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INTERNAL MANAGEMENT REPORTING AND INTERNAL COST ESTIMATION OF PRODUCT TRAININGS FOR A CASE COMPANY

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Opinnäytetyön aiheena oli perehtyä yrityksen sisäiseen raportointiin sekä yritykselle aiheutuvien kustannusten arviointiin. Päätavoitteena oli luoda kohdeyritykselle toimiva sekä visuaalisesti houkutteleva raportointijärjestelmä. Lisäksi tavoite oli esittää olemassaolevan tiedon perusteella yrityksen tuotekoulutuksista aiheutuva kustannusarvio. Tämän toiminnallisen työn osaongelmia oli (1) selvittää, mitä on toimiva sisäinen raportointi, (2) selvittää, mitä tietoa tuotekoulutusraporttiin tulisi sisällyttää ja (3) määritellä arvio kustannuksista, jotka kohdeyritykselle syntyvät tuotekoulutusten myötä. Toiminnallinen tutkimus suoritettiin Elokuun 2016 ja Tammikuun 2017 välisenä aikana.

Tutkimuksen teoreettinen osa käsittelee kolmea suurempaa kokonaisuutta, palvelua tuotteena, sisäistä raportointia sekä kustannusten hallintaa ja arviointia. Teoreettisessa osassa käsiteltiin tarkemmin asiakaskoulutuksia palvelunalana, asiakaskoulutusten hallintaa, johtoportaan raportointia sekä kustannusten arvioinnin osia. Teoriaosuus koostui täysin ammattikirjallisuudesta.

Empiirisessä osiossa käsitellään kohdeyritykselle luotua raportointisysteemiä, johon on vahvasti sovellettu tutkimuksen teoriaosaa. Raportointisysteemin lisäksi luotiin raportointia helpottava ohjekirja, joka sisältää tarkan kuvauksen siitä, miten raportointi systeemi toimii ja miten uusi raportti luodaan. Lisäksi empiiriaosa esittelee tuotekoulutusten kustannusarviota ja vertaa yrityksen käyttämiä koulutustapoja toisiinsa kustannusten kannalta.

Tuotekoulutusten raportointiin luotu excel malli ei kohdannut suuria vaikeuksia projektin aikana. Kustannusarvion problematiikka puolestaan keskittyi olemassa olevan datan puutteellisuuteen. Kohdeyrityksen olematon tietokanta suoritetuista globaaleista koulutuksista esti täysin luotettavan kustannusarvion luomisen, mutta tulos ilmeni tyydyttäväksi ja suuntaa-antavaksi. Joka tapauksessa tutkimuksen päätavoite, eli raportointisysteemi, luotiin onnistuneesti ja se miellytti sekä tutkimuksen tekijää, että kohdeyritystä.

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The purpose of this functional thesis was to explore the factors of internal reporting and cost management and estimation. The main aim was to create an informative and visually attractive reporting system for a case company. In addition a preliminary estimation of costs caused by product trainings was pursued. The estimation was based on the current data available. The partial challenges of this project were: (1) to clarify, what is practical internal reporting, (2) to clarify, what information should be included in a management report and (3) to define a preliminary estimation of costs, caused by the product trainings. The functional study was conducted in a case company between August 2016 and January 2017.

The theoretical part of the thesis addresses three main topics; service as a product, internal reporting and cost management. In detail the theory part discusses issues on customer trainings and learning management, management reporting and cost estimation. The theoretical part relies totally on the professional literature.

In the empirical part of the thesis, the theoretical models and the requirements of the case company are combined, which resulted to the final reporting system. In addition to the reporting system, a guidebook was created, which describes in detail how the reporting system works including the creation process of a new report. Additionally, the empirical part presents the cost estimation of product trainings and compares the two training modes used by the case company.

While creating a reporting system to an excel template, big challenges were managed to be avoided. Cost estimation was a more challenging part due to the lack of data. Because the case company didn't have any global training data available before this study project started, totally accurate cost estimation was not able to be created. Anyhow the result turned out to be guiding and satisfying for the case company. However, the main goal of this project, the reporting system, was managed to be created successfully and the result gratified the researcher and the case company.

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List of abbreviations

AP	Asia Pacific
AS	After Sales Service
CBT	Classroom Based Training
CN	China
CO	Public Address and Voice Alarm Systems
CRM	Customer Relationship Management
EMEA	Europe, Middle East & Africa
ESS	Management Software
FIR	Fire Alarm Systems
IN	Intrusion Detection
LA	Latin America
LMS	Learning Management System
MKK	Marketing Knowledge
NA	North America
USD	United States Dollar
VS	Video Systems
WBT	Web Based Training

1 INTRODUCTION

Due to the developing information technology, open market economy, globalization, regulations, changing product demands and other forces, the global competition and rivalry among firms has been and is constantly increasing. To survive in the market and remain relevant, an organization must gain a competitive advantage. In order to be able to reach that position, an organization must (1) either produce a special product that nobody else is able to offer, or (2) produce the products at the lowest possible costs in order to keep the business profitable.

One of the key success factors in any kind of business is to have an effective cost management. In order to achieve a cost effective management, the management must take correct decisions to guide the organization to profitable actions. To make the right decisions is not as simple as playing lottery. Internal reporting has a high importance in organizational decision-making, because the reports provided by the subordinates to the top management, are the base for either correct or wrong decisions.

Another success factor is customer loyalty and satisfaction. Customer trainings are considered as a vital factor increasing the corporate performance in the competitive market. According to a study (Lohnt sich Schulung, 2014), training customers is beneficial for a company due to increased know-how of the customer which leads to stable customer satisfaction.

The purpose of this thesis is to facilitate the internal reporting of product trainings and to provide the top management valuable reports in order to help them to take the right decisions in strategic and cost effective manner. In addition to the reports, to support the decision making, a preliminary cost analysis of product training costs will be created.

The path of this thesis is following. Chapter two explains the background of the thesis, states the research problems and introduces the case company. The theoretical part is presented in the chapters three, four and five. Chapter three offers an overview on the concept of customer trainings, the fourth chapter presents the purposes and guidelines of

internal reporting, and the chapter five discusses chosen cost management topics related to the cost analysis conducted in the empirical part. Chapters six and 7 discuss the outcome of the created internal reporting system and the cost analysis and explains the solutions answering to the set research problems. The final chapter argues the success of the process and proposes further research ideas.

2 BACKGROUND TO THE RESEARCH

This chapter presents the reasons for the thesis and introduces the research problem and research questions. Additionally the framework of the functional thesis will be explained and the case company introduced.

2.1 Research background

Product trainings are running. Customers and internal employees are participating in trainings to improve their know-how. Product trainings are seen as one of the unique selling points in the case company but the quandary of product training activities is high, the knowledge of what is done is basically nonexistent. Some amount of students participate to trainings in various regions, several different training models are used and there are various trainers in the organization. Some, several and various – vague expressions. This is exactly the reason for the case company to start a research process; the internal lack of knowledge of product training activities.

The researcher completed her internship in the case company in the first half of the year 2016. The training knowledge department (MKK) had expressed their interest in having a supportive student to write her bachelor thesis in their department. The main topic, global training reporting, was decided by the manager of the Training Knowledge department. After discussing the main topic, the manager and the student together decided to specify the topics to top management product training reporting and to include training cost analysis and measurements to the project.

The preliminary objective from the case company perspective was to increase the communication of the global product training activities. Therefore the company wished to have a reporting system in order to report the activities to the management. The case company needed information for questions such as how many trainings are ran, how many trainers the company has, how many students are trained, which are the course highflyers

and which courses had been participated barely at all. Furthermore the company wished to have an estimated calculation on the product training costs.

The researcher found the suggested topic interesting, challenging and above all meaningful for the case company and therefore decided to pounce and take the offer. The empirical part will develop two outcomes; top management report and cost analysis including a cost measurement. As a result the case company will benefit from the thesis by receiving knowledge about the status of their global training activities, receive a reporting system and have an analysis of the product training costs. The analyses of costs will ideally help the case company to see roughly how much money is spent for trainings and whether they could or should reduce the costs. The student in turn will gain six months more work experience in a global company and learn about internal reporting and cost measurement in real working environment.

2.2 Research Problem and Research Questions

The main research problem in this thesis is the internal product training reporting to the top management. The sub problem is the internal costs of running product trainings. The research problems are described in the figure 1.

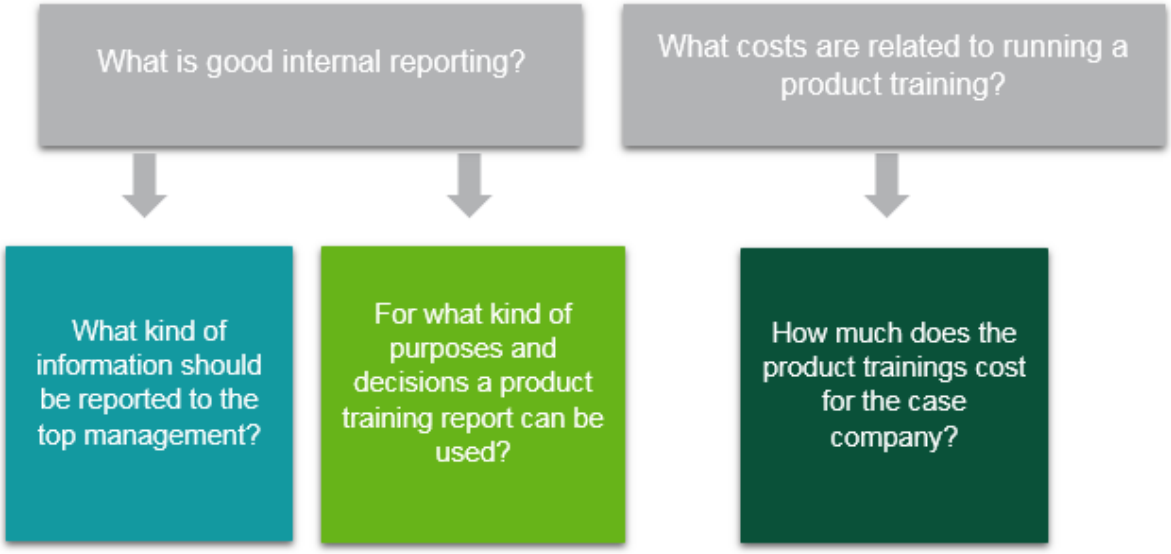


Figure 1. Definition of the research problems

The purpose is to first create a global reporting system based on a data taken from a software called Learning Management System (LMS). The reporting system should be informative, easy to use but also visually attractive. In order to make cost analyses and measurements, it must be considered what costs are included in the product training costs, what actually is possible to be measured and what kind of figures does the management want to receive.

Based on the research problems, the following research questions have been defined:

1. What is good internal management reporting?
2. For what purposes and decisions a product training report can be used?
3. What kind of costs are related to product trainings and how much does the product trainings cost for the case company?

2.3 Framework and methodology summary

This thesis applies functional approach. Functional thesis aims at creating something new or developing the existing systems such as business plans, budgeting systems or company web page. In a functional thesis the theoretical base is used to explain the solutions made. The outcome might be a result of different methods such as interviews, discussions or benchmarking. Ideally a functional thesis process outcome should be tested in practice, if possible. (Niskanen2016)

The theoretical framework is closely connected to the research problems. The framework is presented in the figure 2.

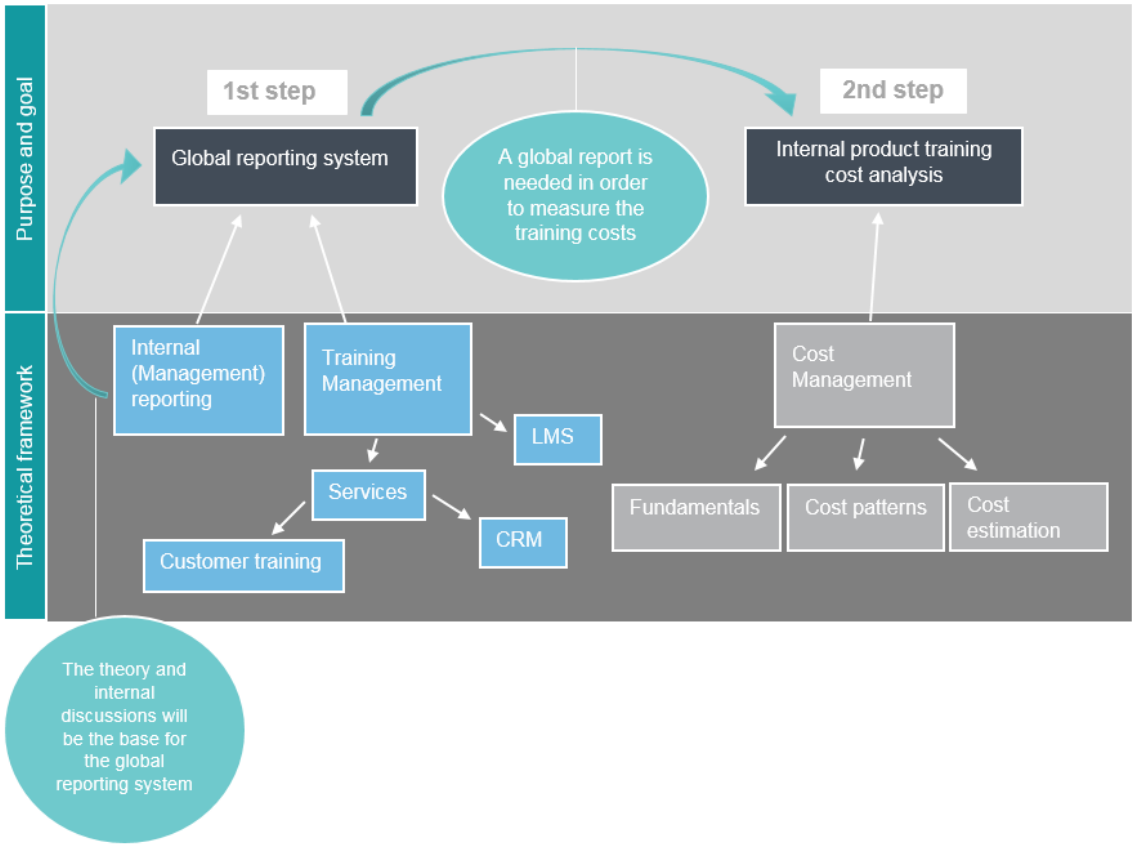


Figure 2. Framework

The empirical part can be divided into two main sections, the reporting system and the cost analysis. First, the empirical part explains the created reporting system while discussing and explaining the content of the reports and the process of creating a report. The second part discusses the cost analyses and measurements made. The cost measurements will be based on interviews and discussions completed with few internal employees who are experts in product trainings.

The empirical part will present the outcome of the process. It will be argued, why the chosen data is presented in the global report but it will not discuss the data. The performance, as well as future predictions, of product trainings will not be discussed in this thesis. Furthermore the regional reporting will be excluded from the discussions and therefore it will not be considered, to what kind of purposes for example the regional managers could benefit the product training reports. In the cost analyses and measurement

will only be analyzed and estimated the internal costs of product trainings. The cost estimation will not take into consideration possible earnings gained for example through training fees. Moreover the earnings, such as participation fees, will not be taken into consideration.

2.4 Case Company introduction

The case company is a global leader in innovation and technology market. It is a European based foundation, operating in more than 150 countries globally. The organization is active in several different technology divisions such as energy and building technology, mobility solutions and consumer goods. Among energy and building technology is included the security systems division. The product variety of the security systems include high complexity technology products including video systems (VS), intrusion detection (IN), public address and voice alarm systems (CO), management software (ESS) and fire alarm systems (FIR). The company is a leading manufacturer of security, safety and communication solutions.

The security systems division is one of the smallest main divisions. It has two main focus areas in daily business: product business and energy and building solutions. Product business includes e.g. earlier mentioned video, intrusion and fire alarm systems. To the energy and building solutions in contrary belong for example building security and building automation sectors. The security systems division plays in the business-to-business (B2B) market and has distribution partners all over the world. The security systems division has currently around 13 000 subordinates all over the world and five manufacturing sites. The sales of security systems on its own reached more than 2 billion euros in 2015.

Due to the high complexity technology products, the company offers its customers highly-available technical support, trainings and certifications, after-sales services and constant business development including close contact with customers. Trainings offered are seen

as one of the unique selling points of the case company and therefore as on important action. (Case company webpage.)

3 CUSTOMER TRAINING – A VALUE ADDING SERVICE

A service may be defined as a production of an intangible benefit for a customer need. It may be provided in its own right, as a main product, or as a partial element of the core physical product. An identified need, to which a service shall provide a satisfaction, may be for instance well-being, security or health need, such as hospitality services, like hotels. (Homburg, Kuester & Krohmer, 2013, 354.)

3.1 Service fundamentals

Organizations may offer two kind of products to the customers; goods and services. There are various characteristics that differentiate between services and goods. First of all, services are intangible deeds, meaning they cannot be seen, tasted, touched or felt before the purchase unlike tangible products. Usually services do not include an exchange of an ownership of a physical element and the customer do not acquire any tangible property as a result of a service. (Homburg etc. 2013, 354-355.) Secondly, services are perishable, meaning that they cannot be saved, resold or returned (Trott 2012, 496).

Moreover services are heterogeneous, including always human interaction, which are lacking 100% standardization, which makes services always a little unique. The standardization of a service depends highly on the technology applied in the user interface (Trott 2012, 496). Services have moreover high variability due to the human interaction and various external factors that influence the production of a service and on the other hand ensures the individuality of each service provided. (Homburg etc. 2013, 355.)

Due to the characteristics of services, managing the capacity planning and demand is not as easy as it is with physical goods (Trott, 2012, 496). Furthermore, services have higher ability to be tailored according to customer needs, when compared to tangible goods (Homburg etc. 2013, 355).

Further distinguishing factor of services from goods is the inseparability character, which means that services are produced and consumed simultaneously. Inseparability factor reflects strongly to the earlier mentioned perishability character of services due to the simultaneous production and consumption which requires interaction between the service provider and the customer. (Trott, 2012, 496.) Therefore the production process for service providers are highly crucial for the organization because of the customer interaction (Homburg etc. 2013, 354-355). Products, in contrary, are produced, sold and consumed in three phases (Trott, 2012, 496).

As a last difference between tangible goods and services is the customer's perceived purchase risk, reflecting to the simultaneous production and consumption process of the service. Due to the lack of opportunity to assess the service before the purchase, services normally create higher purchase risks for the customer than tangible products. (Homburg etc. 2013, 355.)

Services can be divided into two types of services, billable and non-billable, also called hidden services. Billable service, such as upgrading a software, is an invoiced service offered to a customer and calculated as a part of the company's turnover, like a sold product. A non-billable service on the other hand, is a service that the customers are not invoiced for but still has a significant influence to customer's perception of being a customer of the certain organization. Non-billable services such as complaints handling, documentation and customer training, are not only essential services for the customer but also for the organization. Non-billable services ideally make it easier for the customers to be a customer, and this way creates a competitive advance for the service provider. Hidden services are mostly not considered as services by the management and therefore also not managed as value-enhancing services to customers. These services are often considered as administrative routines that have to be taken care of, no matter what. (Grönroos, 2007, 3.)

Anyhow, the hidden services are crucial for the company because it can provide a powerful competitive advantage. As concluded in previous sections, an organization must

have either unique product solution that nobody can imitate, or continuously lower costs, in order to succeed in the open market. By providing customers a variety of high-quality services in addition to the core product, a competitive advantage can be built in a competitive market with similar product offerings at same price level. Hidden services are important since they create customer satisfaction and loyalty, which could not be gained with only low prices for the core product. (Grönroos, 2007, 5.)

