The role of communication in the successful Agile transformation

- A study of the successful communication artifacts in the Agile transformation process

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Abstract

The business world is facing tremendous changes due to the introduction of the new technology, which innovation appears vital to win the competition. The Agile transformation came into place to facilitate the working process meanwhile foster innovation, has proven success across industries such as banking and entertainment industry. With the intention to study on what factors lead to the successful Agile transformation, and to explore how to use communication channels to improve the efficiency, this study focus on what communication contents and which communication channels will improve the process. Based on the Actor-Network theory and Socio-Technical Systems theory, this study collected 95 articles industry to conduct quantitative content analysis covering the scope of banking, media and entertainment, software, internal communication and change management, academic, and communication channels. The chosen method helps with analyzing the relations between industry and factors lead to successful Agile transformation, meanwhile do comparisons between groups. The study found out that the role of communication is vital in the Agile transformation process regarding improving employee engagement to create an open culture by using multiple internal communication tools with high technology. Though different industries emphasize different communication problems, the obvious trend of mentioning less Agile terminology to reduce confusion could be observed. The human aspect and technical aspect function collaborate to contribute a successful Agile transformation, while there should be more attention to focusing on the specific area and conduct more comparison with more dimensions such as cultural difference.

Keywords: Communication artifacts, internal communication content, Agile transformation process, communication channels, successful Agile transformation

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1. Introduction

Over the past two decades, the business world has become increasingly fast-paced, unpredictable and competitive. This has often been attributed to the emergence and improved performance and affordability of new digital technologies such as the Internet and computers. To gain and maintain a competitive advantage, companies across industries have adopted new strategies that enable the adoption of creative ideas, and that upgrade their working and innovation development processes. Here, creativity refers to the use of imagination and original ideas to create true business value (Runco & Jaeger, 2012), and is of key importance within the context of improving operational processes. As such, businesses increasingly value and employ innovation tools such as those outlined under so-called Agile methods (such as Extreme Programming, Scrum and Kanban); these tools can help shape organizational strategies and operational methods to deliver innovation and creativity. The concept, principles and key enablers of the so-called Agile transformation are introduced in the following sections before the specific research questions of this work are defined.

1.1 Definition of Agile

1.1.1 Agile Pprinciples and Agile Software Development

The Agile manifestos and guidelines state the guiding principles of Agile processes and contain multiple overlapping concepts, such as the ability to adapt, be human-centered and transparent (Krush, 2018). These documents are used to inform and encourage participation in Agile practices to support the core functioning of businesses and are key to the Agile software development (ASD). The Agile software development process has been developing since 2001 and is specifically designed to enhance creativity in the field of software engineering; it aims to address the gap between business strategy and operational requirements for software developers through collaborative efforts, self-organization and interaction between multidisciplinary teams (Highsmith & Fowler, 2001; Alliance, 2001).

According to the socio-technical systems theory, the joint optimization of both social and technical aspects within a workplace enhances organizational efficiency, improves the delivery of services and products, and enhances creativity (Storni, Binder, Linde, & Stuedahl, 2015). ASD has an enhanced focus on the human and social aspects of software engineering by taking both the developers' and the consumers' needs as the priority as opposed to budgetary or other administrative constraints – ASD thus increases cooperation and ultimately optimizes socio-technical integration (Cockburn & Highsmith, 2001).

Agility is the very essence of the ASD, essentially lies in contrast to the traditional plan-driven, top-down approaches typified in software development and therefore enables the ability of groups to adapt to demanding conditions to reach appropriate, innovative and creative outcomes (Hoda, Salleh, Grundy, & Tee, 2017). ASD also has a strong emphasis on iterative processes by repeating operational cycles to converge on the desired results. An example of a typical iterative, human-centric process under the ASD may see the delivery of frequent work updates from a software developer or team in daily stand-up meetings between colleagues, this enables the refinement of processes and the delivery of more effective software development results (Schwaber & Beedle, 2002). Again, such a process encourages greater socio-technical integration.

1.1.2 Agile ~~t~~Transformation M~~m~~anagement

Nowadays, Agile is being used in other operational areas such as in project management and is becoming widely used across organizations internationally – the process of adopting Agile principles into business functioning has been dubbed the 'Agile transformation'. The core principles of the Agile transformation emphasize fast-updated feedback loops and are in contrast with the traditional linear-sequential working method such as the Waterfall model that emphasizes a linear-sequential life cycle in which no phase should start before the prior phase is completed.

The most commonly applied Agile methods are Extreme Programming, Scrum and Kanban. Extreme Programming focuses specifically on engineering improvements to shorten development cycles based on customer requirements (Beck, 1999). Scrum is an iterative and incremental method which pays attention to the social aspect of software development and is applied to project management for small-sized teams containing 3 to 9 members. Using Scrum, team-members construct their work based on daily re-planning and deliver updates in 15-minute stand-up meetings; they then break their work into various actions that can be completed within the short iterations called 'sprints' (Schwaber, 2015). Finally, Kanban is a simple, visual toolkit used to balance both social and technical aspects by allowing users to efficiently view the whole flow of a project process, it is renowned for its efficiency in scheduling system support and measuring time across multiple process steps to give a holistic overview of progress (Rooney, 2005).

The implementation of Agile principles into management and operational processes has enabled the successful transformation and optimization of major companies worldwide by scaling up major changes in businesses by shifting the traditional linear working method into the fast-update and iterative methods under Agile. This allows businesses to improve

products and suitably adapt to the continually changing demands of customers and technology (Rigby, Sutherland, & Nobel, 2018). There are multiple success stories of businesses that have implemented Agile principles, including high-profile examples such as Spotify, Netflix, and Microsoft.

ING, the Dutch banking and financial services firm has also demonstrated a successful implementation of the Agile transformation – particularly through the development of its mobile application. The example of ING is notable as incumbent financial service companies can often be considered less adaptable and reactive than more modern technology companies. ING has essentially reinvented itself over the past years, shifting from a traditional organization featuring various separated functional departments such as IT, marketing and finance, into a completely Agile structure (Schotkamp & Danoesastro, 2018). Within the company, the main functions to create customer objectives such as marketing, product development, user experience, data analysis and IT have been re-structured into new teams called 'squads'. The main business functions such as financial services and engineering have also been reorganized in to various squads, which when grouped together are called a 'tribe'. This restructuring has helped ING to increase its efficiency and creative processes, and ultimately the Agile way of working has helped accelerate its productivity and legitimacy with customers. This has enabled it to become the first mobile bank in the Netherlands, delivering frequent releases of application updates to consistently engage and interact with its users.

1.2 Organizational Ccommunication in Agile Ttransformation

Besides the simple intention to adopt of the Agile model itself, there are key enabling factors that can lead to a successful Agile transformation. For example, according to the Harvard Business Review (2018), the role of the HR team along with commitment from executive levels plays a vital role in the successful transformation. With support from the executive board and the HR department, the structured business pillars of an organization can be reinvented to accommodate new people, agendas and ways of working.

Beyond the specific teams and groups involved in the Agile transformation, intra-organizational communication is considered as vital for the adoption of Agile practices; without adequate communication there can be problems that hinder the transformation process that remain unidentified or unresolved (Schotkamp & Danoesastro, 2018). Ensuring effective internal organizational communication between different functional teams may ultimately influence the final result of the transformation by impacting the organizational culture and even the leadership styles; seamless internal communication is more likely to

deliver conditions conducive to innovation (Gandomani, Zulzalil, & Nafchi, 2014). The topic of internal communication within the context of Agile is discussed in the following section.

1.2.1 Communication Aartifacts in Agile Ttransformation Pprocess

In the field of organizational communication, some key factors are considered to be influential in defining the outcome of adopting the Agile method (Newman, 2016), such as the marketing content, the delivery format and chosen communications technology (Puschmann, 2010). The information and messaging within any communications content should be considered in detail – the specifics of what is published through internal communications and the impression and tone that material has will impact the recipients of the content. Considering the intended impact of communications content and appropriately designing it can therefore shape the organizational culture, influence the operational conditions and ultimately affect the deliverables of a business (Welch & Jackson, 2007). Further research by Rigby, Sutherland and Noble (2018) evidences that in successful Agile transformation cases, supportive leadership and an open and communicative culture are enabling factors that practically influence the working atmosphere within businesses.

The specific format in which communication content is delivered is also considered relevant in the adoption of Agile management processes; again, different delivery methods can deliver different impacts (Mohr & Sohi, 1995). For instance, if internal communications are delivered via a workshop, the influence will be limited to a certain amount of people, but the quality of the communication can generally be guaranteed by ensuring that there is full engagement and participation from those in attendance (Bull & Brown, 2012). Conversely, if the content is broadcasted via an internal portal such as via a Vlog, the number of people in the audience may be greater and a broader set of employees may be reached, but the quality cannot be guaranteed as not everyone may be engaged or understand the material (Li, Berens, & Maertelaere, 2013). Furthermore, with new technologies, novel methods to communicate internally are emerging through Virtual Reality or Augmented Reality, these immersive experiences may support internal communication in the future by providing an engaging environment conducive to accepting new business practices and concepts such as Agile (Gill, 2015).

Several structural elements are outlined within existing Agile material that can support a successful Agile transformation, for example the demand for fast change according to the customers' need, continuous integration of customers' needs, training, and business solutions and communities of practice (Dikerta, Paasivaaraab, & Lassenius, 2016). Other softer factors leading to the successful Agile transformation are associated with people's

perception of change, management support and expectations around the product and service (Gandomani, Zulzalil, Ghani, Sultan, & Sharif, 2014). However, the above-mentioned factors are consequential to the communication process – the communications process influences organizational culture before, throughout and after the Agile transformation and is the key enabler at the embryonic stage of the whole process. Note that transparency is considered as core to the Agile principles (agilemanifesto.com), thus the role of communication in the success of the Agile transformation is at the very heart of the process – without communication, it is very hard to be truly transparent. Indeed, adequately conveying the message that change and/or management support is needed, whilst simultaneously delivering on the demand for products and services evidences the importance for effective internal communications whilst delivering structural and organizational change.

1.2.2 The Iinfluence of Communication in Ddifferent Pphases of Agile Ttransformation

The different communication artifacts mentioned above deliver varying impacts on the organizational structure of a company, this rationale therefore poses the question of how different communication elements can influence the various Agile transformation phases. For instance, consider an example of between-sites Agile practice (i.e. applying Agile concurrently to different teams in different geographic locations); the aforementioned workshop mode of communication is largely unsuitable in this circumstance due to the obvious locational constraints. Intuitively, the impact of using a different method such as a Virtual Reality experience for information and knowledge sharing processes would seem like a more effective and efficient exercise. However, the impact of such an exercise remains unclear due to the limited empirical evidence examining this method. As such, the influence of communication artifacts in different phases of the Agile transformation is worthy of study to deliver empirical evidence as to the effectiveness of various processes.

Furthermore, the internal communication strategy in the Agile organization should also adapt to new conditions and resources where appropriate. For instance, take the integrated marketing communication mindset, which focuses on sales promotion, the creation of a product using experience, and advertising. In the Agile transformation process, the focus of integrated marketing communications can shift from external stakeholders to an internal audience to allow the scaling up of Agile practices and engagement of internal stakeholders by using the available internal resource. This approach creates a better user experience for the internal audience through the delivery of high-impact internal events such as conferences and other open space events. Providing additional resources for the purpose of Agile could help organizations to build a Lean-Agile Center of Excellence (LACE) – a LACE is considered

highly important in the Agile transformation process and is essentially a group dedicated to implementing the Agile way of working. As communications methods and the available technology continues to progress, alternative innovative internal communication processes can be implemented, such as the delivery of Program Increment (PI) Planning tours and simulation workshops that specifically aim to align teams on Agile principles.

To summarize, the influence of Agile practices in internal communication is significant, and if an organization plans to adopt Agile way of working and scale their Agile practice, it is pertinent that the channels for internal communication and the content that is delivered is suitably adapted and resourced. There are diverse ways that the specific engagement process can take place, and the most appropriate method may ultimately be determined by the specific conditions, resources and structure of the organization in question.

1.3 Academic Relevance

The importance of socio-technical integration (i.e. the interaction between social systems and technical systems) is described under the socio-technical systems theory and is recognized as highly important within software development; the progress (or lack thereof) of socio-technical integration manifests itself in key functional contexts such as team work, and thus has an impact on the relative output of a business (Storni, Binder, Linde, & Stuedahl, 2015). However, the socio-technical systems theory also reveals the existing gap that exists between strategic business goals and operational engineering implementation, such as the delay and challenges of employees in meeting updated customer demands along with addressing technical working problems that impact the core functioning of a business (Maguire, 2014). The implementation of Agile methods is identified in the literature as one way to close this gap. The existing body of literature examining the Agile concepts recognizes several factors that can affect the success of the transformation process to better integrate the social and technical aspects of processes, including but not limited to: leadership, organizational culture, organizational structure, cultural diversity and employee engagement. The academic work demonstrates that the change of leadership style from a traditional high hierarchical structure into a more collaborative framework builds the foundation of organizational transformation by shortening the power distance across levels amongst employees (Gandomani, Zulzalil, & Nafchi, 2014). A strong and supportive leadership could therefore effectively facilitate the Agile transformation process (Joiner, 2009). Scholars also point out that an innovative culture that is together with leadership support will promote innovation and transformation across an organization in line with the Agile principles (Chen, Lin, Lin, & Mcdonough, 2012).

However, it should be noted that research also consistently emphasizes that these enabling factors must be supported by the appropriate communication channels, which provides the gateway to build trust, transparency and employee engagement with executives across levels within an organization (Karanges, Johnston, Beatson, & Lings, 2015). Likewise, there are key tendencies and elements that can hinder the Agile transformation process that are also considered within the existing research such as embedded hierarchical structures and power distances that may be more prominent in certain regions and cultures (Xie, Wu, & Zeng, 2016). Academic research has worked to define key enablers and barriers for the Agile transformation process – the evidence supplied by this work can ultimately be used to ensure the effective deliverability of Agile methods in business (Dikert, Paasivaara, & Lasseniu, 2016).

As discussed throughout this section, a transparent culture is considered pertinent for an effective transformation; and internal communication is one if the primary enablers of building transparency (Mishra, Boynton, & Mishra, 2014). The existing academic work consistently reiterates the need for ongoing research into different areas of the Agile transformation and Brhel, Meth, Maedche and Werder (2015) specifically state the importance of examining communication itself. Due to the importance of communication under Agile and the new communications methods that are becoming available to businesses, this area of research is considered highly relevant and adds value to the growing body of research here (Vallon, Estácioc, Prikladnickic, & Grechenigb 2018).

