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HOW BUSINESS REQUIREMENTS COMMUNICATE WITH TECHNOLOGY IN SOFTWARE DEVELOPMENT

Case: Integrify Oy

LAB UNIVERSITY OF APPLIED SCIENCES LTD
Bachelor of Business Administration
Business Information Technology
Autumn 2020
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Abstract

Author(s)	Type of publication	Published
Nguyen, Quang Minh	Bachelor's thesis	Autumn 2020
	Number of pages 54	

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Abstract

In the rush-to-market livelihood, some start-up companies pay less attention to the analysis phase for the project. It is one of the factors that can save the repairing cost of the final delivery. For building an application that matches customers' expectations and brings value to the business, the developers should understand clearly the business objectives and goals. Thus, the transferring business requirements process to the development team is crucial to the initial phase before the implementation phase.

The thesis's case study for the development idea is Integrify. A software development company, which provides talent services through training software development and machine learning programs for international talented people. Besides, they also provide consulting services. The thesis aims to help Integrify to enhance the process of transferring business requirements to developers. As they are a small company with a vision mission to grow their business and have a strong consultant team to get more complex and larger projects. Therefore, the developer can build their experience in software development through challenges.

The method used in the thesis is qualitative research, with an in-depth interview for gathering data. The interview is taken from both stakeholders of Integrify and external stakeholders from different companies. Thus, the understandings of different perspectives and experiences in the transferring process. The target groups are people working in three main role groups, such as project manager/product owner/project lead, developer, quality assurance/tester. To answer the main research question, the process diagram of transferring the business requirements of Integrify was illustrated from the interview with internal stakeholders. Along with three sub-questions are generated to support the research topic based on different stakeholders' experiences sharing.

The research findings suggest the involvement and communication of Integrify's internal process, and resources need. Additionally, the new way of documenting the business requirements as well as their content are given in the recommendation.

Keywords

Business requirement, Information Technology, Communication, Software development, Qualitative research, In-depth interview

CONTENTS

1 INTRODUCTION

The world’s technology is changing rapidly every year. Big data market revenues for software and services are predicted to grow from $42B in 2018 to $103B in 2027. The number reaches 10.48% of the Compound Annual Growth Rate. (Louis Columbus 2018.) As a result of the human generation development wants to improve the technology over the last and keep enhancing old the version to support their life. For example, it will be easier and more convenient to communicate, pay bills, and so on. Thus, the demand from users is also increasing when technology has become part of their life. This leads many companies to rush completing projects and delivering many new features to keep up with the market and satisfy their users (Taylor 2003, 74).

Due to the rush-to-market livelihoods from particular industries, many projects have come to the failure stage with fast decision-making without a careful estimation that should be done before the product design phase (Taylor 2003, 74). Analyzing the needs and tendencies of the feature will help involved people understand more about the project. Such as what the feature is about, why it should be done, for whom it will deliver to, and how to implement it. In some organizations, building the system by starting to write code to construct the product in the first place and based on that, the requirements are defined and refined. The result may or may not bring the company to get closer to the market window. In contrast, the cost of repairing all the problems would be more expensive than the phase of planning and analyzing in advance (Taylor 2003, 74). In all, the quality of the final product will be poorly passed to customers.

Furthermore, the involvement in communication makes sure that the development team understands clearly the requirements are important to project success. Although the requirements are documented in detail, the step of transferring is not clear and concentrated will lead to confusion for developers. As the result, the delivery from the team may go completely off from the initial requirements. Moreover, the lack of good communication in a transferring process may cause a misunderstanding problem when implementing the features. The reason comes by providing much information to the developers at once.

According to the problems mentioned above, the internal communication phase to analyze and estimate the requirements with stakeholders and transfer to the development team plays a vital role in the software development process. Having a good communication planning process will bring a clear understanding of the project objectives to parties involved in the project.

The thesis will focus on researching the internal process and communication phase when business requirements are transferred to the project development team within an organization, Integrify Oy.

1.1 Research motivation

The research motivation is related to non-effective communication when transferring business requirements among stakeholders. The idea starts when the author was doing an internship in an organization, where the process of transferring business requirements has not been passed by documentation but through discussion and meetings. Through short oral transferring requirements, the development team could not understand the whole scope of the project. This is a huge problem that leads to project failure.

Another aspect that inspired this research is because it is relevant to a bachelor's degree in Business Information Technology. It is a combination of business and information technology. Besides, the research outcome will fulfill the desire to understand the relationship, the common communication means between the business and the development team. Additionally, the hidden process before the software is brought to the customers.

The commissioner of the thesis, Integrify, has done many mini-projects for the training courses as well as some consulting service projects for clients. Moreover, Integrify wants to improve its process efficiently without duplicating phases in the transferring business requirements process. Thus, it is easier to do some research on problems that Integrify may face by having insightful perspectives from the internal resources of the company.

1.2 Thesis structure

This thesis is divided into four main sections, which consist of seven chapters with their topic. Each section covers the main discussions that will support this research paper.

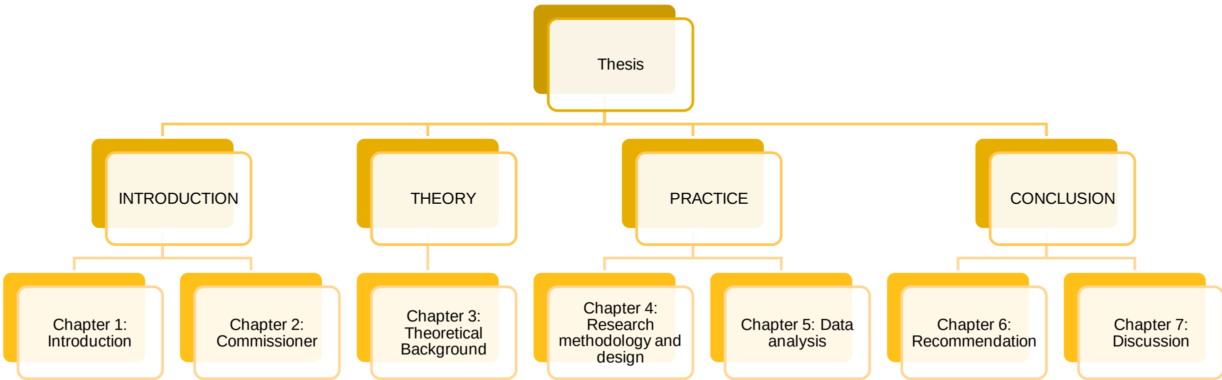

Figure 1. Thesis structure

The introduction section includes chapter 1, which describes common problems that most companies would have and the background of the thesis. The research motivation will also be defined in the first chapter to answer where the idea of the research comes from. The second chapter contains the commissioner, research objectives, and research questions. They describe the general background of the commissioner, define the main questions, and secondary questions to support the achievement of this research.

The second section provides the theoretical background that helps readers easier to follow the concept of the research. Moreover, it accumulates more knowledge after researching about the related topics. The definition of business requirements, software development structure, internal communication, and the impacts of business requirements on the development team are covered in chapter 3.

The next section will be the thesis practice, which contains chapter 4 and chapter 5. Chapter 4 demonstrates how the research has been designed and which research method is used. The goal is to come up with the results and suggestions for the commissioner to improve in the long term. The following chapter is the data analysis, which consists of research data and research analysis. The data in this research is gathered from internal information in Integrify and used to analyze the challenges and problems that the company is facing.

The last section is the thesis conclusion, which is divided into two parts. The recommendation on the process of Integrify when planning and transferring requirements to the developers. Additionally, a summary of all the discussion has been done in the thesis, as well as self-reflection on the thesis work.

2 COMMISSIONER AND RESEARCH DESIGN

This study was commissioned by the organization that the author is currently working as a full-stack developer. The information about the commissioner was gathered mostly from the main website of the company, during the training at Integrify, and through the discussion with a growth leader of the company. Integrify is a software development company, founded in 2016 in the middle of the refugee crisis when it reached its peak. The company is building and developing with a mission to teach talented immigrants software development and machine learning and help to connect them with work. Exploiting the full potential of talented immigrants in the software development area and the shortage of software developers in the job market. Integrify is currently operating two sides of the business. The non-profit association where they provide the education for talent immigrants and integration services, called Integrify Ry. The other side is Integrify Oy, which focuses on information technology and offers talent and consulting business. Two fronts have been building and working together as one until now. After the training program, the students will be part of the talents and consulting services that work for client companies and bring the profit for the company.

At the end of each training program, students will work with mini-projects from client companies. The purpose is to create a practical environment where they can apply the knowledge from the training program to the real-life project. On the other hand, the company will prove the quality of the developers from courses to the clients, and they can also see the potential of the developers to hire them after the course ended. Besides receiving limited mini projects for students, Integrify started their consulting business six months ago when the new CTO joined the company. With the advantages of training and having so many talented developers, the company decided to expand the company and focus also on the consultant front to push the business of the company and gain more profits.

The company currently has two programs with many courses. One of the programs is “Full stack”, where students have the fundamental background of software development and willing to learn more in the field. The “Machine learning” for high skill in computer science background and engineering from students who apply to the course. The vision of the company for focusing on the consulting side is to have four “Full stack” courses per year and choose one to two best students from the course. The chosen students are assessed through the performance during the training program and technical interview at the end of the course to be part of the consultant team. The size of the company is small, but the ambition is big, and it has a clear vision for building and developing the business as well as the internal process of planning projects received from clients and transfer it to the development team. The goal of the company is to get bigger and more complex projects for the consultant team to help them develop themselves in their career path. The experience gains from working with many challenges to improve problem-solving skills.

Not only receiving projects from clients as consulting services, but Integrify also has its product to manage internal students from different courses. The system follows their activities on the assignments and reviewing knowledge tests. Besides, it can also manage applicants who want to be part of the talent services. The project is managed by the CTO of Integrify and has identified some business requirements for the application. Choosing Integrify as a study case for this research paper is a good idea because the company is a small company building and developing their business. Thus, the suggestions for Integrify to improve the process of project planning and implementing steps are encouraged.

2.1 Research objectives

The thesis aims to understand the internal process of transferring business requirements to the development team and the communication among teams within an organization. As technology has been developing very fast with high customer demand, the failure in projects happens in most organizations. The reason comes when they want to build fast projects to meet customer satisfaction. Moreover, they want to be the first that got the technology trend among its competitors by focusing on the product design, and neglect the importance of the analysis phase, as well as documenting the requirements of the projects and features precisely (Taylor 2003, 221).

Integrify has satisfied its clients by providing many high-quality projects and has been building the business model and proving their capabilities to the market and their clients. Starting from when receiving the requirements from their clients then analyze, document those requirements to the implementation phase to bring the final product for end-users. Moreover, the company is in the progress of expanding the consulting side, which focuses on doing more projects for clients to make profits instead of some limited projects done by the students at the end of each program. Thus, it is a suitable time to recall the process status of previous projects, analyze and figure out challenges with internal communication among teams. Especially, in the planning phase for the project requirements and implement the project. Finding the solution and improving the problem to deliver projects to the clients on schedule with high quality. The company may have found a way to communicate with each other within an organization. However, in the long run, especially when the company is about to do consulting for their clients with lots more projects with different levels of complexity. Having all the requirements documented after a precise analysis phase, that can be managed and easier for other teams to understand the requirements, is important to the company.

