Knowledge Workers' Self-Directed Learning Framework for 'Future of Work' Era

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Laurea University of Applied Sciences **Abstract**
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We live in a time of relentless change, and the new context of 'Future of Work' affects every working individual. It is estimated that the number of highly qualified employees will surpass the demand, resulting in increased concern for knowledge worker's own employability and competitiveness in the job market. Simultaneously digital transformation will transform almost all currently established job roles, and new 21st century skills are required. For this reason, iterative continuous learning and updating of skillset are imperative.

This Master's thesis aims to develop a conceptual self-directed learning framework that a mid-career knowledge worker can leverage on in his/her proactive management of career and in future-proofing oneself. The beneficiary of the thesis is a knowledge worker, not a company. The research-based development work used the Double Diamond framework as a tool to construct the overall work.

The theoretical framework is constructed around concepts of knowledge worker, competency, and skills requirements in the context of Future of Work, and adult learning theories of andragogy and self-directed learning. These entities are viewed to provide knowledge and tools to future-proof oneself. Qualitative in-depth interviews with a purposively selected sample were conducted to gain insights for development and co-creation of the framework.

The results of the development work confirm that the proposed concepts provide a navigation tool for a knowledge worker that can facilitate and improve his/her learning. The outcome of this development work is a conceptual framework that enables a knowledge worker more informed learning decisions and selection of learning strategies that ultimately create action towards more future-proof and continuously employable self.

Keywords: Self-directed learning, Knowledge worker, Competence, Skills, Future of Work

Contents

1 Introduction

We live in a time of relentless change. The founder and chairman of World Economic Forum (hereafter WEF) Klaus Schwab view that 'the changes are historic in terms of their size, speed and scope' (Schwab 2017). Even more radical view is hoisted by Sardar (2010) who posits all that was normal has now evaporated and we live in in-between postnormal times where old orthodoxies are dying, new ones are yet to be emerged and nothing makes sense. According to him this transition period is characterized by complexity, chaos, contradictions, and rapid change that leads to uncertainty. International Labour Organization (hereafter ILO) concludes that the majority of world's workforce is affected by mega drivers of change such as globalization, technology, aging demography, and climate change. (ILO 2017A)

From these prelude viewpoints it is natural to passage to question about the new norms of changed work life and its impact on workers. For most professional mid-career workers, the technological change and digital transformation has been and will continue to be the most significant mega driver of change in their world of work. The speed of transformation, acceleration of innovation and the scale of change has been unprecedented in the last twenty years, matching much the views of Schwab and Sardar. The expectations put on all of us to manage future change, new world of work and career is not going to get easier. Many view that we are on the verge of moving to the fifth Industrial Revolution, branded as the era of humans and machines dancing together, metaphorically. (van Eerden 2020)

Digital transformation has already permanently changed the work landscape. Interestingly, Jeremy Rifkin prophesied already in 1995 about the end of work. ''We are in the early stages of a long-term shift from mass labor to highly skilled ''elite labor'', accompanied by increasing automation in the production of goods and the delivery of services'' (Rifkin 1995). About twenty years later Rifkin (2014) concluded that his forecast was, as a matter of fact, somewhat too conservative. Rifkin viewed that digital revolution and nearly zero marginal cost of digital production will significantly reduce employment and even low-paid workers will be more expensive than the additional cost of using an intelligent machine. Renowned work of Frey and Osbourne (2017) assessed 702 occupations distinguishing them into high, medium, and low risk occupations, depending on their probability of computerization. The results estimated that 47% of total US employment will be in the high-risk category and 19% in the medium risk category over next decade or two. In 2014 the Research Institute of the Finnish Economy estimated one third of Finnish employment would be highly susceptible to computerization in next two decades (ETLA 2014). This forecast had remained valid into 2020 when OECD's data predicted seven percent of Finnish jobs will have a high risk of automation

and another 25% will have a significant risk of change in the way jobs are carried out (OECD 2020A).

What does this new future of work mean for an individual mid-career knowledge worker? Will there be a jobless future or golden age of job creation? The accelerated technological innovations have given rise to very sophisticated machines capable of replacing people not only in jobs requiring high dexterity but also high cognitive skills, jobs of the knowledge worker. According to World Economic Forum (hereafter WEF) the time spent on current work tasks by humans and machines will be equal by 2025. On the more positive note WEF suggests that more jobs will be created by 2025 due to new division of labour between humans and machines, than will be lost (WEF 2020). CEDEFOP's survey (2018) predicts there will be significant growth in employment for high-skill occupations such as managers, professionals and associate professionals in Europe by 2030. There are currently very few research available of the absolute terms of job loss or gain due to technology. Nevertheless, conclusions in CEDEFOP's survey (2018) indicate a general trend in Europe: occupational patterns within sectors will more importantly be driven by technological changes, and employment structure of the economy is projected to favor skilled non-manual occupations against medium- and low-skilled manual work. Concurrently, the number of highly qualified employees will surpass the demand, resulting in a situation where significant part of the skilled workforce may not have the opportunity to use the skills accumulated. It is unclear to know which jobs will disappear specifically (ILO 2017B).

On an individual worker level, the changes in labor market are visible and many have experienced them first-hand: diversification of employment forms from permanent employment to non-standard employment such as fixed term or gig economy, job polarization to automated routine jobs and non-routine skilled jobs, resulting often in income inequality. ILO's (2017A) study results revealed that over 90% of developed economies respondents felt job security in a job was important or very important, compared to high income (approximately 75%). Further, 55% of developed countries respondents worried about the possibility of losing their job. In the Nordic context the Norwegian employers' representatives 'warned about the risks of creating a digital underclass' (ILO 2017B). WEF in its report 'Towards a reskilling revolution' (WEF 2018) suggests that digital transformation will transform almost all currently established job roles, and for an employee to adapt to the needs of the new era, an iterative continuous learning and updating of employee's skillsets is imperative.

1.1 Purpose of the thesis

According to Laurea Master's studies thesis objectives the purpose of thesis work is to create, produce and develop new competence for the needs of either workplaces or larger

development projects in experiential and creative nature (Laurea 2022). This report sits in the creative end of the axis. Unorthodoxly, this work does not have a partner organization for the development task. Instead, the development work is tailored for the larger audience of mid-career knowledge worker individuals who are wanting to remain relevant, competitive, employable in the changed labour market and in the new future of work.

Data from Organisation for Economic Co-operation and Development (hereafter OECD) survey suggests that after age 35, people are less likely to engage in adult learning and be motivated to upskill or reskill (OECD 2019). Interestingly, research by Eby, Butts and Lockwood (2003) demonstrate these same characteristics are predictors of career success. According to Eby et al. individuals who are proactive and demonstrate initiative, are aware of one's strengths and weaknesses, are adaptable to new experiences and are engaging in continuous learning and building and diversifying one's skill set are more likely to succeed in constantly changing work environment.

The new work context requires innovative thinking and ways of examining and developing one's career. No longer can an individual rely on organizations for career development as it was more common in the past. Today's workers are the drivers of their own future, and they can themselves with today's choices, decisions and actions influence how their professional future will be. Individual has the responsibility.