1.4 Research Question

Thus, this study will focus on the advantages and challenges of applying Agile methods in communication within the Agile transformation by considering organizational communication and team communication issues.

Specifically, the work will examine the advantages of adopting communication techniques in facilitating the transformation process and consider the limitations and challenges in the communication process between teams that can hinder the creativity output. The work will focus on successful cases of Agile transformation application to generate valuable insights. Therefore, the research question of this study is: What is the role of communication in the Agile transformation process? There are two sub-questions following:

RQ 1: What are the internal communication factors lead to successful Agile transformation case?

RQ 2: What are the communication artifacts that lead to successful Agile transformation case?

1.5 Social Rrelevance

Over the past two decades, the business world has become fast-changing and more unpredictable. To ensure profitability and competitiveness, companies are strategizing and adopting a focus on innovation and creativity. Specifically, organizations are implementing methods that lead to the embrace, generation and execution of creative ideas. Hence, this study works to gain insight into the much-coveted topic of Agile transformation from both the internal communication content aspect and communication channels aspect, this study aims to provide practical insights for how to effectively use the internal communication channels to facilitate the Agile transformation process. Ultimately, this work aims to deliver relevant and interesting evidence to contribute to the growing body of academic research in the field, and to deliver insightful conclusions that have a bearing on real-world business structures and processes.

1.6 Chapter Outline

In the following sections, the theoretical background of Agile transformation and how does communication influence the organizational internal communication process will be explained. Meanwhile, the data collection process of how did the articles select for this study, and quantitative content analysis result will be expanded in the Research Design and Result section. In detail, which SPSS test for different hypothesis will be explained, and the result of how do different factors influence communication in Agile transformation process will be analyzed. Further, the discussion and conclusion will be draw based on the result, which practical implication and further study will be discussed.

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2. Theoretical Framework

2.1 Actor Nnetwork Ttheory and Socio-Ttechnical Ssystems Ttheory

2.1.1 Actor Nnetwork Ttheory

The Agile transformation illustrates the connection between the product development team and customer, which can be framed and contextualized by the Actor Network Theory (ANT). In different phases of Agile transformation, there are multiple relationships between customer's need and preferences, and products and engineers. According to the Actor-Network Theory, everything in the social world is constantly shifting the relationships in the network of linkages among people, objects, processes, and ideas, which can encapsulate the transformation process (Kimbell, 2012). That is, besides humans, situations of transformation include a complex interplay among objects (such as products), ideas (such as consumer's demand), processes (e.g., SCRUM), and any other factors relevant for the development (Yaneva, 2009). This interaction between factors could be observed and analyzed in the different stages of the Agile transformation process.

2.1.2 Socio-Technical Systems

This study is also built upon the socio-technical systems theory that frames the joint optimization of social aspects and the technological aspects of a complex system such as Agile innovation teams (Storni, Binder, Linde, & Stuedahl, 2015). According to Hendrick (2006), the socio-technical theory has the core idea that the improvements in both 'social' and 'technical' aspects of system - while treating them as interdependent - could lead to organizational success. The theory emphasizes various aspects of the interaction between the social system and technical system such as people, technology and environment; how the team autonomous work together; how to increase the job enrichment; how to optimize the process, etc (Maguire, 2014).

Agile emphasizes the importance of developers and the consumers' need, such as how to improve the creativity through innovative working process, which incurs job enrichment and process optimization. Especially when facing the problem such as the gap between the business strategy and developer's implementation, Agile functions as both the bridge between various factors in the organization and the balance between social and technical aspects of the innovation process (Maguire, 2014).The socio-technical systems framework offers a perspective that links the people to the technology, with the focus on how communication issues will have impact on the final creative output (Storni, Binder, Linde, & Stuedahl, 2015).

2.2 Agile Ppractice Ddevelopment

2.2.1 Transition of Agile Ppractices

Different from traditional methods that emphasize the linear-sequential life cycle which no phase should start before the prior phase is completed, Agile practices contain non-linear processes that notably include the aforementioned tools such as Extreme Programming, Scrum, Kanban. Different processes and practices differently consider social and technical aspects. Emphasizing the technical, Agile practices shorten technical development cycles. For example, frequent updates of technical solutions based on new customer requirements is the main feature of Extreme Programming (Beck, 1999). In another Agile method – Kanban - facilitates technical development by scheduling time in different development processes such as measure lead time and cycle time of the full process and process steps. This toolkit is developed by Toyota, and is known to offer an effective scheduling system to support the technical project (Rooney, 2005).While with more focus on the social aspect, the iterative and incremental method for project management – SCRUM - is designed for the 3 to 9 members team constructing their work based on the daily re-plan 15- minute stand-up meetings, and structuring the work into various short iterations called ‘sprints’ (Schwaber, 2015). Different as traditional meeting setting that colleagues bring laptop and discuss in the meeting room, the stand-up meeting in Agile context encourage people interacting with each other and be more energetic during the meeting. The convert of physical position and update of iteration period provide the chance for efficient communication which further facilitate the innovation process.

With the different focus on social and technical aspects, the Agile methods exhibit different strengths and weakness. For instance, to explore on how to improve the product development cycle, Extreme Programming and Kanban emphasize more on the technical aspects. Extreme Programming is designed especially for engineering practices in the software development field; and Kanban is the scheduling system designing for the manufacturing industry. Both of them emphasize on how to shorten the development cycle by improving the technical setting such as testing development rather than the social factors such as meeting setting. Jalali and Wohlin (2012) argued that Extreme Programming was the most commonly used Agile method could be found. However, some focus has been turned to Kanban software development in recent years (Tripathi, Rodríguez, Ahmad, & Oivo, 2015; Viswanath, 2014).

However, there has been increasing attention on the social affordances of Agile methods, for example, the more recent Scrum approach and subsequently hybridization of methods of Extreme Programming to Scrum or Kanban to Scrum. By doing this, the social affordances have enhanced by devoting efforts on working method and working environment. Regarding the social aspects in the development process, the transition to Agile environments could be observed since 2010 as there is increasing attention on applying Scrum to improve the social development. Scrum, and practices that combine Scrum and Extreme Programming appear to have been the most frequently applied methods in recent years (Bass, 2012). Meanwhile, from 2010 onwards, there has been the trend of combining Extreme Programming with Scrum, or Kanban. In the open source software development process, the distributed Scrum was successfully adopted (Lavazza et al., 2010). The transition from the single-site R&D development to the two-site Scrum was reported successful by Vallon et al. (2014). The similar transformation from the traditional waterfall model (i.e., less iterative and flexible approaches, as progress flows in largely one direction - conception, initiation, analysis, design, construction, testing, deployment and maintenance) to a lean and Agile model was studied by Paasivaara and Lassenius (2016). Building up on their previous transformation study, the newest study by Passivaara and Lassenius (2016) described the scaling of two collocated Scrum teams to other 20 teams in four countries. The social development along the technical development are gaining increasing attention in the Agile practices to solve the unbalance between social and technical aspects, meanwhile enhance the creative outcome (Maguire, 2014).

2.2.2 Scaled Agile Framework

With the intention to scale the agile practices across enterprises, a set of organizations and workflow patterns intend to adopt the Scaled Agile Framework (abbreviated as SAFe). By leveraging the knowledge of agile software development, lean product development, and system thinking, SAFe encourages prominent and collaboration in delivering business value and innovative products across large numbers of agile teams (Leffingwell, Knaster, Oren, & Jemilo, 2018). SAFe guarantees businesses of the continuously and more efficiently business value delivery on a regular and predictable basis (Alqudah, & Razali, 2016). Adopted by hundreds of the world's largest organizations, SAFe balances the team and their technical working into faster time-to-market products, meanwhile improving employee engagement with significant increases in productivity and quality (Alqudah & Razali, 2016). In a word, SAFe supports enterprise agility by providing proven and integrated principles and practices.

Specifically, SAFe is especially functional in the solution development in different levels such as team level, program level, and large solution level. By facilitating several actors in the organization such as business strategy execution and results, SAFe guarantees greater alignment and visibility across the levels of the enterprise, which lead to the faster and higher degree of predictability and quality (Laanti, 2014). One important key for the successful Scaled Agile transformation is the leadership engagement combined with knowledgeable training, which the communication with the Scaled agile transformation helps companies unlock business results with SAFe (Ebert & Paasivaara, 2017). The importance of organizational factors such as leadership support and knowledge sharing will be expended in later sector.

2.2.3 Scaled Agile Practice

To provide integrated guidance for the business transformation, SAFe contains 12 steps which could be summarized into 5 stages. Firstly, preparing the SAFe by reaching the tipping point of change - the point that the overriding organizational imperative is to achieve the change rather than resist it - which requires a burning platform (the problem that too severe to solve by adopting the current way of working) and supportive leadership (Gladwell, 2009). Secondly, the Certified SAFe Program Consultants (SPCs) are needed to be trained for the Lean-Agile Change Agents as they will provide the knowledge and horsepower for implementing the change. Thirdly, training of the leaders such as executives and managers is needed, as they will need to support the change and implementation. Fourthly, the transforming organization should create the working group of Charter a Lean-Agile Center of Excellence (LACE) - LACE is the center which inspires continuous source of innovation and energy for change management activities. In a brief conclusion, the first four steps of the Scaled Agile Transformation framework ground the sense of urgency to change and dedicate people to implement SAFe effectively (Laanti, 2014). In essence, the emphasis here is on the socio-communicative practices to prepare for the transformation.

In the second stage of applying the knowledge of training and the organizational business model, the business values will be discussed, and the implementation plan will be set (Leffingwell, Knaster, Oren, & Jemilo, 2018). In the first step of the second stage, i.e. the fifth step in the entire framework, the organization needs to identify the Value Streams and Agile Release Trains (ARTs) - the Agile team to realize the value (Value Stream) to develop a product for customer including the series of steps, containing 50-125 people in the organization and focusing on a holistic system or related set of products or services (ARTs) - to facilitate the flow of value cross functions, of which the understanding of a new

organizational model is necessary. Following this step, the implementation plan will be created as the sixth step. In this implementation plan, the first value stream and Agile Release Train will be selected, and the preliminary plan for additional value streams and Agile Release Trains will be considered as well. Before the plan moving into implementation, the seventh step is to prepare for Agile Release Train launch, which contains the concrete process of relevant training and launching the program calendar. The interplay between social component such as communicating clearly of the organizational goal, and the technical aspect such as selecting Agile Release Trains is the focus of the second stage.

In the third stage, the first Agile Release Train will be trained and launched, and relevant continuing training will be provided (Leffingwell, Knaster, Oren, & Jemilo, 2018). In the eighth step, the training for knowledge for everyone with related role responsibilities is essential before the transformation, such as the role of Scrum Master and Product Owner, preparation for Program Increment Planning, etc. Meanwhile, constant coaching and education in Agile knowledge and Agile Release Train execution are necessary for the following steps as the change requires time for people to behave Agile. SAFe Program Consultants will help Agile Release Trains to optimize the value streams and to coach leaders to think beyond the current transformation and capabilities. By launching the first Agile Release Train and constantly providing training, the organization should focus on the dynamic of the technical teams and their communication support, such as whether the product is delivered in the more efficient way and whether there are any corporation problems between team members.

In the fourth stage, more Agile Release Train will be launched, and the portfolio will be extended, so the Scaled Agile framework will be reached (Leffingwell, Knaster, Oren, & Jemilo, 2018). After the launch of the first Agile Release Train, the teams have the experience and knowledge of launching more Agile Release Trains in the value streams. The steps are similar to the previous that prepare for launch, train teams, and Agile Release Trains and keep coaching the execution. Since there are also different business and operating units in the organization, coach and team members should have the same attention and care in applying the steps in different domains. Once the transformation has matured, the enterprise's Lean Portfolio Management competency will be expended by combing the strategy and solution in the scaled Agile framework and the new working approach to balance the socio and technical aspects will be formed in the organization.

In the last stage, the transformation requires efforts to sustain and improve (Laanti, 2014). Some of these socio-communicative practices are described next.

2.3 Communication in Agile Ppractice

In recent years, modifications to Agile practices to improve team communication and features to facilitate in the global implementation has been observed in the literature (Vallon et al., 2018). To improve the team communication, Zieris and Salinger (2013) developed a new role in the team that understands technical development aspects and team communication complexities related to coordination, such as coordinating and updating meeting and multi-locations communication. Schmidt and Meures (2016) analyzed how to categorize frequent face-to-face interactions (daily meetings, weekly meetings, video conferences, team members trust), multiple communication modes (social networking, stakeholders' analysis), synchronization of work hours (Improved documentation, Standardized processes and Coding Standards), in order to enhance communication efficiency. In the global outsourced software development context, the frequent visits between sites and frequent update meeting have been found effective to build employee trust, meanwhile diverse used of communication channels and functional tracking tools are also functional in the global outsourcing context (Schimidt & Meures, 2016). To facilitate the creative process, Vallon et al. (2014) restructured the distribution of team members into micro teams in two sites, to increase flexibility for small teams of 2-3 people based on different products. In this way, knowledge of the customers' needs will be constantly updated after each meeting meanwhile integrate teams in different locations. To optimize work efficiency, a new role of communication coordinator was added to improve the between-team discussions (Moe et al., 2014). Daneva et al. (2013) call for more focus on the delivery of technical requirements between teams and locations part rather than merely focus on delivery business value; this highlighted the need to optimize the software distribution and communication environment first by better suited functional requirements, design specifications and optional security requirements.

2.3.1 Communication in Scaled Agile Ppractice

As there are various steps and stages of the Scaled Agile Framework, the demand and function of internal communications vary per stage as well. In the first stage which emphasizes on creating the need for change and build an Agile mindset, more materials for training and vision should be prepared for the transformation. For instance, to reach the tipping point of change, a clear and compelling vision, along with the creation of an invested coalition within the company, should be conveyed via internal communication to the whole organization. According to the media synchronicity theory (Dennis & Valacich, 1999),

different media channels have different functions. With the intention to have the high ability to be edited and contains rich information, Intranet and other written form such as email are argued to serve in this stage of transformation (Dennis, 2008). When adopting the scaled agile practice, the communication approach adapts accordingly as well (scaledagileframework.com). With the concept of Integrated Marketing Communication that emphasized on advertising, sales promotion and create user experiences to sale the product and services, LACE communication develops concrete steps of how to communicate internally the scaled Agile transformation practices. For instance, the techniques of hosting events in the marketing communication field to attract external attention is being categorized as internal conferences, meetups, and open space events. Public relations for the external stakeholders have been converted into communities of practices and lunch-and-learn sessions. The interactive marketing strategy has been replaced by workshops, stimulations and Program Increment (PI) Planning tours. Since the Lean-Agile Center of Excellence is the preparation for the scaled agile practices, the focus of communication shifts into internal communication oriented. Thus, the internal communication techniques, content-wise and channel-wise, will be applied in the Lean-Agile Center of Excellence.

