison-Smith and Ruiz (2020) categorized these factors as distance factors and contributing factors that are driven by distance. The distance factors are geographical distance, temporal distance and perceived distance.

Geographical distance seems to be easiest to define, as it can be measured by the number of kilometres between sites or by the amount of time it takes to reach one physical site from another. However, any physical barrier influences communication and collaboration among members of the team, so even a couple of floors in the same office can be considered as physical distance.

Temporal distance is a level of temporal displacement between two collaborators. It can be caused by time-shifts or differences in time zones (Morrison-Smith & Ruiz, 2020). It introduces challenges related to coordination of collaboration due to reduced overlapping work hours between collaborators. Synchronous communication is limited to overlapping work hours. Teams may suffer from the unavailability of vital resources when they need them, which may cause delays in responses and feedback, and a need to rework already processed tasks.

Perceived distance is a subjective distance characterised by a person's impression of how near or far another person is. When people interact strongly and frequently, they can create a sense of closeness independent of physical proximity (Morrison-Smith & Ruiz, 2020). Perceived distance might often be more important than spatio-temporal proximity and have a great influence on team interaction and collaboration.

3. Research Method

The aim of the research was the exploration of challenges regarding managing engineering teams in the organization referred to as ComPlatform. The exploration aimed to answer how to use the development team's topology and technology domains in ComPlatform to optimise delivery of value and prevent creation of 'domain silos.'

To accomplish this goal a qualitative method was applied – a case study supported by a series of individual in-depth interviews. The interviews were semi-structured, following the guidelines of Gray (2004). The list of questions and conversation directions were prepared before the interviews. The intent of the questions was to use them as a guide to keep the conversations within the explored subject, but they did not need to be asked in a specific order; additional questions could have been asked depending on the exploration path during the interview.

The list of interviews and characteristics of the respondents is presented in Tab. 1.

Table 1. List of interviews

No.	Respondent	Position	Language	Experience in current organization (years)	Experience overall (years)
1	RTE	Release Train Engineer Agile Coach	Polish	4	14
2	EM1	Engineering Manager	Polish	2.5	14
3	EM2	Engineering Manager	Polish	5	14
4	DEV1	Software Engineer	English	2.5	14
5	DEV2	Software Engineer	English	2.5	11
6	DEV3	Software Engineer	English	2	11

Source: own elaboration.

The research was focused on exploring the situation inside and among the engineering teams as well as their closest environment, in particular Product Management. This method allowed for the gathering of detailed information and probing of further understanding of the subject explored.

4. Research Context – Characteristics of the Industry and the Company

The way the engineering teams at ComPlaform have been structured relies on Conway's Law and elements of approach described in *Team Topologies* (Skelton & Pais, 2019). The law is the observation that the architecture of software systems is very similar to the organization of the development teams that build it (Fowler, 2022). According to this law, team structures must match the required software architecture or risk producing unintended designs.

James Lewis, a technical director at Thoughtworks, and his colleagues came up with an idea of reverse Conway manoeuvre, the strategy in which organization focuses on organizing team structures to match the architecture they want the system to exhibit rather than expecting teams to follow a mandated architecture design. The goal is to support the ability of teams to get their work done, without requiring high bandwidth communication between teams (Skelton & Pais, 2019).

Following the concepts described above, ComPlatform structured its engineers in small, autonomous, and self-organized teams. Each team is responsible for its part of the solution, referred to as a technology domain. The team performs all the tasks, from design, up to deploying on production environments. The team is also responsible for operating its part of the solution, as designing and monitoring necessary metrics and reacting to incidents.

The solution architecture, and therefore the teams' structure, is designed to close highly coupled system components within a technology domain; these components are usually developed and changed together and require high bandwidth communication and intensive collaboration.

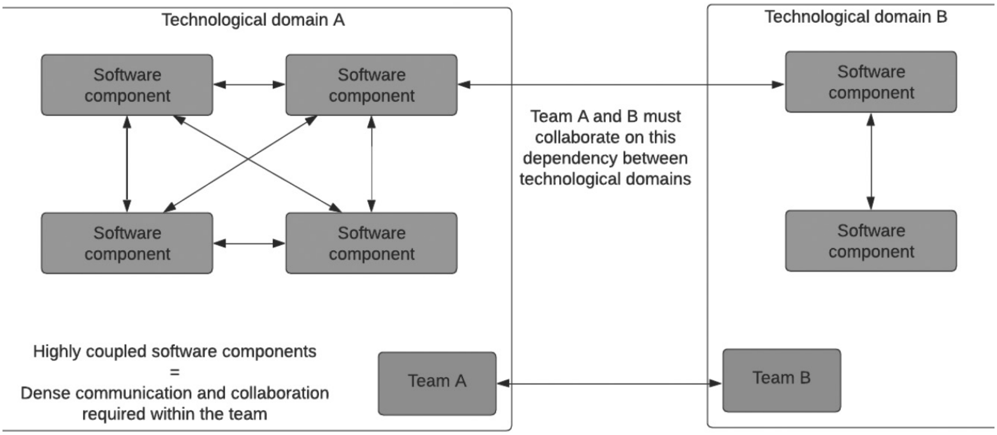
Technological domain A
Software component
Software component
Software component
Software component
Highly coupled software components
=
Dense communication and collaboration required within the team
Team A
Team A and B must collaborate on this dependency between technological domains
Technological domain B
Software component
Software component
Team B