3.2 Training concepts

Training is a process of teaching new knowhow (Dessler, 2015, 254). It has traditionally been used to provide employees with skills and knowhow in order to prepare them to perform in the daily organizational activities and eventually to increase the performance of the whole organization (Aravamudhan & Krishnaveni 2015, 132). Training does not necessarily include increasing the know-how but instead may include teaching new ways of performing with the existing knowledge (Grovo Webpage 2016). The purpose of training is to offer a student, for example an employee, the skills and the knowhow he/she needs in order to complete his/her job (Dessler, 2015, 254). For a company aiming to a competitive advantage, employees possessing skills and knowledge are the most valuable ones (Aravamudhan & Krishnaveni 2015, 131). Training for example a new sales employee can teach the new employee how to sell the company's products. Human resources departments are mostly in charge of designing organizations orientation and training programs but supervisors, or other employees, are usually doing the day-to-day training. (Dessler, 2015, 254.)

As training offers new knowledge, it is an intangible product and therefore considered as a service. A training might be a simple service, where current employee explains a task to a new employee, or a classroom lecture where a person spreads knowhow to wider audience, or an online training, where students individually learn through internet.

Training employees and customers is important because it minimizes the risks and increases the customer satisfaction. A negligent training appears when an employee harms

a third party due to a lack of adequate training offered by the employer. Therefore training is important, not only to increase the performance of employees but also to reduce risks. (Dessler, 2015, 254.)

There are several different training approaches. Classroom based training (CBT) is a training approach, typically accomplished in groups, which enables the students to communicate and share information and concerns with the trainer and fellow learners directly. For this reason CBT is one of the most applied training approach in organizations. (Kong & Jacobs, 2012, 79).

Due to the increasing distribution and capabilities of technologies, online learning has become an alternative learning for classroom trainings. Online learning, also known as web based training (WBT), is a training approach delivered via the internet. In fact, the main difference between CBT and WBT is the entirely different learning environments; face-to-face and internet, or intranet. It is emphasized by various researchers that these two different training approaches cannot be compared and evaluated directly with each other due to the total different learning environment. (Kong & Jacobs, 2012, 79-80.)

Therefore which approach is better or faster way to complete the training, can't exactly be claimed because some reviews claim the online training as the more effective one and some not. Anyhow, online training is a beneficial training method for teaching big amount of individuals remotely. (Dessler, 2015, 268.) Furthermore WBT gives students flexibility to complete a training on a convenient time and locations, while allowing the students to proceed with their own pace (Kong & Jacobs, 2012, 80).

Virtual classroom training is a mixture of in-class lecture and online learning. Various types of collaboration software allows many students remotely to participate to a common training through laptops or other technical devices. The software enables participation with live video and audio and in this way allows the students to take part in conversations and discussions, and to communicate via written text and shared learning material, such as PowerPoint presentations. (Dessler, 2015, 268.) A blended training is a mixture of

different teaching methods. A blended training can include individual online learning as a first step, virtual class as a second step and for example classroom lecture as a last step. (Dessler, 2015, 268).

The input required from the organization to complete a classroom based training is easier to evaluate and measure than the input required for processing a web based training. Regarding to the complexity and length of the WBT, it requires different preparation times from the administrative employee. Therefore it is not simple to evaluate the workload needed to run an online training. (Kong & Jacobs, 2012, 80.)

3.3 Customer Relationship Management

As the pace of today's economy is extremely rapid, the organizations face various challenges while trying to sustain in the global competition. Nowadays the focus of organizations has been shifted from product quality to customer focus, while not disgracing the product quality. The reason for focusing to customers is to better understand the needs of the customers and to learn how to attract them and gain loyal, long-lasting relationships with the customers. Customer focus is crucial for sustaining in the competitive market and to be able to respond to the changes and to the customer needs. Customer relationship management (CRM) is a continuous process rotating around the customer's journey of being a potential customer to staying a long term customer. The objectives of CRM is to heap various data, examine the customer needs, requirements and preferences, communicating through networks, and to develop strategies to meet the customer needs. In other words CRM covers the whole relationship between the organization and the customer. (Venugopal & Priya 2015, 139-140.)

3.3.1 Customer support and after-sales-service

Companies use wide range of marketing strategies to gain new customers and to create stable relationships with the existing customers (Venugopal & Priya 2015, 139-140). In

order to guarantee the consumers positive perceptions of product quality, after-sales-service (AS) is considered to be an effective tool to increase the customer perceptions. The better the quality of the AS the higher the satisfaction of the customers. AS is an integrated component of the core products and adds value to the main product. AS is crucial for the customer satisfaction because even high quality product may be downgraded by the customer due to the lack of desirable after-sales-service. Bad quality in AS cause's dissatisfaction among customers and loss in the future sales. After-sales-service is beneficial both for the company and the customer, because it maximizes the value of the experience and the usage of the product and minimizes potential problems. AS has a wide range of included activities among which installation of the purchased product, technical support and the provision of spare parts. (Asugman, Johnson & McCullough, 1997, 11-13.)

3.3.2 Customer training

Customer training is a service provided to customers in order to increase their knowhow in using the core products of the providing company (Content Raven company webpage 2016). Customer trainings among hardware and software support, documentation and other customer consultation, are usually not part of the customer support (Resnick & Fuerst 1985, 84). Customer training is a strategic business tool and part of good customer service. It may significantly add value to the core product and concurrently have a positive effect to the company's sales figures (Nilson 2002, 25-26). Recently completed research appears to validate the view that customer trainings are a significant driver of add-on revenue (Content Raven company webpage 2016). Moreover it is claimed that the quality of customer support, including customer trainings, is a primary reason for customers to choose their product provider (Resnick & Fuerst 1985, 84). With regard to the study, it can be concluded that the customer training supports the sales by having a positive effect on the sales success of the company products (Content Raven company webpage 2016; Resnick & Fuerst 1985, 86). The benefits of customer training are illustrated in the figure 3. As the figure shows the customer training is based on sharing the product knowhow, such as installation or system planning instruction, to the customer. The customer receives

new skills and knowhow which increases the competence of the customer. In the business to business market increasing the competence of your main customer will increase the satisfaction of the end customer and positively affect to the buying behavior of the end customer. Furthermore it is proved that customers trained demand less customer support than the customers that are not trained. (Lohnt sich Schulung 2014.)

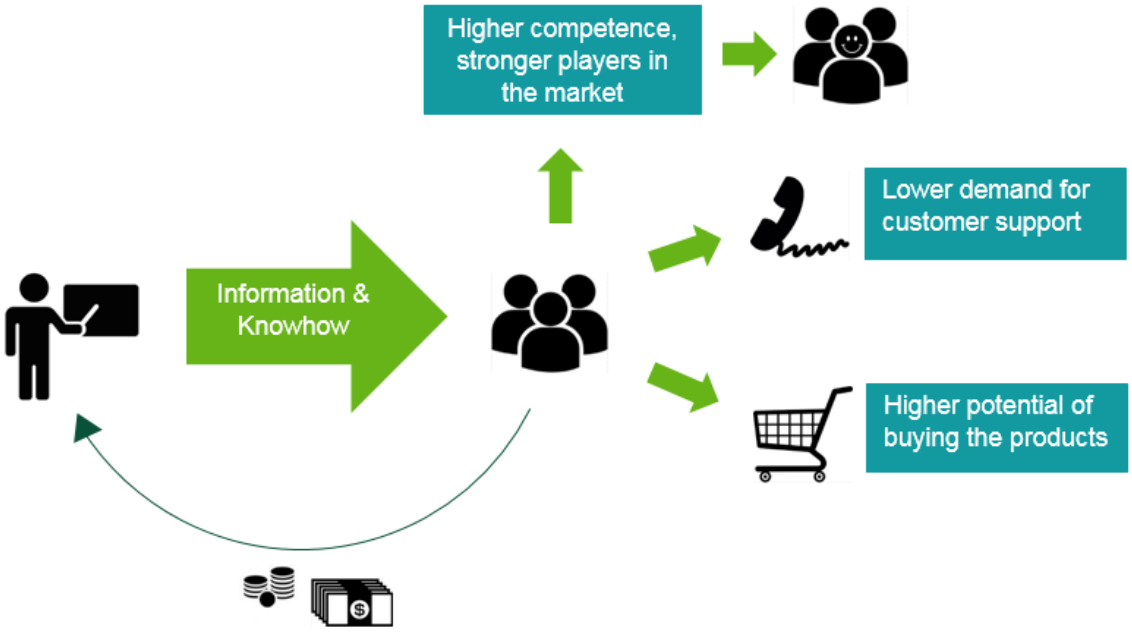


Figure 3. Benefits of customer training (Resnick & Fuerst, Lohn sich Schülung, Nilson)

As declared earlier, some services are offered to customers for free, some not. This applies also with customer trainings. The providing company must first clarify which support must be provided to the customers in order to facilitate their role as a customer and secondly, come to a decision whether customer training is provided without charging the customers or whether trainings are offered as a value-adding service aiming to additional revenue. (Resnick & Fuerst 1985, 84.)

It is claimed that customer training has four steps. First step is the self-instructional step, where a customer gets a first few to the product through manuals, such as installation manual, or other materials, such as tutorial guides, provided by the vendor. Next step is hot-line support, which is provided to customers in order to guide them in operational or

application difficulties. The first two steps usually are bundled parts of the purchase, meaning that customers do not have to pay extra for them. The phases of customer training are illustrated in the figure 4.

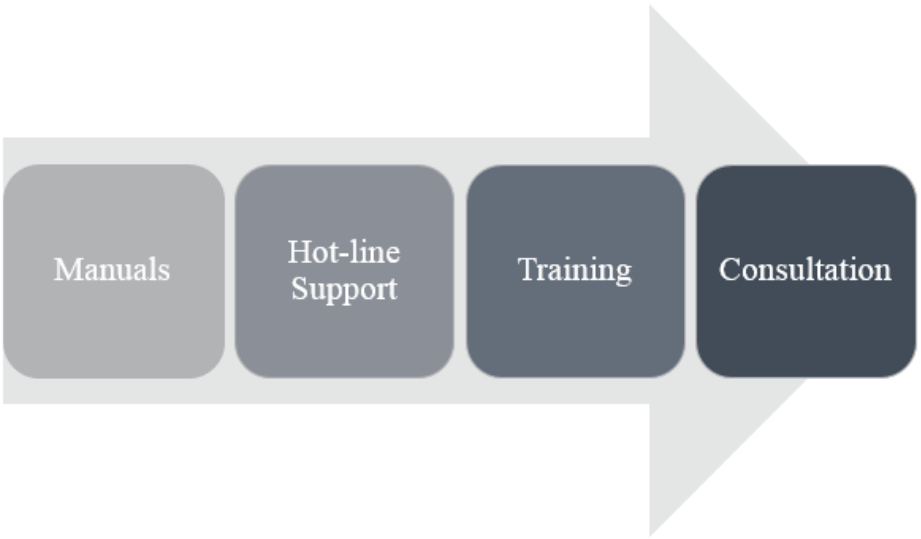


Figure 4. Four steps of customer training (Resnick & Fuerst)

As a third training step may be provided a seminar or a classroom training in order to guide a customer for instance in high complexity installations. As a last part of a customer training is an on-site customized consultation which is tailored according to the individual customer needs. (Resnick & Fuerst 1985, 84.) The third and the fourth steps may be bundled or unbundled to the purchase, depending on the customer support strategy of the organization. Alternatively, if not bundled to the purchase, they are considered as after-sales-services. (Resnick & Fuerst 1985, 87.)

Technical training is customer training entity which has multiple definitions. According to some definitions it handles IT and computer products and services, according to others every training that has anything to do with a product is a technical training. Anyhow, mainly all definitions emphasize the relation to either software or hardware. The purpose of technical training is to provide information about a technology, tool, process or workflow and to prepare technicians in order to be able to operate with the products or services. (Combs & Davis 2010.) A customer training, such as technical training, requires a trainer. There are two type of personnel offering trainings for customers, full time

trainers and part time trainers, who train customers only as part of their whole responsibility area. (Resnick & Fuerst 1985, 85.) As any other training, a technical training may be provided as part of the main product or as an after-sales-service. A customer training may be ran on-site on the customer's location or in the provider's facility. Sometimes the customer's locations are not the best choice to run a training due to poor equipment level which forces the training provider to submit training materials and equipment, which naturally increases the total costs of running a training. (Nilson 2002, 25-26.)

3.4 Learning Management System

Learning Management System (LMS) is a system used for managing learning and training activities online. There are multiple different software available and they are designed for not only online learning management but for managing all initiatives of learning. (Litmos company webpage 2016.) LMS is a tool that helps the training managers to identify the needs for trainings and to manage the scheduling, deliver and assess of the online trainings. LMS enables its users to deliver an online training among many different online trainings in the online course catalog. A LMS software allows students to enroll themselves for the online trainings and supervisors are able to approve them and offer pre- or post-course tests for the students. For internal talent management, the LMS can be used in order to update employee's skills and succession plans based on the trainings they have completed. (Dessler, 2015, 268.)

Global companies, with employees and customers diversely around the world, benefit from using a LMS. The system enables the organization to share the learning material, such as videos and manuals online and to provide trainings for students in remote locations. (Litmos 2016.)

4 INTERNAL REPORTING

Good management requires elaborate understanding on the daily business operations. Thorough understanding and management in turn require internal reports in order to present the relevant information for the persons in charge. (Hamilton Foley, 2009.)
Taking into consideration the research problems in this thesis, only internal reporting with a focus on management reports will be discussed. The basic difference between external and internal reporting is simple, the external reports contain information that may be published to external parties, such as shareholders and government, whereas internal reporting is meant for circulation among the sections and persons internal to the organization. (Madegowda, 2006, 756.) The external reporting will be disregarded and not be discussed.

4.1 The fundamentals of internal reporting

Internal reporting is a practice of accumulating corporate's financial data or other information for internal use (Madegowda, 2006, 753). Internal reports are any type of publication providing information of the organizational activities to the management or others in the business entity to facilitate and guide the decision-making (CPA Australia 2011, 2; Madegowda, 2006, 753; All business webpage 2016). Internal reports include either financial or non-financial information and may perform the form of financial statements, budget, project summary and analysis on expenses (Madegowda, 2006, 756; CPA Australia 2011, 2). The reports are created to help managers to get an understanding about the completed activities in their responsibility area. The internal reporting enables the managers to make right decisions by providing the information about current status of the organizational activities and therefore is one of the important tools for efficient managerial decision-making. (Madegowda, 2006, 756.)

As a very basic, there are two possible reporting ways: oral and written. A subordinate walking to a manager and giving an update about a certain operation can be considered as oral reporting. Oral reporting may occur for example on the hallway, in the office of the

manager or in a meeting. Written reporting in turn has more characteristics and modes, which are described in the figure 5. (Madegowda, 2006, 756.)

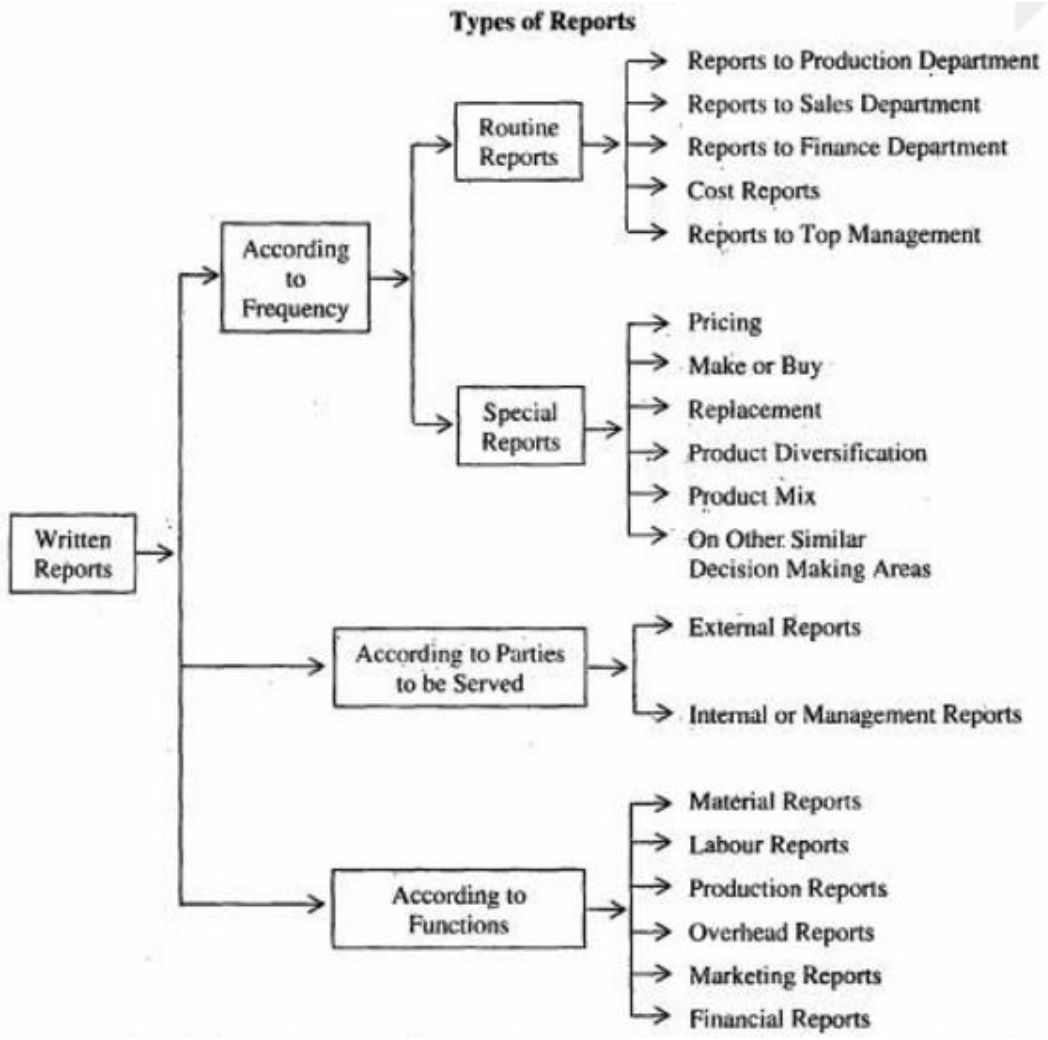


Figure 5. Breakdown of written reports (Madegowda 2006)

As the figure above describes, written reporting is classified into several sub fields. Reporting may be executed according to the frequency, which includes routine based reports and special reports, or according to business functions such as marketing or labor reports. Routine reports are reports that follow a certain time schedule, meaning that the reports are submitted to a manager according to a fixed time schedule, which may be for example on a weekly or monthly basis. The last option is to perform the written report according to the party that shall be served. At this point the party might be external or

internal report, internal including also management reports. As determined before, the external reports will be left out of discussion. (Madegowda, 2006, 753.)

Internal reports are designed to guide the internal decision-making rather than to report to the public. Internal reports usually contain corporate confidential data and therefore are not often available for public (What is internal reporting, 2016). Though the key aspect of internal reports is stated to be that the data included is necessarily not internal information, but rather information that is relevant for the internal use and decision-making (CPA Australia 2011, 2). Examples of the internal reports are for instance expense reports or any other reports that are meant to be forwarded inside the business entity to guide the management (All business webpage 2016).

4.2 Internal management reporting

Internal management reporting (IMR) has three major objectives in a company; managing the organization, controlling the activities and motivating the employees (Madegowda, 2006, 753-757; Gross consulting webpage 2016). IMR facilitates the management of daily business in an organization by providing relevant and accurate performance figures from different sections of the organization in a certain period of time. By understanding the performance of the organization in detail, the management is able to evaluate and measure the progress of the departments and the employees. This enables the management to lead the operations, take appropriate business decisions, set goals for the business and set motivating objectives for the employees. Due to performance measurement of each employee the management is able to set realistic and motivating goals for the employees and later on reward the actions. IMR facilitates the management of large amount of various departments throughout the whole business year. (Gross consulting webpage 2016; Madegowda, 2006, 753.)