The thesis discusses insightful research of Integrify about the communication process to find out the best way that the development team can understand the requirements precisely. Besides, the knowledge of how other mature companies transfer the business requirements to the development team as well as experiences from failures to success is acquired. Through this, the best practice for creating a successful project will be suggested and how requirements content should be documented derived from the project goals and objectives to the company where the thesis worker is currently working. As project goals and objectives should not be overly ambitious but precise and unambitious so the requirements can be realistic, consistent, and complete (Ewusi-Mensah 2003, 57). Therefore, companies could understand and should pay more attention to the planning, analysis activities when starting the project in the future.

2.2 Research questions

The main objective of this research is to have an insight into the handover business requirements process to the development team, the experiences, and the challenges the company faces during the process. To understand and help the company to improve the process, the author will analyze the current process and take different stakeholders and people involved in the project perspective who have experiences from doing projects for Integrify's clients.

Seeing the objective of the study, the target of this thesis will be achieved by answering

- Main research question: **How are business requirements transferred to the development team within a project?**
    - Secondary questions which will appear on the journey of answering the main question as support means:
        - What are the benefits of understanding and documenting business requirements?
        - What are the challenges that each party has in the process of transferring business requirements?
        - How does the result meet the initial business requirements?

3 BUSINESS REQUIREMENT AND THE STRONG CONNECTION WITH THE SOFTWARE DEVELOPMENT TEAM THROUGH COMMUNICATION

The thesis's discussions might have specialization terminology in the software development area. Thus, this chapter will cover all the theoretical background of the study and the key concepts to fill the knowledge gap.

The theoretical framework of this thesis contains relevant knowledge of business requirements, software development structure, and communication while doing the analysis activities. Especially, the impact of business requirements on the development team during the transferring business requirements process. Without a clear understanding of the business requirements of the project or features, there would be a potential problem that the initial requirements cannot be accomplished as expected. This is crucial to Integrify when making a move to expand and focus on the consultant area, which will require an increase in the number of developers in the consultant team. Make sure that the project team understands the requirements and the vision of the product to keep the inspiration of them as well as implement the feature/project on the right path.

3.1 Business requirements

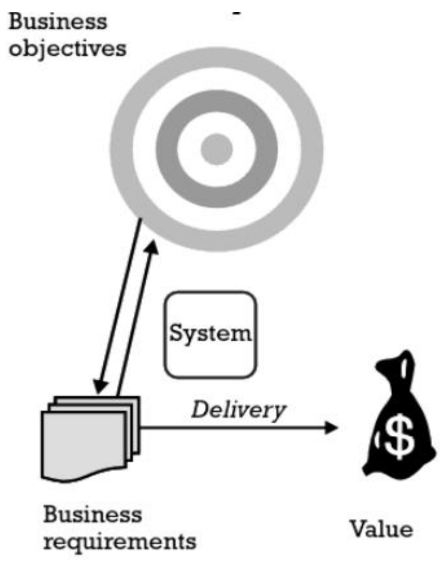

Figure 2. Requirement definition (Robin 2004)

As Robin's (2004, 3) explanation from figure 2, requirements are what deliveries should be brought out to provide value. The source of value will change correspondingly to the type of requirements, however, by fulfilling an objective, it also means that the value is achieved. This will explain business requirements are the achievement of business value when business objectives are met by the system as a means. The system here is neither related to computer hardware nor software but its function as a means of delivery. The layout of business requirements will be high-level goals of customers' expectations to achieve the project.

To ensure delivering the highest value to the organization's customers, acquiring knowledge of the true problem or business need is necessary when operating a company. Only when the true business need is clearly formed, it is easier to start determining the best way to proceed with the construction on building a solution and how that solution is implemented. For instance, the future mission of Integrify is to focus on consulting works, that define and plan the project in collaboration and build the solution for their clients. Thus, understanding the key concept of business requirements and the importance of having them will help the company to deliver high-quality solutions that match the initial clients' requirements and gain more customer satisfaction.

3.1.1 Transferring business requirements

In this thesis, the main focus is to acquire knowledge of the process of how business requirements are transferred to the development team. Thus, understanding the term transfer here is important to the background of the research paper. "Transfer business requirements" means the activity of handing over what customers want the application would be with the project vision and the project objectives, along with stakeholders' objectives to the development team. Another aspect of transferring requirements is to base on them and turn the written requirements to the visual and functional application that customers and users can interact with. The process of transferring business requirements also means sharing the tacit knowledge to every development team member that becomes an explicit knowledge. The sharing can be complicated due to the business requirements just being known by some stakeholders within an organization, the knowledge could contain knowledge that the receiver doesn't understand, and it needs to be in the common language that brings everyone on the same page (Universal class 2020).

3.1.2 Business requirements in the project life cycle

Every project will have the life cycle of processes to follow and manage the activities that occur within the project. The process repeats as many times as needed but does not happen once when it will be one step closer to the completion of the project (Luckey & Phillips 2006, 19). If the previous phase has some problems that cannot be moved forward to the next phase, then it should track the previous phases to find the root cause and repeat the activities to solve the problem.

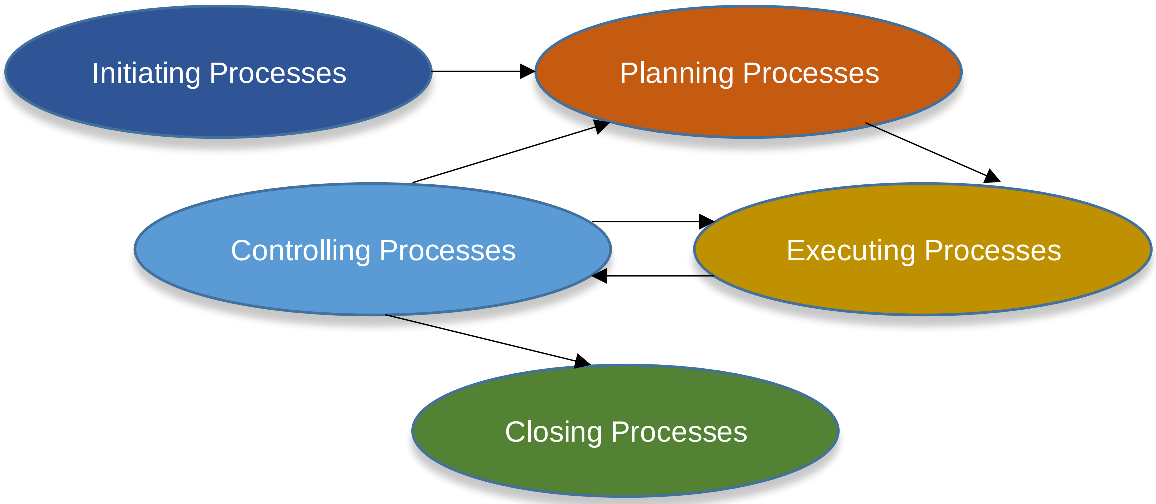

Figure 3. Process group (Teresa & Joseph 2006)

Figure 3 demonstrates the processes of software development projects which start from the software innovation to the final closing process and deliver the product to customers. Different types of projects will have some changes in processes from the typical processes as shown in figure 3 (Taylor 2003, 40). Those processes are important to the success and completion of the project but in this research, the planning process would be more paid attention, where the business requirements are represented.

Business requirement gives the view of business which describes what goals, visions of the project will be in the future and why it is worth being accomplished (Moira Alexander 2019). However, business requirements are high-level information that neither includes technical nor instructing how problems are solved. Recognizing the benefits achieved from understanding the key concept of business requirements, they also need to be written down clearly. Additionally, providing enough content with a good format would help the transferring phase to other teams easier.

Business requirements content

The business requirements will create a tight connection among people involved in the project. They can be internal or external stakeholders and the project team. Business requirements are the source of documentation to provide all the answers related to the project that helps to achieve business objectives. Thus, the content of business requirements should cover the answer for four main typical questions: “What” the project or feature is, “who” does it bring value to, “why” such feature or project should be implemented, and “how” to implement the feature in a general and high level. The “how” to implement the feature should not be detailed, because of the type of business requirement. The content in how to implement, for instance, which application should be used, the iteration of the feature, and the support from which team.

“Business requirements should be in the language of the business” (Goldsmith 2004, 35). The business requirements do not only come from the clients’ company, but some consultant companies will also take the responsibility to make those requirements and review with external stakeholders. The requirements should not be in any own native language and expect foreign companies to translate themselves. Moreover, they are for business so they should be documented as the common business language. (Goldsmith 2004, 35.) The responsibility of involved people is to learn the business language and understand it. There is a high chance that the requirements are translated to the developers’ language and it may cause misinterpretation for other teams.

Business requirements are not the exception of being misunderstood from exchanging, transferring processes. Thus, writing clear and precise requirements is recommended. The explanation of the requirements should come from the natural language of business with a reasonable familiarity with the topic. The higher level of clarity and precision will be based on the importance of the application. (Goldsmith 2004, 35.)

An easier way to build a connection with the project team and helps them easier to understand the business requirements is including the product vision in the content. The main purpose is to keep the enthusiasm of developers. Therefore, they can understand the bigger scope of the application and it is easier for them to implement and scale the application.

3.1.3 Differentiate requirements

When planning the project, some business analysts are struggling with the various concepts of different types of requirements. Gathering the requirement with the right type and precise requirement is the most important phase of software development projects (Stephens 2015, 53). Thus, understanding the differences between requirements and compared with business requirements will help Integrify with the planning process with their customers.

User requirements

User requirements are often referred to as stakeholder requirements, which gives the details on how the application will be used by the ultimate users (Stephens 2015, 62). User requirements are documented in steps and diagrams of how users will use the application to accomplish the use cases, specific tasks along with scenarios, user flows, and prototypes or sketches are included in the document.

The stakeholders from either internal or external cannot describe what they need and want in the project. Sometimes the information provided by them is incomplete, self-conflict, and inappropriate to the capabilities of the project. Moreover, it also depends on the complexity of the product that the users don't understand the fully functional capabilities of it. This leads to the uncertain needs given by the users. In some cases, users cannot communicate requirements clearly despite knowing what they want it to be. (Taylor 2003, 75.) This is an important but difficult step to design the software product based on stakeholders' needs. Due to the unexpecting stakeholders' needs on the product, user requirements are usually considered to be separated from business requirements and system requirements.

System requirements

System requirements describe what the system should do and be built to deliver the product for end-users. Functional and non-functional requirements are two small components that describe the system requirements easier and clearer.

Functional requirements are one of the most needed requirements of the product that provide the detail of the desired project's capability needed for end-users (Taylor 2006, 76). The content of functional requirements is partially similar to the user requirements, with some extra details that can't be directly seen by users. For instance, the report of how applications interact with other applications, and the orders process workflow from one user to another (Stephens 2015, 63).

Non-functional requirements give more detail on the behavioral quality of the application or the project limitation on the implementation of the desired result. It supports the project's success by simply enhancing the appearance and unique things that belong to the organization (Taylor 2003, 77). For example, the logo's color, the location of the logo should be on the front page, or the branding color of the whole application that increases the users' branding awareness. The content usually includes specific things such as the performance, reliability, and security quality of the application (Stephens 2015, 63).

