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Business Intelligence & Analytics (BI&A) Systems Training

The Guidelines for Improving the Effectiveness of BI&A Systems Training for Business Users

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Business Intelligence & Analytics (BI&A) Training: The Guidelines for Improving the Effectiveness of BI&A Systems Training for Business Users

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ABSTRACT (MAX. 200 WORDS):
The technical department usually own the Business Intelligence and Analytics (BI&A) systems. However, due to the need for faster decision-making, the business users started to demand using BI&A in their daily work as well. The traditional training for BI&I focused more on the technical people, who have proficient technical background while the business users lack technical backgrounds. Therefore, the traditional BI&A training program does not satisfy the needs of the business users. This demand of business user stemmed the need for effective training program targeting the business users. The purpose of this thesis is to develop the guidelines for improving the effectiveness of the BI&A systems training program for the business users. From the literature review, we identified the factors that may affect the effectiveness of the training and proposed the initial guidelines for the training program. We then collected data from six trainers and users, who have the experience in either training or taking the training program. Based on the findings, we developed the new guidelines for the training program.

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Ruijing Cheng, Xiaosong Zhang

Lund, May 2018

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1 Introduction

1.1 Background

Business Intelligence (BI) generally refers to systems that combine various decision support technologies, such as data gathering, data storage, and knowledge management, with analytical tools so as to present meaningful and organized information to analysts and decision makers (Chaudhuri, Dayal, & Narasayya, 2011; Negash, 2004). The decision-support applications first emerged in the early 1970s and were modified and expanded over the following years (Watson & Wixom, 2007). In the 1990s, the term "Business Intelligence" emerged and was used by Howard Dressner to describe these decision-support applications (Watson & Wixom, 2007).

Business Analytics (BA) was introduced in the late 2000s as a term to help in describing the value of data analysis in BI (Davenport, 2006). Today, as both BI and BA have similar attributes and complementary to each other, they are combined into the single term BI&A (Côrte-Real, Ruivo, & Oliveira, 2014). BI&A is defined as a collection of "techniques, technologies, systems, practices, methodologies, and applications that analyse critical business data in order to help an enterprise better understand its business and market and make timely business decisions" (Chen, Chiang, & Storey, 2012). The term "BI&A" will be used for the rest of this paper.

Nowadays, BI&A has become essential for the companies. According to the CIO survey conducted by Gartner (2009), the priority technology investment of the 1,527 companies investigated was BI&A. Chaudhuri Chaudhuri et al. (2011) mentioned that the use of BI&A systems has explosively increased in the last two decades due to the lower costs of data storage and larger numbers of available data sources for the companies. There are many industries such as manufacturing, retail, transportation and healthcare have implemented BI&A systems to companies to compete in the market (Williams & Williams, 2003; Wixom & Watson, 2010). For example, in retail banking, BI&A supports the development of customer strategies by identifying valuable customers so that companies can improve its management and processes to attain these valuable customers for the company (Williams & Williams, 2003).

The ultimate goal of BI&A systems is to support the decision-making process, by analyzing raw data and then delivering valuable information, including internal information as well as competitive information, to the decision makers (Negash, 2004). On one hand, decision makers can use the internal information such as sales performance that was generated from the BI&A system to evaluate the position of the company in the market, as well as to make future decisions. On the other hand, decision makers can have a better understanding of the competitors of the company by analyzing the competitive information such as the latest trends and the direction of the market(Negash, 2004). Therefore, BI&A is valuable in helping companies to gain competitive advantages over other companies (Côrte-Real et al., 2014).

The core of analysis work should be the people rather than the system itself. The people who use BI&A systems are often referred to as end-users. There are two groups of end-users closely related to the process of data analysis using BI&A systems, they are the power users and the business users (Eckerson, 2011). Power users refer to highly skilled workers who are also named as technical people sometimes, and casual users usually refer to the business users such as the managers and executives (Lennerholt, van Laere, & Söderström, 2018; Phillips-Wren, Iyer, Kulkarni, & Ariyachandra, 2015). The term "business user" is used in the rest of this paper for the category of casual users. Usually, the technical people have the ownership of data and produce information by using BI&A systems that is then consumed by business users (Lennerholt et al., 2018).

However, as mentioned in the Gartner Report (2016), the recent trends in BI&A industry have the ownership of information handling shifting to the business user rather than technical people, as business users are assumed to have the better understanding about business needs. Therefore, the user base for BI&A system should be expanded and include the business users as well. In response to this trend, some simplified BI&A systems emerged, which can be relatively easier to be handled by business users (TIBCO, 2016).

Nowadays, organizations spend a considerable amount of time and money on training their employees and developing the training program (Dolezalek, 2005). Therefore, ensuring the training program will bring out certain outcomes is vital for the organizations (Velada, Caetano, Michel, Lyons, & Kavanagh, 2007). The expected outcome of BI&A systems training is that the business users can effectively use such systems to solve specific problems in the real working environment.

Traditional BI&A training focus more on technical skills due to that technical people have the ownership of data (Phillips-Wren et al., 2015), which may not be effective for the business users. Therefore, the focus of more advanced BI&A systems training should also change with it accordingly to make the training program more effective for the business users. Thus, this trend leads us to the problem area of this paper.

1.2 Problem Area

Even though more and more companies have implemented these BI&A systems, many companies failed to continuously utilize these systems properly (Papoglou & Antoniou, 2015). The reason lies in the ineffective use of the BI&A systems in the real working environment. In other words, the working performance of end-users has left much to be desired. Business users usually lack a profound understanding of these systems due to their limited technical background. As mentioned earlier, the BI&A systems support better decision-making by delivering valuable information (Negash, 2004). The lack of profound understanding of BI&A prevents the business users to draw out valuable information through data analysis (Lennerholt et al., 2018).

According to Lennerholt et al. (2018), educating the end-users effectively can improve their understanding of the new BI&A systems, which means it is helpful for the successful implementation of BI&A systems (Lennerholt et al., 2018). However, it worth noting if the training for the traditional BI&A systems does not work effectively for the more advanced BI&A systems. The training for traditional BI&A systems and more advanced BI&A systems

are different since they are designed for the different target end-users. For the traditional BI&A systems, such as guided analytics, the target end-users are highly skilled technical people, who have the abundant background in using technology (TIBCO, 2016). The technical background also makes them have higher acceptance for the adoption of new technologies (TIBCO, 2016). Therefore, technical people can achieve the goal of effectively use BI&A systems by learning technical skills in the training.

Different from traditional BI&A systems, the new systems, such as self-service BI and mobile BI, focus more on business users, who generally have little experience in technology, such as programming and performing data analysis (Phillips-Wren et al., 2015). Even though these BI&A systems are designed to meet the needs of business users and are thus more user-friendly, business users still need to gain a deeper understanding of the data and the system itself to customize their reports in the way that they prefer (TIBCO, 2016). Thus, in addition to the basic technical skills, there are more things need to be learned for business users in the new BI&A systems training.

One survey shows that 64 percent of the respondents gave an average or lower grade to their performance in the new BI&A initiatives (Lennerholt et al., 2018), which indicates that the current training for business users in using new BI&A systems is not effective. After the training, the business users may know how to present data to the dashboard and create reports, but they do not know the meanings of what they are doing and how to make it useful, which indicates that their knowledge remains only at the basic level after they initially learn how to use the system. In short, the training is not effective since it did not help to meet the goal of BI&A: transforming data into valuable information (Negash, 2004). The result of this ineffective training is that the low working performance in using BI&A systems in the real working setting, and that is the cause of the failure in continuously utilize these systems that we mentioned at the beginning of our problem has happened.

To sum up, training business users on the more advanced BI&A systems, though challenging, is essential for the effective utilization by end-users and for the successful implementation of BI&A systems by firms. Many previous articles have mentioned the importance of the training; however, they did not specifically address how companies should develop more effective training programs on using BI&A systems, especially for business users.

1.2.1 Research Question

This research will aim to answer the following question:

How to make the BI&A systems training more effective for the business users?

1.3 Purpose

The purpose of this study is to develop the guidelines to improve the effectiveness of BI&A systems training for the business users. To achieve this, this paper aims to investigate the current BI&A training programs for the three most popular BI&A systems, which are Qlik Sense, Tableau, and Power BI. By conducting this study, this paper further aims to provide beneficial information in the form of guidelines to BI vendors, consultancy companies, as

well as to companies who have implemented BI&A systems and are considering designing or restructuring their BI&A training program. Moreover, this paper also aims to contribute to the field of knowledge of Information Systems, and to provide knowledge to students who are interest in the training for BI&A training.

1.4 Delimitation

As we mentioned before, our goal is to provide guidelines for training the business users effectively. Although both understandings of technology and the user-friendly system have effects on the adoption of the technology (Venkatesh & Davis, 2000), we only concerned with the human factors, or the training for the business users, rather than modifying the technology here. Also, there are several factors associated with the success of the training outcome besides the quality or the effectiveness of the training program, such as the organization support and individual readiness (Kraiger, 2003). However, in this research, we only focus on the effectiveness of the BI&A training program for the business users and investigate how to improve the effectiveness of the training program.

2 Literature Review

2.1 BI&A Framework and Process

The framework plays an essential role in helping organizations to deal with their information system tasks by providing a better and clearer understanding of the system itself (Gorry & Scott Morton, 1971). The BI (Business Intelligence) is the system that combines various decision support technologies such as data gathering, data storage, and knowledge management, with analytical tools to present information to the analysts and decision makers (Chaudhuri et al., 2011; Negash, 2004). The BI framework that is shown in Figure 2.1 presents how this system actually work to realize its function. According to Watson and Wixom (2007), "getting data in and getting data out are the two primary activities in BI&A process".

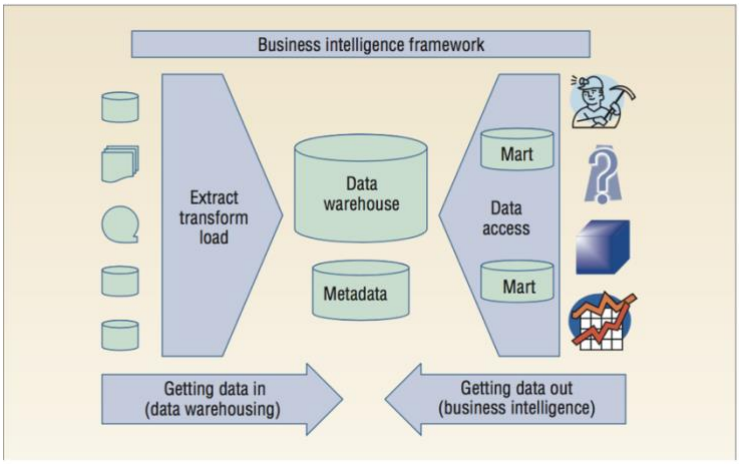

Figure 2.1: Business Intelligence Framework (Watson & Wixom, 2007, p.97)

"Getting data in", also called data warehousing, means moving the data from different data sources such as internal systems, operational data and machine data into an integrated data warehouse (Phillips-Wren et al., 2015; Watson & Wixom, 2007). These different data sources can be characterized into three types of data: structured data, such as spreadsheets and tables, semi-structured data, such as photos and emails that tagged by certain keywords to support users to find them, and unstructured data, which mainly shown as human language text (Gupta, Bostrom, & Huber, 2010). The second step in data warehousing is data preparation, which refers to ETL (extracting, transforming, and loading) data, and data cleansing (Phillips-Wren et al., 2015). The purpose of this step is that the data needs to be identified as relevant so that it can be support the decision better (Watson & Wixom, 2007).

The other activity "getting data out" is usually called business intelligence, and is described as an activity that "consists of business users and applications accessing data from the data warehouse to perform enterprise reporting, OLAP (online analytical processing), querying, and predictive analytics" Watson and Wixom (2007). Phillips-Wren et al. (2015) categorized this series of activities as data analysis, data access, and usage. Based on different methods

and tools, there are three types of data analysis: descriptive analytics, predictive analytics, and prescriptive analytics (Evans & Lindner, 2012). After the data analysis, the users can use the data to conduct various activities, such as querying and creating reports (Watson & Wixom, 2007). Eckerson (2011) categorized the users as the power users and the business users based on their capabilities of using BI while Phillips-Wren et al. (2015) divided the users based on their specialized skills as business users, business analysts, and data scientists.

According to Gartner (2016), the recent trend in BI&A industry is that the ownership of information handling should shift to the business user rather than power users, as business users are assumed to have the better understanding about the business needs. Simplified BI&A systems, such as self-service BI and mobile BI, have emerged in response to this trend (TIBCO, 2016). These more advanced BI&A systems can give the access of data to the end-users with lower technical requirements, which can be easily handled by business users (Abelló et al., 2013).

Self-service BI was defined by Imhoff and White (2011) as "the facilities within the BI environment that enable BI users to become more self-reliant and less dependent on the IT organization". The emergence of SSBI can be traced back to the first activity in the BI&A process, "getting data in". With the increase of information, the large volume of data comes from internal and external has been stored in the data warehouse, which put a huge stress on the IT department to create the data reports (Alpar & Schulz, 2016). Therefore, the SSBI approach appeared as the results of the need for business users to be more self-reliant (Alpar & Schulz, 2016; Lennerholt et al., 2018).

Mobile BI refers to the term that "a procedure in which data critical for making decision available to end-users in the appropriate applications and devices that can be in any way considered mobile" (Hanover, Anderton, & Curtis, 2000). The mobile BI is the result of the emergence of mobile broadband and some hardware systems such as IOS and Android (Hanover et al., 2000). Comparing to the traditional BI&A, the advantage of mobile BI lies on that it can handle the data by using mobile devices rather than by computers, which are located in the offices (Hanover et al., 2000). In other words, the mobile BI enables the data processing to be no longer restricted by the location.

2.2 Training in Organizations

Normally, the training can be divided into three main stages: "Pre-service training", "In-the-job training", and "Off-the-job training" (Miri, Mansor, Chasempour, & Anvari, 2014). Each stage has its own responsibility. The "Pre-service training" is mostly used as an introductory section to prepare the employees for what they are going to learn while the "Off-job training" is more of a fellow-up course, which helps the staffs to consolidate what they have learned before (Miri et al., 2014).

The main difference between the general training and the IS training is that the IS training focuses more on how the outcome will affect the success of the system implementation (Esteves, Pastor Collado, & Casanovas Garcia, 2003). Based on this focus, IS training is considered to be a typical technical training (Esteves et al., 2003). IS training refers to the education or training used for acquiring IS knowledge target the end-users of certain information systems (Nelson & Cheney, 1987). IS training helps the end-users to obtain the

knowledge of the systems as well as increase their interest in using the systems in the work (Esteves et al., 2003). According to Holan and Phillips (2004), there are many factors should be considered in the IS training program, such as the technical and organizational skills, certain knowledge of specific IS products and IS concepts. As mentioned previously, the BI&A system is a combination of techniques that deliver valuable information to its end-users (Chaudhuri et al., 2011; Nelson & Cheney, 1987). It is a kind of information system in essence.

2.3 BI&A Training Program

2.3.1 Training Methods

Usually, there are three ways to deliver the system training program, the classroom instruction supplied by the system vendors, online interactive course, and other distance learning courses (Esteves et al., 2003). Due to the similar forms of the last two courses, people considered them to be the same method and usually named it either as the virtual class or the online course (Esteves et al., 2003). The online courses or the Web-based courses deliver information to students by asynchronous communication. Therefore, this method limits the depth and effective interaction to some extent (Wang & Newlin, 2001). Yet, the convenience of the virtual class lies in that it expands the education opportunities available to people (Rivera & Rice, 2002). Correspondingly, the classroom instruction can enhance the interaction between the trainers and trainees largely (Jones, 1999). In other words, the ultimate training outcomes can be better. But it is often restricted by objective factors such as location, number of students, the funds and so on (Jones, 1999). Meanwhile, the acceptance and satisfactions are also different based on different people (Rivera & Rice, 2002).

2.3.2 Selection of Trainers

The selected trainers should be the natural teachers and experts with rich experience (Esteves et al., 2003). The requirements of experience usually include two aspects: one is in the certain field which they train for, the other one is the experience in teaching (Esteves et al., 2003). According to Pol, Reid, and Fuqua (1983), the experienced trainers usually have rich knowledge in their expert fields, which would be helpful when they teach others more effectively especially in improve the skills. For example, an experienced trainer could help with solving the problems that trainees encounter several times in the training. Therefore, such experience makes it easier for the trainers to explain subject matters in a specific context. The experience in teaching often related to some soft skills such as the ability to structure the whole training process and communicating with different people (Esteves et al., 2003). According to Swanson and Falkman (1997), comparing with novice trainers, the advantages of the experienced trainers in delivering effective training are mainly on the following aspects: their confidence, credibility, proficient time-control, and the ability to engage people and adjust the instruction.

2.3.3 End-Users as Trainees

For BI&A systems training, the usual trainees are the end-users who need to learn about how to use this system. Therefore, we use the term "end-users" to represent the trainees in the rest of this paper. There are various end-users involved in the BI&A, which could be categorized into the power users and the casual users (Lennerholt et al., 2018). The power users are the highly skilled workers, such as the BI experts (Lennerholt et al., 2018). They produce information with the technical skills and statistical skills to develop the analytical or data models for BI&A (Alpar & Schulz, 2016). As mentioned earlier, the traditional BI&A is mostly designed for and operated by the power users who have the ability to use ad-hoc query, design the analytical model, and creating reports based on the needs casual users in making decisions based on the requirements (Alpar & Schulz, 2016). In the current trend, the power users still take an important part in the BI&A since they are the ones who need to develop the analytical models that can be used for other end-users (Alpar & Schulz, 2016).

The casual users, which will be referred as the "business users" in the following sections, are the decision makers, the front-line workers, etc. (Lennerholt et al., 2018; Watson & Wixom, 2007). Comparing to the power users, they are lacking the technical skills and the skills to perform statistical analysis (Alpar & Schulz, 2016). The decision makers include senior executives and middle managers from different business departments (Davenport, 2006). To enable the reliability and quality of the data, the decision makers, especially for those who make tactical decisions based on data, should have the control of data and the system (Abelló et al., 2013). These decision makers need be able to understand the BI&A systems in order to access and understand the data and to effectively use the information, such as dashboard and reports, through BI&A system and to support the decision making (Davenport, 2006; Golfarelli, Rizzi, & Cella, 2004). The decision-makers also need to monitor and control the results of BI&A (Davenport, Harris, De Long, & Jacobson, 2001). Moreover, as mentioned by Wixom and Watson (2010), employees besides the highly skilled workers should involve in the analytical process and be part of the user base for BI&A. Therefore, the employees in different departments should also be able to understand and use BI&A in their daily tasks to analyze the data and to report the data in a way that is more relevant to the business needs.

In a given training setting, an end-user's behavior or performance can be influenced by several factors when using the software or system (Sein & Bostrom, 1989). In correspondence, different individual characteristics of trainees could influence the results of training as well. Sein and Bostrom (1989) conclude the influential individual characteristics as prior experience, learning capability, and motivational traits.

The prior experience of the end-users is an important factor that could influence the effectiveness of the training program especially in software trainings (Sein & Bostrom, 1989). The knowledge that an end-user gained from past experience would help shape intention, therefore, the knowledge will be more accessible in the memory (Fazio & Zanna, 1978). One typical problem that often happened in a IS training program is the user's resistance of software (Kim & Kankanhalli, 2009). The appearance of resistance of the technical system is because people feel threats or losing power profession in their fields (Lapointe & Rivard, 2005). However, their attitudes will be different if they have had some relevant experience in using the system (Fazio & Zanna, 1978).

There are empirical and theoretical evidence showing that the learning capabilities is a critical element to affect the outcome of a training program (Derry & Murphy, 1986). Based on the

conceptual model created by Sein and Bostrom (1989), the three elements identified from the model are cognitive traits, visual ability, and learning mode. Graf, Liu, Chen, and Yang (2009) explain the term of learning capability as the ability that includes the speed of learning, the memorization of learned concepts, and effectiveness of skill acquisition. Derry and Murphy (1986) also notice that learning ability cannot not be improved only by training skills or by direct instruction alone. It is the kind of capability that need to be developed gradually over time.

According to Kanfer and Ackerman (2000), different people get different motivation of the training program, such as the desire of study, personal mastery, and competitiveness. Research from Tsai and Tai (2003) indicates that a clear training goal can enhance the effectiveness of training. In other words, the end-users need to understand why they should lean this system.

2.3.4 Training Skills

Cermak and McGurk (2010) stated that the users could not effectively make use of the BI&A systems without proper skills on hand. For example, Capital One, an American bank, requires the business analyst to have high conceptual problem-solving and quantitative analytical attitudes, related working background, such as engineering, financial and consulting, and the ability to learn the software, manage the project, and express and share ideas effectively (Davenport, 2006). The skill requirements for the technical people and the business users are different as they have the different level of experience with the technology (Lennerholt et al., 2018).

For the business users, one of the main purposes for them to learn about BI&A is to understand how to perform data analysis in their daily work with BI&A when making decisions and create the reports and dashboards that can be presented to others (Davenport, 2006). To begin with, the end-users need to have the proper technical skills including the knowledge of using the system to extract, analyze, and display the analysis results (Davenport et al., 2001), which is also the fundamental purpose of having the training programs. However, some other skills are also important for performing data analysis effectively. As mentioned by Davenport et al. (2001), data by itself does not contribute to any useful meaning, thus do not provide much value for the decision-making. In order to convert raw data into meaningful information to support the decision making, analytical skills are also essential to have for the end-users (Davenport et al., 2001). Without transferring the raw data into useful information, data itself does not make sense to the decision makers or add business values to the companies (Harris, 2012). The analytical skills include the abilities to frame business problems and produce analytical outputs through BI tools (Davenport et al., 2001).

Currently, there is a large gap between the available data and available people who are able to perform the analysis even with proper BI&A technology (Wixom et al., 2011). The survey conducted by Manyika et al. (2011) showed that the US was short of 140,000 to 190,000 people with analytical skills and about 1.5 million managers and analysts to analyze data and making decisions based on data, which confirmed this gap. In order to effectively transfer raw data into information, human analysis is essential (Negash, 2004). As the business users are usually the employees from the different department and lacking in the technical skills and analytical experience (Lennerholt et al., 2018), it is important for them to understand how to use BI&A to do data analysis I the work. The soft skills are also important for the end-users to

have, which include the ability to successfully present the information to and communicate with the people who need this information for making decisions and take actions to improve the business performance (Davenport, 2006).

2.3.5 Training Activities & Data Sources

Effective training can increase the productivity by improving the performance of the employees (Grossman & Salas, 2011), which emphasizes the importance of designing the right training activities for the business users. Designing the appropriate training activates can positively affect the effectiveness of the training program (Grossman & Salas, 2011). The companies implement the training programs to help the users gaining essential knowledge and skills to analyze data with BI&A (Lennerholt et al., 2018). However, the training program cannot be considered effective by just teaching the basic skills or procedures for using the BI&A systems (Gupta et al., 2010). It is also important to understand the meaning and the purpose behind the certain actions or procedures (Gupta et al., 2010).

Helping the business users to transfer the skills and knowledge learned in the training program and using in the training is also an important aspect to consider since it is necessary for the training to have the impact on the work performance (Kraiger, 2003). The research conducted by Montesino (2002) demonstrated that the training can be considered as working positively only when the newly trained competencies have been transferred to the work environment positively. However, only approximately 10% of the training experience has been successfully transferred from the training environment to the real working environment (Baldwin & Ford, 1988). Moreover, Wexley and Latham (1991) stated that such low rate will keep falling with time. Kraiger (2003) also mentioned that only 10 % to 20% of the knowledge and skills from the training is applied in the real working environment. These data illustrate that there is a gap between training and workplace performance, which adversely affects the effectiveness of the training. The emotional changes also occurred as the employees are transferring from the training environment to the working environment (Molinsky, 2014). In the training environment, the employees can freely experiment in using different skills without being worried about mistakes, which create a comfort zone for them (Molinsky, 2014). However, as they complete the training program and enter the real working environment, they gained anxiety as leaving the comfort zone (Molinsky, 2014). Therefore, there is a need to transfer the training to the real working environment and help the employees to better prepare for such emotional changes. Designing the realistic environment that is as close to the real working environment as possible could be a helpful way for this transferring process.

Creating a realistic environment in the training is about choosing the settings of real work and applying them in the training program (Grossman & Salas, 2011). As the settings are close enough to the real work, there is a higher chance of successfully transferring the training outcomes, such as skills, procedures, and knowledge into the real working environment (Grossman & Salas, 2011). The two techniques usually used in applying realistic settings in the training environment are the role-play and scenarios (Grossman & Salas, 2011). The trainers can train the business users by designing the training activities in different scenarios that close to the real working environment to prepare them to use the training skills and knowledge in the work.

Besides the activities, using the right data sources in the training is also important. The business users usually come from the different departments with different backgrounds, which make the training more complex. And, people from different departments have the different emphasis on data and different requirements for the system (Mumford, 1985). For example, the end-users in the financial departments are more familiar with the finance related data sets, and these data usually have a streaming nature and is continuously being generated in a high-speed (Cabañas et al., 2016), which requires the end-users to have the capability of performing the accurate and efficient analysis. However, for the marketing department, the data sets are more about the customers such as profiles and transactions (Paweloszek & Korczak, 2017). And, the employees of the marketing departments need to focus on using data to present some trends to do the future customer segmentation. As mentioned above, it would be more effective if the settings in the training program close to the real working environment (Grossman & Salas, 2011). Gupta et al. (2010) also suggested that brining the personal relevance in the training, such as the personal experience of working, has positive influences on the training outcome and improve the effectiveness of training the end-users to use the targeted systems. Thus, the data resources used in the training should be adjusted based on different needs and should be close to the real data sources that the business users encountered in the work.

2.4 Initial Guidelines Proposal

We developed our initial guidelines based on above work.

1. The classroom training should be more interactive and more effective for the business users.
2. It is better for the BI trainer to acquire related experience in BI&A, and the teaching experience and soft skills are important as well.
3. It would be more effective for the end-users to learn how to use BI&A based on the context that close to the real working environment, rather than just learning the basic technical skills and the function of BI&A.
4. It would be better to train people by groups based on different departments and their individual differences.
5. The training should not only just teach the procedures of using BI&A but should also introduce the concept of the system.
6. Training use data source or data sets that are relevant to the daily work may help the end-users to understand how to use it later in the daily work faster.

2.5 Summary for Literature Review

Figure 2.2 illustrates our theoretical framework for literature. To conclude, we started from the BI framework and the process to get a general background and knowledge of BI. Since the topic of this study is focused on the training of BI, we moved to the general training in organizations. We identified that there are many kinds of training programs and as IS training focus on the successful implementation of systems and targeting on the end-users, the IS training can be considered as a typical technical. Moreover, as BI&A system is also a kind of information system, we identified some essential factors which should be considered when design and develop the IS training and categorized them as the training methods, trainers and

trainees, training skills and training activities and materials. We will discuss these influential factors one by one in the following sections and explain about how these factors affect the training. Table 2.1 summarized the key notions of literature review with their themes and authors.