This work aims to provide the reader with a self-directed learning framework to become more future-proof self. Mirroring above contextual facts and thoughts, it can be viewed that this thesis work is very topical and should provide interesting reading for many. My wish is that this work will benefit others in navigating the changed work landscape and make good for many. This is the foundational context of this work, a new world of continuous change, need to learn and upskill.

1.2 Thesis research problem and development goal

The research problem has been defined as: how do mid-career knowledge workers manage and develop themselves to be future-ready and remain employable in on-going work transition?

Development goal is to provide a framework that mid-career knowledge workers can leverage on in their proactive management of career in the new world of work.

1.3 Thesis framework and delimitation

Thesis frameworks consist of two key theory entities that in my view can provide tools to future-proof oneself:

1. What should be learned? This entity is discussed through topics such as definition of knowledge worker, model of competency, and skills.
2. How should be learned? This entity is discussed through topics such as andragogy, self-directed learning, learning cycle and learning styles.

This thesis is targeted to an experienced knowledge worker who has been in work life for a minimum of 15-20 years and is nowadays feeling the effects of digital transformation whirlpool, especially in career life. The individual is expected to still have a minimum of 10-15 years of work life ahead of them, hence they do need to remain competitive.

There are delimitations imposed on the report, which are useful to be acknowledged prior proceeding to knowledge basis and development work itself. Firstly, the thesis is not discussing the future of work implications to companies or industries but is focusing on an individual and what is within his/her area of influence. Secondly, the individual in focus is a knowledge worker professional, not every working individual. Definitions of knowledge workers will be discussed in later chapter 2. Third limitation is that adult learning knowledge basis is not discussing verifying of learning, even if it is considered an important part of the learning process (Knowles, Holton III & Swanson 2005). Instead, focus has been given to aspects that support instigation of future-proofing actions as the first most important and critical step. Fourth limitation of the work is its geographical scope. While knowledge basis findings, especially in terms of skills, were from research sources around the world, all respondents are Finland based. In my view this does not impose an issue on the results: purposive sampling, used in this development work, allows selection of participants by the researcher (Dawson 2019).

1.4 Structure of the thesis

The report is structured into five chapters. In chapter 2, relevant literature to this study from two domains will be reviewed: model of competency for knowledge worker and adult learning theory. The chapter ends with synthesis of the literature review. Chapter 3 describes the development setting, its purpose and objectives and reasoning for selected development method in more detail. Data collection, data management and data analysis processes will also be explained. Chapter 4 discusses the findings of the development work and qualitative interviews, which are conducted among suitable sample of knowledge workers. Chapter 5 provides conclusions and reflection on the thesis literature and development process findings. A co-created conceptual framework for future proofing oneself is presented. Also, topics of ethical issues and areas for further development will be discussed.

2 Knowledge basis

This chapter contains the knowledge basis on which the development work's framework is based on. Chapter 2.1. discusses the development work's target customer, in this case the knowledge worker. Chapter 2.2. discusses the competences and skills needed in future of work within the context of knowledge worker. Chapter 2.3. describes adult learning and its features, which support the acquisition of future skills. Chapter 2.4. concludes the knowledge basis with a synthesis of the discussed areas.

2.1 Knowledge worker

Over sixty years ago, in 1959, Peter Drucker coined the term 'knowledge worker' in his book Landmarks of Tomorrow. Majority of work at the time was done by manual workers in bureaucratic organizations where supervisors told their subordinates how to perform tasks that typically required minimal education or expertise. The term knowledge worker was used to describe a new class of workers who would need to have formal education and ability to acquire and apply theoretical and analytical knowledge in their jobs. Above all, according to Drucker, these new workers would have to manage themselves, have autonomy, and require a habit of continuous learning and continuous teaching. (Drucker 1999A, Drucker 1999B)

Several synonyms for knowledge worker and several definitions of knowledge worker have surfaced in management field. Drucker's original definition 'someone who knows more about his or her job than anyone else in the organization' is the first one of them. It has been criticized that Drucker's definition is too generic, as it would mean that even a taxi driver would be considered a knowledge worker as he would have a better understanding of his job than others. Davenport (2005) defines knowledge workers as individual who possess high degrees of expertise, education, or experience, and the primary purpose of their job involves the creation, distribution, or application of knowledge. He continues to assert that knowledge workers' activity is critical to innovation and growth. Common attributes of knowledge workers are preference of autonomy and dislike of being told what to do. In addition, attributes of innovation, creativity, flexibility, adaptability, intrinsic motivation, collaboration, desire for challenging work, and social networking has been identified. (Acsente 2010)

Knowledge workers have become the largest single group in the work force for every developed country. It would be too generic to bundle all of them into one knowledge worker category. Research conducted by Davenport, Thomas and Cantrell (2002) involving over 100 academics, professionals and managers from 41 companies concluded there are substantial differences among the types of people who are called knowledge workers, and they could be further segmented depending on the characteristics of their complexity of work and level or work interdependence. Davenport (2005) devised a knowledge work model, for the purpose to

better understand and classify knowledge workers' productivity and performance characteristics, and to use the model as a tool for designing the most effective work environment for each group. The four groups of knowledge worker from the most routine to the most sophisticated are: transaction workers, integrated workers, collaborative workers, and expert workers.

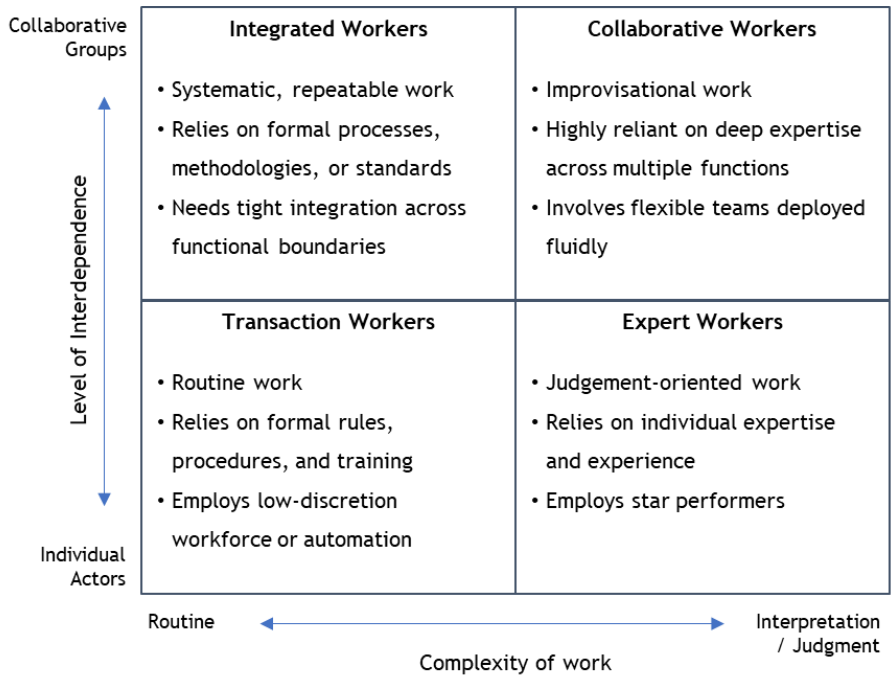

Figure 1: A segmentation Scheme for Knowledge Work (modified from Davenport 2005)

Davenport's model provides a useful framework and clear definitions to constrict the meaning of knowledge worker for this dissertation. Generic term knowledge worker would be too broad in its meaning. In the context of this work, when discussing about knowledge worker, worker, individual, professional, it will be referring to Collaborative and Expert workers as defined in figure 1. When in subsequent sections the dissertation discusses aspects of work those will be discussed through the lenses of Davenport's segmentation for Collaborative and Expert workers.