The difference between the business requirements and system requirements or user requirements are not merely the level of detail as most papers made a mistake. The main difference is the specific function each requirement does to bring the value after the deliverable. The business requirements will answer “what” must be delivered to achieve the value in return, meanwhile system requirements and user requirements present “how” the business requirements can be delivered for the eventual users.

3.1.4 Project scope

Project scope is part of the planning process in the project life cycle which has been mentioned in the previous chapter. Teresa and Joseph (2006, 67) mentioned that the project scope only defined what will and what will not be included in the project, and project scope doesn’t include the cost, schedule, and required resources of the project. As the project scope is defined with a high-level abstract of work needed to be done to deliver a project that the schedule doesn’t belong to the project scope but possibly the project timeline. The schedule gives the plan of the exact date and time the feature, deliverables should start and finish, which does not fit in the project scope as it will vary often based on the priority of the current situation. The timeline will present the period the feature will take in order to be completed.

The difference between product scope and project scope is product scope gives the information of the end product and the work needed to be done for project completion (Luckey & Phillips 2006, 56). However, project scope and product scope support each other to make the scope clearer and each has specific functionality without misunderstanding. The project constraint and limitation are also defined in the project scope so when it is transferred to the project team, developers will know what in-scope for the project is and what is not budgeted and not included in the planning schedule to implement.

Defining requirements is the first step in defining project scope (Taylor 2003, 45) as project scope derives from the business requirement analysis phase to have a clear vision of what the feature is about. The project scope is determined in the best way which involves the correct stakeholders with the analysis of their needs and expectations on the feature (Luckey & Phillips 2006). The stakeholder analysis step is crucial to the project team because it will provide the objectives, demands for the project deliverables.

The success of the project is when internal or external stakeholders, the project team all share the same goals and agreement on the project scope. As the project team can understand the needs of stakeholders and implement the feature in the correct way and stakeholders will be satisfied with what they want. Additionally, with a well-defined scope, the project will not meet the failure stage of budget overrunning, late from the schedule, and changing requirements in the middle of the project.

3.2 Software development structure and internal communication

The business requirements cannot be identified, analyzed, executed, and completed without the agreements and discussions among the involved people. They are project stakeholders internal or external, and the project team. Software projects are group-oriented activities that are planned, implemented, and organized in teams (Ewusi-Mensah 2003, 36). By understanding the structure of the software development, it gives a better knowledge of who should know what information when communicating about the business requirement transferring process. This chapter will cover the structure of software development teams and the importance of communication among teams based on the communication layers.

3.2.1 Project stakeholders

Any specific groups or individuals that have a vested interest in the project and together work with the resources that affect the outcome of it (Larry 2000). Another definition from Teresa & Joseph (2006, 39) mentioned stakeholders are everyone involved in the project, from the project creators to the end-users as well as the customers of the organization. The two definitions are relatively similar to each other and share the same thoughts on the project stakeholders, Teresa & Joseph gave a more specific explanation on who belongs to groups and individuals from Larry's definition. There are lots of stakeholders when the project starts, however, some of the stakeholders are more important than others, which are called key stakeholders. Key stakeholders are people that have an instant influence over the project success, such as project manager, project sponsor, functional manager, ultimate users, and project team (Luckey & Phillips 2006, 39). As Kweku (2003, 58) mentioned that the project which has the wrong stakeholder will lead to the problem of exclusion, with unsolved properly misunderstanding will lead to the further problem at the implementing and testing phase. The explanation of what a project team is and who belongs to the team will be explained in the next section.

3.2.2 Project team

The term "project team" can be different from many organizations as well as what project management method they are using, such as the agile method. Due to the size and complexity of the software project that for any individual developer cannot comprehend it all, it requires people who have the knowledge and skills set about the specific domain to solve and manage the problem (Ewusi-Mensah 2003, 36).

Project team members are a group of people who are passionate and devoted to the project's objectives and goals. The team in software development is unique in the different backgrounds of three groups of employees collaborating to deliver the project under an organization. The first group, in some companies called the development team, consists of technical personnel or developers that have the highly trained skills in technical but lack of knowledge in the problem territory (Ewusi-Mensah 2003, 36). The responsibility of this group will take care of the design and implementation and any technical aspects from the business requirement analysis and specification. The second group includes end-users, who possess limited knowledge about the technical or information technology experience but able to understand everything related to application problem activities (Ewusi-Mensah 2003, 36). This group is expected to provide clear requirements, needs, objectives, and make a decision on the application to be developed. The project cannot run without a leader or manager to take care of the budget, time, keep people motivate and follow the requirements to bring the success to the project, and sponsor for the project, this group of management is the third one to be listed in the composition of the project team (Ewusi-Mensah 2003, 36). The management group plays an important role in exchanging the requirements to stakeholders, providing support and leadership to the other teams.

Understanding the specific role of people within an organization or the software project will give a clearance of responsibility when teams want to approach others for asking for consultations. This will help to transfer business requirements more effectively. As when there are some unclear parts during the transferring process, the team members will know who is accountable for and understand the requirements the most. Therefore, the business requirements are transferred clearly to every member within the project team. Besides, a clear role with its responsibility makes the communication among the team more efficient that everyone received the information accurately and in the fastest way. According to Curtis, Krasner, and Iscoe (1988, 1280) discovered that communication in a project team is important to settle the misunderstanding in requirements or design decisions within a team. That is why identifying the roles in a project team has an impact on the process of transferring business requirements to the development team.

3.2.3 Communication layers

In every organization, everyone has a specific role that matches their expertise to handle works related to their responsibility. Therefore, the information they need to receive through the communication about one topic must be inside their knowledge area. Each role is grouped into three layers like in figure 4, and each layer has its project objectives and responsibility (Luckey & Phillips 2006, 96). Understanding a big picture of what information each layer needs to receive, will help the person who shares the information to know how to communicate efficiently.

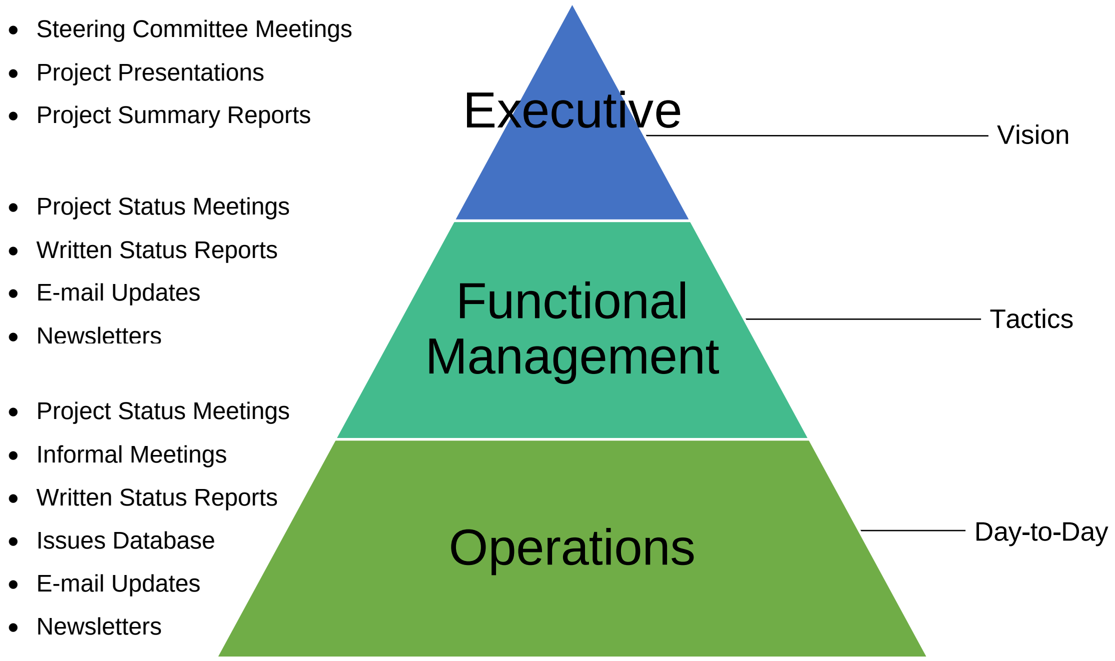

Figure 4. Organization layers with its interests and purpose (Teresa & Joseph 2006)

There are three layers within an organization, each of them supports the layer above it. The executive layer's purpose is to define the vision for the organization that everything related to the project scope, the size of the company. Those are two attributes that they want to take into account. (Luckey & Phillips 2006, 97.) The layer of functional management who will be responsible for determining the entities' function and strategy within an organization. In other words, they will control and manage the operations which include managers, vice presidents, and directors (Luckey & Phillips 2006, 97-98). Communicating with the topic of the project's performance, or the performance of the development team will catch their attention. The project's performance, for instance, the milestone reporting, cost variances, schedule variances, and scope verification (Luckey & Philllips 2006, 98). The last layer which also plays a vital role in performing activities that help to achieve the objectives and purpose of executives has set up for the company's vision and the tactics identified by the functional management (Luckey & Phillips 2006, 96). This layer will do the implementation and design based on the business requirements transferred to them and deliver the outcome of the application. The layer comprises the developers who want to know about the status of the project, whether there are any pending tasks, what are the activities that are falling behind the schedule. Additionally, the project’s risks, the issues happening in the middle of the project from customers' complaints should be covered in the communication with the operation layer members.

3.2.4 The importance of communication

In every area nowadays, people not only communicate face to face but also have a chance to communicate online with verbal or nonverbal such as emails. Communication brings everyone to be on the same page with all the information, ideas that they exchange for each other. Software development is not the exception, the communication within the project process as well as the planning phase is critical to bring the project’s success. However, having effective communication is not easy, especially in transferring requirements with misunderstanding problems, feeling lost in the middle of the meeting because you are not updated and misunderstood from the start (Luckey & Phillips 2006, 79). Without communication, the problem of miscommunication and not being updated about new changes from different teams can easily happen. Furthermore, misunderstanding of business requirements might cause problems in an overrunning budget, falling the scope and costing money of an organization as well as stakeholders.

Effective communication comes when the clear transfer of knowledge is made between the exchanging person and the receiving knowledge person. One of the project success aspects is having clear and accurate communication among involved people in the project (Luckey & Phillips 2006, 80). When the communication is clear from the stakeholders, the requirements are documented precisely and based on the requirements that the design and implementation are done correctly. Thus, the project scope is under the control of the budget and it also meets the deadline of the project. Moreover, when communicating with the development team, the knowledge of the project, the demands of the stakeholders, and the expectation on the project deliverables’ objectives are shared to bring them on the same page as other stakeholders. Not only the project manager or project leader needs to give clear and correct communication, but stakeholders and development team should also openly give accurate information, ideas when they participate in the planning activities.

Communication is needed and vital to the transferring process among the teams. It helps everyone to have an opportunity to share their viewpoints and keep up to date to the nuances of the project status. However, communicating effectively and knowing how to provide enough information to the right person is important for every team member.

3.2.5 Build an effective communication management plan

Not only the communication needs to have a plan on what topics should be covered and who are the audiences, but also in every situation a plan is needed to produce the effectiveness out of the work. The plan should document all the project communication demands, define the project specifications, and the key stakeholders' expectation communication. Defining how and when communication should be held effectively is the key to communication. Moreover, the communication management plan should always be up to date to adjust through experiences of the project progresses and continuous development of the project model of the organization. (Luckey and Phillips 2006, 91.)

