

Developing an Internal Training Program for New Software Developers at a Digital Agency

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Abstract

The capacity at which a company is able to perform is closely related to the people it employs. A unique set of skills and knowledge are brought to the table by each employed individual and managing this pool of expertise while simultaneously providing various forms of opportunities related to growth and development is essential, if a company aims to be successful. The focus of this thesis lies on the development of a training program that is targeted for new software developers at a digital agency, and the process as a whole involves developing, implementing, and measuring the effectiveness of the new program. The training program teaches the Drupal content management framework and the ultimate goal is to have a training program in place that allows the organization this thesis is being written for to employ people with a broader set of talents that can later be fine-tuned to suit the company needs by applying the program. Two trainees were trained during an initial trial period of the new training program. While the presented results indicate that both trainees were relatively satisfied with their training and that significant improvements regarding their knowledge of Drupal had been achieved, there were also aspects of the program that could have been executed in a better manner. To conclude, the constructed evaluation processes worked well and the implementation of the new training program, in general, was a success. However, to be completely certain of this, more individuals need to participate in the training for the results to be accurate.

Keywords: Training, Drupal, Training program, In-house training, Internal training.

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1.0 Introduction

A company's ability to perform is directly connected to the people a company employs. Each employed individual often has a unique set of skills, expertise, and knowledge to offer. Managing this pool of competence while simultaneously providing various forms of training and development opportunities is essential, if a company aims to be successful. Furthermore, the process of managing a balanced competence pool is directly linked to the development and training of employees, since the training of an individual in a company can be seen as a tool for managing competence. A systematic process intended to train employees and, therefore, manage the competence pool contributes to helping companies reach their desired goals, improve their capabilities and deliver more value. [1, 17]

The act of training employees in a work organization consists of a process where human resources, managers, and training staff purposefully craft programs in which a company's employees are allowed to learn and develop their skills. The goal of the programs is to allow the employees to not only develop their knowledge in a certain area, but also to direct their attitudes towards a direction that allows for the best possible performance. The goal of this whole process is to equip the employees with the skills that they need, in order for the company to reach its objectives in a manner considered to be the most cost-effective. [2]

Allowing employees to develop their skills and, therefore, become more effective at their jobs is an essential part of people management. The relationship between employer and employee can be seen as an interdependent one, since a company is dependent on the quality of work that its employees can offer in order for the company to reach its goals, and the employees are incentivised by needs that include career development, achievement, and improved compensation. [2]

This thesis focuses on the development of a training program that is targeted for new software developers at a digital agency. The process as a whole involves developing,

implementing, and measuring the effectiveness of this new training program. The ultimate goal is to have a training program in place that allows the company to hire people with a wider set of skills that can later be refined to suit the company's needs by applying the program.

1.1 Motive and Problem Description

It can generally be agreed upon that the modern companies of the twenty-first century implement a flat hierarchy company structure where innovation is highly valued. It can also be stated that the expertise required in a given field has narrowed and that many fields have been divided into smaller subfields. Knowledge and therefore expertise in almost any given field constantly transform and evolve, and in order for a company to survive in this continuously changing and competitive ecosystem, it has to be able to adapt. [3, 4]

The company that this thesis is being written for is named Karhu Helsinki and will from this point onward be referred to as Karhu. Karhu is a mid-sized digital agency that employs approximately 40 people and that uses Drupal as one of their main development tools. Drupal is a content management framework written in PHP, and the company uses Drupal to develop various forms of websites and applications for their clients. Drupal is known within the developer community for being notoriously difficult to learn, which can sometimes present itself as a problem when it comes to finding talent on the job market.

An effort to widen the field that Karhu focuses on and, therefore, also expand on the expertise that it possesses has been done by adopting new programming frameworks. This has been done either by hiring new talent or by training small numbers of individuals to use the new frameworks. However, this approach does not solve the underlying problem of not having access to the needed number of Drupal developers, which sparked the idea of implementing a Drupal-focused training program for the new software developers that the company hires.

I have personally worked for Karhu for the last five years, and during a majority of this time, I have mainly focused on Drupal development. I also have an interest in teaching

and have, during my time at the company, functioned as a mentor and taught other developers new programming frameworks that the company has chosen to adopt. This has put me in a position where I am now the main developer of a new training program that focuses on Drupal development.

The purpose of this thesis is to aid Karhu in the process of developing, implementing, and measuring the effectiveness of this new training program. The goal is to have a training program in place that allows the company to hire people with a wider set of skills that can later be refined to suit the company's needs by applying the program.

1.2 Thesis Outline

The first chapter of this thesis briefly discusses the importance of employee training within companies and explains how the act of training is beneficial for all the involved parties. It also introduces the problem regarding Drupal's learning curve and explains how Karhu is trying to solve this problem with a new training program.

The second chapter of this thesis goes more in-depth into the impact that employee training has. The chapter also discusses the ways in which Karhu introduces new developers to the workplace and how a new employee is expected to develop their skills at the company.

The third chapter of this thesis focuses on finding research related to the training of employees. Both industry standards and new innovations are analyzed. The findings from this research will be used as a guide when implementing the new program.

The fourth chapter of this thesis focuses on the implementation of the new training program. The chapter discusses the contents, structure, format, and implementation of the new program, and explains how and why various aspects of the program have been done and implemented in the way they have, while simultaneously presenting a plan for how the program is structured and taught. The final part of this chapter gives an overview of the actual implementation process that took place at the company the program was developed for.

The fifth chapter of this thesis discusses the two evaluation methods selected for the evaluation process of the training program, which are interviews and questionnaires. The chapter starts off by discussing the research methods on a general level and continues by describing the ways in which the methods were implemented and utilized during the training program evaluation process.

The sixth chapter showcases and discusses the results derived from the interviews and surveys created for the training program. The chapter ends with a result summary and a discussion regarding my own thoughts and observations from the training sessions. In the final chapter of this thesis, chapter seven, I draw my conclusions.

2.0 Background

The first part of this chapter discusses the impact employee training has on a company and its employees. The second part of this chapter discusses the ways in which Karhu introduces new developers to the workplace and how a new employee is expected to develop their skills at the company.

2.1 The Impact and Benefits of Training

The training that employers provide their employees has been singled out as the most impactful source of education for the working-age population [5]. There is also a vast amount of evidence supporting the benefits training has on teams and individuals. While training often has a positive impact when it comes to performance, other variables that either directly or indirectly have an effect on performance and that are improved by the training of employees have also been documented. The variables that fall into the category of directly supporting performance, include innovation, the ability to adapt, technical skills, and self-management skills. The variables that can be seen to have an indirect effect on performance, are skills related to communication, planning, and task coordination.

Employee training also has a positive impact on the organizational level. Just as with individuals and teams, training has been shown to have beneficial effects on the organization's performance, when it comes to profitability, effectiveness, and productivity. Other variables that can be seen to have a direct effect on an organization's performance, that are positively affected by training, include reduced costs and improved quality. Variables that have an indirect effect on an organization's performance, which are also improved by training, include employee turnover and the overall reputation of an organization.

Aside from the influence that employee training has on an organization, its teams and employees, the benefits of training have also been acknowledged on a global scale. Many countries have chosen to adopt policies that aim to stimulate the development and

implementation of employee training programs. The goals of these policies are to improve a country's labour force, which sequentially has a positive impact on its economy. [6, 9]

2.2 The Current Situation and Solutions

The goal of the training program that is being constructed in parallel with this thesis is to speed up the process of familiarizing a new software developer with the Drupal content management framework. Currently, when a new developer is hired at Karhu, he or she is introduced to general company procedures and the software development process over a period of two weeks. This process mainly covers the following topics:

- **The basics:** An introduction to the company, its internal structure, and the company's clientele.
- **Rhythms and routines:** An introduction to working hours, regularly reoccurring meetings, benefits, and holidays.
- **Activities and processes:** An introduction to the principles regarding project work, customer care, and the company's internal development process.
- **Tools of the trade:** An introduction to various tools and programs used during the work process, including tools for communication, project tracking, and the software development frameworks used at the company.
- **The work environment:** An introduction to the company's offices, equipment, and the people who work there.
- **Work with a mentor:** The new employee is assigned one or multiple mentors, whom they are expected to work with during the first few weeks.

After this, the new employee is placed in a team that usually consists of 5-6 developers and two project managers. The progress that the new employee is making is tracked over a period of six months, during which both the employer and employee are able to give feedback to each other, in order to produce the best possible work environment for learning and development. After this initial six-month period, performance appraisals where one's development needs can be discussed are held twice a year.

The teams at Karhu function as independent units or cells. Each team is responsible for a handful of projects, which means that the work done in each team is usually connected to the projects assigned to said team. When a new developer enters a team at the company, they are expected to gain more knowledge and develop their skills using one or multiple approaches listed below:

- a) **Learn by doing - Work on a new project:** The new developer is assigned a role in a project that is about to start.
- b) **Learn by doing - Work on an existing project:** The new developer is assigned to work on an existing project that the team is responsible for.
- c) **Learn by studying – Web-based training platforms:** The new developer is given access to online training programs.
- d) **Learn by studying – Attend seminars:** The new developer is able to attend various seminars and workshops.

Each of the presented solutions has its ups and downs; option A, “Learn by doing - Work on a new project”, assigns the developer work with a project that is about to start. In the past, this option has shown the most potential when it comes to teaching new developers about the software development process at the company, and it also works as an excellent starting point for learning Drupal. This is because there is great value in seeing how the whole process works from start to end, and the new developer gains a broad understanding of how Drupal development is done at the company. The new developer also has the opportunity to ask for help from a team member who is involved in the same project, and while this hinders the team member from doing their own work in the project, they are still indirectly providing value to the project by helping the new developer. The problem with this approach is that it requires that a new project is about to start when a new developer enters the company. This cannot be guaranteed, which means that the company is unable to rely on this option as a solution for teaching new developers Drupal development.

Option B, “Learn by doing - Work on an existing project”, assigns the new developer work with a project that has either already been completed, or that is in the middle of the

development process. Usually, this work consists of some form of maintenance work, bug fixing, or the implementation of new features. This type of work is almost always available, which means that this option is the one that is most often presented to new developers. This approach also has the benefit of allowing the new developer to familiarize themselves with already existing codebases. However, the codebases that the new developers have to get accustomed to can at times be vast, and the process often requires the guidance of a team member. This hinders the team member from doing their own project work, which means that this approach puts a strain on at least one extra member of the team. This approach is also not as effective as approach A, when it comes to understanding how Drupal development is done at the company, since it can be seen as more difficult to understand the bigger picture, when one is only working with a small part of the whole project.

Option C, “Learn by studying – Web-based training platforms”, allows the new developer to study materials related to software development through a third-party web-based training platform. Karhu encourages all its developers to use this type of training, which means that this approach is not only available to new developers. This approach is also often combined with options A and B, when a new developer enters a team at the company. While this option often benefits the new developer, it is still not a concrete solution to the problem. This is because the training platforms that teach Drupal development are quite few, and new developers often find it difficult to find relevant material on the platforms. It is often seen as a difficult task to know what one needs to study, in order for one to become better at one’s job. Finding the relevant material is burdensome when there is so much new knowledge that has to be gained.

Option D, “Learn by studying – Attend seminars”, allows the new employee to attend seminars and workshops that are in some way connected to the work that they are doing for the company. As with option C, Karhu encourages all its employees to attend relevant seminars if they believe that it could be beneficial for them in some way. Seminars are seen as a good option if one wishes to obtain a quick overview of a certain topic, but the events can seldom give their attendees a deep understanding of the discussed topics.

Furthermore, seminars regarding Drupal are organized once a year in Finland (an event called DrupalCamp Finland), and the discussed topics are usually intended for people who already have some experience in the field.

3.0 Related Work

This chapter focuses on analyzing research related to the training of employees. The chapter analyses both industry standards and new innovations, when it comes to training models and design patterns, how the need for training is determined, how training is delivered and how the effectiveness of training is measured and evaluated.

3.1 Training Theory and Design Patterns for Training

The chapter “*Instructional Design*” in [19] discusses various approaches in instructional design and the models that they apply. The chapter states that there is an “ever-growing” list of models that can be adapted when designing training programs and that the models usually serve the following purpose:

- They encourage improved instructions and learning.
- They improve the development and design of training programs.
- They emphasize the evaluation process.
- They aim to create learning experiences with instructional models.

The models often encourage improved instructions and learning through a structured and well-organized approach, where the goal is to create a learning experience with the help of instructional models. They also improve the development and design of the training programs by controlling and monitoring the process in a systematic way. Furthermore, the importance of evaluating both the programs and the people receiving the training is often emphasized.

In addition to this, the chapter states that a majority of the models used in instructional design have common elements, which consist of the following actions:

- The models try to:
 - Establish the trainee’s needs.
 - Formulate a clear picture of the learning objectives.

- Develop methods for assessing the effectiveness of the programs.
- Determine the best methods for delivering the training programs.
- Evaluate the effectiveness of the training programs.
- Determine the performance increase experienced by the trainees.
- Implement the designed training programs.

In essence, the models try to establish the trainee's needs when it comes to missing knowledge, the training context and environment. They also formulate a clear picture of what the outcome of the training programs should be so that the learning objectives are clear. Models in instructional design also develop appropriate methods for assessing the effectiveness of the training programs and strive to determine the best methods for delivering the contents of the training programs. Furthermore, the models aim to evaluate both the effectiveness of the training programs and the performance increase experienced by the trainees.

Various forms of instructional design models and their uses are described in [18]. The chapter "*What is an Instructional Design Model*" states that these models are guidelines for the design process involved in the construction of training programs at a high level of abstraction. The goal of these models is to function as a guide or template for the creators of a training program, that can be adjusted and tuned according to the program's needs. The chapter "*The Instructional Design Model Today*" states that the two most widely used models for instructional design are the ADDIE (analysis, design, development, implementation, and evaluation) and ISD (instructional systems design) models. The figure below (Figure 1) is a graphical illustration of the ADDIE model.

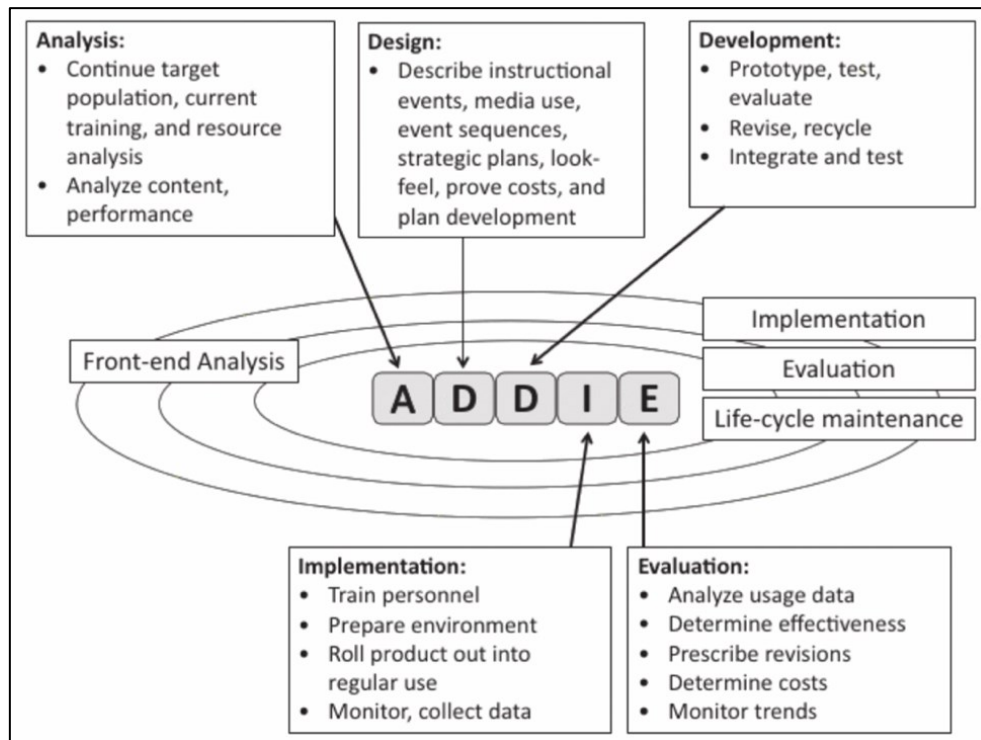


Figure 1: The ADDIE model [18].

Learning environments and their characteristics are outlined in [18], in the chapter “Thinking in Terms of Instructional Environments”. The authors state that the environments should be designed with the learners in mind so that the environments become as appealing and engaging for the learners as possible. The books list common characteristics that are usually shared in well-working environments:

- The environments:
 - Provide a space for solving problems.
 - Provide a task, problem, or challenge that is meant to be solved.
 - Provide resources that can be utilized when solving the problem.
 - Are often created with a certain social context in mind
 - Encourage the participants to provide a solution of some kind.
 - Mentors provide the learners with an evaluation regarding their solutions.

To summarize, the environments provide a space for solving problems. The spaces themselves can be real or virtual, but the important thing is that they should portray

scenarios that with the help of various controllers and related information allows the participants to take measures. Usually, they also supply a challenge or problem of some type. The type of problem varies depending on the intention of the environment, but can generally be anything between designing, building, and diagnosing. The environments also provide resources such as data and information that can be utilized when solving the problem and are usually created with a certain social context in mind. This setting could include either one or multiple participants in addition to one or multiple mentors. Furthermore, the environments should encourage the participants to provide a solution of some kind. The solution might come in many shapes, such as an answer to a question, a multi-media product of some kind, a managed process, or a score. Mentors working in the environments should provide the participants with an evaluation regarding their solutions to the problems that they are working with.

Cost-effective training programs and their implementation are described in [2]. The steps documented in the chapter “*Cost-effective training: a systems approach*” are the following:

1. Identifying the needs for training.
2. Design a training program that allows for development.
3. Assess the effectiveness of the program.
4. Tune the program according to the results.

In conclusion, the people creating the training program need to establish who is in need of training and what said individuals need to learn. The following step is to design a program that allows people to develop themselves with the needed skills, in the most suitable way. It is equally important to determine whether the training program has achieved its goal with regard to performance and to make the needed changes to the previous steps in the process in order to obtain the best possible results.

This approach is known as the *Systems Approach to Training (SAT)*. It is commonly applied both in the public and private sectors and has over a long period of time demonstrated success in achieving cost-effective training programs. The book stresses that

the various steps in the process are interconnected, which means that each step in the documented approach is crucial for the whole system. Neglecting a step in the process will inevitably have a negative effect on the other parts and thus the whole system. The SAT approach is also mentioned in [14] as a typical method for developing training programs, and that the approach is usually combined with the ISD model mentioned in [18].

3.2 How is the Need for Training Determined

The chapter “*Identifying learning needs*” in [2] states that an analysis regarding training needs is a crucial part of the training program creation process. The analysis is done in order to determine whether there is a discrepancy between the skills that are required for a specific job and the skills that the company’s workforce is in possession of. The chapter continues by stating that both the need for a learning analysis and the data needed for the analysis are usually identified in various ways. For example, a company’s human resources department is able to provide the company with information regarding the supply and demand of the workforce. In situations where supply is low, which means that a company is finding it difficult to find workers with the required knowledge and skills for a job, a solution might be to recruit workers with a lower skill level and provide them with a training program that fills the performance gap. In situations where new techniques such as programming frameworks are introduced to a company, a gap between the required skills and the needed skills for effective performance is created simultaneously. This means that the employees of the company are unable to do their work in an effective manner, which means that training is needed. The need for development and training and, thus, a learning analysis might also be revealed by using formal methods during performance appraisals or other meetings of the same kind. These methods usually consist of interviews or questionnaires.

The chapter continues by stating that the information gathered through these channels should then be utilized in the following ways, in order to identify the specific training needs:

1. A job/task analysis should be done.
2. A gap analysis should be done.
3. A specification of learning needs is to be created.
4. A specification of training forms that fill the gap is to be created.

To summarize, a job or task analysis should be done that determines the purpose and objectives of a certain job or task, and the skills and knowledge required for completing said job or task in an effective manner. This should be followed with a gap analysis that determines the gap between the knowledge and skills that the company possesses against the knowledge and skills that it needs. After this, a specification should be created that compares the differences found in the two analyses. Finally, a specification of the forms of training that fill the gaps discovered in the previous specification should be created, in order to satisfy the training needs.