2.2 Model of professional competence

The target audience of the proposed framework, i.e., Collaborative and Expert knowledge workers, were defined in previous section. Next, discussion is turned into - given the change in future work and labor markets - what should a mid-career knowledge worker individual possess and develop to remain employable in the new future of work?

There is wide-ranging literature relevant to this topic and it is often based on surveys or forecasts trying to identify the changing demand for skills and what those skill needs are.

Terminology such as competences, skills, knowledge, attitudes, abilities, surface in most sources. (ILO 2017A, ILO 2017B, OECD 2019, WEF 2018, WEF 2020) A holistic discussion of what a knowledge worker should possess and develop for future needs would be too generic and extensive for the purpose of this work. It was clear that a theoretical framework should be created to guide the writer and readers. A starting point to this framework development is provided with the following analysis: a knowledge worker offers human capital for the marketplace, often for an employer in a form of an organization. The employer has predetermined requirements pertinent to the job and the knowledge worker should match the requirements with his service offering, professional competence. There is a need to be fluid and agile in new work world. The traditional work operating system that defines work as jobs and workers as job-holding employees do not fit in the modern future of work context. (Jesuthasan & Boudreau 2021)

So, what is competence? There is no universal or generally recognized definition of 'competence'. CEDEFOP (2006) propose that professional competence consists of knowledge, skills, attitudes and aptitudes. Streumer and Bjorkquist (1998) conclude that competence most often refers to an individual's ability to execute tasks that have been assigned to him. Very similarly, Cheong and Tsui (2010) describe the concept of individual competence as a set of skills that an individual must hold to be capable of satisfactorily performing a stated job. More so, development of competences enables employees to become more flexible and quicker to respond to business needs (Garavan & McGuire 2001).

For the purpose of this work a particular model of competency is selected and discussed in detail. European Commission (hereafter EC) (2012) financed project 'Transferability of Skills across Economic Sectors: Role and Importance for Employment at European Level' realized in 20 EU countries and Switzerland across enterprises, educators and public sector defined competency as model of a four-component structure consisting of innate or acquired individual's personal characteristics, attitudes, knowledge, and skills leading to high quality performance. Each of the component affect the other and they are strengthened or weakened in tandem:

- Personal characteristics are considered typical or noticeable qualities and personality traits of an individual like sincerity, helpfulness and being dependable.
- Attitudes are a set of emotions, beliefs and behaviors and affect how an individual acts in various situations.
- Knowledge is the set of facts, principles and theories that are related to a field of work or study, which can be acquired by learning or experience. Knowledge claims can be both explicit meaning formal, systematic, or tacit meaning highly personal, hard to formalize.

- Skills, the fourth pillar of the competency model, is the ability to act in accordance with well-managed behavior that leads to the achievement of a certain purpose or aim. Skills can be both cognitive, involving the use of logical, intuitive and creative thinking, and practical, involving manual dexterity and the use of methods, materials, tools and instruments. (EC 2012)

This above-described model has similarities to professional competence model of Cheetham and Chivers (1996). Their model consists of four key components of professional competence: functional competence, personal or behavioral competence, knowledge/cognitive competence, values/ethical competence. Contexts of EC and Cheetham-Chivers' models are very corresponding but different terminology words are used. In Cheetham-Chivers' model functional competence is defined as the ability to perform work-based tasks effectively to achieve specific outcomes, which is nearly identical to EU's skills pillar. Cheetham and Chivers' personal or behavioral competence is defined as the ability to adopt fitting, observable behaviors in professional situations. EC model's attitudes and personal characteristics pillars touch on the same behavioral theme but in broader level, not drilling into work-related situations, but as in life in general. Knowledge/cognitive competence is defined in Cheetham-Chivers model as possession of appropriate work-related knowledge and the ability to apply this knowledge effectively in a variety of ways. Very comparable to EC model's knowledge and skills pillars. Fourth component of Cheetham-Chivers' professional competence model, values/ethical competence, is defined as possession of appropriate personal and professional values and the fitting application of these values in professional setting, making sound judgements. EC model's Personal characteristics and attitudes again describe same topics but with slightly different terminology.

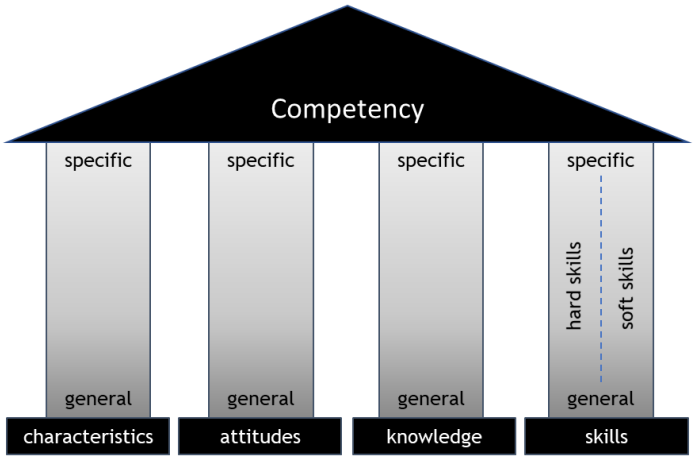

Figure 2: Model of competency (EC 2012)

Competence - the service offering of a knowledge worker – as described in the model is a very large multifaceted entity. To discuss all pillars is too large entity and would not serve the

purpose of the development objective. Again, further granulation to smaller specific topic is needed. Both personal interest of the author and literature on future of work facilitated and affected the selection of focus area. These topics will be shared next.

The profound transformation of world of work, industrial restructuring and the technological advancements are affecting the employment and skills landscape. This is strongly conveyed across governmental, non-for-profit institutions and organizations programs, reports, and research. WEF has studied future of work for over a decade with objective to expand the knowledge base of individuals and organizations about the future of jobs and skills (WEF 2020). European Union (hereafter EU) as recently as 2020 announced its new program 'The European Skills Agenda' as a tool for sustainable competitiveness, social fairness, and resilience (EU 2020). It places skills at the heart of EU policy agenda, with objective to support individuals with reskilling and upskilling.