The communication plan should also set up a general vision of escalation authority (Luckey & Phillips 2006, 93). This happens when large size companies have lots of employees with different layers of authority within one team. Thus, the plan should include the big picture of who could tackle the issue next when the project team is involved to solve it. It will help everyone easier to communicate with the right person.

Creating a communication plan is not individual work. It must not be created by one person but need a collaboration of the development team and project stakeholders to give their opinions on the plan. Effective communication in software development is very important because of its labor-intensive essence (Luckey & Phillips 2006, 94). Therefore, the communication bridge between the project manager and the development team as well as the stakeholders that make the tight, trusting relationship among team members. This is one of the key factors in project success. A regular basis meeting with the development team is needed to update the project status, whether it is going smoothly without any red flags. One of the project management methodologies that have the daily meeting process is an agile methodology. The method is used with scrum as a framework to support the management process. The content of the daily meeting is simple by asking three main questions from the development team:

- What are the tasks they did yesterday?
- What are the tasks needed to be done and the plan for the project today?
- Are there any problems that block their work?

The meeting aims to keep up with the development team to help them if they have any problem with the work. Usually, it will last about 10 to 15 minutes, and a meeting minutes at the end of each meeting as a report for stakeholders about the project current situation when needed.

3.3 Impacts of business requirements on the development team

The key concepts and basic knowledge of business requirements are the most important backgrounds in this research. For instance, who are involved in the project and the importance of communication within an organization. Besides, the relationship of those concepts, especially the business requirements and the development team, is important to the implementation phase. For example, how the development team can design and implement the application based on the requirements identified from the above phases.

In any software project, business requirements are one of the key elements that are analyzed and identified at the start of the project. All the activities and the quality of end product essentials to meet business goals are described in the business requirements. Business requirements create a tight relationship bridge to connect the project team and stakeholders when the project kicks off (John Parker 2012). Inside business requirements include the project vision of the final goal which is one of the things that catches the development team's attention. With the goal determined, the developer can discuss and set priorities for the tasks, find the best solution based on their expertise, and also meet the timeline of the project. Depending on the perspective of each developer that has different views on important parts of the business requirements. Nonetheless, the crucial part that the development team cares about the most is the product vision. Seeing the vision of the project will create a motivation for development team members to perform their best for the product's deliveries. Mis-defined business requirements, or not precise will lead to wrong decision making. It would slow down the progress of the development, disrupt timelines, and affect the other development stages.

The business requirement's language should also be reviewable for technical people, and it should not be in any individual's mind (Goldsmith 2004, 57). The people from the development team should learn about the business language or have the business language translated into the language that they understand. To make it easier to review the business requirements, the needed explanation for each requirement should be done in the documents without extraneous information. Besides, the business requirement should be easily traceable to identify the source of each requirement and where it has been used. Therefore, it supports and is valuable for the reviewing requirements.

Realizing the impacts of business requirements on the development team, the importance of having business requirements will be concentrated at the initial phase of the project. Moreover, business requirements' content will include the vital parts that matter and interest developers in the executing process.

4 METHODOLOGY AND RESEARCH DESIGN

The research method used to conduct this thesis is qualitative research for collecting and analyzing data. To understand the insight of current transferring business requirements to the development team process, it requires many different perspectives from involved people in the process. Additionally, the thesis aims to give suggestions for Integrify on the possible improvement of the process. Thus, investigating in-depth experience from internal and external stakeholders helps to spot out the missing parts of the process and finds the most efficient solution for improving the process that Integrify is applying. From the internal side, the involved people are project stakeholders and the project team. The external stakeholders are people who have experience in the more mature process from different companies.

Furthermore, understanding the differences between the Integrify process and others is vital for the research outcome. The differences come from the opinions of people working in different roles and having experiences with the process. Along with the typical challenges and factors that usually happen during the transferring business requirements process. Therefore, the recommendation for Integrify will be valuable and can be applied to enhance their process.

4.1 Qualitative research

Qualitative research term is defined as a variety of approaches and methods applied for a study about the natural social life (Saldana, Leavy, Beretvas 2011, 3). In order to answer the research question and sub-questions, the understandings of how the process works, different points of view, and experiences from people who have been involved in the transferring business requirement process. They have faced some challenges, difficulties while transferring or receiving the business requirements. Therefore, they can share some crucial factors that should be taken into account in the transferring process. The goal of using qualitative research is to acquire in-depth knowledge from involved people's perspectives with a social phenomenon or an event (Creswell & Creswell 2018, 50).

Not only internal stakeholders of Integrify was interviewed to exploit their thoughts, but the data was also gathered from external stakeholders with the same target groups. With the variety of viewpoints from related people in the software development industry, the objective opinions will be applied to the process of Integrify. Additionally, exploring the challenges that they are facing, and their experience in solving the problem will be easier to find a way to possibly improve the process. The most often used method by qualitative researchers is an in-depth interview. As interviewing with involved people is the base for qualitative research studies. (Saldana, Leavy, Beretvas 2011, 32.)

Qualitative research is an inductive process of constructing data collection to broad themes to a theory or generalized model. Then, it becomes an endpoint from the research. (Punch 2005, 196.) The inductive logic in qualitative studies suggested by Creswell (2009, 63) is to guide this thesis to conduct a process of transferring the business requirements of Integrify. After that based on data gathered, the inference for suggesting ways to enhance the process will be given to the thesis's commissioner.

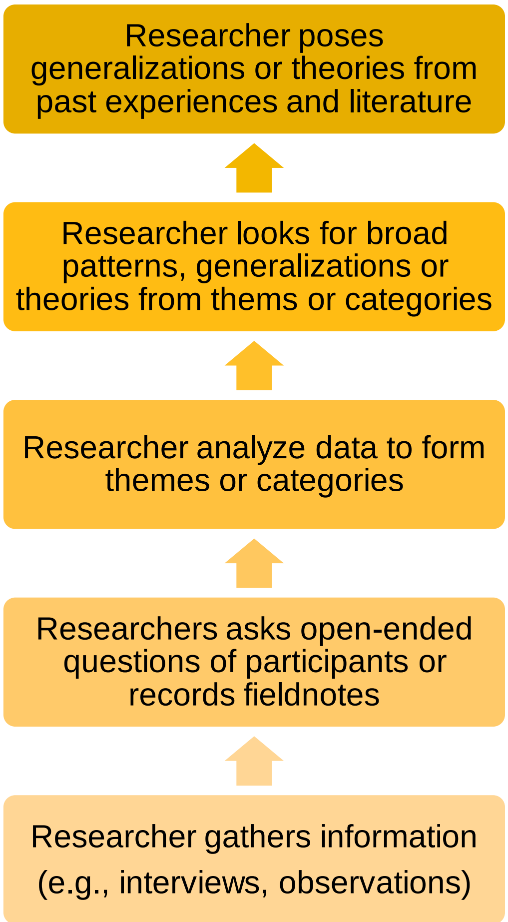

Figure 5. Inductive logic of research in a qualitative study (Creswell 2009, 63)

Gathering information through interviews from different stakeholders both internal and external and form those data collections into themes or categories, is the first step of the process. The viewpoints about the experiences, the difficulties, and challenges that each participant face, are grouped into one theme. After that broad patterns, theories, or generalizations that are developed from those themes and compare with the researcher's experiences or with existing literature (Creswell 2009, 64). When the pattern is created, the inference of typical problems that happened during the transferring process is made. Therefore, the process can be modified and enhanced to be more effective.

4.2 Qualitative research technique – in-depth interview

The interview is planned to do with a group of related people who have been involved in many projects. They are the business development team whose responsibility is also doing sales, project manager/product owner, and the development team. The goal of interviewing different people in different roles is to have different insight viewpoints. With the experience gained from previous projects in the past, realistic sharing will be collected from them. For example, the strengths and weaknesses as well as threats of the process that is currently applied within an organization.

There are two formats of the interview from highly structured to unstructured. The highly structured format is a preparation set of specific questions for asking participants in a particular order. Whereas, the unstructured format is only the list of topics for possible exploration listed out. (Saldana, Leavy, Beretvas 2011, 32.) Moreover, the semi-structured interview is a common format that most researchers prefer to use. Due to the flexibility in the structure of the questions, and the researcher can ask open-ended questions to get a deeper insight into the process and the experience from interviewees. The interview has been prepared with a list of questions, in which some common questions can be applied to any roles. The specific questions aim to a specific role of the participant that is relevant to his/her knowledge area. Furthermore, the order of asking those questions won't be strictly followed by any structure but allow open discussion with interviewees with some related questions.

Through the interview, the goal is to understand the insightful process of Integrify and realistic experiences from involved people. Sharing realistic experiences on real-life projects helps the research data to have a clearer insight into what brings the advantages and which parts are having problems. Based on that, the ideas on how to improve the process with the knowledge reviewed in chapter 3 will be figured out. While interviewing the stakeholders, the findings will be exposed to reach the objectives of the thesis. For instance, the explanation of why business requirements are important, the benefit of having and documenting them clearly. Moreover, the experience when delivering the project to clients and how it matches with what the initial expectation from clients will be explored through the interview.

5 DATA ANALYSIS

5.1 Data collection process

The data was gathered based on the qualitative research technique, which is in-depth interviews with internal people within Integrify and external stakeholders. Through multiple perspectives, the common problems that a startup company like Integrify should pay attention to and avoid having them in their process.

As mentioned above, the interview is taken with two main groups of stakeholders. People working in Integrify and people from different companies working in three main roles (developers, project manager/product owner/project lead/scrum master, and quality assurance/testers). At the beginning of the interview, a summary and explanation of what the thesis's topic is and the concentration of the outcome from the list of questions is given to interviewees. Therefore, the answers' scope is inside the research topic and the result would be high quality with topic-oriented. The interview with stakeholders working in different roles and responsibilities from different organizations was semi-structured interviews. The list of predefined questions without asking in any order and open-ended questions are given to participants. Thus, they can answer openly about the insight of the transferring business requirement process and share the experiences.

The interview questions are designed differently for each group. The interviewing questions for Integrify's participants exploit the current process that they are working with and their perspectives. Whereas, the questions for stakeholders from other companies will focus on investigating experiences and advice from people working with more mature processes.

The list of questions created for internal stakeholders was categorized into two parts. The common part aims for collecting opinions from every interviewee. Whilst, the second part was divided into three groups such as business development team, project manager/product owner/project lead, and developers. The goal for separating specific questions is to collect the data that is relevant to their knowledge and receive honest perspectives from them. The interview was done and recorded online through a google hangout platform and the transcripts were written down after the interview. The questions were reviewed, and data collection was accepted to write in the research paper by the CTO of the company.

The list of questions created for participants from different companies shared the same structure as the list of questions for Integrify. The common questions part for every target group can give opinions and the second part focuses only on two specific groups. They are a project manager/project lead/product owner/scrum master and developer. Both groups have a huge impact on the transferring process because they are directly involved in the process. Besides, the project stakeholders, for example, quality assurance/testers who also know how the process of transferring business requirements works. Thus, they would contribute some valuable thoughts on how to transfer business requirements efficiently.

