



## **TRACKING KNOWLEDGE AND SKILLS IN WORDPRESS COMPANY**

Unlocking Employee's Potential with Skills Mapping

Lappeenranta–Lahti University of Technology LUT

Master's Programme in Software Engineering, Master's thesis

2023

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Examiner: Associate Professor Ari Happonen

## ABSTRACT

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Demand for digitalization-ready software developers grows, however, companies have employees with varying levels of experience and knowledge of specific skills, which can create challenges for the companies. Skills mapping is a process to map and keep track of skills and knowledge visually. With skills mapping companies have previously been able to track, evaluate, and develop employees' knowledge and this thesis focuses on the WordPress industry side of skills mapping.

In this thesis, literature was researched, and interviews were conducted to help to develop a skills mapping tool to help a WordPress company track and evaluate skills. Skills were identified from research, job listing, and interviews with experts to help acknowledge skills that have been seen as useful and valued in software development and WordPress development to guide choosing the skills to the skills matrix. Competency estimations and skills development were also researched from literature and interviews to help understand how to rate employees' skills and give tools to develop those skills. Interviews gave validations and opinions about the skills mapping process. Feedback from interviews showed that the WordPress industry valued the skills mapping process, however, there were concerns about how to effectively implement it to work life. Using this gathered knowledge, the skill mapping tool was successfully constructed for the company. The results of the thesis show that skills mapping tools are valued and can be implemented into the WordPress industry for managing employees' skills.

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## **TIEDON JA TAITOJEN SEURAAMINEN WORDPRESS-YRITYKSESSÄ**

Työntekijän potentiaalin avaaminen taitojen kartoituksella

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Digitalisaatiovalmiiden ohjelmistokehittäjien kysyntä kasvaa, mutta yrityksissä on työntekijöitä, joilla on vaihtelevaa kokemusta ja osaamista, mikä voi luoda haasteita yrityksille. Taitojenkartoitus on prosessi, jolla kartoitetaan ja seurataan taitoja ja tietoja visuaalisesti. Taitojenkartoituksen avulla yritykset ovat aiemmin pystyneet seuraamaan, arvioimaan ja kehittämään työntekijöiden tietoja ja tämä opinnäytetyö keskittyy taitojen kartoituksen WordPress-alan puoleen.

Tässä opinnäytetyössä tutkittiin kirjallisuutta ja tehtiin haastatteluja, joiden avulla kehitettiin taitojenkartoitus työkalu, joka auttaa WordPress yritystä seuraamaan ja arvioimaan taitoja. Taidot tunnistettiin tutkimuksista, työpaikkailmoituksista ja haastatteluista ammattilaisten kanssa, jotka auttoivat tunnistamaan ohjelmistokehityksessä ja WordPress kehityksessä hyödyllisiksi ja arvostetuiksi pidetyt taidot ohjaamaan taitojen valintaa osaamismatriisiin. Pätevyysarvioita ja osaamisen kehittämistä tutkittiin myös kirjallisuudesta ja haastatteluista ammattilaisten kanssa, jotta ymmärrettiin, kuinka arvioida työntekijöiden taitoja ja tarjota työkaluja näiden taitojen kehittämiseen.

Haastattelut antoivat vahvistuksia ja mielipiteitä taitojenkartoitus prosessista. Haastatteluista saatu palaute osoitti, että WordPress-ala arvosti taitojenkartoitus prosessia, mutta huolenaiheena oli, kuinka se voitaisiin ottaa tehokkaasti käyttöön työelämässä. Tämän kerätyn tiedon avulla osaamiskartoitustyökalu rakennettiin onnistuneesti yritykselle. Opinnäytetyön tulokset osoittavat, että osaamisen kartoitustyökaluja arvostetaan ja ne voidaan ottaa käyttöön WordPress-alalla työntekijöiden taitojen hallitsemiseen.

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## ABBREVIATIONS

API	Application Programming Interface
CMS	Content Management System
CSS	Cascading Style Sheets
HTML	Hypertext Markup Language
HR	Human Resources
IT	Information Technology
PHP	Hypertext Preprocessor
SEO	Search Engine Optimization
SQL	Structured Query Language
WIL	Work-Integrated Learning

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### Appendix 1. Interview questions

# 1 Introduction

As the industrial digital transformation continues[17], demand for digitalization- ready software developers grows and websites tend to come more complicated. However, companies have varying levels of experience and knowledge within employees, which combined with potential motivation issues[22], can create challenges for companies. For instance, one challenging difference in competencies within companies has been found when software developers transition from school to work life. Transition has been found difficult as there has been researches where it is said that there is a gap between the industry's requirements and graduates' readiness [3, 5, 11]. Students have been lacking in some required skills such as soft, managerial, and hard skills[3].

Given the challenges that arise from the varying levels of experience and knowledge among employees[35], it will be important for companies to take steps to support their employees. In the ever-evolving software development industry, continuous learning and skill development are necessary to stay relevant. Therefore, companies need to keep track of their employees' skills and take steps to support their ongoing learning and development. One such step is skills mapping. Skills mapping is a visual representation of all your employees' skills and it's used to keep track of employees' skills [10].

## 1.1 Background

One of HR (Human Resource) management responsibilities is developing employees[30]. The HR department aims to improve employees' skills by finding their professional needs and increasing their motivation level. Terms like talent development, skills management, and competency management have been mentioned when talking about developing employees. To effectively develop employees' skills and track their progress, HR departments require a tool to evaluate and monitor skills. This is where skills mapping comes into play. There already have been studies about skills mapping in practice.

Mittal et al. study[21] helps to show the system for skill mapping and utilization of appraisal inputs in improving organizational performance. This study highlights a company's successful implementation of a skill mapping process for its blue-collar workforce. This



process was effective in improving the employees' skills, leading to better performance on key deliverables, such as improved quality and fewer defects.

Milon et al. [20] mapped hard skills of IT (Information Technology) practitioners to support the project management. In this research mapping skills were talked about being crucial aspect for software development organizations that can inform decision-making on team building and project development. By finding competent practitioners, project timelines can be minimized while quality is enhanced. To ease decision-making around team formation, skill acquisition, and contracting, a software company developed a tool through the process of mapping skills among development teams and managers. Moreover, practitioners were able to find areas where they could improve or acquire new skills that are essential for their roles.

This thesis focuses on WordPress side of skills mapping. WordPress is a CMS (Content Management System) and it is the most used CMS by 43.1% of all websites on the internet in February 2023 [28]. While limited research has been conducted on skills mapping in the WordPress environment, this thesis seeks to contribute to the existing knowledge gap by examining skills mapping's effect on WordPress environment.

## 1.2 Motivations and Goals

The motivation for this thesis is to help the company to track employees' skills and develop existing employees. By recognizing and understanding the unique starting points of employees, the company can create a more effective workplace and train employees properly[9]. This could help the company overall with improved performance, cost savings, and identifying employees' strengths and weaknesses. The main goal of the thesis is to create a skills mapping tool for the company, which will be used to evaluate and track employees' skills. To achieve this, research needs to be conducted on skills mapping, competency estimation, and the various competencies required for a WordPress developer. Also interviews are made to experts working in the industry to get confirmation on things that have been researched. The research questions this thesis seeks to answer are:

RQ1: What skills are desired from WordPress developers who are being hired?

The first research question's goal is to gather skills that are found important in WordPress development. Firstly, this can be partially obtained by doing a literature review on the skills that are commonly valued in software development workplaces and comparing them to job listing for support on literature. Secondly, to obtain an understanding of the technical skills required in the WordPress development industry, the study will research the main functionalities of WordPress, review relevant statistics, and conduct data gathering from job listings, given the lack of a definitive answer on the necessary skills for a WordPress developer. Lastly these results are compared to what experts said in the interviews.

RQ2: What methods are used to estimate competencies?

The purpose of the second question is to find ways to estimate competency. A literature review will be conducted to understand different techniques and methods to estimate the employees' competencies and experts' opinions were asked.

RQ3: What means are used to develop skills?

The third question aims to give general guidance as to what ways there are to develop employees' skills. A literature review will be done to find ways to develop employees and their specific skills.

RQ4: How experts in the software industry perceive relevance and value of skills mapping?