Motivating and rewarding employees for their achievements is crucial, because it has a positive impact to the contribution they give to the company they work for. Naturally, this

has a positive impact to the performance of the total organization which usually is presented in different forms in internal reporting. (How to motivate employees, 2009.)

4.3 Reporting to the different levels of management

Internal reporting is providing organizational information to the managerial personnel in various levels of management. The management reports may be classified in three level categories, (1) top, (2) middle level and (3) lower level management. (Madegowda, 2006, 757.) Managers often have limited time and enormous work load. The higher the manager, the wider the area of responsibility, and the lower the level of time to be wasted. The limited time of the managers and the width of the control area should be considered also when dealing with internal reports.

Due to the restricted time of the managers, it is critical to consider the content of submitted management reports. (Madegowda, 2006, 757.) Depending on the position of the managers, the information required varies from closely detailed to wider overview data. A CEO would for example not be interested in the utilization of material used by every individual in a certain department. Conversely, the head of a manufacturing department would most likely want to have that detailed information about the same issue. (Calvasina 1995, 2-3.)

As the top managers control wider areas of responsibility, the level of detailed information in the reports directed to them are more succinct but in contrast the scope of information is wider (Calvasina 1995, 2-3). Top management reports should be less descriptive than the lower level management report. Since the top management has larger responsibility area, it is required to provide the top management with a summarized report (Madegowda, 2006, 757.)

The time period required for issuing a report depends on the manager level of the user. Unlike lower level management, the top management does not require as frequent reporting as the lower levels. (Madegowda, 2006, 757.) Lower level managers might need

and require the reporting on a daily or even shorter basis when in contrary the higher level might be satisfied on just monthly reporting. The reason behind this is that the lower level managers are involved closely in the everyday operations which in contrary, the top level managers are perhaps not. (Calvasina 1995, 2-3.)

Regardless of the level of the managers, they constantly use internal reporting as an assistant guide for decision-making in various activities. The purpose of the reports may vary depending on the activity. The activities that internal reports assist are for example planning, evaluating, controlling, communicating, coordinating, rewarding and decision-making. (CPA Australia 2011, 3.) As stated before, it is crucial for profitable organization to have good cost management and to pay attention to organizational expenses. By paying attention to expense allocation and accurate cost assigning in the business, an organization is able to spot the true profitability factors in its operations. Basic internal financial reports such as revenue stream, being often accurate but at the same time extremely inaccurate, gives an overview on the business revenue but does not truly allocate which operations are profitable and which not. The use of general financial statements as an argument for strategic decisions might even direct the management to continue unprofitable actions. (Gross consulting webpage 2016.)

4.4 Internal Reporting Guidelines

To identify and to observe certain reporting features is essential, due to the fact that the management is making decisions based on the reports submitted to them (Madegowda, 2006, 754). The features encouraged to be followed will be discussed as next.

When creating an internal report there are four main issues to be considered. First ones are the actual report itself and the main users who will use the report. Furthermore should be considered the physical systems used and as a last point strategic alignment. (CPA Australia 2011, 2.)

Regardless of the main user, level of management, and the purpose of the report, there are several fundamental principles that should be followed while creating internal reports. While the principles discussed in this chapter aim at increasing the utility of the reports, they should be taken into consideration while creating reports, in order to guide the management to take the most profitable decisions. (Madegowda, 2006, 753.) Even though there are no legislating rules driving internal reporting, management or other internal reports must follow few principles in order to be effective communicators (Calvasina 1995, 1).

4.4.1 Objectivity and Accuracy

The profitability of the decisions taken by the managers depend on the content of the managerial reports. Based on this, it is said that the objectivity is highly required, meaning that the report should include as accurate facts and figures, as possible. Accurate and up-to-date figures are prerequisite for profitable decisions and in the contrary inaccurate and distorted figures might guide the management to take wrong decisions. (Madegowda, 2006, 754.) Furthermore, any kind of deficiencies or inadequacies in the data provided through internal reports decreases the confidence of the users either towards the reporting system or in a worst scenario, towards to the creator of the report. By providing inadequate information in a report, the users do not get a response to their information needs which sooner or later will drive them to look for more reliable and relevant information elsewhere to support the managerial decision-making. (Calvasina 1995, 1.)

4.4.2 Comparability and Principle of exception

The descripted performance indicators in a report should be based on achievements of the responsibility center (Calvasina 1995, 4). It is claimed that a management report should provide comparable figures comparing the actual or achieved results to the planned or budgeted performance. Furthermore the comparability between more than one periods enables the managerial personnel to identify different performance indicators.

(Madegowda, 2006, 754.) Comparability is related to the relevant figures, because presenting only the most relevant data, enhances the benchmark creations between different factors (Calvasina 1995, 4). In contrary, the content should not compare different responsibility areas with other areas but instead stay on a personal level (John W. Hardy & E. Dee Hubbard 1976).

Internal reports should ideally be neutral and constructive in their tone. Sometimes the reports follow quite judgmental tone by stating strictly the areas of responsibility where a manager hasn't received the budget or other set objectives. (Calvasina 1995, 4.) But in fact, it is even more crucial to point out the areas of failure because these are the areas where management should take corrective actions. The report should draw the attention of the managers to the activities that haven't been performing as anticipated, but, as said, in a constructive tone. Controversially, the report may leave the operations moving forward according to plans to lower attention, because the management do not need to make corrective actions in these cases. To draw the attention to the crucial points saves the limited time of the managers and drives them to concentrate to the exceptional matters of a certain responsibility center. (Madegowda, 2006, 755.) Anyhow, to keep the report neutral, also the well performing areas should be pointed out (Calvasina 1995, 4).

4.4.3 Consistency and Relevancy

A report should additionally be consistent, meaning that the same principles and practices should be used consistently. It is stated that the consistency should apply in the preparation and submission process of the reports, meaning for example that the same measuring methods are used from report to report. (Madegowda, 2006, 754.) In addition to permanently stable content, the report should furthermore follow the same format from period to period (Calvasina 1995, 3). There are contradictory statements on the consistency on the periodical routine of generating the reports. One source states that depending on the purpose of the internal report, it may be generated on routine basis, such as monthly, weekly or daily, or on an ad hoc, meaning extemporary basis. (CPA Australia 2011, 2.) In contrary another statement claims that every report should always have a

permanent period when executed (Calvasina 1995, 3). Under a consistent reporting it is important that the reports forwarded to the top management and the departmental or functional reports, are in an alignment and agree on each other, even when not including all the same information. Nevertheless, it is crucial that the identical data presented in all reports, indicate the same numbers and statements. (Madegowda, 2006, 754.) The consistency of reports is essential and grand changes should be done only when real demand occurs and an explanation of the change should be provided for the main users of the report (John W. Hardy & E. Dee Hubbard 1976).

Internal reports should follow high level of relevancy, in order to provide only the most relevant data for the users to give the most of the use (Madegowda, 2006, 754; Calvasina 1995, 2; John W. Hardy & E. Dee Hubbard 1976; Gross consulting webpage 2016.) Including only relevant data enhances the decision-making while providing only bearing figures (Madegowda, 2006, 754). Lacking the emphasis of information, an internal report may end up complex and too wide, which decreases the usability of the report. A good report is tailored to meet the information needs of the primary user/s. Anyhow, different managers want and need different data, some more detailed and some less. The required information should be discussed beforehand with the main user, in order to avoid either providing a report with too much information or conversely too little. Furthermore, providing information that nobody will use, is expensive and after all wasted time. (Calvasina 1995, 2-3.)

By using only the most relevant figures, the benchmarking and accuracy of the report is more likely to be guaranteed to be highly reliable, because the likelihood of failed identification and measurements is lower. Even the most reliable calculations and statements could be accomplished with all-inclusive approach, it most likely will end up a confusing report with no good informative structure, due to the mixture of too many measurements and factors. (Calvasina 1995, 4.)

4.4.4 Simplicity and Timeliness

Earlier were emphasized the importance of adequate and essential information. In fact, to create a good report, it requires more than accurate numbers. A report must follow simplicity by handling only one central theme and not mixing different areas of responsibility in the same report. (Calvasina 1995, 3.) Even the data presented might be complicated, it should be presented in a simple form in order to convey to the management the same intent as it conveys for the creator of the report (Madegowda, 2006, 754-755).

Informative report is presented properly when it is easy to read and comprehend and enables the user to find and understand necessary information. A good report does not require pro analytic sills or recalculation from the user, but conversely encourages the effective use of the provided data and makes the information easily accessible. Nevertheless, in case of a complex data, the report should include supportive comments or written discussion and analysis, to facilitate the use. (Calvasina 1995, 2-3.) Included comments may also be used to highlight positive performance or improvement. It is claimed that comments do not only act as a highlighter but may also enhance the performance of individuals while giving directional or reinforcing comments. (John W. Hardy & E. Dee Hubbard 1976.)

In conclusion, merging relevancy and simplicity, the data should be presented in a succinct and clear way so that the report includes only pertinent information regarding the responsibility area of the user (John W. Hardy & E. Dee Hubbard 1976.)

Since the decision-making and actions initiated by the management highly depend on the internal reports provided by the subordinates, the reports should be provided on time (Madegowda, 2006, 755; John W. Hardy & E. Dee Hubbard 1976; Gross consulting webpage 2016). The lack of the proper reports restricts and decelerates the managerial actions and therefore it is essential that the reports are sent on time (Madegowda, 2006, 755). Though due to the developing technology, the information is widely available for the companies which enables them to get the needed information fast and easy (Gross

consulting webpage 2016). Although, sometimes accurate figures, which are crucial for an efficient report, may require a longer time to be prepared, when the creator of the report must take a selection between accuracy and timeliness. Accurate figures could be more important for example in cases of financial reports. Internal reports provided in short periods, such as daily, might limit the accuracy of the content. (Calvasina 1995, 3.)

4.4.5 Distinction between controllable and non-controllable variances

The reports should indicate the performance of a certain responsibility center. In addition to a clear indication of the performance figures and achievements, the report should relate also to the areas where the responsibility center has had lower performance than planned. (Madegowda, 2006, 755.) Moreover, the report should consist only of the information that the main user has control over, not outside of his control area. For example including material purchase prices to the head of manufacturing department, might not have any control to the material bought by the purchasing department, and therefore the prices should not be included in a report directed to him. Therefore it can be claimed that the position of the manager determines the level of details presented in a report. In order to create an efficient report, the responsibility and controllability of the main user must be considered in the creation phase. In internal financial reports, if a report includes cost factors, it is said that the items controllable by the main users department should be clearly outstated in the report. In contrary if something in the report is out of the control area of the department head, it should also be stated in the report. (Calvasina 1995, 2-3.)

As discussed earlier, internal reporting is not regulated by law. The principles discussed are also not rules driven by law but rather advisable guidelines what should be taken into consideration while building up a report for the management. By following these principles, a creator of the report is able to help the managers to understand their business better and to make the most profitable decisions and actions. (Madegowda, 2006, 753-757.)

5 COST MANAGEMENT

This chapter introduces the fundamentals of costs and costs management. Furthermore it will be explained in detail what cost patterns are and what for. As the one of the set research problems requires cost estimation, this chapter will introduce the concept of cost estimation and finally introduce the most relevant cost estimation methods.

5.1 Fundamentals of cost management

Cost management, as the words suggest, it is based on managing costs. As simple as it sounds, managing costs includes much more than measuring and reporting the current costs.

"Cost management is an organizational commitment, a professional attitude, and a set of techniques to create more value at lower cost." (Wouters, Selto, Hilton & Maher 2012, 4).

Organizational commitment can be described as a continuous aspiration for improving the decision-making in order to create more value at lower cost. Professional attitude therefore represents the fact that the costs are a consequence of a decision made earlier. A cost management system is a set of various performance measurement techniques that are used individually or together, to support the decision-making and managing the organizational activities. The combination of commitment, attitude and set of techniques allows the measurement of value, costs, quality, time and profits which supports the management to make the right decision by predicting the future impacts of the proposed decisions.

Since the cost management has a major role in a strategic decision-making it is required to have a solid cost management base in a company. A company with a good cost management is more likely to succeed than a company with a poor cost management. (Wouters etc. 2012, 86.)

5.1.1 Fundamentals of costs

To achieve a particular purpose, a sacrifice, monetary or non-financial, must be made. The value of the cost is determined by the value of resources given up. A resource, also named as a cost factor, can be for example an effort, a material, time or utilities consumed. This is one definition of a cost. Costs are not necessarily expenses but any kind of a sacrifice made, in order to achieve a precise purpose, is a cost. (Business dictionary webpage 2016; Wouters etc. 2012, 51.)

Costs are always caused by an activity. In order to estimate the relation between activities and costs, the activities that cause the costs must be identified. When the relation between activities and costs are declared, the activities can be managed and the costs reduced, as described in the figure 6. (Wouters etc. 2012, 87.)

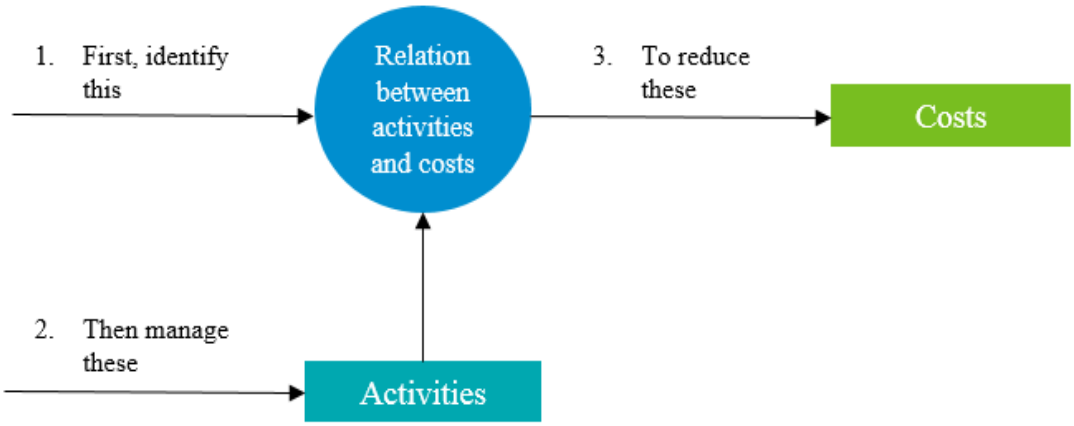


Figure 6. Estimating the relation between activities and costs (Wouters etc. 2012)

Companies have various kind of costs that they need to manage and measure. A cost can have more complexities than just the value of one cost factor. Many different involved factors make estimating the costs more complex. For example, the costs of acquiring raw materials might not only include the purchase price but also the price of picking up the purchased raw materials by a vehicle. In this case the cost of acquiring materials would include the purchase price of the product, the costs for a vehicle, and the costs for the employee picking up the raw materials. (Wouters etc. 2012, 51.) Table 1 describes an

example of costs related to acquiring raw materials. As the picture shows, there are more factors to be considered than just the purchase price of the raw materials.

Table 1. Example of resources and costs related to acquiring nylon fabric (Wouters etc. 2012)

Costs of nylon fabric		
Wholesale cost to buy nylon fabric	€8.00	per square metre
Nylon fabric required per backpack	1.00	square metre
Annual (20xx) usage of nylon fabric	24,500	square metres
Cost for delivery by wholesaler	€50.00	per order, up to 1 000 sq.m
Costs of delivery trucks (2)		
Purchase cost (each)	€ 25,000	per truck (purchased 5 years ago)
Useful lives (each), years	10	years
Useful lives (each), kilometers driven	400,000	km over useful life in years
Annual maintenance (each)	€ 2,000	per year
Annual licence and insurance (each)	€ 3,000	per year
Fuel usage	6.00	km per litre
Fuel cost	€1.35	per litre
Costs of trucks drivers (2)		
Annual salary (each)	€ 30,000	per year
Annual benefits (each)	€ 15,000	per year

5.1.2 Direct, indirect, fixed and variable costs

Running a business causes expenses. The costs caused by producing and having labor can be divided into direct and indirect costs. Direct costs are costs that are directly related to the end product or service, such as material and direct labor costs. Contrary to direct costs, indirect costs are related to the final product costs but not directly. For example a rent for a machine or a storage can be indirect costs. When calculating together the indirect and direct costs of the organization, the total costs can be measured. See the equation in the figure 7. (Wouters etc. 2012, 48; Arline 2015.)

Total costs = Direct costs + Indirect costs

Figure 7. Equation of total costs (Wouters etc. 2012)

Costs are additionally divided into fixed and variable costs. Fixed cost is a fixed amount of expenses that company has to pay periodically independent from the organizations activities. (Wouters etc. 2012, 48.) Such as facility rent and salaries are examples of fixed costs, which do not vary even the activities of the organization would in- or decrease (Weygandt, Kimmel & Kieso 2010, 205).

Variable costs in the other hand, are corporate expenses that vary in an alignment with increasing or decreasing productivity, such as direct material costs (Wouters etc. 2012, 48; Weygandt etc. 2010, 205). Not only business related, but any other costs can be separated into either fixed or variable. Table 2 describes an example of variable and fixed costs in everyday life.

Table 2. Example of fixed and variable costs in everyday life of a student

Costs of living per month	€/ Month	Variable/ Fixed
Apartment costs		
- Rent	1500,00	Fixed
- Insurance	151,20	Fixed
- Electricity and water	22,56	Variable
Transportation costs		
- Monthly public transport card	67,50	Fixed
Others		
- Food	200,90	Variable
- Hygienic, clothes etc.	88,20	Variable
- Gym card	19,99	Fixed
Total	**2050,35**	

As the table describes, cost of living include both, fixed and variable costs. For example rent for an apartment is a fixed cost due to the fact that the amount of rent does not in- or decrease depending on how many hours a tenant spends in the apartment. In contrary, in this example, the usage of electricity and water are invoiced every month, and they are

variable costs since the amount varies every month depending on the consummation of water and electricity. The behavior of variable and fixed costs are presented in graphs in the figure 8. As the fixed costs graph illustrates, the costs stay the same through every level of activity, which could be four example hours spend in the apartment, if referring to the table above. Variable cost on the other hand increase as the amount of electricity usage increases.

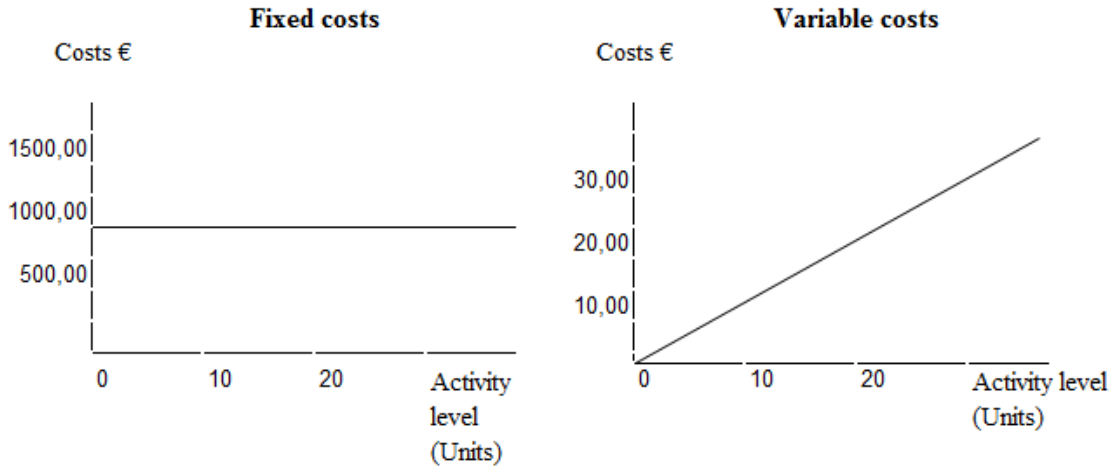


Figure 8. Fixed and variable costs in a graph (Wouters etc. 2012)

In business wise, the reason for measuring the costs is not only for internal managerial purposes but also for guiding decisions in terms of pricing the products or services. The costs of producing a service includes material, labor and overhead costs, indirect and direct costs. (Wassermann 2009.) Material, labor, overhead as well as direct and indirect costs are also included in the example of acquiring nylon fabric in the earlier discussed table 1.