Once the knowledge is applied and the organization is ready for change, the team will create an implementation plan and prepare for Agile Release Train launch as the second stage, which requires more coaching and knowledge sharing via internal communication (Conceicao & Altman, 2011). Specifically, the communication plan entails preliminary message is required at this stage of the transformation (Barrett, 2002). Meanwhile, to better align with the company goal and vision, company priorities should also be communicated clearly to every level in the team (Barrett, 2002).

In the third stage of launching the Agile Release Train and implement the first value stream, increasing engaging activities such as a workshop or face-to-face communication should be encouraged (Kupritz & Cowell, 2011). With the goal to enhance synchronicity to solve the urgent problem, face-to-face or video meeting, interactive workshops, gamification, or mobile application serve as the functional tools to provide the instant solution (Knutas, Ikonen, Maggiorini, Ripamonti, & Porras, 2014).

In the fourth stage of launching more ARTs and expending the portfolio, the strong need for change and open organization culture will be the focus of the internal communication to spread the mindset in the whole organization (Linke & Zerfass, 2011). More accessible information about the training and interacting communication channel should be guaranteed (Barrett, 2002). Meanwhile, the successful agile transformation cases

should be highlighted in order to build the confidence of the expansion (Yukl, 2012). In this phase, Intranet, online forum, online training will help the whole organization to integrate with the transformation (Dennis, 2008).

Lastly, to sustain and improve the scaled agile transformation in the organization, and lean-agile mindset should be consolidated, and more updated information should be accessible for the employees (Rodriguez, Partanen, Kuvaya, & Oivo, 2014).

Stage	Step	Communication Goal
1	Reach the tipping point	Create the need for change, a clear and compelling impetus and vison for change
	Train Lean-Agile change agents	Create the need for powerful coalition
	train executives, managers, leaders	Build the lean-agile mindset
	create lean-agile center for excellence	Create integrated internal communication plan and provide more knowledge and space
	Identify value streams and ARTs	Provide more coaching and knowledge
2	Create implementation plan	Provide more coaching and knowledge
	Prepare for ART launch	Provide more knowledge and coaching
3	Train team & launch ART	Provide continuing training
	Coach ART executions	Coaching, inspect and adapt workshop
4	Launch more ARTs and value streams	More training and knowledge sharing, company business priority and vision clarify
	Expand the portfolio	Lead the change, and create organizational culture
5	Sustain and improve	Relentless improvement and consolidate the lean-agile mindset

Table 2.1: SAFe stages and communication goals, self-created

2.3.2 Internal Ccommunication Aartifacts

Change management implementing strategies to foster change, control change, and adapt people with change. Internal communciation as part of the change management process, facilitate the transformation process to meet organizational goal with proper communication strategies. As effective communication has the function to influence people, what has been published through media channels is very important to create the environment for innovation

and product improvement. As the important element in the change management domain, the positive words and special emphasized aspects in internal communication materials will influence people's pre-impression towards the positive oriented. A study showed that the positive tone in the internal communication will facilitate the group strategy making, in the case the Savings Bank of the Russian Federation (Dolgopi͡atova, Kandidat, Iwasaki, I͡Akovlev, & Palgrave, 2009). When changing and building their corporate image, the Savings Bank of the Russian Federation actively used their internal communication channels to publish positive articles to build a positive image of the company by using virtual words such as 'family', and 'together'. Though no direct relations between Agile transformation and positive internal publications found, the impact of the internal content of shaping the culture and influencing people has been illustrated by scholars (Sharma & Kamalanabhan, 2012).

Besides the content, the socio-communicative channels and technology applied are important. As different actors interact with each other in the whole process, the way the content is communicated can change the interaction with other factors such as inter-person communication and project 's technical solution. Various research has explored the different effects of different modalities. Study concentrated on the effectiveness of different formats leading to different results, such as people would choose telephone to speed up the communication process but the accuracy decreased at the same time, email results in more accuracy but the instant feedback cannot be guaranteed (Edworthy, Hellier, Newbold, & Titchener, 2015). From different evaluation criteria, such as customer-centric approaches, channels, content, and measurable results, different channels have been graded regarding their advantages and disadvantages. Norris (2001) argued that especially in the education field, a workshop can be as the most effective method for the people who intermittently attend training. While regarding the information about hotel social media strategy, scholars suggested the engaging formats such as communication from social media channels is more efficient than information and promotion messages in the hotel branding field that the product and brand image will be shaped in the online communication process (Leung, Bai, & Erdem, 2017). In the marketing environment, paperwork such as booklets and flyers are still functioning as the main channels to reach the audiences in the area of campus recruiting (Chavez, 2017). With the technology development, there are emerging discussion on the influence of using the technique of Vlog or game to engage with the audience. While there's the demand to focus on the effectiveness of the channels and whether it will apply in other industry (Sharma & Kamalanabhan, 2012).

Further, research conducted by EY (2013) indicated that media and entertainment companies were expected to use technology to create an agile organization and cultivate the culture of innovation. While whether the same finding will apply to other industry haven't been verified by other research. Thus, technology and media channels play a vital role in changing the interaction between actors, which would be valuable to study how it will influence the Agile transformation process.

2.4 Organization and Mmanagement

Other than the internal communication aspects, other organizational management factors influence effective communication contains leadership, organizational culture, structure, employee engagement, and internal communication artifacts.

2.4.1 Leadership

Firstly, Joiner (2009) argued that strong and supportive leadership can effectively lead to a successful Agile transformation. As the essence of Agile transformation in the small team setting requires the change of leadership style from command and control into leadership and collaboration, the support from the organizational level is essential (Gandomani, Zulzalil, & Nafchi, 2014). In the scaled Agile framework, in order to push the various Agile teams to supporting one another and make sure the whole system functions properly, change in the leadership style of small teams is not enough; instead - their needs to be prominent advocates: a strong and supportive leadership from the executive board to the whole organization (Rigby, Sutherland, & Noble, 2018). When comparing five dimensions for the creation of a culture of innovation - these dimensions are presence of innovative leaders, the presence of innovative employees, the presence of innovative teams, the organizational working environment of innovation, and the access and connection outside of the organization – the presence of innovative leaders was found to be most impactful (Choutea, Forest, & Nguyen, 2018). Thus, the leadership behaviors facilitate the technological innovation at the strategic business units' level (Chen, Lin, Lin, & Mcdonough, 2012).

2.4.2 Organizational Culture

Organizational culture and structure also influence the transformation process. Although supportive leadership has been argued vital for the innovation process, scholars point out the process innovation should be enhanced more effectively by creating a culture of open communication. (Chen, Lin, Lin, & Mcdonough, 2012). As the key elements to both enhancing and inhibiting innovation, organizational culture always is considered as an

effective tool to improve product innovation (Valencia, 2011). In different companies, the processes to support organizational innovation differs: The layers of organizational culture – artifacts, norms, and innovative behaviors – will influence the support of innovation process in the organization (Hogan & Coote, 2014). Group and rational cultures could also be considered as an efficient tool for consisting the organizational innovation goals by launching appropriate social control strategy (Bausch, Buschgens & Balkin, 2013). In order to cultivate the environment for innovation, the culture exhibited positive relationships with innovation performance (Parveen, Senin, & Umar, 2015). Determinants that influence creativity and innovation include strategy, structure, support mechanisms, behaviors, and open communication (Martins & Terblanche, 2003). To achieve success in the fast-updating environment, companies should react fast toward the market, and take participate in the product innovation process. While on the other hand, lack of flexibility, open culture, and flat organizational structure have been argued to impede sustained innovation (Laforet, 2008). In the open and flat organization and cultural environment, such as the Netherlands, Agile transformation will be relatively easy to apply; while differently in hierarchy hierarchical country like China, the cultural environment is closed and strict, which will be hard for management to imply Agile method (Grabska, 2017). Thus, scholars recommend that companies create an open organizational mindset to support increased openness with the goal to build an open environment for innovation (Westerlund & Leminen, 2011).

2.4.3 Structure

Organizational structure is another factor influencing the innovation and transformation process. As indicated by Büschgens, Bausch, and Balkin (2013), the hierarchical cultures which highlight control and internal order will be less likely to be found in the organization that encourage innovation. The prominence of structure on impacting performance is substantial. For instance, in the hi-technology or knowledge-intensive industry which always encourages innovation, the organizational structure will influence the innovation and learning process which lead to the improved performance (Hao, Kasper, & Muehlbacher, 2012). While on the other hand, in the labor- or capital-intensive traditional industry, a performance increase will be hard to reach due to the high hierarchical structure that information is hard to communicate between level. Meanwhile, employees in different positions consider the importance of structure differently. People in leadership or senior managers position would think performance and innovation will be directly improved by the flat structure, while people in middle and entry position tend to believe the effect is mediated because of the structure change. Further, the degree of the complexity in the structure

together with the degree of organizational integration will also influence the organization's growth (Tushman, Smith, Wood, Westerman, & O'Reilly, 2010). The study argued that the flat organization will encourage people to innovate (Dodge, Dwyer, Witzeman, Neylon, & Taylor, 2017). In a flatter structure, the developmental culture and the importance of HR have been found stronger (Wei, Liu, & Herndon, 2011). Although the high hierarchy structure will guarantee the orderly allocation, innovation is not encouraged in such an environment (Xie, Wu, & Zeng, 2016).

2.4.4 Employee Eengagement

Employee engagement is also considered as an important element for the transformation. And internal communication also plays an increasingly growing role in employee engagement. There's positive relationship between the effort and effectiveness of internal communication and employee engagement, which was categorized into the factors of commitment, discretionary effort, and meaningful work (Hayase & Traudt, 2009). The potential benefits of internal communication include reaching employees with appropriate messages in useful and acceptable formats (Welch, 2012). Internal communication is vital to building transparency between management and employees, which has been argued as an important factor for building a transparent culture (Mishra, Boynton, & Mishra, 2014). Through various internal communication channels such as face-to-face communication, trust has been built from executives to engage with employees (Karanges, Johnston, Beatson, & Lings, 2015). More trust will effectively lead to the positive result of the product improvement. The meaning and trust environment created via internal communication is argued to be supportive in developing and maintaining employee engagement. Paradoxically, wrongly used or poor communication can be counter-productive which pose as a threat to organizational development (Welch, 2012). In order to effectively engage with employees, executives and communication team should invest on building the supportive leadership perception and company identity. The diverse use of communication channels will also influence employee engagement, which further influence the innovative result (Hayase & Traudt, 2009).

2.5 Complexities in the Rresearch

2.5.1 Complexities in Agile Rresearch

The challenges of applying Agile practices have been a debated topic in this field, especially in the recent decade. The study by Kajko-Mattsson et al. (2010) found problems of adopting Agile on the global scale, problems that involved cross-cultural communication,

time zone, training, trust, and other technical problems. Also, Kamaruddin et al. (2012) argued there are 13 problems when adopting Agile by reviewing different case studies, such as the distance related to time and location between distributed software development teams. Besides these issues, risks have also been identified. Shrivastava and Rathod (2015) argued for 5 risks areas based on their experience and literature in the field of project management; these risks pertain to software development life cycle, technology setup, group awareness, and external stakeholder. Pries-Heje (2011) and Modi et al. (2013) narrowed their study to focused on the coordination, communication and cooperation (CCC) challenges in their case study. From the above stated studies, one can observe that the focus on the challenges is moving into a deeper direction with narrowing the focus such as challenges in the video game industry. While studies often study specific aspect of the innovation tool, and often neglected to focus on specific knowledge area from the research.

2.5.2 Complexities of Ceommunication and Iinformation Ssharing in the Agile Ppractices

In recent years, the focus of investigating communication in team dynamics could be seen as the trend of Agile study Vallon et al. (2018). Green et al. (2010) argued that in the different team setting such as in complex global scenarios and daily communication, the use of synchronous and asynchronous communication is different as well. Global teams tend to use more asynchronous communication as they operate across different time zones and locations, while the team in the same site will equally use synchronous and asynchronous communication; for example, synchronous face-to-face communication is possible within a locally situated team. Persson et al. (2012) posed that control of the formal and informal elements of communication could lead to different influence such as more responsibilities on informal roles and closer employee relations in the formal controlled Agile development. Razzak and Ahmed (2014) argued that the local and global team require different knowledge sharing strategies (Systems, Cartographic, Engineering, Organizational and Spatial). Bass (2016) identified 25 essential Agile communication practices to share information in Agile practices. The decision-making that occurs in teams develops and is impacted by multiple factors, that include interpersonal ones such as emotional characteristics and individual differences (Chankong & Haimes, 1983). However, Moe, Dingsøyr, and Dybå (2010) argued that team leadership, team structure, and coordination are also relevant factors influencing the decision-making process. Meanwhile, Sharma and Kamalanabhan (2012) suggested internal communication artifacts, from content wise to channel wise such as an internal Twitter channel, will improve the team work result by increasing the communication satisfaction.

This, all to say that the increased research in the field of communication and information sharing in the Agile practices provide a solid foundation for this study.

2.5.3 ADAPT Mmodel

There have been case studies (Hossain, Bannerman, & Jeffery, 2011; Paasivaara, Lassenius, Heikkila, Dikert, & Engblom, 2013) and literature reviews covering different aspects of the Agile practices field, while there is a lack of an overall framework contributed in this field (Vallon et al., 2018). As the literature review study conducted by Vallon et al. (2018), The focus on analyzing the case overweight building theoretical framework – less practical implementation was formed. The evaluation techniques for systems analysis and design methods by Siau and Rossi (2011) argued that even though currently in this field, there are hundreds of modelling methods and researchers are still generating more new models, the lack of authentic framework and standardized techniques in the evaluation appear to be a problem. They argued that the common sense and intuition of the developers are the main foundation, which the lack of theoretical backup and empirical evidence as the weakness of investigations into their worthiness (Siau & Rossi, 2011). Thus, to seek a comprehensive framework, further empirical studies are needed. This study builds on the ADAPT framework (Agile Distributed Adaptable Process Toolkit), which features 10 guidelines and 29 practices in the Agile practices. The ADAPT framework was created with the intention to generate a comprehensive framework to describe how to apply Agile practices to distributed software development for both researchers and business practices (Vallon et al., 2016). Because of the gap of previous studies as stated above, the fully detailed ADAPT framework could help organize the framework for this study. While according to Vallon et al. (2018), even though ADAPT is an extensive framework which set guidelines for every practice, whether this framework could work in different context, i.e., whether there will be different criteria for success in terms of communication is still unclear.