The fourth question aims to find insights on skills mapping from experts working in the industry. This information will be gathered from experts by interviewing them and making an analysis of their answers. Company validates the data gathered from the interviews.

### 1.3 Scope and delimitations

The scope of the thesis is to focus mainly on the software development side of skill mapping and specifically on WordPress environment. Topics of how to develop employees are talked about without comparing how effective is compared to each other method as the point is to give guidance and ways to improve employees. In this thesis brief guidance on how to estimate the skills is made without going into too much detail as every company has its own metrics. While there are several types of employees in any company, this thesis primarily focuses on developers and their skills within the context of WordPress development.

Research will be done without limitations on the subject area as there is not much literature specifically on WordPress companies, but we apply these methods to the WordPress environment.

#### 1.4 Structure of the thesis

The thesis is divided into 8 chapters. This chapter introduces the background of the thesis and presents the motivations, goals, scope, and limitations of the research. In chapter 2 literature on different skill groups are researched and different skills in those groups are introduced and defined from literature and job listings of the WordPress industry. Literature on competency estimation and developing skills is mentioned in Chapter 3. Interviews and analysis are done in Chapter 4 to get insights and opinions from the experts of the WordPress industry about the skills mapping process. In Chapter 5 a skills mapping tool is constructed. Chapter 6 discusses the results of the thesis. Discussion about the results and future research happens in Chapter 7. Finally in Chapter 8 conclusion is written.

## 2 Soft- and Hard skills

Software engineering positions typically categorize the required skills into two groups as “soft skills” and “hard skills”. Soft skills are typically regarded as non-technical, social, and people communication-related skills and hard skills technical skills that are related to domain specific technologies. In context of skills mapping, it is important to identify what kind of skills there are and to find the most important skills that the company values. This chapter aids to answers on first research question RQ1: What skills are desired from WordPress developers who are being hired?

A useful starting point for understanding the various kinds of skills is to examine the broader concept of competency. Competency is a series of knowledge, abilities, skills, experiences and behaviors, which leads to effective performance in an individual's activities[18]. This means employees' competence level determines their ability to do tasks and achieve their job objectives. As mentioned before, skills are a subset of competence, and they represent the specific knowledge and abilities required to perform specific tasks or activities effectively.

Soft- and hard skills will be examined and how they fit into WordPress environment. To find the necessary soft and hard skills, a literature review will be conducted, followed by an analysis of job listings. Soft skills will be gathered from the literature review and compared to the findings from the job listings. Relevant hard skills will be gathered from WordPress statistics and WordPress own website and compared to the job listings. After that we can get

### 2.1 Soft Skills

As “software is a by-product of human activities, such as problem-solving capabilities, cognitive aspects, and social interaction”[2], it’s important to think about employees non-technical skills. Soft skills can be hard to define, as it is a broad topic. In literature soft skills have been described as “non-technical skills”, “people skills” and “social skills”. Maturro et al. have identified in their research[19] the four common components of soft skills. It was defined as a combination of abilities, attitude, habits, and personality traits. Table 1 is adapted from Maturro et al. research as it provides definitions of components and sources

for those definitions. With these definitions of components, soft skills can be identified and understood.

Table 1: Components of soft skills

<b>Component</b>	<b>Authors</b>	<b>Definition</b>
Abilities	Klaus[16] Ramesh[24] Rao[25]	Competence in an activity or occupation because of one's skill, training, or other qualification.
Attitude	Ramesh[24] Rao[25]	A predisposition or tendency to respond positively or negatively towards a certain idea, object, person, or situation.
Habits	Verma[31] Ramesh[24]	An acquired (learned rather than innate) behavior pattern regularly followed until it has become almost involuntary.
Personality traits	Klaus[16] Verma[31] Rao[25]	Traits that reflect people's characteristic patterns of thoughts, feelings, and behaviors.

Ahmed et al. research "Soft Skills and Software Development: A Reflection from the Software Industry"[2] mentions that "Soft skills have their roots in psychology, and they cover a broad range of characteristics involving personality types, social interaction abilities, communication, and personal habits." Personality traits are believed to play a critical role in task performance, based on the psychological hypothesis not all tasks can be performed equally well by everyone. In the field of software engineering, there is evidence indicating that personality preferences have an impact on motivation and quality of work[15]. The impact of personality preferences on software engineering performance has led to research on soft skills.

Matturro et al.[19] conducted systematic mapping study on soft skills. 44 papers were finally selected, and 30 main categories of soft skills were identified in their research. Communication, teamwork, analytical, organizational, and interpersonal skills were mentioned in at least half of the selected studies. However, the importance of these skills may vary across companies depending on key policies and strategies of the companies. Creating a list of relevant skills can help companies identify the skills that are most important for their use.

In support of the previously mentioned systematic mapping study, job listings data were gathered to see if the same main categories of soft skills were mentioned. Finnish job listings data was collected from Indeed[12], Duunitori[8], and Vierityspalkki[32], and found 35 suitable positions that mentioned WordPress in the title such as WordPress Developer and Frontend/Backend/Full Stack WordPress Developer or mentioned WordPress in the job listings text like Web Developer. After going through the job listings and gathering the soft skills, soft skill mentions are counted in the job listings, as shown in Table 2.

Table 2: Soft skills from 35 job listings

<b>Soft skill</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Communication skills	28/35	80%
Teamwork	27/35	77%
Initiative	26/35	74%
Creativity	23/35	66%
Autonomy	21/35	60%
Problem solving skills	21/35	60%
Willingness to learn	21/35	60%
Organizational/Planning skills	16/35	46%
Critical thinking	11/35	31%
Time management	11/35	31%
Leadership	10/35	29%
Listening skills	10/35	29%
Customer orientation	9/35	26%
Motivation	9/35	26%
Commitment/Responsibility	8/35	23%
Interpersonal skills	8/35	22%
Results orientation	5/35	14%
Ethics	4/35	11%
Change management	4/35	11%
Fast learner	3/35	9%
Stress management	3/35	9%
Analytical skill	3/35	9%

Table 2 does not take a stance on whether the skills are important or not. However, it confirms that all the soft skills found from the job listings were relevant to the research conducted beforehand. Job listings may not necessarily supply a comprehensive list of all the soft skills required for the job, but rather suggest the desirable or necessary skills for working in the company. The company can then develop the employees' soft skills according to their needs.

There were few soft skills that were written differently on job listing but meant the same thing. Adaptability was mentioned a few times, but the definition of adaptability also describes change management. Another skill that was often mentioned was self-directedness, which has the same definition as initiative. Flexibility as a soft skill was left out of this thesis due to being difficult to define as flexibility can have various meanings depending on the context. After identifying the main categories of soft skills, the definitions of each skill will be discussed. In table 3 presented below the skill and their definitions are gathered.

Table 3: List of soft skills and their descriptions based on literature

<b>Soft skill category</b>	<b>Description</b>
Analytical skill	The ability to think logically, analyze information and solve problems.
Autonomy	The ability to take responsibility and complete tasks independently.
Change management	The ability to adapt to changes while doing the task.
Commitment/ Responsibility	The ability to commit, take responsibility and follow through.
Communication skills	The ability to communicate effectively.
Conflict management	The ability to manage and resolve conflicts in work situations.
Creativity	The ability to approach tasks and challenges with a new perspective
Critical thinking	The ability to analyze information, draw conclusion and make decision that support the information.
Customer orientation	The ability to identify and meet the needs of customers
Decision-making	The ability to make beneficial decisions independently
Ethics	The ability to follow a set of guidelines and rules.
Fast learner	The ability to quickly learn new methodologies, and technologies
Initiative	The ability to take the initiative to propose and take any action without waiting for direction from others
Innovation	The ability to create new ideas

Interpersonal skills	The ability to maintain positive relationships with others in both personal and professional settings
Leadership	The ability to lead and guide team members toward a goal.
Listening skills	The ability to listen and understand the needs and perspectives of team members, clients, and stakeholders.
Methodical	The ability to follow a structured approach set by methods to achieve the goal.
Motivation	The ability to exhibit passion, and enthusiasm towards work.
Negotiation skills	The ability to negotiate and find mutually beneficial solutions while maintaining positive relationships.
Organizational/ Planning skills	The ability to plan, organize, and manage multiple projects, timelines, and resources.
Presentation skills	The ability to clearly present information to stakeholders.
Problem solving skills	The ability to identify the problem and solve it.
Results orientation	The ability to take proper action to achieving set outcomes.
Stress management	The ability to manage and cope with stress effectively without allowing it to negatively affect you.
Team management	The ability to manage and lead teams
Teamwork	The ability to collaborate with others to reach a common goal.
Time management	The ability to prioritize tasks and meet deadlines.
Willingness to learn	The ability to have a willingness to learn and acquire new knowledge.