5.2 Cost estimation

In order to create an efficient cost management, the corporation must measure and estimate the costs. Cost estimation is a quantitative assessment of monetary resources required in order to complete an activity, usually presented in units of currency, such as euro or dollar. (Project Management Institute 2000, 88.)

When estimating the costs the relations between cost objects and cost drivers are to be defined (Wouters etc. 2012, 86). Cost object is the target of the cost estimation, which can be for example a product, a service or an activity. Cost driver is a measurement of workload or output, the factor that determines the costs. (Wouters etc. 2012, 86.) Costs must be estimated for every resource included in providing the cost object. Resources connected to projects are usually labor and material costs, but might include also supply and various special categories such as costs caused my inflation. (Project Management Institute 2000, 88.)

Estimating the costs is needed when it is not clear what cost drivers define the costs. It is not necessary to estimate when it is clear, what the costs are and what drives them. (Wouters etc. 2012, 86.)

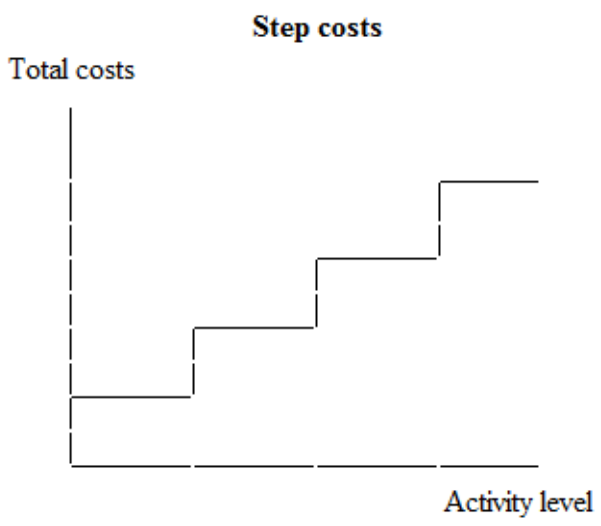
Estimating the costs of a project should not be mixed up with project price designing. They are two different processes, monetary estimation answers to the question, how much monetary assets a company needs to perform the target project. Pricing, in contrary, is a business decision and defines how much the company will charge the customer involved. To define profitable pricing, a company may use the cost estimation as one background factor to specify the pricing. (Project Management Institute 2000, 200.)

The main benefit of developing an approximation of resources needed, is that it defines how much monetary resources are needed to complete a project or activity (Project Management Institute 2000, 200). By estimating the costs, the management is able to make the strategic and operational decisions which are highly effected by the cost management factors. In addition, estimating the costs enables the organization to plan their activities and to set standards. Cost estimation is an important factor in decision-making process because the alternative actions can be compared in terms of costs. (Wouters etc. 2012, 86.)

5.3 Cost patterns

In order to estimate the costs, it is crucial to understand, how the costs behave. In some cases it is obvious what cost drivers define the costs but in some cases the corporation must take a closer look to their cost patterns. An example of an obvious costs driver for example in a transportation company is the amount of kilometers driven. Kilometers driven is an obvious cost driver because it has a direct impact to the fuel costs, which is a big part of the variable costs of a transportation company. Costs behave differently depending on the cost objects and cost drivers, and cost patterns illustrate how the costs behave. (Wouters etc. 2012, 90.)

There are three different cost patterns; step costs, mixed costs and non-linear cost behavior. Step costs describe costs that increase in steps, in an alignment with the increased volume of the cost driver. In other words, the costs for the cost driver is fixed till a certain amount and increase in a certain point with a continuous step figure, as described in the figure 7. This is why step cost is also called a semi-fixed cost. (Wouters etc. 2012, 90.) For example delivery costs behave like step costs. One vehicle has only capacity for a certain amount of goods or packages to be delivered but as soon as the amount of good exceeds the capacity limit, another vehicle must be bought, ordered or rent. The example in the figure 9 allows one vehicle to transport maximum of 15 packages at once.



(Max 15 packages per vehicle)

Packages to be delivered	Vehicle needed
2	1
15	1
16	2
31	3
40	3
45	3
46	4

Figure 9. Illustration of step costs (Wouters etc. 2012)

Mixed cost is a mixture of variable and fixed cost components. As the figure 10 shows, the costs are fixed till a certain volume of a cost driver and afterwards the costs transforms to variable costs. Mixed cost, as the step cost, represents a linear cost behavior. (Wouters etc. 2012, 90.) For example telephone contract companies often have prices for the consumers that follow the mixed cost behavior. The monthly price is fixed till a certain amount but as long as the consumer overruns the agreed capacity, the price for the consumer changes from fixed to variable, determined by the activity of the consumer.

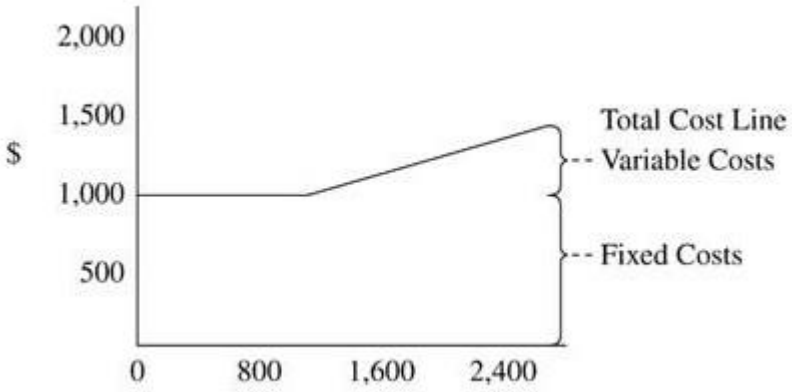


Figure 10. Illustration of mixed costs (Wouters etc. 2012)

Non-linear is a cost pattern representing variable costs that behave not proportional to the cost driver. An example of a non-linear cost is a material cost, such as fabric, which costs per unit decrease as the volume per certain period increases. Non-linear cost behavior is described in a graph in the figure 11. (Wouters 2012, 92.)

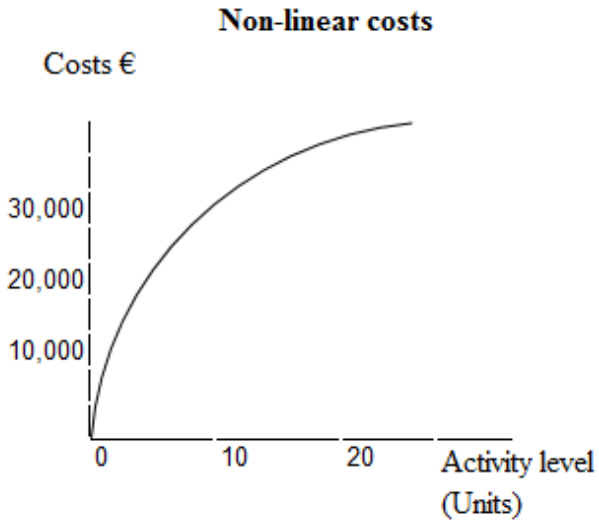


Figure 11. Illustration of non-linear costs (Wouters etc.2012)

5.4 Cost estimation methods and techniques

There are various methods, tools and techniques to measure and estimate costs. Depending on the wished accuracy, resources and objectives of the estimation, different tools may be applied accordingly.

Despite the method, tool or technique to be used, as a first step of a cost estimation process, the cost objects and the cost drivers of the estimation must be considered. Cost object is the target activity of the estimation and may represent for instance an event, a project or a product of which costs need to be declared. Cost driver is a factor that drives the costs, which may be for example the amount of products produced or the guests visiting an event. (Wouters, Selto, Hilton & Maher 2012, 93.) Anyhow, to estimate the costs, another unit of measure such as labor hours or days, may be used in order to create appropriate and realistic estimations (Project Management Institute 2000, 88).

Keeping in mind the research objectives, there are three potential methods and one technique estimate the costs. The cost-estimation methods are account analysis, high-low method and three-point estimation technique. (Wouters, Selto, Hilton and Maher 2012, 86.) Three-point estimation is a technique for estimation considering the worst case and

the best case scenarios, and therefore chosen for the further estimation (Project Management Institute 2000, 200). The chosen methods and techniques will be described in detail in the following sections.

5.4.1 Account Analysis Method

Usually, traditional information systems create cost reports showing the costs by cost category, such as marketing or labor costs. In these reports, it sometimes is not possible to quickly see how much the costs are for one certain cost object. The account analysis is a method that helps the analysts to investigate and scrutinize organization's available cost information. It enables the cost management analysts to get a first perceptions of estimates and how to apply further estimation methods. The method is based on analyzing the company's cost accounts in order to identify the costs of different cost objects. The disadvantage of this method is that it might generate vague and inaccurate results of cost estimation due to the incomplete data. The more accurate the available figures of an organization are, the more accurate is the estimation with account analysis. However, the method includes the three steps described below in the table 3. (Wouters, Selto, Hilton & Maher 2012, 93.)

Table 3. Three steps of Account Analysis Method (Wouters etc. 2012)

1. **Identify the objects for which costs need to be estimated.**
2. **Gather cost and cost-driver amounts for each cost account for each time period.**
3. **Compute the average cost-driver rate for each cost account.**

Account analysis is an easy and fast way to get the first estimates. Since the results reliability may vary from a high to low rate, it shall be considered as a base use further cost estimation methods. (Wouters, Selto, Hilton & Maher 2012, 93.)

5.4.2 Three –Point Estimating

In order to improve the accuracy of activity cost estimates three individual estimates may help to define an approximate range for one single estimation. In this technique, risks and uncertainty are taken into consideration and therefore the final estimation includes the average of the three following estimations; most likely, optimistic and pessimistic estimation.

The most likely (cM) measures the costs based on realistic assessment of effort and resources and any predicted expenses required to complete the activity. Optimistic (cO) in turn creates the estimation based on the best-case scenario and the pessimistic (cP) the worst-case scenario for the activity. The expected cost (cE) can be estimated using a formula described in the table 4. (Project Management Institute 2013, 207.)

Table 4. The formula of expected costs (Project Management Institute 2013, 207)

Triangular Distribution
cE= (cO + cM + cP) /3

Anyhow, which ever estimation method or technique was used to create the estimations, the basis for the estimation should be documented. Furthermore in case of any assumptions the explanation for the assumptions should also be documented. (Project Management Institute 2000, 88.)

6 INTERNAL REPORTING SYSTEM FOR THE CASE COMPANY

The object of the thesis project was to create a global reporting system for a case company. The final format and content of the report has been a result of multiple modifications, new ideas and reformation. The subchapters below will discuss the outcome of the project by shortly explaining the creation process of a new report and presenting and arguing the report content.

6.1 Creating a new global report

The creation process of a reporting system started with a discussion between the global training manager and the researcher. The final reporting system is a result of a project which was going on around three months. The process has been intensive cooperation between the global training manager and the researcher even though the final responsibility has been on the researcher.

The final reporting system has been created on the excel program and the reports submitted to the end users as a PDF-file. Every employee in the case company has access to excel and is able to read PDF files which was the main reason to benefit from these two software while creating and submitting internal reports. An excel template had been created which includes separate sheets for every month of a business year and a sheet which presents the data in graphs and figures. Eventually the graph sheet is saved as a PDF-file and submitted to end users. Several other software, among which Power BI, were considered as a reporting tool but finally due to the easy usability and accessibility of excel and PDF-files, it was considered to be the best alternative. Power BI for instance would have required every user to have the software installed in order to be able to read the reports. Due to the safety instructions and restrictions of the case company, it was not possible to create PDF-files of the reports created with Power BI program.

In short, there are four main steps in the report creation: (1) data gathering from the learning management system, (2) transporting the data to the excel template, (3) updating

the graphs in the report sheet and (4) saving and releasing. The data for the global reports is collected from the learning management system. Various different internal employees create learning data in the system but as the figure 12 describes, there are five training administrators who are responsible of the data entered to the LMS from their responsibility areas. As the same figure shows, the final users of the global report are the board manager and several other high level managers, such as regional managers.

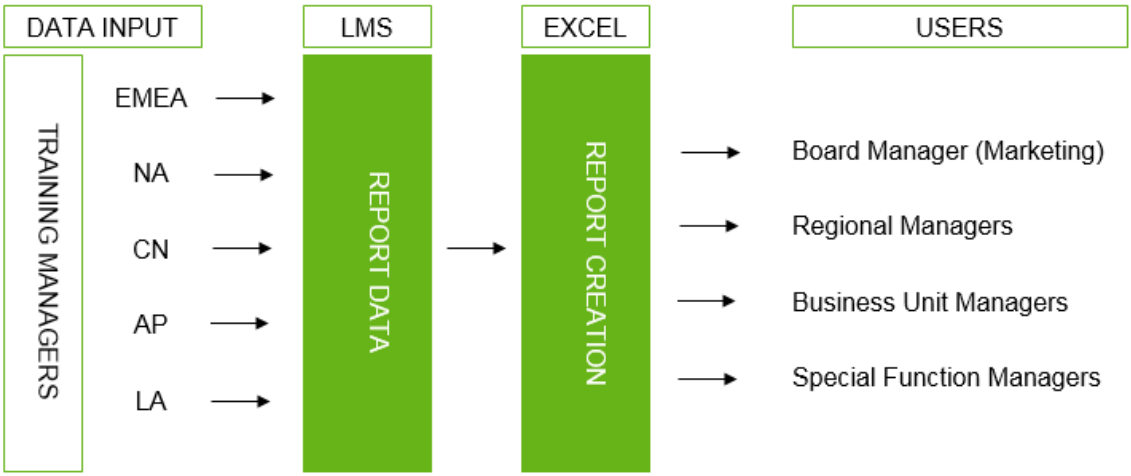


Figure 12. The flow of the training data

Because of the template created, the creation of a report doesn't require too much working time from the global training manager. Every month's sheet is identical and include formulas, which automatically calculate critical data for the report, among which amount of trainer days and student days. The creation of a new global report is estimated to require around two hours of intense working. The most time consuming part in the report is the web based training part, due to the fact that the learning management system doesn't allow to draw out web based training data as uncomplicated as classroom training data.

To support the creation of monthly reports, a guidebook has been established in order to support the usability of the excel template. The guidebook (Appendix 1) is a detailed power point presentation intended for a report creator. The guidebook directs the user to create a new report using the excel template created. By using the guidebook, illustrated in the figure 13, it is ensured that the future reports follow consistency and accuracy

through every month's report. The power point presentation is considered as a crucial tool for a person who is not familiar with the excel report template but must create a new report. The excel template is additionally secured with a password in order to ensure the usability, accurate reports and right formulas.

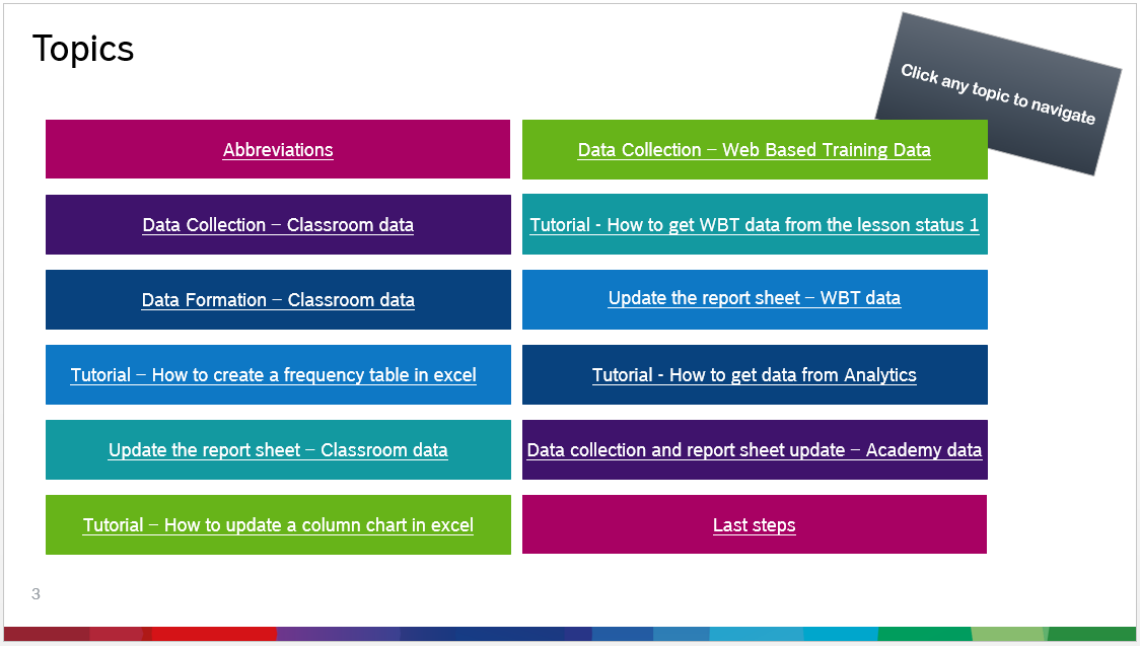


Figure 13. Topics of the guidebook for global report creation

As functional approach should ideally be tested in practice, the usability of the guidebook created was tested in a training intended for the Global Training Knowledge department. The associates of this team will be working with the reporting system in the future and therefore they were trained to use the created system. The guidebook turned out to be easy to use and very helpful for the creation of a new report. There were no further development requests by the trained associates, which indicates success of the guidebook.

6.2 Report content

As the researched theory in chapter four suggests, an internal report should be timeliness and consistent. To follow these guidelines, and the case company politics of monthly reporting, the global report has been decided to be released on monthly basis. The report

is sent in the beginning of every month to the users described in the figure 12. Since the learning management system was launched in the case company in the first half of the year 2016, the data in the system is not yet completely accurate. As argued in the theory, a report might face an issue, when aiming to two goals at the same time; timeliness and accuracy. To release the report on time might affect to the accuracy of the data, especially when the software is relatively new in the company and every employee are not globally using the system yet. As the report content presents training performance figures, it has been concluded to highlight the timeliness over the accuracy. Non-accurate figures in the case company do not make a massive change to the final performance as most of the data is reliably in the system. However, with the release of a new report it should always be mentioned if the data has potential to be not truly accurate.

6.2.1 Classroom training data

The content of the global report can be divided into three main sections; (1) classroom trainings, (2) web based trainings and (3) case company learning academy. The sections are presented in the mentioned order and the main focus of the report concentrates in classroom and web based trainings. To enable the comparison of the information on regional basis and on business unit basis, the report illustrates most of the information comparing the regions and the business units. All report pages are available in the appendix 4.

The first two pages of the report explain the classroom training activities from the past three months. (See figures 14 and 17) While presenting more than the past month, the users are able to compare the performance of each month with each other. Furthermore it saves the time of the users because the managers do not have to search for old reports to compare several months with each other. According to the theory this is preferred by the top managers due to the limited working time and high workload.