2.5.4 Hypothesis

When forming the hypothesis, the published articles were collected as the source of data for this study. Thus, hypotheses will be expressed with literature as the sampling units. With the categories of change management and internal communication, hypotheses to test the result and answer the research question are formed.

Firstly, in the scope of change management, the importance of the culture is important for organizational transformation has been argued by Chen, Lin, Lin, and Mcdonough (2012), and should appear frequently in the articles. Meanwhile, leadership also plays a vital role in

the transformation process, which should be emphasized in the literature. The hypothesis formed are:

H1: Creating an open culture is important for organizational transformation; it will appear prominently (> 50%) of the literature.

H2: Leadership support is vital for the transformation; it will appear prominently (> 50%) of the literature.

Secondly, the way companies adopt technology differs per industry, such as EY (2013) indicated that media and entertainment companies expect to use more technology to enable agility and the culture of innovation. The hypothesis formed is:

H3: Media and entertainment companies expect to use technology to do Agile transformation.

Thirdly, regarding the internal communication, technology is connected with the efficiency of communication (Sharma & Kamalanabhan, 2012). With the development of modern technology, there are assumed to have increasing emphasis on the use of technology in internal communication. At the meantime, with the increased efficiency of internal communication, the employee engagement and open culture are assumed to be boosted via internal communication channels (Hayase & Traudt, 2009; Westerlund & Leminen, 2011). The hypothesis formed are:

H4: There is the trend of increasing emphasis on the use of technology in internal communication channels.

H5: Internal communication should boost employee engagement and create an open culture for the organizational transformation.

H6: Internal communciation should help creating the open culture for the organizational transformation.

~~Word count section 2: 5733~~

3. Research Design

Research Question

The aim of this study is to explore the relations between communication and the agile transformation process, specifically, what influence will communication leave on the agile transformation process. Communication has been defined as the communication content, and communication channels. By categorizing the influence of different communication content, and the effect of different communication channels, the findings will help understand the text of how will communication influence the agile transformation process. The research question of this study is *What is the role of communication in the Agile transformation process?* There are two sub-questions followed: RQ 1: what are the internal communication factors lead to successful Agile transformation case. RQ 2: what are the communication artifacts lead to successful Agile transformation case.

3.1 Method

In order to answer the research question to identify how communication content and communication channels impact the agile transformation process, quantitative content analysis was adopted. Quantitative method is chosen to answer the research question for the below two reasons. The reason for using quantitative content analysis is that it is the through measurements to acquire an overview of how the innovation tools are used through many data samples (Riffe, Lacy, & Fico, 2019). If this research focuses on a small number of articles or small variations, it will be difficult to summarize the good practice from communication. For instance, the focus on the communication in the banking industry might not be applicable in the media industry. The huge amount of quantitative analysis guarantees the quality and reliability of the research. Meanwhile, the methods of quantitative content analysis could first acquire the overview from the current study, then generate insightful reflection by comparing different groups. Content analysis is an effective method to be used in analyzing how the text can be used in the contexts (Krippendorf, 2012). Consequently, the general patterns in the articles can be extracted systematically through content analysis. Since the questions are to explore the positive and negative impacts, meanwhile draw reflections upon the topic, the quantitative content analysis will help with summarizing the conclusion from previous studies, then acquiring insights through the analysis. Thus, this study adopts the quantitative content analysis method to analyze a huge number of articles, meanwhile generate overview and reflection through comparison.

This study will focus on conducting quantitative content analysis to collect the main conclusions from previous publications. The adoption of quantitative content analysis in this research will be explained in the following sub-sections.

3.2 Sample

The quantitative content analysis was conducted by first collecting various articles with purposive sampling. Since the research focus on the successful Agile transformation, the articles collected are mainly about successful cases to answer the research question of what factors lead to the positive result. The data consisted of published journal and articles, and some articles from well-established lay publications such as Forbes and the Harvard Business Review. The number of the articles was 95 which consist of 75 grey literature and 20 academic literature; these varied in length with the shorter one's being roughly 300 words and the longer, 20000 words - on average each literature contains 3500 words. To achieve comparable data, the same search terms were applied in the different databases. The language of the publications is English. Divided by industry, there are 10 grey literature about the Agile transformation in ING as the representative of the banking industry; 10 grey literature about Netflix and 10 grey literature about Spotify represent the media and entertainment industry; 10 grey literature about Microsoft as the representative of the software industry; 20 grey literature about internal communication and change management; 20 academic literature about internal communication and change management; and lastly, 15 grey literature focus on the communication channels. Thus, there are 6 different groups studied in this research. With the purpose to acquire a general overview and comparable results, the year of publication ranges from 2003-2019, while only the literature in recent 10 years, i.e. 2010-2019 are being tested in this study. Thus, one academic literature was being excluded since it was from 2003.

3.2.1 Company Chosen

In the data collection process, the companies chosen were 'ING', 'Spotify', 'Netflix', and 'Microsoft' for the following reasons. ING is the famous Dutch banking company, which renowned with its Agile practices in launching their mobile application. Spotify is the company in the media and entertainment industry, as the earlier adopter of Agile practice, Spotify is famous for its scaled Agile practice in the whole organization. Netflix, the famous media and entertainment company famous for its HR's agile practices, can be used as the comparison with ING of who also values the role of HR. Lastly, Microsoft chose to compare with Spotify's Agile adoption as they are both early adopters of Agile transformation but in the different industry as software industry. As indicated in EY's report (2013), companies in

the media and entertainment industry would like to use more technology in their innovation process. Thus, with the purpose to test this statement, the companies chosen are two from the media and entertainment industry, and two from other industries.

3.2.2 Searching Tterm

The searching terms in this study could be summarized into 'Agile transformation', 'communication', and 'company's name'. The data sources comprise both grey literature on the Internet including the websites for Agile transformation and company's websites, and academic papers, and famous journals such as Harvard Business Review and the Economist. With the purpose to compare the grey literature and academic literature, the same search terms applied in both the database of the Internet, journals' page, company's page, and university library's page.

To balance the articles, each company's data consists of 10 articles. i.e. ING, Spotify, Netflix, and Microsoft have 10 grey articles each. By counting the word count, 20 academic literature have been selected applying the same searching term. Meanwhile, to acquire a deeper insight into the topic of communication, articles about communication have also been included in the sampling. For these, there are 20 grey articles about internal communication and change management in general, and 15 grey articles focus on the communication channels.

3.2.3 Data Collection Procedure

In the first-round selection, the search was limited to abstract, keywords and title, in order to minimize irrelevant content. Specifically, the article types are journals, thesis, and grey articles from websites, books are not included in this study. Inspired by the article of Harvard Business Review (2018), the keyword of searching are the successful Agile transformation cases mentioned as follows:

'Agile' OR 'SCRUM' OR 'Agile Project management' OR 'Agile Transformation' AND 'ING' OR 'Spotify' OR 'Netflix' OR 'Microsoft' AND 'Communication' OR 'Communication artifacts' OR 'Internal Communication'

The business journal such as Harvard Business Review, the Economist, and Forbes were also included in the research. The articles are accessible via university library service (Erasmus University Rotterdam) or available on the Internet. After collecting enough articles, the selection quality assessment was adopted that the articles should directly relate to the research questions, i.e. answer the main questions of the role of communication in the successful agile transformation process.

3.3 Operationalization

Once the selection was done, quantitative content analysis was applied. The quantitative data analysis will follow the guideline for systematic review study design by Kitchenham and Charters (2007) and Petersen et al. (2008). Inspired by Vallon et al. (2018), firstly, the publication types were mapped, such as the category of publications, the study method was grouped. Secondly, the components of the study within the article was the focus, such as whether it studied the whole transformation process, or only focus on one specific phase; or what are the different setting in the study such as the team size, project duration, knowledge, etc. Thirdly, the frequency of Agile transformation was analyzed such as the trends of publication of whether there is the obvious trend of increasing publication with the emphasize on different aspects; or how many roles have been mentioned, how many Agile communication techniques such as "standing up meeting" (the short 15 minutes standing up meeting in the SCRUM), "Sprint" (the iteration adopted in the SCRUM) have been mentioned. In this way, how communication issues relate to the creativity output were being reflected in the special Agile transformation setting such as standing up meeting and shorten meeting period were analyzed. Meanwhile, the topics from the ADAPT framework were also be used as the quantitative content analysis, such as the topic of communication between sites, communication in each functional teams, knowledge and information sharing, communication tool, feedback loops, and overall feedback of the transformation. From mapping and grouping the content, the reasons lead to successful case were generated from this stage.

3.3.1 Analyzing Ceategories

After collecting the data, the articles were categorized and labeled based on several categories. All these coded categories appear in Table 3.1. Firstly, the source categories. All the articles had been labeled based on their content first, such as in which industry, the publication year, and study type. The basic information of the articles collected were mapped in this way, which provides an overview of the articles analyzed in this study.

Secondly, the scope of each study was mapped, such as whether the article includes the whole transformation process, or whether it mentions specific transformation phase. Further, whether Scaled Agile practice has been mentioned in the article. By doing this, the development of Agile practice could be analyzed such as whether there was the increasing attention on the scaled agile practice, of whether people pay attention to specific transformation phase (Vallon et al. ,2018). These were coded as binary (1 or 0) for the

presence (or non-presence) of these elements. All of the subsequent data described below is coded similarly.

Thirdly, since the leadership support is important for the organizational change (Joiner, 2009), the senior roles mentioned in the articles had also been coded. Roles mentioned such as Chief Executive Officer, Chief Technology Officer, Chief Information Officer, Chief Communication Officer, Chief Talent Officer, etc. Since different companies have different strategies for the transformation - some emphasize the implementation of technology, some build a new role for HR, roles mentioned in different articles could generate conclusion on the difference between the Agile transformation strategy in various companies.

Fourthly, agile terminology mentioned in the articles were also coded. This includes the commonly acknowledged Agile terminology such as 'Scrum, sprint, stand-up meeting, review, retrospective, backlog, chapter, planning, iteration, DevOps, minimal variable product', and some Agile roles such as 'Product Owner, Scrum Master, Agile Coach'. While from the articles, other terms had been mentioned as well, such as the adapted version of 'Scrum Master' in ING called 'Squad'. By making the summary of the frequency of Agile terminology mentioned and comparing the mean and the standard deviation per terminology, the trend in recent years and the adoption by different companies could be observed (Vallon et al. ,2018).

Fifthly, the categories in the ADAPT framework, which include 'communication between teams in different sites' 'communication between teams', 'communication within teams', 'knowledge and information sharing', 'communication tools', and 'feedback loop'. By marking which items had been mentioned in the articles, we could observe which aspects does the organization emphasize. Such as whether the company focuses more on the communication between different sites, or do they merely pay attention to smaller size team level Agile practices (Vallon et al. ,2018). The focus might shift per industry and per case, which will be valuable in the study to compare the different between industrial groups.

The items mentioned from the articles but did not fall into the above-mentioned categories were being coded into 3 umbrella categories: organizational factors, employees and HR factors, and communication factors. Each of these is operationalized with a series of sub-codes. While those categories are not directly related to the Agile transformation, they play a role in the organizational change management process, so they were also included in the analysis.

Firstly, organizational factors contain ‘appropriate organizational structure and governance’, ‘agile culture and mindset’, ‘innovation’, ‘working environment’, ‘autonomy and accountability’, ‘leadership support’, and ‘customer's demand’. Those factors indicate the organization’s management perspective and had been mentioned in the articles frequently. Meanwhile, as indicated in the literature, the collaborative leadership style, and supportive leadership will facilitate the transformation process (Gandomani, Zulzalil, & Nafchi, 2014; Joiner, 2009). Leadership support plus the innovative culture will promote the transformation (Chen, Lin, Lin, & Mcdonough, 2012). While high power hierarchy structure in the organizational culture will hinder the transformation process (Xie, Wu, & Zeng, 2016). The importance of organizational factors in the transformation process has been discussed by scholars; thus, those factors were grouped into the sixth category of ‘organizational elements’ and analyzed in this study.

Secondly, there are factors that focus on the role of Human Resources and talent management, such as ‘the new onboarding program’, ‘employee engagement’, ‘right talent’, ‘Human Resources Business Partner’, ‘people services’, ‘flexibility’, ‘training and education’, ‘cultural difference’. As the employee engagement and the role of HR is vital for the transformation which is also the part of change management (Schotkamp & Danoesastro, 2018), the seventh category was grouped with the topic of ‘Employee and Human Resources’.

Lastly, with the articles about communication, the category of ‘communication’ consists of ‘communication expertise’, ‘the use and emphasize on technology’, ‘communication channel’, and ‘information sharing’. Since internal communication plays an influential role in the change management process, studies have shown that the proper choice of communication channels could build trust cross levels in the organization and enhance employee engagement (Karanges, Johnston, Beatson, & Lings, 2015); thus, it is valuable to include ‘communication’ as part of the analysis.