Fig. 1. Dependency between technology domains and therefore teams in investigated organization

Source: own elaboration.

To address this complexity and scale the work of multiple teams, ComPlatform implemented the use of Scaled Agile Framework (SAFe). Engineering teams working on a single solution form an Agile Release Train (ART). Product Managers define product features and prioritize them according to business needs. Features are then assigned to teams according to their fitting in technology domains.

Teams plan the development work for the next Planning Interval (PI) to discover dependencies and risks.

Features accepted to the plan are developed in 5-6 two-week iterations (sprints). This allows for the synchronization of value delivery of all the teams in an Agile Release Train; teams use this cadence to solve dependencies between them and synchronize their work. This also allows teams to choose their agile way of working.

5. Results

Use of Technology Domains

Use of technology domains in software development seems to be a good approach. Numerous advantages are noticed by team members and engineering managers. “Teams feel responsible for their work” (EM2). “Incidents and problems are resolved faster” (EM1); “it is easier to plan and develop changes” (DEV1). “Engineers see value provided to customers and do not jump from subject to subject” (EM1). The positive outcomes mentioned here are also a side effect of stable work environment and low attrition (EM2). Teams appreciate the space in which they can operate and clear borders of responsibility.

Technology domains provide a framework within which a product can be developed. If its structure, and therefore the configuration of software development teams is built properly, it makes Conway’s law work. However, the product, and so its architecture, evolves over time. “The intensity of work in domains changes over time” and the company “should be able to develop many high value features in a single domain – otherwise this is a bottleneck, and the business is not agile” (RTE). These dynamics must be addressed by proper flexibility of the configuration of engineering teams.

The structure must be able to adapt to the surrounding environment; the following aspects can enable this adaptation:

- Long term vision of the product, which must be shared between product and engineering organizations through long term planning, as “early planning identifies dependencies between domains earlier” (RTE).
- Identification of ‘busy’ domains; such domains require reinforcement and restructuring. EM1 indicates that engineering organizations can perform evolutionary adaptations, such as growing and splitting teams, moving individuals between teams or planning recruitment and training.
- Observation of cross-team dependencies emerging during planning; a dense network of dependencies may signal a need to restructure domains or organize multiple teams into bigger clusters.
- Short term needs can be addressed by secondment programmes (individuals temporarily working for other teams) or teams contributing to other domains, however clear rules must be defined in this regard to avoid tension and conflicts (DEV1).

Planning and Delivery

The iterative planning provides good results and is appreciated by ComPlatform stakeholders. The teams value “regular synchronization points, where all the required stakeholders are available for discussions and alignment” (EM1). “Lack of these points would keep us in constant ‘management’ mode and busy looking for new tasks for teams finishing current work” (EM2). It is the time when all involved parties focus on discovering dependencies, addressing risks, and setting expectations. This approach also enables setting goals and milestones, which are reachable by teams; “the period of a quarter is long enough to let teams focus on work and short enough to be able to plan the work and give estimations with high level of probability” (EM1). The movement towards continuous planning is also appreciated, as the period used for actual PI planning event would be too short to discover and then dive into details (DEV2).

However, the success of the PI planning and then its execution depends on the quality of input provided by Product Management. The long-term vision of the product is also very important. Product development directions should be known to engineering teams, so that they can better adapt currently developed features for potential changes expected in the future (RTE, DEV1, DEV3).

Engineering teams do not wish to discuss very details when there are no plans for near-term development of the matter discussed (DEV1, DEV2, DEV3). On the other hand, it is difficult to increase the quality of product management input without engagement of engineers as subject matter experts, especially that technology domains provide easier way to locate the source of knowledge. Engaging individual team members in these discussions seems to be a good compromise (EM1, EM2). A team can focus on its current work without being interrupted, while the knowledge about what is potentially coming is still provided. Information about future requirements flows in both directions without the cost of organizing expensive meetings before it is the right time to engage whole teams for detailed planning.

The level of details in the specifications of features provided as input of the planning requires further standardization. Currently a lot depends on personal relationships between the product manager and the engineering manager in question as well as engagement of the product manager in direct interactions with development teams (EM1).