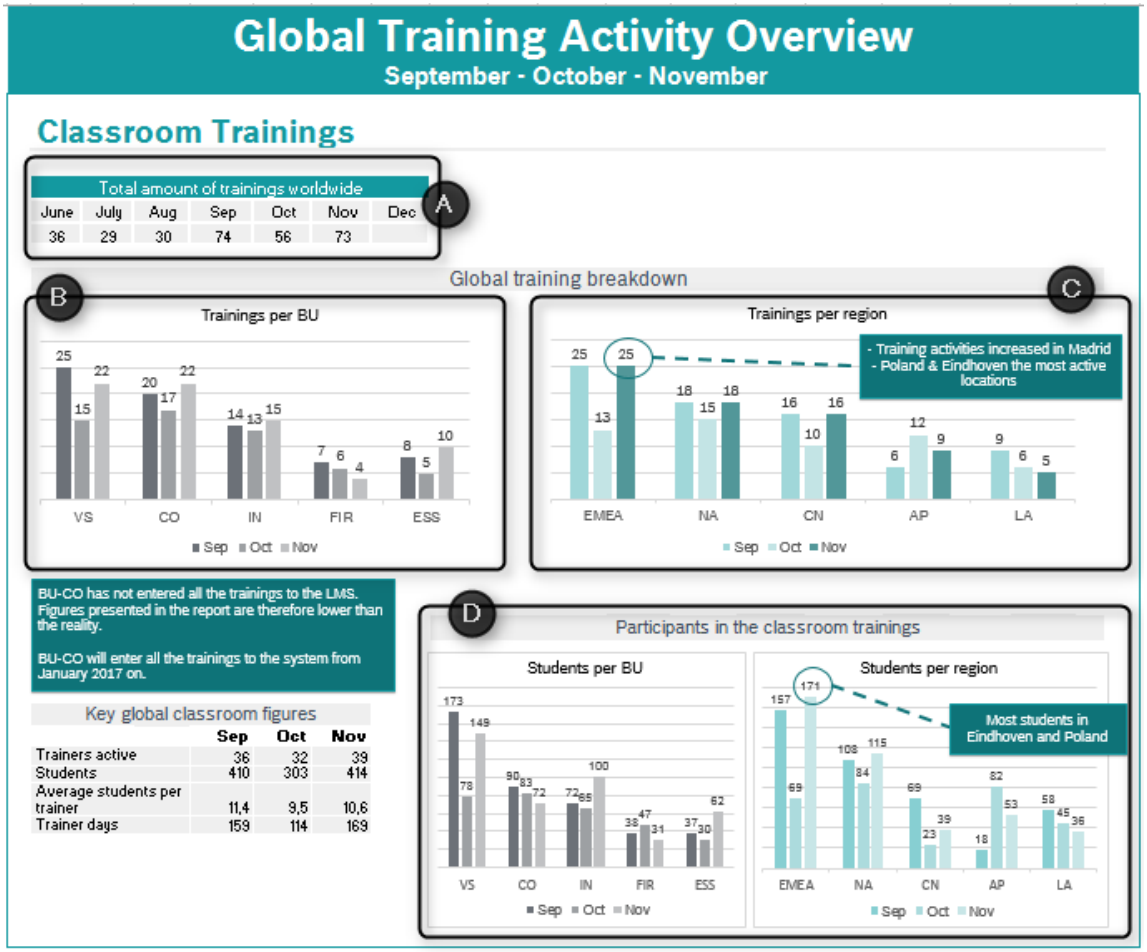


Figure 14. Overview - report page one

The first page of the report, presented in the figure 14, illustrates five different classroom training performance charts. The first table in the report, table 5, states the amount of completed classroom trainings globally, to get an overview how many trainings were run by the whole company in each month of the business year. This table is the only exception that does not present data from the past three months, but instead to show the amount of trainings from the whole ongoing year. Since there is no global training data available before June 2016, the table for the year 2016 included only months from June to December. The table states the performance from more than the past three months, because this way it enables to roughly see the development of a longer time in order to keep in mind how the trainings are developing, while taking a closer look to the latest month.

Table 5. Amount of classroom trainings per month

Total amount of trainings worldwide						
June	July	Aug	Sep	Oct	Nov	Dec
36	29	30	74	56	73	

The second graphs of the report describe the trainings per business unit and per region, as in the part B and C of the figure 14.

In order to compare the amount of product trainings between all five business units, the report illustrates the amount of trainings with columns as in the figure 15. To follow the consistency guideline explained in the theory, the business units represent the same sequence and colors through the report, as do also the five regions. Due to the corporate design of the case company the content creator must use specific colors and must connect specific colors according to the design.

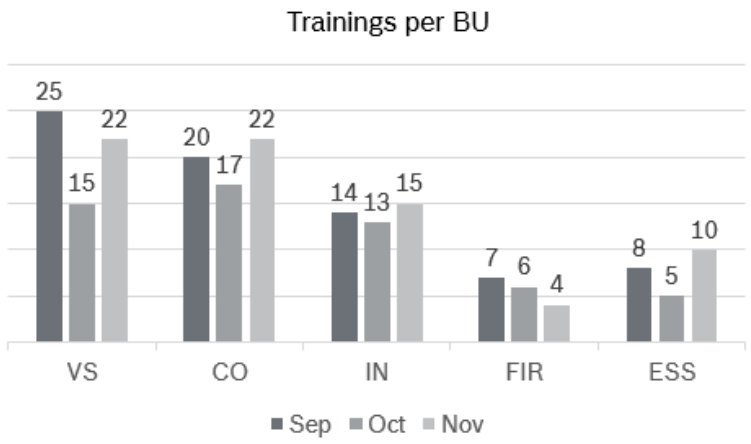


Figure 15. Training volume per Business Unit

The chart presented in figure 16 in contrary illustrates the amount of trainings per regional sales offices (RSO), called in the report by the name region. To present trainings ran by every region is essential, because every region has their own department which is responsible of the trainings completed in the area. In fact this is more important than presenting the trainings by every business unit, because the regions are responsible of the

amounts of trainings. The columns represent every region from biggest to smallest in turnover wise.

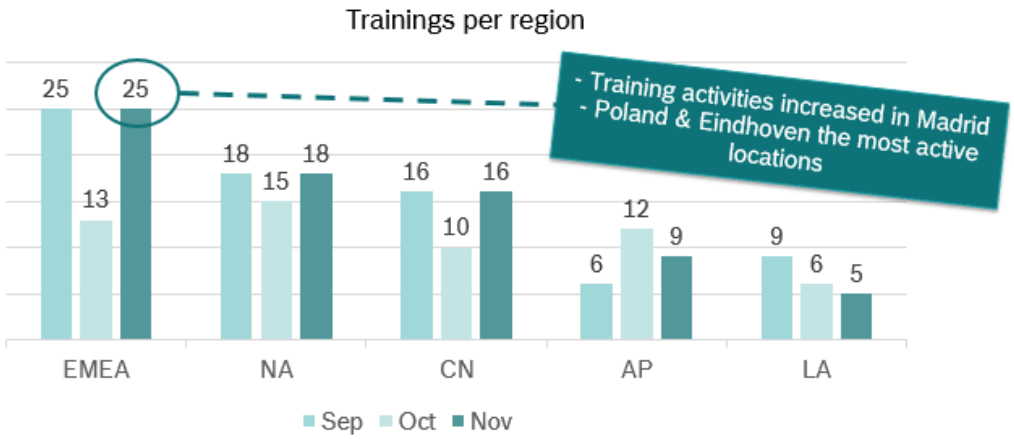


Figure 16. Training volume per region

From this graph the management is able to see which regions are actively running trainings and which regions are performing lower. The top management may follow from this chart the amount of trainings in every region and for example take corrective actions in this case with the region of Latin America, which seems to have low amount of trainings. Nevertheless, the regions are in a strength order which explains the linearly decreasing training performance from EMEA to LA because the turnover is different, which most likely makes the budget for marketing lower and therefore also the resources among which employees and money available for trainings are on different levels. This chart may also just inform the management approximately about the amount of trainings without taking any strategic decisions.

According to the researched theory, supportive comments in the reports facilitate the understanding and reading a report. Since the excel template file with all the informative but complex data is not forwarded to the users with the PDF file, observations, comments that explain the changes in the figures, have been added in case of radical variations. For instance, in the figure 16 the observation explains what reasons are behind the increased amount of trainings in EMEA region, since the performance almost doubled from October to November. Even though the columns and charts update automatically in the excel file

as soon as the data is changed to a new one, the comments must be always added manually. The content of the additional comments and declarations are under a decision of the future report creator.

In addition to the amount of trainings, the first page of the report clarifies the key classroom figures in a table. The table states the amount of active trainers, students trained, average students per trainer and trainer days. Trainer day is a term, the case company uses to describe the duration of the trainings. It is called a trainer day because it states the number of days a trainer has been running a training. The first page additionally presents a closer look on the students of the classroom trainings. As the figure D in the figure 14 shows, the amount of students is presented per business unit and regionally, to follow the comparability and consistency, which both are highlighted in the researched theory. Again an observation is settled on the figure to declare and explain the data in the report to a user who is not able to see the data behind the report.

Figure 17. Second page of the global report

The second page of the report handles data concerning training locations, earlier mentioned trainer days in detail and student days. (See figure 17.) The case company has two basic location options when it comes to classroom trainings. Most of the trainings are ran in the training centers of the case company and a small part in private locations. The percentage of trainings ran in both locations are described in the figure 17 part A. This chart allows the management to see how much the company's own training centers are being used for training purposes and how many trainings are ran elsewhere.

As the part in the figure 17 shows, the amount of trainer days is presented in a chart anew by every region. Below the chart the total amount of trainer days are written in a number. Trainer days can be considered as one of the most important information presented in this report. Trainer days, meaning the duration of a classroom training, presents the days the case company shared and forwarded knowledge and skills regarding to their products. Trainer days tells the management more than for example the amount of trainings because the amount of trainings does not tell exactly how many days the company was training the students. Trainer day is considered as an important number because it shows how active the company actually is with trainings and therefore it is illustrated in the report in detail. Trainer days by every business unit in contrast are not necessary information because thee business units are responsible of the content of a training but regional training managers in turn are responsible of offering and running product trainings.

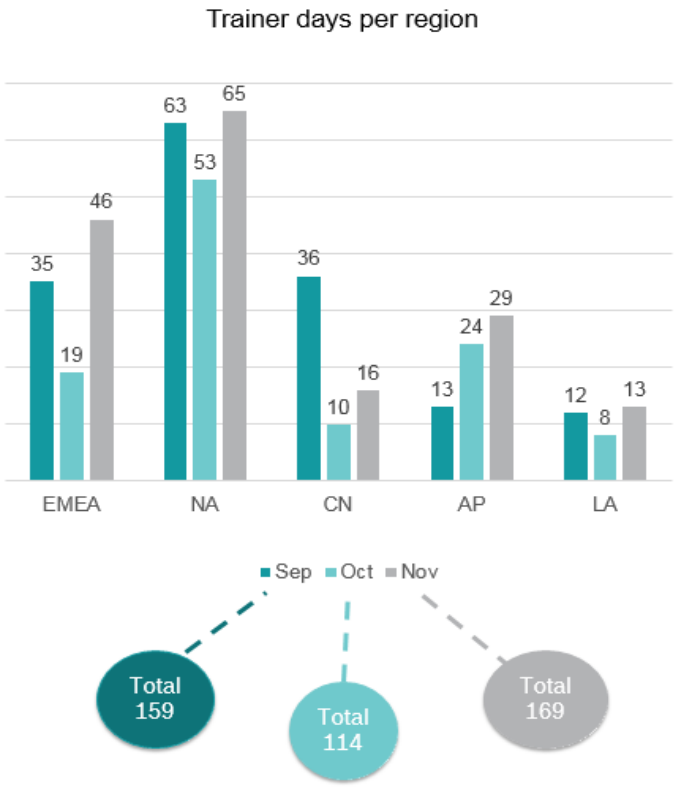


Figure 18. Column chart presenting the trainer days per region

In contrast to the concept of a trainer day, a student day indicates the time a student was participating to a training. In turn student days are crucial to present to indicate the time students were learning from the case company. The amount of student days are presented in order to point out the amount of forwarded knowhow and information to customers and employees. The higher the amount of student days, the more the company has spread their knowledge, either by increasing the amount of training days or by increasing the amount of students.

Both trainer and student days are presented only by regions, because the regions are in charge of the trainings and the business units only in charge of the training content. Therefore comparing trainer and student days by business units is not crucial for the top level managers. For the top management it is not crucial to see how many trainer days or student days each business unit had because it is far beyond their responsibility area. Presenting the data of the second page by business unit would not follow the guideline

rule of controllable variances. Therefore the most useful way is to present the data here by region as in the figure 18.

6.2.2 Web based training data

The third page of the report, shown in the figure 19, represents the most important information concerning the web based trainings of the case company. As only a completed online training represents a successful participation of a web based training module, the report only concentrates on completed modules.

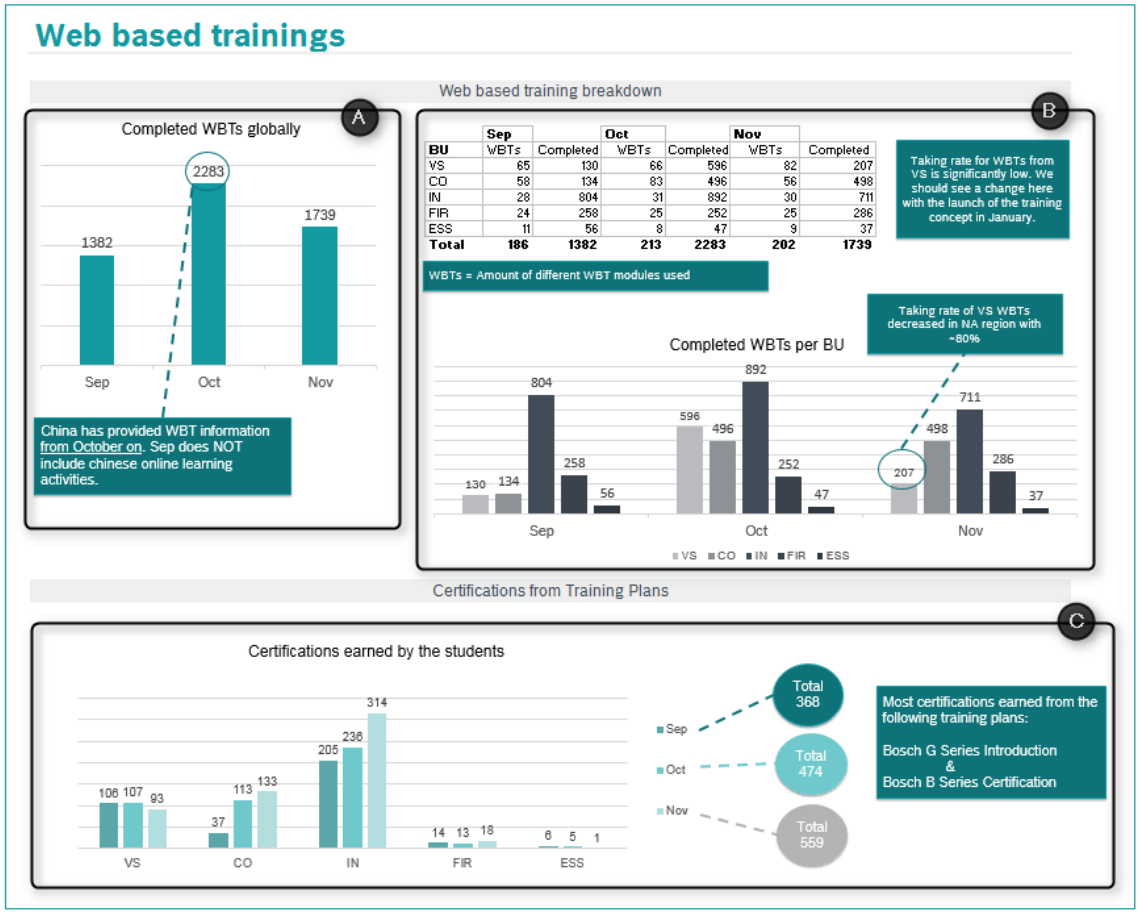


Figure 19. Third page of the global report

Because the business units are responsible of creating web based trainings, every web based training data is presented by business units and not by regions. Regional managers

are not responsible for creating online trainings and therefore it is not essential to provide completions rates by every region.

Online training section in the report illustrates at a first stage the global completion amount of web based trainings per month, as in the part A of the figure 19. Furthermore the report states a breakdown of different modules used and completed by every business unit in the part B of the figure 19.

The online training in the case company does not only consist of individual web based trainings but also from training plans which are a combination at least two WBT modules and may include also virtual classroom courses or face-to-face classroom courses. From every passed training plan a student receives a certification stating the earned knowhow or skill. Certificating the customers is a benefit for the case company, as the certificates prove the quality of the customer which makes the customer a stronger player in the end customer market. The amount of certifications is an important figure to present to the management in order to keep the management updated of the level of certified customers and employees. Earned certificates by business units are illustrated in a column chart in the figure 19 part C.

From the third page the managers are able to see which business units have the most active online training users. Furthermore the management can analyze whether corrective actions should be made, in case the completions suddenly increase or decrease enormously. Dramatic increase might for instance indicate too easy content of a training module or increased demand for a specific product. Decrease in turn might indicate too hard content or decreased demand for online training or possibly discontent on the web based training by the users. There are many issues the management could possibly see from the report and these are only examples of what kind of issues and problems the management could find out from the report.

As the data for the reports grow, the section of online trainings could in the future also include a comparison of visited and completed WBTs in order to find out which courses

are started but not finished. This way the case company could also see which trainings are maybe too hard or in contrast too easy, which means they would always be completed by the users. On the other hand this would be more critical information to the business unit managers rather than for the top manager and the vice president of the company.

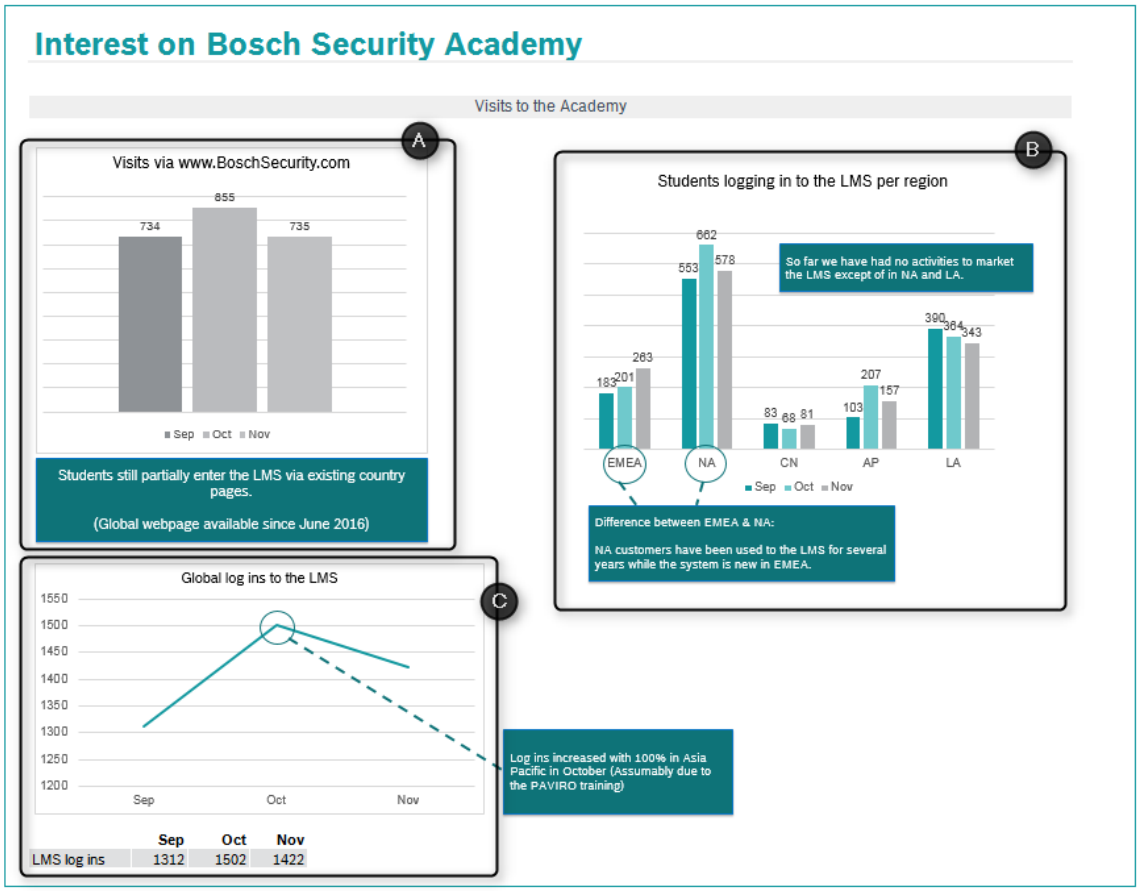


Figure 20. Last page of the global report

The fourth and the last page of the report presents the activities in the learning academy of the case company. The academy was decided to include in the report shortly, because it is the webpage through which customers and employees can log in to the learning management system, see the training catalogue and reserve a place in a training. By presenting these figures, the managers are able to monitor the journey of the company's global web page, which also was created on the first half of the year 2016, and the usage of the learning management system. The amount of visits is assimilated to the interest of customers on the product trainings of the company. The global amount of visits to the

learning platform via the global company webpage are presented in the part A of figure 20. To point out the interest and the usage of the learning platform by every region, the part B in figure 20 presents the amount of user logging in to the system by every region. The part C of the figure 20 in turn represents the amount of students logging in to the learning management system. The column chart 20.A and the line chart 20.C present basically the same information but the chart A does only count the loggings that were done through the global company webpage. As the regional webpages still exist in most of the countries, every log in does not happen through the global web page. Therefore the chart C is added in order to illustrate the real amount of loggings to the learning management system. From the last page of the report the management is able to see how many users are currently using the learning management system.