5.2 Qualitative data analysis

The data collection and analysis process in the qualitative analysis proceed simultaneously (Merriam 1998, as cited in Ivankova 2002, 58). When presenting the data gathered and the analysis happens simultaneously, the researcher can explore further the data and dive deeper with explanations needed. The purpose is to make the point to be clearer and match the context of the thesis. With this constant comparative data analysis term, the systematic coding scheme will be applied to the data and the result of the research will be fundamental to grounded theory. The reason is that the theory will be supported by the examples from data gathered through in-depth interviews. (Harding & Whitehead 2013, 143-144.)

The qualitative research data was gathered through semi-structured in-depth interviews with three stakeholders from three different groups. These interviewees were chosen because their daily responsibilities with their specific roles are relevant to the target groups. Two of them have been working in Integrify over eight months and have been working as a project manager/product owner/project lead and/or developer. The other is working as a business developer of the company. Therefore, they know clearly the internal transferring business requirements process. From the phase of getting the customers' requirements to finalizing the business requirements and transfer to the development team. Moreover, some of them have been working with the old and new process before the CTO has come to the company. Hence, they could share their opinions and experiences when working with the current process.

The interviewees were asked a list of open-ended questions to investigate the process of getting and analyzing clients' requirements before transferring it to the development team. The interviews took about one hour and were recorded with kindly asking for permission from participants. The list of interview questions is referred to the appendix 1 and appendix 2. The analysis steps will include five steps according to Creswell (2002, as cited in Ivankova 2002, 59). The data is explored by reading the written transcripts and taking notes. Then, the text is segmented and labeled to create the code for data. The purpose is to develop themes with codes by accumulating similar codes together, interrelating and connecting those themes. After that building a story of related topics. Based on the analysis steps, the research data is segmented easier and more organized. Making sure it relates to the context of the thesis and reach research objectives by answering the research sub-questions.

According to Denzin (1987, 102), there are multiple forms of triangulation can be applied to this study to analyze qualitative data. Such as data triangulation, methodological triangulation, investigator triangulation, and theory or perspective triangulation. In this research paper, perspective triangulation is used to analyze data. As the research topic was done by multiple perspectives through the comparison of the participants' viewpoints and the alternative theoretical schemes (Denzin 1987, 102). To validate the data, multiple sources are gathered to meet the research objectives and assemble the evidence.

The qualitative analysis is divided into two parts, internal stakeholders and external stakeholders. Inside the internal stakeholders' analysis, the insight process of how Integrify transfers business requirements to the development team. Investigating the challenges each party has during the process, the benefit of having and documenting business requirements. The external investigation focuses on understanding the difficulties each role has during the transferring process. Moreover, what other factors should be taken into account during the process.

5.2.1 Internal stakeholders

The current process of Integrify

The thesis goal is to understand the internal process of Integrify when they analyze and build business requirements. After that hand them over to the development team so they can understand the business problem and start implementing the product. Figure 6 was made by written transcripts, together with the hand-taking note during the interview. Then went through all the results to illustrate the visual process that Integrify is applying. The process contains six phases, and it was grouped into three main groups. The grouping aims to make it easier to understand and mention during the analysis below. The "Clients" and "Customers" would be used for the external stakeholders and the "Company" stands for Integrify.

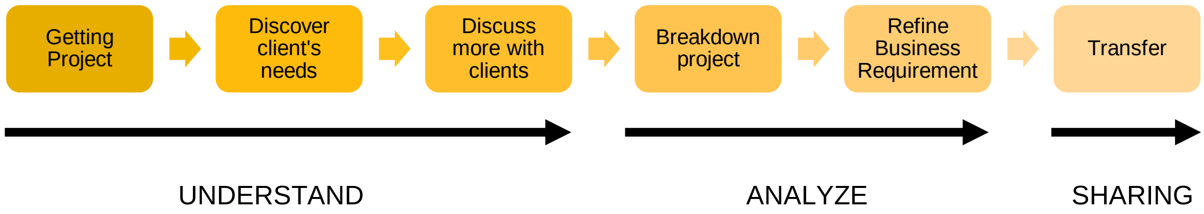

Figure 6. Integrify's analyzing and transferring business requirement to development team process

The process starts with getting the project for the company. Usually, it is not the main responsibility of the business development team. Their main responsibilities are to interact and maintain the relationship with the customers, help them with the recruiting developers, and book interviews for developers. However, while contacting the clients to ask for the needs of some talent services, some clients don't need the resources. Yet, they have projects which Integrify could help them provide a solution. The information provided by the clients to business developers about the project is general and only the business developer is directly involved in the communication. After that, the discussion is passed to internal communication with the CTO of Integrify whether the company can implement the project.

After matching the company's capabilities, more details on the client's needs for building the project is discovered. For getting all the requirements from customers, Integrify provides the list of questions related to the project's technical information in more detail. For instance, what kind of application the client wants? (Web App or Mobile App), the technology they prefer to use for the application. Additionally, the open question to describe the business they are working on and what are the business problems they are facing. Knowing their business as well as the business problems, it is easier for Integrify to have a clear objective of the project and start planning the features to help them solve the problems. When receiving the answers from the clients, the second meeting with clients is held if Integrify wants to discuss more with them. For example, the use cases and user flows to understand deeply about how the application they want it to be. In this phase, the business developer who contacted the client, the CTO of Integrify, and clients will be involved in the discussion.

After getting all the customers' needs and understanding their business, the project is broken down into smaller components with their features and scopes. The analysis stays at a high level to analyze what tasks that Integrify can provide. The features are defined by Integrify or from the clients depending on the clients' preferences. When clients know what exactly features will be needed in the application, Integrify consults them with more features. In case Integrify takes responsibility in defining the features, the features are listed according to the timeline and the budget that the client provided. According to the CTO who is responsible for building and leading the consulting team, managing internal and external projects of the company mentioned that the timeline and scope of the project are based on the priority of features that the client provided.

The number of deliveries for the specific timeline that client wants is limited according to the capability estimation from the company. However, Integrify always provides the margin for additional features deliveries. In the case of the developers have done the main features sooner than expected, the company would provide more features for the application. As the CTO said that the features deliveries agreements would always be under promised and over delivered. At this phase, the architecture of the application has been created and the CTO is involved in the process. When estimating the scope and building the architecture for the application, the business requirements document is made to share with external and internal stakeholders including the development team. The refining phase is done with the involvement of the client, business developer, and the CTO.

Currently, Integrify is using a slides presentation template to document all the business requirements. The content covers the knowledge about the application, the client's business problems, the timeline, and the scope of the project. Additionally, the technical detail along with the features that Integrify will deliver to the clients is included. After everything has been approved with internal stakeholders, the business developer will send the document to the client as an offer so the client can review and adjust if needed.

The final phase when business requirements have been reviewed and approved, it will be transferred to the development team for the implementation phase. The phase is part of the responsibilities of the company's CTO that he and the development team is involved in. Based on the required technical stacks from the analyzing phase, the development team is chosen with the skills and knowledge that match the requirements. The business requirements are handed over to the developers through meetings and go through everything inside the business requirements. When going through business requirements and describing the whole idea of the product, the business case, and the problems will help developers understand and find ways to build the project/feature. Additionally, the architecture of the product with features and the design requirements are also brought to the discussion and shared with the development team. Therefore, they can have a bigger picture which helps them to implement the application easily.

The interview was conducted with developers to gain insightful experiences. Especially when they received the business requirements from high-level management (project manager, product owner). When going through the business requirements with developers, there some points that catch their attention. The main features of the application with its scope, the timeline of when they need to deliver those features. Additionally, how to achieve the business objectives by understanding what the client company is doing with their business. The points mentioned above were collected from one developer of Integrify.

One question was asked to the developer whether he received the business requirements on time or late. There have been two different kinds of projects that he has been working on. One with the clear analysis process and requirements documented from the beginning and the other was the mini-projects. With the clearly documented requirements, it is easy for them to follow and implement the application without any problem. Besides, with the mini project, due to the heavy workload from the client that developers received the requirements very late. As it affects the design of the application as well as how the application will be expected from clients. Moreover, the developer also mentioned that before implementing the application, the needs of understanding the industry and the business requirements are crucial for matching the deliveries with the initial requirements stated.

The final deliveries usually have slight differences from the initial expectation from clients. The case happens during the implementation phase when the clients want to do some modifications in requirements. Unless all possibilities that may cause the schedule late to have been agreed, the requirements should keep the original version.

The process has been improved since the CTO started working with Integrify. The interview also gathered some challenges and difficulties that three stakeholders face when working with the process. The next part of this subchapter discusses the challenges during the transferring process.

Challenges during the process

In every process, there may occur some challenges when the process is applied in reality. The challenges come as a group of phases that has divided like in figure 6.

In the understanding clients’ needs phase, the company has faced some difficulties both from internal and external factors. The internal factor comes when the business developer wants to ask clients some requested technical questions by the CTO of the project. The communication flow was inefficient and slow according to the business developer's perspective. He has to send messages to the CTO through Slack back and forth. Slack is a communication platform that Integrify is using for internal communication. Communicating like this wastes a lot of time for every stakeholder. As the information can be lost and misunderstood while asking through the non-technical person.

Besides, when the meeting was held to discuss more the project, the CTO didn't know how far the discussion has been between the client and the business developer. As the result, he needs to repeat the same information and ask the same question to the clients which are not efficient. Seeing the problem, Integrify has created a list of questions in which all the technical questions and open-ended questions. The open-ended questions cover the business problems that the client wants to describe. After that, the list is sent to them after the initial discussion between business developer and client is done. From the external factor, some difficulties that Integrify faces while communicating and discussing with the clients about the project. It happens when the company wants to discuss with the clients about the technical aspects and the business problems they are having. Some of them don't know how to answer those questions because they are from another department. As the result, the clients need to involve the right people in another meeting so they can give accurate answers. Another concern is that the conflict with the client's internal departments over the decision on working with the project. The solution that Integrify overcame this problem was to have more meetings with the clients. That will gain more understanding of their requirements and suggest to them what to do if they are clueless about how to solve their business problems.

In the analysis phase also has some problems. The most common problem that every project has been facing is the feature/project deliveries don't match the planned schedule and overrun budget. As the result, the company needs to extend for a longer time to finalize the project. The problem comes from the analysis phase that requirements weren't well defined. The reason is that the clients don't know what they want exactly, and they can't imagine how the feature works until the prototype is delivered to them. After that, they can understand the requirements of what they need. The second factor comes during the implementation process that developers have some technical problems and it takes a lot of time to fix the bugs. Last but not least, the factor relates to the project management, the project manager or scrum master if the project implements agile methodology plays an important role to keep track of the scope of the developers when doing the specific features. Sometimes they only focus on fixing the problem or create new scenarios themselves for the feature which is over the scope with the matching timeline.

The problem while transferring business requirements to the development team is the most important part of this research paper. It is because the thesis wants to find out the problem during the transferring process and based on the theoretical framework as well as professional knowledge to help enhance the process to be more efficient. The problem occurs during communication with developers when they don't understand the business problems clearly. One developer mentioned that they found the business problems were sometimes complicated and they couldn't imagine how it would work in reality. The solution for this is they use their observation on similar works that have been done before. Hence, they can have a basic idea of how to implement it. Additionally, some developers don't understand the business language at a high level. They request to have another meeting to breakdown all the features and transfer it to technical detail with the project manager/product owner so they can imagine how it works. For some developers, when they receive the business requirements, they don't want to do the project. It is because they haven't been involved in the initial discussion phase about the project, so they are not interested in the project after being chosen for the team. However, the chances of this case occurring were very rare, according to one interviewee.