Figure 2.2 Theoretical Framework of Literature Review

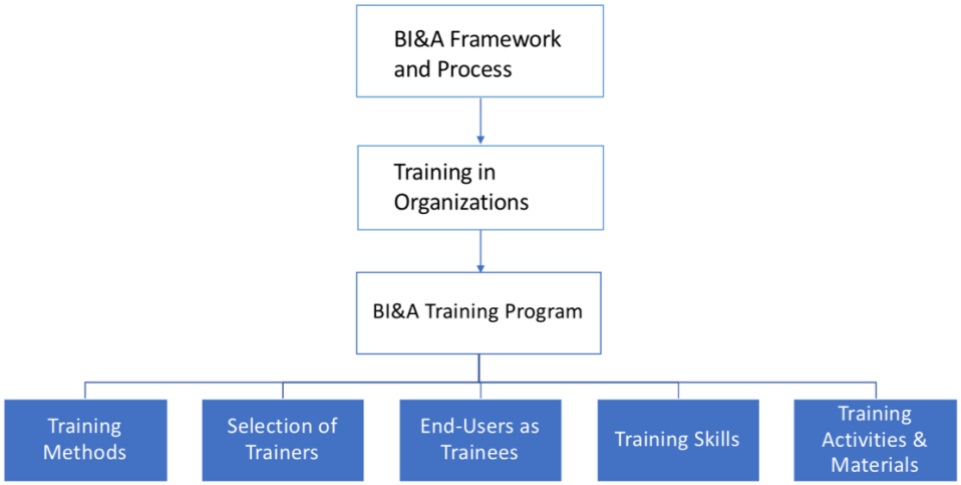

Figure 2.2 Theoretical Framework of Literature Review

Table 2.1: Key Notions of Literature Review with Themes and Authors

Themes	Key Notions	Authors
BI&A Framework and Process	- Getting data in and getting data out are the two primary activities in BI&A Framework.	(Gorry & Scott Morton, 1971), (Chaudhuri, Dayal, & Narasayya, 2011), (Negash, 2004), (Watson & Wixom, 2007), (Phillips-Wren, Iyer, Kulkarni, & Ariyachandra, 2015), (Russom, 2011), (Evans, 2012), (Eckerson, 2011)
	- The recent trends in BI&A industry have ownership of information handling shifting to the business user rather than power users.	(Microstrategy, 2017), (Gartner, 2016), (TIBCO, 2016), (Abelló et al., 2013), (Imhoff and White, 2011), (Alpar & Schulz, 2016), (Lennerholt et al., 2018), (Hanover, Anderton, & Curtis, 2000)
Training in Organizations	- Training can be divided into three stages.	(Miri, Mansor, Chasempour, & Anvari, 2014)
	- IS training as one kind of technical training is different with general training.	(Esteves, Pastor Collado, & Casanovas Garcia, 2003), (Esteves et al., 2003), (Nelson & Cheney, 1987), (Chaudhuri, Dayal, & Narasayya, 2011), (Negash, 2004)

Training Methods	- Classroom instruction training, and online training are the two most common methods.	(Esteves et al., 2003), (Wang & Newlin, 2001), (Jones, 1999), (Rivera & Rice, 2002)
Selection of Trainers	- The trainers need to have experience in the fields that they train for, and the experience in teaching.	(Bancroft et al. 1998), (Pol, Reid, & Fuqua, 1983), (Swanson & Falkman, 1997)
End-Users as Trainees	- The end-users of BI&A systems can be categorized as power users and casual users.	(Lennerholt, van Laere, & Söderström, 2018), (Alpar & Schulz, 2016), (Watson, 2009), (Davenport et al., 2001), (Abelló et al., 2013), (Golfarelli, Rizzi, & Cella, 2004), (Wixom and Watson, 2010)
	- The individual differences need to be considered in the training program. - The individual differences include prior experience, learning capability, and motivational traits. -	(Sein & Bostrom, 1989), (Fazio & Zanna, 1978), (Kim & Kankanhalli, 2009), (Lapointe & Rivard, 2005), (Derry & Murphy, 1986), (Kanfer & Ackerman, 2000), Tsai and Tai (2003)
Training Skills	- There are three types of skills are essential in the BI&A training, they are basic skills in using the system, analytical skills, and soft skills.	(Cermak & McGurk, 2010), (Davenport, 2006), (Lennerholt, van Laere, & Söderström, 2018), (Davenport et al., 2001), (Harris, 2012), (Manyika et al., 2011), (Negash, 2004)
Training Activities and Materials	- Right training activities can improve the effectiveness of training.	(Salas et al., 2006), (Grossman & Salas, 2011), (Lennerholt, van Laere, & Söderström, 2018), (Gupta, Bostrom, & Huber, 2010)
	- Creating the training activities in a realistic environment can help transfer the outcome of training	(Kraiqer, 2003), (Montesino, 2002), (Baldwin & Ford,1988), (Wexley & Latham, 1991), (Molinsky, 2014), (Grossman & Salas, 2011)
	- Using relevant training materials has positive impact on the effectiveness of training.	(Mumford, 1985), (Cabañas et al., 2016), (Paweloszek & Korczak, 2017), (Rose, 1984)

3 Research Method

3.1 Qualitative Method

Our research aim is to design the training guidelines for BI&A vendors and the companies to improve the effectiveness of BI&A systems for business users. The research method was based on the data collection and the purpose of our research. As the purpose of this study is to develop the guidelines for the companies and the vendors to improve the effectiveness of BI&A training programs, we aimed to collect data from the technical trainers and analytical consultants from the vendors and the consultancy companies who deliver the training program for end-users. We also collected data from the end-users of BI&A system who are the trainees in the training program.

Our research question is as following:

1) How can BI&A systems training be more effective for business users?

The answers to our research questions are presented as a design science result that came up with a specifically designed result. According to Bhattacherjee (2012), the exploratory research is often conducted in new areas of inquiry, and one of the goals of exploratory research is to generate some initial ideas about the phenomenon. Besides, Recker (2013) mentioned that exploratory research fits to answer the questions that start with "how." Thus, we naturally classified our research as the exploratory research. Moreover, as the qualitative method could be the most suited method to conduct the exploratory research, we choose the qualitative research as our research strategy.

3.2 Data Collection

As we choose the qualitative method to conduct our study, the data we collected is qualitative data. According to Bhattacherjee (2012) and Recker (2013), interviews are the most common way of collecting qualitative data. Moreover, diverse ideas and experiences are essential in our study as we mentioned before that this research focuses on the aspect of business people rather than technology. Interviews can be considered as an effective way to gather information from different perspectives (Recker, 2013) and it can give the interviewees the opportunities to express their experience and ideas by encouraging the interaction between researchers and interviewees (Kvale, 2006). Thus, we decided to use the interview for data gathering.

3.2.1 Data Collection Techniques

There are various types of qualitative interviews (Gubrium & Holstein, 2002), Myers and Newman (2007) summarized some typical types as the structured interview, unstructured or semi-structured interview and group interview. We decided to conduct our research as a semi-structured interview as this is the one that is used most in qualitative in information systems(Myers & Newman, 2007). According toMyers and Newman (2007), there is an

incomplete in a semi-structured interview, which means researchers need to prepare some questions beforehand and expand these questions in pace with the interview. Therefore, we developed some questions on the basis of our research purpose and structure them as introductory questions, main questions, and finishing questions. We have done all the interviews as semi-structured interviews. In other words, we did not strictly follow these questions during the interview. We extended or deleted some questions based on the interviewees' answers. In addition, as the semi-structured usually requires for researchers' on-site resilience (Brinkmann & Kvale, 2005), we wrote a script including a short introduction about our background and some general information of our research so that the interviewee can get a rough understanding about what he or she will be asked about. We also wrote down some possible answers to the questions and did the rehearsal several to practice how to deal with them. We played two different roles during the interview. One acted as the leader who asks the questions to the interviewee. Moreover, the other should respond to the answers in time such as confirming, explaining and inquiring further, because sometime the interviewee may misunderstand the purpose of the question so the direction, so we need to keep communicating to make sure that we are on the right direction.

According to Kvale (2006), a research interview should be a specific hierarchical and instrumental form of conversation rather than an open dialogue. Thus, a sufficient preparation is essential. We searched for the information of the interviewees as well as their companies and contacted them actively to decide the form of the interview. Initially, we planned to do the face-to-face interviews as face-to-face interaction can enhance the involvers' performance largely in the interview(Myers & Newman, 2007). However, due to the restriction of time and location, we also decided to use Skype video meeting well as WeChat phone calls to conduct the interviews.

3.2.2 Theorizing Study

We structure the interviews and develop the questions based on our theoretical framework, which can be found at the end of literature review (Figure 2.2). Table 3.1 presents how the questions related to each theme of the literature review. We started from the BI training program, to get a preliminary understanding of current BI training program. Then we moved to the users of the system to see whether these belong to the group of power user or the business user because the focus of this research is on the business people instead of technical people, it is essential to make the statement clear here. Then the following questions all pertain to the essential factors that we have listed in the literature review. Since these questions are our main focus for the interview, we also set some introductory question and finishing question, and they are presented in Table 3.2. Also, as we conducted the semi-structured interviews, we have some extending questions during the interviews as well, and they can be found in

Table 3.2. Our interview guide can be found in Table 3.3.

Table 3.1 The Questions Related to Literature Themes

Themes	**Interview Questions**
BI&A Training Program	Q2

Training Methods	Q3
Selection of Trainers	Q4
End-Users as Trainees	Q5, Q6
Training Skills	Q7
Training Activities and Materials	Q8

Table 3.2 Other Questions

Themes	**Interview Questions**
Introductory Questions	Q1
Challenges in BI& Training	Q9
Future Trend of BI&A Training	Q11
Finishing Question	Q10

Table 3.3 Interview Guide and Purpose for Each Question

Introductory Questions	
Q1:	Can you give us a short description of your work?
Purpose:	*To put the interviewees' answer in the context of their background and guide them into the interview.*
Main Questions	
BI&A Training Program	
Q2:	Can you give us a brief description of the BI&A training program of Power BI/Tableau/Qlik Sense? Especially for business people.
Purpose:	*To get a primary understanding of the current BI&A training program and point out our focus to be business people.*
Training Methods	
Q3:	Which training methods do you usually use? For example, the classroom instruction and the distance interactive course? Or others?

Purpose:	*To get an understanding of what is the most common method that has been used in BI&A training and how this method works.*
Selection of Trainers	
Q4:	How do you select the trainer for the BI&A training program? For example, what kind of background and skills are required for the trainer?
Purpose:	*According to the literature review, the trainers have certain influence for the training program, therefore there should be some requirements for trainers. This question here is to explore the specific requirements for trainers.*
End-Users as Trainees	
Q5:	Who are the usual people that will take the training? For example, the decision maker, data experts, or the general employees?
Purpose:	*For IS training, the end-users are the usual trainees. There are power users and business users for BI&A system, as the trend of BI&A development is shifting the ownership from technical people to business people, this question here is trying to validate this kind of shift.*
Q6:	When you train people, do you train them by different groups based on their background or train them together? • What benefits and challenges do you see as training this way?
Purpose:	*According to the literature review, the individual difference can affect the training results to some extent, but due to many restrictions general training will usually not consider this factor when designing training. This question is aimed at exploring the impact of individual differences for training program.*
Training Skills	
Q7:	garding to the BI training process and users, what skills do they train for? • Which skills do you think have the highest value? • Do you think the skill requirements are different based on the roles? What about different departments? • How about letting people know the value of BI&A or what is BI&A?
Purpose:	*This question is aimed at exploring what kind of skills that people can get from the training program. And by doing the literature review, we identified that the analytical skills are the most important skills for BI&A system, we would like to know whether they are the highest values skills in the training program. This question is also related to the individual differences.*
Training Activities and Materials	

Q8:	As the task performance is an essential part of the training, can you give us an example of how you design the training program to fit the daily tasks for the users? • Do you provide users with different data sources and training activities depending on different tasks? • Do you think it would be more beneficial when using different activities and data sources that close to the daily tasks?
Purpose:	*This question is aimed at understanding how to design the daily task to fit the task performance, including the data sources and training activities. And this question is also closely related to the individual differences of the end-users.*
Finishing Questions	
Q9:	What challenges have you experienced as a trainer? For example, the resistance of the software? • And how do you overcome these challenges?
Purpose:	*This is an extending question for the trainers. This question is aimed at examining the current problems of BI&A training.*
Q10:	Do you have any additional comments or suggestions on structuring training program?
Purpose:	*To give the interviewees an opportunity to add things that we did not foresee in and help us develop this research.*
Q11:	How do you look upon the future of BI&A training?
Purpose:	*To explore the future development of BI&A training.*

3.2.3 Selection of Interview Participants

Before we selected the interview participants, we choose to target on the three most famous BI&A systems, Tableau, Qlik Sense, and Power BI. Figure 3.1 illustrates that the current major vendors in BI&A industry are divided into four roles based on the different preference of their software and how they compete with each other in the market. Figure 3.1 shows that the different vendors are considered as challengers, niche players, visionaries, and leaders. Yet, as we mentioned that shifting the ownership of information handling from technical people to business people has become the trend in BI industry, many vendors start developing BI&A technologies that are more self-service oriented. And as shown in Figure 3.1 Microsoft Power BI, Tableau, and Qlik are the leaders among these vendors who own the most mature technology in BI&A (Gartner, 2016).

We conducted the interviews mainly with two types of stakeholders. The first group of our interviewees are the trainers from BI&A vendors. We choose this group of people to get an understanding of what a general BI&A training program currently looks like. The second

group of our interviewees are the trainers and the consultants from companies that have already implemented Qlik Sense, Tableau, and Power BI, since these people usually help people to deal with their specific problems rather than providing a general training. We also interviewed a business user from a company.

Figure 3.1 Gartner Magic Quadrant of BI and Analytics Competitors (Gartner, 2018B)

3.3 Data Analysis

3.3.1 Transcribing

We transcribed the interviews into text document using the online software Iflyrec. The details of transcripts are shown below in Table 3.4. And because we did two interviews in Chinese (IP 4 and IP6), we also did the translation work by Ifyrec Translation after transcribed the record into the text document.

Table 3.4 Transcribe Process

Interviewee	Transcript	Transcribed By	Verified By
IP1	Appendix 2	Ruijing Cheng and Xiaosong Zhang	Ruijing Cheng and Xiaosong Zhang

IP2	Appendix 3	Xiaosong Zhang	Ruijing Cheng
IP3	Appendix 4	Ruijing Cheng	Xiaosong Zhang
IP4	Appendix 5	Xiaosong Zhang	Ruijing Cheng
IP5	Appendix 6	Ruijing Cheng	Xiaosong Zhang
IP6	Appendix 7	Xiaosong Zhang	Ruijing Cheng

3.3.2 Analyzing

According to Recker (2013), the analysis method depends on the nature of the data. After we have conducted the qualitative research and collected data from the interviews, we choose coding to be our main analytical method. Coding may be the most commonly used technique and it could be the most useful way for reducing qualitative data to meaningful information (Recker, 2013). Coding refers to attaching keywords to the part of text (Kvale & Brinkmann, 2009). There are three main coding approaches for analyzing qualitative data, open coding, axial coding, and selective coding (Bhattacherjee, 2012; Recker, 2013). We choose open coding as our coding approach as open coding aimed at identifying concepts or keywords from the textual data (Recker, 2013). We conducted the coding process for each interview. The codes were used for sorting the interviewees' answers for different themes in literature review, and then comparing these answers to summarize the results to draw our final conclusion. The coding structure is shown in Table 3.5.

Table 3.5 Coding Structure

Theme	**Code**
BI&A Training Program	BATP
Selection of Trainers	ST
End-Users as Trainees	EUT
Training Methods	TM

Training Skills	TS
Training Activities and Materials	TAM

3.4 Research Quality

3.4.1 Validity and Reliability

According to (Recker, 2013) and Bhattacherjee (2012), validity and reliability are two essential measurements for the quality of the research. Validity refers to whether the collected data is a measure of what this research intended to measure (Recker, 2013). And the reliability describes whether the measurement is consistent or dependable (Bhattacherjee, 2012).

To achieve validity, the results of the research should acquire generalization in another context of study. The validity of this paper can be examined by comparing the answers from our interviewees. As we mentioned in the selection of interview participants (Chapter 3.2.3). We have two different groups of interviewees, the group of trainers and consultants who are in charge for the BI&A training, and the group of end-users as trainees who learning from the BI&A training program. The trainers and consultants deliver the training courses by the three most popular BI&A systems, and the similarity among these BI&A system is that all of them are easier to be used by the business users. Therefore, the comparisons of their opinions of the training program in these three similar systems can well support the research validity.

For the reliability, Bhattacherjee (2012) suggested that the results of research should be the same in the remaining constant. Based on our research strategy and data collection method, we achieved the reliability by using the terms with certain definitions for all the interview questions, such as the business users and power users. As we conducted semi-structured interviews, which means there may be some extended questions based on the answers of interviewees except the main questions that have already be written in the manuscript. We tried to restrict the questions to be related to the main themes of the questions and keep asking the follow-up questions to lead the answers of interviewees in the right direction.

3.4.2 Ethics

Being ethical is one of the scientific principles of data collection, analysis, and interpretation (Bhattacherjee, 2012). As we choose interviews as our data collection method, the ethical considerations in our research are mainly used for dealing with the interviewees. We conducted our research ethically based on the four principles in science as mentioned by (Bhattacherjee, 2012). The interviewees were voluntary participation and harmless, anonymity and confidentiality, disclosure, and analysis and reporting.

Firstly, we contacted the interviewees before the interviews by email to notify them that their participants are entirely voluntary, and they always have the freedom to withdraw from this study at any time if they feel uncomfortable with anything. We also informed the interviewees that there won't be any adverse consequences of their participants or withdraw. As for the

anonymity and confidentiality, Bhattacherjee (2012) suggested that the participants should not be tracked or identified after the study is published. All the interviews that we did are anonymous, we only mark the interviewees as IP1 and IP2 to show their involvement. We guarantee the confidential by not presenting personal information such as the telephone number and email address in this paper. We consider the anonymity and confidentiality are critical in the research method for this study. Since the interviewees in our research are BI&A trainers, BI&A consultants, and the end-users of BI&A systems, the relationships among them are complicated and conflict of interest may exist. For example, the trainers believe BI&A training should go in one way while the end-users who take the training expect the other way. If these interviewees are identified by some private information in our paper, it may have a negative influence profession and reputation. Although it probably be better to provide some general information of the interview for the participates in advance, disclosing information may also cause biases (Bhattacherjee, 2012). We intended to only introduce few information of ourselves such as the university and which department that we belong to. We also informed the interviewees some relevant information of our research such as the goal of the study and our targeting people. As science progresses through openness and honesty (Bhattacherjee, 2012), we took the ethical obligations to the scientific community on how data is analyzed and reported in the study.

In addition of the four basic principles for researchers, since this part of research plan is qualitative research, we will also learn how to conduct the research morally in qualitative research. According to Brinkmann and Kvale (2005), only learning ethical principles is not sufficient to become an ethically responsible research and qualitative research is saturated with moral and ethical issues.

4 Empirical Findings

The empirical findings of this research can be found below. The findings are presented using the coding scheme developed in chapter3.3.2 and the interview transcripts which be found in appendixes 2-7. The way that these transcripts are referenced is e.g. (7:12), meaning transcript 7, line 12.

4.1 Interview Participants Profiles

We interviewed total of six different respondents. Table 4.1 presents the overview of our interviewees including the interview participants, industry role, organization, position, and details of each interview.

Table 4.1 Overview of the Interviewees

Code	Industry Role	Organization	Position	Interview		
				Date	Type and Location	Duration
IP1	Vendor	Company Q	Technical Trainer	April 23rd, 2018	Face-to-face, Lund	1h11min
IP2	Consultancy Company	Company A	Analytics Consultant and Trainer	May 9th, 2018	Skype	43min
IP3	Consultancy Company	Company B	Consultant and Trainer	May 11th, 2018	Skype	34min
IP4	Company	Company C	General Employee	May 21st , 2018	WeChat	30min
IP5	Consultancy Company	Company D	Trainer	May 25th , 2018	Skype	35min

IP6	Partner Company with Tableau	Company E	Trainer	May 25th, 2018	Skype	28min

4.1.1 Interview Participant 1

Interview Participant 1 works as a technical trainer of one of the vendors. IP1 has Bachelor's Degree in both Information systems and Pedagogics in Working, which give him backgrounds in technology and teaching. In the company, he is mainly responsible for deliver training to the end-users for Qlik Sense and Qlik View.

4.1.2 Interview Participant 2

The Interview Participant 2 works in an international BI consultancy company that provides the BI&A solutions and data strategy for their customers. Training programs for different BI technology, including Tableau, are also parts for the services that they offered to their customers. They offer services for European, Asia Pacific, and North America regions. In the European region, they have offices in the United Kingdom, Netherland, and Germany, which offer on-site trainings for their customers. IP2 is a qualified trainer of Tableau in the company and responsible for training the end-users and look after other trainers in the European region.

4.1.3 Interview Participant 3

The Interview Participant 3 is a BI consultant. She owns a firm that is specialized in providing BI solutions, such as Power BI, for her customers. Designing and providing training for Power BI end-users in the companies is also part of the consultant work. Besides classroom training, she also runs the YouTube channel for BI&A training. She worked closely with the Small and Medium Enterprises.

4.1.4 Interview Participant 4

The Interview Participant 4 is a end-user of Tableau and Qlik Sense. She generally uses Qlik Sense in the work, but also took the Tableau training program to get the Certification for Tableau Association. There is no extra information of the work of IP4 except she is the trainee in the training program. The main focus in the interview of IP4 is about her experience in the training program.

4.1.5 Interview Participant 5

The Interview Participant 5 works in a consultancy company, which provides support for the data analytics for other companies. Their consultancy services also include the training programs for end-users. IP5 is the manager of academy and is responsible for all the training for the customers as well as for their own employees.

4.1.6 Interview Participant 6

The Interview Participant 6 has been a qualified Tableau trainer for three years. He studied in Singapore and currently works in the bank. He delivers the Tableau training courses mainly in Southeast Asia, such as Singapore, Malaysia, and Philippines. He also travels to Beijing and Shanghai to train people using Tableau sometimes.

4.2 BI&A Systems Training Program

Table 4.2 Summary of Empirical Data of BI&A Systems Training Program

Interview Participant	Answer
IP1	There are mainly three different types of training courses, the business administration course, data modeling course, and the data architecture course. The company provides both standardized training and customized training.
IP2	The consultancy company that IP2 worked in offers three different levels of courses, fundamental, intermediate, and advanced courses to the customers. They also offer courses such as Tableau server administration, Tableau server architecture, and Visual Analytics. The training courses could be standardized or customized based on the requirements of the customers.
IP3	IP3 offers standardized training and customized training based on the needs of the customers. There are three different level of courses, the training for beginners, intermediate courses, and advanced courses.
IP4	The training program that IP4 attended offers total of 8 classes with different topics for each class. And, IP4 used to take one class each week.
IP5	The consultancy company that IP5 worked in provides standardized trainings as well as customized training. For the customized training, the trainer provide training for specific projects.
IP6	The company of IP6 has a partnership with Tableau, which deliver standardized training for the most of time. The company also provide some customized trainings. There are three different levels of training courses for Tableau Desktop and two different levels of course for Tableau Server. The company also provides training in visualization and data preparation.

There are usually different levels or types of courses for the current BI&A training programs. IP2 (3:5), IP3 (4:56), and IP6 (7:10) mentioned that the different levels of training courses are designed for people who have different levels of understanding of the BI&A system that they are learning. As both IP2 and IP6 are qualified trainers of Tableau, some of their answers regarding the Tableau training program are similar. IP6 (7:10) said that they have these three

levels of training, and referred to them as level 1, level 2, and level 3, while IP2 (3:5) described their training as,

...one is the fundamental schools Desktop 1, uh, that's two days in person, or it's five days, virtually so five days, two and a half hours per day. Um, and the next one is the Desktop 2 course, which is the intermediate course, they call it. And then the third one is the advanced course.

IP4, as an end-user of Tableau, did not mention which level of the training course that she was in. However, she did mention that the trainers of Tableau assumed that the trainees in the class did not have any foundation and taught them from the basic concepts. The main reason for her to take the training course was to pass the exam for the certification for Tableau Association.

IP1 had a different view for fundamental and advanced courses. The company offers three courses, business administration, data modeling, and data architecture (2:24). First, viewed by the the level of complexity, business administration is the most basic course while data architecture is the most advanced course (2:24). Second, the base course, such as the business administration course, can add additional content and build into a advanced course (2:24).

All the companies provide standardized training as well as customized training. Companies provide the standardized training for most of the time. For example, IP1 (2:24) mentioned that

...eighty to ninety percent of the training is the standardized training. And the last percentages are the customized trainings.

IP1 and IP6 prefer to deliver the standardized training since the structure, activities, and materials of standardized training are well prepared. IP6 (7:18) also believed that standardized training may be more suitable for the beginners because it is easier to start with standard things when learning a new software. Moreover, the materials used in the standardized training have better quality than the materials that are designed just for customized training. On the other hand, IP2 (3:9) tend to provide the customized training. And, IP3 (4:23) and IP5 (6:9) believed the customized training could be more effective than general training.

4.3 Training Methods

Table 4.3 Summary of Empirical Data of Training Methods

Interview Participant	Answer
IP1	The company delivers their training program in two different forms. One is the classroom training, and the other one is the online training called ILT.
IP2	The company offers public courses, on-sites training courses, training the users in the organizations, and virtual trainings. The training methods

	depends on the needs and choices of the customers. About half of the courses are face-to-face while the other half of the courses are virtual courses.
IP3	IP3 runs the YouTube channel, which contain the videos that introduce functions of Power BI and the procedures of using Power BI. She also offers live classes for the business users.
IP4	IP4 took the training program in the form of a webinar, but there are also face-to-face courses in the training program.
IP5	The company offers both classroom training and online training to the customers. About 90 percent of the training courses are held as classroom training. The company also offers following up sessions for the end-users.
IP6	The company of IP6 provides both face-to-face classroom training and online-based training.

Based on the answers of our interviewees, all of the training programs offer the classroom training, which can be held either on-site or in the organization of the customers, and the online training. Both the trainers and the users agreed that the classroom training is the most effective training methods since the trainers and trainees can communicate directly and interact with each other. IP1 (1:32) mentioned that:

...feel like the most if the time where I get the best feedback from my students and the time where I feel that I delivered the best course is when I have all the students in the classroom where can talk and interact with them face to face.

IP2 (3:14) also mentioned that it is easier for the trainer to manage the courses in person than the distance-learning courses. She noted that the active and engagement level can be different for these two training methods (3:14).