The transformation has not been unnoticed by companies and individuals. The Future of Job report in 2020 (WEF) indicate that the share of emerging professions of the total employee base will grow to 13.5% by 2025. New emerging professions require new skills. Same report states that 40% of current workers' core skills are expected to change, resulting in accelerated need for reskilling, upskilling, and learning by 2025, and on average 94% of the business leader respondents expect employees to acquire new skills on the job. Employees are feeling higher demands as well: 46% of European adult employees believe their abilities will become out of date in the next five years, reducing the shelf-life of their skill sets (CEDEFOP 2014). Quite interestingly, recent study estimates that the half-life of a learned skill is just at five years. In simple terms, 'half-life of knowledge' expression describing the time it takes for half the knowledge in a particular domain to be superseded. (Oxford Martin School 2020) As Maurer and Weiss (2010) conclude the ability to continuously gain new skills, to improve existing skills and develop professionally is essential for career success.

The above examples give a solid reasoning and justification why skills will form one of the theoretical pillars for this work. This pillar will be reviewed in more detail next.

2.2.1 Skills

The subsequent paragraphs concentrate only on skills pillar and are dedicated to the description of different types of skills and their characteristics, and their implications for individual employability in the new work landscape.

Through the literature and research on the topic it has become apparent that the skills identification and conceptualizing can be addressed from numerous positions. Cardy and Selvarajan (2006) offer framework that feels fitting to this work. Logical first step could be to analyze what are the concrete skills related to a particular job or occupation, and then to

look at one's own skill set and identify potential skill gaps and future development needs. The potential weakness of this job-based approach is its static nature, assumptions are based on current jobs, not what future requirements are. Future-based approach instead, focuses on identifying competencies and skills needed in changed environment and situation. This approach, however, requires a clear vision of individual's projected career path, planned and managed change and can be difficult to achieve. Third and more novel approach for identifying competencies and skills is person-based approach. This approach focuses on identifying broad and emergent skills and individual attributes that are needed to work effectively in a given environment or professional position. For example, certain general personality characteristics and/or cognitive abilities are required to successfully perform a job. For an individual to be aware of these traits can offer them a suitable and useful development opportunity to support continuous employability. (Cardy & Selvarajan 2006)

Similar to competence, a consistent definition of skills needed for future world of work does not exist. Neither universal nor systematic taxonomies, frameworks, metrics have been defined. Instead, there are a wide variety of different suggestions, canvasses, and proposals on what those essential future skills could be. Boyatzis and Kolb (1991) define a skill as ''a combination of ability, knowledge and experience that enables a person to do something well'' to name one. Already in 2012 in a report by EC it was mentioned that numerous entities have put effort into arriving at agreed and universal definitions and taxonomies for descriptions of competencies and skills. Still, ten years later this work is ever evolving and developing, and most likely will remain ongoing for years.

This work continues next with a model of skills categorization. The model is based on definition and classification of various skills presented in Transferability of Skills across Economic report by European Commission (2012) and builds upon it. The model distinguishes three categories of skills needed in labour market: (1) soft skills, (2) generic hard skills and (3) specific hard skills. Each of these categories can be further valued by how transferable the skill is, i.e., the more general the skill is, the more transferable it is. The more transferable skill set an individual holds, the more it supports employability, suggests the study.

According to EC (2012) soft skills are non-job specific skills that are closely connected with individual attitudes, hence intangible and difficult to measure and develop. Soft skills enable an individual to operate effectively and successfully in the workplace and are nearly perfectly transferable to any future position. Study splits soft skills to five clusters which are:

- personal effectiveness skills, which are related to individual's maturity in relation to himself, others and work and his performance under pressure and difficulties: self-

discipline and stress resistance, self-possession, flexibility, creativity, lifelong learning

- relationship and service skills, which are related to an individual attuning oneself to concerns and needs of the others and working to meet those needs: interpersonal understanding, cooperation with others, customer orientation, communication
- impact and influence skills, which are related to an individuals need for power and concern to have effect on others: impacting/influencing, organization power awareness, leadership, developing others
- achievement skills, which are related to individual's tendency towards action and task accomplishment: achievement orientation and efficiency, concern for order, quality and accuracy, initiative and proactive approach, problem solving, planning and organization, information discovering and managing, self-sufficiency
- cognitive skills, which implies how an individual thinks, reasons and formulate explanations, concepts: analytical thinking, conceptual thinking. (EC 2012)

Above mentioned skills are comparable to Cardy and Selvarajan (2006) person-based approach. Person-based approach is about identifying ones own individual attributes or personality characteristics that allow him/her to work successfully in a position, in other words identifying soft skills.

The EC study (2012) defines hard skills in general as skills that are usually easily observed and measured. The skills can be trained and are closely associated with knowledge. The study further categorizes hard skills into generic hard skills and specific hard skills. Generic hard skills as abilities that are technical and job-specific, which are applicable in most occupations, sectors, and companies. Hence, generic hard skills are considered highly transferable. Following skills were identified as generic hard skills:

- legislative and regulatory awareness, which is the ability to understand basic terms and acts and to utilize this knowledge to solve problems
- economic awareness, which allows an individual to understand basic economic terms and concepts and to utilize this knowledge in everyday situations
- basic skills in science and technology, which is the ability to understand, use and reflect on written texts, and to draw evidence-based conclusions
- environmental awareness, which enables an individual to better understand human's impact on the planet
- ICT skills and E-skills, which allows an individual to have knowledge of and critically use Information Society Technology (IST) like computers, electronic media and internet to collaborate at work and in private life
- foreign languages, which support better sharing and expression on different cultural contexts

Specific hard skills are technical and job-specific abilities that describe special attributes for carrying out an occupation in practice. They are applicable in a small number of companies, occupations, and sectors, and are considered as specific skills that increase the value of a person only within the company. EC study (2012) identified 264 different specific hard skills through their analysis. It is not feasible to list them all here. Instead, a few examples can be given to give the reader a better understanding: project management, preparing and realizing of marketing events, production of texts, acquisition of new clients, customer care and relations, applying knowledge of market, its subjects and behavior, analytical preparation of programming. From an individual's point of view, it is suggested that the more specific the skills needed are, the less likely an individual is to invest in attaining them because of their narrow application in the labour market. Should an individual leave a job position as an owner of large skill set of specific hard skills, they could become useless in a new position.

It is not sufficient to rely on one conceptualization of skills in this work. In this section other prominent literature definitions or frameworks on skills in relation to employability in the new future of work are explored/described/summarized. When researching for additional frameworks and definitions focus was put on more recent works, as EC's framework is ten years old. These other definitions all afford additional material for the development task of this work and provides a wide and reliable basis for discussion on skills topic.