When the business requirements are transferred to the development team, there are some misunderstandings. The reason led to the misunderstanding business requirements is because the initial business requirements weren't clear, and the clients expect differently from what developers understand. Another reason is the client rushed to implement the application and they don't have time to discuss clearly with the development team about the requirements. Lastly, misunderstanding happens when changing resources in the middle of the implementation phase. When the developer jumped in the middle of the work of others, but the client-side was rushing to complete the application, the developer lost track of what the initial business requirements were about.

5.2.2 External stakeholders

The data gathered from interviews with seven people working as project manager/product owner, developers, and quality assurances from two companies X, Y. The interviewees of the companies don't have permission to expose the company name. Moreover, this thesis wants to ensure that the information gathered from two companies won't be compared with each other and with Integrify. The analysis is done into two parts. The first part analyzes the perspectives on the transferring business requirements process in general across different roles. The second part is focusing on analyzing the challenges that each role has during the transferring process.

Part 1: General information related to transferring the business requirements process

Business requirements, the main concept in the transferring process of this thesis scope. It is one of the most important requirements that should be analyzed at a high level and documented clearly before the implementation of the project/feature. The question asked all participants whether business requirements are important to developers. Everyone agreed that developers need business requirements to deliver the project/feature for clients and match their initial expectations. Knowing that the business requirements are important to developers, but what are the benefits they bring when understanding them. The benefits not only have an impact on developers, but they also help stakeholders to manage and keep track of the project easily without lacking knowledge of the project objectives. Besides, the communication among stakeholders related to the project/feature will be efficient because everyone is on the same page. (Taylor 2003, 75.) Additionally, when the business problems have been analyzed carefully, a suitable solution will be given for the clients. Furthermore, the developers will know the goal and the vision on the whole feature/project that they are going to implement. When developers figure out the goal and vision of the work, the inspiration to deliver the best outcome for the clients/customers.

There are different ways of transferring business requirements, either by documenting them into any text editor or holding meetings and involving stakeholders in. However, the easiest way that can avoid missing information and repeating the same information while transferring business requirements is by documenting them down. The documentation can be either paper or electronic depending on the company. Some companies have a template for documenting business requirements, which are categorized into sections. Each section contains its main point that easy for reviewing and modifying. The question asked participants about their experiences and give some benefits of documenting business requirements. Five out of seven people mentioned that it is easier to review, maintain, and update later on if needed. In the case when new people join in the middle of the implementation, they can understand the business requirements of the project/feature without spending time asking relevant questions back and forth. Moreover, it will be much easier to base on what has been documented and do some modifications, even the smallest changes.

When the business requirements are documented, it can be shared with all stakeholders without missing information. The content of business requirements includes much information. For example, the business problems, the current status of the company, the project/feature objectives, schedule, scope and deadlines, and so on. Therefore, the chance of missing information while transferring business requirements is high. The project manager from company Y mentioned those well-described business requirements should be a foundation of every project. It helps to understand the current status of the project for every person involved. Another benefit that two participants whose role as a developer mentioned that can avoid duplicating information while transferring the business requirements to other teams. Especially to the development team. In order to understand the business requirements, it requires time to acquire and investigate them. Thus, duplicating information during the transferring process possibly confuses the developers. Additionally, it may lead to an understanding of business requirements imprecisely. The benefit collected from the project manager from company X that it will lessen the misunderstanding of requirements and also sets the scope of the feature/project.

The business requirements are then transferred to the development team for executing and delivering the functional feature/project to clients. The development team should understand the business requirements clearly and accurately to match the expectation of stakeholders. For that reason, the interviewees were asked to list the best ways for the development team to understand the business requirements clearly. A clear and well-structured outline of the documentation helps the developers easier, faster to review, and catch an important part of the requirements. Some developers don't pay much attention to the parts that may not relate to the responsibility of them. Therefore, they will skim through and jump to the important section to them and then go through to other sections when needed. That is why the business requirements should be well organized and clear for the development team to read.

As mentioned earlier, the goal and vision of the project/feature play a vital role in guiding the developers to understand business requirements. Having them would bring clearance to business requirements. Another suggestion from the product owner of company X that the person who takes responsibility for transferring business requirements should be ready for requirements clarification. To help the process of transferring business requirements work smoothly, the person who transfers the business requirements should understand them deeply and in charge of them. From the building phase of business requirements to the finalizing phase. Another aspect that helps the developers get the whole concept of business requirements is to involve them in the discussion as early as needed. More specifically, the discussion about estimating the project/feature. For instance, the project scope is estimated based on their own experience and knowledge together with their work capacity. Last but not least, when there are any possibilities, translate business requirements from words with bullet points to diagrams. The reason for using diagrams to illustrate the plain text is because they are easy and convenient to create and help readers to get the main ideas faster. Many tools provide the possibilities to create different kinds of diagrams that match the purpose of the text. They are even embedded into some text editors such as Microsoft Word, Google Docs, and many others. Additionally, using diagrams will also describe the context clearly to the readers and catch the reader's attention within a huge amount of plain text.

Part 2: Perspectives from each role on the process of transferring business requirements

When the process of transferring business requirements starts, the concept is different from the other transferring or sharing knowledge concepts. When something is transferred to other people, it means that there is something that has already been done and completed. However, in the context of transferring business requirements, the process is a little bit different. The receiver (developers) could participate in the discussion of creating and refining business requirements until it is completed and transferred to the development team. In order to know whether the developers should be included in the high-level analysis process and in which phase they should be involved in. The data gathered from the interviewees from different roles and analyzed based on each role. Thus, the comparison in different perspectives and investigating those insights deeply is made.

The viewpoints from participants who work as project managers and product owners from company X (product owner X) are different from each other, although they are working in the same company. The product owner answered that developers should be involved only after the requirements are analyzed and before the estimation and scoping phase. Whereas the project manager from company X (project manager X) said that the analyses should be done to a certain extent by the business before going to developers. The permission to have an impact on reviewing the process should be given to developers to join. Two viewpoints from two different people have partially shared the same opinion. However, there is a part that they are not on the same page. Both of them agreed that the business analyses are not the developers' responsibility and they don't have much knowledge to join the conversation as well as contribute the idea for analyzing business. However, the project manager gave a different view from the product owner that developers should be involved in the initial analysis phase of the process, meanwhile, the product owner involves developers only in the different phases. There is a little conflict in the opinion of the project manager.

On the other hand, the researcher gathered a point of view from the project manager of company Y (project manager Y), that cleared the conflict above. The project manager Y is involving developers only in the estimation and scoping phase after analyzing requirements. However, she also mentioned the involvement of the technical lead (TechLead) in initiating phase to have better knowledge about new features. Then the whole development team comes later when requirements are analyzed. Through this statement mentioned by project manager Y, the conflict is resolved. The reason why the project manager X involves developers in the initial analysis phase is that her team has the TechLead role that can represent the whole development team to help her with giving estimations in feature/project scope. Another aspect to make this clear is that the project manager X and the product owner X are managing two different teams, in which the team layers are different. Thus, they give different answers but share the same idea.

The concern of the developers on whether they need to be involved in the business requirements analysis process and what are their responsibilities when being involved. The developer from company X also agrees that they should be involved in the estimations such as scoping for features/projects. There is a case when the product owner and the business analyst choose the way how the system can work in detail. The role of developers is to advise on some possible technical solutions. For instance, the recent trend, which sometimes stakeholders may not know if something is possible to implement.

Another viewpoint from a developer who is working in company Y as a TechLead said that developers should be involved in the initiating process. This matched with the project manager Y viewpoint as she mentioned that TechLead should be involved in the concept analysis phase. Then help his team members which are the development team to review the process easily. According to two people who work in the role of quality assurance from both companies X and Y also acknowledge that the developers should be involved in the phase that they can contribute some ideas with technical related. For example, scope estimation. One of them explains that sometimes developers don’t show interest in the discussion and they just are there for politeness only. The reason why this happens is simply that they don’t know what the value of their presence in the discussion is. Furthermore, when the involvement is in the wrong phase where they cannot contribute their knowledge to the work of others, it turns out to be wasting time to be in the discussion.

Understanding the process of transferring business requirements to the development team and who should be involved in the analysis process to help refine the requirements.

The thesis also aims to investigate different challenges that each role has during the transferring process. The target groups that will support the investigation are project managers/product owners and development team members. The project manager/product owner group will take responsibility for transferring the business requirements and the development team will be a receiver.

The challenge faced by people who work as project managers or product owners during the transferring process is there are many different estimations from the development team. Based on each developer's experiences and knowledge on the feature/project that they can have different estimations. Besides, the capacity of each developer is also different, some of them are very quick and easy to adapt to the new project due to the experience they have on the work before. Another reason why there are different estimations from development team members is the result of unclear requirements and the goal of the project/feature. This leads to a misunderstanding of what the project/feature is about and what the scope of it is. The project manager/product owner also shared about the estimation experience during the process. When a new technology is required to fulfill customer/business requirements, the developers always need time to get familiar with before they can give an accurate estimation.

The second difficulty that the project manager/product owner has, is the business requirements are too vague without clear customers' expectations on the feature/project. Not only do the unclear business requirements come from the one who analyzes them, but it also comes from the clients. The problems are usually solved by suggesting the features that are trendy and suitable to be implemented from the company that provides the solutions.

The last difficulty that the researcher gathered from the participants is that there is always a chance of misunderstanding the requirements. For example, things can be easily "lost in translation". There is a common problem when translating business requirements such as business goals, objectives, rules into words that can be understood by all stakeholders. They are including business stakeholders and developers. The problem occurs when translating the meaning of business requirements for the development team and other stakeholders. The purpose is to make sure they can understand business requirements clearly. Especially, when the stakeholders are not able to understand the content of business requirements that have been written. As the result, the final result of the deliveries will not meet the expectations of business stakeholders (clients).

The difficulty of developers during the transferring process occurs when the business requirements are not clear and well organized. This problem has also been mentioned earlier that the project manager doesn't follow the structure of business requirements and go through them with developers. The developers mostly focus on the features, scope, and vision of the feature/project to execute it. As the business requirements are high-level requirements, it requires some knowledge to review, follow, and get the idea of the business objectives and goal. Thus, having structured requirements will help developers to easily understand the business requirements.

Another difficulty comes from the lack of product/feature vision in the business requirements. When the developers cannot see the result of the product/feature, they will be excited at first and lose motivation in the middle of the implementation process. A project vision is a long period that brings everyone to focus on the same goals. It includes the project's purpose, reduces confusion for the development team, and provides inspiration for them to execute the project/feature (Robert B. Sowby 2020). Without the project vision, the overall image of how the application is completed and delivered to the end-users cannot be formed. One example of the project vision is the prototype design of the application is created to give the developers a general view of how the application will look like. That explains the benefit of having a project/feature vision before the implementation phase.