Now that in Table 3 the soft skills are defined, many soft skills in the job listings in Table 2 refer to attitude, habits, and personality traits rather than abilities. For example, if we look Table 2, it seems that companies value willingness to learn more than fast learning. This aspect helps to understand that companies also value soft skills that do not directly relate to technical skills but significantly impact employee performance and overall success in the workplace.

## 2.2 Hard Skills

Hard skills, also called technical skills, refer to a person's ability to perform specific tasks or activities, which includes knowledge and expertise in methods, processes, procedures, or techniques [7]. As for what hard skills are needed for WordPress development, it cannot be



generalized. The specific skillset required may vary depending on two factors: the company's values and the employee's position in the company. As different positions call for different skills, not every employee needs the same set of skills to do their job. This means it's important to explore a range of hard skills relevant within WordPress development to find right skills for the company, for the employees and for improving the expertise of the employees.

To get information what kind of hard skills there are and are relevant in WordPress development first we can look through WordPress' own website[4] and WordPress statistics to get knowledge on how WordPress is build. WordPress is an open-source CMS that requires an understanding of its features and capabilities, including themes, plugins, and website customization. WordPress is built using PHP (Hypertext Preprocessor) and it uses MYSQL databases that uses SQL (Structured Query Language) programming language for managing these databases. WordPress is used to build websites and knowledge of web development essentials like front-end development which includes knowledge of HTML (Hypertext Markup Language), CSS (Cascading Style Sheets), and JavaScript, responsive design and web accessibility are important to make website usable for different kinds of users.

WordPress sites need to be hosted on server. Cloud computing has become increasingly popular in recent years due to its flexibility, scalability, cost-effectiveness, and ease of use[34]. This means developer needs to understand how to deploy and manage web applications on cloud service platforms or have knowledge of hosting own server and managing it. One popular use case for WordPress site is to build E-commerce webstore. In February 2023 every fifth WordPress site has e-commerce plugin WooCommerce on their website[29]. With e-commerce websites you also need to know API (Application programming interface) integrations for third-party services as payment gateways for transactions.

To support these previously mentioned hard skills, the same 35 job listings that were used in sub-chapter 2.1 to gather information on skills that were mentioned earlier and to identify any additional skills that may be relevant in this industry. After going through the job listings and gathering the hard skills, hard skill mentions were gathered in table 4 the same way as in table 2.

Table 4: Hard skills from 35 job listings

<b>Hard skill</b>	<b>Frequency</b>	<b>Percentage (%)</b>
WordPress development	35/35	100%
Front-end web development	32/35	91%
PHP	31/35	89%
Version Control	18/35	51%
API Integrations	14/35	40%
Databases	13/35	37%
Graphic design	11/35	31%
Server Management	9/35	26%
E-commerce Integration	7/35	20%
Cloud computing	6/35	17%
Docker	5/35	14%
Project Management tools	5/35	14%
Performance Optimization	4/35	11%
SEO (Search Engine Optimization)	3/35	9%
Analytic tools	2/35	6%
Web Accessibility	2/35	6%

After going through the job listing, seven more hard skills were found. Graphic design was quite common as almost every third job listing mentioned it. Graphic design helps to improve branding and user experiences. Few job listings mentioned the need for docker knowledge as dockers enable fast and consistent application development and deployment across different environments. Also, project management tools were mentioned as employees need to know project management methodologies and how to use project management software.

The last three hard skills related to optimizing your website are analytic tools, performance optimization, and SEO. Analytic tools help track user behavior, site traffic, and conversion rates, while performance optimization is aimed at improving site loading speed and overall user experience. SEO involves implementing various techniques to improve the website's visibility and ranking on search engines. After identifying the main categories of hard skills, the definitions of each skill will be discussed. Table 5 below summarizes all the previously mentioned hard skills and descriptions. Skill descriptions are based on job listings, discussions with the company and from own experience.

Table 5: List of hard skills and their description based on job listings and industry standards.

<b>Hard skill category</b>	<b>Description</b>
WordPress development	Knowledge of WordPress development, including its core functions, theme development, and plugin development.
Front-end web development	Knowledge of HTML, CSS, and JavaScript.
PHP	Knowledge in PHP programming language.
Version Control	Knowledge of version control systems and the ability to manage code changes and collaborate with team members.
API Integrations	Knowledge of APIs and the ability to integrate third-party services with WordPress.
Databases	Knowledge of database management and SQL.
Graphic design	Understanding of design principles, including color theory, typography, layout, and composition.
Server Management	Knowledge of how to configure and maintain servers.
E-commerce Integration	Knowledge of e-commerce platforms and the ability to integrate these platforms with WordPress.
Cloud computing	Understanding of cloud computing platforms and how to deploy and manage web applications on these platforms.
Docker	Understanding of containerization technology and how to use Docker to build, deploy, and manage containerized applications.
Project Management tools	Knowledge of project management methodologies and how to use project management software.
Performance Optimization	Understanding of techniques for improving website performance.
SEO	Knowledge of optimizing websites for search engines.
Analytic tools	Knowledge of web analytics tools and how to use them to track website traffic, user behavior, and conversion rates.
Web Accessibility	Understanding of web accessibility best practices and guidelines.

This sub chapter doesn't name every hard skill related to WordPress development. This sub chapter's idea was identifying key hard skills that are commonly valued in the industry. It is the responsibility of companies to identify the specific areas they want to specialize in and determine the skills necessary to achieve their goals.

## 3 Related literature on skills

The aim of this chapter is to address research questions RQ2: What methods are used to estimate competencies and RQ3: What means are used to develop skills as these support the use of skills mapping by finding ways to estimate competencies and then guiding how to develop them. This can be achieved by researching relevant literature on different approaches and methodologies that can help in estimating and developing employees' skills.

### 3.1 Competence Measurement

The software engineering industry relies heavily on employee competencies as its main asset. As developing skills mapping process, company needs to evaluate the competency of their employees. Competence can be measured both indirectly and directly. Indirect competence measurement refers to using methods that infer competence rather than directly measuring it. For example, companies might use an individual's educational background or work experience as indicators of their competence. This can be achieved by using objective metrics. Objective metrics provide measurable indicators of concrete tasks and outcomes. In addition to indirect competence measurement, there is also direct competence measurement. Direct competence measurement directly assesses an individual's abilities or knowledge in a specific area. For example, a company can have tests or performance assessments to evaluate competence. This can be achieved by using subjective metrics. Subjective metrics are based on someone's opinions or judgments.

Research on competency measurement has already been done. In “Competence Measurement and Competence-Related Risk Management in a Health Care Organization” [13] Jääskeläinen researched how to measure and manage competencies and how can competence measurement be used in the process of competence management. In this research it was mentioned that competence resources must be classified and measured to be able to develop and manage. The selection of competencies to be measured can be made from the goals of the company's strategy or directly selecting the competencies that are found to be important for the company. Competence measurement was found helpful for

several competence management activities. Measuring competence was helpful both in finding out the current state of competence and in determining the necessary competence.

Competence was measured with a survey-based tool, which was found to be well suited for searching for competence development targets. One of the challenges of designing the measurement tool was the selection of the competencies to be measured. Although the skill requirements and the characteristics were gathered from various sources and interviews, better expertise on the subject would have been necessary in some situations. However, the thesis mentions that it is more companies' role to select the things to be measured. The measurement was decided to be carried out subjectively, because in this way it was possible to get comprehensive and direct information about the level of competence. In practice, the direct competence measurement often must be performed subjectively, which can weaken the reliability of the results. Problems associated with subjective measurement include that people may understand the levels involved in assessments differently. The evaluator may also misunderstand the entire thing being evaluated. In subjective measurement, attention must be paid to the choice of evaluator and the evaluation method. It is good to use not only the employee's own evaluation but also the supervisor's evaluations to get more accurate estimation. Although it is easy to criticize subjective measurement results, it should be noted that reviewing the results with development discussions can improve result reliability. The competence measurement results were considered useful when preparing the personnel strategy.