Table 3.1. Variables and codes of “media frame” for content analysis:

MAIN CATEGORIES	**VARIABLES**
SOURCE CATEGORY	Industry based
	Publication Year
	Study Type
STUDY SCOPE	Transformation Process
	Specific Transformation Stage

	Scaled Agile Framework
ROLES MENTIONEDS	Chief Information Officer
	Leadership
	Chief Executive Officer
	Chief Communication Officer
	Chief Operation Officer
AGILE TERMINOLOGY	Squad
	Tribe
	SCRUM
	Chapter
	backlog
	Stand-up meeting
	Scrum Master
	Product Owner
	Sprint
	Review
	Planning
	Iteration
	Retrospective
	DevOps
	Minimum Variable Product
	Agile Coach
ADAPT FRAMEWORK	Communication Between Sites
	Communication Between Teams
	Communication Within Teams
	Knowledge and Information Sharing
	Communication Tools
	Feedback Loop
ORGANIZATIONAL ELEMENTS	appropriate organizational structure and governance
	agile culture and mindset
	Innovation
	Way of Working, working environment

	Autonomy and accountability
	Leadership support
	Customer's demand
EMPLOYEE AND HR ELEMENTS	New Onboarding Program
	Employee Engagement
	Right Talent
	Human Resources Business Partner
	People Services
	Flexibility
	Training and Education
	Cultural Diversity
COMMUNICATION ELE EMENTS	Communication Expertise
	The use of Technology
	Internal Communication Channels
	Information Sharing

3.4 Data Aanalysis Pprocedures

The software used in the analysis was SPSS in order to obtain descriptive statistics such as mode, averages, standard deviations of codes. In this way, there will be a comprehensive view of the study conducted, which helps the future study to make up the gap.

Firstly, 95 articles were coded in the Excel codebook following the above-mentioned categories and variables, the codebook was imported into the IBM SPSS Statistics 24. Hypothesis 1 was tested with a one-sample t-test. Since the hypothesis aims to test whether the open culture is important for the transformation, the dependent variable is Culture. Meanwhile, the open culture should appear prominently (>50%) of the literature was assumed, so 0.50 was used as the test value. The additional analysis to test whether there is a relationship between industry and the extent of expression of open culture were conducted with a Chi-square test (goodness-of-fit test), the sum and mean were being described for different groups for further analysis and comparison.

Similar to Hypothesis 1, hypothesis 2 was tested with a one-sample t-test. Since the hypothesis aims to test whether the leadership support is vital for the transformation, the dependent variable is Leadership Support. Meanwhile, the leadership support should appear prominently (>50%) of the literature was assumed, so 0.50 was used as the test value. The additional analysis to test whether there is a relationship between industry and the extent of

emphasizing on Leadership support were conducted with a Chi-square test (goodness-of-fit test), the sum and mean were being described for different groups for further analysis and comparison for hypothesis 2.

Hypothesis 3 was tested by conducting the Chi-square test. Since the hypothesis is to test whether media and entertainment companies will emphasize the use of technology more than other industries, Chi-square was conducted to compare whether the time mentioning technology between media industry and other groups is significantly different. Meanwhile, with listing the sum and mean for different groups, further analysis could be formed for hypothesis 3.

Hypothesis 4 aims to explore the trend and pattern of mentioning technology in the literature, thus the regression analysis was conducted by testing the relations between publication year and the amount of technology mentioned in the literature. The dependent variable is technology, and the independent variable is publication year. Since the hypothesis assumes there will be an increasing trend, the result of the regression test will help interpret whether there are increasing or decreasing trend. Meanwhile, the patterns of more terms were being tested in this stage as well. For instance, terms in Agile Terminology category such as Sprint and Agile Coach were being analyzed by conducting regression analysis to explore the trend. Other variables in the ADAPT Framework category were being tested in regression analysis as well, including communication between sites, communication cross teams, communication within teams, knowledge and information sharing, communication tools, and feedback loop. By doing this, not only the trend of mentioning technology will be studied, other interesting findings were analyzed at the same time.

In the fifth hypothesis, whether internal communication will boost employee engagement was tested. After coding the articles, there were 4 variables grouped into the internal communication category: communication expertise, the use of technology, communication channels, and information sharing. To test the effectiveness of internal communication on employee engagement, 4 separate chi-square tests were conducted in order to exam whether the variable will lead to a significant change to employee engagement. After 4 chi-square tests, the above-mentioned 4 variables were computed into 1 new variable called Internal communication, preparing for testing the overall effect of internal communication on employee engagement. Since the hypothesis is to explore whether there's a positive and increasing trend between 2 variables, regression analysis was suitable at this stage. When interpreting the result for regression analysis, the 1-tailed significance was considered since the aim is to test for a positive relation.

Similar to hypothesis 5, hypothesis 6 consists of the assumption of internal communication will help to create an open culture in the organization. To Test the effect of internal communication on creating the open culture, 4 individual Chi-square tests were conducted to test the significant value. By using the combined Internal communication variable, the co-relations between internal communication and create an open culture was tested. The regression analysis was applied with the feature to test direction and trend, and the 1-tailed significance value was considered.

3.5 Reliability

In each industrial group, 2 articles were chosen to conduct the inter coder reliability test (Appendix A), which means the second coder need to read 12 articles to check whether the literature covers the content for this study. Whether the articles cover the topics of coded questions for the hypothesis were being checked: 'open culture' (75% agreement), 'leadership support' (66.7% agreement), 'the use of technology' (75% agreement), 'employee engagement' (75% agreement), 'the amount of communication expertise' (91.7% agreement), 'communication channels' (83.3% agreement), and 'information sharing' (91.7% agreement). The reliability results for each coded question are between 66.7% agreement to 91.7% agreement, and the detail could be viewed in Appendix A. The sample and analysis will be expanded in the next section.

~~Word count section 3: 3255~~

4. Results

Sample Ddescription

The variables are summarized into 8 categories coded in this study: source category, scope of the study, roles mentioned, Agile terminology, ADAPT framework, Organizational factors, Employee and human resources factors, and communication factors. The results of this study are expanded in the following text.

The articles collected for this study ranged from 2003-2019, which publications from 2015 to 2019 took 82.1% of the whole sample. Specifically, the publication year 2017 and 2018 take most of the publication, which is 20% and 26.3% respectively. Regarding the scope of the study, 95.8% of the literature mentioned the whole Agile transformation process, while only 23.2% of the literature paid attention to Scaled Agile practice, and even less only 5.2% highlighted specific stage of the transformation. Specific roles in the organization are mentioned in several articles, such as Chief Information Officer (3.2%), leadership and senior management (57.9%), Chief Executive Officer (9.5%), Chief Communication Officer (9.5%), Human Resources (11.6%), Chief Operation Officer (1.1%). Among those the importance of leadership and senior management role have been highlighted, which including senior executives, vice president, and management.

Specific Agile terminology appeared in grey articles and academic literatures: squad (24.2%), tribe (17.9%), scrum (49.5%), chapter (14.7%), backlog (28.4%), stand up meeting (27.4%), scrum master (31.6%), product owner (34.7%), sprint (30.5%), review (8.4%), planning (12.6%), iteration (9.5%), retrospective (9.5%), devops (6.3%), minimum viable product (6.3%), agile coach (23.2%). As the most commonly used tool in the Agile method, Scrum has been mentioned more than other terminologies, and the role of the product owner is also been mentioned quite often in literature.

Some team communication factors have been included as well. Based on the ADAPT framework, factors including the between sites communication (31.6%), between team communication (75.8%), within team communication (71.6%), knowledge and information sharing (71.6%), communication tools (54.7%), and feedback loop (55.8%). Team level communication such as between teams and within team communication, knowledge and information sharing appear to be more important. Some organizational factors are important for the Agile transformation and have been mentioned in several articles: Structure (11.6%), culture (34.7%), innovation (9.5%), working environment (15.8%), autonomy and accountability (4.2%), leadership support (10.5%), and customers' demand (4.2%). Organizational culture is mentioned more than other factors in this category.

In the ‘Employee & HR’ category, besides the importance of employee engagement (12.6%) as analyzed in the previous text, the right training and education (16.8%) have also been mentioned frequently in the literature. Especially in the academic literature, the importance of training and education took 50% of the overall mentioning. Besides those, new onboarding program (2.1%), right talent (10.5%), human resources business partner (9.5%), people service (3.2%), flexibility (1/1%), and cultural difference (1.1%) are also be mentioned in the literature. Some of the communication factors have also been included, such as the amount of communication expertise (1.1%), the use of technology (18.9%), communication channels (27.4%), and information sharing (5.3%), among which the importance of communication channels has been highlighted.

Detailed results and analysis to test the hypothesis and answer the research questions will be expanded in the next section.

4.1 The Iimportance of Open Culture

H1: Creating an open culture is important for organizational transformation; it will appear prominently (> 50%) of the literature.

As the mean of the open culture variable (coded as binary) is a proportion, a one-sample t-test was conducted and revealed that the prominence of open culture (M = .38) is not greater than 50%, t (93) = -2.32, $p < .05$. An alternative, slightly more accurate, test was also run (a chi-square goodness-of-fit test) to examine if the proportions deviated from 50%/50%. The results are similar with $\chi 2(df=1) = 5.149$, $p < .05$. Thus, the test would indicate that H1 itself is directly unsupported.

Additional analysis to compare between industrial groups reveal that companies in media and entertainment industry mentioned the importance of open culture in the 60% of the overall mentioning, which hugely different with the mentioning in the academic literature (26.3%) and in the literature about Communication Channels (13.3%). The different presence of open culture might be based on different characteristics of each industry. For instance, media and entertainment company are based on the idea of creativity, in contrast with the academic field that would focus more on the organizational culture. Meanwhile, literature about communication channels might focus merely on the utilization of different channels, rather than create open culture in general. Additionally, literature about Software companies tend to emphasize the open culture (60%) much more than literature about communication channels (13.3%). Similar to the media and entertainment industry, software industry invests

on innovation and fast-forward transition, of which creating the open culture is more important than merely discussing communication channels.

Thus, the hypothesis is partially accepted and partially rejected: in the industry of media and entertainment, and software, creating the open culture is important for the transformation process, while in the rest it is not vital. Though it is important for some industries, it didn't appear prominently in the literature. (see Table 4.1.)

Table 4.1.

Open culture and Agile transformation by Industry

	Industrial Group						
Open Culture	Banking	Media and Entertainment	Software	Internal Communication and Change Management	Academic literature	Communication Channels	Total
Mentioned	4	12	6	7	5	3	36
Percentage	40%	60%	60%	35%	26.3%	13.3%	38.3%

$\chi 2(df=1) = 5.149$, $p = .05$

4.2 The Iimportance of Leadership Support

H2: Leadership support is vital for the transformation; it will appear prominently (> 50%) of the literature.

As the mean of the leadership support variable (coded as binary) is a proportion, a one-sample t-test is conducted and reveals that the prominence of leadership support (M = .13) is not greater than 50% $t(93) = -10.760$, $p < .001$. In fact, we see that leadership support is significantly less than 50% of the samples. An alternative, slightly more accurate, test was also run (a chi-square goodness-of-fit test) to examine if the proportions deviated from 50%/50%. The results are similar with $\chi 2(df=1) = 52.128$, $p < .001$. Thus, H2 is fully unsupported. Meanwhile, it didn't appear prominently (>50%) in the literature, which only appear 12.8% of the literature. Companies in the media and entertainment industry mentioned the leadership support (33.3%) slightly more than software company (8.3%). Among the

12.8% of mentioning, company in the banking industry takes 16.7%, literature about internal communication takes 25%, and the academic literature takes 16.7%.

Thus, the hypothesis 2 about the leadership support is rejected that from the literature of this study, leadership support is not vital for the transformation and it didn't appear prominently of the literature. In different industries, companies pay different attention on leadership support, slightly different could be observed that media and entertainment company emphasize leadership support more than the software company. (see Table 4.2)

Table 4.2.

Leadership support and Agile transformation by Industry

	Industrial Group						
Leadership support	Banking	Media and Entertainment	Software	Internal Communication and Change Management	Academic literature	Communication Channels	Total
Mentioned	2	4	1	3	2	0	12
Percentage	16.7%	33.3%	8.3%	25.0%	16.7%	0.0%	12.8%

χ^2 (94, 5) = 3.85, p = .61

4.3 The Uuse of Tttechnology and Ccommunication Cchannels

H3: media and entertainment companies expect to use technology to do agile transformation.

A Chi-square test revealed that media and entertainment companies do not use technology to do agile transformation more than other industries, that there's weakly significant different cross groups $\chi 2(N = 94, 1) = .28$, $p = .76$. The use of technology was mentioned in 19.1% of the literature, among which literature about communication channels mentioned the most (38.9%), following literature about internal communication and change management (22.2%). Academic literature and literature on media and entertainment industry shared the same percentage of 16.7%, and banking industry only took 5.6%.

Thus, the hypothesis is rejected since media and entertainment didn't mention the use of technology more than any other industries, rather literature on communication channels

and internal communication value more on the use of technology in the transformation process. (see Table 4.3)

Table4.3

The use of technology and Agile transformation by Industry

	Industrial Group						
The use of technology	Banking	Media and Entertainment	Software	Internal Communication and Change Management	Academic literature	Communication Channels	Total
Mentioned	1	3	0	4	3	7	18
Percentage	10.0%	15.0%	0.0%	20.0%	15.8%	46.7%	19.1%

χ^2 (94, 5) = 10.62, p = .06

H4: there's the trend of increasing emphasis on the use of technology in internal communication channels.

A linear regression with the use of technology as dependent variable and publication year as predictor was conducted. The model was not found to be significant, F (1, 90) = .01, p = .91, $R2$ = .01. Thus, the yearly trend of use of technology is in fact slightly negative (β = -.012, p = .91), but severely insignificant. Since the test was not significant, therefore H4 is rejected that there's no increasing or decreasing trend from the influence of publication year on the use of technology. Meanwhile, from neither analyzed by publication year, nor by comparing in industries, the relevant relations on the use of technology were not found. (See Table 4.4)

Table 4.4

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	101.037	39.142		2.581	.011
	Publication	-.002	.016	-.012	-.114	.909

	Year

a. Dependent Variable: Technology

4.4 Internal Communication and Employee Engagement

H5: Internal communication should boost employee engagement for the organizational transformation.

In order to test the relations between internal communication and employee engagement in the transformation process, 4 variables in the internal communication categories were being tested by 4 separate Chi-square tests with engagement as the dependent variable, and 1 linear regression test was conducted by computing 4 communication variables into 1 variable to explore the overall effect of internal communication on employee engagement.

4.4.1 Employee Engagement and~~&~~ Communication Expertise

Chi-square test revealed that employee engagement is not related to the amount of communication expertise that the more communication expertise in the organization will not influence the employee engagement $\chi 2(N = 94, 1) = 2.54$, $p = .24$. (see Table 4.5)

Table 4.5

The employee engagement by the amount of communication expertise

	Communication Expertise	
Employee Engagement	Mentioned	Didn't mention
Mentioned	1	11
Percentage	50.0%	12%
Didn't mention	1	81
Percentage	50%	88%

$\chi 2(N = 94, 1) = 2.54$, $p = .24$.