From the aspect of end-users, IP4 took the training in the form of webinar and found that the conversation is more of a one-way conversation, which is not very effective for the users to ask questions and engage in the class (5:27). However, IP1 (2: 92), IP2 (3:14), and IP4 (5:17) have pointed out the benefit of having webinar, which is convenient for both trainer and the end-users since it has less restriction on the location and time. IP4 (5:27) also mentioned that,

...it is more convenient because everyone has to go to work besides doing the training.

And, IP1 (2:94) and IP6 (7:51) noted that online training may be the future trend of BI&A systems training.

4.4 Selection of Trainers

Table 4.4 Summary of Empirical Data of Selection of Trainer

Interview Participant	Answer
IP1	For the technical trainer, the basic requirements are technical background, the teaching experience, and the experience of using the system or other similar BI&A systems.
IP2	It is better for the trainer to have the technical background. Other skills, including the ability to communicate and clearly explain concepts to the trainees, should also be considered. The trainer also need to be flexible, adaptive, engaging, and having imaginations to adjust the course materials.
IP3	The background of the trainers does not really matter, but it can be beneficial if the trainers have the business background and speak the same language of the end-users. The trainer should also have the ability to explain things clearly and be good at telling stories to the users.
IP4	IP4 believed one of the most important capability for the trainer of BI&A training program is explaining things clearly rather than just giving a general explanation for the questions. And, it is better for the trainers to have the experience of solving problems with the BI&A system, which can be shared in the class.
IP5	IP5 suggested that the trainers should have communication skills, such as explaining things clearly and giving feedback to the end-users, and skills of using Tableau. The trainer can be from multiple backgrounds such as business, business and IT, mathematical, etc.
IP6	IP6 suggested that the trainers need to understand the concept of BI&A and have experience in using Tableau. Soft skills such as communication skills and interaction skills are also needed.

All of the trainers and the consultants agreed that the trainer of BI&A needs to acquire certain soft skills such as communication skills. IP4 (5:41) also agreed that the skills in explaining contents or procedures clearly are the most important thing.

Regarding the backgrounds of the trainers, the respondents have different opinions. IP1(2: 34) and IP2(3:11) both suggested that it is better for the trainers to come from the technical backgrounds and have experience in working with the systems that they need to teach, such as Qlik Sense and Tableau. However, IP3 (4:10) and IP5 (6:61) suggested that background of the trainers does not really matter. The same opinion in the background of the trainer can also be found from IP6 (7:37). The trainer said,

... Tableau has its own training program for trainers, which means anyone could become the trainer, no matter this one is a novice or an expert in BI&A.

IP3 (4:10) believe that it is more important for the trainers to be "curious and willing to learn" the necessary knowledge and skills. IP5 (6:55) mentioned that the trainers can come from

"multiple backgrounds… for example, a business administration backgrounds, sometimes it's more a business and IT background".

The other thing that needs to be noted is that sometimes it may be better more effective for the trainers to have relative similar backgrounds to the end-users sometimes. In that case, the trainers can explain things in a way that make sense to the end-users (4:12). IP2 (3:11) also acknowledged the benefit of *"sharing the same language as having the similar background knowledge with the end-users".*

Besides the skills mentioned above, IP2 (4:11) suggested some additional skills that the trainers should have, including ability to deal with problems and engage people, being flexible in the class, and having imaginations. These requirements can also be flexible if the person who want to be the trainer is a quick learner or has any other prominent abilities. IP1(2:77) shared with his experience as,

...they thought that I was seemed to be a fast learner. And I seem to be able to uh, fit in like first person on the first personality level of the company as well.

4.5 End-Users as Trainees

Table 4.5 Summary of Empirical Data of End-Users as Trainees

Interview Participant	Answer
IP1	The end-users of Qlik Sense include the technical people and the business users. The people that will take the training are different from company to company sometimes based on the size of the company. Usually, some people come to the training program and become the experts of the system, and then go back to the companies and teach the other end-users.
IP2	The trainees in the training program usually include both highly skilled people and other business people. And the current training program usually train people together instead of dividing them into different groups.
IP3	The training program is mostly designed for teaching the casual users, including managers and the general employees. For the YouTube Channels, there are more BI experts and technical people. The live classes are only for the business users. The people who come to the training are usually the power users from different departments.
IP4	People from different departments and with the different level understanding of BI&A system take the training program together, and this group of trainees was assumed that they do not have relevant background or experience in using BI&A system at all.

IP5	The end-users who take the training include the business users, the business analysts, and the data analysts. For one type of courses, the end-users are trained based on different departments. And, in the multi-discipline course, users come from different departments and backgrounds are trained together.
IP6	The trainees include the power user and casual users and they were trained together.

Both IP1(2:81) and IP2 (3:18) suggested that some of the end-users are the power users and the other business users are coming from different departments. IP3 (4:25) also stated the power users are the ones with more experiences of working with data from different departments. The other business users include the subject matter managers and the other general business users from different departments (3:20).

According to the responses collected from the interviewees, these end-users in the training program are usually different in backgrounds or levels of experiences in using BI&A. For different departments, the data that they processed in the work are usually different (6:75). Moreover, IP1 (2:81) mentioned that the levels of experiences in IS and data analysis could be varied in the different department. For example, the employees of financial department usually have more experiences with various Information Systems and data analysis compared to the employees in the Human Resources department.

Regarding the question of dividing the users into different groups and training them separately, the responses were quite different. IP2 (3:22) agrees that dividing users into different groups based on the different levels of experiences would be more effective, such as advanced users in one group and less experienced users in another group. She said that,

... it adds a huge benefit because it just means that everything speeds up or everything slows down according to the requirements of the group...

IP5 (6:77) also mentioned that she would prefer to have the end-users with the similar level of experience to be in the same group during the training, which would be more efficient. She suggested:

...the people would just lower level. They really slow down the training. They ask a lot of questions which other people already understand. So, that is less effective than when you have people with the same level.

IP2 (3:22) mentioned that the users that trained in the same group do not have to be in the same department but would be valuable if they come from the same place. IP5 (6:75) has two opinions about training people based on different departments. On the one hand, the end-users coming from the same department usually have similar questions in the training, which enables the trainers to go deeper in analytics about the backgrounds they are from (6:75). On the other hand, the end-users from one department sometimes need to collaborate with the end-users from the other departments. Thus, training departments together could be more effective (6:75).

However, IP1(2:86) and IP6 (7:31) argued that it is not necessary to divide users into different groups since the willingness to learn has more effects on the training outcome than the different backgrounds. IP1 (2:86) believed that it would be more interesting to have the people with different level of experiences to interact with each other. IP4 (5:75) also stated that it is not necessary to train people separately.

4.6 Training Skills

Table 4.6 Summary of Empirical Data of Training Skills

Interview Participant	Answer
IP1	It is difficult to generalize the specific skills since there are so many factors such as the culture, prior experiences, and the willingness to learn that need to be considered.
IP2	The trainees need to learn the basic skills such as analyzing data and functions of Tableau. They also need to learn about how to tell a data story to the audience. Analytical skills are also important to have.
IP3	End-users need to have interests on the analytical skills when they are in the training program.
IP4	IP4 said that the analytical skills were not mentioned in the class. The main skills that IP4 learned from the training is just some basic knowledge in how to use the BI&A system.
IP5	The end-users need to learn data in general, how to calculate certain numbers, present data in a correct way, and instruct other people to work with data that they are working with.
IP6	The skills that can be learned from the training program can be found in the training guideline of Tableau. The focus is learning the functions and features of Tableau. Analytical skills will also be mentioned in the training, but it is only a very small part of the training.

IP2 (3:25), IP3 (4:10), IP5 (6:65), and IP6 (7:37) mentioned that the end-users need to learn about the functions and features of BI&A and basic skills and procedures for using BI&A systems. IP2 (3:25) summarized all the skills that need to learn, they are building reports, connecting to data, understanding data connections, modifying destinations, building reports and dashboards, using different types of charts, learning about different concepts of visualization. IP4 (5:21) also confirmed that the skills that they learned from the classes include the basic skills of using BI&A system. IP5 (6:65) suggested that the end-users should also learn about data in general, such as data types, differences between measures and dimensions, and how to calculate the numbers.

IP2 (3:27), IP3 (4:29), IP5 (6:67), and IP6 (7:26) all agreed with the importance of analytical skills. However, not everybody who come to the training have the analytical skills (3:27). IP3

(4:29) pointed out that the analytical skills could be quite hard to learn if the end-users do not have them at the beginning. IP2 (3:27) suggested that the easiest way to improve the analytical skills would be motivating people to asking questions. She also gave an example (3:27):

I always talk about the questions that people want to answer. And if you frame it from a questions perspective rather than an answers perspective, than that is automatically more analytical.

IP5 (6:67) offered a different approach to improve the analytical skills besides asking questions. She suggested that the end-user can exercise the analytical skills by learning and practicing making different kinds of analytics in different cases with the help of the trainers during the training (6:67). IP5 said,

The key is to keep practicing analytical skills in different scenarios during the training and learned the insights behind each action from the trainers.

Besides the basic skills and analytical skills mentioned above, IP2 (3:25), IP3 (4:29), and IP5 (6:67) also mentioned other skills necessary to learn and practice in the class. For example, IP2 (3:25) and IP3 (4:29) pointed out that the end-users should be able to tell the data story to other audiences. And, IP5 (6:31) mentioned that the end-user need to instruct other people to work with data that they are working with.

4.7 Training Activities & Materials

Table 4.7 Summary of Empirical Data of Training Activities and Materials

Interview Participant	Answer
IP1	The technical trainers usually teach people how to solve general problems rather than a specific problem. Also, as there are three types of training courses, people should take them all instead of only taking the visualization course. Since the standard course is five-days, people still need the fellow study to learn them.
IP2	The data sources or data sets used in the training program for practicing should be close to the data sets that they encountered in the daily work. The trainer tried to keep asking questions to engage the end-users and inspire them to learn.
IP3	By using storytelling, the trainer can help the end-users understand the value of doing analysis using BI&A. The activities are designed to be closely related to the daily work of the end-users. The materials (data sources) that used in training are similar to the data that users usually work with but should not use their actual data sets. And there is also the need of having the support from the power users and the IT departments.

IP4	The data sources that used in the training program is provided by the trainers' company and it is not related to the daily work of IP4. And IP4 believed that the concepts of BI&A system are sometimes too abstract to learn compared with the introductory steps of using the system.
IP5	The training sessions usually start with a presentation that introduces the content of the training. The trainer will give people some instructions and assignments.IP5 uses relevant data sources with the end-users' daily work in the training.
IP6	The trainer sometimes gives the case or scenarios to explain questions and sharing his own experience while teaching. The training materials are same in the standard training, but the trainer will use the data that familiar are to the customers if they have such need in the customized training.

Based on the answers of our interviews, the training activities and materials are varied among different trainers and consultants. For example, someone believes using relevant data sources in the training can help people to understand the BI&A systems better and faster, while other people think that people should focus more on the system itself instead of the data. The detailed answer about training activities and materials are presented below.

Most trainers and consultants except IP1 believe that it could be more effective if the training activities are more relevant to the end-users' daily work. For example, the trainer can bring in a case or a scenario to explain the questions. As IP1 prefers delivered general training, what he tried to do is helping people solve their problems by what they have learned from the training (2:52). What he suggested to do with specific problems is that trainers train end-users some common knowledge to use the BI&A systems, and the company should also have another position such as the consultant to support with the problems in detail (2:52).

For IP2, she usually starts with simple questions to attract people to enter the class and then go ahead with their daily work to figure out what the end-users' interests are (3:31). After getting an understanding of such basic information, IP2 will design the training activities based on their differences. She described the training activities as "constantly keep picking up on the same threads" (3:31). IP3 (4:44) thought that the more relevant the training activities to end-user' daily work, the more attractive to them. Her answer to this question is,

...you go into an organization, you learn what they do. You know, you learn what their needs are. And then you learn the language. You know, you learn to speak the way that it makes sense to them.

IP4 (5:23) hold the same opinion that explaining problems by cases and scenarios step by step could help the trainees learn faster. She said that,

He can share something, for example, showing a case in the form of recording. How did they analyze case by Tableau from the beginning to the end, then what kinds of conclusions were drawn from that, and then what kind of insights of that? It may be better to have the cases.

IP3 (4:44), IP5(6:45) and IP6 (7:26) also mentioned that different scenarios can also help people learning. But since developing scenarios or cases is time consuming and costly, it is usually used for enterprises rather than small or medium companies (6:45).

For the training materials. IP1(2:70) and IP6 (7:18) have a complicated feeling about different data sources. They said that of course they can use the data that more familiar to the end-users, but from the aspects of the trainer it is time-consuming. IP1(2:70) said,

I need to be able to look up their data and see what's, what does this mean. Where do you want this is a, uh a dimension or measure field you want this aggregate… I need to sit down and learn their data.

However, the rest of the trainers and consultants agreed that using related data source can help the end-users learn more effectively. IP2 (3:33) said she enjoyed seeing different kinds of data in the class and this data is practical in training. But IP2 (3:33) and IP3 (4:50) also did not recommend use the end-users' real data, as the focus will be only and solely on the data.

4.8 Additional Suggestions of BI&A Training Program

Table 4.8 Summary of Empirical Data of Additional Suggestions

Interview Participant	Answer
IP1	As the new type of role for BI training are data scientists who understand, for example coding, mathematics, and statistics. There should be more advanced training for BI&A system. And there is also a need for companies to invest more in BI&A system. Worldwide online platform or virtual classroom on the Internet may become more popular in the future.
IP2	The users can easily forget about the skills and procedures learned in the training if not using the technology very often. Therefore, it is better to have modular training so that the users can gradually learn and practice the skills and techniques. The training could also be performed periodically.
IP3	It is important to guide the users to use BI&A in the proper way. It is also important for them to understand the data sets, such as the measure of the tables, or they can go into the incorrect direction. Also, it is better not to feed large amount of information to the users, especially the beginners, too quickly.
IP4	IP4 believed that it could be better to have the technical support system to help end-users to solve specific problem in their real work environment.
IP5	The combination of personal skills, training process, and the technology that has been used in the training may help the training program to be more successful.

IP6	The online-based training is the trend in the BI&A industry. The number of end-users of the system may influence the career of the trainer.

4.9 Summary of the Findings

There are two main types of training in the current BI&A training program, the standardized training, and customized training. For companies, which types of training they choose depend on the many factors, such as the size of the company, financial budget, and specific needs of the project. The training courses are usually divided into three levels from the most basic one to the advanced one, but they can also be divided into different courses that based on different trainee groups. There are two forms of training methods in BI&A systems training, one is face-to-face classroom training, the other is in the form of webinar or online training. Based on our interviews, most training programs occur as the classroom instruction training and it is also considered as the most effective way to train people using BI&A systems.

The trainer, as one of the essential part of the BI&A training program, needs to meet some requirement. The first one is that the trainer needs to have absolute knowledge in BI&A as well as experience in the BI&A systems. Then it is the requirements for soft skills. Communication skills, explanatory skills, and interaction skills are also considered as the key to effective BI&A system training. The requirements for the background such as teaching experience or business are not very strict. The end-users are the trainees in BI&A systems training. They can be the power user as well as business users. Nowadays, they are trained together in the BI&A training program. But based on the answers, it could be more beneficial to group them according to some factors, such as their understanding of BI&A and which departments that they come from.

The end-users need to learn many skills in the BI&A systems training, for example, building reports, connecting to data, and modifying destinations. The primary goal of learning these skills is to give the end-users basic operations of BI&A systems so that they can know how to use the system to solve problems. Besides these necessary skills, most interviewees felt that the analytical skills are also crucial in help end-users to use BI&A systems more effectively. Yet, seldom do training programs will especially teach about analytical skills. To conduct an effective BI&A training, it is also better to make the training activities and data source more relevant to the end-users' daily work. One example for achieving this is using cases or scenarios to explain the questions step by step, and the trainer here can also share personal experience and insights to encourage the learning efficiency.

5 Discussion

5.1 Training Methods

We found that most of the interviewees agreed that the classroom training is generally more effective than the online training. Jones (1999) pointed out that the classroom training enhanced the interaction between the trainees and trainers, which improves the effectiveness of the training. The interviewees confirmed that it is easier for the trainers and the trainees to interact with each other and the trainers as they are in the same room. Moreover, the trainers found it easier to give feedback to the users. The online training, on the other hand, tends to be more unilateral dialogue and less interactive compared to classroom training, as suggested by one of the interviewees. Thus, the online training is less effective than the classroom training. Overall, classroom training could be the best method for improving the effectiveness training.

However, in some cases, the online training could be relatively more effective than the classroom training. First, the face-to-face classroom training has the limitation in the flexibility of the location and time, which the online training does not have (Jones, 1999). One of the interviewees (IP1) suggested that the online training can expand the availability of the BI&A systems training since all the materials and guides for training can be available on the platforms. Thus, the trainees would be able to access these materials without the restriction of time and location.

Moreover, one of the problems mentioned by several interviewees is the short-term training sessions. After certain period of time, the trainees may forget what they have learned from the training if they did not use the systems frequently. Several studies show that the memory decays over time, and the knowledge that learned from certain process or activities will decline over time if the memory has not been maintained well (Holan & Phillips, 2004). One of the interviewees (IP2) suggested that the modular training could be a more effective way for BI&A systems training. According to the interviewee, the modular training is the kind of training approach that teaches people certain skills and knowledge in different cases repetitively. Practicing knowledge and skills is a good way for people to maintain the memory (Tomey, 2003). In addition, as mentioned before, one of the trainer recommended that all the materials to be available in the online training, which means that the trainees can consolidate what they have learned by going back and viewing the training materials whenever they need. This availability of BI&A systems training also supports the continuous learning.

5.2 Selection of Trainers

According to Esteves et al. (2003), it is essential for the trainers to be experts in the field. The experts in BI&A field are usually people with certain technical knowledge with data who work as data analyst or data scientists (Phillips-Wren et al., 2015). The purpose of the BI&A trainer needs to be an expert is that, on the one hand, solving the technical problems usually relies on the experience. There are more problems that the trainees may encounter in the BI&A systems training that beyond using the system itself. For example, system updating and docking with other systems. In this situation, if the trainers does not acquire enough

knowledge to help the trainees to solve such technical problems, they probably need to turn to other technical people for help. This will slow down the progress of training, thereby weakening the efficiency of training. On the other hand, as mentioned before, with the experience of working with data, these experts may be better at explaining questions with data. In our research, some of the interviewees strongly suggested that trainers should have enough technical background while the other interviewees argued that it does not matter. One of the interviewee pointed out that it is also feasible to become a trainer with different backgrounds through the training program that aims at educating trainers. The most important thing is that the trainers should be willing to learn about how to use the BI&A system and teach others. However, all interviewees agreed that trainers should to be very experienced in using the BI&A systems either through prior experiences or training. One of the interviewee (IP5) also suggested that many of their trainers are working as consultants which boosts their training capability. Therefore, the trainers should have adequate experience of using the BI&A systems in the real the world besides understanding about how to use BI&A systems theoretically.

Esteves et al. (2003) pointed out that trainers should have sufficient experience teaching others, which is often related to soft skills such as communication. One of the trainers (IP1) suggested that trainers with teaching experience are better. Also, according to Esteves et al. (2003), training can be more effective if trainers have more experience in teaching. Moreover, all interviewees emphasize the importance of having good communication skills particularly the ability to explain things in a clear and concise manner. Therefore, for a training to be effective, it is important for trainers to appropriately and clearly explain functions and procedures of how to use a BI&A system. Two of the interviewees also pointed out that trainers should be able to communicate in the same language as the trainees to improve the effectiveness of the training. The same language refers to use the terms that familiar to the end-users or explaining things in the way that the end-users can understand. Therefore, trainers should be able to understand trainees' questions and be capable of explaining things in a way that can be easily understood by the trainees. In conclusion, one of the most fundamental soft skills that all trainers should be the communication skills. Also, it is vital for all trainers to have adequate experience in using the BI&A systems.

5.3 End-Users as Trainees

We identified from the literature review that individual difference of trainees may be an influential factor in the BI&A training. However, from the interviews, we noticed the trainers are more concerned with the difference in levels of experience with BI&A systems and backgrounds of the end-users rather than the individual differences. The interviewees had different reactions regarding training the end-users with different levels of experience in the same room. One interviewee suggested that it would be interesting to have the end-users from different levels to study together and interact with each other. However, the other two interviewees suggested that this difference slows down the training process. And, in most of the cases, they usually have end-users from different levels to be trained together. In this case, the effectiveness of the training could be improved by introducing collaborative training methods to the training program. Gupta Gupta et al. (2010) suggested that the collaborative training encourage the students to work together and to accomplish shared goals, which have positive impact on the training for adult, especially for the beginners. They also suggested that using experts to help beginners in this case can produce positive results in the training (Gupta

et al., 2010). Thus, the trainers could encourage the end-users with different level of experiences in the training sessions to work together to improve the effectiveness of the training.

The other difference is that the trainees come from different backgrounds, such as different department. Two of the interviewees suggest that the difference in background is attribute to the different data sources that they usually work with. It could be benefit to group people from the same background is since they understand the similar data sources and it is easier for trainer go deeper in the analytics based on that background. However, one of the interviewees argues that training people from different backgrounds help them to improve the communication of data among different departments. In this case, it could be beneficial to train the departments who need to share the data frequently.

5.4 Training Skills

We identified that analytical skills and skills in storytelling may be helpful for end-users to learn BI&A systems more effectively. The answers of our interviews confirmed the importance of analytical skills. It is essential for trainees to have analytical skills when using a BI&A system as it is the system with analytical tools to present information (Chaudhuri et al., 2011; Davenport, 2006; Negash, 2004). Even though most of the interviewees confirmed the importance of that period, they also mentioned that analytical skills can be hard to acquire in a BI&A systems training. Most interviewees acknowledge that they focus more on learning the basic functions and how to use BI&A systems, but not much for the analytical skills. Some interviews argued that improving analytical skills depend on how the trainees practice on their own. Another interviewee proposed that the trainers can help the end-users in developing the analytical skills by guide them to do different analytics based on different cases, and provide suggestions and explanations regarding the analysis.

Besides the analytical skills, interviewees from the consultancy companies suggested that it is important to learn about the functionalities of the BI&A systems and to gain necessary skills of how to use the system before going deeper. Since analysis is largely associated with datasets, it is necessary to learn about data such as types of data, different measures of data, and basic data analysis techniques. Another interviewee also suggested that to be able to conduct an analysis, one should know how to work with numbers.

5.5 Training Actives & Materials

According to the interviewees, there are generally two types of the training courses, standardized training, and customized training. The standardized training uses a set of standardized materials including data sources and guidelines in training. Different from the standardized training, customized training provides the training that targeting on specific business case or project so that the training can be closer to the real working environment. The effectiveness of these two pieces of training is controversial. Some interviewees prefer the standardized as it is usually well structured and has been used by the trainers for many times. They argue that it is designed in a way that better illustrate the different functions and capability of BI&A systems, which can be easier understood by the trainees, especially the

beginner. On the other hand, one reason for these interviewees who prefer standardized training is that customized training requires the trainers to take time and study the data sources and the working processes in the companies.

However, as what we have mentioned earlier, the effectiveness of the training program links to the transfer of training (Grossman & Salas, 2011). And, as the settings are close enough to the real work, there is a higher chance of successfully transferring the training outcomes into the real working environment (Grossman & Salas, 2011).. Different from the customized training, the standardized training generally does not really apply to the settings in the real working environment, which might be less effective. Four out of six of the respondents acknowledge it can be considered more effective if the training activities and materials that reflect the settings in real working environment. Some of the interviewees argues that it is easier for the trainees to understand the skills and procedures with the training that closer to the real work. And, it is easier for them to apply the skills in the training to the work. Some interviewees suggest that this customized training is more suitable for the advanced learning. Four of the do propose that the long-term assistance or follow-up sessions might be more important to help them to transfer the training to the real work environment. It can be either to have the power user who understand the business or the trainer who work as consultant at the same time to do support the continuous learning.

Using the data from customers make the end-users feel closer to their real working environment. Most of the interviewees agree that it will be more effective if the trainees are working with their familiar materials. However, some of the interviewees argue that using the real data sources from the company should be avoid. Since the purpose of the training is more on using BI&A systems and solving problems with it, one of the interviewees concerns that the trainees will be focused too much on the data sets rather than learning about how to use the system. Some of the interviewees also argue that what the data sources can be modified into the data sources that closer to the data that the trainees usually work with, but do not necessary to be the same. Again, the training should be focused more on the ability to use BI&A systems in solving the problem.

5.6 Summary for the Discussion

We developed our first guidelines proposal based on the literature. We revise the content of the first proposal based on the discussion of our empirical findings. Table 5.1 shown our final guidelines that categorized by different themes, and the themes are related to our theoretical framework Figure 2.2.

Table 5.1 Guidelines for BI&A Systems Training

Guidelines for BI&A Systems Training	
Training Methods	Despite the restriction of time and location, face-to-face classroom training is a better choice for BI&A training.
	Online training can be designed as the modular training to support the continuous training for the end-users.
Selection of Trainer	A BI&A trainer needs to meet at least two requirements, the experience with BI&A systems and soft skills especially communication skills.
	A technical background is not necessary but could be helpful for becoming a BI&A trainer.
End-Users as Trainees	The trainers can encourage collaborative learning among the end-users with different levels of experience in the class room to improve the effectiveness of training.
	The end-users from different departments, which frequently sharing data in daily work, can be divided into the same group.
Training Skills	Basic skills in learning the functionalities of BI&A systems is necessary for end-users before they are going deeper.
	Analytical skills can help end-users understand BI&A systems better, thus promote the effectiveness of the training.
Training Activities & Materials	Standardized BI&A training could be more effective for beginners.
	Customized BI&A training could be designed for more advanced courses. • Using the data that customers are familiar could be effective. • There is a need to balance between focus on data and focus on the system itself.

6 Conclusion

6.1 Research Question and Purpose

The purpose of this research is to identify the factors that may influence the effectiveness of BI&A systems training, and by exploring how these factors affect the results of training, we aim to develop the guidelines for companies to train their employees, especially the business users who use BI&A systems more effectively in their daily work. We did this by trying to answer the question: How to make the BI&A systems training more effective for the business users? Based on our research, we present the factors that affect the effectiveness of BI&A systems training and how they affect the training.

6.2 Implication of Findings

This study answers the research question in four steps. Firstly, we identified five factors that affect the effectiveness of BI&A systems training by reviewing the relevant literature. We considered these factors as different themes and formed our theoretical framework based on them (Figure 2.2). The five themes are the training methods, the selection of trainer, the end-users and trainees, the training skills, and the training activities and the materials. Based on the above work, we proposed our initial guidelines. Secondly, we designed our questions for interviews based on the guidelines to collect empirical data. Through six interviews with trainers, consultants and one end-user, we identified whether the factors in the guidelines can or how these factors affect the effectiveness of the training. Thirdly, we discussed and summarized the data that we collected. Finally, we developed our final guidelines based on the findings and the literature review.