Even though the focus on the research was on healthcare organization, the same principles can be used to software industry when measuring competencies as the skills can be changed to fit more into software industry.

### 3.2 Developing Skills

As mentioned before the software industry constantly evolves and keeping up with development becomes important to stay relevant and competitive. This means employees need to either continuously learn new skills or update their existing skills to avoid falling behind development. As a company, it is important to acknowledge that an employee's skills need to be continuously developed and updated. This leads to the companies needing to be

aware that there are different kinds of learners. The four most common learning styles are listed below[33].

- Readers - those who learn best by reading.
- Listeners - those who learn best by listening.
- Doers - those who learn best by doing.
- Watchers - those who learn best by watching.

Various kinds of learners need to be considered when developing skills as there is no clear answer to what the most effective way is to learn for everyone. In this sub-chapter we are going to look through different approaches and methodologies to develop employees' skills and knowledge. Chapter 2 discussed the categorization of skills into two groups: soft and hard skills. To effectively develop skills, it is important to specify which type of skills are being addressed, as not all methods may be suitable for every skill. This sub-chapter is divided into 2 sections where soft skills development and hard skills development are discussed.

### 3.2.1 Soft skills development

Lecture-based learning has not been seen the most effective approach to help achieve the soft skills learning objectives[11, 14, 23]. Liguó et al. research *Developing Soft Skills by Applying Problem Based Learning in Software Engineering Education*[23] describes how problem-based learning that is a student-centered learning approach helps students develop soft skills. In the research studies find that problem-based learning helps develop soft skills, such as communication skills, documentation skills, team working skills, and interpersonal skills. Solving real-world problems has been found helpful to acquire knowledge and skills that are hard to gain through lectures. This method has been used to reduce the gap between industry expectations and what school can provide.

Jacksons research *Employability skill development in work-integrated learning: Barriers and best practice*[14] mentions WIL (Work-integrated learning) as a way to improve soft skills WIL is the practice of combining traditional academic study, with exposure to the world of work to prepare students for working life. WIL has been found instrumental to job-readiness

as WIL encourages students to experience authentic work practices and learn and practice applying skills and knowledge in a real-world context. Completing WIL has been shown to improve various soft skills such as team working, problem-solving, communication, information literacy, and professionalism.

In “Teaching ‘Soft’ Skills in Software Engineering”[11] González-Morales et al. researched ways to teach soft skills by using Project Based Learning to help student to acquire the necessary skills. Working on real problems with real clients is a fundamental element for the development of student’s soft skills. Students have been able to develop the necessary soft skills, mainly related to teamwork and leadership, through this training. Project Based Learning has confirmed that students are achieving higher performance and are better prepared to enter working life.

These researches have shown that the most effective way to develop soft skills is to put people into real-life problem-solving scenarios. As this is a great way to learn by doing there is still need for lecture-based learning. As mentioned in Jacksons research [14] that WIL in more of a complement to lecture-based learning rather than alternative solution. Lecture based learning still gives foundation of knowledge before doing real life scenarios.

### 3.2.2 Hard skills development

As mentioned before, hard skills are more specialized knowledge to perform specific tasks, making it easier to find what to focus on. With this knowledge, individuals can develop their hard skills through targeted learning, training, and practice. To develop hard skills, real life scenarios have also been found helpful. In “Teaching ‘Soft’ Skills in Software Engineering”[11] González-Morales et al. mentioned that Project Based Learning also helps to develop hard skills. Working on real problems with real clients helped to improve students’ technical knowledge.

To get more different choices for developing hard skills Indeed.com was used to find different ways. Indeed.com[1] is an employment website for job listings. They have had experience with helping people find jobs and in their career guide section, there is an article[27] on developing hard skills. Article mentions four different ways to develop hard skills:

1. Enroll in courses – Learn from training programs.
2. Use a self-study training program – Learn independently by “how-to” books, self-paced online lessons, or free training materials on the internet.
3. Learn from a professional – Individual teaches you the skills.
4. Learn on the job – Learn by doing real life experiences.

These four different ways give different kind of options for different kinds of learners. Table 6 below gathers all the ways to develop hard skills.

Table 6: Ways to develop hard skills

<b>Development way</b>	<b>Description</b>
Courses	Courses can help individuals develop hard skills by providing a structured learning environment with clear learning objectives, and assessments.
Books	Written materials can provide helpful information and help understand the topic.
Training materials	Training materials, such as manuals, online tutorials, and instructional videos, can provide step-by-step guidance on how to perform specific tasks.
Mentoring	Mentors can offer guidance, feedback, and advice on how to improve skills.
On-the-job training	On-the-job training involves learning through hands-on experience while performing tasks related to a particular job.

With these different ways companies can offer different kinds of options to maximize developing employees’ hard skills. As there is not a best way to learn, efficiency of learning really depends on the person and what company can offer.



## 4 Interviews and analysis

Researches have shown positives signs of skills mapping processes[20, 21], but there is no feedback from WordPress industry about skills mapping. In this chapter interviews are conducted with people working in the WordPress industry for qualitative validation and thoughts of skills mapping process. Interviews and open-ended questions were chosen as the primary research method in this thesis. The reason behind these selections was that case company wanted to get as much open information on this topic. Open-ended question was chosen as it provides more detail and delivers new and often unexpected insights. This means after the main question talk can go into different directions and this means even if some person didn't mention some aspect, it doesn't mean that person is against it. Interviewees were selected based on companies' recommendation of people that have experience in this industry. Five people were able to be interviewed.

- Person 1 is an entrepreneur with 20 years of experience in the WordPress industry.
- Person 2 is a cofounder and COO of a small WordPress company with 10 years of experience.
- Person 3 is a project manager in a marketing office with 2 years of experience. Person 3 has a lot of knowledge on managing WordPress freelancers.
- Person 4 is a CEO and company owner with 30 years of experience in the software industry including WordPress.
- Person 5 is the CEO of a small WordPress company with 5 years of experience.

In this chapter, the term “person” is used for experts to ensure anonymity. Interviews were done individually so that other people's answers wouldn't influence their own answers. Questions related to skills mapping were asked from these and the answers were summarized in this chapter to give narrative about things experts said and how other experts saw it. From the answers analysis can be done.

The first question is “What soft skills do you consider to be relevant in the WordPress industry?” and follow-up question after answers was “What do you consider the most important of those answers?”. Answers were gathered on table 10 below.

Table 7: Soft skill interview question answers

	<b>What soft skills do you consider to be relevant in the WordPress industry</b>	<b>What do you consider the most important from those answers</b>
Person 1	Communication, Attitude, Situational Awareness, Listening skills, Willingness to learn, Bravery	Communication, Attitude, Situational Awareness
Person 2	Communication, Listening skills, Customer orientation, Responsibility, Leadership, Result orientation,	Communication, Customer orientation
Person 3	Communication, Honest, Writing skills, Commitment, Trust, Initiative, Time management, Be yourself	Communication, Writing skills, Initiative
Person 4	Communication, Teamwork, Customer orientation, Business knowledge, Interest	Communication, Customer orientation, Business knowledge
Person 5	Communication, Teamwork, Customer orientation, Problem solving skills, Empathy skills, Prioritization, Initiative	Communication, Customer orientation, Initiative

From these answers we can see a clear implication that communication has been the most important soft skill to have in experts' opinion. Communications were mentioned in every interview and many times in context of being able to communicate properly to coworker, manager, or client. Person 1, 2 and 5 added that with good communication you need to be able to explain things easily to different stakeholders, especially for client as misunderstandings have bad impact on the work.

Another skill that was commonly talked about in these interviews was customer orientation. Persons 2, 4 and 5 say that employee needs to be able to identify and understand customers' needs for success. Lastly, one important skill that stood out in these interviews was taking initiative. Experts value individuals who take the initiative and don't wait to be told what to do. By showing initiative and a positive attitude, you can make a strong impression.