While result is insignificant, the articles mentioning communication expertise also are not more likely to mention employee engagement.

4.4.2 Employee Engagement and the ~~&~~ U~~u~~se of Technology

A Chi-square test revealed that employee engagement is not related to the use of technology in the communication process that the increased investment on the technology in

the internal communication process will not influence the employee engagement $\chi 2(N = 94, 1) = .30$, $p = .69$. (see Table 4.6)

Table 4.6

The employee engagement by the use of technology

	Use of Technology	
Employee Engagement	Mentioned	Didn't mention
Mentioned	3	9
Percentage	16.7%	11.8%
Didn't mention	15	67
Percentage	83.3%	88.2%

$\chi 2(N = 94, 1) = .30$, $p = .69$.

While result is insignificant, the articles mentioning the use of technology also are not likely to mention employee engagement.

4.4.3 Employee Engagement and~~&~~ Communication Channels

A Chi-square test revealed that employee engagement is not related to the diversity of internal communication channels that the diverse and creative use of internal communication channels will not influence the employee engagement $\chi 2(N = 94, 1) = 1.35$, $p = .30$. (see Table 4.7)

Table 4.7 *The employee engagement by the use of communication channels*

	Communication Channels	
Employee Engagement	Mentioned	Didn't mention
Mentioned	5	7
Percentage	19.2%	10.3%
Didn't mention	21	61
Percentage	80.8%	89.7%

$\chi 2(N = 94, 1) = 1.35$, $p = .30$

While result is insignificant, the articles mentioning the use of communication channels also are not likely to mention employee engagement.

4.4.4 Employee Engagement and~~&~~ Information Sharing

A Chi-square test revealed that employee engagement is not related to the fluid of information sharing flow that the extend of information sharing will not influence the employee engagement $\chi 2(N = 94, 1) = .25$, $p = 1.00$. (see Table 4.8)

Table 4.8

The employee engagement by information sharing

	Information Sharing	
Employee Engagement	Mentioned	Didn't mention
Mentioned	1	11
Percentage	20.0%	12.4%
Didn't mention	4	78
Percentage	80.0%	87.6%

$\chi 2(N = 94, 1) = .25$, $p = 1.00$

While result is insignificant, the articles mentioning the information sharing also are not likely to mention employee engagement.

4.4.5 Overall Internal Ccommunication Eeffect

A linear regression with the employee engagement as dependent variable and internal communication as predictor was conducted. For this independent variable, the four internal communication variables were summed to an overall internal communication variable. The model was found to be insignificant, $F(1, 90) = 1.84$, p = .178, $R2 = .02$. However, the coefficient for internal communication's effect on employee engagement is positive and weakly significant ($B = 0.059$, $p < .10$, one-tailed). Since the effect of internal communciation could be observed in one direction, thus the one-tailed significant was taken. Therefore, there's weak significant influence of internal communication effort on employee engagement found, that presence employee engagement will increase the chances of internal communication by 5.9%. The more appropriate binary logistic regression exhibits the same effect ($B = .140$, p < .10, one-tailed). Thus, we can say that H4 may be very weakly supported when considering all of the internal communication types together (the amount of communication expertise, the use of technology, the use of communication tools, and information sharing). Thus, the hypothesis is partially accepted. (see Table 4.9).

Table 4.9

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.096	.042		2.295	.024
	Internal Communication	.059	.043	.140	1.356	.178

a. Dependent Variable: Employee Engagement

4.5 Internal Communication and Open Culture

H6: Internal communciation should help creating the open culture for the organizational transformation.

In order to test the relations between internal communication and create the open culture in the transformation process, 4 variables in the internal communication categories were being tested by 4 separate Chi-square test, and 1 linear regression test was conducted by computing 4 communication variables into 1 variable to explore the overall effect of internal communication on creating the open culture.

4.5.1 Open culture and~~&~~ Communication Expertise

Open culture does not seem associated with the amount of communication expertise as open culture appears 0% of the time when communication expertise appears. Chi-square test revealed that open culture is not related to the amount of communication expertise in the communication process that the increased the amount of communication expertise in the internal communication process will not help creating the open culture $\chi 2(N = 94, 1) = 1.27$, $p = .26$. (see Table 4.10).

Table 4.10

The open culture by the amount of communication expertise

	Communication Expertise	
Open culture	Mentioned	Didn't mention
Mentioned	0	36
Percentage	0.0%	39.1%
Didn't mention	2	56
Percentage	100.0%	60.9%

χ^2 (94, 1) = 1.27, p = .26

4.5.2 Open culture and the& Uuse of Technology

Open culture does seem associated with technology use as open culture appears 44.4% of the time when use of technology appears, whereas only 36.8% of the time when use of technology does not. A Chi-square test revealed that open culture is not related to the use of technology in the communication process that the increased investment on the technology in the internal communication process will not help creating the open culture $\chi 2(N = 94, 1) = .36$, $p = .55$. (see Table 4.11)

Table 4.11

The open culture by the use of technology

	The use of technology	
Open culture	Mentioned	Didn't mention
Mentioned	8	28
Percentage	44.4%	36.8%
Didn't mention	10	48
Percentage	55.6%	63.2%

χ^2 (94, 1) = .36, p = .55

4.5.3 Open Cculture and& Communication Channels

Open culture does not seem associated with communication channels use as open culture appears 26.9% of the time when communication channels appears, whereas only 73.1% of the time when use of communication channels does not. A Chi-square test revealed that open culture is not related to the use of communication channels in the communication process that the increased investment on communication channels in the internal communication process will not help creating the open culture $\chi 2(N = 94, 1) = 1.97$, $p = .16$. (see Table 4.12).

Table 4.12

The open culture by the use of communication channels

	Communication channels	
Open culture	Mentioned	Didn't mention
Mentioned	7	29
Percentage	26.9%	42.6%
Didn't	19	39

mention		
Percentage	73.1%	57.4%

χ^2 (94, 1) = 1.97, p = .16

4.5.4 Open Ceulture and& Information Sharing

Open culture does seem associated with information sharing as open culture appears 60.0% of the time when information sharing appears, whereas only 40.0% of the time when information sharing does not. A Chi-square test revealed that open culture is not related to the information sharing in the communication process that the increased investment on the information sharing in the internal communication process will not help creating the open culture $\chi 2(N = 94, 1) = 1.05$, $p = .31$. (see Table 4.13)

Table 4.13

The open culture by the use of information sharing

	Information Sharing	
Open culture	Mentioned	Didn't mention
Mentioned	3	33
Percentage	60.0%	37.1%
Didn't mention	2	56
Percentage	40.0%	62.9%

χ^2 (94, 1) = 1.05, p = .31

4.5.5 Overall Internal Ceommunication Eeffect

A linear regression with the open culture as dependent variable and internal communication as predictor was conducted. The model was not found to be significant, F (1, 92) = .16, p = .69, $R2$ = .04. The use of internal communication had no significant influence on creating the open culture (β =-.04, p = .69). (see Table 4.14) Since the test was not significant, therefore the hypothesis is rejected that there's no increasing or decreasing trend from the influence of internal communication effort on creating the open culture.

Table 4.14

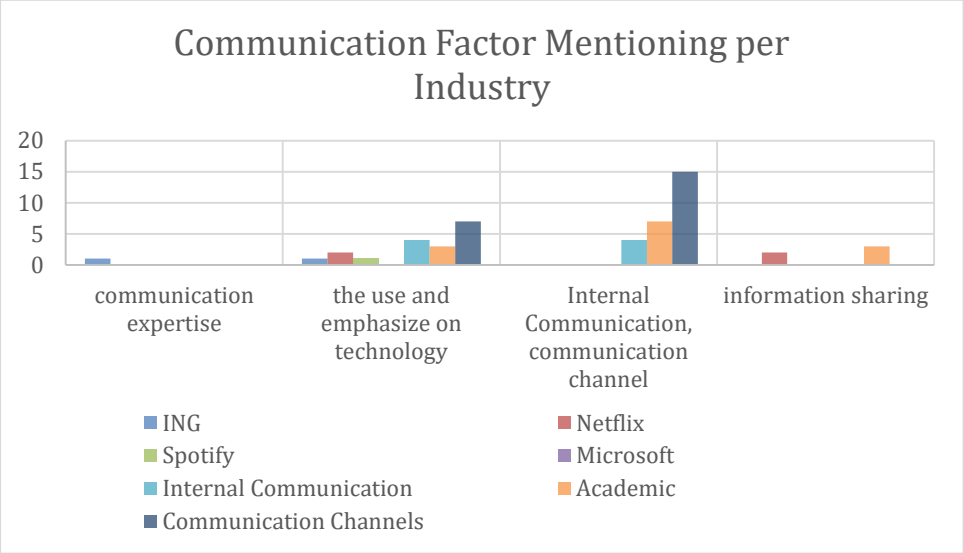
Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.

1	(Constant)	.397	.061		6.474	.000
	Internal Communication	-.026	.064	-.042	-.405	.686

a. Dependent Variable: Open Culture

Table 4.15 Communication Factor Mentioning per Industry



4.6 Exploratory Analysis

Given the lack of support for most of the hypotheses, some exploratory analysis may be appropriate. These analyses involve the coding categories of Agile Terminology, and the application of ADAPT framework.

In the Agile Terminology category, the relations with the use of SCRUM and Sprint were found interesting; and in ADAPT framework category, each variable were tested since they are all relevant in the topic of communication.

4.6.1 Agile Terminology: t~~T~~he M~~m~~ention of SCRUM and~~&~~ P~~p~~ublication Y~~y~~ear

A linear regression with the mention of SCRUM as dependent variable and publication year as predictor was conducted. The model was found to be significant, F (1,90) = 6.60, p = .01, $R2$ = .07. Publication year have significant influence on the decreasing trend of mentioning SCRUM (β = -.26, p = .01). The mentioning of SCRUM significantly goes down 26.1% with the publication year growth. (see Table 4.16)

Table 4.16

Coefficients[a]

	Unstandardized Coefficients	Standardized Coefficients

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	101.037	39.142		2.581	.011
	Publication Year	-.050	.019	-.261	-2.568	.012

a. Dependent Variable: SCRUM

Meanwhile, the ANOVA test revealed a significant main effect for industry groups on the use of SCRUM, F (5, 88) = 12.09, p < .000, partial η2 = .41. Tukey post-hoc comparisons revealed that the banking industry (M = .50, SD = .53) significantly mentioned more SCRUM than literature about Communication Channels (M = .00, SD = .00), p = .03. Tukey post-hoc comparisons also revealed that media and entertainment industry (M = .60, SD = .50) significantly mentioned more SCRUM than literature about internal communication (M = .20, SD = .41), p < .000. Software company (M = .90, SD = .32) also mentioned more SCRUM than internal communication literature, p < .000. Literature about communication channels (M = .00, SD = .00) mentioned SCRUM significantly lower than other industries.

Thus, with the year growth, the mention of SCRUM significantly goes down, and there's significant difference of emphasizing on SCRUM in various industries. (see Table 4.17)

Table 4.17

ANOVA Comparisons of the use of SCRURM from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	.50	.53
Media and Entertainment	20	.60	.50
Software	10	.90	.32
Internal Communication	20	.20	.41
Academic	19	.84	.38
Communication Channels	15	.00	.00

F (5, 88) = 12.09, p < .000, partial η2 = .41

4.6.2 Agile Terminology: t~~T~~he M~~m~~ention of Sprint and~~&~~ Publication Year

A linear regression with the mention of sprint as criterium and publication year as predictor was conducted. The model was found to be significant, F (1, 90) = 5.38, p = .02, $R2$ = .24. Publication year have significant influence on the decreasing trend of mentioning sprint (β = -.24, p = .02). The null hypothesis of year not affecting Sprint mention was rejected that the mentioning of Sprint significantly goes down 23.8% with the publication year growth. (see Table 4.18)

Table 4.18

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	84,398	36,250		2,328	,022
	Publication Year	-,042	,018	-,238	-2,320	,023

a. Dependent Variable: Sprint

Meanwhile, the ANOVA test revealed a significant main effect for industry groups on the use of Sprint, F (5, 88) = 6.99, p < .000, partial η2 = .28. Tukey post-hoc comparisons revealed that the media and entertainment industry (M = .05, SD = .22) significantly mentioned less Sprint than literature about software company (M = .60, SD = .52), p = .01. Tukey post-hoc comparisons also revealed that media and entertainment industry (M = .05, SD = .22) significantly mentioned less Sprint than academic literature (M = .63, SD = .50), p < .000. Software company (M = .60, SD = .52) mentioned more Sprint than literature on communication channels (M = .00, SD = .00), p = .01. Academic literature (M = .63, SD = .50) mentioned SCRUM more than literature about communication channels (M = .00, SD = .00), p < 000. (see Table 4.19)

Thus, with the year growth, the mention of Sprint significantly goes down, and there's difference of mentioning Sprint cross various industries.