Our findings show that there are several ways to improve the effectiveness of the training. Firstly, from the data collected from the interviewees, face-to-face training is the most effective training method, which aligns with our literature reviews. Online training is considering to be less effective due to the lower interaction between the trainers and the trainees. However, the online training can be used to support the modular training and the continuous training, which helps the trainees to enhance the skills later. Secondly, in order to achieve effective training, the trainers should have proficient experience with BI&A systems and able to communicate in a way that makes sense to the trainees. The technical background is not required but could be beneficial to have. Third, considering the differences in the trainees, it would be more effective to group the trainees with the similar level of experience or handling similar data in daily work. Forth, besides the technical skills, the trainees should also improve the analytical skills through practicing different analytics with different cases and scenarios. Finally, the activities and data sources should be close to the real setting of the working environment to help them apply the training skills and experience in work.

There are two contributions of this study. Firstly, for the practical knowledge contribution, this study provides the guidelines for improving the effectiveness of BI&A systems training especially for business users. The guidelines may help BI&A systems vendors and consultancy companies to redesign and develop their BI&A training programs to get the higher effectiveness of the training. Our guidelines can also help companies understand what

is the most effective to train the business users using BI&A systems. Companies could use the guidelines to develop their own BI&A systems training, or they can choose the training programs that provided by vendors or consultancy companies. Secondly, since there are only studies focus on the side of technologies in BI&A field, the primary knowledge contribution of our study for academics is that it has provided an insight of the perfective of people, in other words, the end-users of BI&A systems in academia, for generating further studies of BI&A systems correspondingly. Moreover, our study also has shortened the literature gap of specific knowledge about specific effective training for end-users of BI&A systems.

6.3 Future Research and Limitation

The focus of our study is to improve the effectiveness of BI&A systems training. Therefore, in order to conduct a comprehensive study, it is important to learn about the experiences of the trainers who design and holding the training sessions and the business users regarding the training. Our initial aim was to collect data from the perspectives of business user and the trainers. We tried to find business users who took the training program for the BI&A through different channels. However, due to the resource limitation mentioned above, we were not able to collect much information from the perspective of the users. Consequently, the findings of this study are largely based on the perspective of the trainers from the vendor and the consultancy companies rather than on the users.

In the future research, the guidelines proposed in this study need to be further refined and tested based on the perspectives of the users. Moreover, since the methods, materials, and activities are generally different for different companies, it would be better to collect the information from the trainers and the business users in the same training program.

Appendix n

Appendix 1 Interview Guide

Introductory Questions	
Q1:	Can you give us a short description of your work?
Main Questions	
BI&A Training Program	
Q2:	Can you give us a brief description of the BI&A training program of Power BI/Tableau/Qlik Sense? Especially for business people.
Training Methods	
Q3:	Which training methods do you usually use? For example, the classroom instruction and the distance interactive course? Or others?
Selection of Trainers	
Q4:	How do you select the trainer for the BI&A training program? For example, what kind of background and skills are required for the trainer?
End-Users as Trainees	
Q5:	Who are the usual people that will take the training? For example, the decision maker, data experts, or the general employees?
Q6:	When you train people, do you train them by different groups based on their background or train them together? • What benefits and challenges do you see as training this way?
Training Skills	
Q7:	garding to the BI training process and users, what skills do they train for? • Which skills do you think have the highest value? • Do you think the skill requirements are different based on the roles? What about different departments? • How about letting people know the value of BI&A or what is BI&A?
Training Activities and Materials	

Q8:	As the task performance is an essential part of the training, can you give us an example of how you design the training program to fit the daily tasks for the users? • Do you provide users with different data sources and training activities depending on different tasks? • Do you think it would be more beneficial when using different activities and data sources that close to the daily tasks?
Finishing Questions	
Q9:	What challenges have you experienced as a trainer? For example, the resistance of the software? • And how do you overcome these challenges?
Q10:	Do you have any additional comments or suggestions on structuring training program?
Q11:	How do you look upon the future of BI&A training?

Appendix 2

Interview date: April 23rd, 2018
Interviewee: IP1
Interviewers: RC, XZ
Interview type: Face-to-face interview
Interview duration: 1h11min
Transcribed by: RC, XZ
Transcription date: April 25th, 2018

No.	Code	Person	Content
1		RC	Can you tell us a bit about your background and like your role as a trainer in [redacted]?
2		IP1	Sure. So, I worked as a technical trainer at [redacted] for three years. And, when I start at [redacted] that was the first formal role as a trainer that I had. I did work as a mentor during my studies at university, so we did workshops with the students that were couple of, the students at programming, database courses a year after me worked as a trainer at university. But, that was the formal training role that I had before that. Otherwise, I worked a lot with sales, and I worked some with SharePoint Internet site. Parts of the beginning of process, when you sit at their workshops with your customers and you sit down and get to know what they and their demands, and you try to build a solution to their specification. Otherwise, I have bachelor's and Master's in Information System in University. I also have Bachelor's in working life at Partigargis. Do you know what Partigargis is?
3		RC	No.
4	ST	IP1	It's like the theory of teaching. And, it is the theory of teaching focus on people that work, not on the small kids, but on the people have been worked. So, how to train, motivate, lead, and work with education for people at workplaces.
5		RC	Okay.
6	ST	IP1	So, that's kind of fits into the role that I have to do.
7		RC	Okay, so do you actually learn more about technical background in the Master?
8	ST	IP1	So, the bachelor's course is more technical than the Master courses. In the Bachelor courses, we had advanced database, we had a lot of programming, while in the Master course, we did more, there's more of mixed. There were some technical things, but more was theory based, and focused on that way.
9		RC	Okay, so for the Qlik Sense, what are the targeted user for Qlik Sense? Are that more technical people or more business people?

10	EUT	IP1	Oh, I would say that, I mean, there are many different users. But, Qlik Sense's targets towards users is kind of depends on who we are trying to sale the software for. Recently, we focused a lot towards the business users, so we have two products, we have Qlik Sense and Qlik View. Qlik View is an old product, Qlik Sense is a new product. When marketing Qlik Sense, we market a lot towards the business users. Even though it's used by both, like, data architects and really technical people, a lot of the communication from the marketing departments is towards business people.
11		RC	So, as we learned that Qlik Sense is more self-service BI software.
12		IP1	Yeah.
13		RC	So, how do you describe this could be different from other traditional BI tool, I mean those that mostly used by the technical people.
14	BATP	IP1	Yeah, so, I mean it is the question a little bit hard to answer in a good way, but I will try to give a good explanation in this case. So, self-service BI was kind of buzz word a couple of years ago, or my definition of buzz word, at least to something that you go out and say that self-service BI or big data or something like that, something that kind of drive the market. So, you have couple of things are popular for. And, those things, they spend around for couple of years. And, couple of years ago, self-service and Big Data became a buzz word. And, what you often mean when you are talking about self-service is that you want to empower the user, the person sit around somewhere with the tool to be able to help them self-gain knowledge that is maybe not present in the screen in front of them, so you want to raise or lower. When you use the word empower, it's not just to make it possible technically for them to do that. It is to make it possible by simplify the tool to make it easier, and by giving right amount of training and preparation, so it comes easier for them to use as well. So, that's something important to think about when you think about self-service. Now, the problem with the buzz words is that a lot of different people putting in their own definition, so there is not an official definition for what self-service BI tool. There's a lot of different marketing departments, different vendors, that create their own definitions of what it is. And, I mean, within [redacted], if I explain self-service, I might explain in another word than some of my colleagues do as well. So, there is kind of a tradition. So, the self-service part is quite complex. The word itself is quite complex. And, if we look at the traditional BI tool, when we try to split the self-service from the traditional

			BI tool, traditional BI tool would be, I mean I usually call them when I explain it to my students in the classroom, I usually say that we have two points in the market. One side we have the self-service BI tool, and on the other side we have something called guided analytics tools, while the guided analytics tools themselves, they show information and data to the users and guide them through the BI experience, but they don't allow the users to interact and make that much changes in the data. So, I would say that the traditional, or the main difference between the two types of tools, if we split them into two groups, there's probably more than two groups, but if we try to split them into two groups, and really separate self-service BI, what you want from this self-service BI is that we are looking for more of a marketing towards the modern business user, where the business users themselves, what we want to do is to give them the tools to answer their own questions without have to run back to the IT department, or the data modular, or to the designer to change the entire tools, and to make a sandbox thing, where you still have a high level of governance, because that's very important, so you need to be able to governor you information so you let them play around a little bit with the information on top.
15		RC	Okay. So, it like make it more flexible for the business users.
16		IP1	Well, it is flexible for business users because the other tool is not flexible at all in that case, but, I mean, generally, technically speaking, they share, both the new BI tool, or the self-service tool, and the old tool share the same technical structure from the bottom of the data tool, that is from the data layer up to the data model and up to the end-user interface, the only thing we do in the self-service is that try to let the user play around a little bit with the product. But, still, it is like the tip of the iceberg. It is where become a bit tricky, what's self-service and what's not self-service, but in general, when you talk about self-service, you let them play around with a tip of the iceberg, but the rest of the iceberg is generate and governor by the company, the same thing goes for our tool. Both our tools share the back infrastructure up until it's time for visualizing information.
17		RC	So, based on the differences that you mentioned, do you think the training for self-service BI, like Qlik Sense, is different from those traditional BI, like for the technical people?
18	EUT	IP1	So, it depends on which part of the training. I generally, or mainly, do three types of trainings. I do training for system administrators, that's the people that set up the

			server, set up user accounts for the product, and give them access or not access to the resource. That's one type of training I do. Then, I do data modelling training. Data modelling training is how do I acquire information from various data sources and built them into a data model that is good to users, BI tool. So, I mean, we want the same data model depends on which tool, I mean, we want to build the same one that our competitors do, but how do we do it within our tools, so how do we import data, how do we... So, that's the second part. And, the third type of training that we do is the training for the business users, for the business administrator, whatever you want to call it. So, that's for the person that based on the data model builds visualization make the data understandable, comprehendible for the end-user. Now, I done training for our traditional tool and for the self-service tool. The difference isn't that large between making training on the different tools. So, the actual training courses are actually really similar. It is just another interface that you build in. The one main difference that I would say between the trainings is that on the new training, I focus a lot on trying to, especially on the business user training for visualization, I focus a lot on teaching and telling them when they go back to the work place, they need to educate the users on this product. So, you need to train the end-users to be able to work self-service on the business tools because it is not always that intuitive that the marketing departments may want it to seem. You still need to train your end-users even though give them half-an-hour training, make them understand on how to use and build their own visualization with this tool. But, generally speaking, I tend to educate with power users, I tend to educate the more advanced users during my training. So, usually you don't send a normal end-user to our training.
19		RC	So, it is more about like company will send some people to here to get training for the product, and they will go back and train other end-users?
20		IP1	Yeah, I focus when I tell them, I've done training for a lot of end-users in companies as well, and I still try to do the same training for the experts because they need to know that. So, that doesn't differ. I say that the differences are between, just to summarize this question, the difference is between self-service BI and traditional BI is not that much, the only thing is to tell and teach them what a self-service BI tool is to make them understand what self-service is. Cause otherwise the training doesn't differ that much.

21		XZ	So, what is the expectation of the training? The outcomes?
22	BATP	IP1	So, the users expectations for the training are a lot of different depends on the user. But, generally if you want to summarize IT to just say like one thing is to increase their ROI and the return on investment. So, they want to, get a faster, they wanna get them up and working with the tool faster than they would if they just sat down and then they built it all on their own. So, the one, educate the users faster and they want they want their users to start working. So, ROI which is measured in a couple of different ways. One way to measure it is the level or the percentage of adoption of a tool in a company. How many people actually log on and use a tool, and have day-to-day basis and, also, what problems have we been able to solve. What information can we now see that we couldn't see before. So, those are the two things that are going within the return on investment. So return on investment. Um. How many users are using the tool? What problems are we solving that we couldn't see before? And, there's actually a third category as well, which kind of fits in here or not? Some you some users or some companies that are in with in different markets, they're hard. They're rarely strongly regulated by different standardization, like different standards and stuff like that. And some of these standardization, they say that, um, you have to have a certain technical tool. Uh, in this case, you might have to have a BI tool. And this tool has to meet a couple of different demands. You have to be able to trace who sees what information and so on. So that's also one thing that that the expectation of the training is that they are able to build a technical platform that they need to reach a certain level of standardization.
23		RC	Uh, so like can you give us like a brief description of training program, especially targeting on the advanced users?
24	BATP	IP1	So yeah, so I mean it's split up into a couple of different parts in training. Um, as I said, we mainly have three different types of courses. We have the visualization course or, sorry, the business administration course, we have the data modeling course. And, we have the user administration course. So, there's the survey courses we can call it as well. So those are the three main courses, then we have a lot of small courses that fits into one of those categories as well. Now, we do, uh, standard training. So, we have, uh, within our education department in our company split into three different parts, two parts that are relevant for this. One part is the trainers that's us. And the other part is the content producers. And those are the people that build our training for us. So, they sit down and they create training materials uh, for these different courses. So when we go out, we have our training materials, we have our manuals, we have our exercises. And then we go into the classroom, we deliver that. Um, so those are the standard training. And, we do those uh, on site, uh, that's out at a customer site, for example, if they want to standardize training, we can go out and have it outside on their track. And

			we do it here that there are different training facilities and we have multiple training facilities around the world. We have office, we also have a training room or something that could be used as a training room. And those are more public courses where anyone can sign up. And we have a mixture of clients and customers on those training. And it could be external customers, partners, but also internal uh, employees from [redacted] that attend those trains as well. And then we have also the possibility for our uh, customers to request a customized train. So what we can do then is that we can pick parts from our different training or build an entire different training, and then do that more customized for the customer needs. I'd say that generally maybe eighty twenty or ninety ten percent, some sort of eighty, eighty to ninety percent of the training are the standardized training. And the last percentages are the customized trainings. And then there are a couple of different levels of complexity uh on these training. So uh you asked for four more advanced training. So there are two ways of defining an advanced training. Either you go on our base courses uh and you uh sort them from easy to hard, where the easiest course would be the best business administration course and the data architecture course or server course. So that's in in the level of complexity in one row. And then you'd have courses where you can build on uh the uh the base courses with additional content. So for the great visualization course we have a one day follow up course that's advanced expressions for example and then on the data modeling course we have a we have a couple of day long courses as that as well, while on the system administrator course was about one or two days that you can read with more advanced concepts. But generally, speaks, you can you can look at it in two ways. The base courses are more technical, difficult as the more technical, the more complex, of course. And then you have built on courses or more advanced elective topics, as we call them.
25		XZ	By the way, do you design the training program or just teach people?
26		IP1	So, we have a department within our, part of the organization, within the education organization, that the designs of the standardized training course. So they build all the standards training. And, what I do if there is a custom training that I want to prepare for, I would either try to use a reuse a lot of the materials from the standardized courses, or I build it up from scratch. It’s kind of depends on, but there are very few times where I really have to go in and make a really customized course. Usually I can just take bits and pieces from the different courses and then, when I go around to the universities, for example, which I don't do as a technical trainer, but that's another role, in those cases, I'd build a more of a custom course. For the workshops there, I'd do more customized workshops. I use a lot of the parts that we go through in our regular, uh, standard courses. But I do my own examples.

27		RC	And, like what do you see as the benefits and maybe challenges for both for the standard training and for the customized training.
28	BATP	IP1	So, the benefits of the standard training are that it's prepared. All the material is there. We have a technical platform which we can deliver it on. And everything is like fixed. I know it by heart. I know. So, I've delivered it much. Uh, so I don't even need to look at the manuals or the materials. I can just go through and show all the moments for or the all the different parts and steps for the people in the classroom. So, I really, I know that by heart, because it's, I've done it so many times. So that's the benefit of it. Um, It's, um, a robust and it's well developed. And there there's been a lot of feedback from the technical trainers for the different steps and things that we go through themes on the course. So, we know that it's showing what we wanted to show, uh, uh, the thing that's not that good with it is that, um, or the main criticism that we get towards the training is that it's sometimes, so we work with a data set which has to do with sales and some uh, some customers or some companies where we are. They don't think that sales data that relevant for them. They want this to be, they want to do everything that they want to do it on their own data. Uh, so that's generally the criticism, although, um, it's a bad idea to do on their own data from a training perspective, because the training perspective, it's involved learning how what data is on the bottom. It's about learning the different problems that you can occur. So, it's about learning structures and problems and solutions for those problems. Um, the benefits with custom training is that the user gets to, uh, be with and tell them, tell us to make try to make the training more relevant. So they skip some parts and then add some other parts. Uh, the uh, so that that would be b maybe the biggest benefit. The general problem with the customized training is that sometimes they can tend to be a little bit unstructured. Uh, you do not get the same materials as you as you get on a on a standardized, course because in a standardized course, you have access to theory and practice exercise everything. You just log onto a portal, you have everything to access their, Uh, unfortunately, I don't have the time or the resources to build that for the custom courses. So, in that case, it would just be those two days. So, it's a little bit hard to go back afterwards and redo the steps and exercises that we do on a custom course. So, it's a little bit more unstructured. It might be a little bit more relevant, but it's, um, you get a little bit less for the money. And it's also usually you need to pay a little bit more for a custom training as well, because there needs to be a couple of days to prepare.
29		RC	So, is that the classroom structure is that like more often?
30	TM	IP1	So there are a couple of different ways that we deliver training. Today, the things that I've been talking about right now is the classroom training, because that's where I am most, uh, of the time. Uh, but then we also have um, built an online classroom as well. So, uh, we, um, the thing that I do is called

			ILT, instructor led training structure. Late training can either be delivered in a classroom or remotely, uh, but it's still considered classroom training. But in that case, it is that I'm in one classroom that participants are in other classrooms, but it's still categorizes as ILT and then we have something that we started with, I was gonna say recently, but IT's two years ago. It's just time flies, something called a continuous classroom, which is a platform where we offer a module-based training on the three different roles that I've talked about before, where we have thirty to sixty minutes courses with the way open up a specific theme of the course that you're looking at. You get a couple of videos that you can watch. Then you can download some exercise files, do those exercise files. There's a take away document and also a little quiz afterwards to test that you caught up on the most important things. So, more like an e-learning platform. And, I think that's that we put down a lot of resources into that recently to get that up and running and get a lot of material on that platform as well. Because that's also a way to deliver training. And, connected to this platform, there are expert sessions, that's when one of us trainers are go on and we do uh, half an hour an hour webinars or seminars about and they have like an expert topic or something like that. That's not mainly covered by the material on the continuous classroom. So those are the two main areas of training. So, either we deliver it in the classroom or we deliver it on the Internet, like through that material. And then we have a lot of self-study material as well. A lot of resource we have YouTube videos and tutorials and stuff like that. So, there's a lot more the ways to learn. But, as me as a teacher, in my role, I either do ILT that's in in the classroom or I do a webinar recession in the continuous course.
31		RC	So, which one do you think is most effective?
32	TM	IP1	I think, in the classroom and on the face to face one as well. So, I'm not that, I feel like the most if the time where I get the best feedback from my students and the time where I feel that I delivered the best course is when I have all the students in the classroom where can talk and interact with them face to face.
33		RC	Okay, so regarding the training process and users like what skills do they usually have to train for? And, do you think there's any skill requirements that like a different based on their like roles, like decision makers of the just a general business with that?
34	TS	IP1	So, I mean back to the point that we have three different types of training. Such three-different people that we tend to focus on is the business user, the data architect, and the system administrator. If we start with the simple ones first, so the system administrator that kind of part of the of the training you need to have a technical background to be able to do that. You need to know your way around servers. I mean they of course you could be uh new on it as well, and I mean I can in the classroom dictate the tempo and focus more on one thing another thing but the goal or that are group for those uh that

			module is people that work with system administration. So, that's kind of a prerequisite for that. Training the data modeling there becomes a little bit more a gray area. So, on the one side, uh, to get the most out of that course or those courses there are within that that part of the organization, you should know some data modeling before, you should be familiar with the database and some SQL. In the best-case scenario also worked with a BI tool before, being Qlik or another tool. Uh, and you should have done the front and there where business user course or the business administration course as well. Those are what I want my students inside of a classroom to those skills that I want them to have. Now I can, of course, um, change the tempo and format the course inside the classroom. If I know if I get to know that not everybody has those prerequisites. Uh, and I mean, that happens anyway, I get classes when everybody's a beginner inside of the class, but you won't get that much out of that class in that case. So, in that case, you also want to have someone who knows a little bit about computers and data modeling.
35		RC	Okay. Sorry to interrupt. For the data modeler, is it better for them to have like a both background in technical and…
36	EUT	IP1	I would say that those are the that's a course for the developers. So usually I mean you have some kind of development or develop a background or you've read a technical course at the university or stuff like that. So you know what you know what an if statement in the for loop is that's about I mean if you if you do that I'm content and I can teach you the rest. Uh, not everybody listens to that. So it's but that's where I want it to be. And then we have the course that maybe is the most complex when trying to do define who goes in and under what pretext. But that's the uh, the data or sorry, the system, uh, business administration course of the business uh, for the business users, because that's where I get everybody. Every time we write types of persons, I get people that work in management, I get people to work on the finance department, and people at work on the floor at production facilities. So, they monitor and look at that, I get people that are consultants, and get people that just finish school and just started working at a place. So, beginners really beginners. But that's kind of uh, where you get the general, mass of different people. And those classrooms are filled with different levels of experience as well.
37		RC	Okay. So, like, what skills do you think they should…
38	TS	IP1	So, I mean, uh, I see that to get the most out of that course, you should have maybe done, uh, we always before the course, we'll send out an email with some links, preparation links, go into this year, read a little bit about the product and so on. So generally, it would be preferable for me that that they go in and do that preparation work. I would say that most of them do not, unfortunately. But that's where what, what I want them to do. So.

39		RC	Okay.
40	TS	IP	Otherwise, it's, um, you could go into that course without any previous knowledge. It's just uh, if you get a course with a lot of difference in the technical background from the people. So, some people are really uh, been into the market for a long time, worked with another BI tool before. And then you get a lot of beginners in the same classroom. It gets really hard to find a tempo that suits everybody that usually goes out under the on either, either the people that know a lot suffer or the people that don't know anything suffers. But that I mean that's not a specific problem for my classroom. That's a problem you have generally when you work with education and treat teaching and training is that you have people with different levels of background and with a different speed of learning that something that you as a teacher need to take in account when you deliver it.
41		RC	Okay. So, like so, do you think like, because they are like, for the companies, there are all kinds of different departments. Do you think the skills requirement for those departments are different or they are just pretty much the same?
42		IP	Sorry, they give departments for?
43		RC	Uh, for example, there's like a marketing or like a financing department. So…
44	TAM	IP	I mean, today's worker, I mean, if we talk about them generally as, as… So, what we do is that we, um, we get, um, we are exposed to a lot of different systems. I think that uh, today when I log onto my computer, I think I log in to ten or fifteen different types of information systems with my email and uh some time reporting to and a follow up to for the classrooms and, uh, some kind of collaboration tool on the internet. And I was going to book this room for us today. I did that from room booking tool. So, there's a lot of different tools that that that kind of that we can use. Uh, and I feel like uh, in generally or now today, it's not become a discussion of what technical background you have when you, when you sign up for something. I mean the company uh, expects that you learn the tools that you need to be able to do the work in the role that you need. And I mean and there I would qualify Qlik as a, if we talk about the business, uh, part of the tool, just building the visualization, so using it in your work as a self-service too. I would say that it comes sometimes some somewhere in the middle of the complexity scale when it comes to the easy to use tools and the hard to use tools where the more hard used to be, uh, ERP Systems like