Another concern is that due to the heavy workload of project manager/product owner, they don't spend enough time to transfer business requirements. Business requirements are sometimes the term that developers have never heard before. Additionally, how to exploit the business requirements deep enough to understand the concept of the business objectives and goals. Sometimes the transferring session only happens once and it lasts for three to four hours, with lots of information given during the transferring process. As a developer, they want to first understand the big picture of the feature description, and the next meeting will go into more detail. The reason for this is that the developers will have time to think over the topic that they received and examine as well as come up with questions to make themselves clearer to understand business requirements.

The last difficulty faced by developers is that the business requirements are unnecessarily complicated and hard to relate to how it works in reality. When the project manager/product owner chooses the technical solution, they don't involve developers to give the suggestions before deciding to choose it. They might not know whether some easier solutions can perform similarly but easier to adapt and implement. Moreover, the developers want to see how the feature works in reality. Thus, they can adjust the sample to meet the expectation of all stakeholders.

6 RECOMMENDATION

The interview data has been analyzed to get insights from Integrify and different companies working in software development. The results are found, and the recommendations are made to enhance the process of transferring the business requirements of Integrify. Moreover, they help the commissioner to avoid some typical challenges that other companies have faced. The recommendations are made based on the researcher's experience, knowledge from the theoretical background. Along with other factors gathered from interviewing with external companies.

6.1 Documentations and content

Through analyzing the current process of Integrify, they document the business requirements by using Google Slides. It is an online presentation program that allows you to create and format presentations and work with other people. The documentation is used as an offer to share with clients and internal stakeholders. It is easy to describe the content of the business requirements in each slide. However, it will give stakeholders hard to review because they cannot see the full content of the documentation. Unless they have to go through every slide and find the part that they want to review or modify. Moreover, when business developers want to add more requirements, they don't know where to put the requirements inside the documentation. One of the interviewees from Integrify suggested that the template in a text editor should be designed and used. The purpose is to help the reviewing, maintaining, updating phase become easier. Having the template will contain and categorize the small sections that can be reviewed with related stakeholders. In case they don't understand the technical terms or business terms. Additionally, when seeing the full content of the document, it would be easier to skim through and follow the whole concept of the business requirements.

Not only the business requirements should have a template, but Integrify should also create the template for other kinds of requirements and specifications. One of the solutions that can give clear business requirements is to avoid combining all requirements in one documentation. As the business requirements are the high-level requirements, in comparison to user requirements and functional requirements. Those requirements documented in more detail how the feature/project should be done. The differences among requirements have been explained in chapter 3. Besides, the content can be clear for transferring when the terminologies used in the business requirements are consistent. Therefore, it doesn't give a confusion about the documentation. Another suggestion from external companies' interviewees that all the requirements should be documented in one place. Some projects have documented the requirements in the main documentation. Whereas, some appear in the project management tool with an inside task description or comments. This will make the requirements hard to maintain and update. Moreover, it may lead to losing some requirements when transferring to other business stakeholders to review and agree.

Another suggestion that can help the transferring business requirements to the development team becomes easy to catch the concept of the requirements is visualize diagrams. The suggestion got from the analysis results that one picture is more worth than a hundred words. Due to the heavy plain text of business requirements, the diagram would help to clarify information and be more user-friendly for all stakeholders. This research suggests a scope model for illustrating the scope of the feature/project instead of using bullet points. The inspiration taken from the technique used in a book called A Guide to Business Analysis Body of Knowledge (BABOK Guide) (2009, 175). Besides the scope model can also be known as a functional decomposition diagram.

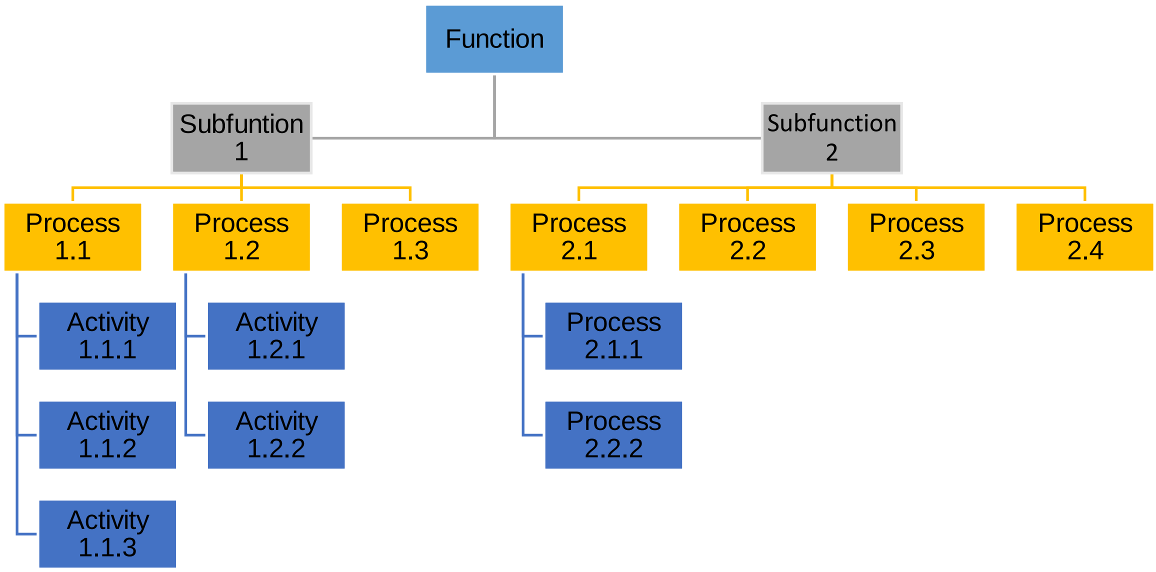

Figure 7. Functional Decomposition Diagram by International Institute of Business Analysis (2009, 175)

The scope model in figure 7 identifies the high-level of a function and then breaks down into smaller components. The purpose of the functional diagram is to decompose processes, functional areas, or deliveries that can be analyzed separately with each part (International Institute of Business Analysis 2009, 174). Figure 7 illustrates the function can be broken down into smaller sub-functions with many processes. The purpose is to ensure that the problem is solved independently and can assign the problem to different teams. This model will help Integrify to have an ability to scale the feature/project and manage it in larger projects. Additionally, it will provide a consistent scope view of the effort for all stakeholders (International Institute of Business analysis 2009, 175).

6.2 Involvement and communication

As the analysis has been done with external stakeholders about the involvement of the development team in the business requirements analysis process. The current process of Integrify doesn’t involve developers when they start creating business requirements. The suggestion from this thesis that all stakeholders should understand the whole process of transferring business requirements. Especially, the involvement of developers in the initial phase of getting a project, analyzing, estimating the scope of the feature/project. Due to the size of the company is small, the involvement of relevant stakeholders is recommended. The reason is to prevent the surprising feeling towards the refined requirements. When they receive the business requirements after everything has been refined and agreed upon, they would feel disrespectful. The perspective was collected from the experience of one developer of company X. Additionally, they can understand the business objectives clearer before starting to implement the project. The developers don’t have to participate in every discussion. For instance, the discussion about the business-related, they will not be fond of joining if they cannot make any contribution to the discussion with their technical knowledge.

When Integrify has established its business to medium size, the dedicated role for the project is needed. The role will present for the whole development team is the technical lead. Especially, when they start writing the business requirements. As the result, the developers don’t have to join the initial phase of the project and the business requirements’ analysis because they might not show interest in the discussion. The developers should be involved only when needed in the scoping and estimating phase. Besides, the effective way to ensure the estimation is accurate even though developers haven’t taken part in the earlier discussion is having different meetings. The meeting should be held for developers to introduce the project with business requirements, project goals, and project features. Thus, they can have a general idea about the project. After that give them some spare time to go through the business requirements to have a clearer vision of the project/feature that they are going to estimate. During that time, the self-reflect on their technical knowledge and experience in working with similar projects/features. Hence, they can examine the current technology to give an accurate estimation.

In order to transfer business requirements efficiently, good communication among the stakeholders should be focused. It is between the person who transfers the requirements to business and technical stakeholders. When the transferring process starts, the business requirements should be transferred partially. Firstly, presenting the big picture through one meeting to describe only the feature with objectives. Then, the next meeting can be more detailed into the feature. Sharing too much knowledge in one session is not a good idea, it's good to give developers some spare time to think over the topic and study about it.

Furthermore, a daily basis communication with all people who can give valuable input to the feature/project deliveries. The reason for this is to bring everyone on the same page and deeply understand the business objectives, goals, processes, scopes. Communication should be done frequently. However, communicating in the right way with good preparation. The purpose of the communication with the right topic to the right person is more effective than meeting every day and jamming each other with technical and/or business jargon. Those jargons are hard to understand for some stakeholders. Some of the stakeholders don't have business knowledge or don't understand anything about technical terms. This may waste others' time without gaining the advantage of communication.

6.3 Equality of features complexity level estimation

For solving the problem that almost project manager/product owner/scrum master has during the estimation phase, the equality estimation should be taken in action. The problem occurs when developers give different estimations from each other. The project manager/product owner should not involve in the discussion among developers. Yet, leave the discussion for them to bring the final estimation after everyone has agreed with each other. According to the agile methodology feature estimation, when the estimation of each developer is different from the group, he/she needs to explain why he/she thinks it is suitable for that complexity level.

6.4 Resources needs

Based on the knowledge of the researcher and the research findings, some suggestions on the internal resources to give a better transferring process performance. One interviewee of Integrify suggested having a dedicated role such as a project manager or account manager. The role takes over the responsibility of contacting the development team and business stakeholders to understand their expectations. Thus, business requirements can be transferred easily based on their information preferences. The role currently belongs to the CTO of the company, he is so busy with a heavy workload with lots of main tasks to do in his daily work. As the result, he might not have much time on taking care of the transferring process and skip some phases. For instance, involving the developers in the estimation phase or go through the business requirement from the big picture to more detail. This would lead to unclear business requirements for developers.

Furthermore, a project manager should have some knowledge of technology. Therefore, they can determine which feature can be implemented or they know the context of the feature/project. It would give an easier understanding for developers when they receive the help needed from the project manager.

7 DISCUSSION

The chapter will recap how the thesis is completed by reflecting on its process and evaluate the result of it. The evaluation bases on how well the research paper has followed the qualitative research method. Together with the theoretical framework and bring the outcome that meets the research objectives. The reflection on the research findings and see whether all the research questions are answered. Moreover, the key results will be evaluated whether the analysis has taken into account different stakeholders' perspectives on the transferring process. Additionally, how the results match the expectation of the case study of this thesis. The subchapters include the limitation of the research, the trustworthiness of the data collected, the suggestion for further research development, and the professional development assessment.

7.1 Thesis process

The thesis process has followed closely to qualitative research. Collecting data by in-depth interviews and using the perspective triangulation technique to analyze the data. The thesis was well-defined with a good reason why choosing Integrify as a commissioner. The suggestions from both internal and external stakeholders have been integrated with the researcher's experience and knowledge from the literature review.