ILO Global Framework on Core skills for life and work in the 21st Century (2021) has been created based on extensive literature review of core skills frameworks around the world and joint consultations with academia, other UN agencies and experts in skills development. The framework is revised taking in consideration the drivers of transformative changes on the world of work and the requirements of future of work. ILO's model groups essential 21st century skills into four categories:

1. Social and emotional skills, including communication, collaboration and teamwork, conflict resolution and negotiation, and emotional intelligence
2. Cognitive and metacognitive skills, including foundational literacies, analytical and critical thinking, creative and innovative thinking, strategic thinking, problem-solving and decision-making, self-reflection and learning to learn, collect, organize and analyze information, planning and organizing, and career management
3. Basic digital skills, including use basic hardware, use basic software, operate safely in an online environment
4. Basic skills for green jobs, including environmental awareness, waste reduction and waste management, and energy and water efficiency

Basic digital skills and basic skills for green jobs are not overly relevant for this work. Basic digital skills are a default set of skills all knowledge workers already possess. Skills for green

jobs are defined in ILO's framework more for the less developed countries and its individuals, hence less relevant for knowledge workers. On the contrary, social/emotional skills and cognitive/metacognitive skills are core attributes that define collaborative and expert knowledge workers. More so, they are all highly transferable across occupations and professions. Social and emotional skills are vital to effective social interaction at work and assist in overall learning process. Cognitive skills enable individual to process new information, understand, remember, and apply it to different contexts. Metacognitive skills allow an individual to develop an awareness and understanding of one's own learning or thinking processes. (ILO 2021)

The report 'Towards a Universal Framework for Essential Skills' (Ravenscroft and Baker 2020) defines skills into three broad types: technical skills, essential skills, and basic skills. Technical skills being specific to a particular role or sector, furthering from a particular body of knowledge, and often not easily transferrable. A clearly corresponding definition to specific hard skills. Essential skills, identical to previously described generic hard skills, were defined in the report as ''highly transferable skills that everyone needs to do almost any job, which support the application of specialist knowledge and technical skills'' (2020, 2). Basic skills are defined for example as literacy, numeracy, and digital skills.

Jesuthasan and Bourdreau (2021) posits that in the new work operating systems where jobs are deconstructed into tasks and projects may be assigned not only to employees but also to machines and contingent workers in talent marketplaces, workers will increasingly be identified not as holding a specific job but as possessing a set of skills and talents that can be applied wherever the organization may need them, allowing talent to flow between work assignments. This means worker will increasingly have to adapt to changing circumstances and hold a variety of skills, a kind of rounded package of skills, to ensure his/her future success. Individual with a range of skills, especially highly transferrable skills, can respond to new conditions in a better way.

2.3 A learning adult

Learning is an essential competence for adults, especially in current rapidly changing and complex world. The ability of continuous learning is required for on-going work success. (Hall & Mirvis 1995). Understanding how adults learn will help an individual to make more informed and effective decisions about his/her own learning and development. (Knowles et al. 2005) The adult learning theories come into play to explain adult learning and its specific characteristics.

There is no one unified adult learning theory, but a vast number of theories, models, set of principles and explanations in the research literature on adult learning. (Minter 2011) Different theories will fit the needs of different users. (El-Amin 2020) It will not be feasible to

cover all the theories in this thesis. Merriam and Baumgartner (2020) suggest there are two foundational theories that are essential in conceptualization and understanding of adult learning: andragogy and self-directed learning. These two theories were selected because of their relevance and applicability in creating the desired framework. There are connections and overlapping themes among the selected learning theories.

2.3.1 Andragogy

Malcolm Knowles, an American educator, and creator of Andragogy theory in 1968, is considered the father of adult learning. Andragogy is likely the best-known theory of adult learning, also outside the field of adult education. Andragogy theory is based on the premise that adults learn very differently than children. It states a set of assumptions about adult learner and understanding these differences can be used to strengthen the learning transaction. Model's key assumptions are:

- Adults need to know why they are learning something and how it benefits them before undertaking learning
- Adults are capable of being responsible for their own decisions and can self-direct learning
- Adults' own experiences assist in understanding learnings, but can also negatively affect outcomes because of biases and presuppositions
- Adults have readiness to learn when new social or life roles are imposed upon them
- Adults are real-life task- and problem-centered, learn by doing, and are keen to apply new learning immediately to situations
- Adults are motivated to learn most by internal factors such as self-esteem, quality of life. External motivators (promotions, higher salaries) are less important. (Knowles et al. 2005)

The characteristics of andragogy suggest that adults concentrate more on the process of learning and less on the assessment of learning outcomes, even though the utilization of learning is dynamic. (El-Amin 2020)

2.3.2 Self-directed learning

The second adult learning theory in the literature review captures aspects relevant to self-directed learning (hereafter SDL). SDL is an adult learning theory originating from the 1970s. Main contribution to the theory came from Allen Tough's research with Canadian adult learners that were documented in his book The Adult's Learning Projects (Tough 1971). Other key contributors to the theory are Knowles, Rogers and Lucy Guglielmino. (Hiemstra 1994, Morris 2019)

The SDL theory imposes that much of adult learning takes place at the learner's initiative, informally and outside the classroom or influence of instructor. SDL theory is based on the fact that individual's learning objectives and means are highly individual depending on his/her life situation. SDL is considered (1) as a process in which (2) individual acts on, (3) with or without the aid of others, (4) in identifying his/her learning requirements, (5) formulating learning objectives, (6) determining human and material resources for learning, (7) choosing and executing appropriate learning strategies, and (8) evaluating learning out comes. (Boyer, Edmondson, Artis & Fleming 2013) The learner exercises full control over all learning decisions and planning.

Central to SDL is the individual perspective, SDL is driven by the attainment of individual's goals not the pro-organizational goals. SDL is also characterized by the following features: (a) it is acquirable, (b) it encompasses an active and long-term approach; an individual reflects and anticipates on future opportunities and challenges and will directly initiate on learning rather than passively respond to environmental change, and (c) is dynamic with constant adaptation to the environment. (Raemdonck, Thijssen & de Greef 2017)

How is self-directed learning process done then? Tough (1971) describes the process of self-directed learning as linear, predefined three-step process:

- First initial steps relate to individual's decisions on whether to learn or not, and what to learn. Learning subjects can naturally range from complex life and career changing topics to simple trivial single skills.
- Second fundamental step is to decide who will be responsible for the detailed learning planning? The individual himself/herself or possibly someone external such as instructor. In this step the concept of the Planner enters the model. The Planner is the person or group or object that does most of the detailed day-to-day planning in a learning project. The Planner decides about what to learn, such as detailed knowledge and skills in each learning episode. The Planner similarly decides strategy, activities, resources of learning, in other words how to learn. Decisions about when to begin learning and the pace of learning are also done by the Planner. (Tough 1971). Five distinct types of planners are: the learner himself, a nonhuman resource such as online course, a human instructor in a one-to-one situation, a group or its leader instructor, and mixed non-dominant type of planner.
- Third and final stage of Tough's (1971) theory offers a practical list of ''preparatory steps'' for learning implementation that each learner should go through in their planning. The steps are viewed to assist in successful learning implementation and completion:
    1. Deciding what detailed knowledge and skills to learn
    2. Deciding specific activities, methods, resources, and equipment for learning

3. Deciding where to learn
4. Setting intermediate target and specific deadlines
5. Deciding when to begin a learning episode
6. Deciding the pace for learning
7. Estimating current level of individual knowledge and skills, and progress in gaining the desired level of knowledge and skills
8. Detecting blockers for learning, or aspects making learning inefficient
9. Obtaining resources and equipment for learning
10. Preparing the space for learning
11. Saving or obtaining the money for the use of learning resources
12. Finding time for the learning
13. Taking steps to increase the motivation for learning (Tough 1971)

These preparatory steps can be considered too linear to suit today's complex systemic world. More recent cyclical and iterative SDL learning process model has been presented by Knowles et al. (2005) where the individual (a) determines the need to learn, (b) develops a plan to meet learning needs, (c) deploys the plan, and (d) evaluates the outcome and the method before reiterating the process.