Person 5 mentions that the more leading role you have the more empathy skills you need. Person 1 emphasizes that people who are really interested in leading role will go there naturally as their personality and soft skills will guide them into that position. Persons 1 and 3 add that it's wrong to try to fit someone in for some kind of job position that they don't fit

based on personality but would be a great opportunity in terms of career development. Persons 3 and 4 talks about own experience with software developers being typically introverted and that is important to consider when assigning roles and responsibilities. In conclusion, this question highlights the significance of effective communication, customer orientation, and initiative as essential soft skills valued by experts. It is important to recognize individual traits and consider them when assigning roles and responsibilities within a team.

The second question is “What technical or hard skills do you consider to be relevant in the WordPress industry?” and follow-up question after answers was “What do you consider the most important of those answers?”. The question is general question as roles can also impact what kind of hard skills are needed.

Table 8: Hard skill interview question answers

	<b>What hard skills do you consider to be relevant in the WordPress industry</b>	<b>What do you consider the most important from those answers</b>
Person 1	The most important thing is to focus on keeping your own interest and improving knowledge	The most important thing is to focus on keeping your own interest and improving knowledge
Person 2	Frontend development, PHP, Database management, Maintenance, Monitoring, Analytics, Optimization	Frontend development, PHP, Database management,
Person 3	Expertise, Integration skills, SEO, Security, Optimization, Easy to Use, Front end development, WordPress development, E-commerce Integration	Performance optimization, Expertise
Person 4	WordPress development, PHP, SEO, Measuring Conversions.	WordPress development, PHP
Person 5	Problem solving skills, WordPress development, Knowledge of internet technologies, Front-end development, PHP, IT-service skills	WordPress Development, Coding expertise

In this question answers varied as expected because this was broad question, and it shows that there are no single right answers. Skill set really seems to depend on who is your employer, what job role you have and what work you do. But as a WordPress developer it

was shown that at least three things were seen good to know about: WordPress development, front-end development, and PHP. What all experts valued in these interviews was that person had something to show for skills and show interest in the topic. As shown in sub-chapter 3.2.2 there are a lot of different ways to develop hard skills, so companies shouldn't worry about employee missing a specific skill. As mentioned in the first interview question, it's important to find something that interests you. Trying to do something you don't enjoy will only lead to a negative experience. From these answers, it seems like if you have skills and can show them, you'll be able to succeed.

The third question is "How do you adapt to changes in the workplace or new technologies?". Person 2, 3, 4, and 5 emphasized the importance of staying aware of changes as the industry constantly evolves. Person 5 recommends reading forums and blogs to be up to date about updates affecting WordPress. Even though industry constantly evolves, person 1 reminds us that we shouldn't jump on every time new technology, or a library comes around, without really mastering anything. There needs to be fine line between learning new and focusing on previous skills.

Some interviewees mentioned where adaptation should be happening. Persons 3, 4 and 5 encourage companies to create an atmosphere for self-development and Person 5 adds to this by saying that it should be management level's responsibility to set time for it. Person 4 emphasizes a dual responsibility for both parties in skill development. On one hand, the employer must create an atmosphere for self-development. On the other hand, the developer must have his own motivation to develop skills, research the matter and maybe propose things to the company.

Outside of work person 4 mentions that WordPress hobby has been seen beneficial. Person 5 says the same thing but also mentions the company can't demand that. In the end it comes to the fact that an employee is passionate about the work and wants to develop itself either it's from work or own time.

From these answers, it sees that adapting to workplace changes and new technologies requires staying informed and striking a balance between learning and mastering skills, as emphasized by the interviewees. Creating a supportive environment for self-development is essential, with both employers and employees sharing responsibility, while personal interests and passion can also contribute to individual growth.

The fourth question is “How should competencies be estimated?”. For hard skills all experts answered that previous projects, results and experience should be enough for estimating persons competencies and person 2 adds that also certifications can give an idea of competencies. But as these persons mentions it is hard to estimate competencies from project as there are many project specific things that can affect the process. This includes project workload, price to quality ratio, time to quality ratio and how independently work was done. These things affect a person’s accuracy and efficiency that affect customer satisfaction that defines quality and results. As Person 4 says there will always be occasional successes and failures, but what truly matters is the frequency of an employee's success or failure to deliver. Person 4 stated that “the thing that matters the most, in the end, is money”. This highlights the importance of customer satisfaction in achieving success.

Few experts talked about soft skills estimation. Person 1 and 2 talks about difficulties of estimating soft skills. Person 2 suggests that conducting interviews can be an effective way to evaluate and understand a person’s soft skills. There were few ideas how to estimate in recruitment processes. Person 2 mentions that in recruitment processes he would ask surprising questions, to test how applicant reacts and for understanding applicants’ soft skills. And for hard skills do some kind of preliminary task for the sake of visuals to show that you have the basic skills if they don’t have any previous projects.

On the other hand, person 1 was against coding tests. Person 1 said that previous projects and experience in the industry should be enough. If the applicant didn’t have anything to show it can negatively impact their initial impression. Person 1 also raises a point that the interviewee comes to the interview and sometimes it's difficult to know what they can do because of the situation. Applicant can be nervous and then potential can remain hidden. Person 1 says many good candidates have been left out. Person 1 emphasizes that we shouldn’t stare too much directly at the results. What matters is attitude and potential to learn but these things can be difficult to monitor or know. Lastly person 1 mentions that one company hires juniors and lets them grow there. They just want to see attitude, passion, and willingness to learn.

From these answers, it seems that there are lots of things to think about when estimating any skills. For soft skills it was said that it’s hard to estimate. It really depends on persons personality and how others would rate persons soft skills. For hard skills results can be

enough for estimating competencies, but different variables that have affected results should be taken account when estimating.

The fifth question is “Have you used formal skills mapping in your company?”. Depending on the answer follow-up questions will be asked. If they haven’t used formal skills mapping follow-up questions is “How competencies were tracked, and do you have any information on what skill level employees have?”. If they had used formal skills mapping follow-up questions is “What tool was used, what are the benefits and challenges of the skills mapping and what is the effect of the skills mapping?”.

Four out of five experts haven’t used formal skills mapping. Knowledge of employees’ skills was gained by talking and getting to know the employees. After knowing then people needed to rely on memory. Person 5 talked about their own experience of knowing employees’ skills and assigns them to tasks. Person 5 trusts their own judgment based on what the employee has done. Person 5 says that it’s difficult to explain the reasoning behind their judgment to others as it just how person 5 sees. Person 4 mentioned that hasn’t personally used skills mapping but knows that self-developed excels has been used. Benefits have been that person managing the excel gains access to important employee information that can be utilized effectively.

From these answers, it becomes apparent that the industry often depends on subjective judgment rather than formal methods when evaluating employees' skills. Sixth question will go more into reasons and opinions of using skills mapping and pros and cons of it.

The sixth and final question is “Do you find skills mapping relevant?” and it has two follow-up questions “Where are the values that it produces?” and “Is there some kind of threshold to use skills mapping?”.

Every single interviewee found skills mapping process helpful to some degree. There were few mentions of what values skills mapping process will have for companies. Person 1 says it is good for those that want to develop, and Person 2 says that this encourages employee to develop own skills. Person 2, 3, 4 and 5 also say that it helps organization to understand employees’ skills, helps resourcing, helps project management, and gives peace of mind knowing that the employee can do a specific job that employee is assigned. If there is no data, then you must evaluate subjectively. Person 5 highlighted that skills mapping can even

be utilized for determining an employee's salary by analyzing the skills set. However, Person 5 then reminds it shouldn't be the focus of skills mapping.

For thresholds there seems to be few reasons for not using the skills mapping process. Person 5 talks about need for time and resources for the skills mapping process, because in practice it is away from something else when using skills mapping. Person 5 wonders where it is away from and is there ever a suitable moment for skills mapping? One should never say that there is no time because there is always time but is it that important than something else person 5 adds. Company needs to make it a priority if they really want to use it as it takes time and resources.

Person 2 and 4 says it really depends what kind of tool or method is used. If it takes too much time, complicates the process, and doesn't meet company's needs, they don't see the point. Person 2 adds that if you can make it a weekly routine, you could see some benefit from it. In Person 1 opinion skills matrix should be open to all employees. Person 1 talk about many ratings being anonymous, which may be harmful if there are no visible comparison. Skills mapping should be more open process and offer development discussion rather than skill review.