These statements are supported in numerous studies. The chapter “*Training needs analysis*” in [16] states that the process of conducting an analysis regarding training and development needs is one of, if not the most important part of training program development. The chapter continues by stating that the primary meaning of conducting these analyses is to establish where exactly the training is required, what subjects or topics need to be taught, and who it is that is in need of the training. Similar statements are made in [15], where the authors claim that a systematic analysis of the training needs is a crucial initial step in the development of training programs and that this step substantially influences the outcome and effectiveness of the program itself.

These methods have also been utilized on a more practical level. The article [12] discusses a training program named PRISE. The program was mainly developed by the Computer Research Institute of Montréal which collaborated with the Ministry of Industry, Science and Technologies. Several IT and engineering companies based in Montréal were also involved in the project. The program was intended to function as a curriculum for retraining more than 300 unemployed engineers in groups of 20 over a period of three years. The researchers who developed the program utilized both interviews and questionnaires in order to determine the needed skills. This data was then utilized in a

job/task analysis, in order to reveal what knowledge and skills the unemployed engineers were lacking. Questionnaires also proved to be a useful tool for the Faculty Development Committee at Baylor College of Dentistry, when they were asked to assess the development needs of the college in [13]. The same methods were also utilized in [11].

In addition to interviews and questionnaires, tools for aiding in the job/task -analysis have also been developed. The article [14] contains a chart (Figure 2) listing the criteria for selecting tasks for training. The chart groups tasks under various categories depending on the task’s characteristics, such as its difficulty, importance, and frequency. Tasks that fall under the “Don’t train” category can often be learned on the job. Tasks that fall under the “Train” category require some type of formal training, and tasks that fall under the “Train extensively” category require intensive formal training.

Filtering out the unneeded tasks can be an excellent way to save company resources, since according to [10], training activities are usually the first items to be hit by budget cuts in situations where capital needs to be saved.

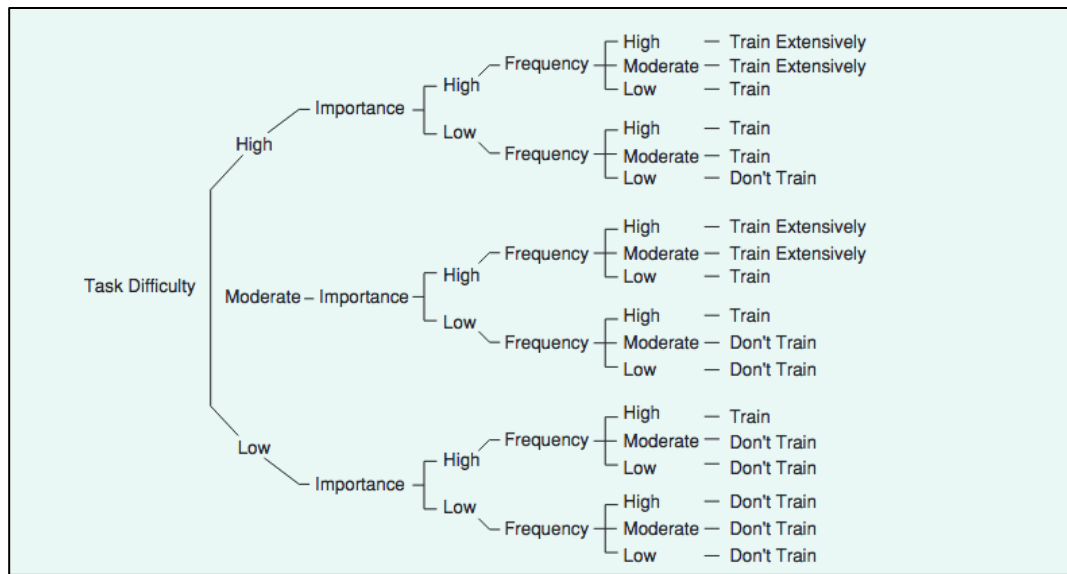


Figure 2: Criteria for selecting tasks for training [14].

3.3 Training Methods

The article [20] is an integrative literature review that researched training methods. The literature review revealed a total of 13 different training approaches, which were case studies, game-based training, internships, job rotation, job shadowing, lecture, mentoring, programmed instruction, role-modeling, role play, simulation, stimulus-based training, and team-training. The feature, attributes, and connections between each method were analyzed by using various criteria, such as trainer presence, proximity, interaction levels, cost considerations, and time demands. The list below showcases the seven most relevant training methods for this thesis:

Case study: This method allows trainees to participate in the process of solving problems. The participants partaking in a case study are usually given a problem of some kind and are either asked to find a solution by themselves or presented with the solution as an example. This type of training works best when the people participating have some form of former knowledge of the topic at hand but could profit from the hands-on aspect of the training. Case studies are able to train multiple people at the same time and are categorized as a low-risk and low-cost approach [21].

Internship: This method has a trainee work in the position for which he or she is being trained. The work is usually restricted in some manner and simultaneously supervised by a more experienced employee. The pay that the trainee receives is usually a small fraction of the normal pay or no pay at all. At a glance, this method seems like a win-win situation for the company offering the internship; the trainees can be trained at a fraction of the normal cost and the trainees receive hands-on experience in the role that they are training for. However, studies done on internships have shown that the method is not always favorable for the trainee; a survey done for practicing physicians revealed that they had found their internships as variable, fragmented and unsupportive in their development [22].

Job shadowing: This method has a trainee observing another employee while they are doing their work in a job environment. The tasks suited for observation are usually very

specific, and the idea is to give the trainee a chance for understanding the details of a certain job. The authors of the literature review recommend job shadowing when companies are in need of training an already existing employee for a new position, or when the employee needs to be given the opportunity to try for a new position.

Lecture: This method entails a trainer communicating training material to participants by using various forms of instructions which are often verbal. The method is suitable for almost any audience size, takes a smaller amount of time to implement and design when compared to other methods, and is easily modified by the training staff if the need arises. On the other hand, lectures have been criticized for their lack of interaction and support for overcoming challenges [23]. The authors recommend lectures in situations where the material that needs to be absorbed by the trainees is not too difficult to understand, and where the consequences of not interpreting the material correctly are not too severe.

Mentoring: This method involves a more novice employee or newcomer working closely together with a more experienced employee. The idea is for the more experienced employee to provide support and advice to the inexperienced one. The learning environment created between mentor and trainee is almost always a beneficial one, as long as there is no personal conflict between the two parties. The pairing of mentor and trainee should always be done with caution, and it is not unreasonable to have both the mentors and trainees partaking in questionnaires regarding their preference of either mentor or trainee [24]. In addition to this, mentors should be supported by providing training regarding their communication and leadership skills for the best possible outcome.

Programmed instruction: This method uses some type of computer software or program to deliver the intended training material through a device such as a computer. This approach is considered to be very flexible and consistent, since it allows trainees to retake the training as many times as they want. Disadvantages to the method include trainee motivation being affected in a negative manner in situations where the trainees are unfamiliar with the technology used for delivering the training. Trainees using this method usually do so alone, which means that a greater level of self-discipline is required in order to resist the temptation of skipping either difficult or boring parts of the content [25]. The

authors of the literature review recommend this method of training in situations where the trainees are comfortable with the technology used for delivering the content and where the flexibility the method offers is appreciated. It should also be noted that this method might not be suitable if skipping parts of the training has major consequences.

Team-training: This method is intended for groups of people who form some sort of team at their place of work. The intention is to improve the combined knowledge of the team collectively, or to train the people in the team on a skill specific to said team. Team-training has been found to improve social skills within a team. Studies on team-training have also shown the group performance of a team is better if they have been trained together, compared to teams where the members were trained individually. On the other hand, team training can be negatively affected if a member of the team is not willing to participate in the training. In order for team-training to work, all the members of the team have to be on board and actively participate in the training [26]. The authors of the literature review recommend team-training in situations where the employees of a company have to work together in teams.

The table below (Table 1) is a simplified version of the one presented in [20]. It compares the various training methods relevant for this master's thesis on the criteria mentioned at the beginning of this chapter. The table categorizes training methods with various criteria. "Requires trainer" indicates whether or not a trainer or mentor needs to be present during the training, "Location" tells us whether the training takes place at a training facility or if it can be taught remotely, "Interaction" describes the interaction level needed of the trainees participating in the program, "Cost" describes the program's development and implementation costs, and "Time demand" indicates how much time is needed from the trainee when partaking in a program that is utilizing a certain method of training.

Table 1: Comparison of criteria for the different training methods [20].

Method	Requires trainer	Location	Interaction	Cost	Time demand
<i>Case study</i>	Yes	Training facility / Remote	Varying	Inexpensive	Moderate
<i>Internship</i>	Yes	Training facility	Somewhat interactive	Inexpensive	High
<i>Shadowing</i>	Yes	Training facility	Not interactive	Inexpensive	Low
<i>Lecture</i>	Yes	Training facility / Remote	Not interactive	Moderately expensive	Low
<i>Mentoring</i>	Yes	Training facility / Remote	Somewhat interactive	Inexpensive	Moderate
<i>Programmed</i>	No	Remote	Not interactive	Moderately expensive	Low
<i>Team</i>	Yes	Training facility	Interactive	Moderately expensive	Low

3.4 Training Evaluation and its Effectiveness

The terms training evaluation and training effectiveness are at times used as if they meant the same thing, but in reality, they are two different measures. The process of evaluating a training program can be seen as a systematic approach for measuring the outcome of the program, while the process of determining a training program's effectiveness studies said results on a more theoretical level. Training evaluation reveals a concentrated view of the training outcome and should be used as a tool for determining how well training programs achieve their objectives. The assessed metrics are dependent on the goals of the program itself and usually involve the evaluation of the content and design of the training program, learner changes, and general payoffs. Studying the effectiveness of a training program results in a broader understanding of the training process, as it is a study of the variables that most likely have an effect on the outcome of the program at various parts of the process. Individual, training, and organizational factors are the three major categories of

effectiveness variables that are thought to have the largest impact on the training process as a whole. [8]

One of the most utilized models for training evaluation is the *Kirkpatrick model* [7, 8, 16, 27, 41]. The model has served as a foundation for training evaluation for decades, and many sub-versions and improvements have been made to the original model over the years [28, 29, 30, 31, 32]. The original model divides the outcomes of the training program into four levels of criteria and measures each level separately. The levels of criteria are:

1. The reaction level, which measures the participants' reaction.
2. The learning level, which measures acquired skills.
3. The behavioural level, which assesses lasting impact.
4. The results level, which measures direct results.

The participants' reaction to the training program is measured at the reaction level. The measurements are typically done with surveys, and the goal is to find out whether the participants found the training engaging and relevant for their jobs. The learning level assesses the gained knowledge of each participant by determining if they have acquired the desired information and skills that the program taught. This assessment can be done by utilizing both formal and informal methods and should be carried out both before and after the training has been completed. The behavioural level assesses whether the training has had a lasting impact on the participants by observing if they are using the acquired knowledge in their daily work. The assessment is also capable of revealing problems on an organizational level, as a lack in a participant's behavioural changes does not necessarily have to indicate a failed training program, but rather that a certain aspect of the workplace is not suitable for the desired change. The results level measures the direct results or financial gains of the program, which means that the program's costs are weighed against its benefits. The variables measured at this stage are the key performance indicators (such as improved quality or increased sales) that originally needed improvement and are the reason for the training in the first place. [41]

Another popular approach that is often utilized, not only in training scenarios but in situations where performance feedback is needed, is the *360-degree feedback* model. The model can be defined as a systematic approach for evaluating an individual by collecting performance data from various stakeholders. The model suggests that individuals should be evaluated by various respondents, such as their colleagues, peers, boss, customers, and staff. The collected information is often able to reveal both strengths and areas which are in need of development. The collected feedback can be utilized in many ways, such as in performance appraisals, staff development, and training evaluation. Using the 360-degree feedback model is often considered to be a lengthy process, especially if one has development in mind. It starts off by collecting feedback from various stakeholders for a certain target individual, often in the form of questionnaires. The data are analyzed and used to identify development needs in the individual. This information can be used for constructing a development plan, after which the evaluation cycle continues, if deemed necessary. [7, 33, 34, 35]

Another important topic that has to do with the evaluation and effectiveness of training programs involves the calculations of their returns on investment or ROI [4, 36, 37]. In [36], it is stated that the following formulas are commonly used for establishing the ROI of training programs:

$$\text{BCR} = (\text{Program benefits} / \text{Program costs}) \text{ (1)}$$

$$\text{ROI (\%)} = (\text{Net Program benefits} / \text{Program costs}) \times 100 \text{ (2)}$$

The first formula (1) calculates a benefits/costs ratio (BCR), where the program's benefits are divided by its costs. The second formula (2) expresses the ratio as a percentage value and divides the program's net benefits by its costs. These formulas are often used in other types of company investments as well, which places training-related investments in the same category as other investments. The simplicity of these formulas also has the benefit of being easily understood by key management and others involved in the evaluation process.

4.0 Implementation of the New Training Program

This chapter discusses the contents, structure, format, and implementation of the new training program. The first section in the chapter discusses how the training program was developed, how we decided on which areas and topics the program should cover, and which areas and topics we eventually included in the program. The second part of this chapter discusses the various parts of the training program, such as the material bank and its structure, the training material and its layout, and the training project and how it is to be used. The third part of this section discusses how the training is meant to be taught and delivered, and what the best methods for utilizing the training program are. The final part of this chapter gives an overview of the actual implementation process that took place at the company during the spring of 2022.

4.1 The Contents of the Training Program

I initially proposed the idea of a training program to Karhu in the spring of 2021. The concept was met with a positive attitude from key stakeholders in the company and development began rather quickly. At first, we had a limited understanding of what the training program was going to look like, what the training program was going to cover, and how it was going to be delivered. Training programs had been constructed at the company before, such as when Drupal 8 was released, a version change that drastically impacted the framework and its development process, but these programs were of a noticeably smaller scale than what we had in mind now. I and the company's CTO initiated the process by drawing up individual lists of topics related to Drupal and the company's development process in general. These lists and the topics they contained were thought to be suitable areas to cover in a training program that was meant for new developers that the company hires. When we each had drafted our own list of topics we deemed suitable for the program, we compared notes and merged the two lists together. This final list of topics is presented in the table below (Table 2), and it worked as the initial content structure for the training program.

Table 2: Initial structure of the training program.

Area	Covered topics
<i>The development process and tools related to it.</i>	Version control, Project tracking, Development environments, Server infrastructure, Development tools.
<i>Drupal in a nutshell.</i>	Why and how the company works with Drupal, What Drupal is and who is behind it.
<i>Drupal from a developer standpoint.</i>	How Drupal works under the hood.
<i>Features that Drupal provides.</i>	Content management and structuring, Users and roles, i18n and l10n, etc.
<i>Content management in Drupal.</i>	A general view of content management, Entities, Bundles, Fields, etc.
<i>Common contributed modules.</i>	Webform, Paragraphs, Metatag, etc.
<i>Development in Drupal.</i>	Coding standards, Site planning, Patching, etc.
<i>Drupal theming.</i>	Front-end development in Drupal.
<i>Drupal module development.</i>	Back-end development in Drupal.

The next area of concern was the delivery method for the selected areas and topics they covered. Since past experience had shown that new developers had had the best learning experiences when they were introduced to Drupal in the form of a project, a small-scale training project that covered a wide range of the desired topics was deemed as the best approach. The training project would cover the various areas and their topics on a beginner-friendly level and provide a practical aspect to all the theoretical information that the training program covered. At this point, I started the construction of a material bank that would work as a source for all the information and content that the program covered. The information gathered in the material bank would later be compressed into training material that would be presented during training sessions. The planning of the training project started simultaneously.

After the first few weeks of development time (in reality, this was months, because the time we could dedicate to the program each week was limited), the material bank had

started to take shape, and we also had a prototype for the training project. We quickly realized that the project would be larger than what we initially had thought, which was a problem since both time and resources were limited. This led to an approach where we during the whole development process of both the training material and the training project continuously cycled the covered areas and topics through a funnel similar to the one presented under heading 3.2 *How is the need for training determined (Figure 2)*. This basically meant that we questioned the necessity of each topic and the areas it covered by asking ourselves the following questions, when debating wheatear or not something should be included in the program or not:

- How difficult would it be for a trainee to grasp the topic?
- How important was it that the trainee understood the topic?
- How frequently did the trainee have to work with the topic?
- Can the topic easily be taught on the job?

Areas and topics that passed through the funnel were developed with extra care, while the ones that did not were either dropped from the training program or merged under another area for re-evaluation. The final list of areas and topics that were going to be covered either by the information in the material bank, training sessions, training material, or a training project are presented in the table below (Table 3). The table is a list of areas that the training program covers as a whole. Each area and its topics are covered by various parts or channels of the training program, which are “*Covered by the material bank*” (CMB), “*Coverage by training sessions*” (CTS), “*Covered by training material*” (CTM) and “*Covered by training project*” (CTP).

Table 3: *The final list of areas for the training program and how they are covered.*

Area	CMB	CTS	CTM	CTP
1. <i>Drupal in a nutshell.</i>	X			
2. <i>The development process and tools.</i>	X	X		
3. <i>Content, settings and user management, and the built-in features Drupal provides.</i>	X	X	X	X

<i>4. The structuring and displaying of content.</i>	X	X	X	X
<i>5. Drupal theming.</i>	X	X	X	X
<i>6. Drupal module development.</i>	X	X	X	X

The area “*Drupal in a nutshell*” works as an introduction to the training program and is only covered by the training material. The area “*The development process and tools*” is covered by the material bank and brought up during the training sessions on a more practical level. The areas “*Content, settings and user management, and the built-in features Drupal provides*”, “*The structuring and displaying of content*”, “*Drupal theming*” and “*Drupal module development*” are covered by all four delivery channels that the training program offers. A detailed list of the final content of the training program can be seen in the table below (Table 4).

Table 4: The final list of areas and their topics that are covered in the training program.

Area	Covered topics	
<i>1. Drupal in a nutshell.</i>	What Drupal is. The community behind Drupal.	The use cases of Drupal. Drupal core, themes and modules.
<i>2. The development process and tools.</i>	Version control. Project management. Server infrastructure.	Development environments. Command-line tools for Drupal. Drupal updates and Composer.
<i>3. Content, settings and user management, and the built-in features Drupal provides.</i>	Content management. Users, roles and permissions. Menus. Managing data in Drupal.	Internationalization and localization. Views and content listing. Image styles and responsive images. Text formats and filters. Text editors.
<i>4. The structuring and displaying of content.</i>	Entity types and instances. Bundles and fields. Content types and nodes. Vocabularies and terms. Media and media types. Entity references.	Regions. Block. View modes. Field formatters.

5. <i>Drupal theming.</i>	What is a theme? The structure of a theme. Base themes and sub-themes. Template files. Overriding template files. Hooks.	Asset libraries. Twig in Drupal. JavaScript in Drupal. CSS and CSS pre-processors in Drupal. Gulp. The modular Compony theme.
6. <i>Drupal module development.</i>	What is a module? The structure of a module. Info files. Hooks. Plugins. Events and event listeners. Routes and controllers.	Services and the service container. Dependency injection. The Render API. The Form API. The Entity API. Permissions. Debugging.

4.2 The Structure of the Training Program

Once the training areas and topics had been decided on, it was time to start developing content for the material bank that eventually would provide all the source material needed for the training material presented during training sessions. Development of the training project started simultaneously, since we wanted to be able to use code examples from the training project in the material bank and eventually in the training material. The material bank was written in Slite, which is a web-based documentation tool that the company uses. Content was produced during the summer, autumn, and winter months of 2021. In the end, the training program consisted of four different channels that each delivered the content of the training program in their own way. These channels are:

The material bank: The material bank itself is a collection of documents totalling about 150 pages. The bank is divided into six sections which represent the areas selected for the program. Each section covers all the relevant topics that belong to said area, and the information is represented with text, images, graphs, and code examples. Each section is also filled with links to external material (such as the Drupal documentation) that covers the same topics. In this way, a reader can deepen their understanding by reading the external material, if they feel like the content in the material bank is not sufficient enough. An example page from the material bank can be seen in the figure below (Figure 3).