			SAP or something like that, which is quite a complex tool to learn when the easiest tools would be like the mail to Outlook or something like that, which is quite easy to use or Excel or Word or something like that. So I mean it's, I think that would, if you look at them, if you think about it a little bit, if you put on your prejudice classes and you try to look at that the different roles, I would say that generally people that have a higher technical understanding over information systems, thereby BI tools as well, they focused or tried, they generally you generally see them at the finance department. You'd see them as data scientists working for the IT department or a centralized IT department. Uh, and then maybe you won't find them in the same degree at an HR department, for example. So, I mean if you look at it in that way, you can say that. Ok. So, I am good at information systems. I generally tried to work at this department. I tried to choose this career path and work, but I has the technical base technical knowledge increases for each generation, for each working generation. Those borders tend to, um, uh, be a little bit greater out, especially when we now demand from the people in the HR department, for example, to understand how to build a BI application to understand how to log into uh, uh, customer satisfaction system or uh, something like that. So, so we tended, we tend to like we tend to decentralize the IT a little bit more and make it a little bit more up to the work to learn fifty different systems instead of, like before, maybe knowing one or two systems, and then going to a system expert when you want to know something more. But that's my just my general opinion of it.
45		RC	OK.
46		IP1	There might be people that say other things as well. And it is also a cultural aspect of course. Uh, I look at this as a person that works for American company in the Nordics. And it might be a little bit different if you worked work uh, at another company, another part of the word world as well. I mean there there's part, I mean so generally if you tend to look at Sweden as a technical, tech country. So, we have a lot of we have quite good general base technical knowledge. And, I mean if you travel south in Europe or if you travel west or east somewhere, I don't know exactly where, but there will be countries where you generally might not be able to demand that from your workforce. I mean, I don't know, something that.
47		RC	OK. So, it's more like your understanding about technical that that's kind of, a little bit different …
48		IP1	Yeah, so what I what I wanna say, it’s um, more of a complex problem than can be answered with the

			question. So, for example, if we take the HR department is a department where we generally need a less, uh, technical, proficient people, it would still be a difference between HR departments in different parts of companies in different world in different parts of the world as well where you might be in certain parts and they uh, they know everything about everything. In in other parts there are more focused on maybe not the technical tools but on the management or the management or something like that. I mean it's there you can't, you can generalize and say everybody in HR, everybody in finance departments, because there's so many different levels of granularity on different levels of the uh, the culture aspects as well. So, it's hard to say that that is it's always like this or so is like that. I can. So, uh, uh, uh, yeah, so back to the question is that I would say that, um, the important thing when you come from uh, a company to learn Qlik Sense, uh, is not your technical background, uh, but it's your willingness to learn. And you too. And the willingness to learn is something that's even more harder to place or put into a different category of a person, because that's more a person aspect. So, I mean I have people in the classroom that have about no technical background about BI tools that learn quicker than someone who has a long experience with technical with the BI tools as well. So, I mean, you can't, yeah. So, it's interesting.
49		RC	um, so like the task performance is really important because like you have to know to how to use this to like in your daily task.
50		IP1	Yeah.
51		RC	And so, can you give us like an example how you design a training program to fit daily task.
52	TAM	IP1	So, uh, because we do kind types of the… Because we do general trainings, we try not to solve a specific problem, but we try I what I tried to do is to teach the people in the training to solve their problems. Because uh, it's really hard to find a specific task, especially when we talk about BI tools, because BI tools, you can build them in many different ways. And what they usually do or the one of the main focuses or parts of a BI tool is that, it's supposed to help you to prioritize, uh, in your day to day work to see these are the problems that I have are these are part of the problem. So, for example, if you want to talk about a specific task like, okay, so we need to, uh, um, find a way to become more efficient with producing our products. For example, that's major tasks that need to solve. It's hard for me in the classroom too. Uh, sit down with the customer and teach them how to build a BI tool to solve their specific problem. But what I

			can do is show them how to build uh, or visualize certain types of information, how to build different types of visual objects, like KPI objects, bar charts, line charts, or common charts and so on. And I can teach them how to build a data model based on their different types of data sources. But it's hard for me to build a training which is focused on solving a specific task is usually just short talk about generally on how to build a good BI to and then it's up to the customer to build the BI to solve their specific tasks. When I get questions in the training, where are they say we have this problem or we have that problem, um, I try to take a general discussion about it. Hopefully there will be other people that have a similar problem, or they're trying to solve a similar problem. But otherwise, I say that I can just tell you how to build a tool, not how to use it to solve specific time.
53		RC	Uh, like, cause like I had a workshop.
54		IP1	Yeah.
55		RC	That's for the other system but similar.
56		IP1	Yeah.
57		RC	But like the trainer, the teacher actually gave us an introduction about the product. And, but, however, when we actually use it, we found out like they're the training we had was like too simple compared to what we're trying to do. So yeah, it's not, because I think part of, it's because like, it's what we have been trained for it's not like really relevant to what we're actually like what we actually want to do.
58	TAM	IP1	Yeah, I understand. I can, I understand what you're talking a little bit about their uh and that is uh, I mean, uh that's also uh so it's not specific to our tool but other BI tools as well. Uh. The thing that I talked about we have three different types of training. We have types of training for the business administrator the data architecture and the system administrator. Now a lot of the tasks that you are going to try to solve is gonna be a data architect problem. So that means that, you need to maybe you're downloading information from, for example the United Nations' database or something like that, which I happen to know was one of the tasks that used to be done on your education before. So, one of the project was that you were gonna choose a BI tool. And then you download information from, I don't know, with the UN or another kind of data from the world something with that kind of dataset, and then you build visualization is based off of this dataset. Now the problem there is that if you only have a training that focuses on visualization, that data you're going to miss the important thing and that's to get the right data into the system. Because when

			you download that CSV file or excel file and you just push the import button, you're not gonna get a BI dataset. You're gonna get the dataset as its exported. There is a table maybe as a cross table or something like that. So, you won't even be able to show because when you start to build your dimensions and measures in your visualization, you won't be able to base the offer correct data model. So, you're simplifying the problem by just going in and saying that this is the task can be resolved by just knowing how to build visual the visual tasks. And I think that just to connect this to the question that you're asking more towards the task-based questions, when I get someone that's in my visualization course, that's the for the business administrator. And I hear them talking asking questions on how to solve this problem, how to solve that problem. If I identify those as data modeling problems, which they usually are, because that's something that that's hard to stay away from. That's when I tell them that I am, uh, unfortunately, this isn't the forum or the class or the training where I'm going to be able to solve these problems for you. You need to go to the data modeling course to do that, because I can't within the context of the business administrator and in the visual part, solve those problems. That's not the right form to solve those problems. It's like uh, giving you uh, nail and then to, uh, to put that nail into, uh, to uh, uh, something where you want to nail. I give you a balloon. It's like It's not the same. You can't use the balloon to force a nail into the plank order during a nail. And you can't solve data modeling issues in the context of learning how to create correct visualization. And you cannot create correct visualization if you don't have a correct data model to start with. So, uh, that's also why I tend to uh, when I um, mean so it's hard, you need to know your audience. So, you need to know what they what they need to do, what they need to learn. Uh, the problem is that when you're not into that part of the, um, I mean, if you're not a partition and you tend to look at it from the outside, you look at the things, the marketing departments tell you, look at the people, things that the sales people tell you, and they tell you a simplification of the truth. I think that's one of the problems. So, when we go out and say our tool is really easy to use. We mean that our tool is really easy to use. If you're an end-user and you do the self-service parts. But that entails or that demands that someone has built the correct date amount on the bottom.
59		RC	Okay.

60		IP1	So, the front thing is really easy to use in the same thing with our competitors that were with you. I mean the front and part of their tools really easy to use, it is. Uh, but the problem is that you need to build a data model to get that off and running. And it's hard for a trainer to cover all that things in two hours.
61		RC	Okay, yeah.
62	BATP	IP1	So usually are um, business administration course is two days and our data modeling courses is three days. And even if you do those five days, you're not uh, full developer, you need to sit down and learn more. So, I mean, it's, that's a promise to where… And this is nice because it ties into a lot of your questions. So, the problem with these buzzwords and how the market is that, suddenly someone says, ok, it's self-service or it's as they were talking about, now it's advanced analytics or big data or uh and stuff like that. So, we're going to do that. We need to do that. We need to be there. Uh, we'll send our people to a two-hour training course and they learn everything. It's not that simple. You need to respect that. These are quite complex things to do, to get the tool that supposed to be able to be a good BI tool, not just to show a snapshot over how a data might look right now, but to be able to also be a scalable and flexible. And to answer a lot of the other questions as well. You need to build a correct data model on the bottom. And it doesn't matter which tool you're on. If you're an art tool, if you're on our competitors to someone who's a lot smarter than me has to sit down and build that data model. Because that's where a lot of that's what I talk about when I mean governance.
63		RC	Okay.
64		IP1	So yeah, that didn't actually answer the task thing. But it's kind of tied into what I think that you want to get out of that question, at least.
65		RC	Yeah. And also like I think uh, mentioned like it's like for the standard training is like a you just used pretty much similar data source for the training.
66		IP1	Yeah.
67		RC	And for the customize. Like you can use some like some data sources that's more relevant to their things. Do you think, like do you think it would be a little bit more benefit?
68	BATP	IP1	Well, yeah, but usually when we do the customized training, it's so usually when do your customized training you'll do on our base data source. But we do other exercises than I do. That's probably not the way the one customized training, but that could happen. Uh, we do it on data sources that I gather or as it is in most cases

			when they want a customized training, we do it on the customers' data source. Now when done rights, that would be most beneficial for the customers to get the training done on their data sources, because it comes easier for the users to understand. Because a lot of the training, especially to data modeling training, as we talked about recently, uh, is um, about knowing your data. And it's hard for someone who has worked with sales to know what sales data is. So usually if say that, for example, that they work in the school there a school teacher and I'm here to teach them how to build a data model to show the greens and the pupils and everything and the students and stuff like that. So that's what I want on the show. It's hard for them maybe to relate that what I'm trying to show here on the financial data is the same problem that are gonna face when they're gonna build this but on their own data. So, it's better for them to do it. The problem here is that I don't know their data.
69		RC	Okay.
70	TAM	IP1	So, for me to be able to build a custom training based off of their datasets, I need preparation time. And this preparation time is often more preparation time when customers willing to pay. Because for maybe ah two-day course for example if I was to do that on a customer data, I need two or three days to prepare on it because it's I need to sit down, and you get access to those systems. Usually I need to be on the customer site when I do this as well. So, some traveling costs with it as well and then I need to be able to look up their data and see what's, what does this mean. Where do you want this is a, uh a dimension or measure field you want this aggregate or does the field HQ for example. It's, oh, so It's in that case, I need to sit down and learn their data. And often it's easier for them to learn a little bit about the sales data than it is for me to learn things about their data as well.
71		RC	So, is there like the time consuming? It's like one of the challenge.
72		IP1	Yeah. I mean well time consumed in this case. I think the research that we need to talk about is money because that's what it usually follows the post on to. So, uh first off, a two days or three days for five days course is quite expensive for the customer. So, it's not for free. And then if they want if I need the same amount of time to prepare for the course as well, it becomes really, really expensive for the customer. So usually what they say is we'll do it on your data instead.
73		RC	Okay.
74		XZ	As I read a lot of paper said in the training program, you cannot just teach the users how to use a system. They

			also said understanding the value of BI system is also important. What do you think?
75	TS	IP1	Yeah, maybe I uh, yeah, understanding the value. I'd say that mainly if I look back in my experience and I've taught over a thousand people how to use BI systems, uh, the last three years. Uh, it's not understanding the value of BI system. It's understanding what a BI system actually is. So, I think that's what's important. So, uh, and I mean, I would guess that that's a little bit value oriented as well. So why should I took on the side can go into this system? What is a BI system? What do I use it for? Um, so I think that's the yeah, I think that's important. Uh, but another thing that I always highlight, uh, that's that I think is even more important is that I always tell my, the people in the training, I think I said this once before, but I really want to highlight this is that I can teach you how to be a Qlik developer. I can teach you how to be a Qlik administrator in one to five days. What I can do is I can help you over the first couple of steps. I can learn you, I can teach you the terminology that we use in the platform and show you some of the typical problems that you'll encounter. But then it's up to you outside of this class room to sit down and kind of transform or translate this knowledge or the training that we've had into practical skills and then how to learn to be a Qlik developers. Something that you do on your own on your data. I think that's very important. I think that's also something that's kind of miss communicated or underestimated when it comes to signing up people for training. The person that that pays the bill for the people that go the person that goes to the training often expects that. Ok, so now you've been away for five days. Now you're a Qlik expert were now you've been away for five days. Now you know everything about this and try to, and that's a dangerous thing to go out with. It's not you can't. It's hard to do that. Yes.
76		XZ	OK. So, um, like you're the trainer, I would like to know what kind of background or skills are required for the trainer of a BI program.
77	ST	IP1	Um, so I'm actually a good man or a bad example of that because I applied for a position as a trainer that I wasn't qualified for, uh and got in anyway. So, in that case, it's kind of they usually when we go out and ask for or look for trainers, we focus on a couple of different skills. First, we want a technical background. So, some kind of technical background. But we have usually when we go out seek trains we want specific Qlik to experience as well. So, one to two years where uh just normal technical train. So, we have two different trainers and we have

			technical trainer some way senior technical trainers for our normal technical trainers but one to two years of uh Qlik experience in one or another way or other BI systems if they don't have Qlik. We want a couple of years of teaching maybe two to three, something like that. I'm just guessing on the numbers. Just feel these as kind of general. So, uh, we want that as well. And then also we're looking for some people, people's skills as well. And in click we um, we have kind of a rigorous hiring process where you get interviewed by a lot of different people will try to find people that would fit in. So, so it's also a lot about who you are as a person. I think that's where I got in because I didn't have two three years' teaching experience. I didn't have one to two years technical background either. But I had, the, they thought that I was seemed to be a fast learner. And I seem to be able to uh, fit in like first person on the first personality level of the company as well. Um, but generally a couple of years technical working with BI tools and a couple of years working with uh, teaching.
78		XZ	So, there is no specific requirements for, like some business background?
79	ST	IP1	No, not as a trainer. No. But that's because uh, we get so many different types of people in the classroom. So, I can't even, I can't tell. I mean that you can say that we're there's all there's mostly people from the finance department or there's most people for management because so varied. I have everything from, as I said before, people at work on the factory floor and control quality there or just some little workers there, two people management groups to the and everything there.
80		RC	Um, and so like for, like for the people who usually come here and take the training program, uh, like what are usually like their roles in companies…
81	EUT	IP1	Back to the… This is very different from company to company. Some companies are small companies where they're BI department or they're BI resources are two people so they're both system owners and system administrators and expert users and everything in once. There are some people that are hear they don't even, they aren't even gonna build their own thing. They're gonna work with consultants but they need to understand how you build a solution to be able to easily communicate to their consultants and what they want. I want to build on their users and BI departments where they have twenty people working there where they have people that are specialized on the front and the back and on the server department. So, it's very different. And I also from the representation from different departments. But usually

			what we get in here in the classroom here, at least and also when I'm around, is not like the end-user, but the people that are gonna be experts within the system. So that would be kind of a general. So, the people that are here are usually some kind of experts in something.
82		RC	Usually says they come to here and then go back to teach others?
83		IP1	Yeah. If we have a company that understands how the complexity between maybe it would be between implementing uh, information system, they would do that. Otherwise they just let their users go in and Qlik on for the best.
84		RC	Okay.
85		XZ	And as you mentioned that you teach different people with different background in one classroom. Do you have ever considered about train them by groups?
86	EUT	IP1	So, um, we have uh, between, I'd say three to twelve participants per class. We don't want more than twelve participants, because that becomes too many. It's still we're learning about my technical things. And I feel like, um, so, uh, way if you want to, if you're a company and you have a lot of experts and you want to train those experts, you do a custom on-site training, is that for them. So that's what you do. But in the public classrooms that says we have, uh, I would say that I'm more encouraged there to be a mix. I feel that's more beneficial for the training course because that because the discussions become more interesting and more diverse, uh, we get kind of people help people in the classroom as well. So, the person that's a little bit, uh, faster a little bit, uh, understands a little bit faster would help maybe the person that set next to them that's not that that fast or that doesn't really understand which button to push. So, I kind of like that environmental bit more um, but I mean sometimes, I have had courses where we afterwards discuss that sometimes we need to maybes sometimes have more advance the simpler courses, even on the base courses as well. So, I mean, they sometimes there's time for that as well, but mostly generally, if in fact, they might be looked at like the normal situation in the classroom, I encourage and feel that the diverse classes are the best classes stuff.
87		XZ	So what challenges have you experienced as training people? Like the resistance of the software?
88		IP1	Yeah. So, um, uh, there are a lot of lot of challenges. There are, um, there is um, some kind of there's with the sometimes, there's a language barrier when I do training in Denmark and I talk English for example or when I talk English in classrooms in Sweden, sometimes when we

			have people that are both from different we have different backgrounds. So, there is a language and cultural barrier. Uh that that's part of it. Uh but I mean the main part I would see is, uh working with the prejudice from the people that are in the classroom. So especially when people that have worked with another BI tool come in the classroom either they changed jobs and now start work with and you two or the companies decided to change to Qlik Sense for example uh, those or go from Qlik you to Qlik Sense. Those are the, I think most challenging people because they have their way of solving the problem. They have their expert knowledge within the system that they were used to using. And now you're changing that system. So, you're actually, you're demining their positions in the company by taking away the thing that makes them experts that made people run to them and talk to them and changing into something that you might not understand, where we solve a problem a different way than you might have sold a problem before. So those I see that's the most that's the most difficult things you have people that and that already go and come into the classroom in the classroom with the uh, the notion of that. I'm skeptical this is for something that I have right now. So those are the most challenging ones. And then the other one would be the people that don't understand. I mean, there are some people, not that many. Uh, but there are some people that um, I can explain something to twenty times and they still don't understand or don't listen. In that case, there's not much I can do.
89		RC	Is that they just don't want to learn, or just don't understand it?
90		IP1	I mean it's some I mean in one way I think there might be other I don't want to learn aspect of it, but sometimes it's just that they don't, they, this is so outside of their comfort zone. So, they just they just can't learn. And it's not that many. But there are a couple of examples of people they just can't learn. So that's it. But I'd say that this is maybe not the most uh, or the biggest, uh, versus. So, the biggest problem or the biggest challenge is the people that go in with the notion of that. I already know the system that I work with. Uh, but sometimes they're people just can't.
91		RC	Okay. So how do you look upon the future of their training? Like what you see like some something can be and gonna change or?
92		IP1	I see that then. I mean if we look a little bit on how it looks right now and the future from today and onwards, I see a couple of different things there. So, uh, first off,

			um, back to the buzzwords thing we talked about what we're talking a lot about self-service. Other news buzzwords are on the map is big data and um advanced analytics. So, what we, what I see that being in a training perspective is a demand for more advanced training. So advanced analytics is more of the data scientist way of looking at data. So, before business intelligence or decision support systems have been a lot about making data available for everybody in the company. Now when we've done that or where we come along way, we need to make companies investing more money into BI tools. And the way to do that is to start looking at more complex things like predictive analytics and stuff like that. When you do that, you need a new type of role, a data scientist role. Someone knows mathematics, uh, people know math and uh statistic. And um, some programming language like R or Python and stuff like that. So, we need to let teach that. I mean, that's can be a big problem, because that traders generally don't have that background. So, I say that's one of the things that we're facing. The other um, uh, thing uh, that I would see as the future is moving more and more training online or to the um, virtual classroom. So that's something that I think uh, a lot of people in our departments here at the Qlik look a lot on this. That's a lot of you know, the reason why we created the continuous classroom is to create uh, platform, not only a platform that uh, makes information and training more available, but also reads this out to people that aren't comfortable with, um, doing training in the classroom. So, I mean there's a little a lot of different ways to learn. I mean they're depending on which person you listen to there between the five seven twelve different learning styles some people they learn best when they're inside of a classroom focus on a teacher and the teacher talks, some people learn better when they sit down and do something. Some people are better if they're outside of the classroom and so it's kind of different depending on who you are as a person. So, what we see there is that an online platform is not only something that reaches out to the people that can't be on the physical place. But it's also people that might wanna do ten minutes here and ten minutes there or not like set up five days a week to do training but do some like an hour train per day in a module-based form. So, I think that's also a future BI training is looking at how to facilitate a global all-around learning. So, we have uh, the more uh the advanced analytics, the uh, online training. And then there's a little, little uh, thing that's my own uh, notion on the future as well. And that's also to

			make BI training available for everybody. Not only people uh, uh, pay money on companies as well. And the reason why I think that's gonna be important is because of the uh IOT, IOT you know that is internet of things where we want to maybe in the future have some kind of consumer BI as well where, because we're gonna have like one hundred devices in our home talking uh to us all everything from our refrigerator to our vacuum machine to a lawn mower or whatever. So, we're gonna need to be able to build like BI systems for our household and BI systems for ourselves as well. So I think that there's gonna be a couple a little bit training very easy train but still on how to how to build a simple application on a tool because a lot of not only us but also our competitors we make our tool available free for consumers so as a consumer you don't have to pay any money you can use it and play around with it as much as you want to. It's not until you installed on an enterprise environment that we start taking money from it. And I think that in the future, a lot of the consumer households will need a tool that gathers information from not just the different devices in the home but also from their banks with their spending information. What they spend the money on like everything else as well, just gathers all this information on the shows that in the dashboard everything from your energy, um, how much energy you spend until which food you're missing here. Then I'd see that's just three different things. Advanced analytics. That's the more technical I mean the more advanced training on BI tools. I say that um, the online platform on internet as well. And then also consumer BI see those everything.
93		RC	Okay, so you have any additional comments or suggestions about like structure, the training program?
94		IP1	So, I'd like to get back to one of the themes that we've talked about here, but it's also something that we might not have put out into words. But when my base notion or my way of looking at it both on the future and how it is right now, is that uh, instead of trying to model our trainer or training after our customers' specific problems, we do more of a general notion of this is what BI is. This is how you build a data model. This is how you build a visualization, because that's what we can teach in the classroom as we can deliver a good quality product on um, the things outside of that it falls under uh, consulting instead. So that's when you need an expert that comes in and sits down in your company, helps you fix the problem on your own, and you need to be able to separate consulting from training, because these are two different things. Training is teaching someone and giving

			them the tools to empower them to solve their own problems. That's what we need to do. Uh, consulting is sitting down with the customer in their environment, solving problems together with them. Do you understand the difference that I make there? I feel like a lot of the times when our customers go in and say, can you do this training on our data? It's not uh, mainly because it's easier for them to understand that data is because they have problems in your data. Are there problems with creating applications and they want us to come in and solve those problems and that can never be training up to the trainer to go in and solve the problems of the customers, that it's teaching them how to solve problems. That's important.
95		RC	Okay.
96		XZ	So that’s all the questions.
97		IP1	All right.
98		RC	Thank you so much for the interview.
99		XZ	Really thank you.
100		IP1	It's my pleasure here.

Appendix 3

Appendix 3
Interview date: May 9th, 2018
Interviewee: IP2
Interviewers: RC, XZ
Interview type: Skype Video Meeting
Interview duration: 43min
Transcribed by: XZ
Transcription date: May 10th, 2018

No.	Code	Person	Content
1		XZ	OK, so can you give us a short description of your work?
2		IP2	Yeah, sure. So, um I'm the training lead for into West Europe. Um, we are a BI consultancy. We have a small office in Christchurch, in Dorset in the UK. Um, we have a few people just around Germany, we have an office in Amsterdam as well. And uh, the rest of us are in London, and it's an international company as well. So, we also have all over the US and also uh, Asia pacific. I'm responsible for the kind of European place. Um, so what I do is I'm a qualified trainer in tableau, which is a BI tool which you guys already familiar with that. We also have uh, the BI two is different pieces of the picture. Um, and so I'm a trainer in that and I also responsible for making sure that everybody else is able to train on that. So, we train end-users, we run public training, we also go into organizations and run trainings. And so, I look after all of our trainers in Europe, and I also delivery the training myself. Ok, training courses. We run two days to four days, sometimes virtually. Sometimes in person. It's just really up to the client normally. And we normally whenever we do a project like the new consultancy project, the project will put some training in somewhere.
3		RC	Uh, and can you give us like a, uh…
4		XZ	A brief description of the training program of Tableau?
5	BATP	IP2	Yeah sure. So, the BI training program of Tableau, um, is signed for, yeah end users in mind. Um, this a number of different courses that you can do. So, one is the fundamental schools Desktop1, uh, that's two days in person, or it's five days, virtually so five days, two and a half hours per day. Um, and the next one is the Desktop2 course, which is the intermediate course, they call it. And then the third one is the advanced course. And that's all folks from Tableau Desktop so that's um building ports, connecting to data understanding data

			connections, modifying destinations, building reports, building dashboards, um, different chart types, different concepts of visualization. Then there are different causes as well. So, they have server and Tableau Server Admin course, Tableau server Architecture Course. So, this is all about hosting their reports, publishing reports, uh, enabling users to interactively kind of access the reports and how you host them on the server. And then the third, um, sorry, the kind of third section of new type of training are they do our visual analytics, which is also always about visual best practices. So how do you build the most kind of compelling report visualization, which tells your story in the best and most effective way. And then the second part of that is actually a new course they've just launched, which is tabloid press. This is about preparing and shaping data, ready for analysis. So, making that kind of a mess and tidying up getting it ready. So those are all the Tableau offerings that Tableau has. And in addition to that, uh, into self-service itself, we offer slightly different courses. So, we do, um, visual best practices, course which is designed to be more of a kind of workshop style. Um, so that gets users in a room from a department maybe, and they talk about what they're trying to achieve. So, we're really focusing on them. It's custom to them. And then we also do courses um, designed around server, which is all about adoption. So, um, when users start kind of published reports, organizations then try to get those reports out in people's hands, and like one of the best ways to use it and things like that. So that's sort of supports from the adoption perspective. But this is all in the Tableau area or supporting Tableau roll outs.
6		RC	Ok, so and also like do, like in your experience, do you usually provide a standard training or like a customized training and like…
7		IP2	Sorry, I'm sorry, say again, a little bit louder. I'm sort of struggling to hear you that.
8		RC	Okay, sorry. So, like, do you usually provide standardized training or customized training? And like what benefits and challenges do you see like from the both of them?
9	BATP	IP2	Yes, most of what we do is the standard training. Um, but the trainers tend to do is customize it slightly. So, let's say we go into um an organization where their business is tourism. So, when we go in and we're doing sort of um teaching methods teaching specific lessons and techniques, we'll try and bring that factor tourism. So, we're talking about things that are important to the

			tourist industry. Maybe we'll show demonstrations of tourist's data, so they're learning in in data that they are familiar with. And the concepts are things that familiar with that when they are doing the exercises, they would be doing the standard content. Now the main reason for that is because if I tried to develop whole new content that's gonna take a lot of time. And when you've got twenty users in the room or fifteen users is in the room, they need something to refer to. Right? So, we give them a manual. So, they have instructions, they have pictures, they have materials from they need, and then they can kind of follow them. So, I can't help everyone can't help fifteen people at once. I can help maybe three people and then two and then one. But then these people all have instructions to follow, so they were working off the same thing. So, the materials tend to be standardized. Even if the way that we train the things we took about examples we took that might be slightly customized, the custom end of the training, that means that we have to spend some time with the customers, just plan out what that looks like. So, we have to understand that data and join us on their model. We have to understand what service they are working with, and limitations, maybe if the technology or anything we need to consider. Um, that creates a bit of a challenge. So, it's more of a longer-term engagement. We have to do different courses. The customer, we have to kind of talk through various things. They have to send us sample data, which we then have to like to unlock and build some stuff with. We can do it, but you have to plan in all the time. I'm sort of in the ramp up and then afterwards. And that really can engage people. What we tend to do it is say by the standard training, we know we'll teach in our custom way, teachings kind of training. And then we'll add on some custom information once we got to know you better. So, we'll add on like a piece of custom training at the end. Um, then they then they get the best of both worlds. The challenge really is managing that classroom and looking after all those people. And that's in person close to or in a virtual classroom, you have to manage and make sure that everybody's following. And if everyone's doing something about custom and a bit new, and we haven't bought the materials, then it's gonna fall apart quite quickly. So that's why we tend to stick more to standard. Does that answer your question?
10		RC	Yeah, oh, okay. And so, the trainer. Yeah. So how do you select trainer for this training program like this, like

			what kind of background and skills do you require for the trainers to have?
11	ST	IP2	With the trainers specifically? Yeah. Um, slightly, it's kind of a weird uh, role. So, if you think about most people that work in technology, they tend to be quite technical and they tend to want to sit behind a lunch hour. So, the challenge is finding somebody who is technical, but also can communicate. Um and that's what we're really looking for. So, somebody that understands the technical piece, but at the same time is able to communicate that in a way that other people can understand and not just communicate it in one way but probably communicate in five different ways. So, I'm trying to explain a concept and I have to be able to tell you like one person that way and I need to draw a picture for another person and I need to show another person and I need to run through in a different scenario. Another person I need to kind of use a different example for somebody else, because everybody understands in different ways when you're teaching. You also want somebody who is, um, it's kind of a bit unflattering live. Don't know if that's the term that you would to be familiar with. Somebody who doesn't panic when things start to go wrong. Because when you get into a training room and you've got fifteen people, the chances are two of the laptops won't work properly. Just always happens. Um, also that you might maybe run out of time sometimes. Or maybe, um, you know, the whiteboard is not there, you don't have a whiteboard, or maybe the screen resolution isn't quite right or perfect. So, you can't be one of those people that wants everything to be perfect and set up, or the time you have to be fairly flexible and adaptable, and you have to be able to deal with problems when they arise. Um, you know, somebody says, I need to leave at three o'clock today. What's their choice? But you want them to get the benefit of the training. So, you kind of rearrange things to make sure that they have the benefit before they leave. Um, you have to be that kind of flexible person. We hire people who are, yes strong communicators, pretty flexible, very adaptable. We hire people that love traveling. That's really important because you travel for work. Right? So, you travel go to different places, you have to be friendly, you have to be able to chat, people get to know people don't mind staying in hotels on your own, all of that kind of stuff. You have to be ok with that. That's a really important skill set. Um, the other thing that we look for is, um, yeah, as I said, people that are kind of uncomfortable,