The analysis has been done by separating stakeholders' perspectives. Firstly, understand the current process that Integrify is applying, investigate different insight challenges, and viewpoints from them in general. The current internal process of how business requirements are transferred to the development team has been illustrated through the diagram in figure 6. The diagram was created from plain transcription text, gathered from interviews, and reviewed with the CTO of Integrify to develop ideas. By creating the diagram, it is easier to understand the general image of the process visually from the massive pool of data collected from an in-depth interview. The purpose is to reduce misunderstandings among stakeholders and bring everyone on the same page. Additionally, it avoids missing information after verbal discussion, and it is easy to maintain and develop. Secondly, the external stakeholders' perspective analysis aims to explore the other mature processes. Additionally, the challenges that possibly occur with Integrify's process. Therefore, this thesis can base on that and suggest the solutions. The thesis has created a strong relationship between research questions and research methods that can meet the objective of the thesis and build a structural research paper.

Furthermore, the research paper has met the expectation of Integrify. It aims to suggest the current process to enhance the efficiency of transferring the business requirements process. The process will be smoother when the development team can understand the business requirements clearly with a scope model instead of heavy text documentation.

To improve the thesis process, it would be nice if the process can be tested run with one consulting project with clients. Integrify will take responsibility for creating business requirements and provide solutions for the clients with a new process. As the result, the investigation on the feedback from developers, whether they think it has solved all the difficulties they had before the new enhancement is applied.

7.2 Key results

The thesis's main objective is to understand how the business requirements are transferred to developers. The insight into the current process of Integrify has been investigated and exploited with challenges that each stakeholder in a different role has. The templates for documenting business requirements should be created with a text editor. To fulfill the expectation of Integrify and provide suggestions on the process, the analysis of multiple perspectives from external companies has been done. The research findings are the involvement of developers in the analysis business requirements process, the benefits of understanding and documenting them. Moreover, the difficulties faced during the transferring process from three main groups of stakeholders were discovered. They are project manager/product owner/project lead/scrum master, developer, and quality assurance/tester.

The main research question was answered. It is how business requirements are transferred to the development team within a project. The diagram of the transferring business requirements process of Integrify was illustrated. Additionally, the analysis of why and when developers should be involved in the process. The reason is to ensure the business requirements are clearly understood and transferred to them. Moreover, the best ways for the development team to understand the business requirement completely have also been given in the data analysis. Understanding these factors, Integrify's process can be scalable and can apply to larger projects. That matches the vision-mission of Integrify. As they want to build a strong consultant team that can take bigger and more complex projects with more challenges for developers to learn more.

7.3 Limitation

The first limitation of the thesis is the data findings for the thesis is limited in quantitative research. At the beginning of the research design, the thesis was planned to use mixed-method research. It is a combination of quantitative research and qualitative research method. The goal is to have different perspectives from external stakeholders in different companies besides Integrify. With the survey questionnaires, the data is diverse with different perspectives from people who have been working in software development. The results are not only gathered inside Finland but also spread all over the world. The purpose is to understand problems when working with the process of their company.

Due to the limitation of the target group that a survey is only for people who are currently and/or have experience in software development. Thus, they can provide suitable answers for the context of the thesis. Another concern is that the thesis workers have a shortage of connections with people working inside the industry. The questionnaires have been posted through Facebook and LinkedIn as well as through friends. However, the number of responses received from the survey was only 44 responses, which did not account for half of the survey sample size. As the result, the conclusion cannot be made because of bias in the key findings.

The second limitation is that the thesis was written during the summer holiday. Most of the employees of Integrify have taken their days off and is difficult to book an interview with them. The data collection has been planned to ask the experiences of people who have worked with the process before the CTO came to the company with some changes in the process. Therefore, the thesis can investigate more advantageous and disadvantageous base on their opinion on old and new processes applied to their work.

7.4 Trustworthiness and validation

The evaluation for data trustworthiness will be divided into three segments. The literature review, data from mixed methods research, and ethical viewpoints. The theoretical framework and the method used in this thesis were taken from mostly printed sources, online journals, and online sources. Those sources have been cited in many research papers. For example, the article Mixed Methods Research: A Research Paradigm Whose Time Has Come from Johnson and Onwuegbuzie (2004) has been cited with 5293 citations. The source was taken from the research gate and inside they have mentioned the source from Denzin 1987.

The data gathered from an interview with many perspectives from different roles in different organizations. The goal is to investigate experiences as well as the real challenges they faced in their company. The interview was kindly asked for permission without forcing and recorded for writing a transcript to support the analysis phase. The participants were given the list of questions that have been designed with open questions. They are related to the insightful process of Integrify and opinions on the process. The list of questions was sent before the interview to provide the interviewees time for preparation and understand the concept of the interview. With preparation for the answers, the accuracy of the present status and honestly experiences is shared. Besides, the data from interviews are analyzed and visualized in the transferring business requirements process diagram. It was reviewed by the CTO to make sure it is correct with the current process of Integrify. The data analysis is based on the data gathered through the interview without forcing participants to give answers to the individual’s assumption.

The last one is about the ethical viewpoints. With interviews, the author informed the interviewees about the thesis topic and the objective, who will be involved in the interview. Additionally, how the interview will be constructed and what is the outcome of the research. Moreover, the author also asked the interviewees kindly intending to record the interview and ask if the data can be written in this thesis as well as the public for others.

7.5 Continuous research development

During the interview with the internal stakeholders, the findings show the importance of having templates for documenting business requirements into clear sections. The software that supports the template documentation creating is using Microsoft Word or Google Docs. Microsoft office 365 is widely used over the world by over a million companies (Shanhong Liu, 2020). Besides, with two billion monthly active users using G Suite products which include google docs (Lisa Eadicicco, 2020). When the non-technical people want to modify the file or add more information, they will know where information should be placed within the templates.

The deeper exploration more about the content of the current business requirements and a template for the company is created. Therefore, they will solve the problem when editing and transferring requirements to other stakeholders. However, the scope of the thesis is limited to an understanding of the transferring business requirements process. Additionally, it will be easier for the readers to focus on understanding the transferring process and find out the way to enhance it.

Not only do the business requirements need a template, but also other documentations also need their own. The reason is to avoid duplicating or losing information while transferring knowledge to others. For example, the feature specification and documentation when doing the project/feature. The need for this document is when the project/feature is implemented, and the feature/project is not yet finished. It will be handed over to another person to continue the work and catch up with the current progress of the project/feature.

Another aspect that can grow more from this research is the project recovery techniques to overcome project failure. During the discussion of what could be the factors that cause the project failure, the need of investigating those factors occurred. Along with the ways to overcome and reduce the possibility of paying extra costs for repairing. The topic may support career development to become a project manager/product owner. As it is related to plan, manage, and create a strategy for the project.

7.6 Professional development

When starting the thesis, some understandings about the topic and the concept through quick research from online. Along with the working experience as a developer and a technical lead. Then the author finds it is interesting after reading more books to gain more knowledge about the research topic. The topic that can help him to grow further in his career path as a project manager/product owner and even higher positions in software development industry management.

The first few pages were difficult to write because the outline of the thesis is unstructured. With the support from the supervisor, the mentor from Integrify, and a colleague the thesis outcome is brought and helped Integrify in their future vision. Besides, the author is passionate about developing himself from a developer to be a project manager/project lead or product owner. Thus, investigating the transferring business requirements process will help the author in his future career development in the IT industry. The process starts from the initial phase to the phase when the development team receives those requirements and ready to implement them.

Through the thesis, the author has gained more understandings of how the customers/business's requirements are analyzed and documented. The author has done a few software projects with different companies; However, he doesn't understand the importance of documenting and understanding the business requirements before starting to do programming. Thus, understanding business requirements, as well as being able to differentiate requirements is vital to the start of the development process. They are user requirements and system requirements.

At first, the thesis topic was huge, which was how business requirements communicate with technology. Noticing the scope of the thesis about the technology aspect was wide. Therefore, the research's scope is narrowed down to focus on software development which also matches the goal of the commissioner of the thesis. Furthermore, the author also knows how to connect the research questions with the objective, and how to answer them through research methods.

In all, the thesis process was good. The research outcome can spot out the missing aspects of the process of Integrify and suggest efficient ways to enhance it. This matches with the commissioner’s expectation when accepting to be the case study for this thesis. Last but not least, the thesis outcome builds deeper knowledge on the related topic and supports further research development.

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APPENDICES

Appendix 1 Interview questions for internal stakeholders

Common

1. What is the role you are working at Integrify? And what are your main tasks?
2. How long have you been working at Integrify?
3. How do you usually document after the discussion? What is the content of the documents? (Are you using any template?)
4. What are the challenges during the analysis process to bring out the business requirements? How do you usually solve the problem?
5. How does Integrify transfer business requirements to the development team?
6. What are the difficulties when communicating with the development team?
7. Have there been difficulties in projects that the Integrify team has worked with, caused by the misunderstanding of business requirements? What are the consequences?
8. When a single feature/product increment has been delivered to the clients, how does it match the initial identified requirements?

Business developers

1. How do you currently collect requirements from customers?
2. How do you document and transfer/involve IT project owner/project manager?
3. How do you negotiate with customers, after business requirements have been analyzed with open questions/clarification?

The product owner/project manager/Project lead

1. How do you currently receive business/customer requirements from the sales/business development team?
2. How do you analyze at a high level before passing down to the development team?
3. How and who do you refine the business requirements with?
4. How do you create scopes and a timeline for deliveries?

5. Based on your experience, what are the factors that cause the schedule late, overrun budget? How did you overcome such challenges?

Developers

1. What are the challenges when receiving and reviewing the business requirements from the project manager/product owner/project lead?
2. What do you expect more from business requirements before it is handed to you?
3. Are you receiving it late/in-time/early?
4. How do you solve those problems to make the business requirements clear to you?
5. How much you are involved in the estimating timeline and scoping for the feature/project?

Appendix 2 Interview questions for external stakeholders

Common

1. What is your role in company X?
2. How business requirements is important for developers?
3. Which phase of the software development process will help to avoid extra repairing result product costs?
4. What are the benefits of understanding business requirements?
5. What are the benefits of documenting business requirements?
6. Why should developers be involved in the business requirements analysis process?
7. In which phase should developers be involved in the business requirements analysis process?
8. What are the best ways for the development team to understand the business requirements clearly?
9. What are the other factors you can think of that should be taken into account during the business requirements transferring process?

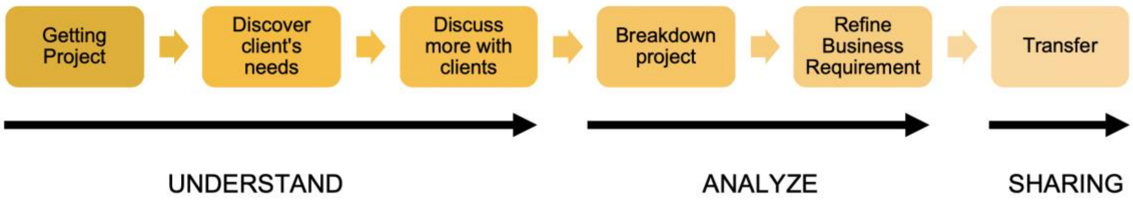
Developers

1. What are the difficulties when receiving business requirements from the Project Manager/Product Owner?
2. What are the factors that give you the motivation to continue working with the project/feature?
3. How do you solve the problems to make the business requirements clear to understand?

Project Manager/Product Owner/Project Lead/Scrum Master

1. Are you involving developers in high level/early phase feature/project estimation?
2. What are the difficulties when transferring business requirements to the development team?

Appendix 3 Integrify's analyzing and transferring business requirement to development team process



Appendix 4 Thesis structure