In constantly and rapidly changing digitalized world self-directed learning is considered a fundamental competence for adults and means of empowerment to change. Theory's humanistic assumption is that learners are independently capable of smart decision-making, are responsible to themselves, possess an urge towards self-actualization, are good-natured, and have unlimited and uniquely formed potential for purposeful growth and personal development. (Morris 2019). In self-directed learning the locus of control is with the learner.

But are all adults capable of SDL? To better understand the readiness to manage your own learning and to take the discussion to a more concrete level, a self-report instrument Self-directed Learning Readiness Scale (hereafter SDLRS) developed by Lucy Guglielmino in 1977 is an excellent starting point. The instrument was developed through three-round Delphi study of 14 self-directed learning experts including Knowles. It is regarded as the most valid and widely used assessment tool in the field of self-directed learning; it has been used by over 500 major organizations, 120,000 adults and researched in nearly 100 doctoral dissertations (Guglielmino & Associates 2022). SDLRS instrument measures individual's attitudes, abilities, and characteristics around eight dimensions, and estimates through them his/her readiness to engage in self-directed learning. The eight dimensions are: love of learning; self-concept as an effective, independent learner; tolerance of risk, ambiguity, and complexity in learning; creativity; view of learning as a lifelong, beneficial process; initiative and independence in learning; self-understanding; and informed acceptance of responsibility for one's own learning (Brockett & Hiemstra 1991).

The instrument suggests there is a relationship of self-directed learning readiness and performance in an occupational setting: individuals with high self-directed learning skill tend to perform better in jobs requiring a high degree of problem-solving ability; a high degree of change, and a high degree of creativity. In addition, high scoring individuals tend to prefer to govern their learning needs, and plan and implement their own learning. (Guglielmino & Associates 2022)

Alternatively, Patterson, Crooks and Lunyk-Child (2002) proposes six antecedent competencies that are required for an individual to become self-directed learner in today's, technologically evolving world: (1) Being capable of assessing his knowledge/learning gaps and exploring different learning styles and approaches to learning, (2) evaluation of self and others as part of everyday practice, (3) using reflection of past experiences into future learning, (4) information management, (5) being capable of critical thinking that is purposeful and goal-directed thinking, and (6) critical appraisal.

According to literature self-directed learning offers numerous benefits and is beneficial to everyone. During the earlier years of adult learning theory discussion its key benefits were considered in less career focused manner, but more as general: feeling of pleasure and increase in self-esteem (Tough 1971), being able to retain information and use it better and for longer periods of time (Knowles 1975). More recent sources view benefits of SDL as to remain relevant and employable in world of work, using SDL as a tool for career development. Brown, Bimrose, Barnes & Hughes (2012) assert SDL and self-directed development support successful career transitions. Morris (2019) posits that to avoid evasion of knowledge and skill obsolescence is of great importance for knowledge workers in complex careers. He views that SDL enables individual to upskill and hence ensure on-demand employability, which will foster long-term career success.

Research done by European Commission suggest that lack of engagement with learning and development increases the likelihood of career decline and vulnerability in the labour market during times of change. (EC 2013) Positively, research has demonstrated that SDL is a skill that can be successfully learned (Dynan, Cate & Rhee 2008). It can be concluded that self-directness and self-directed learning is an essential part of every individual's model for future proofing oneself and securing employability.

2.3.3 The learning process

At this point relevant adult learning theories for the context of the development work have been introduced. Now the theoretical framework focus moves to the learning process. To learn effectively it is important to tailor study approaches and habits to individual's own needs and preferences. Understanding the adult learning process and learning styles will help in this. Both domains will be discussed in this and the following section.

As concluded earlier, most adult learning occurs in natural informal settings, and experiences, knowledge, values, and relationships influence the learning. Building upon 20th century theorists – notably Dewey, Lewin, Piaget, James, and Freire – David Kolb developed in 1984 a model to describe learning process, Kolb's Learning Cycle (Kolb & Kolb 2005). Considered to be one of the key theoretical models in management education Kolb's Learning Cycle model is based on experiential learning theory (hereafter ELT) that emphasize the central role of experience in the learning process. ELT proposes learning is best conceived as a process that does not end at an outcome, nor is always evidenced in performance. Furthermore, learning involves all aspects of person – cognitive/thinking, affective/feeling, perceiving, and behaving – and is a transaction between the person and the environment resulting in creation of knowledge. (Kolb & Kolb 2005) It should be mentioned that key characteristics of Kolb's learning cycle are like the constructivism paradigm, which theorizes that a person's learning is an active process, where knowledge is built in and created in an ongoing way creating your own subjective representation of reality. (Bassot 2012)

Kolb's Learning Cycle model proposes four different phases or modes of learning that follow each other:

1. Concrete Experience (hereafter CE) – Doing something, being actively involved is key to learning. These concrete experiences are the basis for next step.
2. Reflective Observation (hereafter RO) – reflecting, thinking about what has been done and experienced will assimilate in new thoughts that are processed in next step.
3. Abstract Conceptualization (hereafter AC) – comparing past doing and knowledge with new models/theories one has learned that result in new action for step 4
4. Active Experimentation (hereafter AE) – putting learned into practice, doing something new or doing the same thing in a new way, resulting in new learning cycle to start with new experiences (Kolb & Kolb 2005)

These modes are simply divided into two different axes about how a person grasps, takes in information (through concrete experiments or abstract concepts) and how a person transforms, acts on the information he has experienced (through active experiments or reflection).

It is suggested that overall learning effectiveness is improved when individuals are highly skilled in engaging all four modes of the learning cycle (Kolb & Kolb 2005). Additionally, benefit of being aware of learning cycle and following it through is simply the following: explicit knowledge is more easily internalized and converted into tacit knowledge when a more complete learning cycle is followed. In the age of rapid knowledge expansion, the internationalization of external, universal knowledge and effective utilization of it is important. (Tsai & Lee 2006)

Each mode of the learning cycle process presents an individual with a choice. For example, it is not possible simultaneously to program a software (considered CE mode learning) and analyze a coding manual about the software (considered AC mode learning). An individual is imposed with a conflict, and he/she must choose which one to do. Each learner is directed in his/her choices by individual preferences developed through their genetic makeup and life experiences: do I prefer concrete or abstract way of learning; do I prefer actively experimenting or reflecting? These preferences and patterned ways how an individual spiral through the learning cycle modes are called learning styles. (Kolb & Kolb 2013).