			who are adaptable and manage problems. But we also look for people with kind of imagination, because the material can be very much the same if you just stick to the center material. But we rely on our trainers to make things exciting and engaging, find different ways of sort of entertaining themselves as much as entertaining the students. So, we look for that sort of active imagination as well. And those are not necessarily what I would call standard technology traits. Um, but the industry is changing and we're getting a lot more, for example, women in the industry, um, over time. And we're getting a lot more kind of adventurous startup type people in the industry. So that so that makes it easier. For a few years ago, it was really hard to find consultants who could talk to people. Does that make sense? So that's the kind of difficulty.
12		RC	Okay.
13		XZ	Also, about the training methods. Um, for example, the classroom instruction or the distance interactive courses, which one is the most common one that you use?
14	TM	IP2	Yeah. Um, so I split my time, half and half between uh, classroom training and virtual training. In the US, just in our company in the US, we tend to do more virtual training just because of the distance. However, our virtual trainers tend to have already been classroom trainers first. And that's really important, because if you can manage a classroom environment and all the interaction pieces in the classroom environment, then learning how to manage a virtual environment. Uh, distance learning is a slightly easier transition, but it is harder because if you imagine you're teaching and you're talking to could be twenty people from all different countries and some of them are a kind of active, but a lot of them will be really quiet. And it's almost like you're talking to an empty room and you have to try and engage. You can't see people's faces just because of purely numbers. I can talk to you guys. I can see your face is your reaction to me. We can see each other's faces, but when I'm teaching, I'm showing on a screen, so I can't see anyone's face. So, I have to do things like, oh, what do you, what do you think about these guys? Any thoughts on, you know, you're constantly trying to get people to engage. IT's really, really tough. Um. So, we actually have a separate training component when we train our trainers on how to deal with virtual environments virtual distance learning because it's much harder. But at the same time, it can be really rewarding because you can get

			somebody to open up who maybe wouldn't open up in a classroom because they can open up either they can type chat and you can have a conversation with chat or you can kind of have a little one to one um you know verbal conversation. So, it can also be really rewarding. But I find it very tough myself and I know that a lot of the trainers do too. In the classroom. I tend to jump around. I'll go from like one end of the room to the other in the room. I'm very, very interactive. I'm up on the whiteboard and drawing things and bring different stuff into the classroom like different, um, you know, objects and things I can use to teach with and for teaching it can't do that in a virtual classroom. So, distance learning, you use lots of videos. You use lots of polls and quizzes, things like that. Um. We can all draw on our screens, you know using a finger or using the mouse. So that also allows us to sort of draw diagrams people and have those whom it's like a whiteboard type environment. Um getting them to often say things you have to use humor. You have to, I mean is the most uncomfortable silence when you ask a question, and nobody answers. Um, but you have to wait to a certain degree and you have to be disciplined and yourself. You have to say, right, here's a question, guys. I'm not gonna I'm not gonna be run until somebody answers it. So, I'm waiting, you know, make a joke out of it, but you have to wait for people to interact. And framing questions. So that is an answer. And it's easy for people to answer um, festival and then making the question is more difficult, uh, is one of the techniques we use. So, ah, something like so, tell me your name, tell me what you do for living. What's your role? Um, who likes cheese? You know, silly things, and then people can answer that.
15		RC	So, like, what kind of people do you usually train for? Like is that usually the business people or like more technology, uh, technical people?
16	EUT	IP2	Um, it's bit of a mix, actually. So, what tends to happen uh, in a in a big Tableau project is there tends to be a few, um, what we call kind of champions, the people that are really technically strong anyway. So, they're either an analyst background, or maybe they're an IT background. Um, and they sort of the people you're happy to see, um, you know, come into a training room. So, you just think, oh, they're gonna that strong excel users or maybe they've done some different, uh, you know, Power BI or different view whatever different tools before. But they won't be the only users. And they're such a minority because there's such a precious

			commodity. And they're probably also quite thinly spread across technical to the business anyway. So, then you also have maybe, um, subject matter experts in different areas of the business. So maybe someone from marketing, product design or with different people like that who have a used to really consuming reports, they're not really used to building reports, so that for them will be a bit of an uphill challenge. And then the last kind of set of people you'll get in coming in sort of a senior people who, um, have different reasons for being there. So, they might be assessing the tool they might be participating. Because if the whole department is participating, or they might be, um, you know, wanting to learn a few simple things, and they're not really paying attention to the whole course, they're just taking away maybe like fifteen percent. And it's good to try and profile these people when you're teaching them, um, to make sense of right. Those are the endless. I can touch them at this level. Then I can talk to other subject matter experts. They're really helpful to have, because I want to learn what's important to them. And they're going to give me the best examples for this teaching, uh, for this class. And then the senior people you sort of have to not spend too much time with. Is that probably not gonna take away that much practically from the course? They're probably only gonna take away a little bit from the course. Um, you want them to understand the basics. You want to give them some quick shortcuts and some things that they find useful and some quick tricks that they can show off. But you don't want to spend, you know, hours with them because they probably gonna use ten percent of what you teach them.
17		RC	So, is that like you usually train for, like some kind of like power users and them, like they will just go back to their companies and just to share their knowledge with their new knowledge?
18	EUT	IP2	Yeah, so we don't really, um, we train people to train others, but what we do is we would run people through um, all of the training courses, so they would do dust at one. Let's talk to they would also do desktop three. This is the advanced one. And then we probably invest some extra time and getting them ready to communicate what they're gonna take back to the organization. And they would be the power users that the real benefit for the real kind of support and kind of value that we can give to the power users is after the training, they need support. So, what we tend to do is give them, um, assist time, which is our uh, support service that we offer. But I think other consultant companies do the same thing.

			So, this is like a bank of time that they can call upon. So, they sort of sign up to like, I don't know, they sign up to twenty hours of support time. And that means that whenever they get to a point that they can't answer the question from, use it internally, they're not then at a brick wall. That's the most important thing. You don't want them to then feel like, oh, well, I can't answer it. So, the tools are, you know, that's useless. We can't do anything. They need to have somewhere that they can go to back them up. And so that's really important for them is giving them that long term support and then also coming back in with them and doing more consoling time with them like they're always gonna hit roadblocks. So having some consulting time you know in a month's time let's come back and see how you're getting on and then we can start to build out what's called that center of excellence and that would be all your power users who are kind of working together and know what they're doing and really can come and communicate and help the rollout in the business.
19		RC	And also like when you train people, do you train them by the different groups based on their backgrounds? Or like do you just train them together?
20	EUT	IP2	Normally just train them together because we don't have a choice. So that people come to us are either you know, it's a few departments. We rarely get that opportunity to split up the teams. Uh, if I go into a really, really big training project. So actually, I'm working one of the moment where we sort of trying to design a training plan. If I have everything I want in a real blue sky thinking everything is perfect for sure and it's great day. Um, I would love to have, yeah, the power uses in one group, the department heads in another group and the subject matter experts in another group. That would be ideal, but it almost never happens unless we have a really, um, you know long-term project with a with a big organization like this one huge insurance company that I think we've done that with globally. Um, and then we're able to slightly not tailor the training, but kind of pitch the training at different level each time. Uh, but yeah, we normally don't have a choice, you can have completely different people in the room. So, I took one public training course that was a course where we were hosting. And then people join from different places. And I had um like PhD by a medical person over here who was like super, super bright. And then I had um, someone who worked for an estate agent over the other side who was pretty much

			new to everything. So, you have a spectrum, but you just have to manage it.
21		RC	But do you think it's going to be benefit if to train people like by the different groups?
22	EUT	IP2	Yeah, definitely I think that um, just from the rare occasions that I've seen that work, it adds a huge benefit because it just means that everything speeds up or everything slows down according to the requirements of the group. And so sometimes just by pure luck, I'll be teaching an advanced course on everybody will be really advanced and that be great. So, even more stuff we can get through the standard content, we can talk about lots more we can learn from each other. It becomes a really nice valuable cause for everybody. They get a lot more ask for it. And then other times I'll be teaching some quite advanced people and some less advanced people in the same class. And what I spend a lot of time doing is navigating between those two things. So definitely putting people in similar I wouldn't say necessarily roles, but maybe similar levels of experience and expertise. And maybe assessing that in in an initial assessment would be the best way to make sure that everybody's getting the most out of it. They don't have to be in the same department were doing the same thing. But if they're coming at it from the same place, I think would be really, really valuable.
23		XZ	Okay, okay. Um, so about the BI training process and the users, what skills do you usually train them like some analytic skills? How to use the Tableau or understanding the value of BI system?
24		RC	Sorry, uh, just like completed. So, like she's trying to ask like to ask you to train for the end users like so do you have to train them for like some analytical skills and also like the technical skills like how to use the tableau or like you also do also need to like maybe just help them to understand like, oh…
25	TS	IP	What is BI? Yes. Yes. Um, a bit of all of those really. So, what we're hoping that people will do, let's say, let's look at the fundamental schools. So, they're likely begin in schools by the end of the course. They should be able to build a functioning dashboard that is interactive and tells a story. That's what we're going for. Doesn't have to be the most beautiful, doesn't have to be the most like technically interesting or tricky or complicated can be but doesn't have to be just can be really simple build um three or four sheets and put them together into dashboard to make them work make those pieces work together and give it a title give it some instructions all

			of that. In order to do that they need to technically know where in the interface to do things right they need to know I need to do this. I've gotta go here. Gotta go here go in here would teach them more technical stuff then they will need to do that so that users who do want to do a little bit more they can they can do that. But a lot of what they're learning in that first courses, you know, welcome to business intelligence. This is what it is. This is why we are doing it. It's sort of starting from basics. And you have to assume that people don't necessarily understand how to tell a data story. A lot of what people do is analysts is they report on what happened, as opposed to reporting on the things that might happen, the things that change. Let's investigate all of those things. So, they just kind of show yesterday's news. Yesterday's picture. They don't really show uh, more give people the opportunity to interact with and investigate, which is what dashboarding, you know, true business intelligence is all about is about looking for those trends, those patterns, understanding, getting insight. So, we don't do a big section on what is beyond. Are you a big section of what is on the sticks? But throughout the course, we tried to get their messages across really simple things like, ok, you build a pie chart which has got seventeen segments when nobody can get anything out of that. That doesn't tell them anything. But you build a pie chart with just three or four segments. And then you ask people to click on those segments to drive the rest of the dashboard. And that does tell people something. So, using the same, you know, I can tell people show someone how to build a pie chart, but until they understand why and what the limitations and why does it what makes that good analytical tool and how that works in business intelligence. There's sort of missing the fundamental pieces. They just know how to do it. Um, so we try to cover all of that, but that's a lot. So, you can only do so much in two days. You know.
26		RC	So, like so how do you do, uh, how would you like to improve their like analytical skills to work with things, just like it is a really important part?
27	TS	IP2	Yeah, I think the analytical skills are really important. Um, and people don't necessarily have them. Not everybody is an analyst and or everybody is highly analytical. Um, the way that I find it easiest to teach analytical skills is to engage people in asking questions. So, whenever I talk about reporting, I took about um, that dash boarding, charts, visualizations, I always talk about the questions that people want to answer. And if

			you frame it from a questions perspective rather than an answers perspective, than that is automatically more analytical. Um, so all the way through my training, I'll be saying, what question am I asking here? Um, what if I wanted to answer this question? What could I do if this was my if this is the question I was interested in, what am I missing? Very all like very similar thematic things. But repetition is important in teaching anyway. But yeah," questions "is this sort of key.
28		RC	Um, and also like the task performance is like an essential part in the training course. Like they have to know how to, like to do that for their daily work. And so, can you give an example like how you design a training program to fit the daily tasks for the user?
29		IP2	How do I find the training program to fit for what? Sorry?
30		RC	Oh, I mean how to design the training program to fit the daily task of users? Like to train them every day?
31	TAM	IP2	Yeah. Um, I mean, that's also a little bit tricky. What they tend to do is asking lots of questions about in my world. What would I do? So, one of the ways that I sort of do that is where all the trains do. This is we have an introduction section at the beginning of the class on the first day where I introduce myself and give myself a little bit of background. And then all of the participants introduce themselves, and I and we ask them specific questions. So, in that introductory question, in an introductory section, I'll say, what's your name? What's your role in the organization? Um, what kind of data are you looking at on a regular basis? And, um, what are the questions that you're trying to answer will give me an example of a specific question. They are trying to answer with your data. Have you build dashboard before? Things like that. So, I get an idea about what they're doing day to day and what they are, you know, finding difficult or what they might be thinking about, um, going forward. So yeah, we encourage them to introduce themselves in that sense, and then throughout the course will constantly keep picking up on the same threads. So, I'll say, well, you spoke about um, doing risk analysis right the beginning. So, if you were looking at risk, what kind of risk would you or like kind of what category of risk would you maybe put along your rows here? What would make sense? And if you were comparing two measures in risks, what would that be? The number of risks or the occurrence of risks? So, things like that try and uh, help them understand how they would do in their daily works.

32		RC	Uh, and also like us, you're like doing the training, like what kind of, do you usually use the standardized data sources like just one for everyone or just you usually use like different sources that's more like relevant to their departments and experience?
33	TAM	IP2	Yeah. Um, so I because I trained a lot, I like to use different sources said I don't get bored because I think if I get bored, everyone can see on board. So, I tend to bring in something new into every course. Um we're when we do the training courses, we have the standard materials and that that includes multiple training set. So, the super store is the standard Tableau were most of the stuff is on superstore coffee chain, but then there's also um this Olympics one and then um from the twenty fourteen such again I think and then there's so there's sort of like ten normally ten different data sets which you can have a look at, but they are specific for different practices. So, I can make use of those. And the reason for making use of those is that some students learn by doing what we call kinetic learners. So, they learn by doing. So. Therefore, if I'm teaching them something and they cannot also do that and follow along, then they're gonna be a disadvantage. So, most of the time I would teach using those uh, datasets. But then I like to throw in a couple of different things. So for if I find a good dataset somewhere, so I tend to keep an eye on, um, dates to London data store and by various kind of government sites where people have datasets up and also follow blog sand, uh see what other people are doing business about on Tableau if I can get that data and if I think it's interesting than it helps me to tell a story. The reason for doing that not just because otherwise I get bored, but also um, which is to explore it together. So, we can kind of say, well, what are we interested in this data set? And that might be something that appeals to people. And it sorts of surprises them sometimes. And they start thinking about learning about data outside of work. Um, you know, if somebody's a sports fan might bring in something about sports, or if they're interested in the environment, might talk about, you know, recycling levels or something like that, it just it engages a little bit more.
34		XZ	Uh, so what challenges have you experienced as teaching those people? Like some, I know some people just resistant to use, uh, some new software like Tableau, oh, have you experienced that?
35		IP2	The biggest challenges. Um, actually, the biggest challenge that we face genuinely is people who overestimate their ability. Okay, so we have three levels

			of training for Tableau Desktop, just keeping that just focusing on those. And people come into the desktop three, the advanced course, because they've been playing with Tableau for a few months. Um, they, they've done lots of stuff in Excel. They know some other tool and they think, yeah, I'm ready for advance and they come into the advanced course on and you're like, well you don't know any of the intermediate concepts and you're not familiar with something like table calculations. So how can we talk to you in advance? That's really quite a challenge. So that's probably the biggest challenge that we face in a in a room. Because when you're training, you have if you have two or three people like that or one person in that in a boat, but then other people are really advanced. So, you have to bridge. And that's a very, very difficult bridge to cross. Um, you know constantly for two days. You're explaining to everyone else it's like this. And then going back to that person and saying, you don't really know that yet. But let me tell you something that helps you understand it. So that's probably the biggest challenge. Um, people love Tableau. You don't really have a challenge of people going. Um, or this tool is too slow to use, or you know, finding this difficult. Most people who do the training walk out of it going that was great. That was amazing. I now know how to do because it's easy to use and it's easy for end-users to get good at quite quickly. So that's sort of one of the benefits of teaching Tableau. The challenge that we do sometimes faces is people's expect, you know expected to do what Excel does. In Excel, I can do x why can't I do that in Tableau or in Power BI can do this. Why can't I do that in time? But most of the BI tools have got all the same functionality. They might be in slightly different places in the user interface. You might have to go over to the last story, but to the right to do things. The hardest thing is probably the Excel comparison. In Excel. I can just type in a number. Why can't I do that here? Well, it doesn't work like that. It's not just an interface. You can just type numbers into its business, intelligence reporting, visualization, tools. So that can be a bit of an education for people. So, I would say those are the biggest challenges is yeah, people have resting overestimated their ability. And then um, yeah, expecting it to do something that that it doesn't do.
36		RC	Ok, so how do you get over these kinds of challenges?
37		IP2	The only way is, I mean, I have a lot of teaching experience, so that helps. Um, I use humor lot, humor is really helpful. Um, and I think was being honest about

			that all about the training environment and about what you're capable of. So, um, if somebody says, why can't I do what I wanted to do in Excel? I just say, well, it's not Excel. And let me tell you about what the benefits and I don't try to cover up. I don't try to find a way that it can or like a workaround. I just say if you want to go to Excel because Excel is your tool and you love itself, and here's a way that you can explore all the data from Tableau into Excel and you can do stuff in Excel. But what you can't do there is and let me show you ten of the things that you can't do in Excel with people of different abilities. Uh, that continues to be a challenge like a setter use humor a lot. Um, but then I also would do things like ask that maybe that weak as student or weaker students to spend time with me after class and I tried to explain a few things, so I tried to catch them up um or I can give them a little bit more one on one attention. Well sometimes I can find a stronger person in the class and I can pair them up with the weak a person and they can help them.
38		IP2	It's just about managing, managing the dynamics really in the classroom. There's no easy solution for that one. You just, you just have to deal with it, and everybody finds it a challenge. The nicest thing that we have in my company anyway, we have, um, we talk to each other for the staff. And so, we have a slack channel where we um we just basically go, ah I've got three students you've never done tableau before and they just stand up to an advance because ah what can I do? And then we all sort of offer support and I think not being alone when these things happen is really important because it can be quite track challenging and difficult. So, it's nice to have support and nice to have people giving you smiley faces on sending you a little videos and stuff to make it off.
39		RC	Okay, I might have to jump back to one of the questions sorry.
40		IP2	Sure.
41		RC	Like, do you think it's gonna be like more effective way for the like the end-users in this training if they're using the data source that's more like relevant to their daily works or I mean if they feel more comfortable to become…
42	TAM	IP2	Yeah, it's a fair question. Um, a lot of the time we have customers asking for custom training for this exactly this reason. So, they want to look at data that they're familiar with. And I know um, in some industries, for example, the education industry, a colleague of mine was teaching recently, um, educators now really

			luckily, she used to work in education. So, they were saying this doesn't look like my data. I don't understand this, and they really struggled, and she was able to quite quickly because she's a very experienced trainer. Well, she's quite quickly able to just flip into a data set that they are familiar with, um, using some sample data that she brought from a previous engagement with education company. Um, and that's because yeah, the number you know, they don't measure like pounds or dollars or whatever, then the measuring people. And it's such a different set of data that actually made a lot of sense. She taught all of the all of the concepts when she was demonstrating on the screen. She was teaching in this states that she was talking to about um, their data and how that compares and the sorts of things that she understands. But she could only do that because she was experienced in education. And that's the challenge. So, I do think companies will get a lot out of working on data that they are familiar with. But at the same time, it's really challenging to know enough about that industry to be the, to be the expert at the front of the room. And we can't all the time. So actually, um, I think we have to find somewhere in between, there needs to be balance. So, the way that we do that is as I've described, they have the standard materials, the training materials. And we say we're just teaching you concepts. One thing that we can do sometimes in Tableau, which is um, something that I do of people query me on it, and it's quite simple. Maybe you've seen it is you can alias um, the dimensions. So, if someone says to me, I work in retail and um, we sell shoes. So, I don't, this isn't data that I understand like an alias, the super store data. So, I can replace, um, you know accessories over place whatever computer, how hardware with um, high heel stiletto shoes and, um, you know, trainers and sneakers and flip flops, whatever sandals. And I can just replace that. And then suddenly it's like, oh, okay, I get it and their eyes open up and they understand. So, it's not that they don't. It's not that they can't understand the concept. IT's like sometimes they can't see past just the names. And actually, the numbers, the values don't matter too much. It's just the names. Data is data most of the time. Okay. Um, so to a degree, yes, but I also just think about slightly overstated. How important is that they, that they be familiar with that data.
43		RC	OK. Uh, so do you have any additional comments or suggestions about how to structure the training program for the company?

44		IP2	Yeah. Um, I think one of the most important things that we keep seeing time and time again, and this is a continual challenge that I run into, is we people really well, and they get it and then they fall of a cliff. And that's the anyway, I can kind of describe it. They don't let you fall off cliff, but they don't use the technology for like three weeks or four weeks or something. And they've forgotten a lot of what we're taught. And so, what I'd love to see is more of a kind of modular training where um, they learn a particular technique or techniques. And then they apply it sort of multiple times repetition overseas. So important when you're learning a new skill. So, they apply it multiple times there for a period of time. And then they do another bit of learning and they learn something else and then something else. And that's why I think um, you know, self-control or What about learning on demand is becoming much more popular. However, that means that you don't have the support of a of a lecture of a teacher one to one. So, I don't know how that would work. Um, but that would be something to think about is something that we always see. People get it they're really good. That got it and then they because they've taken that say they're taking a week off to do lots of training now there really busy so for the next four weeks they have to do all this stuff they were doing before they don't get to use Tableau for maybe a month. And then they forgot lot of stuff. So, the only way that we can deal with that is we go back in and we do follow up sessions. Um, but that's, you know, that's hard for people to buy into. So that's something to think about maybe is how you could make that a little bit more modular. And then follow up with, you know, repetition follow up with quizzes, follow up things to sort of embed that knowledge.
45		RC	Ok, thank you so much.
46		IP2	No problem. I hope IT helps a lot. Good luck with your research.

Appendix 4

Interview date: May 11th, 2018
Interviewee: IP3
Interviewers: RC, XZ
Interview type: Skype Video Meeting
Interview duration: 34min
Transcribed by: RC
Transcription date: May 12th, 2018

No.	Code	Person	Content
1		XZ	Firstly, can you give us a short description of your work?
2		IP3	Uh, well, I am a Business Intelligence consultant. I have my own firm and work with, all its small and medium enterprise companies, help them, you know, with their Business Intelligence solutions.
3		RC	So, do you provide the training to the end-users?
4		IP3	Yes, yes, I did, that's also some part of the consulting work. So, if they want me to do some training, I will do it for them. And I run a YouTube channel. What I do training for free for everybody.
5		RC	So, can you give us like a brief description of the BI training program, like for using the power BI, especially for the business user.
6	BATP	IP3	Yeah, okay, I have that just for, I mean it's private training. So I do it for my enterprise customers. So I don't have any link online to those. But for the YouTube channel you can see they're all the training topics that I have.
7		XZ	Yeah, I have seen your channel.
8		IP3	Yeah, um.
9		XZ	Um, so, uh, what kind of background and skills do you think that the trainer should have based on your experience?
10	ST	IP3	Well, I don't think, um, I mean, I think it's, oh, it's like Excel. You know, it's a very, very popular tool that anybody with any background can learn. So, the only thing you need to do is just to be curious and interested and you see works. I mean I've seen a lot of uh, finance people do really wonderful things in Power BI and excel. I have seen the engineers, of course, the Computer Science people, a lot come from that background. Oh, teachers. I mean, I've seen all kinds of backgrounds for and I don't think it's an estimate. Of course, if you have an eve previous knowledge, for example, with Excel, if you're an Excel Power User is a good thing, because you will understand your audience better. A lot of the business intelligence people come

			from Excel. This is a good thing. If you know SQL is a good thing too, if you work with them, you know courts of law is a good thing too. So I don't think it's just secured a data driven person. You can learn the skills. I don't think it's a problem. And, different teaching of learning.
11		RC	Okay, so do you think there's any, um, I don't know, like soft skills, and communication or those kinds of skill?
12	TS	IP3	Obviously. Yes, of course, if you are teaching, you need to be able to put yourself in the skim of the people that you're teaching, and you have to know their level. So if you have, you know, people are coming from the extra world, you wouldn't do it the same way as people are coming from the IT world. So, you have to understand your audience before you're doing any training, and you have to be able to explain things clearly. IT's not that they see all the time to definitely that is a must. But you know, people are compromising. You might not be able to explain things clear. It's sometimes it's better to have a teacher that comes from, but what I say, from business background, because they know the words that they have to say. So people understand and they know how to explain things in a way that makes sense to a business audience instead of an IT audience. So everything depends. If you're training BI people get trained business users what the best method is.
13		RC	Okay, so, uh, so who are the usual people that will take the training? Are they the decision maker, the data experts?
14		XZ	Or just the general employees that… Can you hear us? Hello?
15		IP3	Yes. One more time?
16		RC	Ok, so who are the usual people that will taking the training program?
17		IP3	Who am I training?
18		RC	Who are the like usual people that will take the training program like who do you usually train for?
19	EUT	IP3	Oh, who do I usually train for. I normally train business users. But then, for example, on the YouTube channel there is a lot of BI people are there, you know, like to technical people. And then I have of course business users there too. But those are not live classes. All my live classes are for business users.
20		RC	So do you think it's, what's most challenging for training these business people?

21		IP3	Um, I think you need to speak the language. Those are the most important thing. You cannot go with passwords or IT complex things, and you cannot assume that they know what you know, you know, their normal life, the normal businesses is to do something else, data, something the skills that they need to be able to do a task is not something that they do for a living. So you have to be very clear when you pick to them. So they understand and give samples that make sense to them. And if they are related to the industry even better. So that's why it's good to make trainings that are fitting for. I mean if you're working with an insurance company, so you speak their language too or if you are training and an engineering team that you can actually give them examples of things that they can relate to, other than you know, the typical business case from a company or CEO that wants a report that might not ring a bell. Two people are working on engineering, for example. So the more specific you can be, the better. Definitely.
22		RC	And do you usually provide a standard training, or do you provide like a customized training?
23	BATP	IP3	Customize training? Yes, I hope them with whatever they need the reports, and then I do training afterwards that allows me to learn their language, the you know, the way they speak, they allow me to understand what they normally would to do. You know, they want to normally calculated year over year things or they wanna do more, I don't know, customer analysis or, and then I can fit the training for them. And it is always more effective done if you just do in general training.
24		RC	Yeah. So do you, Oh, do you think people, user should be uh, should be trained by different department or just a from, based on their different backgrounds, like their understanding of the technology?
25	EUT	IP3	Well I think in my experience there is always like a power user on the departments or at least on the company. You know, this person that does not come from the IT background, but they are good at it because they love data and they love working with these two. And then those people are often the best ones to actually give training, because they will be able to do it in a way that makes sense to the audience. But then I mean, it's not always that those people have actually the time or want to do it. Sometimes they just do it for themselves. So, in that case, I mean, I am necessarily recommended they're all IT department to do it, but to seek training outside.