Karhu Helsinki

Drupal-perehdytysohjelma / Materiaalipankki / 4.0 Sisällön strukturointi ja esittäminen

Find anything

Drupal-perehdytysohjelma

Materiaalipankki

- 1.0 Drupal päihinänkuoressa
- 2.0 Kehitystykönkulkua ja työkal...
- 3.0 Sisällön, asetusten ja käytt...
- 4.0 Sisällön strukturointi ja esi...
- 5.0 Drupal teemaus
- 6.0 Drupal moduulikehitys

DRUTOR

- 1.0 Projektin esittely
- 2.0 Rakennusmoduuli | Peruss...
- 3.0 Teemausmoduuli | Perussi...
- 4.0 Rakennusmoduuli | Resepti
- 5.0 Teemausmoduuli | Resepti
- 6.0 Rakennusmoduuli | Etusivu
- 7.0 Teemausmoduuli | Etusivu
- 8.0 Koodausmoduuli | Resepti...

4.3 Sanastot ja Termit eli Taksonomiat

Aiheesta muualla:
https://www.drupal.org/docs/user_guide/en/structure-taxonomy.html

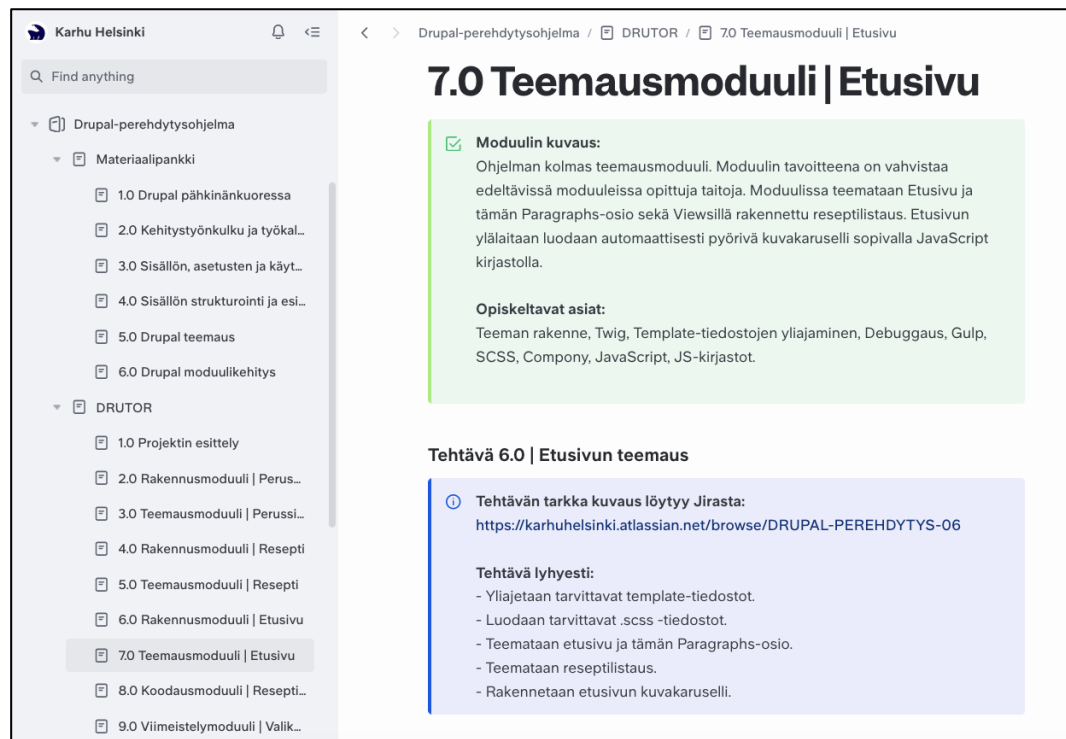
Drupalissa taksonomiat (eng. taxonomy) tarjoaa tavan luokitella sivuston sisältöä. Tämä tehdään käytännössä luomalla taksonomia sanastoja jotka täytetään sanastoon kuuluvilla termeillä. Tämän jälkeen esimerkiksi sisältötyyppiin voidaan lisätä entiteetti viittaus-kenttä (entity reference field), missä viitataan tietyn sanaston termiin tai termeihin. Teknisestä näkökulmasta termit ovat oma sisältöentiteetti-tyyppinsä, ja sanastot näiden bundleja.

Figure 3: An example of the content from the material bank.

DRUTOR: DRUTOR stands for “*Drupal tutor*” and like the material bank, it is a collection of documents that total around 250 pages. DRUTOR was developed simultaneously with the training program’s training project, and it is meant to work as a step-by-step guide for building the whole training project. DRUTOR is divided into nine sections or modules, each of which walk the reader through a specific step of the project’s development process. The guide starts off with an introduction to the project and continues with various “building”, “front-end” and “back-end” modules. Information is represented with text, images, and code examples.

DRUTOR and its content is also connected to the company’s project tracking tool, Jira. The DRUTOR documentation is initially split into sections or modules, which in turn are split into “tasks”. A task can be seen as a short description of a specific functionality that is going to be implemented for the project in a specific module. The reader is given a short overview of the task in the DRUTOR documentation and encouraged to read the full description in Jira. In this way, a reader who is following the guide is simultaneously

introduced to the project tracking tool that the company uses. An example page from the DRUTOR material can be seen in the figure below (Figure 4).



The screenshot shows a web browser interface for 'Karhu Helsinki'. The breadcrumb trail is 'Drupal-perehdytysohjelma / DRUTOR / 7.0 Teemausmoduuli | Etusivu'. The left sidebar contains a search bar and a navigation menu with categories 'Drupal-perehdytysohjelma' and 'DRUTOR'. Under 'DRUTOR', item '7.0 Teemausmoduuli | Etusivu' is selected. The main content area has the title '7.0 Teemausmoduuli | Etusivu'. It features a green box with a checkmark icon and the heading 'Moduulin kuvaus:'. The text describes the module's goal to enhance skills in Drupal 9. Below this is a section 'Opiskeltavat asiat:' listing technologies like Twig, JavaScript, and SCSS. A blue box contains a task description 'Tehtävä 6.0 | Etusivun teemaus' with a link to a Jira ticket and a list of tasks: 'Ylläajetaan tarvittavat template-tiedostot.', 'Luodaan tarvittavat .scss -tiedostot.', 'Teemataan etusivu ja tämän Paragraphs-osio.', 'Teemataan reseptilistaus.', and 'Rakennetaan etusivun kuvakaruselli.'

Figure 4: An example of the content from DRUTOR. A task encourages readers to view a full description of the task from the project tracking tool Jira.

The training project: The training project was developed simultaneously with the material bank and the DRUTOR documentation. The project is a website developed with the Drupal 9 content management framework, that was designed with the trainees' future work assignments in mind. Like the material bank, the training project touches upon each of the topics selected for the training program in one way or another. The training project was developed with the help of version control, which allows a trainee to start developing the training project from the desired section. For example, a trainee who is already familiar with the front-end parts of Drupal can jump directly to the part where the back-end development starts in the project, without having to complete other tasks beforehand. An example page from the training project can be seen in the figure below (Figure 5).

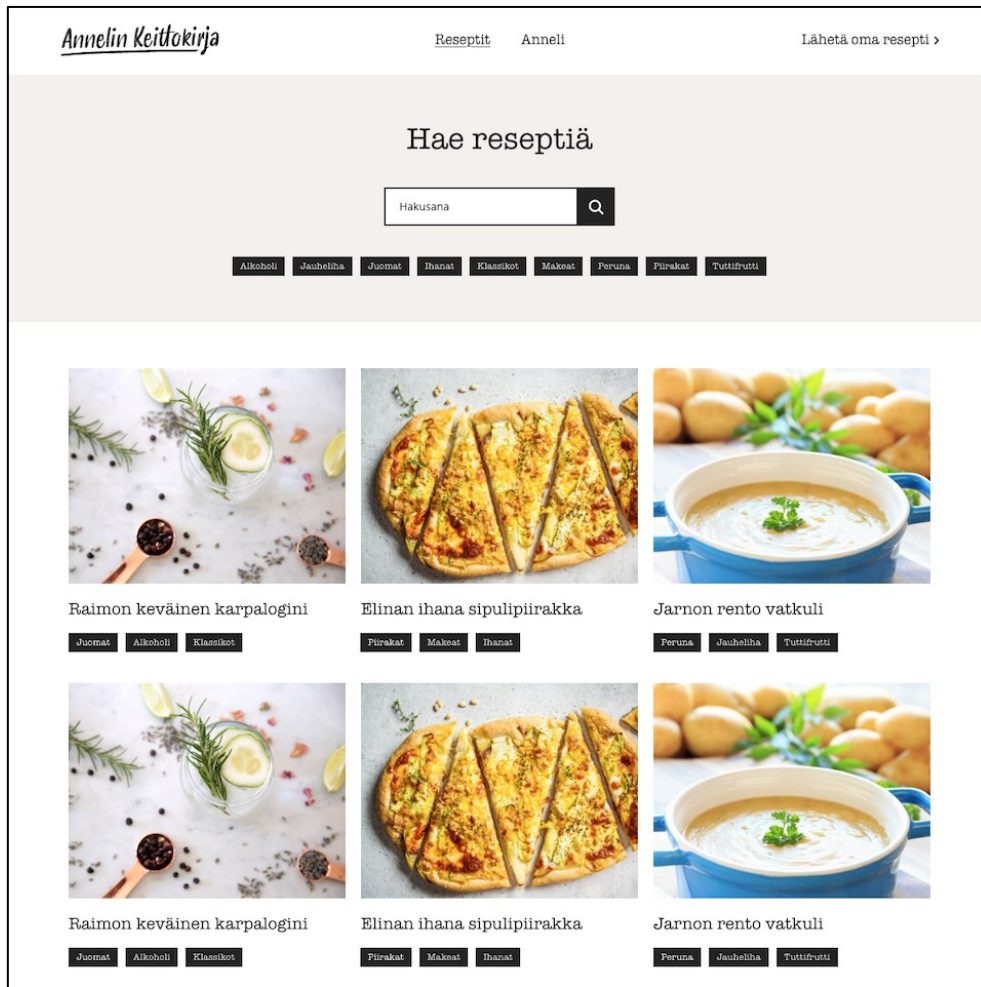


Figure 5: An example page from the training project. The recipe filtering functionality is part of the training projects back-end development module.

The training material: The training material was produced when both the material bank and the training project had been completed. The training material consists of roughly 150 PowerPoint slides that represent a compressed version of the information in the material bank and the training project. The training material is divided into four sections, which are the following:

1. *Content, settings and user management, and the built-in features Drupal provides.*
2. *The structuring and displaying of content.*
3. *Drupal theming.*
4. *Drupal module development.*

The training material functions as the main source of information that is presented to trainees during training sessions. Each set of slides starts off with an introduction to the areas and topics that are going to be discussed in the training session. This is done in order to ensure a clear picture of the learning objectives during a training session. The material is presented with text, images, graphs, and code examples. Example slides from the training material can be seen in the figures below (Figures 6, 7, 8).



Figure 6: An introduction slide that mentions the topics that are going to be covered in the training session.

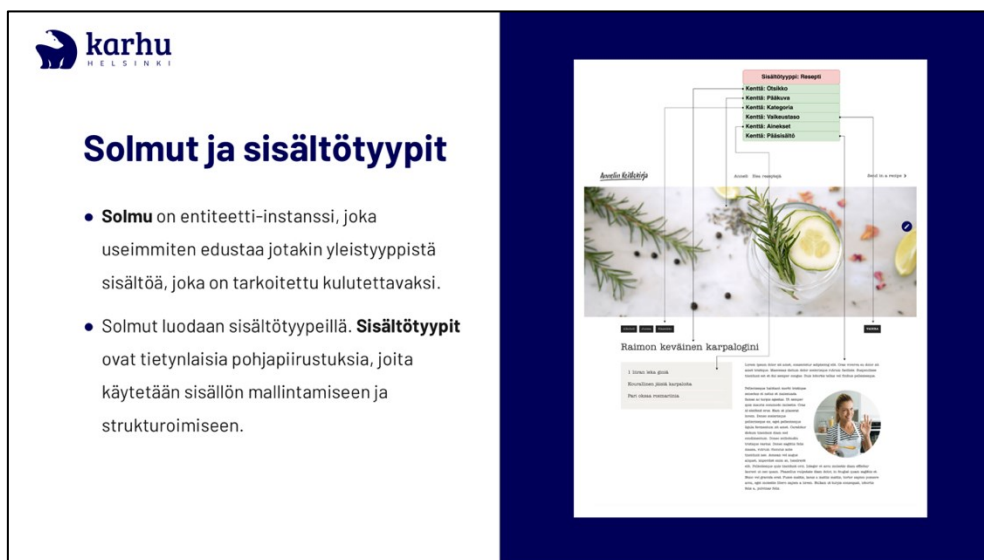


Figure 7: An example of a normal content slide in the training material.



Figure 8: An example of a content slide in the training material that displays code.

4.3 The Format of the Training Program

There are several ways or paths for trainees to familiarize themselves with the training program and its content. Each trainee initiates the training by participating in interviews and surveys that try to determine the trainee’s learning needs and current skill level. Similar sessions are held after the training has been completed in order to collect feedback and to determine the performance increase of the trainee. It is known that applying the acquired knowledge gained from various forms of training to a “real-life” problem can be valuable. For this reason, trainees are also given the possibility to bring in client work to the training sessions, which they can either work on or solve in its entirety with the help of a trainer.

The training material itself can be presented in various ways, depending on how much time and resources are available. In an ideal world where neither resources nor time is limited, the trainee is able to take in all the training material and complete the training project at their own pace which, depending on the skill level of the trainee, is estimated to take two to three weeks. However, resources and time are seldom unlimited, which means that the training program has to have various faster options for delivering its content. The training is, therefore, conducted in various formats and paces depending on the trainee’s

learning needs and the time and resources that Karhu is able to part with at a particular point in time. The format or delivery options are the following:

Option 1, or “The whole nine yards” option: With this delivery option, the trainee is given all the time needed to complete the training program at a suitable pace that prioritizes learning. Training is initiated with interviews and surveys (Appendix 4A and 5A) that try to establish the learning needs of the trainee. The process continues by giving the trainee access to the material bank, which allows them to familiarize themselves with the topics of the upcoming training. This is followed by training sessions with a trainer, where the training program’s training material is presented in a lecture-like style with the help of PowerPoints. The lectures are not only intended to present the training material but also work as pair-programming sessions between the trainer and trainee, where the intention is to aid in the process of building the training project or the “real-life” work problem. When the training project has been completed and all the training material has been presented, interviews and surveys are again held to determine how much the trainee learned during the training sessions, and to collect any feedback that the trainee might like to give. After the training process is finished, the trainee can turn to both the training material and the material bank, in order to fill gaps in their knowledge. The estimated completion time lies between two and three weeks, depending on the trainee’s skill level.

Option 2, or “The hybrid” option: This delivery option can be seen as a balanced version between the three available formats where both learning and performance are prioritized. As with the first option, training is initiated with interviews and surveys, and the trainee is given access to the material bank. The training continues with training lectures, which are faster in pace as compared to the previous option. As with the first option, the trainee receives aid with the training project, but the project will only be partially completed, which means that there is not enough time to focus on all the topics and areas on a detailed level. Interviews and surveys are held after the training, in order to receive feedback and to determine what the trainee learned. The estimated completion time is around one week, depending on the trainee’s skill level.

Option 3, or “The fast track” option: This delivery option is the fastest of the three and focuses almost solely on performance. As with the first two options, training is initiated with interviews and surveys, and the trainee is given access to the material bank. The training continues with training lectures, which are faster in pace as compared to the two previous options. This time, there is no time for a training project, so small code examples and pair-programming sessions are held instead. Interviews and surveys are held after the training, in order to receive feedback and to determine what the trainee learned. The estimated completion time is three to four days, depending on the trainee’s skill level.

There are pros and cons to each delivery method, and the “correct” option to select is going to vary depending on various factors, such as available time, resources, and the trainee’s skill level. Training is always going to be very resource and time-intensive, and robust training is always going to require both of them. The three delivery options or training program formats are compared in the table below (Table 4). The “Pace” column compares the speed at which the material is taught. The “Training project” column compares how much of the training project can be completed during the training sessions. The “Priorities” column compares the priorities of the delivery method and the “Completion time” column the speed at which the program is completed.

Table 5: Comparison of the training delivery formats.

Option	Pace	Training project	Priorities	Completion time
<i>Option 1</i>	Slow-paced	Whole project	Learning	2-3 weeks
<i>Option 2</i>	Medium-paced	Partial project	Learning and performance	1 week
<i>Option 3</i>	Fast-paced	No project	Performance	3-4 days

4.4 Training Program Implementation

The new training program was initially implemented at Karhu during January 2022. Two training candidates were trained with the new training program, both of which had worked at the company for a little less than a year and who were relatively new to the Drupal

content management framework. The candidates were trained separately using the third delivery method or the “fast track” option. The steps that took place for each candidate during the whole training process were the following:

1. The candidates were approached with an approaching letter.
2. The candidates filled out a survey prior to the training.
3. The candidates took part in interviews prior to the training.
4. The candidates participated in training sessions.
5. The candidates filled out two surveys after the training.
6. The candidates participated in interviews after the training.

Approaching letter: An approaching letter (Appendix 1) was sent via email to each candidate selected for the new training program. The letter informed the participants that the company would like for them to participate in the training program that had been constructed in parallel with this master’s thesis. The letter gave clear instructions regarding the participation in the program and explained the training schedule; each participant was instructed to start by answering a survey regarding their knowledge and training needs. This would be followed by an interview which, in turn, was to be followed by training sessions. The training would end with more surveys and interviews, which gauged learning progress and collected feedback in order to determine the program’s effectiveness. Since the participants had both worked at the company for a while, they were encouraged to bring in “real-life” project tasks that they needed help with, which would be solved during the training sessions with the help of the lecturer and the training material. Attached to the approaching letter email was also a form of consent (Appendix 3) and a data management plan (Appendix 2).

Surveys and interviews prior to training: Each trainee who participated in the training program had to answer survey questions and partake in an interview before the training took place. The first survey (Appendix 5A) was divided into five sections, which represented the areas and topics of the training program. The survey contained a total of 50 questions. The goal of the survey was to determine the trainee’s learning needs, in order to avoid training the participants on areas and topics that they were already familiar with.

The survey was followed by an interview (Appendix 4A), which tried to gauge the participants' learning style, motivation, and previous experience. The goal was to use both the survey and the interview as tools for tailoring the training program according to the trainee's needs.

Training sessions: The actual training took place during three training sessions, which lasted a total of three days per participant. Each participant had had both the training material and schedule tailored so that it suited their learning needs. These adjustments had been done based on the information gathered from the first survey and interview. In practice, this meant that each trainee participated in lecture-like sessions, where a trainee went through the various topics of the training program at a varying pace, depending on the information gathered from the survey and interview. Each trainee also participated in coding sessions together with the lecturer, where a small feature of the training project was constructed. In addition to this, both trainees brought in a “real-life” project task that they needed help with, which were successfully completed during the training sessions. In essence, the training sessions provided the trainees with a space for solving problems, where both the problem and the material needed for solving the problem were available. A visualisation of the tailoring effect can be seen in the figure below (Figure 9), which displays the hours spent per training subject in each training module.