2.3.4 The learning styles

Kolb's Learning Style Inventory (hereafter KLSI) is used to assess individual learning styles. KLSI assess and defines each person's learning preferences within the two-dimensional learning space of the Learning Cycle (Concrete Experience/Abstract Conceptualization and Active Experimentation/Reflective Observation). The output of this assessment is a unique kite shaped learner profile defining individual learning style preferences for the four phases of the learning cycle. The 1970's instrument originally consisted of four different learning styles: Accommodating, Assimilating, Converging and Diverging. Thanks to empirical and clinical research data from over 30 years, KLSI has been refined further into nine distinct learning styles that are naturally much more detailed and less potentially misleading than the original four. Also, the name of KLSI has been changed to KLSI 4.0. Typology for the nine learning styles of KLSI 4.0 are:

- 'The Initiating style is distinguished by the ability to initiate action to deal with experiences and situations.
- The Experiencing style is distinguished by the ability to find meaning from deep involvement in experience.
- The Creating style is distinguished by the ability to create meaning by observing and reflecting on experiences.
- The Reflecting style is distinguished by the ability to connect experience and ideas through sustained reflection.
- The Analyzing style is distinguished by the ability to integrate and systematize ideas through reflection.
- The Thinking style is distinguished by the capacity for disciplined involvement in abstract reasoning, mathematics and logic.
- The Deciding style is distinguished by the ability to use theories and models to decide on problem solutions and courses of action.
- The Acting style is distinguished by a strong motivation for goal directed action that integrates people and tasks.

- The Balancing style is distinguished by the ability to flexibly adapt by weighing the pros and cons of acting vs. reflecting and experiencing vs. thinking.' (Kolb & Kolb 2013)

Understanding one's unique learning styles will give an internal competitive advantage in planning and implementing your own learning to the maximum benefit. Through this knowledge several conclusions and decisions can be taken what type of learning is best suited for me, how do I best absorb information, what are my learning weaknesses and strengths, what are my dislikes, what brings me enjoyment, what strategies I should use to improve my learning and learn more effectively. As in any business situation, knowing and understanding opponent's key drivers, weaknesses and strengths will result in better outcome for the undertaker. Situation is just the same on individual's path to efficient and effective self-directed learning. Understanding individual learning style preferences and dislikes will give an individual concrete idea how to improve his/her learning and goal setting.

2.4 Synthesis of theoretical framework for development work

Transformed context of work and future requirements of changed labour market put a strain on all individuals, including knowledge workers. Individuals must understand the need to upskill, reskill and transform their competence to harness the benefits of these changes and to remain employable in the new world of work. The framework provides a model that assist knowledge workers to understand key elements in their journey to future-proof themselves.

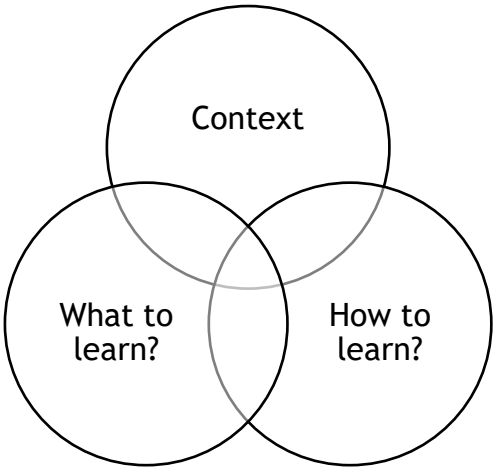

Figure 3: Synthesis of theoretical framework for development work

The three elements can be summarized as follows:

- Context: this includes factors relevant to the development needs of knowledge workers, such as drivers of change, new work environment, deconstructed jobs, newly or to-be created occupations requiring new skills, adult skills levels

- What to learn: this encompasses understanding of components of professional competence, being able to anticipate and identify key requirements and skills to remain employed in the future; what should/must be learned
- How to learn: this involves recognizing special characteristics of adult learning and self-directed learning, and being able to establish key principles and to use learning approaches and tools to facilitate and improve own learning

Modern learning must fit the individual knowledge worker, and there is no single off-the-shelf, one size fits all solution. What this model hopefully conveys is that changed needs of work can be managed in a structured way, and every knowledge worker can improve their employability attractiveness and professional future proofing through self-directed learning.

3 Development setting

This chapter describes the development setting in more detail. It will re-present the purpose of the development work and describe its objectives and development task. After this development approach and methods will be described, followed by descriptions on data collection, data management, and data analysis. The results of the development work will be discussed in a separate chapter after.

3.1 Purpose and objectives of development work

Digital transformation influences every knowledge worker. Already occurred changes in the world of work have been unprecedented in scale, and continuous change is viewed as the new norm. This setting puts tremendous strain on non-digital native professionals. How will the digitally transformed work influence the matching of mid-career knowledge worker to future work? How to keep up with all the changes, keep oneself continuously relevant in the job market? The list of important questions could be much longer.

To answer these questions through traditional scientific research approach would be very difficult, and perhaps even impossible. Instead, research-based development work is an approach that aims to create new insights through practical development activities. It can be undertaken by practically anyone who wishes to improve existing practices, resolve ongoing problems, or create new services or products. Research-based development work originates from authentic developmental task and requires partnership among stakeholders (Moilanen, Ojasalo & Ritalahti 2022) These definitions gave the justification to choose research-based development work as the approach for this work.

The major purpose of this research-based development work is to construct an adult learning framework that serves as a navigation tool to identify areas for professional development and

to create action within mid-career knowledge workers to stay employable in the changing labor market and new future of work.

1. Firstly, it aims to provide an exploration canvas for many knowledge workers that assist them to understand what should be learned to be more future-ready.
2. Secondly, the work intends to deliver relevant knowledge on adult learning systems for the reader, which will enable him/her more informed and better decisions and implementation of learning strategies allowing more efficient outcomes, henceforward create action.

Ultimately, the report aims to point to the actions that individuals can take to better prepare themselves for the future.

The objectives of this thesis are:

1. To identify through literature research important elements of adult learning and phenomena of future-ready competencies to construct a tentative learning framework
2. To conduct a set of semi-structured in-depth interviews of relevant sample to collect responses
3. To analyze data through thematic analysis methods
4. To apply respondents learned experiences, understanding and concepts to improve the proposed framework

It is important to mention the outcome of development work – the framework – is not to be a one-off fixed solution, a final proof of empirical development work. It is an expression of my view at a given time stamp, based on a set of knowledge and parameters. It should be considered tangible, but continuously changing and evolving framework.

3.2 Description of development work approach and method

Moilanen et al. (2022) lists five different approaches for research-based development work: case study, action research, constructive research, service design, and innovation generation. Choosing an approach to follow in this development work was not a straight-forward exercise. Normally, in development work concrete needs of a partner company determine or at least nudge towards using a particular approach. This work does not have a traditional business partner but instead future partners, knowledge workers benefiting from using the framework. It meant in practice that I had to be self-driven with my own objectives in choosing the approach. Case study and action research were excluded due to fact that there was no case company involved in this work. Remaining were three approaches that all had overlapping and similarities to a great extent. Service design with its creative approach and purpose to create practical solutions that meet future requirements of the users was reviewed. Characteristics

of constructive research, solving a problem by creating a new construct or concrete output like a model or information system through close integration of practice and theory was also fitting to the task. Innovation generation approach can produce new kind of processes or models that may help to produce a benefit. Again, somewhat fitting to the development work objective. Yet the work is missing the commercialization aspect of innovation research as identified by Moilanen et al. (2022). It was realized this development work did not have a clearly selected one exact approach, more important was to be aware of the range of approach possibilities within research-based development work and combine them to best suit this work. This approach is also supported in research-based development literature (Moilanen et al. 2022).