26		RC	And so do those like power users after, uh, they gain knowledge about using Power BI from the training program, do they actually just go back to their organization and share their knowledge with the other users?
27		IP3	Yes, that would be the definitely the best way to do it. And it's also a way to evangelize how to use a to Power BI or Excel or whatever they're using. You know, it's a way to because that person is going to have their organization in mind, and they will be able to do a training that is specific for them. And that would make sense to those users. So if that is possible, identify definitely power users drain them, and then let them do the evangelization in the organization.
28		RC	Um. Okay, thank you. And so what skills do you think it's important for the business users to grasp during the training? Also, do you think like it's uh important to have the analytical skills and how do you train then for this kind of skills?
29	TS	IP3	Oh, that's a great question. Um. It definitely if you have analytic skills, you're a good candidate for the win the BI training, that's for sure. Yeah, if you don't, I think it's a hard skill to learn if you don't have that from the beginning. Yeah, if you don't have the interest is very difficult too, because it's so such a role topic. You know, you're talking about numbers. In that case, you need to be very, very good up telling stories, as a teacher, you have to make the courses, again, something that relates to them something that, okay, I want these things so much that I'm willing to learn something that I really, I'm not that interested in. And for that you need to be good a story telling to do the course in a way that is like a story that you can actually follow.
30		XZ	So do you think if you teach people like what is BI and the value of BI will be helpful for them to know it.
31	TS	IP3	If you do it in a way that makes sense to them, definitely. But that's when you have to be able to tell the story. You have to say that, ok, BI is not just crunching numbers. That's what you need to do to actually be able to understand it. Very simply. They are working for a marketing department. Of course, they want to know how efficient their campaigns are. For example, they've launched Facebook campaign and they want to know how good that is. So you can make a training for that so they actually see the value of it. So crunching numbers is just like a pin point of something, so you can get the gold, which is ok, was my campaign so successful? And what should I do and what you're

			not there after that my learning. So you have to do it that way and not focus so much on the actual be I think, but focus on what people will actually get from it. You know what I mean?
32		RC	Yeah, and also things for the business users, they're include like them usually the managers and the other casual users are just a decision maker. You are the decision makers and just the general employees. Do you think like the skills they need to understand from this training is different or they're just basically the same?
33	TS	IP3	My experience so far is that managers, they have to work often times we have to work with members. You know, they have budget and head counts. And they have all these kinds of things that force them to work with numbers. And they have to do reporting all the time, like monthly reporting or even daily report. And depending on the business it is. So, they are often very eager to learn. So, I don't think, manager, sorry, oh, don't say that must be hard. I think it's like the normal employees that they see that the effort is too big for the results that they actually get. That's where you have to put it more emphasis.
34		RC	So, um, what other skills do you think is important besides analytical skills?
35		IP3	Besides Analytical skills?
36		RC	Yeah, are there any other skills that they we need to learn from this training?
37	TS	IP3	Yeah, I think it helps if you are, you know, a curious person, you know that you're always asking yourself why. Um, this is a part of an analytical, I'm not sure, but we need to be curious about how is this going on? We doing better, or it has to be a part of your job in that case. Um, I don't know, you have to be curious. You have to be, of course, and the analytical, you have to be willing to learn and put some hours. You have to have to re house a little bit of discipline, because it takes it takes time to learn. Um, I don't I don't know. And I can actually see from the beginning when I'm doing training, I can see was going to use the program afterward and who is not. So clear. And this often they're the people that are asking questions and they are, oh, I have this case. And I would like to do this or you know where you're talking, they feel enthusiastic and they feel empowered. Those are the ones that will use the program afterwards. Well, you know, the ones I just sit out, they don't normally pick up the program

			afterwards. I normally ask them after my trainings. One of the questions I have is have you used Power BI after the training? And have you opened the file and use it once? And it's quite interesting results. Not everybody after training, you know, it's ended up one week, two weeks afterwards. And then you get like fifty percent that has worked with it and fifty percent that's not even open Power BI.
38		RC	Uh, so how do you think the training could be more effective for the, I mean, cuase we learned that the training program is usually kind of short time period. So do you think, I don't know, the longer training program or like some post training, uh, could be more efficient, I mean, could improve their ability to work with BI or Power BI?
39		IP3	It's a hard one. I think people would learn Power BI or Excel or any BI tool either because they really love data and they want, you know, they are curious, and they want to actually know things, or they needed for their job. And then you have these rare users, you know, users that they just need information from time to time. And because it takes time to learn, I think those users get lost in the way. And even if you do refreshment course, I don’t know, I think that the actual effort needed, some people will always follow of the model, I don’t know if you understand what I mean. But there's some people that will never put the time to learn. Okay?
40		IP3	And you can see that also with excel, you know, it's like the biggest BI tool in the world. There's some people that even today will experience a commodity is something that everybody uses. They don't. They should for their jobs, but they don't. So, I don't know. It's a good interesting then hopefully you can tell me afterwards in your papers.
41		RC	So, since these trainings need to teach the users to, I mean, to use the Power BI in their daily work. So, can you give us an example like how you design a training program to feed their daily tasks for the user so that they can just able to use it for their daily work.
42		IP3	One more time. I didn't get that.
43		XZ	Uh, as we mentioned is that the task performance is an essential part of training. So can you give us some example how you design a training program to fit the daily task for the users so they can use Power BI on their daily work?
44	TAM	IP3	Yeah, I think that works very well. For example, when you're doing the customized training that I’m doing, you know, you go into an organization, you learn what they do. You know, you learn what their needs are. And

			then you learn the language. You know, you learn to speak the way that it makes sense to them. So if you have, I don't know, uh, manufacturing company that is creating pumps, you actually start talking about the pumps and this talk about motor performance. And then you can create a course that is fitted for them. So, you actually, I'm not doing, for example, if you are looking to an engineering department, you shouldn't do your Power BI a course based on sales, because they don't know anything about sales. You should be, I don't know, some motivate us somewhere and do the course based on that, because that will appeal to them, and they will make sense for them. And then you can say, ok, and you can actually, from these data set, you could actually learn these and these and these that will help you understand this and this and this. And the close you get to their needs, the more effective the program is. But of course, to do this, custom made courses in costs. So it's basically only available for enterprise companies. I would say.
45		RC	So for the small companies would, so they could have just, maybe some highly skilled people to learn this technology. And then they can build like the training program for the other employees ?
46		IP3	Yeah yeah, that would be the perfect way, the best way for small companies actually to have somebody that actually is willing to learn, is curious and wants to put the time and the effort that is required. And then that person can do the training inside. That would be definitely the best. What normally happens is that small companies, a million companies, they do this normal training like the standardized training, which is okay, it's just that depending on what your business are, it might not be relevant at all. And you might not feel that you're getting an understanding of what the tool can do for you.
47		RC	Yeah. Um, also, during the training, do you think it's more benefits to use like the relevant data source for the training? Uh, oh, just like, it's pretty similar for all kind of data set to be used the training?
48		IP3	One more time?
49		RC	Do you think it will be more benefit for using different activities and data source that's close to their daily tasks during the training?
50	TAM	IP3	Definitely, absolutely. But I wouldn't recommend using their data set. Because if you use their data, they will ask you questions about the data in order to including, you know, the focus will be only and solely on the data. And you want to avoid that because the training needs

			to help them learn Power BI, I'm not to help them manage their data set. I will definitely think, and I recommend this to all my customers too hired IT people do training on data. You know, so they learn the data set, but there's another training, there's something else.
51		RC	And so what challenge do you usually uh, have you experienced as training the business people, for example, the resistance for the using the software? And how do you overcome these challenges?
52		IP3	Well, because I'm a consultant, I don't think I see the actual resistant. The organization, they do see it. They give me the students, you know, you're going to be restraining, and this is the people that wants to do the training. And then if somebody, I can see when somebody's there that is not interesting. I mean you can see if you can pick it quite fast. Um, but I don't really see how many people actually don't want to learn the tool. This is something that I don't get to see. I'm already, you know, I already have the training schedule, and they've already give me the participants. What I tried to do always on each training is to try to be inspired. Don't like dry training, you know, to just try to see, okay, and you can do this, and you can do that. Um, look at these and so they actually can see things beyond what they are normally doing. And I think that's the best way. If you see, if you hear a few hours during the training, then you know you doing good job. You have to get there whether they actually get excited and inspired mixed and they will start using the tool more.
53		RC	And it's like what are is there any other challenges as you see from the training?
54		IP3	All the challenges are so big. Uh, and only for this year cities only all, uh, the thing with Power BI is that it looks easy, but it's not. And you do need to have training to be able to use it properly. And I have helped organizations and business users, you know, try to use Power BI correctly. Because if you don't, then the these a mess and you can imagine like this IT is giving you this business users a data set. And that data set is being prepared in a way that makes sense to IT, and then suddenly you give this to the business users and the business users don't know, don't have the background. So there are, for example, some measures that you should not use with these tables. And there are some tables that you should not try to join together because it won't work. And they don't know that, they just get the data set on this, Okay, now you can do your analysis. There is a huge risk that they will actually get their own data, even if they think they're doing the right thing.

			And there's a huge huge risk with self-service. So, I mean, you need training for BI is it's not like Excel. You would need training for Excel too, but by all means. So I don't know. And then the IT department has the challenges of securing the data. You're given the data to everybody. And how do you know that the data secure that he's not leaving your building now that everybody has really access to it? Um, the huge challenges, but the risks are worth it. Because when you empower business users, amazing things happen, especially when you power them with data is really, really fun to see.
55		RC	Do you have any additional comments or suggestions on structuring the training program?
56	BATP	IP3	Yeah, but normally do like, you know, like not normal. You start with a beginners training, you go to an intermediate course, and then you do the advanced courses, and then, you know, try to put some surprise elements on all of them. So the beginners courses end up with some intermediate stuff. So they can say, oh, you can also do that. Even if you don't show them how to do it, you know, this is possible to do if you continue learning. So you have to have also this elements all the time. So they want to learn, but otherwise is just like any other you know, you have feed them with spoon. So you don't they, don't get too much too soon, because otherwise you quit. You can get quite complicated. So it's good if you teach them to do things that are useful for them, you get these quick wins. This is very important. So they leave the course. And I said, oh, I can use these already today on my daily work. Did have done a good thing. And then we continue building from that, so they don't get too overwhelmed.
57		RC	Thank you so much, that's all the questions.
58		XZ	Thank you. It to be really helpful for us, for our study.
59		IP3	Very good. Make sure you send me the final results. It will be very fun too to read when you're ready with the paper.
60		XZ	Okay, thank you very much.

Appendix 5

Interview date: May 21st, 2018
Interviewee: IP4
Interviewers: RC, XZ
Interview type: WeChat phone call
Interview duration: 30min
Transcribed by: XZ
Translated by: XZ
Transcription date: May 22nd, 2018

No.	Code	Person	Content
1		RC	Can you start by saying something about some of your training program, such as courses, activities to do and materials to use?
2	BATP	IP4	At that time, our training was in the form of webinar, and then, it was divided into eight classes and we took one class each week. It seems to be more than an hour for each class. Then he will list a general guide before the course. Anyway, just see the videos every week. That course is mainly for helping us to get the certificate of something called Tableau Association. It's the course for the exam
3	TAM	IP4	The main content is some basic concepts and the knowledge points are all in that guide. Then, before each class, the trainer will ask us to see some videos, and then after the videos, there are also some online questions for you, and then they also have some standard online courses that you can find from the official website of Tableau. All you have to do is just go to finish it, and then after you finish it, they'll find a time to explain the questions for you. We seem to have dozens of people on that Internet. And the trainer will start explaining the questions one by one, and, that is, he has several questions for us every time, anyway. All the questions are related to the certain topic that week. Then he would question some people from us, to figure out that how we did it. Then he, the trainer, will ask some more concepts and let someone explain them. Just to see if we understand it or not, and then to see if we understand it correctly.
4		RC	So, it's that like asking you about the concept of the software, or how to use it?
5	BATP	IP4	How to use it, mainly how to use it. Yes, he just gave you the kind of questions. He will give you the data, for example, in one month of 2018, just say how much the sales are, how much the sales have increased, he will give you a specific question and you need to use that

			data to complete the task. If you just watch the videos, then you won't get understanding of the questions.
6		RC	Oh, so will he say, for example, he wants you to get something, and then you have to find a way to get it, right?
7		IP4	Right.
8		RC	Do you think this training really works? Dose it effective?
9	TAM	IP4	It can be a little useful to get the certificate, but I don't think it would be the most helpful way in the daily work.
10		RC	Then you use this, like their tutorials or something, for example, is the data source or the data more related to your work, or it is just a casual data?
11	TAM	IP4	They use their own data and that is completely irrelevant to our work.
12		RC	But do you think that using this kind of data that you are not familiar with, well, I mean comparing with familiar data and unfamiliar data, which one do you think will help you master the software faster?
13	TAM	IP4	The familiar one, of course, the familiar data can help us faster. His data is simple, but the data in real work is actually quite complex.
14		RC	Does that mean that even if you finish this training, you may still have to spend some time practicing it to be able to use it more successfully in real work?
15	TAM	IP4	Right, because he taught very basic things. Then in reality, customers will have a lot of tricky problems, and there will be many kinds of requirements. So basically, I think it is nearly possible to start the project quickly after just done the course.
16		RC	Oh, okay. Then, do you mainly learn how to use these things? Like the functions or something? Right?
17	TS	IP4	Right.
18		RC	Did they teach something like how to understand it? I mean, that the kind of analytical skills. Did they teach this?
19	TS	IP4	No, not at all.
20		RC	So, you have to practice them on your own?
21	TS	IP4	Yes, they won't teach you how to analyze it. The main thing is how to use this software.
22		RC	Do you think if, for example, when he is teaching, could it be helpful for starting the work if he can teach some analytical skills or brings in some problems in the real working setting, and then promotes the participants to analyze them?
23	TAM	IP4	I don't know what other courses are like, but I think he can share something, for example, showing a case in the form of recording. How did they analyze case by

			Tableau from the beginning to the end, then what kinds of conclusions were drawn from that, and then what kind of insights of that? It may be better to have the cases.
24		RC	So, oh I'm sorry. Is it that like that kind of, for example, sharing their thinking process?
25	TAM	IP4	Yeah, how they think, and then how they do it, and then they can share it to us from beginning to end like a package. Then the dataset inside can also be shared with us.
26		RC	Oh, yes. And for the training method, you use webinar, right? And I think they should have both webinar and face-to-face courses. Which one do you think might be more effective for you?
27	TM	IP4	I think face-to-face could be more convenient to communicate. But for the webinar, it is more convenient because everyone has to go to work besides doing the training. And I think the important thing is, I think training is just one aspect. For other times, for example, you encounter a problem in the program, and you search on the Internet, but you can't find the answer. If there is a person from Tableau who can help you answer the question at this time. That can be better, just like this kind of supports.
28		RC	I have interviewed a person before, and he also said that the more helpful way is that companies provide supports for a long time, for example, you can ask them for help if you have any questions.
29		IP4	Yeah. Because I don't really know what other people are, our company actually have the partner relationship with Tableau, but it seems that there are no such technical supports for us. Just like other software, for example, I use Qlik Sense, which comes the same company with Qlik View. They sometimes, like if you ask them questions, you can book a time with them and then they will send someone to help you.
30		RC	Okay I see. Then, for example, because some people say that after this one-time training is finished, they will forget what they have learnt soon. So, do you think, if there are some sort of recurring activity, for example, after a period of time, and then giving people a second training that is more in-depth to help you recall the previous content, would it be better?
31		IP4	I think it's depends on the people. Sometimes if you use it every day, you won't forget it. If you forget, it means you don't really have the demand in using it. And then if you want to remember it someday, for example, if you get a new job, and then you start using this tableau again, you can just go to class again.

32		RC	OK.
33		IP4	Oh, and there is something about their website. Actually, I really cannot get their answers when I go to their website to read the tutorials or something, you know?
34		RC	What do you mean?
35	BATP	IP4	I mean, they show you the video, and then they'll give you the questions. And then I couldn't get their answers. The explanations of those questions are very very simple, that is, very general explanations. It's like when you were a kid and you were doing your homework; the explanations just tell you the conclusion but there is no steps of how they get this conclusion. I really don't know what to say, if there is no real trainer at this time. Then I just don't know how to do it.
36		RC	So, is that just like I said before, giving a case, giving them more detailed ideas, and something like how they achieved that by steps?
37		IP4	Yes, that's right. You can't just write a very general answer. I really don't know how to do with it.
38		RC	Well, that's true. Also, what kind of trainer do you think that can improve your learning efficiency more?
39		IP4	What kind of trainer?
40		RC	Yes, because there are many kinds of trainers actually. Some can active the atmosphere, and then some are, for example, he needs to be able to explain things in more detail.
41	ST	IP4	I don't think the atmosphere is important, the important thing is explaining things clearly. That is, if you ask me why and then I can explain to you step by step. He can also describe it in detail but not in a very vague way.
42		RC	Do your trainer have technical backgrounds or just with a general teaching background?
43	ST	IP4	I don't really know much about it, but every week the trainer is the same one.
44		RC	Oh really? I thought it should be one person that is responsible for a whole training program.
45	ST	IP4	No, the trainer is different every week.
46		RC	Do you think it would be better that the same person responsible for the whole training? Or?
47	ST	IP4	Of course, it would be better to be the same person in charge, otherwise I will have the feeling of losing something.
48		RC	Is that the feeling like you know one trainer before, and then suddenly a new person comes and then you need to get in touch with this new trainer again?
49	ST	IP4	Yeah, that’s it. It's like an unstable class.

50		RC	Do you participants have much communication with the trainers?
51	ST	IP4	No communication actually. He just interacted with each other in class, for example, to question. And it's so embarrassing. I know that they're trying to active the atmosphere, but in fact, some of us are very busy, and we really do not have time to finish the course. At under this situation, if you can question me for that, I don't know how to answer it. It is very embarrassing indeed. As far as I can tell, for example, it is better for him to give a general explanation first and then he can begin to let us answer the questions.
52		RC	So, starting with explaining some questions, isn't it?
53		IP4	Right, right. Maybe because they just wanna save time but I really think that the situation that it's really too late for you to see the videos happens a lot. In fact, there are quite a lot of things to prepare, there are maybe 8 to 10 videos one time.
54		RC	How long is the video?
55		IP4	Some are very short, just a little bit more than ten minutes. Some are longer and sometimes you need to do the assignments. I just fell it takes time.
56		RC	Oh, there's not enough time, right?
57		IP4	Yeah, and we can be really in a hurry sometimes. I have to work overtime, and then I have to go to the training. If my project is not specific for this, I have to take extra time to see this.
58	BATP	RC	Well, so it's that better to consider about the staffs when have a training program? For example, assigning some tasks with considering the actual situation of the employees. It's better to give a general explanation at the beginning of the program?
59		IP4	Well, yes.
60		RC	So you are actually took the kind unilateral class?
61		IP4	Right. Similar to that.
62		RC	What if there is more interaction?
63		IP4	Their interaction is literally just asking us questions.
64		RC	What kind of interaction would you prefer? Or you just prefer to just finish the training as soon as possible?
65	TAM	IP4	It's all right to ask us to answer the question. The main thing is that you really don't know the answer, and then he asked people casually, which is embarrassing. Well, if he can change the way, for example, let me think about it. He can ask us what problems we have and what we don't understand after he has finished lectures.
66		RC	For example, on his class, he can add some of his own experiences, some experience in using the software.

			Anyway, just add some meaningful experience or something?
67		IP4	I think it can work. Because sometimes, for example, Tableau, if you want to make something, you can get the same result by different steps. He can share more about this. Sometimes, how to say, it can have several practices to achieve the same purpose, and then some may be more intuitive. He can just show us how he did that.
68		RC	Explaining something, for example, when I am using this system, what I want to achieve by this system, such some concepts, rather than the simple steps? Do you think it can be helpful for you to understand it?
69		IP4	I think it is more useful to introduce steps, because the concepts are too abstract to remember.
70		RC	But what I mean is that when you learn these steps, do you feel that they help you to understand?
71		IP4	I still think the introduction process would be better.
72		RC	Okay. Then for people who come from the different department, or have different understanding of this software or BI, did they train them together?
73	EUT	IP4	Right
74		RC	So, for example, some people may know more about it, and then some people may really not understand it at all. I think the different department may use the software differently. Do you think it will be more effective if these people are trained separately?
75	EUT	IP4	First of all, we've been assumed that you don't have any foundation in the class. And then you will get in touch with the very basic concepts. Then if you've got a little experience yourself. Then I think I can you can just skip the very basic parts on your own. Then look at other things that what he wants to see.
76		RC	But will he rephrase the basics during the lecture?
77		IP4	Yes, he assumed you don't know anything. Because the main purpose of that class is for the certificate. Some people may have used it before. How to say that? You have used Tableau for a while. But it doesn't mean you can get the certificate. And in fact, I think the actual using and the real work are two different things, and you may not be able to start work directly even if you have pass the test. But those who do participate in the project may still not be able to get the certificate, because it is not a cause and effect.
78		RC	So, is that means the contents of this training are too far away from the actual work?
79		IP4	Yes, it is the very basic course.

80		RC	So basically, it's just teaching you how to use it, but you still need to rely on yourself for the final successfully use in the work?
81	TAM	IP4	I feel like that he taught you 26 English letters and then a little basic vocabularies and grammar. But then you need to write a paper when you start doing the work later.
82		RC	So, not very relevant to the real work, isn't it?
83	TAM	IP4	Just like they teach you how to calculate and then ask you to write the proof.
84		RC	Yeah. And that's about the last question. What other additional suggestions do you have, or the expectation of how these training can be changed? Except for the things that we talked before.
85		IP4	Actually, I really feel nothing about it. Yes, they can just offer some supports. Anyway, I think it is very important. I mentioned Qlik before, and they had that kind support system. In addition, they will send someone to give us the Doctor Date every Friday, for example, you can ask what problems you have encountered from different project. It's kind like an expert asking.
86		RC	So, like help you solve a specific problem in a direct way?
87		IP4	Right, for example, you encountered a problem in one project, then you really can't solve it, or if no one on the Internet has ever met this problem. Or sometimes some functions are very new, and you really don't know how to do it, and then you can ask them directly. Because there are a lot of new things of Tableau and it has to dock with some other software sometimes. These are very specific and very customized problems cannot be found on from Internet. And then you have to do it, you can't, just you can't imagine doing it in air. At this time, you'd better find someone from Tableau and ask carefully. Because sometimes even if it was written on the Internet, for example, there are some questions about updating systems or version problems. Anyway, it's not like the instructions on their website, so you have to ask a real person?
88		RC	Yes. And that's all the questions.
89		IP4	Oh, yes, the Tableau, their license is so expensive. The teachers are not willing to let us use it, it's so expensive. For example, you are a student, so you apply it for free in a certain time? Well, for us, if we want to use it for practice after the training, the license is expired, and I can't get in that.
90		RC	It seems that students may use it free for one year, and then, yeah, it's quite short. They'd better, for example,

			giving a little longer period after the technical support so that you can practice later, right?
91		IP4	But I still think it's not very good, because this is not good for everyone to use their system. Then it may not be conducive to widespread dissemination.
92		RC	Well, that's true. Then I'm almost done with my questions.
93		IP4	All right.
94		RC	Thank you.
95		IP4	It's all right.

Appendix 6

Interview date: May 25th, 2018
Interviewee: IP5
Interviewers: RC
Interview type: Skype Video Meeting
Interview duration: 35min
Transcribed by: RC
Transcription date: May 26th, 2018

No.	Code	Person	Content
1		IP5	Good morning.
2		RC	Good morning. Thank you for doing the interview with me.
3		IP5	You're welcome. Is your colleague also there?
4		RC	Uh, no, she's doing another interview.
5		IP5	okay.
6		RC	Uh, so should we start?
7		IP5	Yeah.
8		RC	Okay. So first, can you give me a short description of your work?
9		IP5	Yeah, I work at the [redacted], and [redacted] is the company who is helping other companies with their data analytics. And among others, we use Tableau for it. And I am the manager of our academy and responsible for all the training we give at our customers and also uh, training of our own employees.
10		RC	Okay, so, um, so who are the usual people that will take the training a from the business, like the power users or maybe other business users in different departments.
11	EUT	IP5	Both, we give training to um business users, business analyst, data analyst, sometimes more data scientist. And we not only give training in Tableau but also in all Artyex and uh, and some uh, training which is mix between Artyex and Tableau. Are you aware of Artyex?
12		RC	Uh, no, sorry.
13	EUT	IP5	Ok, no problem. I will type the word for you. So you have an idea of what I'm talking about. It's more like a data prep tool. And Tableau is more for the visualization and analytics. And on that side, we often train business analyst, data analysts and business users.
14		RC	So is that business users may be like the decision makers, the managers, I mean like a subject matter managers?
15	EUT	IP5	Ah, yeah, most of them, like a financial manager or marketing manager, but also um, a marketer or uh, sometimes um, someone of the logistics department. It can be anyone.

16		RC	Okay, yeah, okay. So, can you tell me a bit about the training method. Like, do you usually provide classroom training or online training?
17	TM	IP5	We usually provide classroom training I think in ninety percent of the time, and it works very well because people uh, have the time then to be a whole day in a classroom. And one of our trainers can help them. Yeah, by understanding what they are learning. And normally if you do, for example, uh, online training, it depends on the time that you have to spend on it. And we see that, people to follow an online training is often very high.
18		RC	Okay, so is that it's usually more effective for doing the classroom training?
19		IP5	Sorry, what did you say?
20		RC	I'm sorry. So, is that usually more effective for doing the classroom training?
21	TM	IP5	Yeah, we think that the effect of the classroom training is higher than the online training.
22		RC	Ok. Uh, so also, uh, do you provide just standardized training or maybe the customized training for the customers?
23	BATP	IP5	Uh, we do both. Normally, we start with a standardized training, and we, um, you know we have a training following up the concept of learning by doing, so, we have a couple of assignments, the trainer, uh, give some instructions. And then um, the customers are going to, uh, learn by doing. So, they are just going to draw things in Tableau, and the trainers helping them following a standard procedure. And sometimes we also have a customized training where um, uh, yeah, our customer asks us to help them, uh, for example, with a specific financial discourse. How can we design it? How can we use to write data, which visual best practices should we use? And then it's more customized.
24		RC	Ok. So, can you may be give me, so do you have a courses for from the beginners to intermediate and to the advance?
25	BATP	IP5	Yeah, we have for training at multiple levels.
26		RC	Okay. Ok, so and also, maybe can you give me some examples about the usual train activities?
27		IP5	And which activities? Sorry.
28		RC	The usual training activities. For example, do um, uh, do you usually apply the relative ah I'm sorry.
29		IP5	No problem.
30		RC	I mean the usual activities that you usually do in the classrooms.