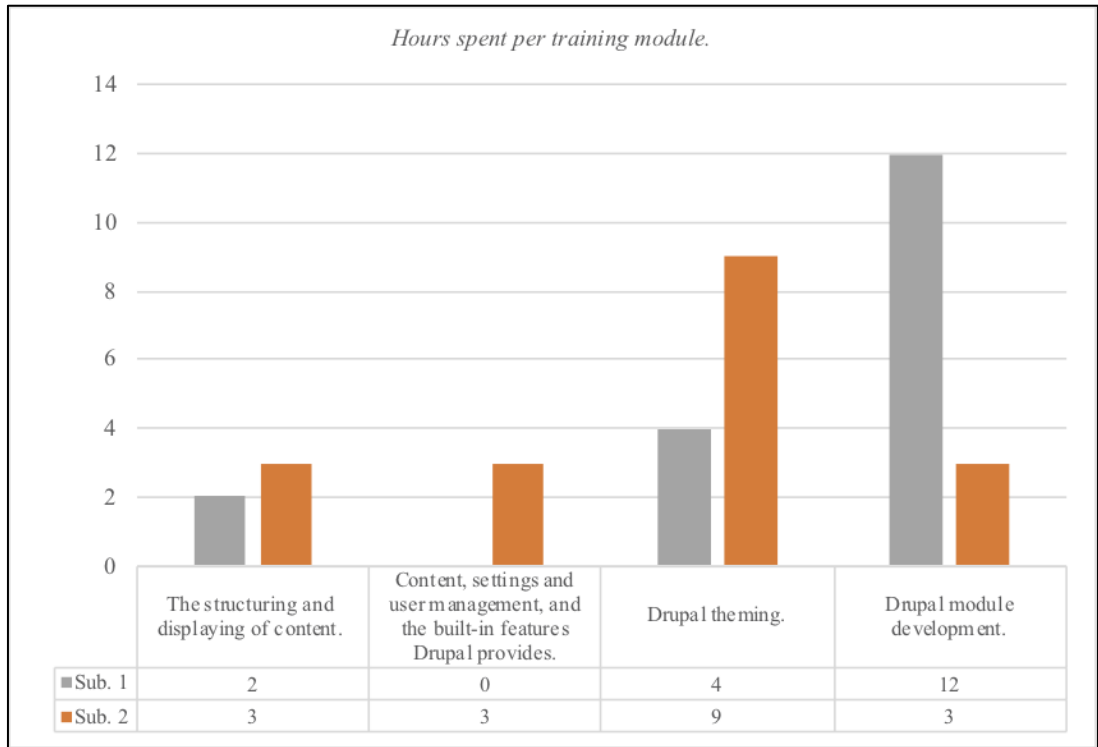


Figure 9: Hours spent per subject per training module.

Surveys and interviews after the training: After the training sessions had been completed, each trainee filled out two surveys (Appendix 5A and 5B) and participated in an interview (Appendix 4B). During the second round of survey questions, each participant had to fill out two surveys. The first survey was similar to the one presented to the participants before the training took place, and the aim of it was to determine how much each trainee had improved during the training sessions. The second survey contained more feedback-oriented questions. The second interview can be seen as a wrap-up session between the trainer and trainee, and it is held in order to collect any form of feedback or improvement ideas that the trainee would like to give.

5.0 Evaluation Methods

This chapter discusses the evaluation methods utilized during the evaluation process of the training program. The chapter starts off by discussing the two evaluation methods selected for the evaluation process, which are interviews and questionnaires. The chapter continues by describing the implementation and utilization of the previously mentioned research methods in the training program.

5.1 Interviews as a Research Method

Interviewing is a qualitative research method that enables researchers to learn about how subjects perceive and comprehend their surroundings. Interviewers are given the opportunity to widen their understanding of a subject's views by allowing them to talk about their experiences and opinions in their own words. Therefore, qualitative interviews have for a long time been seen as a powerful method for extracting information regarding a human situation. [38]

Ethical issues are always of high concern when generating interview information through discussions and interactions between a subject and an interviewer. From an ethical standpoint, both the personal interactions between a subject and an interviewer, and the various stages of the interview process, demand close attention to detail. Furthermore, ethical guidelines of the interview process stress the importance of a subject's consent to partake in a study, the confidentiality of the matters discussed during the interviews, the implications of involvement in the study, and the researcher's role in the process. [38]

The openness of qualitative interviews is seen as one of the method's main advantages. While the interview process lacks rules that are set in stone, conventional options intended to guide one through the process of making the correct methodological and ethical decisions are available. The chapter "*Planning an interview study*" in [38] discusses the seven stages of the interview process, which are the following:

1. **Thematizing:** Determining the goal of the study.
2. **Designing:** Making a plan for the design of the study.
3. **Interviewing:** Conducting interviews with the help of guides.
4. **Transcribing:** Transforming the interview material into analyzable content.
5. **Analyzing:** Deciding on an appropriate analysis method.
6. **Verifying:** Making sure of the validity and reliability of the results.
7. **Reporting:** Conveying the results and findings.

To summarize, the interview process should start by determining the goal of the study, which means that the researcher should be able to answer the questions: Why are we doing this study, and what are we trying to find out? The answers to these questions will also determine whether interviewing people is the correct tool for solving the problem. The next step of the process involves making a detailed plan for the study and the interviews. This plan should be fed through a filter that questions the study's ethical standpoint and the power asymmetries that inevitably arise during the process. The following step involves conducting the actual interviews which, in the case of structured and semi-structured interviews, should be done with the help of an interview guide that has been prepared beforehand. It is the interviewer's responsibility to conduct the interviews so that they are constantly mindful of the south knowledge and the interpersonal relations in the process. The interviews are followed by a transcribing process, where the usually audio-recorded interviews are turned into written text. This step is followed by an analysis and verification process, where an appropriate analysis method is chosen based on the study's purpose which, in turn, is used for determining the validity, reliability, and generalizability of the collected material. The final part is the reporting process, where both the utilized methods and results are communicated in a way that adheres to scientific standards, which involves considering the ethical issues of the study and producing a readable product.

5.2 Questionnaires as a Research Method

Questionnaires have their roots in the social sciences. From there, they have been brought over to other fields to serve as a tool for collecting answers to questions in a structured and systematic way. In the area of management research, the questionnaire serves as the most popular data collection method, since it is seen as a reliable and unbiased way of collecting valid information from respondents. The chapter “*The Purpose of the Questionnaire*” in [39] states that the method fulfils its purpose by providing a tool that can be described to have the following properties:

- A tool for collecting reliable information.
- A tool that provides a logical structure to the collected data.
- A tool that provides a standard format that guides its users.
- A tool that facilitates both information processing and protection.

To summarize, the questionnaire’s main purpose is to collect trustworthy and accurate data. This is usually done by asking a certain group of people either open-response or closed-response questions that are based on research objectives and goals. Closed-response questions allow the respondents to choose answers to questions from a set of options provided by the researcher. Open-response questions, in turn, work by giving the respondents more freedom when providing their answers, which are often given in free format. For the data collection to run smoothly, the questionnaires should be logically structured and well organized. This structure provides a standard format that can easily be followed by the respondents. The logical and organized structure of the questionnaire also provides insurance of the information’s validity.

The chapter “*The Process of Questionnaire Construction*” in [40] states that there are various blueprints or frameworks for constructing questionnaires and that each framework includes various steps that have to be completed in a specific sequence for the questionnaire to be effective. The framework presented in the chapter describes a seven-step process, which includes the following:

1. Examine the data needs that facilitate a questionnaire.
2. Construct questions that when answered meet the information requirements.
3. Fine-tune the questions and assess their validity.
4. Decide on either open-ended or closed-ended questions.
5. Decide on a format and wording for the questions in the questionnaire.
6. Decide on the format of the questionnaire itself.
7. Run through the steps again and evaluate the constructed questionnaire.

The first step of the process refers to understanding the problem for which the questionnaire is being created, which means that the researcher should be able to state why the information is gathered and for what it is going to be used. The next step of the process involves formulating the questions that, when answered, provide the needed information for solving the problem. This step should be followed by an evaluation process, where the questions are fed through a filter that consists of the following questions: 1. Can the question be understood by a respondent? 2. Can the question be answered by a respondent? 3. Is a respondent going to answer the question? If the answers to these questions are all “yes”, then the process continues by deciding on either closed-ended or open-ended questions, which means that the respondents are either going to choose their answers from a set of options or are encouraged to respond in free format. This step is followed by a process where each question and its wording are examined. The questions themselves should not be phrased or worded in a way that impacts the provided answers given by the respondents, and the researcher should remember that even a slight change in a question's wording can drastically impact the results. The following step involves constructing the questionnaire itself. General guidelines state that the questionnaire should be constructed in a way that facilitates its completion and analysis, which means that the questionnaire should be easily understood by the respondents with the help of informative descriptions and appropriate spaces for answers. Furthermore, the given answers should be easily transferable to an analysis process. The final step involves examining the final product and all its various aspects for potential problems.

5.3 Interviews in the Training Program

The interviews created for the training program have the purpose of serving as tools for collecting information from the trainees who participate in the program. Two interviews are to be held in total for each participant in the program, the first before the training has started and the second after the training has been completed.

The first interview (Appendix 4A) is meant to function as a tool for determining the preferred learning style, training needs, and skill level of a trainee who is participating in the program. In addition to this, questions regarding previous training experiences were also discussed. The interview is semi-structured, which means that an interview guide with questions was composed beforehand. The first interview contained a total of seven questions, which revolved around their previous experiences, current developer role, preferred learning styles, motivation, and things the trainees found difficult about Drupal. Each question could also have additional support questions, which were used in situations where a trainee needed additional guidance when answering a specific question. The interview was audio-recorded and transcribed for analysis. The gathered information was used together with the answers collected from the first survey for composing a training plan and for tailoring the program according to the needs of a trainee. An example question (translated into English) and its support questions from the first interview are presented below. The question asks a trainee to tell the interviewer about their current developer role and to talk about the technologies they like to work with. The answer to the question can be used for tailoring the program according to the trainee's needs. For example, a trainee who is oriented more towards a front-end role and front-end technologies might have had the program altered in a way that emphasized the front-end components of the program more than the back-end ones.

Question: *Describe your developer role. What tools and technologies do you like to work with?*

- **Support question:** *Oriented towards a front-end role?*
- **Support question:** *Oriented towards a back-end role*

- **Support question:** *Oriented towards a full-stack role?*

The second interview: (Appendix 4B) is meant to function as a tool for collecting trainee feedback after the training has been completed. The interview can be seen as a wrap-up session where the trainee is asked questions regarding their thoughts and feedback about the program and to list any improvement ideas that the trainee would like to give. The second interview was also a semi-structured one, which means that an interview guide was composed beforehand. The interview contained a total of 12 questions, which revolved around the training program's structure, content and pace, the training environment and its delivery, and whether or not the trainee had improvement ideas of their own. Each question could also have additional support questions, which were used in situations where a trainee needed additional guidance when answering a specific question. This interview was also audio-recorded and transcribed for analysis. The gathered information was used together with the answers collected from the second and third survey for making improvements to the program. An example question and its support question (translated into English) from the second interview are presented below. The question asks the trainee about their thoughts regarding the program's pace and whether or not they felt they could allocate time for the training. As an example, an answer describing a stressful situation might indicate that a participant felt that their concentration was hindered by other work-related tasks during the training, which means that the company should emphasize the trainees to concentrate on the training when it is taking place.

Question: *What did you think about the pace of the course?*

- **Support question:** *Do you feel you were able to allocate time for the training?*

5.4 Questionnaires in the Training program

The questionnaires crafted for the training program were created to serve as tools for collecting information from the trainees who participate in the program. A total of three

surveys were created, one of which the trainees filled out prior to the training and the second two after the training had been completed.

The first survey (Appendix 5A) was created in order to determine the participants' training needs and current skill levels on the various topics included in the training program. This was done in order to ensure that a participant that already possessed knowledge on a certain topic would not unnecessarily be trained in the areas that they were already familiar with. This meant that the questions that had to be answered were directly connected to the training program and its training material. The questionnaire in the first survey was divided into five sections and contained a total of 50 questions. The sections were identical to the areas covered in the training program, and the questions mirrored the various topics discussed in each area.

The questions in the first survey were closed-ended questions, which means that the trainees had to select their answers from a set of options. The options themselves were based on a modified version of the Likert scale, which is a widely used rating scale for close-end questionnaire questions [40]. The selectable options in the first questionnaire determined whether or not a trainee would be trained on a specific topic. An example question (translated into English) from the first survey and the available options are presented below:

Question: *I am familiar with best practices for writing JavaScript in Drupal.*

- **Option 1:** *I have a deep understanding and the ability to apply this knowledge.*
- **Option 2:** *I have some hands-on experience.*
- **Option 3:** *I have a theoretical basis of the subject.*
- **Option 4:** *I have no knowledge of the subject.*
- **Option 5:** *I do not know.*

Trainees who answer a question with option 1 are never trained on the specific topic that the question corresponds to. If option 2 is given as an answer, then the topic connected to the question is skimmed through at a quicker pace than the rest of the material in the

program, since it is determined that the trainee is able to deepen their knowledge on the job with the hands-on experience that they already have. In situations where either option 3 or 4 were given as an answer, the topic connected to the questions is trained either in a normal manner or very thoroughly. Option 5 means that the trainee does not understand the question, or that the trainee is unable to tell whether or not they have experience with the topic connected to a specific question. In either case, this option almost always leads to thorough training on the matter.

The second survey (Appendix 5A) is similar to the one presented to the trainees before the training has taken place. The survey contains the same section, questions, and answer options as the first survey. This survey was constructed to work as a tool that would be able to determine how much each trainee had improved during the training sessions. This can be done by comparing the answers to the second survey with the answers given to the first survey.

The third survey (Appendix 5B) is meant to function as a tool for the trainees to give feedback on the training program and the training they received. The intention is to use said feedback to make improvements to the program over the course of its existence. The questionnaire in the third survey was not divided into sections and contained a total of 20 questions. The questions in the third survey were all closed-ended questions, which means that the trainees had to select their answers from a set of options. The options themselves were based on the Likert scale, which means that the questions were declarative statements, and the response options a scale of agreeableness, ranging from “I strongly agree” to “I strongly disagree”. All the questions in the third survey revolved around the trainee’s experience of the training program, and the questions themselves can be divided into the following categories: *Content and Structure*, *Pace and Execution*, *Relevancy and Learning Needs*. An example question (translated to English) from the third survey that demonstrates the Likert scale is presented below. An answer that falls between option 1 and 2 can be seen as a satisfactory one, while one that falls between 4 and 5 means dissatisfaction.

Question: *The learning objectives of the training program were clear to me.*

- **Option 1:** *The objectives were very clear.*
- **Option 2:** *The objectives were clear.*
- **Option 3:** *The objectives were somewhat clear.*
- **Option 4:** *The objectives were not that clear.*
- **Option 5:** *The objectives were not clear at all.*

The questions that fall under the *Content and Structure* category measure the trainee's satisfaction with the training program's material and logical structure. A negative response to the questions that fall under this category might mean that a trainee is a) dissatisfied with the presented material, b) felt that the material was not engaging enough, c) felt that the learning objectives were not clear, or d) felt that the training and its material were disorganized. Questions under the *Pace and Execution* category measure the trainee's view of the program's workload and the training sessions themselves. A negative response to the questions that fall under this category might mean that a trainee a) felt that they could not allocate the time needed to participate in the training, b) felt that the training sessions were held at a pace that was not suitable for them, c) felt that the tools used during the program were unsuitable for the training, or d) felt that they are not satisfied with the quality of the training. The questions that fall under the *Relevancy and Learning Needs* category measure a trainee's view of the program's usefulness with regard to their job assignments and how well the material of the program suited their needs for learning. A negative response to the questions that fall under this category might mean that a trainee is a) dissatisfied with the covered areas and topics, b) felt that the material was presented in an unsuitable way, or c) felt that the program was not helpful to them.

6.0 Results

This chapter showcases and discusses the results derived from the interviews and surveys created for the training program. Chapter 6.1 starts off by talking about the first and second interview, both of which were transcribed, coded, categorized and destructed, and analyzed with the help of a content analysis. Chapter 6.2 continues by discussing the surveys created for the training program, which were analyzed with the help of various bar charts. At the end of this section, chapters 6.3 presents a result summary and chapter 6.4 discusses various improvement ideas that have been derived from the results and my own personal observations from the training sessions.

6.1 Interview Results

A content analysis was done on both the first and the second interview rounds, totaling four interviews. The content analysis involved reading through the transcribed interviews and marking various sentences, words or phrases with tags or codes. These markings were later categorized under predefined categories, which would aid in interpreting the collected information.

The first interview (Appendix 4A) is meant to function as a tool for determining the preferred learning style, training needs, and skill level of a trainee who is participating in the program. In addition to this, questions regarding previous training experiences were also discussed. The results from this content analysis were used in combination with the results from the first survey to tailor the training program and its content according to the needs of a trainee. The primary categories into which the first interview was divided were: 1) The subject's coding experience and interests, 2) The subject's views on Drupal and motivation, 3) The subject's previous training experiences at the company, and 4) The subject's preferred styles of learning. The tables below (Tables 5) present the first interview in a categorized format for the subjects that participate in the program. Each category is discussed in detail below the table with quotes from the interviews. The quotes have been translated from Finnish to English.

Table 6: The first interview, coded and categorized for two training subjects.

Category	Code	Frequency
<i>Coding experience and interests.</i>	<i>Experience of a full-stack role.</i>	1
	<i>Experience of a front-end role.</i>	5
	<i>Interests towards a back-end role.</i>	1
	<i>Interests towards a front-end role.</i>	1
	<i>Interests towards site-building.</i>	1
<i>Views on Drupal and motivation.</i>	<i>Negative view.</i>	2
	<i>Positive view.</i>	6
<i>Previous training experience at the company.</i>	<i>Training portals.</i>	2
	<i>Training with a mentor.</i>	2
	<i>No time for training.</i>	3
	<i>Difficult to find material.</i>	1
<i>Preferred learning styles.</i>	<i>Code examples.</i>	2
	<i>Project work.</i>	2
	<i>Online classes.</i>	1
	<i>Mentoring.</i>	1

The “*Coding experience and interests*” category was used for formulating an understanding of the trainees’ previous coding experiences and interests in the field. A total of six codes were identified under the analysis process of the two individual interviews regarding this particular category, the most frequent one being the “*Experience of a front-end role*” -code. Both of the trainees indicated on several occasions (Quote A1 & A2) that they had worked with some form of front-end development either at their previous job or at their current employer Karhu.

Quote A1: “Well right now I’m feeling like the front-end development – we have been using compony (front-end framework) in the project (project name), and I’ve started to get the feeling that I know what I’m doing, and I’ve been writing quite a lot of styles as well.

Quote A2: “Well, at Karhu I have been doing mostly Drupal theming, so front-end development, and then a little bit of Drupal content management. And well, I like them both a lot.”

The trainees differed when it came to the roles that they wanted to develop into – one of the trainees expressed an interest towards back-end development (Quote A3), while the other felt that they wanted to keep their focus on a front-end role (Quote A4), although the same trainee pointed out that they eventually wanted to learn about back-end development as well.

Quote A3: “Well, as I mentioned earlier, I have not really done any module development in ages, so I feel like that would be more beneficial to me, and that we could start from the very beginning.”

Quote A4: “I had a thought about module development, and it would definitely interest me a lot, but I’m not sure if it is necessary at the moment.”

The coding and categorizing process of this specific part of the interview was used for tailoring the training program according to the learning needs of the trainees, which in the case of one of the trainees meant a focus on back-end development, since it was established that they were more experienced on the front-end side, and they expressed an interest towards back-end development. For the other trainee, this meant a focus on front-end development, since it was established that that was what they already had some experience in, and what they wanted to keep their focus on.

The “Views on Drupal and motivation” category was used for formulating an understanding of the trainees’ views on Drupal and their motivation level towards the

training. In this category, the transcribed interview sessions were coded as either negative or positive experiences, and the positive experiences clearly outweighed the negative ones. Interestingly, both of the trainees stated that their initial reaction towards Drupal had been somewhat doubtful (Quote A5 & A6). One of the trainees stated that they had found the framework to be unnecessarily difficult, while the other pointed out that they were more used to coding everything by hand, while Drupal has the user configuring a majority of the needed setting through a graphical user interface.

Quote A5: “I initially started working with Drupal when I worked as a freelancer for a friend’s company. We were using Drupal in a project, and I have to say that I was astonished about how damn difficult everything was.”

Quote A6: “Well, to be completely honest – I have a React background, so at the start, it felt that, well, I have always felt that content management systems, well, they do help you with some parts of the work, but still, I’m used to coding things by hand with React, so Drupal felt a little different at the start.”

However, both of the trainees continued by stating that by giving the framework a chance, they had realized its potential and were eager to learn more (Quote A7 & A8). Both of the trainees were also happy that the training was being organized and were clearly motivated to develop their skills in the area.

Quote A7: “But after some time with the system, I started to realize why things are so difficult, or why Drupal is so diverse and how it can be used and customized for almost anything. Maybe the realization that we are not building a basic homepage anymore, but that we are working with a very robust content management system which can be used by the customers or content creators for different things.”