Table 4.19

ANOVA Comparisons of the use of Sprint from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	.30	.48
Media and	20	.05	.22

Entertainment Software	10	.60	.52
Internal Communication	20	.30	.47
Academic Communication Channels	19	.63	.50
	15	.00	.00

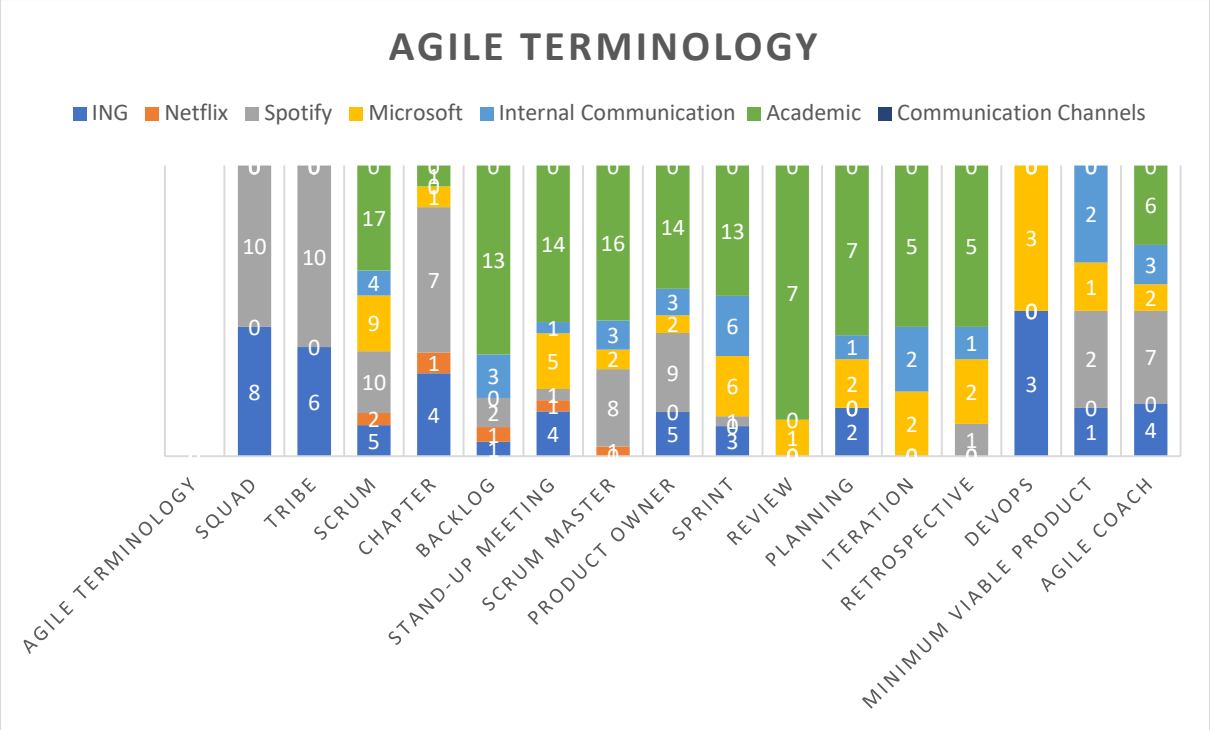
F (5, 88) = 6.99, p < .000, partial η2 = .28

4.6.3 Agile Terminology: Explorer Ff~~f~~indings

Besides those variable, other interesting finding from the Agile Terminology category is that some companies would like to shift the terminology in their own way. For instance, ING named the SCRUM team as 'Squad', while Microsoft named it as 'Ship'; ING named the bigger cluster of teams 'Tribe', and Microsoft named it as 'flag'. This might because the adaption of the company would lead to more intimate of the transformation, which could foster the innovation culture that facilitate the transformation.

Meanwhile, academic literature would like to introduce and explain the terminology case by case, such as indicate in the below graph, academic literature mentioned more Agile terminology such as SCRUM, Backlog, Stand-up meeting, Scrum master, Product owner, sprint, review, planning, iteration, and retrospective. This might result in the requirement of the academic literature, as scholars would like to explain the relevant concepts and dive into details of the theory in the literature review section, which provide more coding in this analysis. (see Table 4.20)

Table 4.20 Agile Terminology Mentioning per Industry



4.6.4 ADAPT Framework: Communication Bbetween Ssites and& Publication Year

A linear regression with the mention of communication between sites as dependent variable and publication year as predictor was conducted. The model was found to be significant, F (1, 90) = 4.51, p = .04, $R2$ = .05. Publication year have significant influence on the increasing trend of mentioning sprint (β = -.22, p = .04), the mentioning of communication between sites significantly goes down with the publication year growth. (see Table 4.21)

Table 4.21

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	78,407	36,771		2,132	,036
	Publication Year	-,039	,018	-,218	-2,124	,036

a. Dependent Variable: Communication between sites

Meanwhile, the ANOVA test revealed a significant main effect for industry groups on communication between sites, F (5, 88) = 3.24, p = .01, partial η2 = .16. Tukey post-hoc

comparisons revealed that the academic literature (*M* = .53, *SD* = .51) significantly mentioned more between sites communication than literature about communication channels (*M* = .20, *SD* = .41), *p* = .04. It also revealed that media and entertainment companies (*M* = .50, *SD* = .51) mentioned between sites communication slightly more than literature about internal communication (*M* = 10, *SD* = .31), *p* = .06. (see Table 4.22)

Table 4.22

ANOVA Comparisons of mentioning Communication between sites problem from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	.10	.32
Media and Entertainment	20	.50	.51
Software	10	.30	.48
Internal Communication	20	.10	.31
Academic Communication Channels	19	.53	.51
	15	.20	.41

F (5, 88) = 3.24, p = .01, partial η2 = .16

Thus, there's the decreasing impact from the publication year on the mention of between sites communication, but there's slight difference among different industries.

4.6.5 ADAPT Framework: Communication Bbetween Tteams and& Publication Year

A linear regression with the mention of communication between teams as dependent variable and publication year as predictor was conducted. The model was not found to be significant, *F* (1, 90) = .12, *p* = .75, *R2* = .00. Publication year have no significant influence on the increasing trend of mentioning communication between teams (*β* = .04, *p* = .75). Meanwhile, the ANOVA test revealed a significant main effect for industry groups on communication between teams, *F* (5, 88) = 2.48, *p* = .04, partial η2 = .12. Tukey post-hoc comparisons revealed that the literature on banking (*M* = 1.00, *SD* = .00) significantly mentioned more between team's communication than literature about media and entertainment industry (*M* = .55, *SD* = .51), *p* = .07. (see Table 4.23)

Thus, no trend between the publication year and communication between teams found, but there's the weak difference between banking industry and media and entertainment industry in emphasizing between teams' communication.

Table 4.23

ANOVA Comparisons of mentioning Communication between teams problem from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	1.00	.00
Media and Entertainment	20	.55	.51
Software	10	.80	.42
Internal Communication	20	.85	.37
Academic	19	.84	.38
Communication Channels	15	.60	.51

F (5, 88) = 2.48, p = .04, partial η2 = .12

4.6.6 ADAPT Framework: Communication Wwithin Tteams and& Publication Year

A linear regression with the mention of communication within teams as dependent variable and publication year as predictor was conducted. The model was not found to be significant, F (1, 90) = .21, p = .65, $R2$ = .00. Publication year have no significant influence on the increasing trend of mentioning communication within teams (β = .05, p = .65). Meanwhile, the ANOVA test revealed a significant main effect for industry groups on communication within teams, F (5, 88) = 3.06, p = .01, partial η2 = .15. Tukey post-hoc comparisons revealed that the literature on banking (M = 1.00, SD = .00) significantly mentioned more within team's communication than literature about media and entertainment industry (M = .45, SD = .51), p = .02. literature about internal communication (M = .85, SD = .37) also significantly mentioned more within team communication than literature about media and entertainment industry (M = .45, SD = .51), p = .05. (see Table 4.24)

Thus, no trend between the publication year and communication within teams found, but there's the weak difference between banking industry, literature about internal communication and media and entertainment industry in emphasizing within teams' communication.

Table 4.24

ANOVA Comparisons of mentioning Communication within team problem from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	1.00	.00
Media and Entertainment	20	.45	.51
Software	10	.60	.52
Internal Communication	20	.85	.37
Academic	19	.79	.42
Communication Channels	15	.67	.49

F (5, 88) = 3.06, p = .01, partial η2 = .15

4.6.7 ADAPT Framework: Knowledge ~~and~~, I~~i~~nformation S~~s~~haring and~~&~~ Publication Year

A linear regression with the mention of knowledge and information sharing as criterium and publication year as predictor was conducted. The model was not found to be significant, F (1, 90) = .00, p = .93, $R2$ = .00. Publication year have no significant influence on the increasing trend of mentioning knowledge and information sharing (β = -.01, p = .93). Meanwhile, the ANOVA test revealed a significant main effect for industry groups on knowledge and information sharing, F (5, 88) = 5.64, p < .000, partial η2 = .24. Tukey post-hoc comparisons revealed that the literature on banking (M = .90, SD = .32) significantly mentioned more knowledge and information sharing than literature about media and entertainment industry (M = .40, SD = .50), p = .03. Literature about media and entertainment industry (M = .40, SD = .50) also significantly mentioned less knowledge and information sharing than academic literature (M = .89, SD = .32), p = .00, and less than literature about communication channels (M = .93, SD = .26), p = 00. Software company (M = .40, SD = .52) also found less knowledge and information sharing mention than academic literature (M = .89, SD = .32), p = .03, and less than literature about communication channels (M = .93, SD = .26), p = 02. (see Table 4.25)

Thus, no trend between the publication year and knowledge and information sharing found, but there's the significant difference between banking industry, media and

entertainment industry, software industry, academic literature, and literature about communication channels.

Table 4.25

ANOVA Comparisons of mentioning knowledge and information sharing from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	.90	.90
Media and Entertainment	20	.50	.40
Software	10	.52	.40
Internal Communication	20	.44	.75
Academic	19	.32	.89
Communication Channels	15	.26	.93

F (5, 88) = 5.64, p < .000, partial η2 = .24

4.6.8 ADAPT Framework: Communication Ttools and& Publication Year

A linear regression with the mention of communication tools as criterium and publication year as predictor was conducted. The model was not found to be significant, F (1, 90) = .05, p = .81, $R2$ = .00. Publication year have no significant influence on the increasing trend of mentioning communication tools (β = -.02, p = .81).

Meanwhile, the ANOVA test revealed a significant main effect for industry groups on the emphasize of communication channels, F (5, 88) = 10.32, p < .000, partial η2 = .14. Tukey post-hoc comparisons revealed that the academic literature (M = .79, SD = .42) significantly mentioned more communication tools than the banking industry (M = .30, SD = .48), p = .03. Academic literature (M = .79, SD = .42) also mention the importance of communication tools significantly more than the media and entertainment company (M = .15, SD = .37), p < .000, and software company (M = .30, SD = .48), p = .03. Meanwhile, literature about communication channels (M = 1.00, SD = .00) significantly mention more communication tools than literature about business industry, such as the banking industry (M = .30, SD = .48), p = .00, media and entertainment industry (M = .15, SD = .37), p < .000, and software industry (M = .30, SD = .48), p = .00. Literature about internal communication and

change management (*M* = .60, *SD* = .50) mention communication tools more than the media and entertainment companies (*M* = .15, *SD* = .37), *p* = .01. (see Table 4.26)

Thus, no trend between the publication year and the emphasize on the use of communication tools found, but there's the significant difference between industry groups.

Table 4.26

ANOVA Comparisons of mentioning the use of communication tools from Industrial Group

Group	*n*	Mean	*SD*
Banking	10	.30	.48
Media and Entertainment	20	.15	.37
Software	10	.30	.48
Internal Communication	20	.60	.50
Academic	19	.79	.42
Communication Channels	15	1.00	.00

F (5, 88) = 10.32, p < .000, partial η2 = .14

4.6.9 ADAPT Framework: Feedback Lloop and& Publication Year

A linear regression with the mention of feedback loop as criterium and publication year as predictor was conducted. The model was not found to be significant, *F* (1, 90) = .06, *p* = .80, *R2* = .00. Publication year have no significant influence on the increasing trend of mentioning feedback loop (*β* = -.03, *p* = .80). Meanwhile, the ANOVA test revealed a significant main effect for industry groups on the emphasize of feedback look, *F* (5, 88) = 2.89, *p* = .02, partial η2 = .14. Tukey post-hoc comparisons revealed that the literature on communication channels (*M* = .93, *SD* = .26) significantly mentioned more communication tools than literature about media and entertainment industry (*M* = .40, *SD* = .50), *p* = .02. (see Table 4.27 and Table 4.28)

Thus, no trend between the publication year and the emphasize on feedback loop found, but there's the significant difference between the literature on communication channels and media and entertainment industry in the use of communication tools.

Table 4.27

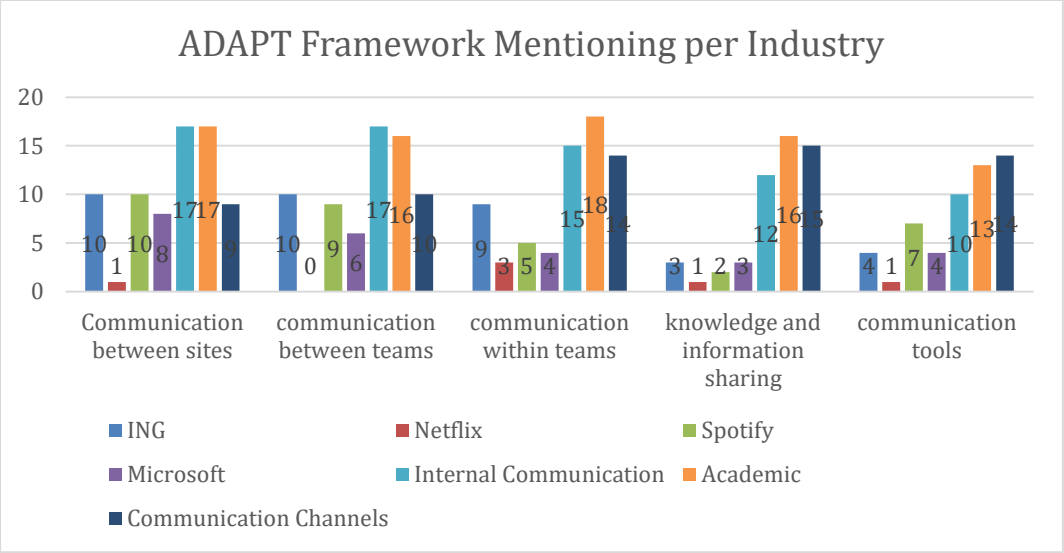
ANOVA Comparisons of mentioning feedback loop from Industrial Group

Group	*n*	Mean	*SD*

Banking	10	.40	.52
Media and Entertainment	20	.40	.50
Software	10	.40	.52
Internal Communication	20	.50	.51
Academic	19	.63	.50
Communication Channels	15	.93	.26

F (5, 88) = 2.89, p = .02, partial η2 = .14

Table 4.28 ADAPT Framework Mentioning per Industry



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5. Discussion and Conclusion

To answer the research question of what is the role of communication in the Agile transformation process, there are two sub-questions in this study: RQ 1: what are the internal communication factors lead to successful Agile transformation case; RQ 2: what are the communication artifacts lead to successful Agile transformation case. 95 pieces of literature were gathered for this study from a variety of data sources, and six industries were covered: banking, media and entertainment, software, internal communication and change management, academic literature, and communication channels. In order to answer the RQ and sub-RQs, six hypotheses were formed to study different aspects of the topic, and various test and comparison were conducted to answer the research question.