The internal management report follows all the reporting guidelines discussed in the researched theory. The reports present accurate figures and enables the managers to compare two essential factors with each other, regions and business units. The excel template created is secured which maximizes the reliability of the data presented in the report, and enables the training knowledge department to release reliable and accurate information to the managers. The report is through all months consistent. The same principles and practices, among which ways of measuring and visualizing apply in every report. Throughout the ongoing process of the report, various amounts of data have been collected, analyzed and eventually finalized in order to include the most relevant data to support the nature of the project. The finalized data include overview of the most important training performance of the case company and anything that is outside of the controllability of the top management are excluded in the report. An example of data excluded in the name of controllability, are for example detailed student and trainer data. The report further follows simplicity, as it is continuously strictly focused on the training topics only and to specific chosen factors such as trainer days and student days. Additionally the report is easy to comprehend, especially with the additional comments. Moreover the reports are neutral and highlights only important variations in the performance. The reports are released in the beginning of the month to follow the timeliness and to provide important data for the managers on time.

7 RESULT OF COST ANALYSES OF PRODUCT TRAININGS

This chapter explains the second part of the project which object was to declare the costs of product trainings in the case company. The aim was to estimate how much the company spends money on trainings. The result is divided into two sections, classroom cost estimation and web based training cost estimation which both will be argued separately and eventually compared.

7.1 Cost estimation of classroom trainings

The cost estimation of classroom trainings is a result of several skype meetings, phone discussions and e-mails with the North American regional training manager and his assistant. The first meeting was hold on 19th October 2016 via Skype. The researcher prepared the meeting with several general questions regarding to the topic (Appendix 2). The meeting was planned to be a preliminary discussion to discuss with the regional training manager the aims and goals of the global training management department, and to find out the opportunities of the measurement of the training costs. After the first meeting the objectives and possibilities of which costs should and could be estimated were clear to both sides which enabled the project to continue. Sub sequential the researcher received detailed cost information regarding the classroom trainings, among which for instance trainer salaries and facility costs. The first estimation was created in the end of October but due to the lack of training data, a new estimation was decided to be created in the beginning of January by using the training data from the timeframe of June and December 2016.

The reason the training manager in North America was chosen to be the source of cost information is, that in that specific region there has been a longer recording of trainings than in any other regions. None of the other regions know exactly the key training indicators such as amount of trainings, trainers or students trained before the global reporting started in August 2016. Additionally North America is a sales region which

includes only two countries, United States of America and Canada, which enables more accurate cost estimation because of only two separate countries and currencies. As a last argument, North America is the most active region in terms of classroom trainings and represents one of the highest cost level in the market. EMEA is the most successful region for the case company in terms of sales and turnover but it turned out that EMEA would not have had enough cost information of trainings and enough training data, since the learning management system was launched in the first half of the year 2016. EMEA additionally includes more than 20 different countries which would have made the estimation rather difficult especially due to the lack of information and different cost levels and currencies in different countries.

The data yielded by the discussions provides convincing evidence that the cost patterns of classroom trainings include step costs, variable costs and fixed costs, which are described in the figure 21. The costs have been separated to the cost patterns to better understand the costs and the relationship between cost factors and cost objects. As the figure 21 presents, the equipment and facility costs are not driven by any variable factors but instead they are a fixed amount through a year. Catering and shipping, including training material such as books and notebooks, vary according to the amount of participants and therefore considered as variable cost pattern. As a last cost pattern is a step cost which represents trainer costs. One trainer is able to train a certain amount of students but as soon as the amount of students increases beyond the capapcity of one trainer, either another trainer or a new training is required. As the trainer expenses do vary depending on variable factors such as where the trainer is currently located and not depending on the students, it cannot be illustrated as a clear cost pattern.

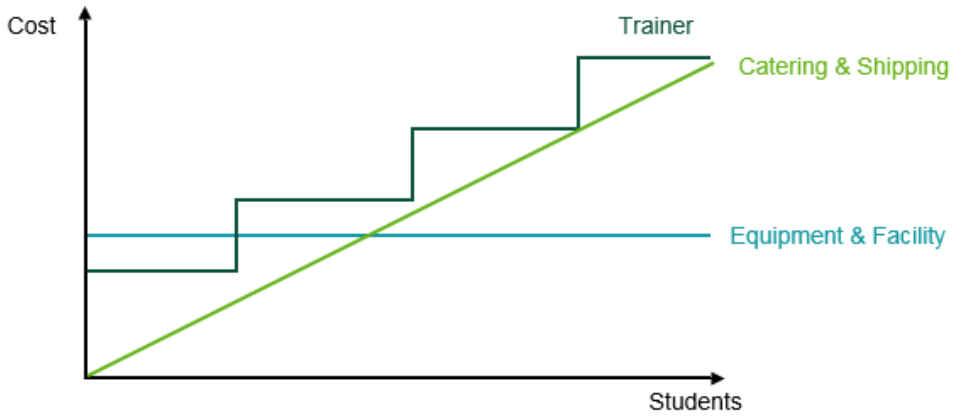


Figure 21. Cost patterns of classroom trainings

Based on the meetings and discussions hold with the regional training manager in North America, the data gathered eventually appears to suggest that a classroom training includes four main indirect cost objects and several costs directly related to a classroom training. Among the main cost objects are trainer salaries, facility costs, management fee and equipment renewal costs. The cost factors of a classroom training are reported in the table 6, which additionally presents separately all the costs related to a trainer day. The calculations are based on the information generated by the regional training manager and additionally based on the data gathered from the learning management system.

Table 6. The estimation of classroom trainings costs in a training center

Training Center		
Cost per training day	**€***	**%**
Trainer wage	1.339,69 €	63%
Expenses of a trainer	525,58 €	25%
Facility	96,47 €	5%
Catering	121,64 €	6%
Shipping	22,53 €	1%
Additional fixed costs	29,83 €	1%
Equipment shipping	- €	
Total	**2.135,73 €**	

*0,901 09.11.2016

The available evidence, reported in the table 6, seems to suggest that 88% of the total classroom training costs are directly related to a trainer. The rest of the costs, including facility, additional fixed cost, such as management fee, catering and shipping costs seem to be a minor part of the total classroom training costs. Even the data appears to suggest, that eventually the costs per a classroom training in a training center is estimated to be around 2.100 euros, it is not the final estimation. This amount does only argue for the costs of a training day ran in a training center.

As the classroom trainings ran in the region of North America may be ran in different locations, additional factors must be taken into account. Most of the trainings are ran in the training centers of the case company and some are ran in private locations, among which customer's sight and hotels. The data gathered seems to debate, that around 42% of trainings ran in the region yearly are ran in the private location and around 10% of those are run in hotels.

Since private locations are being used as a location in almost half of the trainings in the region, it has been taken into account while creating the final estimation. Table 7 describes the cost factors of a training day in case of a private location. As private location may mean a training ran either at a hotel or at customer's sight, the table below includes both cases.

Table 7. The estimation of classroom training costs in a private location

Private Location				
Cost per training day	Hotel (€*)	%	Customers sight (€*)	%
Trainer wage	1.339,69 €	56%	1.339,69 €	70%
Expenses of a trainer	525,58 €	22%	525,58 €	27%
Facility (hotel)	225,25 €	9%	- €	0%
Catering	121,64 €	5%	- €	0%
Shipping	22,53 €	1%	22,53 €	1%
Additional fixed costs	29,83 €	1%	29,83 €	2%
Equipment shipping	121,64 €	5%	121,64 €	6%
Total	2.386,15 €		1.917,63 €	

*0,901 09.11.2016

As the tables 6 and 7 present, the difference between the training day costs in different locations turned out to be minor. Nevertheless, all three cases have been taken into consideration in the final estimation, in order to take all the possible cases into account. Due to the three different results of the costs per training day a weighted average was calculated and as a result the average cost per training day was created. As the different training locations were taken into consideration in the cost estimation, the method used is the three point estimation. As the theory researched claims, three point estimation takes into account three cases; (1) optimistic, (2) most likely and (3) pessimistic case. In this case the most optimistic case is the lowest price at customers sight, the most likely is the mid value in training center and the pessimistic is the value in hotel. The final result is an average of all the three cases.

Table 8. The final result of classroom training cost estimation

Cost of trainings in NA	Training day (€)	%	Weighted average
Training center	2.135,73 €	58%	1.238,73 €
Private Location Hotel	2.386,15 €	32%	763,57 €
Customers sight	1.917,63 €	10%	191,76 €
Average	**2.146,50 €**		**2.194,05 €**

On the basis of the evidence currently available, it seems fair to suggest that a training day costs approximately 2.200 euros for the case company. Considering the fact, that the result is based only on the data received from the North America region, the estimation may perhaps be slightly under- or overestimated. Underestimation is rather detrimental because the reality might prove that the estimation provided before turns out to be lower than the reality. This indicates to the management weak performance of the department responsible of the estimation. Nevertheless, significant underestimation has been avoided by creating estimations based on a region that has high salary levels and costs of facility. In addition, overestimating is rather ideal when the possibility of fully reliable estimation is low, because it indicates more reliable impression than an estimation that finally turns out to be lower than the actual costs.

The learning management system of the case company is able to provide data from June 2016 on. As the measurements and estimation were completed in the beginning of the year 2017, the global data available for the use was from the past six months. The data appears to prove that the average amount of trainer days per month is 234. With regard to the defined cost of a trainer day, the available data seems to suggest that the case company spends approximately 3 million euros on classroom trainings per year. However, if the costs of global training management and content creation is included, the total amount can be argued to be globally around 4.5 million euros per a year. All calculations, estimations and training data used are available in the appendix 3.

However it should be taken into consideration that some of the results presented are potentiality an overestimation and could be assumed to be higher than the reality. The reality is expected to be a bit lower due to regional differences on salary levels and general cost levels, for example in terms of facility costs.

7.2 Cost estimation of web based trainings

The cost estimation of the case company's web based trainings is based on data gathered from two internal employees. The employees are the responsible persons of the web based trainings in business unit intrusion alarm and video systems. After the first global reports were created, it appeared that the business unit's intrusion and video systems were the most active business units in terms of web based trainings. The data sources for the cost estimation were therefore decided to be the responsible person of web based trainings in these both business units.

The measurement and estimation of web based training costs has a clear objective but due to several characteristics of the process of creating an web based training, it turned out to be impossible to measure the costs and aim to fully accurate result. Subsequently the result of the measurement is rather called an estimation because it includes certain uncertainty. Due to two existing issues, the measurement of web based training costs is not possible to make truly accurate. First reason is the recent launch of the learning management system

and the lack of training data. Another reason is, that the business units do not have accurate information on the costs of creating a web based training, due to problematic characteristic of the creation of the object. Figure 22 explains factors that affect to the time, effort and in that way also to the costs of creating a web based training. As the figure describes, depending for instance on the complexity, style, content and language of a web based training, different amount of time for the creation process are required. Nobody has closely monitored the creation time, or the costs. Additionally the case company has various different web based trainings which increases the difficulty of conducting the measurement.

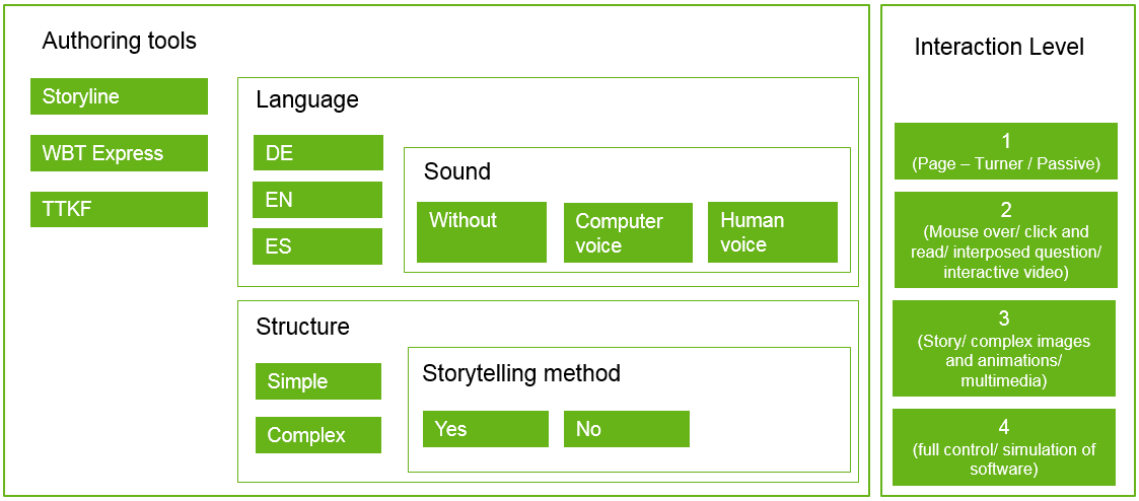


Figure 22. Cost influencing characteristics of a web based training (Case company internal file 2016)

According to the employees responsible the web based training costs has three main direct cost factors; salary of the instructional designer, software costs and translation costs. As cost patterns previously mentioned cost factors are all fixed costs as they do not vary in an alignment with increasing or decreasing level of activity. As figure 23 argues, none of the cost factors vary in alignment with the amount of students. Based on the figure it can be claimed that no matter if the amount of participants is low or high, the costs for the company are the same.

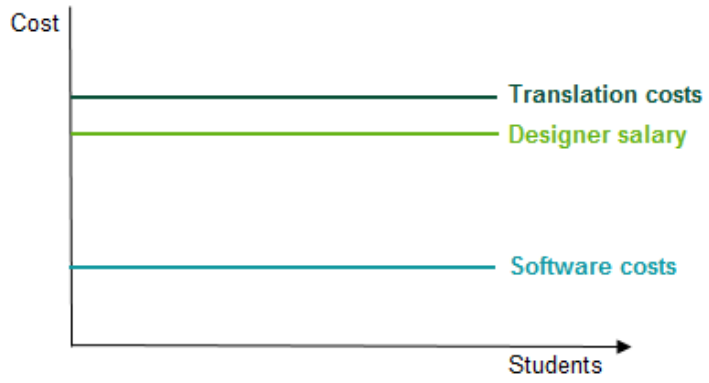


Figure 23. Cost Patterns of Web Based Trainings

The data generated by the employee responsible of intrusion alarm web based trainings, seems to suggest that the cost of creating a web based training module varies enormously. The biggest cost objects turned out to be translation costs and the instructional designer costs. However, the final result appears to suggest that the total price for creating an average module, 30 minute long and translated to three languages, would cost around 8.700 euros for the case company, as presented in the table 9. On the other hand, there has been an inconclusive debate about whether the result can be considered as a proper average estimation. The person who is responsible of web based trainings in video systems, has announced disagreement on the behalf of the topic. Firstly, video web based trainings are 20 minutes shorter than intrusion web based trainings, secondly, video trainings are planning to be translated into seven languages unlike intrusion modules only to three languages, thirdly, the life time of a module is expected to be maximum two years by the video business unit but intrusion in contrast gives a module around 7 years of life time, only with minor updates, now finally, intrusion alarm systems have only few modules while video systems in comparison have many modules. Despite this, as the data available is rather limited, it has not been possible to include other business units than intrusion alarm to the cost estimation.

Table 9. Cost of creating a Web Based Training

Cost per translated WBT module (30min)	
Creation costs	2.434,39 €
Translation costs (3 languages)	6.222,00 €
Total costs of a WBT	**8.656,39 €**

Based on the data available and the three point estimation method, it can be claimed that the cost per user of a web based training is in average around two euros. As the table 10 describes, three different WBT modules with varying taking rates, were chosen and their annual taking rate was estimated in order to estimate the cost per user. The method used is three point estimating and therefore the calculations takes into consideration the most optimistic, pessimistic and most likely situations.

Table 10. Costs of Web Based Training per user

Cost Estimation	Takes per year	7 years	Cost per user
G Series Introduction Product Overview	1128	7896	1,10 €
B Series Introduction Product Overview	464	3248	2,67 €
B/GV4 Assessment	112	784	3,11 €
Average			**2,29 €**

Furthermore the result appears to suggest that there can be seen two extreme scenarios; best case and worst case scenarios. As illustrated in the figure 24, the best case scenario has a low cost per user due to high demand of the module, simple content of the training and long life time. On the other hand the worst case scenario, has higher cost per user due to three main reasons; (1) low amount of module completions, (2) complex module content and (3) short lifetime.

Figure 24. Best case and worst case of Web Based Trainings

7.3 Comparison

Considering the results of the cost estimations, it can be concluded that the costs derived from the two different training ways, face-to-face and online training, vary massively. With regard to the result of the classroom training day costs, it can be argued that the cost per student per training day is around 500 euros. In contrast, the cost per student in case of web based training, has turned out to be lower. As the best case and worst case scenario in figure 24 presents, the costs per user in web based trainings vary enormously. Anyhow, it can be claimed that a web based training is more cost effective option for the case company, if a module is completed more than 18 times, as the table 10 presents. (Total costs of creating a web based training divided by the cost per student in classroom trainings.)

The result only applies in a case where the expected life time is seven years, the taking rate stays the same through all seven years and the module is translated into 3 languages. Furthermore, if the amount of students in classroom trainings would increase, it would mean lower cost per student which would increase the limit of web based training being cheaper than classroom training. The cost per user per a web based training presented in the table 10, is measured using the three-point-estimation method. There are three cases chosen for the measurement and the result is an average of these three. The detailed calculation is available in the appendix 3.

Table 11. Comparison of cost per student in different training modes

Classroom Training vs. Web Based Training

Web based training	
Expected lifetime	7 years
Duration	30 min
Languages translated to	3
Cost per module created	8.656,39 €

Training type	**Cost per student**
Classroom	500,00 €
WBT	2,29 €

8.656,39 € / 500,00 € =	17,3

To bring the estimations closer to the reality, as the duration of a module is around 30 min, the result of a web based training cost per student should be multiplied with 16, assuming that a working day is eight hours. Even the result is multiplied with 16, which would make 36.64€ per user, the cost per user would still be lower than in the case of classroom trainings. Despite this, it cannot be argued for which training mode the case company should truly focus on. As the efficiency and the effects of the different training modes have not been measured, it cannot be claimed which training type would eventually be the best choice. However, as the completion rates of the web based training modules are relatively high, it is more cost efficient for the case company to focus on web based trainings.