Quote A8: “It is super nice and I’m very glad that this training is being organized. When I started, I got a small introduction to Drupal theming,

but this training is going to be nice in the sense that I hope that I'm going to learn about the various things that can be done with Drupal."

The “*Previous training experience at the company*” category was used for formulating and understanding regarding the trainees' previous training experiences at the company and their thoughts about them. A total of four codes were identified from this section of the interviews, two of which had to do with training methods and two regarding their experiences with the previous training. Both of the trainees stated that they had been given the opportunity to learn and develop their skills with the help of mentors and had been given access to various training portals (Quotes A9 & A10).

Quote A9: “I have been watching some of the videos at OS training, but I don't have that subscription anymore. I tried Drupalize.me for a month, but I did not have the time for it. I also use YouTube every now and then.”

Quote A10: “I have been studying some of the online Drupal courses and some of the courses provided by Aquia and such. And then of course, in a work situation, my colleagues in my team have been able to provide help when I've had something.”

However, the trainees had both experienced problems when it came to allocating time for training (Quote A11) and had found it difficult to find relevant material from the training portals that they had been given access to (Quote A12). One of the trainees also stated that if a particular skill they are trying to learn is not directly connected to their work, and they are unable to practice and apply the knowledge they have acquired, then there is a high chance of them forgetting about it in the near future.

Quote A11: “I have a few days per month allocated for training, but in reality, this never happens. And if it does, it is usually one hour there and another here. And then, if I'm learning something new and I'm not able to use it in my work in the near future, then there is a high chance of it just being left hanging in the air, if I'm not able to apply the knowledge.”

Quote A12: “It is difficult to find good or high-quality training material about Drupal. I don’t know if it is because it is so small – I don’t not know. But it has been difficult to find relevant material”

The “Preferred learning styles” category was used for formulating an understanding of the trainees’ preferred styles of learning. The training program can be altered and tailored according to the needs of a trainee, which means that a trainee who for example prefers pair-programming sessions might have a higher number of said sessions during their training than others normally would. A total of four codes were identified during the categorization of this section of the interview process, the most popular ones being “Code examples” and “Project work”. Both of the trainees stated that they liked learning with the help of various code examples. One of the trainees said that project work that started from “scratch” had previously been a good learning experience for them (Quote A13). Online classes and mentoring were also brought up by one of the trainees (Quote A14).

Quote A13: “And then of course code examples that you can play around with. This has also been very good this (name of project) project where I have been able to do things from the very beginning and I haven’t had to look at code that somebody else has written and try to solve or improve upon it. Doing something by yourself from the very beginning is really something great.”

Quote A14: “I like online courses. When you dive into them you can really learn a lot. Then of course on the job, when you’re trying to solve a problem and attempt to find the solution from the internet or something like that. And mentoring - so that you can get help when needed.”

The second interview: (Appendix 4B) is meant to function as a tool for collecting trainee feedback after the training has been completed. The interview can be seen as a wrap-up session where the trainees are asked questions regarding their thoughts and feedback about the program and asked to list any improvement ideas that the trainee would like to give. The results from a content analysis done on the second interview are going to be used in

combination with the results from the second and third survey to make improvements to the training program over its lifetime. The primary categories into which the second interview was divided were: 1) General feedback, 2) Program content and structure, 3) Program pace 4) Program environment and delivery, and 6) Improvement ideas. The tables below (Tables 6) present the second interview in a categorized format for the trainees who participated in the program. Each category is discussed in detail below the table with quotes from the interviews. The quotes have been translated from Finnish to English.

Table 7: The second interview, coded and categorized for two training subjects.

Category	Code	Frequency
<i>General feedback</i>	<i>Positive feedback.</i>	5
	<i>Constructive or negative feedback.</i>	-
<i>Program's content and structure.</i>	<i>Positive feedback.</i>	7
	<i>Constructive or negative feedback.</i>	1
<i>Program's pace.</i>	<i>Positive feedback.</i>	-
	<i>Constructive or negative feedback.</i>	5
<i>Program environment and delivery.</i>	<i>Positive feedback.</i>	7
	<i>Constructive or negative feedback.</i>	1
<i>Improvement ideas</i>	<i>Advanced examples.</i>	1
	<i>Evaluated assignments.</i>	1
	<i>Applying knowledge to work.</i>	1
	<i>More training.</i>	1

The “*General feedback*” category was used for collecting general thoughts, ideas, and feedback that the trainees wanted to give. In this category, the transcribed interview sessions were coded as either “Positive” or “Constructive or negative” feedback, and the

positive experiences clearly outweighed the constructive ones. One of the trainees stated that they had liked the fact that the training program had been quite difficult for them, since they thought that it was preferable that the program's difficulty matched the difficulty of actual client work (Quote B1). The other trainee liked the program because it introduced them to concepts that they had no knowledge of or were unfamiliar with and stated that they now felt that their competence level and professional ability had reached new levels (Quote B2).

Quote B1: "Setting the bar high is a good thing. Real-life work and the client work that we do is usually difficult, and easier cases, well, they usually don't exist. But of course, if it is way too difficult then it no longer promotes learning, if you always feel lost and like you don't understand."

Quote B2: "We covered a lot of things that I didn't know, or that previously were unfamiliar to me. This really opened my eyes to everything that can be done – I feel more professional."

The “*Program content and structure*” category was used for collecting feedback on the information, areas, and topics that were discussed in the program, and the ways in which said information had been structured and laid out. In this category, the transcribed interview sessions were coded as either “Positive” or “Constructive or negative” feedback, and again, the positive experiences clearly outweighed the constructive ones. A constructive feedback comment made by one of the trainees regarded the training program's language, which was written in Finnish. While they understood that the company's working language is Finnish, they thought that the program could have been written in English, since that is the language in which the programming work is often done. Other than that, both of the trainees felt that they had received a good overview of Drupal in general and that their understanding of the system as a whole had become substantially better. Both of the trainees liked the way in which the program had been structured and were happy about the knowledge they had acquired regarding the areas in which they wanted to specialize (Quote B3 & B4).

Quote B3: “But in any case, a really good summary. It is difficult to find a “in a nutshell” description of Drupal. Usually everything is just about a single thing and you are left with small fractions of knowledge.”

Quote B4: “I thought that this was very interesting. I got new knowledge, and this opened my eyes to the things that can be done, for example in module development, and everything that belongs to it, how it can be used to add new functionality to Drupal. And how things are structured and how components are built and other basic stuff. The content was really good. It was a nice and professional course.”

The “Program pace” category was used for collecting feedback on what the trainees thought about the training program’s schedule and pace. In this category, the transcribed interview sessions were coded as either “Positive” or “Constructive or negative” feedback, and this time, the amount of constructive feedback clearly outweighed the positive ones. While each trainee concluded that the training program had had a good flow, both of the trainees stated that the pace of the program had at times been too fast for them and that they thought it had hindered their learning. Both of the trainees also stated that the amount of information overwhelmed them at times and that they had lost track of what the discussed subject was. Both of the trainees voiced a need for processing and internalizing all the new information, which was difficult because of the program’s pace and schedule (Quote B5 & B6).

Quote B5: “We covered a lot of topics and I often felt that I’m unable to keep up. Sometimes we had more than five files open at the same time, and I felt that I could not keep up.”

Quote B6: “In all other ways it was very good, but well, three days in a row was a rough experience, and now I feel like I’m recovering. A very tightly bundled training which was good, but well, I felt that I didn’t have the time to internalize some of the things that we went through.”

The “*Program environment and delivery*” category was used for collecting feedback on what the trainees thought about the way in which the training was delivered, which included factors such as the used tools, teaching methods, teaching environment, and the number of simultaneous participants. In this category, the transcribed interview sessions were coded as either “Positive” or “Constructive or negative” feedback, and the positive experiences clearly outweighed the constructive ones. Both of the trainees were glad about the fact that they had received the opportunity to participate in the program alone (Quote B7 & B8). One of the trainees stated that they believed that their learning experience had been better because of the program’s personal touch and that they appreciated the fact that they did not have to prepare for the lecture sessions in any way. The program’s teaching methods also received praise from one of the trainees, who stated that they liked the way in which the trainer had repeated difficult topics on multiple occasions, in order for them to properly sink in. An improvement idea regarding the presentation of code was also brought forward by one of the trainees, who stated that a split-screen approach could have been utilized when explaining the communication between two code files.

Quote B7: “You are good at explaining things. I liked the way in which you repeated what you said very often, and when I was the sole participant then, well, it felt pretty luxurious. But yeah, it was good that you repeated things.”

Quote B8: “It was a really good, really good individual training. I thought that it was nice, or when I initially heard about this training, I thought that there would be multiple participants at the same time. But yeah, that was nice.”

The “*Improvement ideas*” category was used for identifying improvement ideas from the trainees who participated in the program. These ideas could involve anything regarding the training material, approaches for how the material could be presented, or suggestions regarding the program’s pace and schedule. In this category, a total of four codes were identified, which were “*Advance examples*”, “*Evaluated assignments*”, “*Applying knowledge at work*”, “*More frequent training*”. One of the trainees mentioned

that the training the company offered could be more frequent and that it would be nice to view examples from a real-life project during the training sessions as well (Quote B10). The other trainee brought forward the idea of small training projects or assignments that could be viewed as homework, which the trainee would receive feedback on after completion (Quote B9). Another idea mentioned by the same trainee included the presentation of large-scale code examples, which could help them wrap their head around more difficult concepts, such as integrations.

Quote B9: “It would be nice, or at least it would probably be a better learning experience if we could do some things and we would have some practice work that we would get feedback on or something like that. And then maybe integrations for example, PIM integrations, which are complete gibberish to me, like how they are done, this could be interesting.”

Quote B10: “It would be nice if these training sessions could be organized more often. There could also be examples from client projects that we could look at together.”

6.2 Questionnaire Results

The questionnaires crafted for the training program were created to serve as tools for collecting information from the trainees who participate in the program. A total of three surveys were created, one of which the trainees filled out prior to the training, and the second two after the training had been completed. The questionnaires were analyzed with the help of bar graphs. The analysis process involved grouping the survey question results into various categories which would aid in interpreting the collected information. The categorization was based on the nature of the question, which for the first two surveys meant grouping the results by the areas covered in the training program, and for the third survey, the grouping utilized the same categorization as the second interview.

The first survey (Appendix 5A) was created in order to determine the participants' training needs and current skill levels on the various topics included in the training program. **The second survey** (Appendix 5A) contains the same questions and answering options as the first survey. This survey was constructed to work as a tool that would be able to determine how much each trainee had improved during the training sessions, which can be done by comparing the results from the two surveys. Each survey contained a total of 50 close-end questions, where the answering options were based on a modified version of the Likert scale. All the answering options for the first and second survey were a) I do not know, b) I have no knowledge of this subject, c) I have a theoretical basis of the subject, d) I have some hands-on experience, and e) I have a deep understanding and the ability to apply this knowledge. The results presented below (Figures 10-13) are grouped by the areas covered in the training program, which were 1) Content, settings and user management, and the built-in features Drupal provides, 2) The structuring and displaying of content, 3) Drupal theming, and 4) Drupal module development. Each category and an associated bar chart are discussed in detail below.

The “Content, settings and user management, and the built-in features Drupal provides” section contained a total of 11 questions which were answered by two subjects before and after the training sessions. The bar graph below (Figure 10) displays the given answers by Subject 1 (grey and yellow) and Subject 2 (orange and blue) for this specific section. The most frequent response for Subject 1 before the training had taken place was “*I have some hands-on experience*” ($\approx 90\%$), and for Subject 2, the most frequent response was “*I have some theoretical basis of the subject*” ($\approx 45\%$). For Subject 1, the answers indicated that they were quite comfortable with their expertise in the area, something which was also supported by the first interview. The answers for Subject 2 indicated that they still needed training within the area. The conclusion was drawn that Subject 1 did not need training within this specific field and that Subject 2 would receive a refresher on the topics covered in this section. After the training, the most common response from Subject 2 was “*I have a deep understanding and the ability to apply this knowledge*” ($\approx 81\%$), indicating that their training in this area proved to be useful.



Figure 10: Answers to survey questions regarding the "Content, settings and user management, and the built-in features Drupal provides" training module.

The “*The structuring and displaying of content*” section contained a total of 10 questions which were answered by two subjects before and after the training sessions. The bar graph below (Figure 11) displays the given answers by Subject 1 (grey and yellow) and Subject 2 (orange and blue) for this specific section. The most frequent response for Subject 1 before the training had taken place was “*I have some hands-on experience*” (90%), and for Subject 2, the most frequent response was “*I have some theoretical basis of the subject*” (50%). For Subject 1, the answers indicated that they were quite comfortable with their expertise in the area, and the answers for Subject 2 indicated that they still needed training. On the basis of the first interview and the first survey answers given by Subject 1, the conclusion was drawn that they would get a quick refresher on the topics in the area. Subject 2 also received training based on the given answers, but this time the training was more extensive. After the training, the most common response from Subject 1 was still “*I have some hands-on experience*” (90%), and “*I have a deep*

understanding and the ability to apply this knowledge” (80%) for Subject 2, indicating that the training in this area proved to be useful for Subject 2.

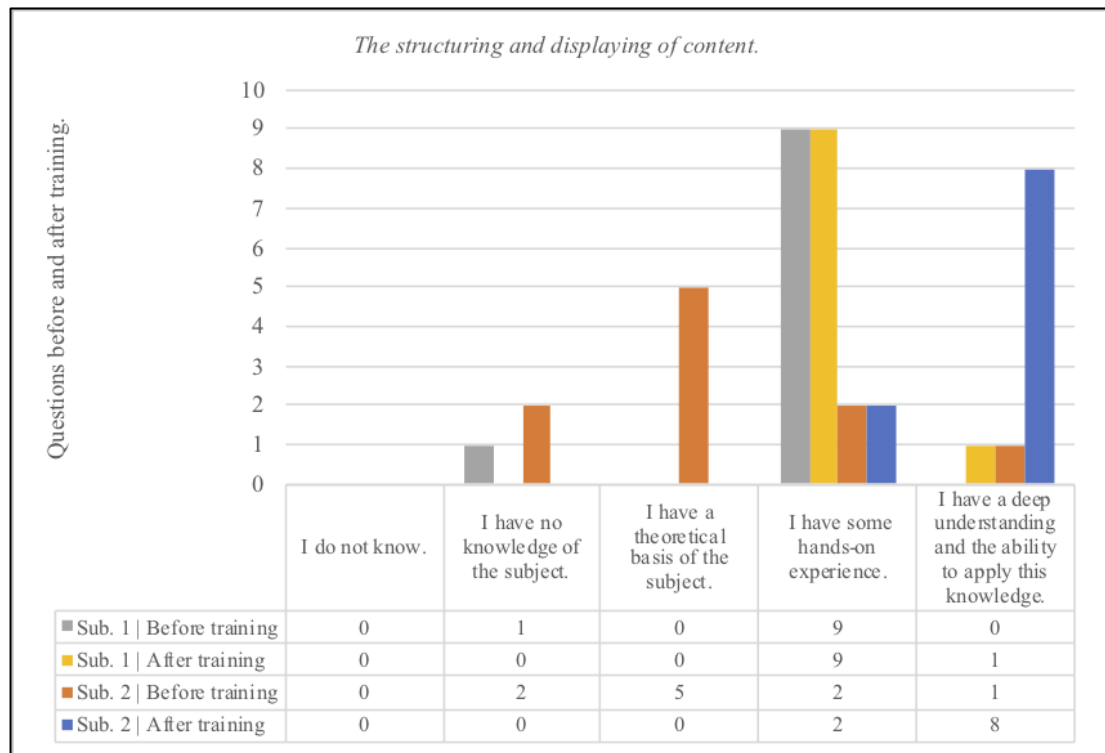


Figure 11: Answers to survey questions regarding the "The structuring and displaying of content" training module.

The “*Drupal theming*” section contained a total of 12 questions which were answered by two subjects before and after the training sessions. The bar graph below (Figure 12) displays the given answers by Subject 1 (grey and yellow) and Subject 2 (orange and blue) for this specific section. The most frequent response for Subject 1 before the training had taken place was “*I have some hands-on experience*” (75%), and for Subject 2, the most frequent response was “*I have no knowledge of the subject*” ($\approx 58\%$). Again, for Subject 1, the answers indicated that they were quite comfortable with their expertise in the area, and the answers for Subject 2 indicated that they needed extensive training. On the basis of the first interview and the first survey answers given by Subject 1, the conclusion was drawn that they would get a few hours of training on the topics related to this area. Based on the first interview and the survey answers given by Subject 2, it was decided that they were to receive extensive training. This decision was made clearer by the fact that Subject

2 expressed an interest in this specific area during the first interview. After the training, the most common response from both subjects was “*I have some hands-on experience*”, ($\approx 92\%$ for Subject 1) and ($\approx 58\%$ for Subject 2), indicating that both subjects benefitted from the training they received in this area.

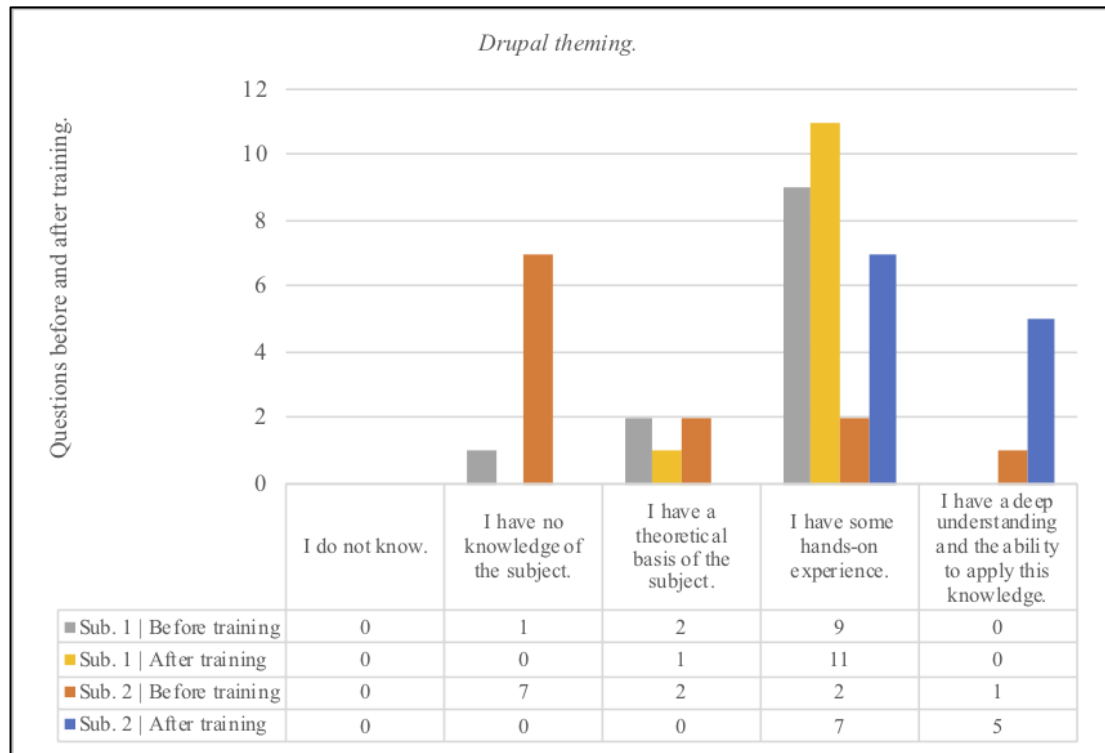


Figure 12: Answers to survey questions regarding the “*Drupal theming*” training module.