31	TAM	IP5	Um, yeah, often we start with a presentation about the company about Tableau and what we are going to do uh, during its raining. And we have some, um, uh, instructions for you to just give some instructions on how to do this or to do that. Um, we have some assignments. What I said before, uh, we do learning by doing so. Just have a try and ask a question. If you uh don't know how to proceed. Um, sometimes we watch a little video during the training. So yeah, we have a mix of different methods that we use.
32		RC	Okay. Uh, do you usually apply real setting, the settings that's relatively close to the real work environment in the training as you are training for the skills and procedures.
33	TAM	IP5	Um, sometimes when we have a large project at our customers, we also uh, train for skills and for and train for how you can apply the dashboards in your processes of the company. But it depends on the under assignment that we got from our customers.
34		RC	Okay, but do you think it's going to be more effective to train in that way? I mean since I read some articles about if the settings in the training is close to the real working environment then is just may be more effective for the users to actually using these skills and procedures in the as they're really doing the daily work.
35	TAM	IP5	Yeah, I think uh, that the effect will be larger when we apply the training in their working environment than if we don't. And most of the time we have a two-day training standard training to learn Tableau. And then after a week, we come back, and we do a follow up session. And uh, we ask our customers, how did you implement it in your own job and which questions do you have and how was it working? And we help them to apply it in their job.
36		RC	Okay. Okay. Um, also, since you are training the skills and procedures by doing it, um, I mean, as you, is that all you provided like a different scenarios maybe like a close to the work process.
37		IP5	Sorry, the last sentence I didn't hear.
38		RC	Okay, sorry.
39		IP5	No problem.
40		RC	So, do you usually provide different scenarios which are kind of, I don't know, maybe like a close to their working experience and maybe uh, uh, maybe some kind of problems that they will usually encounter.
41		IP5	I'm not sure what the last sentence was. Do you ask if we do different scenarios during training, you know, in a working experience?
42		RC	Yeah.

43		IP5	And the other thing, what was the other thing? Uh, you know, you can type the words. I don't hear what the words you're saying.
44		RC	The last one is not that important. So maybe can you just answer the question?
45	TAM	IP5	Um, yeah, well, we do have uh, different scenarios. I think, well, in most of the time it depends on the size of the company, what kind of training we uh, provide. The company is very small. Then we often do a standard a tool training to learn Tableau. And we have a follow up session and sometimes we help them to implement uh, dashboards in their work. And when we are at larger companies who work at multiple processes in multiple project teams, we often have a project leader over there who was also helping to, um, yeah, to change processes are to implement, um, yeah, what they've learned in their processes. Okay, so is that what you mean?
46		RC	Yeah.
47		IP5	OK.
48		RC	And also, uh, besides teaching the skills, do you maybe provide insights about the purpose behind the actions or the function? Like give them some insights about like why doing certain actions?
49	TS	IP5	Yeah, we do. We for example, um, we help them to choose the right visual when you're analyzing a certain kind of data. What is the best way to changes? For example? Why are you presenting it this way? Um, also, um, which calculations are you using and why are you doing it? Um, when you're design dashboard, what is the right way to design the dashboard? And how can you tell a good story? So yeah, we do okay.
50		RC	Uh, I did some interviews before and someone told me that, he's a user, and he think it's more helpful for him if the trainers giving the insights of doing analysis and, I mean also to give some the own experience, so do you think that's, do you think, how do you think about this?
51	TAM	IP5	I think that's important too. Um, our trainers also work as a consultant. So, they are not only training people, but they're also doing projects on their own. So they are experienced in working on Tableau projects and during training day can share their experiences so that the ones in the training are inspired and have ideas to do it themselves.
52		RC	Okay, also from some interviews what I learned it's more effective, if you can show the customers the other users whoever you're training about any different approach to the, for example, if there's a case and you set up, for example, this is some kind of things you want to demonstrate and that you should maybe show

			them, uh, like maybe just not just to let them to do it, but also show them like a different ways for achieving the same result.
53	TAM	IP5	Yeah, we do that as well. Yeah, sometimes when uh, our customers agree, we can share examples and one customer to another customer. Okay, yeah.
54		RC	Um, and also like, do you think it can be more effective? If, uh, oh, sorry, what kind of characteristics or backgrounds should the trainers have in order to conduct effective training?
55	ST	IP5	Um, well, we develop our trainers during a train, the trainer program, so we teach them, um, he'll still give an appropriate training. Um, that's not a skill side. And they also should be very skilled in using Tableau, so doing analytics. And on the backgrounds, um, we have trainers from multiple backgrounds, uh, for example, a business administration backgrounds, sometimes it's more a business and IT background. Um, we also have people from a more mathematical background. So, it's uh, yeah, on the border of business and IT, so something like that. It can sometimes we have one training was more marked here, but with interesting in data analytics, and that's also fine.
56		RC	Ok. what about the soft skills,
57	ST	IP5	The soft skills? Well, they should be a communicative. Uh, they should be, I'm going to search for the words. Detectives is an English word. I will search for it, one moment. Ok, detectives. Uh, and with that, I mean, uh, that you know how to um, to learn people something. So training skills, um, some skills you need to, be able to give feedback to people, um, yeah, you need to know how to present now more like communication skills. And so I think that are the most important soft skills.
58		RC	So kind of like explaining things like clearly?
59		IP5	Also.
60		RC	Do you think, um, it's important for the trainers to maybe have some backgrounds that kind of relative to the, I mean, for example, as the business background or like all from different scenarios, uh, different areas so they can speak the same language of the users or they can just learn from the other training?
61	ST	IP5	We have both. Sometimes we have someone with a marketing background or financial background, but we also have uh trainers with a broader background a general background. I mean and um, yeah, well they learn on the job. So when they are training more the financials they read stuff about financial dashboard and they prepare themselves for the training. So it's not really necessary, but sometimes it can be helpful. And

			it's more helpful to have the same background as your customers when you are doing a more experienced training, because then you take a dashboard into a higher level.
62		RC	Ok. So it is more important for more advanced training.
63		IP5	Yeah.
64		RC	Ok, and also what are some skills that do you think, I mean, for the users like what skills do you think is really important for them to learn after, to get out from the training program?
65	TS	IP5	Um, well, they need to learn something about uh, data in general. So what kind of data types do you have, for example, Uh, the difference between measures and dimensions. Um, they should know something about how to how to calculate certain numbers. Um, they should know how to um, yeah, to present data in a in a correct way, for example, in a in a graphic or in a pie chart or in the visual part. Um, and after the training, uh, they should also be um, capable of um, instruct other people to work with the days that they are working with. It should be aware of uh, what they are working with.
66		RC	Okay. So from the literature review, we learn that in order to achieve the full potential of the BI system such as Tableau, it's important to have the analytical skills. Uh, and it's really doing analytics in the work. So do you think how can they be improved during the training, how these kind of skills could be improve on the training?
67	TS	IP5	Um, and it's learning, you learn to make different kinds of analytics. Uh, so you're practicing during the training. And um, how should I say? Um, well, for example, you have a data about sales and you need to combine the orders and the customers you sold things to. And uh, during training, you learn how to uh, compose it into low and what kind of analytics you can do on it. So you practice your analytical skills during the training.
68		RC	Ok, so it's to, um, practiced analytic skills by doing different kind of problems or just to practices which different I'm questions or something like that?
69	TS	IP5	Yeah, we uh, we have uh, different business cases during the training and you learn by doing. And of course, you can ask questions and are trainer will also explain things about the analytics that you are doing.
70		RC	Ok, uh, and also do you usually divide people, the users, or the people who take the training into different groups based on the different departments or maybe different ability of understanding the technology.

71	EUT	IP5	When we offer training um, in house. So at the company, um, after we do train a department. So it's a combined group of almost the same background. And we also offer, um, so called open training. So it's a classroom training where one can just enroll. And then we have a multidisciplinary group with people of different backgrounds. I think in about eighty percent of the time, we have a group of people who are from the same background.
72	EUT	RC	So is that usually training the people from the these are the same background, ah, I mean maybe the similar department, and maybe the people who are using similar data forms from their work.
73		IP5	Yeah, oh, yeah.
74		RC	Do you think is more effective to training this way?
75	EUT	IP5	Um, well, I have two opinions about that. Uh. The first one is that um, it's easier to train people with the same background because they understand each other. They have the same sort of questions. And you can go, uh, some more deeper into analytics, um, about the background they are from. Um, but sometimes working with data implies that you need to work with people from other departments because the data is going through the whole company and you need to collaborate as a financial, for example, with the market here. And for someone who is uh, purchasing your products. Ah, in that case, it can also be important to have a multidisciplinary team. So did you learn how to do it together? Okay, and you and understand each other, uh, questions and backgrounds.
76		RC	Ok, what about the different ability of understanding the technology parts since the especially for the business user couple come from like different backgrounds and who's very much like using lacking off the skills. So do you think is important is important to, like maybe the people at the same level to be trained together.
77	EUT	IP5	And uh, we always like having people at the same level when we provide training. Um, but I think half of the time we do see that there is a lot of differences in the level uh, of the customers who are joining the training. I think training will be more effective if you have people. So um, we prefer to have people of the same level in one training because it's more effective if you can do your assignments at the same level. Um, sometimes we have people with a lower level or higher level at the same training. Um, yeah, the people would just lower level. They really slow down the training.

			They ask a lot of questions which other people already understand. So um, that is less effective than when you have people with the same level. So we prefer to have, uh, yeah, the same left when in the training.
78		RC	Okay. Oh, is there any common challenges that you experience as training the people?
79		IP5	Well, often people got sent to a training. Uh, then the day after the training, they just go back to their daily work. So, uh, someone needs to help them to implement and the knowledge they gained from the Tableau draining into their daily work. So that is a big challenge.
80		RC	Okay, so how do you usually overcome this kind of challenges?
81		IP5	Sorry?
82		RC	How do you overcome this kind of challenge?
83		IP5	Uh. Well, we try to overcome by um using the follow up session. So let me come back one week later and we give them some assignments and I really need to implement uh it into their daily work because we are coming the next week and we are going to help them with it. Um, that's one way. And we also uh, sometimes have project leaders outside of our customers who are helping them to uh, to implement in their daily work.
84		RC	So is that like coaching? I mean like for the leaders is that can look like the coaching like to have the expertise to be there as to solving some problems and maybe bring them insights. And uh, and maybe that's to teach them back or refresh the skills for them?
85		IP5	Yeah. And we also do, uh, coaching on the job so that we are on the department and when someone has a question, we can help them. And what is also very important that you have a sponsorship at the executed level. So that's the leader from the company is really stimulating their people to work with Tableau. So that's people uh, are really going to use is and not just follow its training and then go back to work.
86		RC	Okay. Uh, and also from some other interviews I did, they say usually it could be like, since the power users, they have, it is just easier for them to learn about how to use it and become like more expert of this uh, like tableau. So I post someone said it would be more effective for them to learn and go back to the companies and then, I mean, to help others to solve the problem.
87		IP5	Um, hum, we are stimulating um, uh, organizations to do self-service, business intelligence. And um, our training is by the purpose that we train them to do with themselves. So indeed, it's a good idea to create one or

			to our users in a in a company so that they can help their colleagues.
88		RC	Okay, um. And do you have any other comments about to conducting an effective training program?
89		IP5	Um, I need to think about that one. Uh, well, I think it's always very important, um, for people to combine three things. Um. One is your own skills as a person. Uh, two is the process. If you're working in, are they, uh, matching the skills that you are learning? So can you really apply the things you've learned into your daily work? And the other thing is that the technology that you use, so in this case, the Tableau is very helpful in doing analytics. But if you have, um, other programs to use, uh, well, that should that could harm and the way that you do analytic. So it's always a combination between people the process and technology who um, will make it as a success or not.

Appendix 7

Interview date: May 25th, 2018
Interviewee: IP6
Interviewers: XZ
Interview type: Skype Video Meeting
Interview duration: 28min
Transcribed by: XZ
Translated by: XZ
Transcription date: May 25th, 2018

No.	Code	Person	Content
1		XZ	Hello, can you hear me?
2		IP6	Yes, I can. I'm sorry, but I can't have a video meeting because I'm sick.
3		XZ	Oh, yes, that's all right. Well, shall we start now?
4		IP6	All right.
5		XZ	Can you give me a brief description about your personal background firstly?
6		IP6	Well, my name is [redacted], and then you can call me [redacted] in English. I came to Singapore to study about 15 years ago, and then stay in here for work. And I worked in a bank for five years after graduation. And then, at that time, it was the first time that I to know about Tableau, which is a little faster than Excel and PowerPoint. And then I decided to work with Tableau. But where I work is Tableau, it is a company that has a partnership with Tableau. To some extent they can say represent Tableau to do the service and training and selling. And then I have get in touch with training in the last three years. Yes, we are now teaching Tableau Desktop mainly in southeast Asia, such as Singapore, Malaysia, Philippines, and then I go to Beijing and Shanghai sometimes.
7		XZ	Well, can you give me a simple example of your Tableau training program?
8	BATP	IP6	Because we basically represent the official training, so what we do is just Tableau training, which you can find it on Tableau.com. Have you ever looked for their web pages before?
9		XZ	Yes, I had known about Tableau in my class before. They are probably standard courses, right?
10	BATP	IP6	Yes, we have standard courses. As you may know that there are two main products from Tableau, and now there are three, one is Tableau Desktop, and the other is Tableau Server. We have three levels in the course of Desktop, level1, level2, and level3. The Server has two levels，maybe two different levels. The subject that we teach is, one may be a little bit more related to the backstage, and

			one may be focus more on Server IT. Like how does this thing work, how Tableau build this server? Therefore, the most people prefer the former course, to learn how to us and manage it, and how to be familiar with this interface. And then there are some other courses that I personally didn't cover. One is the new product called Tableau Pack, so it's a software that prepares data for data processes, it is the previous step before data visualization. And this is a new product that just released one month ago. And now it got the training courses. Somethings like visual analysis, that is, to do this visual analysis, and there may be some good examples of this visualization that can be share with you. Yes, generally speaking, the courses are like what I said. And all of them can be found in the Tableau.com, in the classroom training.
11		XZ	Yes. Then I would also like to ask, expect these standard courses, do you also provide customized training for the customers? What I mean is help the customers based in their needs.
12	BATP	IP6	Yes, we can provide it according to customer demand.
13		XZ	Oh, so you also provide it, right?
14	BATP	IP6	Yes. For example, the standardized training of Tableau Desktop is used the data set that provide by Tableau itself. The data is talking about a supermarket or an online supermarket, which has subscription to something, such as the products ordered, the prices ordered, and the quantity ordered. But there are also a lot of people from telecom or banks, for example, who think that this data has nothing to do with them, and they think something like, I think this is a lot worse than my actual work environment. I want to replace all these examples with my own data set. Then we said it takes time to communicate with them and get their data set before class. Before starting the class, it takes a few days to replace all the examples with their data. This is one kind of customized training, which is to change the teaching materials. The other kind of customized training is, for example, after you look at some of the outlines of the standard Tableau Desktop 1 or Desktop 2 courses, and you think there's something that you might not see there. For example, how do we draw donate chart or layout chart, just some kinds of graphics. And you think this is related to your business. Although I think the whole outline is very good, I just need this part, so we can add 1 or 2 classes properly for you, and that will be fine.
15		XZ	All right. In your opinion, which one would be more efficient, the customized training and the standard training?
16		IP6	Well, good question. I think so…I'm sorry. I just got out of the hospital after a terrible illness.

17		XZ	Oh, I feel so sorry about that, I hope you can get better soon.
18	BATP	IP6	I think it might be better for beginners to come to the standard course, because of some considerations. First is that you don't have any idea of this software at. There is a standardized thing for you to start with, it is easier to get started with such thing. The examples and course materials are with high because they were developed after a certain amount of time accumulation. People unified such a teaching method or this example of this way to teach, which must be more than a temporary one or a customized case. I think it will be easier to understand. Even if you may not need to use Excel in your work, but maybe you use this as an example to understand the concept. I think standardized thing is better. But from other side, something like, for example, your technology level, your understanding of this software, or you reach a new level in this course. Just like you may not be interested in the standardized content if you go to the advanced course. Or if you think the answer did not fully answer your questions, maybe the one-to-one customized training will be more effective at that time.
19		XZ	Oh, so it depends on the personal level, right?
20	BATP	IP6	Well, it can be said in this way, depending on one's personal level. I have another point that if we have a class, the customer training also finds a kind of balance. Saying, maybe for the training progress. I won't say that I'm going to look for an additional example for you, but you can just ask questions. Anytime when you're resting, when you're having lunch, or when you're having two days of classes, you can ask in advance. This is my own case, so we can help you solve it. Then you try to take care of your own content and the content of your study.
21		XZ	Yeah. There is also a question about, do you provide face-to-face training or you the online-based courses. Or both of them?
22	TM	IP6	For our own company, we do face-to-face training. Because as I mentioned we provide standard Tableau training. But if you look at Tableau itself, it has these two kinds of training methods. One is like our way of customer training. People come here for two-day studying. And the other way could be online course. The online course, it could be five days, but it is two days in the standard training. Each class takes half an hour, and you spend about two and a half hours a day. Every day you use a computer, and then maybe your trainer is in the United States, but you live in Singapore. Anyway. He can still give you this course. Personally, both of them can be effective, but I personally recommend face-to-face

			courses, because you have an interaction opportunity that would be better. The other benefit is there is no limitation for asking questions or something. Two and a half hours is really short for only one-time learning, the teacher may concentrate on these standard things first and then send the question directly to you and get the answer the next day.
23		XZ	So, what skills do you usually teach them in your training program? Is to teach them how to use this software? Or would you teach them to know about the value of the stem?
24	TS	IP6	Well, as we all have the standard training, we followed the syllabus. It is in the form of PDF that may be two pages long, and it has every chapter on it and explain the content of each section. We usually follow that guideline. My personal understanding is that this is also the one of the advantages of customized training. By looking at training video, or how to say it, finding online training resources. It can solve the problem of how to it. That is to say, if I can't draw this picture, how should I draw it? If I can't do something, what should I do, just follow step123. But I don't understand the whole process very well, for example, why did Tableau do this in this wat? You can discuss these "why" questions with us and can be more effective to accept it.
25		XZ	And, the information that I've been exposed to about Tableau is that most people use it as doing data analysis. Will your training program teach them a little bit about analytical skills?
26	TS	IP6	Well, we will talk about it. Because all kinds of Tableau's feature are used for data analysis. For example, filter and parameters, we might give examples like parameters can be used in which areas, why am I interested in doing it? To put some scenarios in the training like this, you might understand a little better. But it does not say that there is a chapter developed to data analytics. That is the kind of thing that I believe should be found in the visualization courses.
27		XZ	Yes. Well, I'd like to ask will you share your experience in using while teaching people using Tableau? For example, I want to do the case in this way. Then what steps will I follow, and why did I do it? Are you going to teach them that kind of experiences specifically?
28	TAM	IP6	Yes, I will share some of your own experiences, for example, some situations that I gave encountered before. But these things are more likely to be included in the interaction part. For example, someone asked this question, he asked for that, and if I had any experience in it, I would tell him. But I won't tell him not too much,

			because after all, as I said, our courses are designed standard.
29	ST	IP6	And the trainers like us will also take the training called the Trainer Training, so the quality of our teachings are pretty similar.
30		XZ	Well. Also, because our research is about that, for example, if a company wants to train its employees to use Tableau, there may be different employees from different departments. So, will you train these people from different departments together or train them separately? Do you have any experience in that?
31	EUT	IP6	I think, no point actually. It's just that I don't think separation is very valuable for the training. We usually train up to 15 people in small classes, 15 to 20 people, and you can come from all kinds of departments. As we said, we tend to use standardized course materials, we tend to use standardized data model, and then the focus is on teaching the technique of using Tableau. Or using every function of Tableau. After you learn, when you go back, you get your own data, and then you can start your own data analysis. For example, there may be people who know financial, there may be people who come from HR, someone do the operation, and someone do the marketing. They are perfectly all right studying in the same room.
32		XZ	Yeah. So, have you ever met some situations, for example, the company might have used some other data analysis tools before, and now they switched to use Tableau. Thus, some people may not be willing to learn and use it. Have you ever been in this situation?
33	TAM	IP6	From the aspect of training organization, to be honest, why should care for that? If I come to teach people, just like when you are the student, you can study in class and listen carefully, but you can also choose not to go to class. Your processor won't change their way of teaching. Because you pay for the class, so just like me, my clients pay for me to let me teach this thing. Then I'll just teach them. Unless he goes to make the conflict in class like saying that you are the garbage or something that affects others, otherwise we should not care for that, at least there won't be too big a problem for that. But from another aspect, for example, if I want to sell, I want to sell you this software, then our approach may be that I need to reach the person who can make a decision. For example, the boss who pays for this. If he doesn't like, he thought he didn't want to sell it to you, and there's no way, so just don't go that case. But here is the thing, when someone, for example, the one has been very skilled in Excel, and he can also draw some basic pictures by Excel, so he doesn't really need (Tableau). And his work doesn't involve too much data analysis. You can

			make some reports all the time. So, under this situation, Tableau is indeed an additional software to him, and he could do without it. This is understandable. Every time I answer this question just say that it is not the software that can solve your problem, it is you who solve the problem. And the tool is only the tool that can help you.
34		XZ	All right. Oh, and based on my previous interviews from the trainers, they said that the classroom often filled all kinds of different people. For example, some people have higher education while someone don't. Then the learning ability and thinking mode are also different from people to people, will that affect the progress of the course? What do you?
35	EUT	IP6	Yes, and that requires your control over the progress. That is to say, you know what you're going to say today, and you see what you're going to say for half a day today, and maybe you're going to say something before 8:00 to 10:00. If you followed your schedule, you can encourage a little more discussion, but if it exceeds your time, you have to have a well control of your customers. Let's say, we're going to move on because of the time and we can continue this discussion when we're offline or in the middle of the break. Or I may promise to come over and continue this discussion with someone at lunch. Just don't turn one's behavior into the behavior of the whole class and let others wait.
36		XZ	Well, that is, as you are a trainer, do you think there are some requirements for skills and background for the trainers who train people to use BI tools?
37	ST	IP6	Well, it may be better to have an understanding of BI industry and the tool. Because I think the biggest (problem), Tableau has its own training program for trainers, which means anyone could become the trainer, no matter this one is a novice or an expert in BI&A. Even you do not know anything in the beginning, you can still talk about somethings if you followed what the program says. For example, what we gonna talk about in this chapter. You just can read it one by one according to the guide they gave you. But the biggest problem is that once someone asks a question or interacts with you, but you have no experience in that and you say I'm sorry I don't know I have to go back and ask for others. In that case, it will just damage your or reduce your students' concentration in the class. So, I think the most important thing is the understanding of this aspect.
38		XZ	So, you mean some experience with BI, right?
39	ST	IP6	Not only the experience of the BI, also some experience with using Tableau.
40		XZ	oh, so how about for example, experience in teaching?

41	ST	IP6	Of course, it is also helpful. Because the trainer can also be considered as a job that need soft skills. Like the communication skills. You need to know how to deal with people's emotions. It is also important that you have to understand what others are saying.
42		XZ	All right. It's still the issue of soft skills. I met some trainees before and they said that their trainers can't explain the problem clearly. They will only give a general answer for the question. Well, do you think the ability of explaining the problem well can also help to create an effective class?
43	ST	IP6	I think that you need to understand the question before you explain it. See if you can, because the problems can really fly from all aspects. I think the first step to explain the problem is, for example, using a metaphor, to take him to your own rhythm. It is indeed an issue that need to pay attention to.
44		XZ	well, I would also like to know, what kind of people in the company will come to participate in this training program of Tableau? The power users or just general employees?
45	EUT	IP6	Well, both of them.
46		XZ	Both?
47	EUT	IP6	Yeah. Because you before you become the power user you are also the general employee. Many people who have known Tableau for the first time may feel that this thing really helps them. So, they will spend time on it after they go back and become the power user. Even if, for example, the boss has some high expectation of this thing and he believes that is very good and there is a need for using it. But the employee just has no interest, then maybe he studied only for two days, and after that, he threw it away and forget it soon. So, he can't be a power user. One tricky thing in software training is that the training can only show you the direction, how far you can go is totally rely on yourself.
48		XZ	Well, what's the biggest challenge you've had in training these people?
49		IP6	The biggest challenge I think is the questions, and the other is, as we discussed just now, the control of time. For example, what is the first thing that we are going to say today? Then we will eat from 12 to 1, and have classes at five o'clock, but we will talk about a little more today, and there is no way to finish it. It means you are too slow. But generally, I would be keep my promise? If I said the class would be over at five o'clock and it will end at the time, and in the next day, I will just hurry up and talk about what was missing yesterday. Another challenge is that, as mentioned before, Tableau course includes Desktop 1 and Desktop 2, which are two-day course. Then we also have a

			course called Accelerate Course, Desktop 1 + Desktop 2. However, the contents are the same, but you have to finish it within 3 days, which should be the four-day course. So, we have to race against time. I feel a little annoyed about it. But since there is the need for that then we have to do it. There is no enough time for discussion and the pressure of time will be greater, so this is the challenge.
50		XZ	So, how do you look upon for the future BI training? Or do you have any expectation of some changes?
51		IP6	I think training is, for Tableau, it has traditional trainer like us and online tutorials as well. Now the enterprise can just purchase for the training. For example, we can help them with this training course directly, and he can also buy this training course online. It seems to be, like, the online course that we know when we were in the school. That is, you can log in on the computer and you watch the videos over and over again. You can also hand in your homework, and then someone will help you correct it. I think it is possible, from our point of view, that some enterprises will go that way, because that will be cheaper. And the other one, I think, is probably a trend. Because if you are teaching, after all, you can guarantee quality at one time, and there may be only 15 people for that time. For example, if you are, some enterprise like Alibaba or Tencent, they decide to use Tableau. They couldn't let the employees stay there for a whole year, and then teach different kinds of lectures every day. They just buy the courses and then go directly to the inside online education method. I think this should be the trend.
52		XZ	Okay, that's the last question. Is there anything you'd like to add about Tableau training? Or something that I didn't mentioned but do you think it's important?
53		IP6	Well OK, I'm pretty interested in your research, usually people ask me how to use Tableau. But you ask for Tableau training. For the Tableau, which country use Tableau mostly?
54		XZ	I think based our research, it seems that the United States uses more with Tableau, but since I am in Sweden, and they use the other BI system that is Qlik Sense.
55		IP6	yes, Qlik. I see. In the past three years, Tableau has been developing in China very well, it has a good development, but the headquarters of Tableau must be in the United States. And then about Europe, like you said, Qlik Sense. This industry is still more competitive, so as we are trying to select a good product, which has more users. And that will influence the trainers' career. Well, maybe. I have nothing to add. Do you have any other questions?
56		XZ	No, that's all. Thank you for this interview and wish you good health!

57		IP6	Bye!

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