Structure of Self-Organized and Autonomous Teams

All the respondents from the group of software engineers share the opinion that it is up to teams to define an agreement on how they work. “The ‘why’, benefits and drawbacks of agreed way of working should be discussed inside the team” (DEV3). “Every team should have its own way of working best for this team according to agreement of all the members” (DEV2). “If an agreement has been established, new team members must adapt and learn first, then they can give feedback and propose changes" (DEV2). Software engineers value autonomy, and they underline that they want to be told what the problem is and would like to have as much freedom on how to solve it as possible. However, they do admit that there are necessary limitations to this autonomy. All agree that PI planning and synchronized sprints are elements to which all teams should align. They also notice that "the bigger flexibility on changing teams by individual members is expected, the higher alignment between teams is required" (DEV1).

Engineering teams expect higher alignment around technology and system architecture as well as design of APIs. They expect that stricter guidelines and verification processes should exist in this regard. API design guidelines are an example of a bigger picture, which must be defined outside of an engineering team. "It is a company decision to set constraints such as technology and the team cannot disagree with it, but it should be able to decide how implement the change" (DEV3). "The team cannot set its way of working in a way violating the company rules" (DEV3).

The point of view of software engineers is shared by engineering managers. All the respondents agree that the way of working should be left to teams, but expectations of the environment still must be met. There is a need to align to certain processes and reporting needs outside of the team. "If planning on a piece of paper is good enough for a team, in theory there is no reason to force other way, but this level of visibility will not meet the expectations of other parts of the system" (EM2). "Too high flexibility inside teams limits the flexibility on cross-team collaboration" (EM2). According to engineering managers, even if the decision of "how" belongs mostly to teams, technology used in the company must be centrally aligned, otherwise "too high variability brings too many problems" (EM2).

The configuration of an individual team may depend on many factors; in the case of ComPlatform the most important seem to be the complexity of a domain to be taken care of and the geographical location of team members. It is expected that intensive collaboration in the longer term takes place inside a team and that the team has all the necessary skills to perform its tasks; if this is not the case, it might indicate the need to review the borders of technology domains. The size of 4-5 software engineers seems to be most reasonable but can be higher if a domain is bigger or a team is in the process of growing to be split in the future. "The size above 9-10 engineers introduce a risk to create sub-teams within a team" (DEV3).

As far as the skillset is concerned, all the respondents agree that it depends on tasks realized by a team. EM1 indicates a need to have area leaders, team members working as subject matter experts in their part of the team domain. According to DEV2, "the team needs people who are specialists in selected areas, and generalists in others, so that they can support specialists."

6. Conclusions

The purpose of this research was the exploration of challenges that managing engineering teams face in an international company and providing solutions in Software as a Service model. To accomplish this goal, a series of individual in-depth interviews was performed with people directly involved in developing and delivering solutions offered by the company.

The study shows that organizing teams in technology domains ensures that the teams become naturally responsible for their work. It also ensures high speed of delivery and problem solving, higher expected predictability, and product quality in long term, as well as stable environment for engineers and low attrition. However, technology domains cannot remain static. The teams must evolve along with changes in the solution, and life cycle of the product components. It can be achieved through building a long-term vision and planning, early identification of 'busy' domains and observation of emerging cross-team dependencies. Evolutionary adaptations can be made to restructure teams to face emerging challenges.

Proper planning and distribution of work to teams is a key element of making the system of teams perform effectively. An approach based on iterative planning brings regular synchronization and alignment points for teams and other stakeholders. It facilitates the discovery of dependencies and setting short-term goals and expectations. However, success depends on the quality of input provided by product management organization. A move towards continuous planning should enhance this aspect, but further alignment and standardization is still required.

The study shows that engineering teams at ComPlatform appreciate autonomy in their way of working. They effectively use collaboration tools that help reduce the perceived distance in a hybrid environment. Good organizational culture and trust in teams help to overcome potential barriers related to geographical distance. However, barriers in this form of work and the value of physical interactions were also noticed. Respondents underlined good cooperation within teams and challenges in cross-team collaboration.

The limitations of this study are the small sample size and the focus on a particular division of the company. The challenges reported in this study are not expected to be unique to ComPlatform, but the research method cannot be used to easily generalize the findings.

It is recommended to extend this research to product management organization and potentially other stakeholders. It seems to be crucial that both product management and engineering teams must be better aligned.