The “***Drupal module development***” section contained a total of 14 questions which were answered by two subjects before and after the training sessions. The bar graph below (Figure 13) displays the given answers by Subject 1 (grey and yellow) and Subject 2 (orange and blue) for this specific section. The most frequent response for Subject 1 before the training had taken place was “*I have some hands-on experience*” (50%), and for Subject 2, the most frequent response was “*I have no knowledge of the subject*” ($\approx 85\%$). For Subject 1, the answers indicated that they had some knowledge within the area, but that they still needed training. Subject 2 indicated that they had little to no knowledge within the area and needed extensive training. On the basis of the first interview and the first survey answers given by Subject 1, the conclusion was drawn that they would receive

extensive training in this area. This decision was made clearer by the fact that Subject 1 expressed an interest in this specific field during the first interview. Based on the first interview and the survey answers given by Subject 2, it was decided that they would receive a few hours of training on these specific topics. The survey answers indicated that the training should have been more extensive for Subject 2, but their interest in Drupal theming and time restrictions hindered the completion of multiple extensive training sessions in different areas. After the training, the most common response from both subjects was “*I have some hands-on experience*”, ($\approx 92\%$ for Subject 1) and ($\approx 57\%$ for Subject 2), indicating that both subjects benefitted from the training they received in this area.

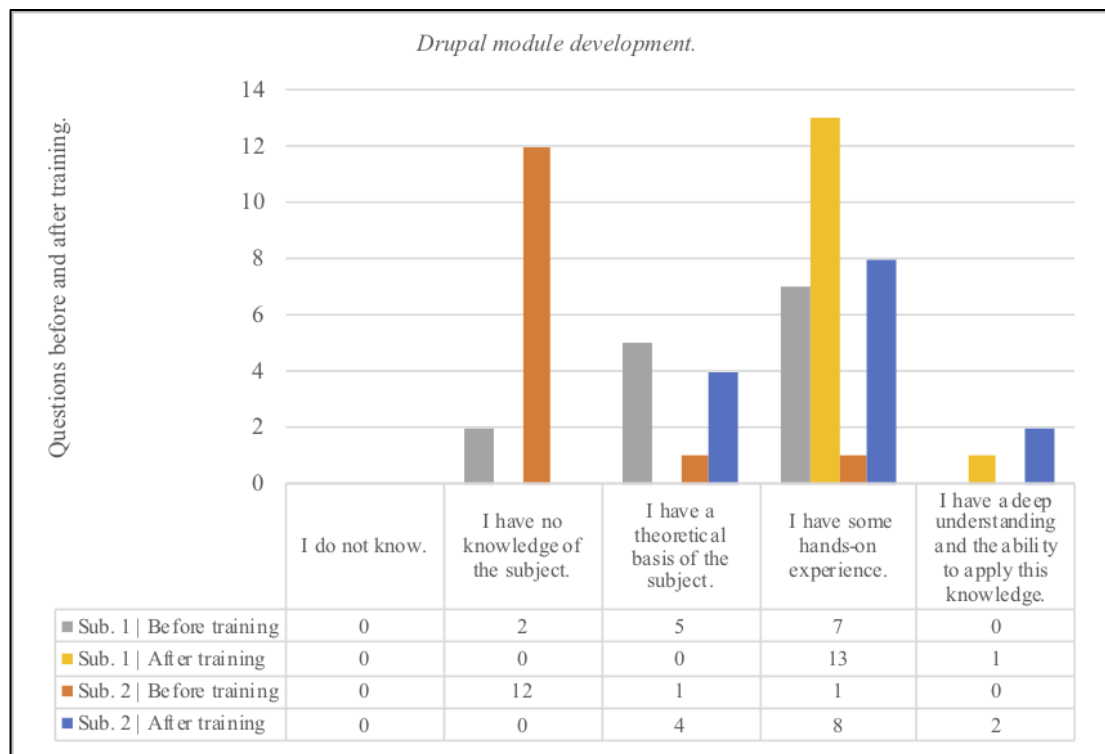


Figure 13: Answers to survey questions regarding the "Drupal module development" training module.

The third survey (Appendix 5B) is meant to function as a tool for the trainees to give feedback on the training program and the training they received. The questions in the third survey were all close-end declarative statements, with selectable answers based on the Likert scale. The results presented below (Figures 14-17) are grouped by the same

categories utilized in the results presentation of the second interview, which were 1) Program content and structure, 2) Program environment and delivery, 3) Program pace, and 4) General feedback. The questions have been simplified and translated into English, and the answers have been converted to a scale of agreeableness, ranging from “Strongly disagree” to “Strongly agree”, in order to get an easier overview of the results. Each category and an associated stacked bar chart are discussed in detail below.

The “*Program content and structure*” category contained a total of 6 questions which were answered by the two subjects that attended the training program. The stacked bar graph below (Figure 14) displays the given answers by Subject 1 and Subject 2 for this specific category. The most frequent response for both subjects was “*Strongly agree*”, indicating that both subjects were happy with the training materials quality, thought that the content was engaging, felt that the topics taught to them were suitable for their learning needs, and felt that the content was well organized and easy to follow. Both subjects also agreed that the material did not need to be more practical, and one respondent felt that the material could have been more theoretical.

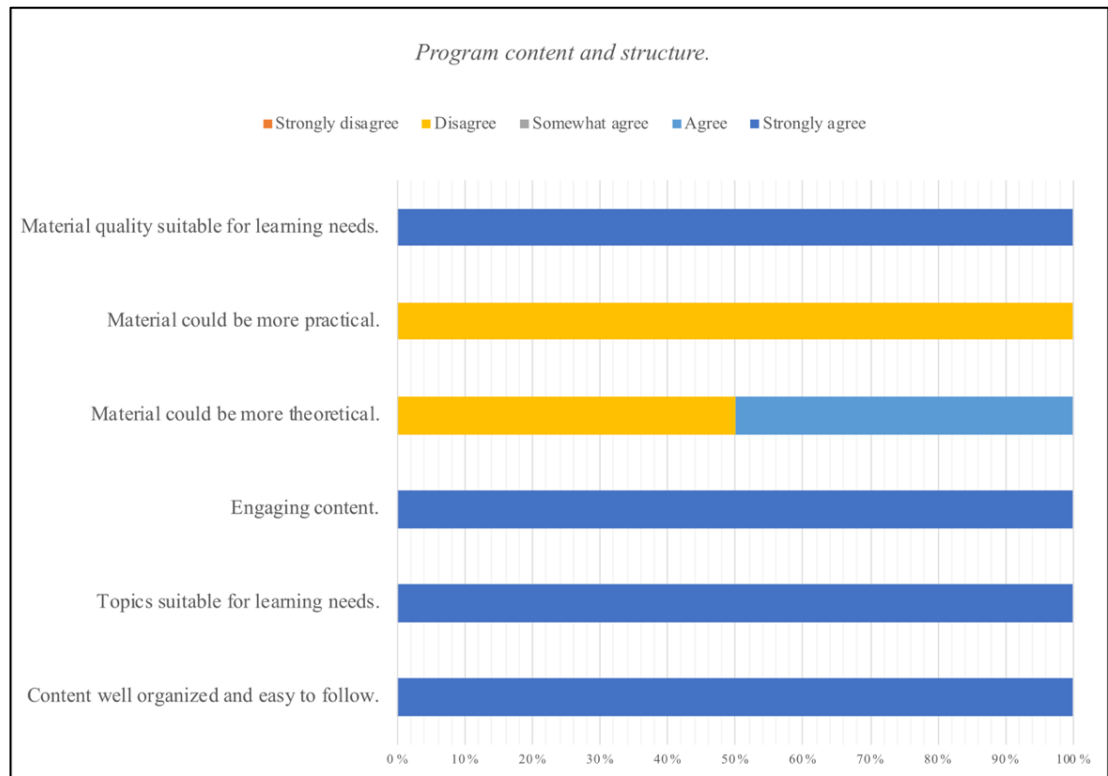


Figure 14: Answers to survey questions regarding the training program's content and structure.

The “Program environment and delivery” category contained a total of 7 questions which were answered by the two subjects that attended the training program. The stacked bar graph below (Figure 15) displays the given answers by Subject 1 and Subject 2 for this specific category. The most frequent response for both subjects was “*Strongly agree*”, indicating that both subjects felt that the program’s learning goals were clear and that the material was presented in a suitable way. Furthermore, the answers also indicate that subjects felt that the teaching was of a high standard and that the trainer was knowledgeable. The answers also indicate that the subject felt that the tools and equipment used during the training and that the number of concurrent participants in the program were both suitable. The only disagreement in this category happens during the question regarding a suitable teaching style, where one participant answered “*Agree*”, indicating that they were somewhat happy with the outcome.

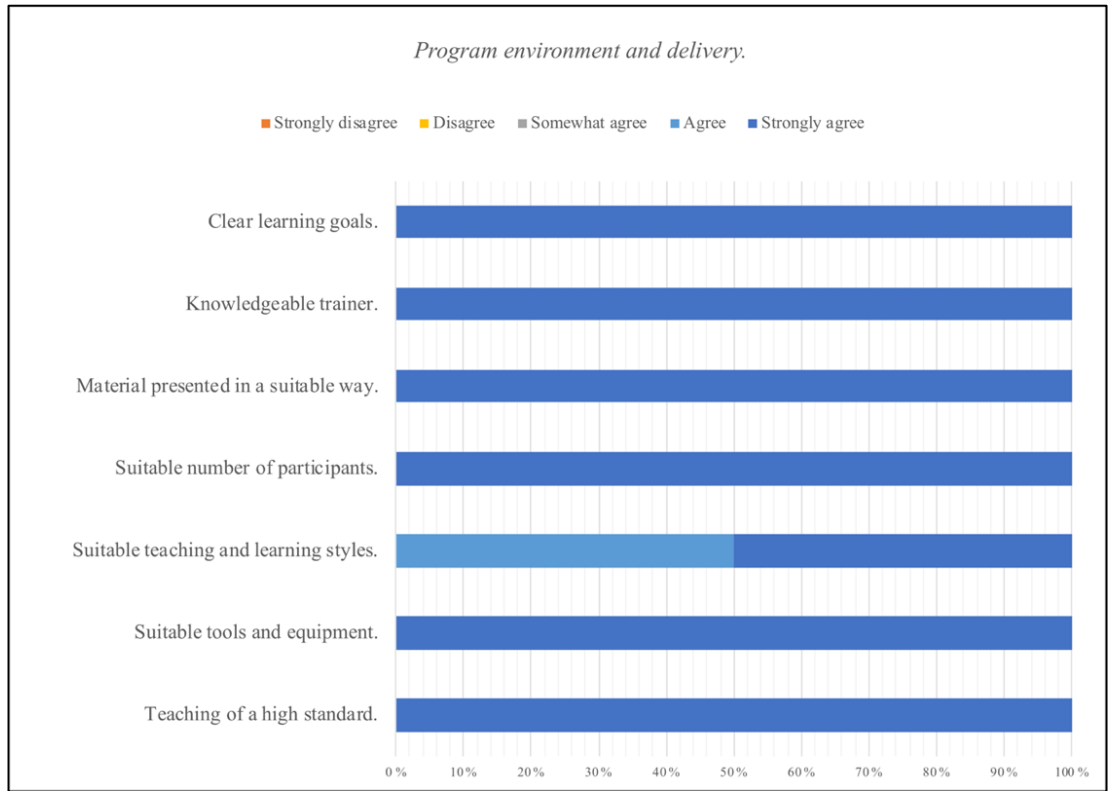


Figure 15: Answers to survey questions regarding the training program's environment and delivery.

The **“Program pace”** category contained a total of 2 questions which were answered by the two subjects that attended the training program. The stacked bar graph below (Figure 16) displays the given answers by Subject 1 and Subject 2 for this specific category. The most frequent response for both subjects was **“Strongly agree”**, indicating that both subjects felt that the program's pace was suitable for them and that they felt they had time to participate in the training.

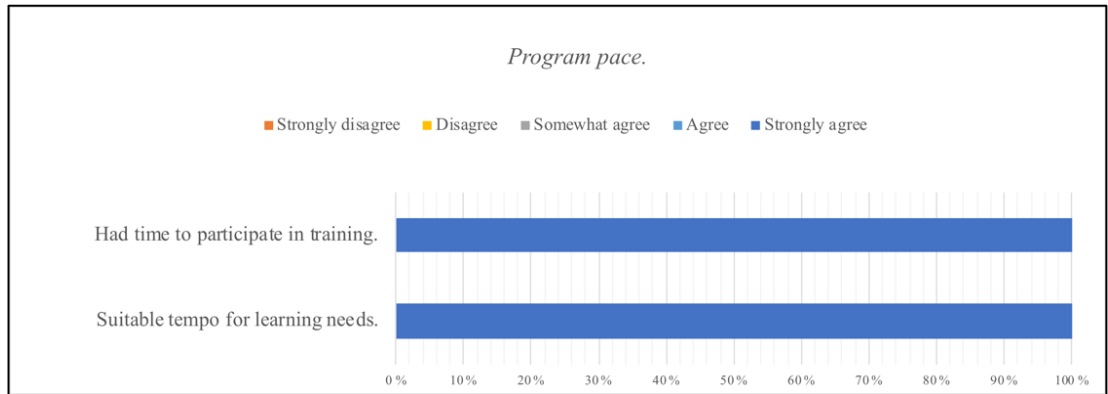


Figure 16: Answers to survey questions regarding the training program’s pace.

The “**General feedback**” category contained a total of 2 questions which were answered by the two subjects that attended the training program. The stacked bar graph below (Figure 17) displays the given answers by Subject 1 and Subject 2 for this specific category. The most frequent response for both subjects was “*Strongly agree*”, indicating that both subjects would want to participate in the training again. A disagreement happened when questioning the usefulness of the training, where one participant answered “*Agree*”, indicating that they were somewhat happy with the outcome.

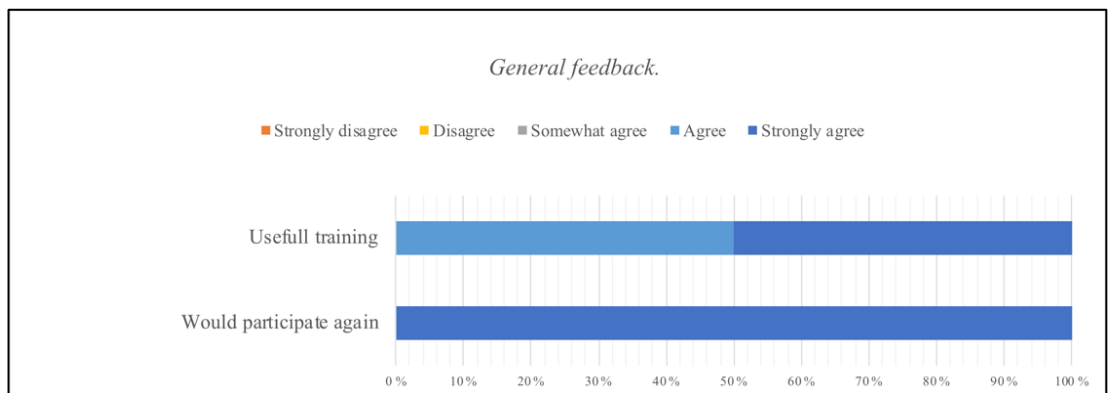


Figure 17: Answers to survey questions regarding general feedback for the training program.

6.3 Result Summary

The **first interview** utilized in this training program proved itself as a useful tool for establishing a trainee’s previous experiences and interests, motivation and preferred learning styles, and views on the training methods that the company already provides. The

knowledge gained from the first interview helped in the tailoring process of the training experiences provided to the two trainees. This was done by talking to the trainees about their previous coding experiences and listening to their interests regarding their role at the company. It was also observed that both of the trainees had been doubtful about Drupal during their first experiences with the framework but had learned to appreciate its capabilities once they had become more familiar with it. Both of the trainees also seemed motivated to participate in the program in the hope of learning more about the system and seemed happy that the training was being organized. The first interview also gave more insight into the current training situation at the company, which indicated that employees feel they do not have enough time for training and that finding relevant material can be a difficult task.

The first and second survey created for the training program established themselves as a good mechanism for determining the current training needs of a trainee and for measuring the improvement that had occurred during the program. The first survey was utilized in combination with the first interview for resolving a trainee's current skill level on the various topics included in the training program. Questioning a trainee's knowledge of specific topics and areas taught in the training program allowed for fine-grained tuning of the training experiences for each participant. This approach allowed for more effective training, where skills already possessed by a trainee were avoided during the program, saving the company both time and money. The second survey provided insight into how much each trainee had improved during the training program and made it possible to establish whether or not a trainee had gained enough knowledge in order to continue their learning with more regular tasks on the job.

The second interview and third survey worked as tools for collecting trainee feedback after the training had been completed. Thoughts and improvement ideas regarding the program's content, structure, pace, environment, and delivery were all acknowledged and assembled. Both the interview and the survey indicated that the trainees were happy with the topics and areas covered in the training program. The solo-training approach was also appreciated, and the trainees felt that the delivery was of a high standard. Feedback ideas

were also collected during the second interview, where ideas such as evaluated assignments, advance examples, and applying knowledge in work situations were discussed. The two methods differed in their results when it came to the program's pace; in the second interview, both trainees indicated on several occasions that the pace of the program had been too fast and that they, at times, felt that they lost track of the discussed subject. This was contradicted in the third survey, where both trainees implied that they were happy with the program's pace. This might indicate that the trainees were more agreeable during the process of filling out the feedback survey than they were during the final interview. In general, a majority of the received feedback was of a positive nature, and both participants stated that they would like to participate in similar training sessions again.

6.4 Personal Observations and Improvement Ideas

My personal lessons and takeaways from the training sessions held with the two trainees are mostly in line with the feedback that the training program received. The training material presented during the training sessions seemed engaging to the audience and was generally well liked. I personally also appreciated the one-on-one nature of the training environment, since I believe this to be the most effective method when teaching difficult subjects. Increasing the number of participants in the training sessions will have an impact on the program's personal touch, something which I believe to be a negative effect. This effect and its consequences will obviously have to be weighed against the number of simultaneously participating people, since the effect might be mitigated in the long run, when the number of trainees attending the program at the same time rises above a certain threshold.

Another aspect of the training program that worked well was the fact that we decided to develop the training project in parallel with the training material and that almost every single area and topic presented in the material could be demonstrated on a practical level with the training project. There were several occasions where the trainees had difficulties understanding a certain subject when the information was displayed to them through the

training material alone, and the “Ahaa!” moment was only achieved after the same problem was demonstrated through practical means with the help of the training project. The fact that the trainees were allowed to bring in real client projects from the teams they work in also demonstrated the same effect, which leads me to highly encourage that this practice is continued in the future.

The second interview intended for trainee feedback demonstrated that both of the trainees felt that the pace of the training had at times been too fast and that there had been occasions where they lost track of the discussed subject. I completely understand the nature of this feedback and am by no means surprised by it. The amount of information that was crammed into the three-day training sessions surpassed any forms of optimal levels for learning, which means that the program’s pace negatively impacted its outcome. I believe that future training sessions should be organized over longer periods, where time for reflection is also allowed for the participating trainees.

The idea of evaluated assignments was brought up as an improvement idea during the feedback interviews. This I have also been reflecting on during the development of this training program, and I believe they would be a valuable addition to the program for two reasons. Firstly, it would allow the trainees to practice their skills and test their newly gained knowledge in a safe environment, where they would be able to receive constructive feedback on every single part of the completed task. I personally believe that these kinds of feedback sessions could have a great impact on the learning experience and positively affect the trainees’ quality of work. Secondly, the implementation of evaluated assignments would allow for quantitative measurements regarding the trainees’ progress and improvements, where for example task completion time or the number of lines of code utilized in a solution could be measured.

7.0 Conclusion

A company's ability to perform is directly connected to the people a company employs. Each employed individual often has a unique set of skills, expertise, and knowledge to offer. Managing this pool of competence while simultaneously providing various forms of training and development opportunities is essential, if a company aims to be successful.

The purpose of this thesis was to construct a training program that is targeted at new software developers at a digital agency. The process as a whole involved developing, implementing, and measuring the effectiveness of this new training program. The ultimate goal was to have a training program in place that allows the company to hire people with a wider set of skills, that can later be refined to suit the company's needs by applying the program.

The end result was a fully fledged training program that was used for training two trainees during the writing process of this thesis. The program itself was constructed by firstly creating a material bank, the content of which was utilized when producing training material presented during training sessions. The training sessions themselves can be altered and tailored depending on the needs of a trainee and on the available time and resources. The training sessions also had the trainees completing various tasks of a training project created specifically for this program. A written guide for the training project named "DRUTOR" (Drupal Tutor) was also constructed, the idea being that a trainee can complete the project on their own time, should such a need arise.