Firstly, the hypothesis of creating an open culture (H1) is important for organizational transformation; it will appear prominently (> 50%) of the literature has been tested, and the result partially support the hypothesis that creating an open culture is vital in the transformation process. While interestingly, it didn't appear prominently of the literature, but revealed the difference among industrial groups: media and entertainment industry, and software industry tends to emphasize more about creating the open culture, while academic literature on the topic of Agile transformation mentioned this less, and the literature on communication channels and internal communication mentioned this the least. The result partially meets the theory that emphasizing on open culture is important for the transformation (Westerlund & Leminen, 2011), and that different industry has different emphases (Hogan & Coote, 2014). This study found that media and entertainment company, and software company tend to emphasize the importance of the open culture more. This might result in that various factors act differently in different industries, i.e., different industry has different emphases. Also interestingly, as software company tend to emphasize on more technical aspects of work, the highlight of open culture demonstrates the importance of social aspects of the transformation as well.

Secondly, the role of leadership support (H2) was found not significant for the transformation, and among the scope of this study, the various emphasizes on the role of leadership support is slightly different. The result contradicts to the theory of leadership support should help facilitate the transformation process (Gandomani, Zulzalil, & Nafchi, 2014), while that might because leadership support is already part of the factor in creating open culture according to Chen, Lin, Lin and Mcdonough (2012). As the role of open culture has been verified in the previous test, additionally emphasize appear unnecessary. Meanwhile, the result also applied to the industries difference and cultural difference. Firstly,

there's different cultures in different industries, such as in the Internet and software industry the organizational culture tends to be more flexible compared with other traditional industry (Datta & Roy, 2011). With the limited scope of this study which covers more media and entertainment industry and software industry, the result of under-estimated importance of leadership support should be expected. Meanwhile, the social distance -- societal power distribution and social hierarchy are interesting to consider. As in the Asian country, there is more power distance compared with European countries, which results in the high hierarchy in the organization (Oh, Guay, Kim, Harold, & Shin, 2014). The high hierarchy leads to the importance and admiration of the leadership, of which the leadership support will be vital in the decision-making process (Liu & Liao, 2013). Due to the limitation of this study, the lack of comparable literature explains the reason why the results contradict with the theory, but leave more hint for the future study. Thus, if the study will include more literature to compare internet industry with other traditional industry, and include literature about Asian company, the result will be interesting to investigate on how different factors will interact.

Thirdly, with the increasing attention on the use of technology (H3 and H4), this study found that there's no significant difference among how different industries use technology in their communication; but in the area of internal communication and change management, and communication channels, there are more emphasize on using diverse media channels with high technology. This finding partially rejects the study of EY (2013) that media and entertainment company will use more technology in their communication process (H3), but provide insight on how to use diverse media channels with high technology (H4). According to the sample of this study, gamification proved to be efficient regarding engaging with young employees (Kamasheva, Valeev, Yagudin, & Maksimova, 2015), and traditional channels still function well when sending messages in the company with multiple locations worldwide. Though there's no significant difference among industries found, but the importance of the diverse use of technology and communication channels are the interesting finding of this study, which also facilitate the interaction of change management factors.

Fourthly, internal communication effort will effectively boost employee engagement, while it will not help to build the open culture (H5 and H6). By analyzing the effect of the amount of communication expertise, the use of technology, the use of communication tools, and information sharing, the result shows that the combined internal communication effort will engage employees (H5), while it will need additional support to build the open culture (H6). Merely improved single aspect won't lead to improvement. This might result in the optimize relations between internal communication and employee engagement that build

perception of support and identification among employees require great internal communication effort (Karanges, 2014). While as analyzed above there are no significant relations between leadership support and the transformation process, which has been argued as a primary element for creating the open culture (Wildermuth & Pauken, 2008). This explains the insignificant result from this study that internal communication effort will not help to build the open culture since the leadership support has not proven to be effective in this study. Thus, internal communication has found optimize relations with boosting employee engagement.

Fifthly, when mentioning the Agile terminology in the Agile transformation process (Exploratory analysis), it's interesting to observe that there's the decreasing trend of mentioning Agile terminology in the communication. For instance, SCRUM and Sprint were found significantly go down with the year growth. Though difference among industries found such as software industry tend to mention more Agile terminology, but in general, there's decreasing trend and the terminology will only be briefly explained in the communication process. The reason for more terminology mentioned in software industry might result in Agile is originated from the software industry in the engineering team, software industry appears more familiarity with the Agile way of working compared with other industries. Academic literature also mentioned more Agile terminology compare with other groups, while that might because with the essence of academic-industry is to explain everything clearly, those terminologies are explained to continue the literature. In general, there's decreasing trend of Agile terminology mentioned in the literature of this study. With less professional Agile terminology mentioned, less confusion will be reached, which proved to help the communication in a large organization. Especially in the transformation process which the common understanding is vital to form in the beginning phase (McKay, 2012). Interestingly, when adopting the Agile transformation, some companies would like to change the terminology into their own feature, such as ING name their own 'Squads' and 'Tribes'. By doing this, more sense of belonging and familiarity will be created, which further facilitate the scaled Agile practice (ing.com, 2017). Thus, overall there's the decreasing trend of mentioning professional Agile terminology in the communication, but in the special industry such as the software industry, some adjustment could be observed.

Sixthly, when applying Agile transformation in the multi-site organization, some aspects of communication in the ADAPT framework has been analyzed. Though a slight difference in the trend of describing the communication problems with the year growth could be found, there is an interesting comparison in different industries that different problems

have been emphasized. Regarding communication between sites, there's decreasing trend of mentioning this problem cross industry, while media and entertainment industry, and academic literature address this problem more often than other industries. But on the team level communication (communication between teams and communciation within team), banking industry addressing communication between and within teams more than other industries. Literature about communication channels emphasizes more on the way of communication such as how to use communication tools and how does the knowledge and information-sharing work. According to Artz (2016), the development of transnational media corporations has radically changed the way how communication product has been produced and distributed, which explains the phenomenon of emphasizing communication between sites' problem in the media and entertainment industry. On the team level, since this study collects how ING, works in the Agile transformation to develop a new mobile application, the communication on team level has been emphasized as showcasing how did the Dutch branch successfully implement Agile. As there are lots of description of how did the team corporate with each other, communication between and within team problem have been addressed more often than other literature. Lastly, since the literature on communication channels take the view of analyzing the communication problem, the focus is on how to use and facilitate communication generally, which explain why the knowledge and information-sharing and communication tools have been addressed in the literature about communication channels. In a word, different industries emphasize different aspects of communication problem, some are overlapped but some are taking a different perspective. Overall they have a mutual influence on the final result and communication topic.

5.1 Conclusion

In conclusion, to answer the research question of what is the role of communciation in the Agile transformation process, two aspects are taken in consideration: what communication factors and artifacts that lead to successful Agile transformation. After conducting quantitative content analysis based on 95 articles, firstly, the factors lead to successful Agile transformation including the combined effort of the amount of communication expertise, the use of technology, the use of communication tools, and information sharing to increase employee engagement. Meanwhile, use less Agile terminology and create an open culture are vital for the successful transformation. While in general, there's no prominent influence of open culture and leadership support found in this study that they didn't appear greater than 50% of the literature. Secondly, there should be

emphasized on the diverse use of internal communication channels and the use of technology to engage with more employees to facilitate the transformation. Though there's lack of sample to analysis on how different tools influence different stage of scaled agile practice, the emphasize on the use of high technology in various internal communication channels appear interesting. Among different industries, different communication problems have been emphasized such as banking industry would highlight team level communication issues more.

In a word, the role of communication in the Agile transformation process is important: efficient internal communication will help with engaging employees by effectively using internal communication tools with high technology to create the open culture. And different industries have different emphasize on communication problems, but there's an obvious trend of mentioning less Agile terminology to reduce confusion. Each factor works corporately in the transformation process, such as the human aspect of employee engagement, and technical aspect to build the final product. The Actor-Network Theory and Socio-Technical Systems theory help to analyze the Agile transformation process especially in the interaction between different organizational factors, while there should be more attention on studying the specific focusing area on the industrial base. Actor-Network Theory and Socio-Technical Systems theory help analyzing the interaction between different organizational factors in Agile transformation process, while there should be more attention on studying the specific focusing area on the industrial base. The effect is mixed that regarding the open culture and leadership support, the insignificant results revealed that if the technology aspect is highly valued in the development, the socio aspect downplay their importance. But since the data are fully online, some reality of Agile transformation might not be fully captured.

5.2 Practical Iimplication

The finding of this study indicates that there should be more technology used to engage with employees, especially when the company consists of more young people (Daiga, 2015). A popular method such as gamification or mobile application suggested in the literature (Knutas, Ikonen, Maggiorini, Ripamonti, & Porras, 2014) could be interesting to invest in. The use of gamification and mobile application increase the attachment with employees as people are spending more time on their mobile device (Salehan & Negahban, 2013), develop mobile application and online game provide effective channels to communicate with employees. Secondly, less confusing terminology in the communication process will effectively reduce misunderstanding which facilitates the transformation process

(McKay, Kuntz, & Näswall, 2013). As Agile is a very professional area, the effort on training and education is important for future development. Internal communication should focus on how to create an awareness of change rather than only mentioning Agile terminology. Lastly, each industry has a different focus area and problem, the organization should use its internal communication channel to focus on the priority and most important problem, instead of covering all. As a way to solve the problem of communication between sites is different to deal with team level communication, there should be a focus on the specific problem in the communication process.

5.3 Limitation and Ffuture Sstudy

The limitation of this study is from two aspects: data collection and method. Firstly, there should be more data to focus on different industrial groups and cultural groups. As analyzed above, it would be interesting to investigate whether there's a difference between traditional industry and internet industry. For instance, whether traditional industry will emphasize on the leadership support more than internet industry because of their high hierarchy structure, and whether companies from Asian countries will value leadership support significantly important compare with their European counterpart. Also, the culture difference influences the result as well, such as to what extent will the leadership support influence the transformation rooted in how people consider the importance of leadership, power distance differs in cultures which will influence the result of this study. It would be interesting to gather more data to focus on industrial comparison or cultural comparison. Secondly, the method could improve by doing a combined method study: some qualitative analysis should be included in this study. Interviewing Agile team in the organization (both teams lead to team members, and other people who didn't practice Agile in the organization) and Agile consultant could help with gathering in-depth feedback from communication expertise or Agile consultant to know how does the transformation work and could help form the answer of which communication channel is more effective in a different phase of the transformation. The qualitative content analysis could help with analyzing how to describe the specific aspect, for instance how to describe the Agile terminology to reduce misunderstanding in the communication process. Also, the insightful input generate from interview might also reveal why the linkage (i.e. significant findings) were not found through articles. From different perspectives, people might experience the dynamics hidden in some cases that academic or grey articles ignored.

~~Word count section 5: 2495~~

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Appendix

Appendix A: Agreement on the data collection precision

Q1: Is this article really talking about creating the open culture?

Article Q1

Article	Coder 1 (original code)	Coder 2
Banking 1	-	+
Banking 2	+	+
Media and Entertainment 1	+	+
Media and Entertainment 2	+	+
Software 1	+	+
Software 2	-	-
Internal Communication and Change Management 1	-	+
Internal Communication and Change Management 2	+	+
Academic 1	+	-
Academic 2	+	+
Communication Channels 1	-	-
Communication Channels 2	-	-

And the agreement rate for Q1 is 9/12= 75.0%

Q2: Is this article really talking about leadership support?

Article Q2

Article	Coder 1 (original code)	Coder 2
Banking 1	+	-
Banking 2	-	-

Media and Entertainment 1	-	+
Media and Entertainment 2	-	-
Software 1	-	-
Software 2	-	-
Internal Communication and Change Management 1	-	+
Internal Communication and Change Management 2	+	+
Academic 1	+	-
Academic 2	+	+
Communication Channels 1	-	-
Communication Channels 2	-	-

And the agreement rate for Q2 is 8/12= 66.7%

Q3: Is this article really talking about the use of technology?

Article Q3

Article	Coder 1 (original code)	Coder 2
Banking 1	-	-
Banking 2	-	-
Media and Entertainment 1	+	+
Media and Entertainment 2	-	-
Software 1	+	+
Software 2	+	-
Internal Communication and Change Management 1	-	-

Internal Communication and Change Management 2	-	-
Academic 1	-	+
Academic 2	-	-
Communication Channels 1	+	-
Communication Channels 2	-	-

And the agreement rate for Q3 is 9/12= 75.0%

Q4: Is this article really talking about employee engagement?

Article Q4

Article	Coder 1 (original code)	Coder 2
Banking 1	-	+
Banking 2	+	+
Media and Entertainment 1	-	-
Media and Entertainment 2	-	-
Software 1	-	-
Software 2	-	-
Internal Communication and Change Management 1	-	-
Internal Communication and Change Management 2	-	-
Academic 1	+	+
Academic 2	+	+
Communication Channels 1	+	-
Communication Channels 2	-	+

And the agreement rate for Q4 is 9/12= 75.0%

Q5: Is this article really talking about the amount of communication expertise?

Article Q5

Article	Coder 1 (original code)	Coder 2
Banking 1	-	-
Banking 2	-	-
Media and Entertainment 1	-	-
Media and Entertainment 2	-	-
Software 1	-	-
Software 2	-	-
Internal Communication and Change Management 1	-	-
Internal Communication and Change Management 2	-	-
Academic 1	-	-
Academic 2	-	-
Communication Channels 1	-	-
Communication Channels 2	+	-

And the agreement rate for Q5 is 11/12= 91.7%

Q6: Is this article really talking about the use of communication channels?

Article Q6

Article	Coder 1 (original code)	Coder 2
Banking 1	-	-
Banking 2	-	-

Media and Entertainment 1	-	-
Media and Entertainment 2	-	-
Software 1	-	-
Software 2	-	-
Internal Communication and Change Management 1	+	+
Internal Communication and Change Management 2	+	-
Academic 1	+	-
Academic 2	+	+
Communication Channels 1	+	+
Communication Channels 2	+	+

And the agreement rate for Q6 is 10/12= 83.3%

Q7: Is this article really talking about information sharing?

Article Q7

Article	Coder 1 (original code)	Coder 2
Banking 1	-	-
Banking 2	-	-
Media and Entertainment 1	-	-
Media and Entertainment 2	+	+
Software 1	-	-
Software 2	-	-
Internal Communication and Change Management 1	-	-

Internal Communication and Change Management 2	-	-
Academic 1	-	-
Academic 2	-	-
Communication Channels 1	+	-
Communication Channels 2	+	+

And the agreement rate for Q7 is 11/12= 91.7%