References

Agile Alliance. (2024). *Agile Glossary: Extreme Programming.* Retrieved January 17, 2024 from https://www.agilealliance.org/glossary/xp/

Ambler, S. W. (2014). *The Non-Existent Software Crisis: Debunking the Chaos Report*. Retrieved January 17, 2024 from https://www.informationweek.com/machine-learning-ai/the-non-existent-software-crisis-debunking-the-chaos-report

Beck, K., Beedle, M., van Bennekum, A., Cockburn, A., Cunningham, W., Fowler, M., Grenning, J., Highsmith, J., Hunt, A., Jeffries, R., Kern, J., Marick, B., Martin, R. C., Mellor, S., Schwaber, K., Sutherland, J., & Thomas, D. (2001). *Manifesto for Agile Software Development.* Retrieved January 17, 2024 from https://agilemanifesto.org/

Bento, F., Tagliabue, M., & Lorenzo, F. (2020). Organizational Silos: A Scoping Review Informed by a Behavioral Perspective on Systems and Networks, *Journal of Societies*, *10*(3), Article 56. https://doi.org/10.3390/soc10030056

Eisenberg, J., Post, C., & DiTomaso, N. (2019). Team Dispersion and Performance: The Role of Team Communication and Transformational Leadership*. Sage Journals*, *50*(3). https://doi.org/10.1177/1046496419827376

Fowler, M. (2022). *Conway's Law.* martinFowler.com. Retrieved March 11, 2024 from https://martinfowler.com/bliki/ConwaysLaw.html

Gray, D. E. (2004). *Doing Research in the Real World*. Sage Publications.

Hansen, T. S., Hope, A., & Moehler, R. C. (2012). *Managing Geographically Dispersed Teams: From Temporary to Global Virtual Team.* SSRN. http://dx.doi.org/10.2139/ssrn.2143185

KPMG. (2019). *2019 Survey on Agility.* Retrieved January 17, 2024 from https://assets.kpmg.com/content/dam/kpmg/be/pdf/2019/11/agile-transformation.pdf

McPherson, L. (2018). *5 Ways to Break Down Organization Silos.* Zapier Blog. Retrieved January 17, 2024 from https://zapier.com/blog/organizational-silos/

Morrison-Smith, S., & Ruiz, J. (2020). Challenges and Barriers in Virtual Teams: A Literature Review. *SN Applied Sciences*, *2*, Article 1096. https://doi.org/10.1007/s42452-020-2801-5

Rigby, D., Sutherland, J., & Noble, A. (2018). Agile at Scale: How to Go from a Few Teams to Hundreds*. Harward Business Review Magazine*, May-June. Retrieved January 17, 2024 from https://hbr.org/2018/05/agile-at-scale

Skelton, M., & Pais, M. (2019). *Team Topologies – Organizing Business and Technology Teams for Fast Flow.* IT Revolution Press.

Sobande, T. (2020). *Cross-Silo Leadership: How to Create and Maintain Effective Communication and Break Down Silos Across Your Organization.* Retrieved January 17, 2024 from https://www.researchgate.net/publication/340570264_CROSS-SILO_LEADERSHIP

Uludağ, O., Putta, A., Paasivaara, M., & Matthes, F. (2021). Evolution of the Agile Scaling Frameworks. In P. Gregory, C. Lassenius, X. Wang, P. Kruchten (Eds.), *Agile Processes in Software Engineering and Extreme Programming. 22nd International Conference on Agile Software Development, XP 2021 Virtual Event, June 14–18, 2021, Proceedings* (pp. 123-139). Springer. https://doi.org/10.1007/978-3-030-78098-2

Analiza wyzwań w zarządzaniu zespołem stojących przed menedżerami w firmach IT

Streszczenie: Celem pracy była analiza wyzwań w zarządzaniu zespołem, przed jakimi stoją menedżerowie w firmach IT. Dotyczyła ona konkretnej firmy dostarczającej rozwiązania w modelu Software as a Service. Analizowana firma stosuje zwinne podejście, rozwijając swój produkt, i jak wiele innych firm IT boryka się z wyzwaniami związanymi z jego skalowaniem na wiele zespołów. Organizacja używa odwrotnego manewru Conwaya, który zakłada formowanie zespołów w taki sposób, żeby odzwierciedlały oczekiwaną architekturę tworzonego rozwiązania. W artykule próbowano odpowiedzieć na pytanie, w jaki sposób wykorzystać topologię zespołów rozwojowych i ich otoczenie, żeby zoptymalizować dostarczanie wartości dla klienta i nie stworzyć ryzyka powstania silosów zespołowych. W celu analizy problemu przeprowadzono serię wywiadów z wybraną grupą osób. Przedstawiono analizę zagadnień będących tematem przeprowadzonych wywiadów oraz rekomendacje dotyczące wybranych obszarów.

Słowa kluczowe: zarządzanie zespołami, skalowanie podejścia zwinnego, mentalność silosowa, zespoły wirtualne, prawo Conwaya