7.4 Reliability and Validity

Reliability and validity can be defined from two perspectives, from the research method perspective and from the result perspective. Reliability indicates how reliably and consistently the research has succeeded to measure results for the set research problem. Reliability depends on the frequency of the measurement and the faults made during the measurement. The research method must be consistent and precise in order to reach high reliability. Furthermore the framework must be clear and the aims must be understood by

readers. Reliability measures whether the research result is only a coincidence or whether the result is frequent. In this thesis the reliability of the result must be considered from two sides, since there were two outcomes. The reporting system is a reliable result because it was created and constantly improved in cooperation with the case company, following the framework created in the beginning. Furthermore the result provides a reliable result for the set research problem. The cost analysis of product trainings can also be considered as a reliable result, as the result answers to the set research questions. The result is as close to the reality as possible but the frequency was not able to be measured from longer period. As the data base at the company was not large enough to make totally accurate measurements, the cost estimation created should be considered as a preliminary measurement. Nevertheless, the set research problems where answered by the project and the result created based on six month data can be claimed to be quite reliable and not a coincidence.

Validity indicates the success of the research method, meaning that a high validity research has measured what was supposed to measure in the project. If the validity of the research is high, it has succeeded to provide results to the set research problems. If the research is not valid it has measured something totally different than what was supposed to. In this functional thesis the validity can be claimed to be high, because the chosen research method and the result corresponds to the set research problem and research questions. This thesis has succeeded to provide answer and create a solution to the research problem that was set in the beginning.

8 CONCLUSION

Management reporting is requirement for successful management especially in large global companies. Reporting is crucial in order to guarantee the best possible decision-making and effective management. Cost management on the other hand has an important

role in management because it measures, monitors and manages the resources of the organization. Costs must be managed and in order to enable the cost management, the cost factors and objects must be clarified.

This functional thesis created two outcomes, a reporting system and a cost estimation. The first phase included the creation of an informative, reliable and visually attractive reporting system. As the project was conducted in a case company, it was an ideal environment for the researcher to test the project result in practice and to develop the system constantly. The case company took the reporting system in to monthly usage in September and since then the reports have been improved constantly both, in content and layout wise. The very final format of the report has been in usage since beginning of December 2016. The top management has been satisfied with the report and the company is using the reporting system as created by the researcher.

The global training reporting system, provides reports to the top management including informative information in clear, simple and attractive layout. The management is able to quickly take a look at the product training performance of the company and compare it with the previous months. The report may be used to take decisions on strategic level. As the management is able to compare the training performance by every region and every business unit, they may invest more resources on specific location or business unit, if necessary. As the global reports mainly present the data from the past three months, it does not indicate seasonality. Seasonality on the other hand will be presented in an annual reporting which is excluded from this project.

The cost estimations created are rather preliminary estimations. It has not been possible to create accurate estimations due to several reasons, among which lack of training data and lack of cost data. North America was the only region that had accurate cost figures of classroom trainings ran in their area. Nevertheless, the cost estimation result guides the case company to have an idea how much resources they spend on trainings and which training mode is the most cost effective one. The result suggested that online training is

more cost effective than classroom training, if the online training is attended at least 18 times.

Both of the project results have been used in the case company as they are. The research problems found in the beginning have all been discussed and researched during this thesis project. Every research question has been successfully answered and solved. Further research could be conducted on the area of student satisfaction or the benefits of different learning modes. More accurate measurement of costs, which would not be possible on a short term, could be researched after a web based training module has come to the end of its lifetime. Additionally the effect of customer trainings on company revenue could be researched in the future.

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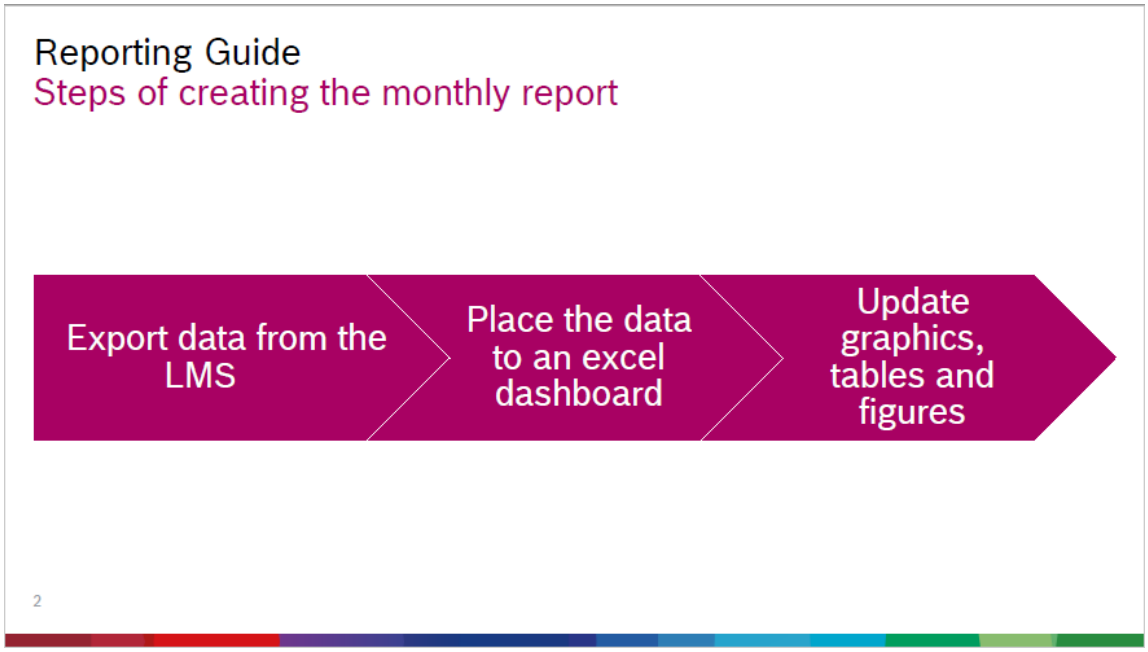
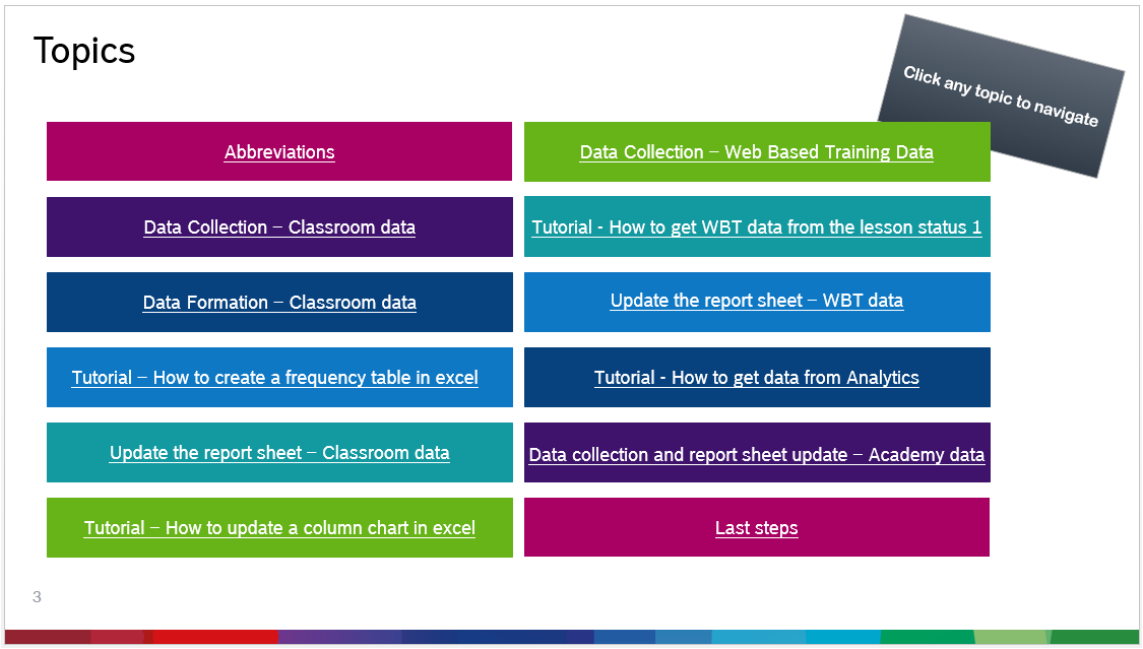
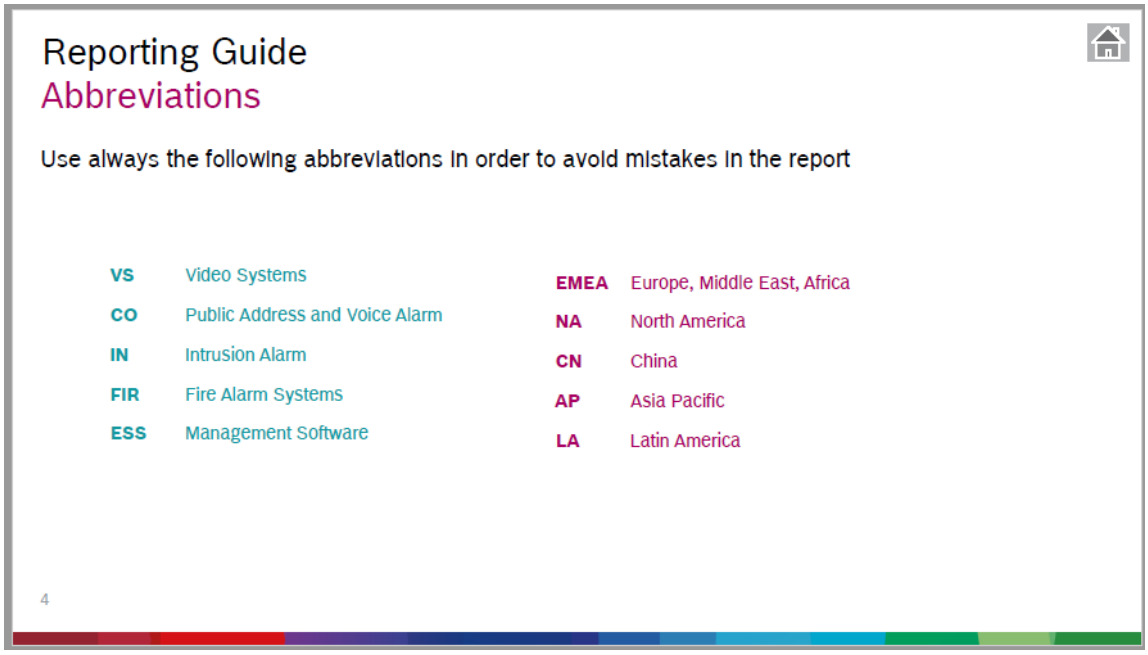
APPENDIX 1


GLOBAL TRAINING
REPORTING GUIDE


Reporting Guide
Steps of creating the monthly report
Export data from the LMS
Place the data to an excel dashboard
Update graphics, tables and figures
2


Topics
Click any topic to navigate
Abbreviations
Data Collection – Web Based Training Data
Data Collection – Classroom data
Tutorial - How to get WBT data from the lesson status 1
Data Formation – Classroom data
Update the report sheet – WBT data
Tutorial – How to create a frequency table in excel
Tutorial - How to get data from Analytics
Update the report sheet – Classroom data
Data collection and report sheet update – Academy data
Tutorial – How to update a column chart in excel
Last steps
3


Reporting Guide
Abbreviations
Use always the following abbreviations in order to avoid mistakes in the report
VS Video Systems
CO Public Address and Voice Alarm
IN Intrusion Alarm
FIR Fire Alarm Systems
ESS Management Software
EMEA Europe, Middle East, Africa
NA North America
CN China
AP Asia Pacific
LA Latin America
4

Collecting data
Data collection and exporting to the dashboard – Classroom data

1. Start creating the report in the back hand of the LMS.

2. Go to Face-to-Face section, choose planning and under planning choose course.

3. Insert the dates required and change the status from open to any.

Click search.

4. All classroom courses available in the set time period are available for you to see in the list now. Export the data to the excel by clicking on the left side "export to excel".

5. Now you have the data in excel. Delete from the list all the following trainings:

- Trainings with registration amount of 0
- Test trainings
- Presentations in the Experience Center

6. Add the data of the following columns to the global training report dashboard. Remember to use the sheet of the current month.

- Class ID
- Course Title
- Start and End
- Venue
- Trainer
- Registered

5

Classroom data
Formatting the data

Tutorial video for the steps 8 and 9 on the next slide!

6. Modify the Start and End dates to the following format: dd.mm.yyyy.

If this step is forgotten, the formula will not be able to calculate the duration correctly.

7. As the LMS is not separating the courses based on BU's and regions, it must be done manually.

Insert to the columns "BU" and "RSO" the correct abbreviations.

Use class ID's (e.g. V_* -> VS) and the venues (e.g. Shanghai Office -> CN) to figure out the right BU or RSO.

Location	Trainings	Training days	Students in Locations	VS	CO	IN	FR	ESS
Eindhoven	1	3	5	5	0	0	0	0
Grasbrunn	1	1	2	0	0	0	0	2
Ballerup, Denmark	2	2	35	35	0	0	0	0
Fairport Training Center	1	4	9	0	0	9	0	0
Ontario Training Center	1	4	2	2	0	0	0	0
Greer Training Center	1	4	4	4	0	0	0	0
Lancaster Facility	1	3	10	0	10	0	0	0

8. Create frequency table for the venues.

1. Mark all the Venues in the data list and include the header (Venue)
2. Go to the Data tab
3. Click filter and then advanced
4. Choose copy to another location
5. Choose the right cells to the "copy to" section
6. Select "Unique record only"

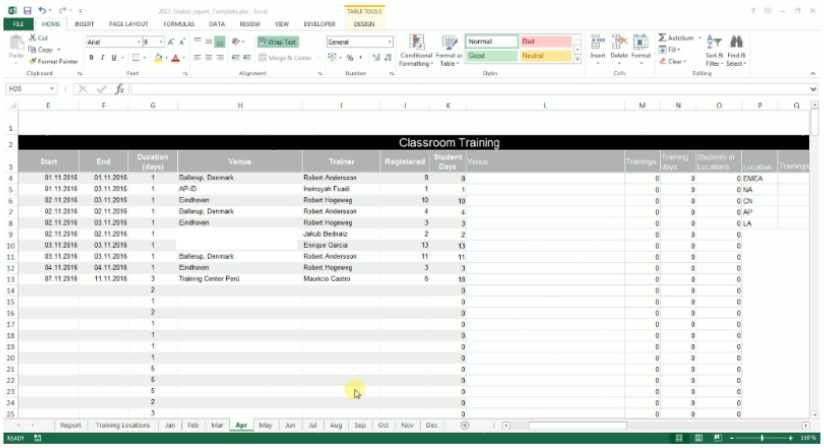
As soon as the venues are mentioned only once, the following columns calculate automatically the trainings, trainer days and students in every venue and in every BU.

9. Create frequency table for trainers, as you just did for the venues.

The amount of classes, students and trainer days per trainer will be calculated automatically.

6

Tutorial
How to create a frequency table



7

Creating a Global Report
Updating the Report Sheet – Classroom data

Detailed description of the update of a column chart is on a next slide

1. All the classroom data is calculated now in the sheet of the current month. The next step is to update the graphics on the report slide.

2. Start writing manually the amount of trainings of the current month to the first table.

Total amount of trainings worldwide						
June	July	Aug	Sep	Oct	Nov	Dec
36	29	30	74	56		

3. Update all the column charts by adding the newest month and deleting the latest.

   The monthly sheets are already connected to the column charts. All you need to do is to select the months you want to show in the graph.

8

Creating a Global Report
Updating the Report Sheet – Classroom data

4. Update the data manually in the key figure table.

5. Update the line chart like you updated the column charts by selecting the months you want to illustrate in the chart.

6. Continue to update the web based training part of the report.

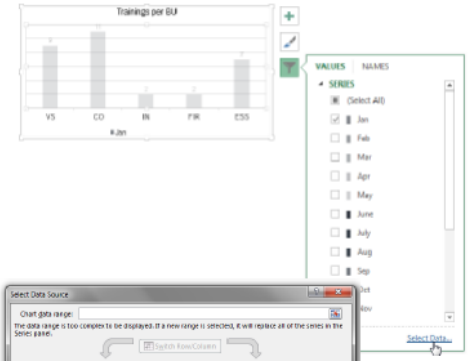
Key global classroom figures	Month	Month	Month
Trainers active			
Students			
Average students per trainer			
Trainer days			

9

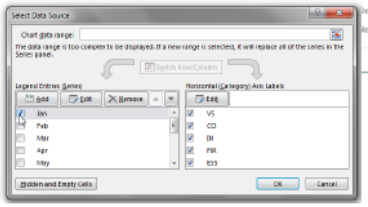
Creating a Global Report
Updating a column chart

1. Choose the chart you want to update
2. Select "Select Data" under the filter button
3. Select the months you want to include in the chart
4. Select OK
5. Move to the next chart and repeat the same in all column charts

2.



3.



10

Creating a Global Report
Data collection – Web based training data

Tutorial video how to get the data from the lesson status 1 on the next slide

1. Start colleting the data in the Tutoring section of the LMS.

2. In the forth hand, go to lesson status 1.

3. Search for WBT data separately by every BU, using the abbreviations listed in the slide 3.

4. Import the data to excel and calculate the data required.

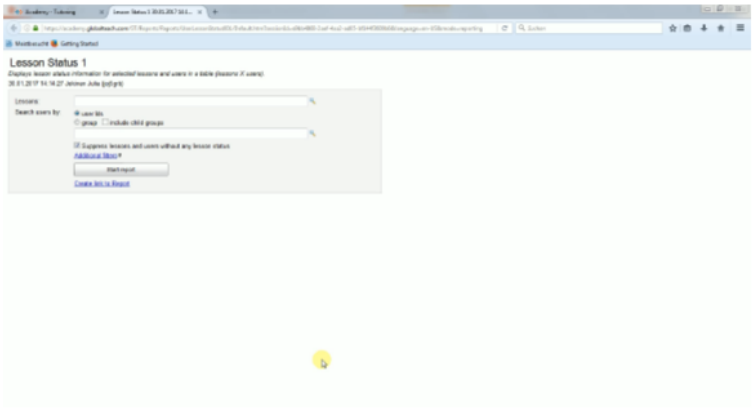
The data you will need to export from the LMS are marked below.

AD	AE	AF	AG	AH	AI	AJ	AK	AL
BU	WBTs	Users	Passed	Completed	Total completed/ passed	Training Plans entered	Certificates (Passed TPs)	Ratio
VS	14	108	92	1	93	158	81	51%
CO	53	95	30	170	200	94	52	55%
IN	27	226	519	199	718	374	246	66%
FIR	25	86	28	193	221	39	12	31%
ESS	12	49	21	82	103	27	7	26%
Total	131	564	690	645	1335	692	398	

- Amount of WBTs
- Amount of Users
- Amount of Passed WBTs
- Amount of Completed WBTs
- Amount of training plans entered
- Amount of training plans passed

11

Tutorial
How to get WBT data from the lesson status 1



To keep in mind while exporting WBT data from the LMS:

1. Select the identification depending on which BU data you are looking for
2. Select either web based training or training plan option
3. Include all the training modules
4. Choose from additional filters the time frame wished

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Creating a Global Report
Updating the Report Sheet – Web Based Training data

1. As you now have all the data in the monthly sheet, you must update the graphs and information on the report sheet.
2. Copy the data of number of WBTs and completed WBTs from the month sheet to the table in the report sheet.
3. Now you should see that the column charts in next to and below the table update automatically.
4. Update the 'certificates by students' column chart by choosing the months you want to present in the graph.