Before the training took place, both of the trainees participated in interviews and filled out surveys. These interviews and surveys had been constructed to work as tools for determining the learning needs of the trained individuals and for measuring improvement and collecting feedback after the training had been completed. In total, two interviews were held for each trainee, one before the training took place and one after the training had been completed. As for the surveys, the trainees filled out one survey before the training started and two after the training had come to an end. While the presented results indicate that both trainees were relatively satisfied with their training and that significant

improvements had been achieved, there were also aspects of the program that could have been executed in a better manner. The program's pace received criticism from both of the trainees, which was a problem that I as a trainer also noted. Furthermore, improvement ideas regarding evaluated assignments were suggested, in order to allow for practice and constructive feedback for the trainees and quantitative measurements regarding the trainee's improvement. To conclude, the constructed evaluation processes that are the interviews and surveys worked well and the implementation of the new training program, in general, was a success. However, to be completely certain of this, more individuals need to participate in the training for the results to be more accurate.

Svensk sammanfattning

Utveckling av ett internt utbildningsprogram för nya programvaruutvecklare på en digitalbyrå.

Introduktion

Ett företags förmåga att prestera kan anses ha en direkt koppling till personerna som företaget anställer. Varje anställd person har ofta en unik uppsättning färdigheter, expertis och kunskap att erbjuda. Att förvalta denna kompetenspool och samtidigt erbjuda olika former av utbildnings- och utvecklingsmöjligheter är oerhört viktigt för att ett företag ska kunna vara framgångsrikt. Därmed kan det anses att processen där de anställda får utveckla sina färdigheter och bli mer effektiva i sitt arbete är en viktig del av personalförvaltningen. Förhållandet mellan arbetsgivare och arbetstagare kan ses som ett ömsesidigt beroende, eftersom företag är beroende av kvaliteten på det arbete som de anställda kan erbjuda för att företaget ska kunna nå sina mål, och de anställda har motivationsbehov som b.la. innefattar personlig utveckling, prestationer och förbättrad belöning. Syftet med det här diplomarbetet är att utveckla ett internt utbildningsprogram för nya programvaruutvecklare på en digitalbyrå vid namnet Karhu Helsinki. I sin helhet innebär processen både utveckling, genomföring och mätning av effektiviteten på det nya utbildningsprogrammet.

Bakgrund

Målet med utbildningsprogrammet som byggs upp parallellt med detta diplomarbete är att påskynda processen för att göra nya programutvecklare bekant med innehållshanteringssystemet Drupal. När en ny utvecklare anställs på Karhu introduceras han eller hon för närvarande med företagets allmänna rutiner och den allmänna utvecklingsprocessen under en period på två veckor. Därefter placeras den nyanställde i ett team som vanligtvis består av 5 - 6 utvecklare och två projektledare. Teamen på Karhu fungerar som självständiga enheter eller celler. Varje team ansvarar för en handfull

projekt, vilket innebär att arbetet som utförs i varje team vanligtvis är kopplat till de projekt som tilldelats teamet. När en ny utvecklare kommer in i ett team på företaget förväntas de få mer kunskap och utveckla sina färdigheter med hjälp diverse tillvägagångssätt, vilka kortfattat är a) inläring via ett nytt projekt, b) inläring via ett existerande projekt, c) inläring via webb-baserade utbildningsportaler, och d) inläring via seminarier. Varenda ett av de uppräckande sätten har både sina för och nackdelar, varav nackdelarna nu skall försöks kringgåas med det nya utbildningsprogrammet.

Tidigare forskning

Under skrivningsprocessen av denna avhandling analyserades även tidigare forskning gällande utbildning av anställda. Både branschstandarder och nya innovationer gällande utbildningsmodeller och mönster, hur behovet av utbildning fastställs, hur utbildningen genomförs och hur utbildningens effektivitet mäts och utvärderas utforskades. Målet var att använda och utnyttja den upphittade kunskapen vid utvecklings-, implementerings- och evalueringskedet av det nya utbildningsprogrammet. Idéerna bakom diverse utbildningsmodeller som uppmuntrar till förbättrade instruktioner och inläring genom systematiska tillvägagångssätt utnyttjades i utbildningsprogrammet. I ett nötskal går den implementerade modellen ut på att försöka fastställa deltagarnas inlärningsbehov samt det bästa metoderna för att genomföra utbildningsprogrammet, att formulera tydliga inlärningsmål, att utveckla metoder för att bedöma både programmets effektivitet och deltagarnas prestationsökning, samt att genomföra det utformade utbildningen.

Implementering av det nya programmet

Kapitlet gällande implementeringsprocessen av det nya utbildningsprogrammet diskuterar programmets innehåll, struktur, format och genomförandet av två utbildningstillfällen som tog plats på företaget under våren 2022. Konceptet av ett utbildningsprogram föreslogs ursprungligen åt Karhu under våren 2021. Idén möttes av en positiv attityd från företagets ledning, och utvecklingen av programmet började relativt snabbt. Utvecklingsprocessen initierades med att fastslå en lista över ämnen som ansågs vara relevanta och lämpliga områden att täcka in i ett utbildningsprogram avsett för nya

utvecklare på företaget. Listan i sig själv gick igenom flera finslipnings- och granskningsprocesser, och när den ansågs vara färdig, påbörjades utvecklingen av en materialbank. Innehållsstrukturen på materialbanken avspeglar sig i både utbildningsprogrammet och utbildningarna som hålls under programmets gång. Själva innehållet från materialbanken användes senare till att framställa utbildningsmaterial. Vid sidan om materialbanken och utbildningsmaterialet framställdes även ett utbildningsprojekt. Projektet är en webbplats som utvecklats med Drupal, och som utformades med tanke på deltagarnas framtida arbetsuppgifter. Till projektet utvecklades ytterligare en dokumentation med avsikten att fungera som en ”steg-för-steg” guide, som möjliggör för att färdigställa utbildningsprojekt från början till slut på egen hand. Det färdiga utbildningsprogrammet testades av två kandidater under våren 2022. Kandidaterna kontaktades med ett informationsbrev, en dataskyddsbeskrivning samt en samtyckesblankett. Utbildningarna inleddes med intervjuer och frågeformulär, vars syfte var att fastslå kandidaternas utbildningsbehov. Processen fortsatt med skolningar under en tre dagars period, och avslutades med ytterligare intervjuer och frågeformulär, för att samla feedback och mäta deltagarnas prestationsökning.

Evaluering av det nya programmet

Under utvärderingsprocessen av utbildningsprogrammen användes både intervjuer och frågeformulär som forskningsmetoder. Dessa intervjuer och frågeformulär hade konstruerats för att fungera som verktyg för att fastställa utbildningsbehoven hos personerna som deltar i programmet, och för att mäta prestationsökningen samt samla in feedback efter att utbildningen hade avslutats. Totalt genomfördes två intervjuer för varje kandidat, en innan utbildningen ägde rum, och en efter att utbildningen hade avslutats. Kandidaterna fyllde även i en enkät innan utbildningen började och två efter att utbildningen var färdig. Även om de presenterade resultaten visar att båda deltagarna var relativt nöjda med sin utbildning och att en prestationsökning hade uppnåtts, fanns det också aspekter av programmet som kunde ha genomförts på ett bättre sätt. Programmets tempo fick kritik från båda deltagarna, vilket var ett problem som jag som utbildare också noterade. Dessutom föreslogs förbättringsidéer när det gäller utvärderade

övningsuppgifter, för att möjliggöra övning och konstruktiv feedback för praktikanterna, samt kvantitativa mätningar av praktikanternas förbättringar. Sammanfattningsvis kan man konstatera att de konstruerade utvärderingsprocesserna, dvs. intervjuerna och enkäterna, fungerade bra och att genomförandet av det nya utbildningsprogrammet i allmänhet var en framgång. För att vara helt säker på detta måste dock fler personer delta i utbildningen för att resultaten ska bli mer exakta.

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Appendix

1. Approaching letter - Lähestymiskirje

Tiedoksi asianosaisille,

Niemeni on Alexander Tallqvist, ja kirjoitan tällä hetkellä diplomityötä yhteistyössä Karhu Helsingin kanssa. Diplomityö ja siinä teetetyt tutkimukset ovat osa Åbo Akademin tietotekniikan maisteriohjelman pakollisia opintoja. Diplomityön tämänhetkinen työnimike on: *Developing an internal training program for new software developers at a digital agency.*

Karhu Helsinki kehittää itselleen koulutusohjelmaa, missä uusia työntekijöitä perehdytetään käyttämään Drupal-sisällönhallintajärjestelmää. Diplomityössä analysoidaan tieteellisiä artikkeleita ja tutkimuksia, jotka tavalla tai toisella liittyvät kouluttamiseen ja perehdyttämiseen. Tätä tietoa käytetään myöhemmin koulutusohjelman suunnittelussa ja määrittelyssä sekä käyttöönotossa. Diplomityössä kehitetään myös erilaisia mittareita, jotka auttavat ohjelman analysoimisessa ja parantamisessa. Nämä mittarit koostuvat kyselylomakkeista ja haastatteluista.

Koulutusohjelma, jota kehitetään diplomityön ohessa, on jaettu neljään eri osioon. Nämä osiot ovat seuraavat:

1. **Sisällön strukturointi ja esittäminen:** Tässä moduulissa käsitellään Drupalin tietomallia, sisällön strukturointi ja sisällön esittämistä.
2. **Sisällön, käyttäjien ja asetusten hallinta sekä Drupalin tarjoamat ominaisuudet:** Tässä moduulissa käsitellään erityyppisen sisällön ja käyttäjien hallintaa sekä Drupalin käyttöliittymää. Moduulissa käydään myös läpi Drupalin tarjoamia ominaisuuksia.

3. **Drupal teemaus:** Tässä moduulissa käsitellään teemojen rakentamista Drupaliin.
4. **Drupal moduulikehitys:** Tässä moduulissa käsitellään moduulikehitystä Drupalissa.

Teitä pyydetään osallistumaan koulutusohjelman koulutuksiin sekä niihin liittyviin haastatteluihin ja kyselyihin. Käytännössä tämä tarkoittaa seuraavaa:

1. **Allekirjoitatte suostumuslomakkeen:** Tutkimukseen osallistuminen ja tutkimuksen eettisyys edellyttävät kirjallista suostumusta. (LIITTEEN NIMI). Tutkimukseen osallistuvia henkilöitä kehoitetaan myös lukemaan tiedonhallintasuunnitelma (LIITTEEN NIMI).
2. **Vastaatte kyselyyn, joka täytetään ennen koulutusta:** LINKKI. Kysymysten vastauksia analysoidaan diplomityössä, ja niitä käytetään koulutustarpeen kartoittamiseen sekä koulutuksen räätälöintiin.
3. **Osallistutte haastatteluun, joka pidetään ennen koulutusta:** Haastattelulla pyritään selvittämään perehdytettävän henkilön koulutustarpeita ja parhaiten soveltuvia oppimistapoja. Ensimmäisen kyselylomakkeen vastaukset käydään myös tässä yhteydessä läpi. Tätä tietoa analysoidaan myös diplomityössä.
4. **Osallistutte koulutuksiin:** Osallistutte koulutuksiin, joidenka katsotaan olevan teidän kannaltanne sopivia ja relevantteja. Käytännössä tämä tarkoittaa osallistumista 1-4 em. moduuleista.
5. **Osallistutte haastatteluun, joka pidetään koulutuksen jälkeen:** Haastattelulla pyritään selvittämään, mitä mieltä perehdytettävä henkilö oli saamastaan koulutuksesta. Tätä tietoa analysoidaan diplomityössä, ja sitä käytetään koulutusohjelman parantamiseen.

6. **Vastaaatte kahteen kyselyyn, joka täytetään koulutuksen jälkeen:** [LINKKI](#).

Kysymysten vastauksia analysoidaan diplomityössä, ja niitä käytetään myös koulutusohjelman parantamiseen.

Koulutuksen aikataulu on seuraava:

- dd.mm.yyyy: Vastaaat ensimmäiseen **kyselyyn**, joka on tarkoitus täyttää ennen koulutusta. Tässä yhteydessä allekirjoitetaan myös **suostumuslomake**.
- dd.mm.yyyy: Osallistut **haastattelun**, joka pidetään ennen koulutusta. Haastattelu pidetään Teamsin välityksellä. Haastattelu kestää noin tunnin.
- dd.mm.yyyy: Osallistut **koulutuksiin**, joiden katsotaan olevan sopivia sinulle. Koulutukset pidetään **toimistolla**. Toimistolla ollessa ohjeena on se, että samassa tilassa työskennellessä tulee käyttää maskia.
- dd.mm.yyyy: Osallistut **haastattelun**, joka pidetään koulutuksen jälkeen. Haastattelu pidetään joko toimistolla tai Teamsin välityksellä. Haastattelu kestää noin tunnin.
- dd.mm.yyyy: Vastaaat kahteen **kyselyyn**, jotka on tarkoitus täyttää koulutuksen jälkeen.

Saat lähiaikoina tietoa haastatteluiden ja koulutuksien tarkoista aikatauluista ja kellonajoista. Mikäli kaipaat lisätietoja tutkimuksesta tai koulutusohjelman sisällöstä, voit olla yhteydessä minuun.

Ystävällisin terveisin,

Alexander Tallqvist

2. Data management plan - Tiedonhallintasuunnitelma

Tutkimuksen työnimike: Diplomityö - Developing an internal training program for new software developers at a digital agency.

Tutkija: Alexander Tallqvist, alexander.tallqvist@abo.fi

Yhteys: Åbo Akademi

Kenelle tutkimusta tehdään: Karhu Helsinki

Tutkimus alkanut: 01.11.2021

Tutkimus päättyy: 31.05.2022

Tiivistelmä:

Tutkimushanke on osa Åbo Akademin tietotekniikan maisteriohjelman pakollisia opintoja. Tutkimusintressi on luonteeltaan sellainen, että kvalitatiiviset haastattelut ja kvantitatiiviset kyselyt Karhu Helsingin työntekijöiden kanssa ovat hyödyksi.

Drupal-spesifinen koulutusohjelma kehitetään rinnakkain tämän tutkimuksen kanssa. Haastatteluja ja kyselylomakkeita kehitetään, jotta voitaisiin selvittää, mitä työntekijät ajattelevat ohjelmasta ja saamastaan koulutuksesta.

Haastattelut nauhoitetaan, ja kyselylomakkeiden vastaukset tallennetaan sähköisessä muodossa. Haastattelut tehdään joko kasvotusten tai Teams-ohjelman avulla. Tiedot kerätään analysointia varten. Haastatteluista ei luoda rekisteriä, joista haastateltava henkilö voitaisiin tunnistaa. Poikkeuksena ovat suostumuslomakkeet, jotka sisältävät haastateltavien henkilöiden nimet. Tutkimukseen osallistuminen ja tutkimuksen eettisyys edellyttävät kirjallista suostumusta. Näitä asiakirjoja säilytetään kaksi kuukautta, jonka jälkeen ne hävitetään. Kyselylomakkeiden vastausten rekisterinpitäjän toimii Karhu Helsinki.

Haastatteluaineisto kerätään äänitallenteena tutkijan omilla laitteilla. Äänitiedostoja säilytetään kaksi kuukautta. Tänä aikana tallenteet analysoidaan ja litteroidaan. Transkriptio ei sisällä henkilökohtaisia tietoja, jotka voisivat yhdistää heidät osallistujaan. Transkriptiota säilytetään tämän diplomityön valmistumiseen saakka, eli noin toukokuuhun 2022. Diplomityössä ei anneta tietoja, jotka voisivat yhdistää transkription tähän tutkimukseen osallistuneisiin. Valmis diplomityö saattaa sisältää sitaatteja, mutta nämä esitetään anonyymissä muodossa. Kukaan muu kuin tutkija ei pääse käsiksi tallenteisiin. Tutkimusta rahoittaa Karhu Helsinki.

1. Yleinen kuvaus kerätystä tiedosta

1.1 Mihin tietoihin tutkimus perustuu? Mitä tietoja kerätään, tuotetaan tai käytetään uudelleen? Missä tiedostomuodoissa tiedot ovat?

Tutkimushanke on osa Åbo Akademin tietotekniikan maisteriohjelman pakollisia opintoja. Tutkimusintressi on luonteeltaan sellainen, että kvalitatiiviset haastattelut ja kvantitatiiviset kyselyt Karhu Helsingin työntekijöiden kanssa ovat hyödyksi.

Kerätyt tiedot ovat seuraavat:

- **Haastattelujen äänitallenteet:** Haastattelut nauhoitetaan tutkijan omilla henkilökohtaisilla laitteilla. Äänitiedostot tallennetaan .mp3-muodossa. Haastattelut litteroidaan. Äänitallenteet poistetaan kahden kuukauden sisällä ja transkriptio poistetaan diplomityön valmistuttua, eli toukokuussa 2022. Transkriptio ei sisällä henkilötietoja, jotka voisivat yhdistää ne osallistujaan. Vain tutkijalla on pääsy näihin tiedostoihin.
- **Kyselyiden vastaukset:** Näitä tietoja hallinnoi tutkimuksen rahoittaja Karhu Helsinki.
- **Suostumuslomake:** Suostumuslomake sisältää osallistujan nimen. Vain tutkijalla on pääsy näihin asiakirjoihin. Nämä asiakirjat tuhotaan/poistetaan kahden

kuukauden sisällä. Tutkimukseen osallistuminen ja tutkimuksen eettisyys edellyttävät kirjallista suostumusta.

1.2 Miten tietojen johdonmukaisuutta ja laatua valvotaan?

- **Haastattelujen äänitallenteet:** Haastattelut litteroidaan. Transkriptio ei sisällä henkilökohtaisia tietoja, jotka voisivat yhdistää heidät osallistujaan.
- **Kyselyiden vastaukset:** Tietoja ei manipuloida millään tavalla.
- **Suostumuslomake:** Tietoja ei manipuloida millään tavalla.

2. Eettinen ja oikeudenmukainen tutkiminen

2.1 Mitä oikeudellisia kysymyksiä tutkimukseen liittyy?

Henkilötietojen käsittely perustuu tutkittavan suostumukseen. Osallistujilla on laillinen oikeus peruuttaa suostumuksensa milloin tahansa. Suostumuksen peruuttaminen ei vaikuta ennen peruuttamista suoritettujen käsittelyyn lainmukaisuuteen.

2.2 Miten oikeuksia tietoihin hoidetaan?

- **Haastattelujen äänitallenteet:** Vain tutkijalla on pääsy äänitallenteisiin ja tallenteista luotuihin transkriptioihin. Tiedostot suojataan salasanalla ja tallennetaan laitteille, joihin vain tutkijalla on pääsy.
- **Kyselyiden vastaukset:** Näitä tietoja hallinnoi tutkimuksen rahoittaja Karhu Helsinki.
- **Suostumuslomake:** Vain tutkijalla on pääsy näihin asiakirjoihin. Asiakirjoja säilytetään paikassa, johon vain tutkijalla on pääsy.

3. Tallennus ja varmuuskopiointi tutkimusprojektin aikana

3.1 Mihin tiedot tallennetaan ja miten tiedot varmuuskopioidaan?

- **Haastattelujen äänitallenteet:** Sekä äänitallenteet että transkriptio tallennetaan elektronisiin laitteisiin, joihin vain tutkijalla on pääsy. Tiedostot suojataan salasanalla ja tallennetaan laitteille, joihin vain tutkijalla on pääsy.
- **Kyselyiden vastaukset:** Näitä tietoja hallinnoi tutkimuksen rahoittaja Karhu Helsinki.
- **Suostumuslomake:** Vain tutkijalla on pääsy näihin asiakirjoihin. Asiakirjoja säilytetään paikassa, johon vain tutkijalla on pääsy.

3.2 Kuka vastaa tietoihin pääsyn valvonnasta ja miten suojattua pääsyä valvotaan?

- **Haastattelujen äänitallenteet:** Tutkija on vastuussa pääsyn valvonnasta. Tietoja ei jaeta. Tiedostot suojataan salasanalla ja tallennetaan laitteille, joihin vain tutkijalla on pääsy.
- **Kyselyiden vastaukset:** Näitä tietoja hallinnoi tutkimuksen rahoittaja Karhu Helsinki.
- **Suostumuslomake:** Tutkija on vastuussa pääsyn valvonnasta. Tietoja ei jaeta.