Person 3 thinks that one threshold could be that if you are already familiar with the individuals, skills mapping may not be essential. While this seems to be common opinion as found from question 5, person 4 says that it shouldn't be used as an excuse for not implementing it. Person 4 emphasizes that even in small companies where familiarity exists, biases and assumptions can cloud judgment. According to person 4, skills mapping can bring development discussions and unlock new opportunities for employees.

From these answers, it seems apparent that the skills mapping process holds value for companies by showing employee development, helping in resource allocation, project management, and providing a basis for informed decision-making. It also highlights the importance of systematic development and the potential use of skills mapping in determining salaries. Biggest threshold for using the skills mapping process is all the uncertainties with the skills mapping proses like the allocation of time and resources, as it requires prioritization within the company and the chosen tool or method.

## 5 Developing skills matrix template

In this chapter, skills mapping tool and skill matrix are developed to the company based on knowledge gained from the earlier chapters. Skill matrix is visual representation of employee's skills in a matrix layout. Firstly, all metrics are mentioned before building the matrix. This includes a pointing system, evaluation metrics and skill groups. After defining these aspects, the company is consulted, and a matrix will be built.

### 5.1 Implementing rating scale

To get a better understanding of employees' skills there needs to be a rating system to categorize employees' skill levels. In this thesis numeric and descriptive scale is used for employee evaluations. The numeric scores provide objective measurement, while descriptive scales provide qualitative information and context to the number. This combination provides a more complete picture of an employee's performance and provides understanding for both employee and manager where an employee's development is. 4-point scale was chosen to be used by the company as it satisfied the needs for the scale. In this 4-point scale rating evaluates skills, with zero being the lowest rating and 3 the highest rating. Table 7 below shows the rating scale created for the company.

Table 9: Rating scale

Target level	Number	Skills description
Knows	1	The person has basic knowledge and understanding of the skill but may require guidance and supervision. The person can recognize the subject and perform simple tasks related to it.
Can do	2	The person can apply the skill independently in a practical context that requires knowledge related to the subject.
Masters	3	The person has expertise in the skill and can apply it with confidence. The person can guide and mentor others in the subject and can perform complex tasks demonstrating mastery of the skill.



This is simple guidance on how to rank skills, but every metric should be discussed between companies as every company has its own goals. The company needs to keep the rating scale consistent across the employees ensures fairness and comparison between employees to see knowledge of the company. The goals of the skill levels must be expressed clearly so that everyone understands what should be done to achieve the skill level.

## 5.2 Point weight

Some skills may be required across roles, with varying levels of importance. For this reason, it is important to assign point weights to the rating scale to reflect the relative importance of each required skill. Table 8 below shows the chosen point weights for the skills matrix.

Table 10: Point weight

<b>Numerical weight score</b>	<b>Description</b>
1	Low importance
2	Moderate importance
3	High importance
4	Critical importance

This point can be used to help to tell the importance of skill in specific role. Formula that tells the importance will be:

$$\text{Rating scale score} \cdot \text{Score weight} = \text{Weighted score}$$

where Rating scale score is the score between 1-3 that tells the skill level, Score weight is the weight that is added to tell the importance of the skill between 1-4 and Weighted score is a multiplication of the previous numerical scores that creates a new score for the skill that fits better for the employee.

## 5.3 Evaluation metrics

Based on scores mentioned in previous sub-chapter, company can follow specific information that helps to understand their situation. Table 9 shows metrics that can be used to get a better understanding of companies' skill levels.

Table 11: Evaluation metrics

<b>Name of the metric</b>	<b>Description</b>
Median score	Middle value when all scores are arranged in order.
Average score	The sum of all the scores is divided by the number of scores. It represents the average performance
Minimum required score	Score that an individual or a group needs to achieve to meet the requirement
Gap to required score	Difference between an individual's or a group's actual score and the required score

Using median score company can see middle value of skills in the company, while average score gives insight what is the average performance of the skill in the company. These both can be useful for different purposes depending on the context. But both scores suffer when there are not enough participants as it does not give enough validity to the score. Also, average scores may not always accurately reflect the overall skill level of the employees, especially if there are extreme outliers in the data. These situations mostly happen in small companies. Minimum requirement tells the requirement that the company sets for the skill level. This can be obtained by using the median score, average score or deciding at least a certain number of employees needs to know this skill at some specific level. Lastly the gap to the required score informs the difference between minimum requirements that was set on minimum required score. This helps companies visualize the gap between minimum requirements.

These metrics can be useful to see companies' skills in the bigger picture and to be used to compare market averages and competitor numbers, but most importantly it should firstly be analyzed at employee level as it gives insight to the company about the specific employees.

#### 5.4 Sections

In this sub-chapter skills were divided into sections to help navigating the matrix and categorizing the skills helps to get better understanding of the skill requirements. Soft skills are divided into four groups that define the meaning of soft skills in this thesis. Those groups are:

- Abilities – Analytical skill, Communication skills (oral/written), Conflict Management, Customer orientation, Decision making, Fast learner, Innovation, Interpersonal skills, Listening skills, Methodical, Organizational/Planning skills, Presentation skills, Problem solving skills, Results orientation, Stress management, Teamwork, Time management
- Attitude – Autonomy, Commitment/Responsibility, Ethics, Motivation, Willingness to learn.
- Habits – Change management, Initiative, Team management
- Personality traits – Creativity, Critical thinking, Leadership, Negotiation skills

To categorize the hard skills, they were divided into different areas based within their specific field. Hard skills were divided into:

- Design - Graphic design, Web Accessibility
- Development - WordPress development, Front-end web development, PHP, Version Control, API Integrations, Databases, E-commerce Integration, Cloud computing, Docker, Server Management
- Optimization and Analysis - Performance Optimization, SEO, Analytical tools
- Management - Project Management tools

These groupings make it possible for companies to see focus on specific skills that are needed for their strategy.

## 5.5 Developing Matrix

Using the information gathered from previous sub-chapters and talks with the company, template can be created in ClickUp. ClickUp is a cloud-based collaboration and project management tool [6]. ClickUp was chosen for this thesis as the company already uses it to manage tasks and employees and it offers a wide range of features to support the development of the template. To begin, premade template is available from ClickUp for skills mapping [26] that can be modified to support the company's way to track skills. Skills mapping view is divided into tabs for easier navigation. Tabs include getting started guide,

skill assessment form, skills mapping, soft skills, and hard skills. Getting started guide includes instructions how to use this skill mapping tool for the employer. The primary purpose of the tool is to display employees' skills visually, which is why the tool includes a skill rating feature. This feature is supported by a skill assessment form that helps employees in evaluating their own skills. Skills assessment form was chosen as a method to estimate skills from research in chapter 3.1 where it was shown as a great way for employees to estimate their own skills.

## Skill assessment form

The purpose of this form is to collect your self-assessment reviews in the areas of expertise. The goal of this assessment is to understand your strengths and areas for improvement in these skill areas.

**Rating system**

1 - Knows:  
The person has basic knowledge and understanding of the skill but may require guidance and supervision. The person can recognize the subject and perform simple tasks related to it.

2 - Can do:  
The person can apply the skill independently in a practical context that requires knowledge related to the subject.

3 - Masters:  
The person has expertise in the skill and can apply it with confidence. The person can guide and mentor others in the subject and can perform complex tasks demonstrating mastery of the skill.

**Note!** If you don't have experience with a skill, you can skip answering that skill.

First and Last name\*

Markus Lähteenmäki

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**Analytical skill**

★ ★ ★

**Autonomy**

★ ★ ★

Figure 1: Skill assessment form

Figure 1 shows the form consists of instruction text, name field and skill ratings. To simplify the rating process, skills are assessed using a star rating system ranging from 0-3 stars. This approach enables easier and more intuitive skill evaluation compared to assigning numerical values. Rating system was previously defined in sub chapter 5.1.

All the skills that were previously mentioned on Chapter 2 are included in the template, but all the non-necessary skills for the case company can be disabled. It is company's job to choose needed skills. Employees self-evaluate their own skills in the skills assessment form and submit the answers. After submitting the form, employees' skills are sent to the skills matrix.