	Jan		Feb		Mar	
BU	WBTs	Completed	WBTs	Completed	WBTs	Completed
VS	10	50				
CO	15	100				
IN	10	50				
FIR	15	100				
ESS	10	50				
Total	**60**	**350**	**0**	**0**	**0**	**0**

13

Creating a Global Report
Data Collection and Updating the Report Sheet – Interest on

1. The l Data is collected from two different platforms; LMS and Analytics. Start by looking how many users logged in per region. Go to LMS and go to the backhand.

AM	AN
RSO	User log ins
EMEA	
NA	508
CN	90
AP	96
LA	281
	975

2. Go to 'Users' tab
3. Select the group you want the data for.
   (For example st_stud_emea)
4. Select the wished time frame in the 'last login' section. Click 'Search'.
5. Update the column and line chart in the report sheet again with the required months.
5. Now you are only missing the data for the chart 'Visits via ' Next slide will instruct you to get the last data.

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Creating a Global Report
www. .com

1. As soon as you have logged in, click pb.com
2. Go to ”Content”
3. Go to “Navigation Level 1-4”
4. Go to “5. Learning and Support”
5. Take the visit rate from
6. Remember to put in the right time frame

15

Creating a Global Report
Last steps

- Now all your data except text boxes are updated. Add your comments and add the total amounts to the text boxes, where required.
- Save the report as a PDF and submit it.

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APPENDIX 2

Classroom Training costs in NA 19.10.2016

Skype Interview/ Discussion with two internal employees from the North America Region

We suppose that the two main cost factors of classroom trainings are the trainer and facility costs.

Trainer related questions

1. What kind of costs are related to a product trainer?

2. How much does it cost for the company to have a trainer for example in a year, in terms of salary, and additional payments e.g. pension?

Facility related questions

3. The facility costs probably consist mainly from the rent, how much is the rent and are there any additional costs e.g. electricity?

4. What about trainings in private location, how much does the company have to pay to rent for a seminar room in a hotel for a training?

Additional questions

5. Apart from the trainer and facility costs, what are the other cost factors of classroom trainings?

6. What additional costs or issues should be taken into consideration while calculating the total costs of a classroom trainings?

APPENDIX 3

NA TRAINING DATA 2016	Trainings	Trainer days	Students	Trainers	Tdays in Private Locations	Tdays in Training Centers	Average duration of a training	
Aug	16	57	77	9	27	30	3,6	47%
Sep	18	64	114	10	29	35	3,6	45%
Oct	15	53	84	11	19	34	3,5	36%
Nov	17	63	112	10	20	43,0	3,7	32%
Dec	11	38	75	8	18	20	3,5	47%
Average	**15,4**	**55**	**92,4**	**9,6**	**22,6**	**32,4**	**3,6**	42%

Trainer days	In a month	In a year
per trainer	6	69
in Training Center	32	389
- per training center	6	78
in Private Location	23	271
Trainer days	55	660

Classroom Training Costs in North America

Cost item			FY Cost 2017	€
Fully burdened wages & benefits* (10 Trainers)			$ 1.022.235,00	921.033,74 €
	per trainer		$ 102.223,50	92.103,37 €
Facility Rent**			$ 38.029,00	34.264,13 €
Facility cleaning and maintenance**			$ 3.600,00	3.243,60 €
	Per facility		$ 8.325,80	7.501,55 €
Management fee**			$ 1.059,00	954,16 €
Renewing equipment			$ 20.000,00	18.020,00 €
	Per trainer day	636 per year	$ 33,11	29,83 €

*Source: 2017 wage file

** Source: Chris Tierson 20.10.2016

Training Center		
Cost per training day	**€***	**%**
Trainer wage	1.339,69 €	63%
Expenses of a trainer	525,58 €	25%
Facility	96,47 €	5%
Catering	121,64 €	6%
Shipping	22,53 €	1%
Additional fixed costs	29,83 €	1%
Equipment shipping	- €	
Total	**2.135,73 €**	

*0,901 09.11.2016

Private Location				
Cost per training day	**Hotel (€*)**	**%**	**Customers sight (€*)**	**%**
Trainer wage	1.339,69 €	56%	1.339,69 €	70%
Expenses of a tra	525,58 €	22%	525,58 €	27%
Facility (hotel)	225,25 €	9%	- €	0%
Catering	121,64 €	5%	- €	0%
Shipping	22,53 €	1%	22,53 €	1%
Additional fixed	29,83 €	1%	29,83 €	2%
Equipment	121,64 €	5%	121,64 €	6%
Total	2.386,15 €		1.917,63 €	

*0,901 09.11.2016

Cost of trainings in NA	Training day (€)	%	Weighted average
Training center	2.135,73 €	58%	1.238,73 €
Private Location Hotel	2.386,15 €	32%	763,57 €
Customers sight	1.917,63 €	10%	191,76 €
Average	**2.146,50 €**		**2.194,05 €**

Average spends on classroom trainings per year		3.070.030,04 €
Content creators expenses	(0,6; 2,2; 3; 0,9; 3)	893.402,72 €
Training Administrators (5,5 persons)		506.568,55 €
Spends on classroom trainings		**4.470.001,31 €**
Cost per student		534,65 €

Global Training Data from June 2016 – December 2016

Month	Training days	Trainings	Average duration	Students	Average amount of student per class
June	101	46	2	487	10,6
July	127	56	2	415	7,4
Aug	88	43	2	269	6,3
Sep	185	93	2	500	5,4
Oct	124	65	2	345	5,3
Nov	140	64	2	377	5,9
Dec	106	50	2,12	289	5,8
Total	871	417		2682	
Average per month	234	113	2	697	5
Estimation for a year	1407			8361	

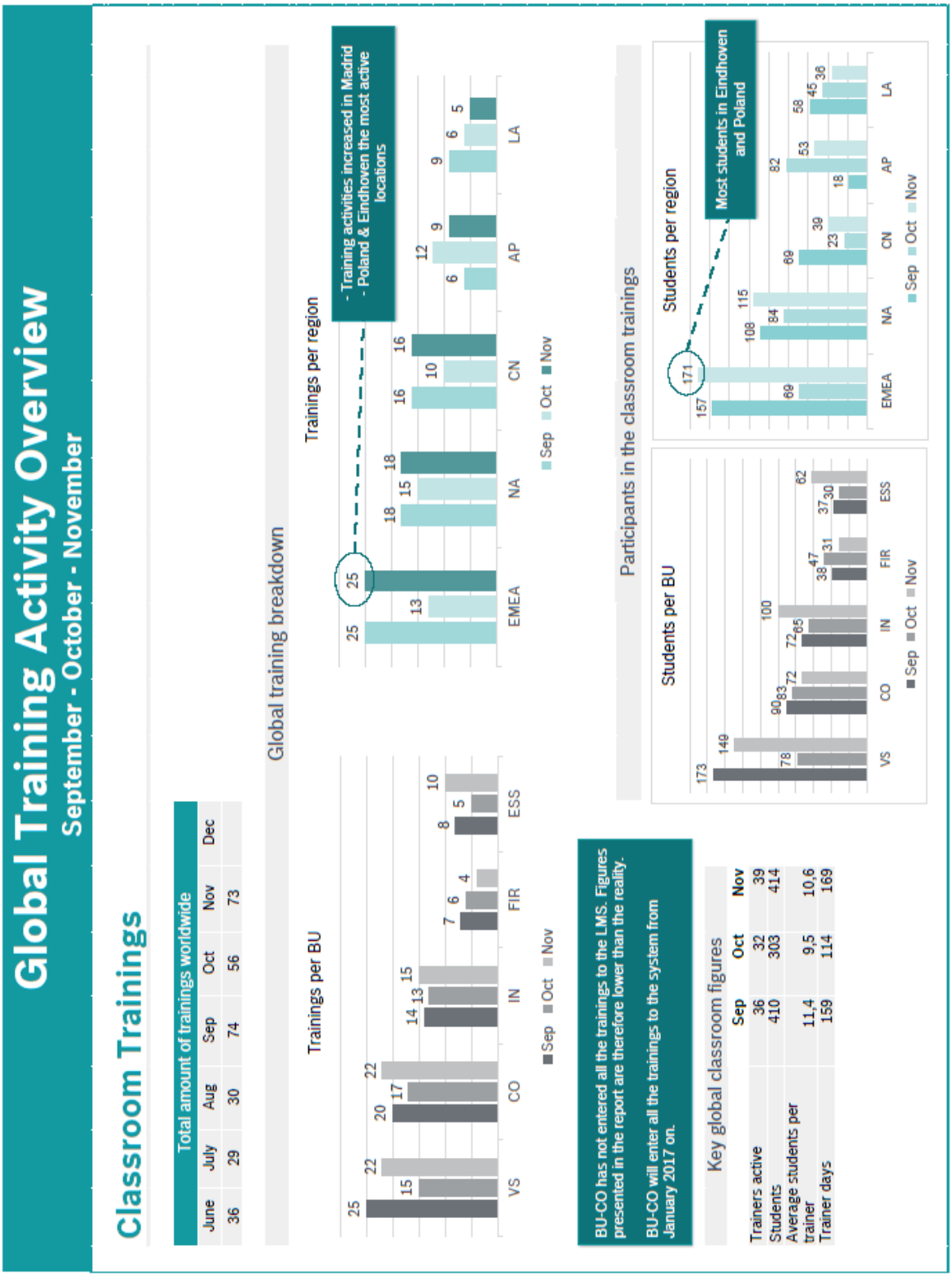
Web based training cost calculations and estimations

Cost per WBT module		EUR	USD
Approximate AnnualSalary		45.050,00 €	$50.000
- Time Spent on ID Work	75%		
Approximate Annual Salary (ID Work)		33.787,50 €	$37.500
Approximate Annual Software Cost		1.621,80 €	$1.800
Approximate Annual ID Cost		**35.409,30 €**	**$39.300**
Administrational costs (+10%)		**38.950,23 €**	
Created modules by the person	16		
Cost per module (30 min)		**2.434,39 €**	

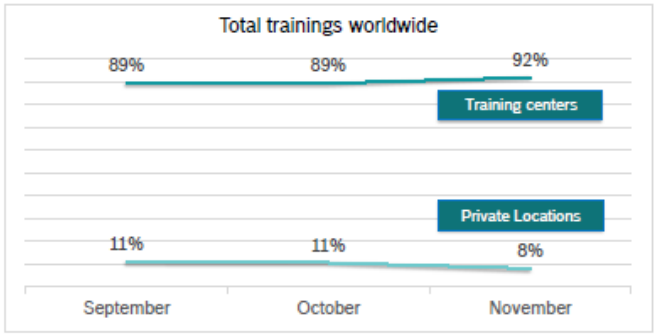
Translation costs			
Average Translation Cost Per Module/Language		1.750,00 €	$1.879
Average ID Time to Input Translation (1 module/1 language	24 hours		
Average ID Cost to Input Translation (1 mod/1 language) (Co-op hourly 13,5€)		324,00 €	$360
Average number of language translations per module	3 Languages		
Average Translation Cost Per module (Translation cost + Input Cost)		**6.222,00 €**	**$6.717**
Modules translated or to be translated	14		
Translation costs in total		**87.108,00 €**	
Cost per translated WBT module (30min)			
Creation costs		2.434,39 €	
Translation costs (3 languages)		6.222,00 €	
Total costs of a WBT		**8.656,39 €**	

Module	Takes (according to LMS oct -dec)	Takes per month (average)	Takes per year (average)	Takes over the lifetime (7 years)	Cost per user*
G Series Introduction Product Overview (translated)	282	94	1128	7896	1,10 €
B Series Introduction Product Overview (translated)	116	39	464	3248	2,67 €
B/GV4 Assessment (not translated)	28	9	112	784	3,11 €
*per module if completion rate stays the same					**2,29 €**

APPENDIX 4

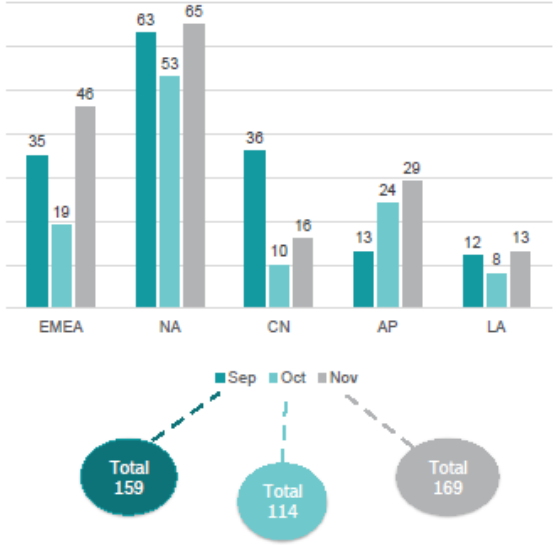

Global Training Activity Overview
September - October - November
Classroom Trainings
Total amount of trainings worldwide
June July Aug Sep Oct Nov Dec
36 29 30 74 56 73
Global training breakdown
Trainings per BU
VS CO IN FIR ESS
Sep Oct Nov
Trainings per region
EMEA NA CN AP LA
Sep Oct Nov
- Training activities increased in Madrid
- Poland & Eindhoven the most active locations
BU-CO has not entered all the trainings to the LMS. Figures presented in the report are therefore lower than the reality.
BU-CO will enter all the trainings to the system from January 2017 on.
Key global classroom figures
Sep Oct Nov
Trainers active 36 32 39
Students 410 303 414
Average students per trainer 11,4 9,5 10,6
Trainer days 159 114 169
Participants in the classroom trainings
Students per BU
VS CO IN FIR ESS
Sep Oct Nov
Students per region
EMEA NA CN AP LA
Sep Oct Nov
Most students in Eindhoven and Poland

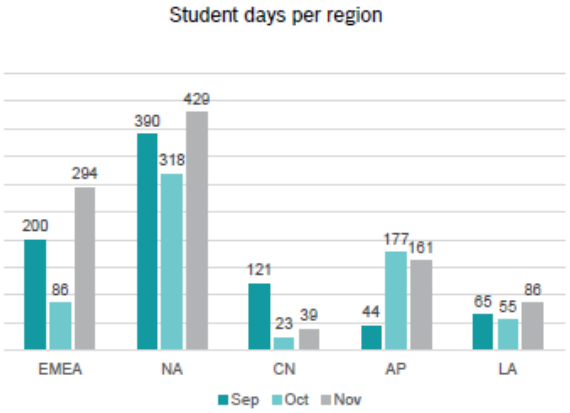
Trainings in [redacted] training centers and private locations



All trainings in private locations were run in the North America region

Trainer days & Student days



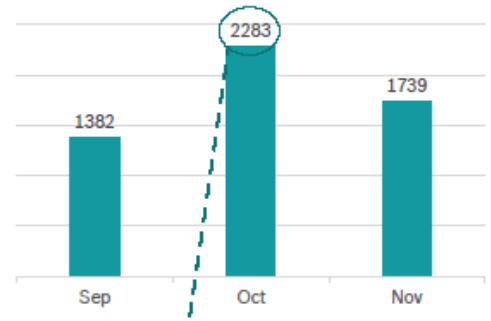


All BU's active with trainings in EMEA and train about the same amount of students

Web based trainings

Web based training breakdown

Completed WBTs globally



China has provided WBT information from October on. Sep does NOT include chinese online learning activities.

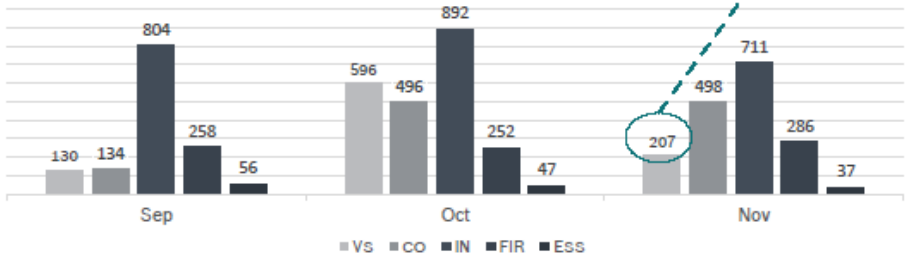
	Sep		Oct		Nov	
BU	WBTs	Completed	WBTs	Completed	WBTs	Completed
VS	65	130	66	596	82	207
CO	58	134	83	496	56	498
IN	28	804	31	892	30	711
FIR	24	258	25	252	25	286
ESS	11	56	8	47	9	37
Total	**186**	**1382**	**213**	**2283**	**202**	**1739**

Taking rate for WBTs from VS is significantly low. We should see a change here with the launch of the training concept in January.

WBTs = Amount of different WBT modules used

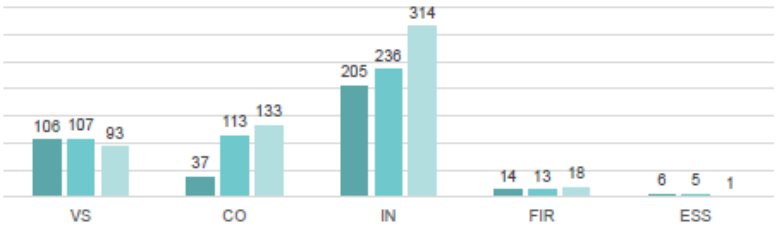
Taking rate of VS WBTs decreased in NA region with ~80%

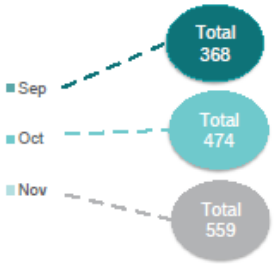
Completed WBTs per BU



Certifications from Training Plans

Certifications earned by the students





Most certifications earned from the following training plans:

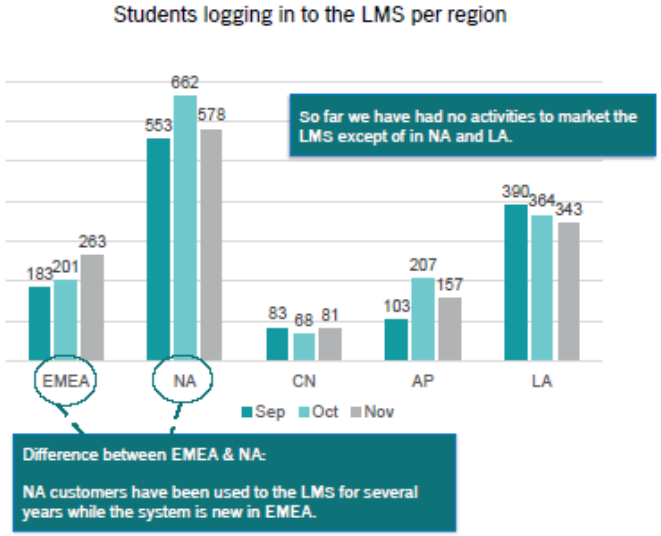
- [redacted] Series Introduction & Series Certification

Interest on [redacted] Academy

Visits to the Academy

Students still partially enter the LMS via existing country pages.

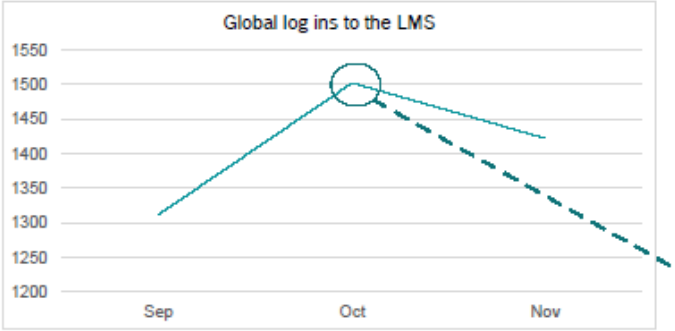
(Global webpage available since June 2016)



So far we have had no activities to market the LMS except of in NA and LA.

Difference between EMEA & NA:

NA customers have been used to the LMS for several years while the system is new in EMEA.



Log ins increased with 100% in Asia Pacific in October (Assumably due to the PAVIRO training)

	Sep	Oct	Nov
LMS log ins	1312	1502	1422