4. Aineiston avaaminen, julkaiseminen ja arkistointi tutkimusprojektin jälkeen

4.1 Mikä osa tiedoista voidaan asettaa avoimesti saataville tai julkaista? Missä ja milloin tiedot tai niiden metatiedot asetetaan saataville?

- **Haastattelujen äänitallenteet:** Haastattelujen transkriptioita hyödynnetään diplomityössä. Diplomityö julkaistaan sähköisesti Doriassa, joka on

Kansalliskirjaston ylläpitämä julkaisuarkisto. Kaikki esitetyt havainnot anonymisoidaan.

- **Kyselyiden vastaukset:** Kyselyihin saatuja vastauksia hyödynnetään diplomityössä. Diplomityö julkaistaan sähköisesti Doriassa, joka on Kansalliskirjaston ylläpitämä julkaisuarkisto. Kaikki esitetyt havainnot anonymisoidaan.
- **Suostumuslomake:** Näitä asiakirjoja ei esitetä kenellekään.

4.2 Tietojen pitkäaikainen säilytys

- **Haastattelujen äänitallenteet:** Haastattelujen transkriptioita hyödynnetään diplomityössä. Diplomityö julkaistaan sähköisesti Doriassa, joka on Kansalliskirjaston ylläpitämä julkaisuarkisto. Kaikki esitetyt havainnot anonymisoidaan.
- **Kyselyiden vastaukset:** Kyselyihin saatuja vastauksia hyödynnetään diplomityössä. Diplomityö julkaistaan sähköisesti Doriassa, joka on Kansalliskirjaston ylläpitämä julkaisuarkisto. Kaikki esitetyt havainnot anonymisoidaan.
- **Suostumuslomake:** Tiedot poistetaan/tuhotaan pysyvästi kahden kuukauden sisällä.

5. Tiedonhallinnan vastuut ja resurssit

5.1 Tietojen hallintaan liittyvät vastuut

- **Haastattelujen äänitallenteet:** Tiedonhallinnasta vastaa tutkija.

- **Kyselyiden vastaukset:** Tiedonhallinnasta vastaa Karhu Helsinki.
- **Suostumuslomake:** Tiedonhallinnasta vastaa tutkija.

3. Form of consent - Suostumuslomake

Osallistuminen diplomityöhön, jossa käsitellään koulutusohjelman kehittämistä yritykselle Karhu Helsinki.

Karhu Helsinki kehittää itselleen koulutusohjelmaa, missä uusia työntekijöitä perehdytetään käyttämään Drupal-sisällönhallintajärjestelmää. Diplomityössä analysoidaan tieteellisiä artikkeleita ja tutkimuksia, jotka tavalla tai toisella liittyvät kouluttamiseen ja perehdyttämiseen. Tätä tietoa käytetään myöhemmin koulutusohjelman suunnittelussa ja määrittelyssä sekä käyttöönotossa. Diplomityössä kehitetään myös erilaisia mittareita, jotka auttavat ohjelman analysoimisessa ja parantamisessa. Nämä mittarit koostuvat kyselylomakkeista ja haastatteluista.

Kyselylomakkeilla ja haastatteluilla kerättyä tietoa käsitellään diplomityössä, joka toteutetaan Åbo Akademin tietotekniikan maisteriohjelmassa. Diplomityön kirjoittajana ja tutkijana toimii Alexander Tallqvist, ja työn ohjaaja toimii luonnontieteiden tohtori Kristian Nybom. Tutkimuksessa noudatetaan tutkimuseettisen neuvottelukunnan (TENK) laatimaa hyvän tieteellisen käytännön ohjeistusta ja voimassa olevia tiedonhallinnan määräyksiä (ks. myös erillinen tiedonhallintasuunnitelma). Valmis diplomityö julkaistaan Doriassa, joka on Kansalliskirjaston ylläpitämä julkaisuarkisto, jossa on usean organisaation tuottamaa sisältöä. Kyselylomakkeiden ja haastatteluiden tulokset raportoidaan diplomityössä niin, että tuloksia ei voida yhdistää yksittäisiin henkilöihin. Tutkimukseen osallistuminen on täysin vapaaehtoista.

Haastattelut nauhoitetaan, jotta niistä kerättyä tietoa voitaisiin analysoida myöhemmässä vaiheessa. Nauhoitetut haastattelut litteroidaan, jotta tieto olisi helpommin analysoitavissa. Nauhoitukset poistetaan kahden kuukauden jälkeen, ja nauhoituksista koostetut tekstit hävitetään, kun diplomityö on valmis. Kyselylomakkeiden tuloksien rekisterinpitäjänä toimii Karhu Helsinki.

Allekirjoittanut sitoutuu osallistumaan tutkimukseen ja siihen, että kerättyjä tietoja käsitellään edellä ja tiedonhallintasuunnitelmassa mainittuun tarkoitukseen ja tavalla.

Päivämäärä Osallistujan nimi

Päivämäärä Tutkijan nimi

4. Interview guide – Haastatteluopas

Puolistrukturoidut haastattelut yhdessä Karhu Helsingin työntekijöiden kanssa. Haastattelut pidetään yritykselle kehitetyn koulutusohjelman yhteydessä. Haastatteluja järjestetään sekä ennen koulutusta että koulutuksen päätyttyä. Ensimmäinen haastattelu on tarkoitettu osallistujan oppimistyylin ja koulutustarpeiden selvittämiseen. Toisessa haastattelussa yritetään selvittää, mitä osallistuja ajatteli koulutuksesta. Haastattelut pidetään suomeksi. Haastateltavat eivät pääse käsiksi kysymyksiin ennen haastattelua.

A: Kysymykset ennen koulutusta:

- Kuvaile kehittäjärooliasi. Minkälaisen työkalujen ja teknologioiden parissa tykkäät työskennellä?
 - Front-end painiotteinen?
 - Back-end painiotteinen?
 - Full-stack painiotteinen?
- Millaisia kokemuksia sinulla on Drupalista ja muista vastaavista järjestelmistä? Millaista työtä olet tehnyt järjestelmän kanssa? Mitä mieltä olet järjestelmästä yleisesti?
 - Tietomalli / Teema / Moduulien kehittäminen
 - Muita sisällönhallintajärjestelmiä?
 - Muita ohjelmointikehyksiä?
- Mikä on motivaatiosi tähän koulutusohjelmaan ja koulutukseen yleensä? Mitä toivot saavasi tästä koulutuksesta?
- Onko sinulle tarjottu mitään koulutuksia ennen tätä ohjelmaa? Mitä mieltä olit niistä?
- Miten tai minkä formaatin avulla tykkäät opetella uusia asioita työpaikalla?

- Oppiminen yhdessä mentorin tai ohjaajan kanssa?
- Oppiminen seminaarien ja työpajojen kautta?
- Projektien ja kokemusten kautta oppiminen?
- Yksinoppiminen kirjallisen ja videopohjaisen materiaalin kanssa?

- Millaisesta opetusmateriaalista pidät? Miksi?
 - Puhtaasti teoreettisesta?
 - Sekoitus teoreettista ja käytännöllistä?
 - Puhtaasti käytännöllistä?

- Mitä tulee Drupaliin, minkä aiheiden kanssa koet kamppailevasi eniten? Mitkä ovat suurimmat oppimisen esteet mainittujen aiheiden oppimisessa?

Haastattelu jatkuu analysoimalla kyselylomakkeen vastauksia, joka täytettiin ennen haastattelua. Kyselylomakkeen kysymyksillä pyritään selvittämään haastateltavan koulutustarpeita. Tavoitteena on räätälöidä koulutus koulutuksen saavan henkilön tarpeiden mukaan.

B: Kysymykset koulutuksen jälkeen:

1. Mitä mieltä olit koulutusohjelman rakenteesta?
 - Oliko sisältö hyvin järjestetty ja sitä oli helppo seurata?
 - Oliko sisällön rakenne selkeä ja looginen?

2. Mitä mieltä olit koulutusohjelman tahdista?
 - Tuntuuko sinusta, että sinulla oli hyvin aikaa osallistua koulukseen?

3. Mitä pidit koulutusohjelman sisällöstä?
 - Olivatko käsitellyt aiheet relevantteja?
 - Olivatko oppimistavoitteet selvät?
 - Kiinnostiko sisältö sinua?

- Millainen oli esitetyn materiaalin laatu?
4. Onko sinulla näkemyksiä koulutusmateriaalin esittämisestä? Olisiko muita mediamuotoja voitu hyödyntää?
 - Esitysten rakenne
 - Enemmän vai vähemmän teoreettista tietoa?
 - Enemmän tai vähemmän käytännön läheisyyttä?
 5. Mitä pidit koulutusohjelman toimituksesta?
 - Vastasiko oppimistyyli tarpeitasi?
 - Vastasiko opetustyyli tarpeitasi?
 6. Mitä mieltä olit ympäristöstä, jossa koulutusohjelma pidettiin?
 - Osallistujien määrä?
 - Työkalut, joita koulutusohjelmassa hyödynnettiin.
 7. Mitä pidit koulutusohjelma kouluttajasta?
 - Ohjaajan laatu?
 - Ohjaajan asiantuntemus?
 - Opetuksen laatu?
 8. Oliko koulutuksessa jotain sellaista, minkä itse olisit toteuttanut toisella tavalla?
 9. Oliko koulutuksessa jotain sellaista, mikä mielestäsi toimi poikkeuksellisen hyvin, tai mistä pidit?
 10. Oliko koulutuksessa jotain, joka ei vastannut odotuksiasi, mitä voitaisiin mielestäsi parantaa?

11. Tuntuuko sinusta, että olet oppinut jotain uutta tai saanut jonkinlaista tietoa, jota sinulla ei aiemmin ollut?

12. Oliko koulutus mielestäsi hyödyllinen? Olisitko halukas osallistumaan tämän tyyppiseen koulutukseen uudelleen, jos sitä tarjotaan sinulle?

5. Surveys - Kyselylomakkeet

Kaksi kyselyä ja niiden kysymykset, jotka annetaan Karhu Helsingin työntekijöille. Kyselyt toteutetaan yritykselle kehitetyn koulutusohjelman yhteydessä. Ensimmäiseen kyselyyn vastataan ennen koulutusta. Kyselyn tavoitteena on selvittää osallistujien koulutustarpeet. Toiseen kyselyyn vastataan koulutuksen jälkeen. Tällä kyselyllä selvitetään osallistujien mielipiteet koulutuksesta. Käytännössä kaikki kysymykset hyödyntävät Likert-asteikkoa.

A: Kyselytutkimuksen kysymykset ennen koulutusta:

Tämän kyselyn kysymyksiin vastataan valitsemalla yksi seuraavista vaihtoehdoista. Tämä koskee osioita 2-5. Kysymykset on jaettu viiteen eri osioon, ja kysymyksiä on yhteensä 50.

1. Minulla on syvälinen ymmärrys ja kyky soveltaa tätä tietoa.
2. Minulla on jonkin verran käytännön kokemusta.
3. Minulla on jonkinlainen teoreettinen perusta aiheesta.
4. Minulla ei ole tietoa aiheesta.
5. En osaa sanoa.

Osio 1: Perustiedot.

1. Etu- ja sukunimi.
 - Syötä nimi.
2. Tämänhetkinen kehittäjärooli.
 - Front-end painiotteinen.
 - Back-end painiotteinen.
 - Full-stack painiotteinen.
3. Olen osallistunut tähän koulutusohjelmaan aiemmin.

- Kyllä.
- Ei.

Osio 2: Drupalin tietomalli sekä sisällön strukturointi ja esittäminen.

1. Tiedän, mitä entiteettityypit, entiteettityyppien alatyypit ja entiteetti-instanssit ovat.
2. Tiedän, mitä kentät ovat, sekä mihin ja miten niitä käytetään.
3. Tiedän, mitä sisältötyypit ja solmut ovat, sekä mihin ja miten niitä käytetään.
4. Tiedän, mitä sanastot ja termit ovat, sekä mihin ja miten niitä käytetään.
5. Tiedän, mitä mediatyypit ja mediat ovat, sekä mihin ja miten niitä käytetään.
6. Tiedän, mitä entiteettiviittaukset ovat, sekä mihin ja miten niitä käytetään.
7. Tiedän, mitä alueet ovat, sekä mihin ja miten niitä käytetään.
8. Tiedän, mitä lohkot ovat, sekä mihin ja miten niitä käytetään.
9. Tiedän, mitä näyttötavat ovat, sekä mihin ja miten niitä käytetään.
10. Tiedän, mitä kenttien muotoilijat ovat, sekä mihin ja miten niitä käytetään.

Osio 3: Sisällön, käyttäjien ja asetusten hallinta sekä Drupalin tarjoamat perusominaisuudet.

1. Tunnen Drupalin käyttöliittymän, ja minusta tuntuu, että löydän etsimäni.
2. Tiedän, miten sisältöä hallitaan Drupalissa.
3. Tiedän, miten mediaa hallitaan Drupalissa.
4. Tiedän, miten termejä hallitaan Drupalissa.
5. Tiedän, miten valikoita hallitaan Drupalissa.
6. Tiedän, miten käyttäjiä, rooleja ja käyttöoikeuksia hallitaan Drupalissa.
7. Tiedän, miten Drupal-sivuston asetuksia synkronoidaan eri ympäristöjen välillä.
8. Tiedän, miten Drupalilla toteutetaan monikielisiä sivustoja.
9. Tiedän, mikä Views on, sekä mihin ja miten sitä käytetään.
10. Tiedän, miten Drupalin kuvatyylejä hallitaan, ja mitä responsiiviset kuvat ovat.
11. Tiedän, miten Drupalin tekstimuodot, filtrit ja tekstityökalut toimivat.

Osio 4: Drupal teemaus.

1. Tiedän, mitä teemat ovat, ja mihin niitä käytetään.
2. Tiedän, miten teemat strukturoidaan, ja ymmärrän niiden kansiorakenteen.
3. Tiedän, mitä päätteemat ja aliteemat ovat, sekä mihin ja miten niitä käytetään.
4. Tiedän, mitä Drupalin mallitiedostot ovat, sekä mihin ja miten niitä käytetään.
5. Tiedän, miten Drupalin mallitiedostoja yliajetaan.
6. Tiedän, mitä koukut ovat, sekä mihin ja miten niitä käytetään teemoissa.
7. Tiedän, mitä ominaisuuskirjastot ovat, sekä mihin ja miten niitä käytetään.
8. Tiedän, mikä Twig on, sekä mihin ja miten sitä käytetään.
9. Tunnen parhaat käytännöt JavaScriptin kirjoittamiseen Drupalissa.
10. Tunnen parhaat käytännöt CSS:n kirjoittamiseen Drupalissa, sekä miten tyyliä tulisi jäsentää ja erotella toisistaan.
11. Tiedän, mikä Gulp on, sekä mihin ja miten sitä käytetään.
12. Tiedän, mikä Compony on, sekä miten sillä rakennetaan teemoja.

Osio 5: Drupal moduulikehitys.

1. Tiedän, mitä moduulit ovat, ja mihin niitä käytetään.
2. Tiedän, miten moduulit strukturoidaan, ja ymmärrän niiden kansiorakenteen.
3. Tiedän, mikä moduulin infotiedosto on, sekä mihin ja miten sitä käytetään.
4. Tiedän, mitä koukut ovat, sekä mihin ja miten niitä käytetään moduuleissa.
5. Tiedän, mitä pluginit ovat, sekä mihin ja miten niitä käytetään.
6. Tiedän, mitä tapahtumat ja tapahtumien tilaajat ovat, sekä mihin ja miten niitä käytetään.
7. Tiedän, mitä reitit ja kontrollerit ovat, sekä mihin ja miten niitä käytetään.
8. Tiedän, mikä palvelu ja palvelusäiliö on, sekä mihin ja miten niitä käytetään.
9. Tiedän, mitä riippuvuusinjektio on, sekä mihin ja miten niitä käytetään.
10. Tiedän, mikä Render-API on, sekä mihin ja miten sitä käytetään.
11. Tiedän, mikä Form-API on, sekä mihin ja miten sitä käytetään.
12. Tiedän, mikä Entity-API on, sekä mihin ja miten sitä käytetään.

13. Tiedän, miten käyttöoikeuksia hallitaan ja luodaan Drupalin moduuleissa.
14. Tiedän, mikä Kint on, sekä miten sitä käytetään koodin virheenjäljitykseen.

B: Kyselytutkimuksen kysymykset koulutuksen jälkeen:

Kysymyksiä ei ole osioitu. Kysymyksiä on yhteensä 20.

1. Etu- ja sukunimi.
 - Syötä nimi.

2. Kuinka monta osallistujaa koulutusohjelmassa oli, kun osallistuit siihen?
 - Syötä numero.

3. Mitkä moduulit suoritit?
 - Moduuli XXX
 - Moduuli XXX
 - Moduuli XXX
 - Moduuli XXX

4. Koulutusohjelman sisältö oli hyvin organisoitu, looginen ja helposti seurattava.
 - Täysin samaa mieltä.
 - Samaa mieltä.
 - Jokseenkin samaa mieltä.
 - Eri mieltä.
 - Täysin eri mieltä

5. Koulutusohjelman tempo vastasi oppimistarpeitani.
 - Täysin samaa mieltä.
 - Samaa mieltä.
 - Jokseenkin samaa mieltä.

- Eri mieltä.
 - Täysin eri mieltä
6. Minulla oli hyvin aikaa osallistua koulutukseen, eivätkä esimerkiksi projektityöt stressanneet minua.
- Täysin samaa mieltä.
 - Samaa mieltä.
 - Jokseenkin samaa mieltä.
 - Eri mieltä.
 - Täysin eri mieltä
7. Käsitellyt aiheet olivat oleellisia koulutustarpeitani ajatellen.
- Erittäin oleellisia.
 - Oleellisia.
 - Jonkin verran oleellisia.
 - Eivät niin oleellisia.
 - Eivät ollenkaan oleellisia.
8. Koulutusohjelman oppimistavoitteet olivat selkeät.
- Tavoitteet olivat hyvin selkeät.
 - Tavoitteet olivat selkeät.
 - Tavoitteet olivat jokseenkin selkeät.
 - Tavoitteet eivät olleet niin selkeät.
 - Tavoitteet eivät olleet lainkaan selkeitä.
9. Koulutusohjelman sisältö oli mielestäni mielenkiintoista.
- Todella mielenkiintoista.
 - Mielenkiintoista.
 - Jokseenkin mielenkiintoista.
 - Ei niin mielenkiintoista.

- Ei lainkaan mielenkiintoista.

10. Esitetyn materiaalin laatu vastasi koulutustarpeitani.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä

11. Koulutusmateriaali esitettiin sopivalla tavalla.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä

12. Koulutusmateriaali olisi voinut olla teoreettisempaa.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä

13. Koulutusmateriaali olisi voinut olla käytännönläheisempää.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä

14. Koulutusohjelman opetus- ja oppimistyyli olivat sopivia oppimistarpeisiini.

- Todella sopivia.
- Sopivia.
- Jokseenkin sopivia.
- Eivät niin sopivia.
- Ei lainkaan sopivia.

15. Koulutusohjelman osallistujamäärä oli oppimistarpeisiini nähden sopiva.

- Todella sopiva.
- Sopivia.
- Jokseenkin sopiva.
- Ei niin sopiva.
- Ei lainkaan sopiva.

16. Koulutusohjelmassa käytetyt välineet olivat koulutukseen sopivia.

- Todella sopivia.
- Sopivia.
- Jokseenkin sopivia.
- Eivät niin sopivia.
- Ei lainkaan sopivia.

17. Koulutusohjelman opettajalla oli tarvittava asiantuntemus.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä

18. Opetuksen laatu oli koulutusohjelmaan sopivaa.

- Täysin samaa mieltä.

- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä.

19. Minusta tuntuu, että koulutusohjelmasta oli minulle hyötyä ja opin jotain uutta.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä.

20. Haluaisin osallistua tällaiseen koulutukseen uudelleen, mikäli sille olisi tarve.

- Täysin samaa mieltä.
- Samaa mieltä.
- Jokseenkin samaa mieltä.
- Eri mieltä.
- Täysin eri mieltä.