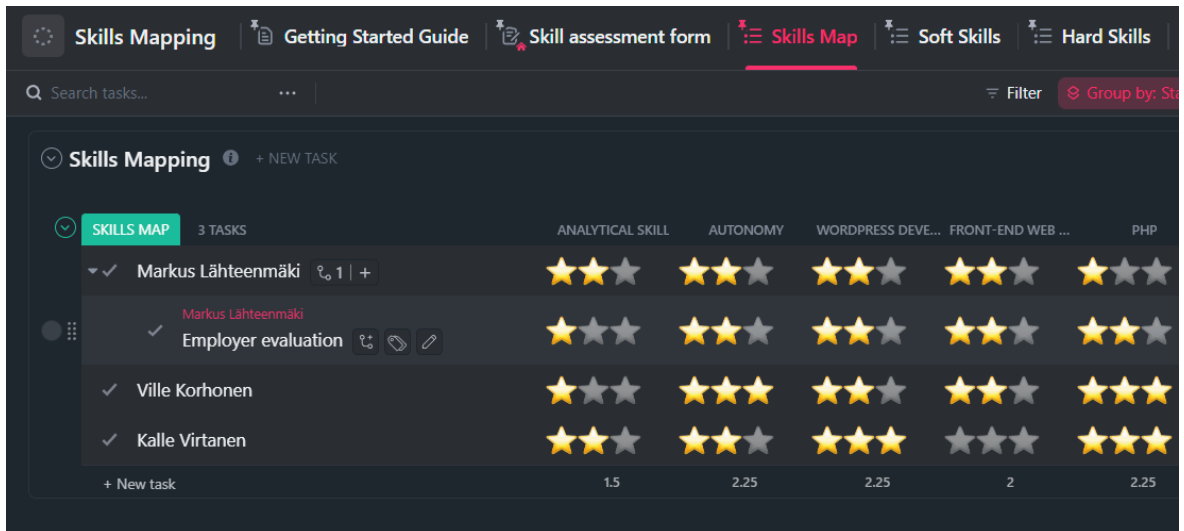


Figure 2: Skills matrix view

Figure 2 shows the view of the skills matrix. On the left employee's name is the heading of the task and the rating is on the right. This view is skills mapping process visual representation of employees' skills. This visualization of rating help to easily understand employee's skill level and makes comparisons easier.

By clicking the subtask emblem next to the task name, employers create subtask below of main task where employer can rate employee skills to give their own evaluation on the skills. At this point discussion can happen between employee and employer in the form of development discussion. Development discussion has been found useful for obtaining more accurate estimations by incorporating the perspectives of both employees and employers, as highlighted in Chapter 3.1. This approach helps to decrease misunderstandings. After skill review the main tasks, rating can be adjusted accordingly.

Other features that ClickUp allows are average for columns as seen on Figure 2, filters for and sorting by skills rating for better user experience for employer. Then next, by clicking employees name on the skills matrix personal view of task opens.

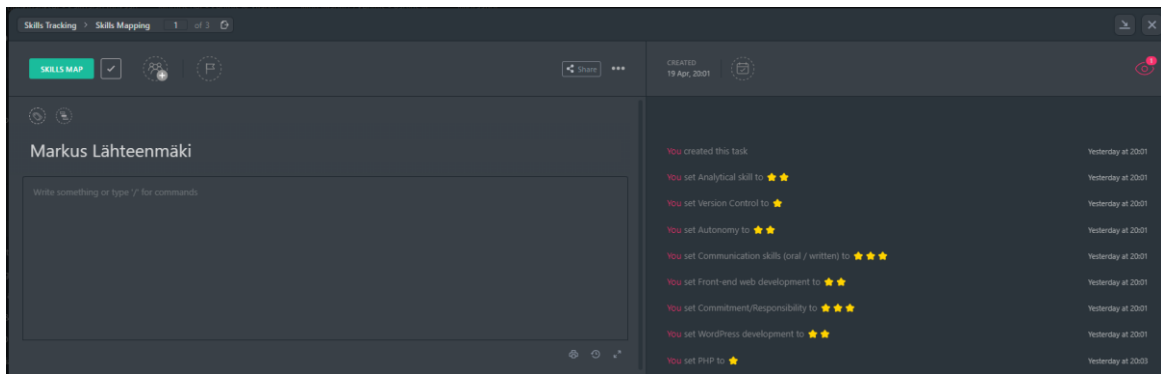


Figure 3: Personal view

On the right side you can track the change log of the employees' skills where you can keep track of the changes. This helps both employers and employees to track the progress of skill development. It not only allows employers to analyze the duration required for skill enhancement but also offers valuable insights and guidance for further improvement. This process promotes effective skill monitoring. On the left side you can add any description or notes for the employee for any additional context. Figure 4 shows more additional features that are on the left side of the personal view.

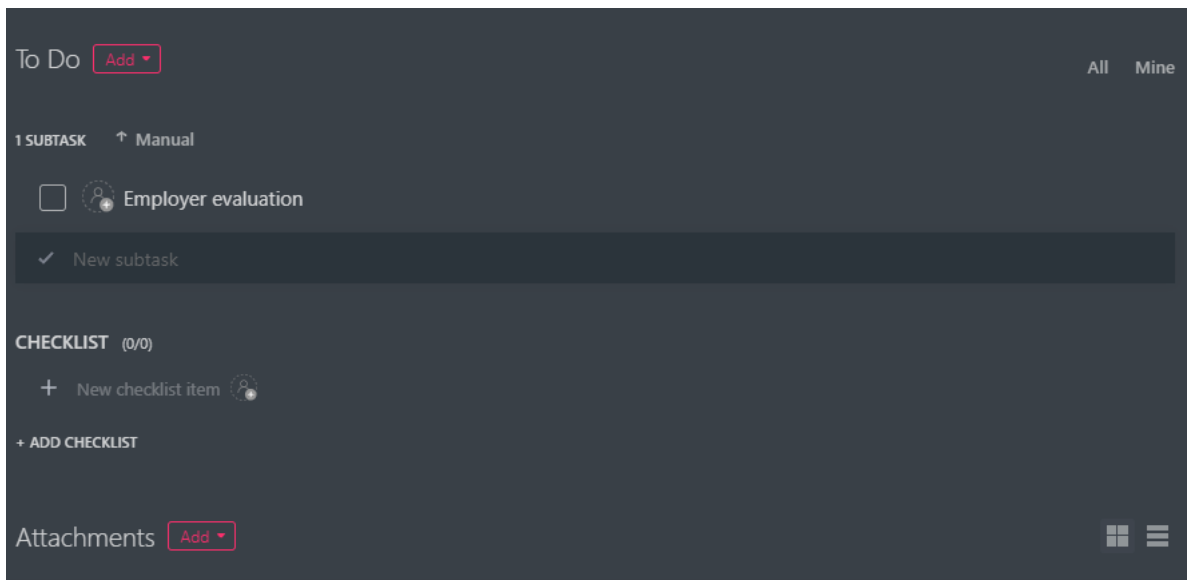


Figure 4: Additional content from personal view

With this view from Figure 4 you can assign to do lists, add subtasks, add checklists and attachments. These features serve to help task management, allow tracking of actions, and support related information like certifications. The soft skills and hard skills tabs in this skills mapping tool have the same function as skills mapping tab, but the soft skills tab lists all the

non-technical skills, while the hard skills tab lists all the technical skills. This categorization makes it easier to track specific type of skills.

Additionally, point weight and evaluation metrics were discussed but they were not found relevant at this point for the company, and this is why they were left out of the skills mapping process. In the future if the company wants to track development and use evaluation metrics skills, they should make a different development view. Additionally, if in the future there are roles that have different point weights, they can be found in sub chapter 5.2.

## 6 Results

In this chapter we go through all the results from this thesis from research and interviews. As previously mentioned, the skills mapping process encompasses various factors that must be considered, including the creation of a skills matrix, rating methodologies, estimation techniques, and strategies for skill development. The findings provide valuable insights into the importance of these factors and how they impact the effectiveness of skills mapping.

WordPress developer's skills were able to be identified and gathered from literature, job listings and interviews. In the WordPress industry, soft skills such as effective communication, customer orientation, initiative, teamwork, analytical thinking, organizational abilities, and interpersonal skills have been consistently emphasized in the literature, job listings, and experts' opinions.

Based on job listings and interviews, the identification of hard skills varied depending on the specific role or employee. However, there was constant emphasis on the importance of WordPress development, front-end development, and PHP skills in both sources. Experts also mentioned that they don't look specific skills but rather knowledge and experience to show. While not all skills soft and hard skills mentioned on this thesis may be beneficial to every company, it is important to acknowledge the range of possibilities in case a company's strategies or perspectives change.

Estimating competences has been found informative in finding out the current state of skills and in determining the necessary skills. Competence estimates with a survey-based tool and the decision to carry out the measurement subjectively to obtain comprehensive and direct information about the level of competence has been found successful and was implemented in skills mapping tool. Experts found it difficult to estimate competencies, with hard skills often assessed indirectly through previous projects and experience, while soft skills required methods like interviews and observations. Subjectively estimating was found helpful but there should be development discussions with employee and employer to get more accurate results.

Literature about developing soft and hard skills were studied. On the soft skills side it was clear that learning real-life problem-solving scenarios was the common factor developing



soft skills. On the hard skills side there were more suggestions to develop hard skills and it really depends on what kind of learner the employee is. It was found that courses, self-study, professional mentoring, and on-the-job learning were suggested ways to develop hard skills. Experts pointed out that it is important to create a supportive environment for development.

Validation from experts was needed as there wasn't any research on effectiveness of skills mapping process in the WordPress industry. The value and interest in the skills mapping process were visible through the interviews conducted with experts. Although formal skills mapping was not widely used, it was seen as valuable for employee development, resource allocation, project management, and decision-making, dependent on factors such as time, resources, tools, methods, open communication, and prioritization. Finally, the skills mapping tool was successfully implemented to the company's project management environment based on research and interviews.

## 7 Discussion

After researching skills mapping and getting interviews from industry experts, the results show that there is interest in skills mapping process within WordPress industry. Even though there seems to be interest there are few concerns around using it. As this thesis has shown it is not that simple to implement skills mapping the right way as there are so many things that companies should decide and things that affect how to build skills mapping tool. This includes what is the company's strategy, what skills to choose, how to rate skills, how to estimate skills and the size of company can affect the use of skills mapping.

Companies should take time to consider these things and how to implement skills mapping tool on their weekly or monthly basis. Without such a tool, HR or project managers may face difficulties in effectively managing their workforce, relying solely on subjective judgment. This subjective assessments can become problematic when there is a change in management personnel, potentially leaving the company vulnerable. Skills mapping can give companies valuable information about the state of employees' skills and way to know what skills company has if skills mapping is to be used continuously. Also, it can be used for job hiring to see what kind of employee is needed and how applicant skills would be rated in the matrix.

Another challenge that arose was the possibility that some employees may not want to develop their skills. Experts identified two types of individuals: Those that want to improve and develop their knowledge and those that just focus on their job responsibilities. While this shouldn't be an issue as long as the employee performs well, they develop by doing and company gives employees time and tools to develop their skill. With skills mapping tool it's easier to track development of their skills and in skill discussions these things can be brought up to support employee.

Results of this thesis aligned well with previous research where skills mapping showed promising results as did this thesis. Results answered all the research questions even though there are some uncertainties with each question. Skills were identified and most valued skills were found. As there are so many skills it is hard to know what the most important ones are as it really depends on the company and work they do. But with soft skills you can't go wrong with communication, teamwork, customer orientation and initiative as they seem to be valuable to every company.

Even though a way to estimate employees was found and it was successful there is always uncertainties with estimating subjectively. But there is no reliable way to estimate objectively as there are different things that can affect the results as mentioned before. Success of rating subjectively really depends on how well employee and employer can express the reason behind the rating in skill review. Both should be open to discussions and be able to find ways to develop to next level and find comparisons to help explain reasonings.

In this thesis ways to develop skills were found and with hard skills there seems to be a lot of ways to develop taking into consideration different kinds of learners. Difficulties come with soft skills as there are not many ways to develop soft skills and personality plays a big part in soft skills. With this in mind depending on the context companies should consider two things, is this role right for this type of person and can we train specific soft skills by doing. With these things in mind, they can find right people for right roles.

It seems that when all these uncertainties are solved then skills mapping process is a very valuable process that should be considered. The company needs to find motivation and find the way to implement it. With many companies it seems that even though they value this process, it seems they think that they don't need it.

## 7.1 Limitations

This thesis has several limitations that should be acknowledged. Firstly, the findings of this study may not be usable in industries other than software. Additionally, the hard skills selection was explicitly focused on WordPress, and therefore may not apply to other software platforms. Secondly, since skills mapping consists of various subtopics that provide insights into different aspects, the supporting literature for the work was limited. The literature does not provide definitive answers on the best approaches, but it offers guidance to choose different methods and directions.

Also, there were limitations on data gathering in skills and validation. When gathering the skills, we used 35 jobs listing in Finland to gather different skills to see if they matched on the literature or if there were any additional skills that were not mentioned in the literature. As 35 is enough for making conclusion, it does not provide the strongest validation as companies' needs differ from each other. As to the interviews, the number of interviewees

needs to be addressed. We were able to get only five people for interviews. Five people are reliable enough to get a reasonable conclusion from interviews, but it doesn't give the strongest conclusions of opinions. With more people we could be more certain about the conclusion.

## 7.2 Future research

As this thesis forms a foundation for skills mapping in WordPress environments, further research is needed to examine the impact of skills mapping on the software industry and identify ways to improve it. This includes exploring additional literature and viewpoints to enhance the credibility of specific targets in skills mapping such as researching more about suitable skills, improving competency evaluations, and providing guidance on skill development from one level to the next. In addition, investigating the use of skill profiles could simplify the process of selecting skills for specific job positions and ways to implement skills mapping process to companies' workspace. Outside of skills mapping future research should think of implementing skill trees to achieve skill level by going different paths as not all job positions need to go same path to achieve certain level. On the opposite side of the positioning, it should be thought whether the job can be adapted to applicant skills, if the applicant seems like a good person but lacks some skills.

## 8 Conclusion

This thesis contributes to the software industry side of skill mapping with the focus on WordPress industry. The objective of this thesis was to study skills mapping in software industry as a management tool and create a working skills mapping tool for the company based on the research. Reason behind this was to track employees' skills, estimate employees' competencies, identify employees' strengths and weaknesses, and develop existing employees. This can also help companies easily allocate right employee to right task.

Technical skills used in WordPress industry and non-technical used typically in software industry were identified to help acknowledge skills for companies' strategy. Competency estimations techniques were researched and subjectively estimating was found useful with help of development discussions. Skills development were also researched from literature and interviews and real-life problem-solving situations are effective for developing soft skills, while different approaches like courses, self-study, mentoring, and on-the-job learning are suggested for improving hard skills. Interviews gave validations and opinions about the skills mapping process. Interview results were in line with literature about skills mapping process and various factors that affect skills mapping process. These findings highlight the significance of skills mapping in the WordPress industry, offering guidance for effective employee development, resource allocation, project management, and decision-making, while also acknowledging the need to address challenges and uncertainties in its implementation.

Results show that WordPress industry values skills mapping process and in the future skills mapping can be integrated into the software industry with this knowledge from the thesis for easier tracking of the employees and better understanding of the knowledge and skills of the employees. Future research is needed to examine the impact of skills mapping on the software industry and identify ways to improve it, including exploring additional literature and viewpoints. It also should consider how to implement it effectively to companies' workspace.

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## Appendix 1. Interview questions

1. What soft skills do you consider to be relevant in the WordPress industry?
  - a. What do you consider the most important of those answers?
2. What technical or hard skills do you consider to be relevant in the WordPress industry?
  - a. What do you consider the most important of those answers?
3. How do you adapt to changes in the workplace or new technologies?
4. How should competencies be estimated?
5. Have you used formal skills mapping in your company?
  - a. If not: How competencies were tracked, and do you have any information on what skill level employees have?
  - b. If yes: What tool was used, what are the benefits and challenges of skills mapping and what is the effect of the skills mapping?
6. Do you find skills mapping relevant?
  - a. Where are the values that it produces?
  - b. Is there some kind of threshold to use skills mapping?