A variety of different development frameworks and tools exist to advance the results of research-based development projects. Whilst investigating approaches, additional models surfaced from the research-based development literature. Few of them were explored in more detail to choose the most suitable development framework for this work and its objectives. Some development frameworks were more applicable in situations when an exact data measurement was viable or clear problems were identifiable, such as 8D or DMAIC models. (Marin-Garcia, Garcia-Sabater, Garcia-Sabater & Maheut 2020) PDCA-cycle (Plan-Do-Check-Act) features a continuous cyclical process used for carrying out change. This widely used model felt still somewhat limiting; it is designed to make incremental small changes that are reviewed after each step before moving on to next phase. PDCA-cycle in my view would not allow discovery of opportunities and new converging ideas as on-going fluid process.

3.2.1 Double Diamond framework

Design Council's (2019) Double Diamond framework allows to deal with ambiguous topics that do not have clear answers, also in consecutive cycles that become continuous innovation and improvement process. Double Diamond's clear and visual description of the design process felt easy to understand and use. This model was chosen as the development framework for the thesis.

The diamonds consist of four process stages: discover, define, develop, and deliver. The overall process starts with a challenge/an issue, and through the four stages results in an outcome. This outcome takes the creator back to the beginning with a new type of challenge, and the process starts again.

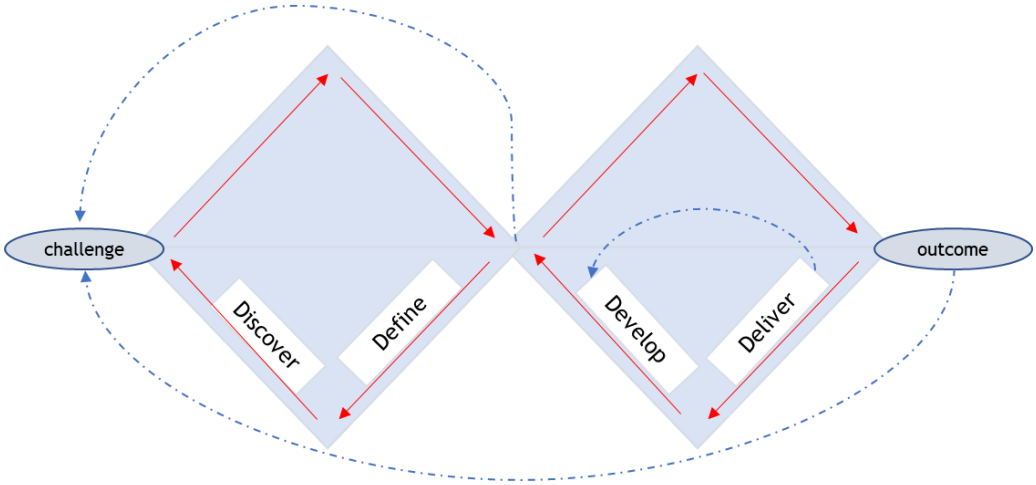

Figure 4: The Double Diamond (modified from Design Council, 2019)

3.2.2 Development Method

In traditional research literature there are three different research methods a researcher can choose to use: qualitative, quantitative, and mixed-method research. (Saunders, Lewis & Thornhill 2015) Each research paradigm has its own characteristics, and it is useful to understand these to choose the most suitable orientation for one's own work. Generally, common characteristics of qualitative research are flexibility, inductive research logic, iterative design, person-centeredness and a certain open-ended starting point to support discovery and exploration, and qualitative analysis. (Holloway & Todres 2003, Saunders et al. 2015) Qualitative research is used in dealing with phenomena that are not mathematically quantifiable, such as beliefs, meanings, and attributes, and used to uncover insight for hypothesis, to understand reason and motivation. Quantitative research characteristics are focus on deduction, theory and/or hypothesis testing, investigating between groups, finding causal effects, having precise and numerical data, and statistical analysis. (Brinkmann 2013) Mixed method research is combining both qualitative and quantitative strategies resulting in complementary strengths and more superior research product to mono-method studies. Mixed-method research can answer a broader and more complete range of research questions, add insights and understanding, and provide stronger evidence for a conclusion. Despite the apparent benefits of mixed-method research compared to monomethod research, it does have weaknesses too. A single researcher might not have the knowledge and understanding to mix methods appropriately, nor the time, capacity or resources to carry the research on his/her own.

The selected method for this development work is a qualitative research method. Following arguments support the appropriateness of the selection for this thesis: qualitative research is useful for studying a limited number of cases in depth, it offers understanding of people's personal experiences of phenomena, and it allows researcher to respond, and shift focus

during the conduct of a study, if required. Moreover, inductive design is viewed suitable to study emerging, non-hypothesized phenomena. (Brinkmann 2013) Previously mentioned characteristics and weaknesses of quantitative and mixed-method research act as justifications to forego these paradigms as development method for this work.

Before choosing on the most suitable research method, the context and limitations of the development work were taken into consideration. The work was conducted without a case company and timeline to complete the development was set at 1,5 months. Three basic qualitative research methods were considered: in-depth interviews, focus group discussions, and observation (Hennink, Hutter & & Bailey 2020). Focus group is considered more suitable method to identify a range of opinions at less deep level. This did not fit the context of wanting to gain in-depth information at an individual level. Observation as a research method would have been equally non-fitting for the research objective; the phenomena cannot be studied by seeing and observing the subjects in their natural settings, there is nothing physical to see. Selected qualitative method for this work was in-depth interviews, which allows seeking of personal information, perceptions, and experiences of participants. Interview method can be viewed as a purposeful discussion between two or more people and can be used to gather valid, high quality and reliable data relevant to research questions and objectives. It was for these reasons that this method – interview - was chosen.

According to Brinkmann (2013) there are four factors that may differ in qualitative interviews: the structure of the interview, the number of participants in each interview, the media used and the interviewer style. These forms each have their advantages and disadvantages and the researcher should be aware of them.

The interviews were conducted as semi-structured interviews. Semi-structured format allows the interviews to remain as dialogical as possible. At the same time this format allows the interviewer to steer the conversation to topics and issues she deems important in relation to research work, as well as act as a knowledge producing participant in the research process itself. (Brinkmann 2013) With a structured interview format, possibility to improvise, draw meanings and adjust the on-going dialogue accordingly would not be possible.

Individual interviews as a method were chosen for two reasons. Firstly, individual interviews allow for atmosphere of discretion, trust, and uninterrupted narrative, where the interviewee is considered as the expert on his/her own life experiences. Secondly, the interviewer can easier lead the conversation to serve the research interest compared to for example in focus group situation.

Interview media was online video meetings, equaling in modern context as face-to-face interview. More specifically, MS Teams platform was selected as it had recording capability that could later be converted to meeting transcriptions for each interview. It was considered

that interviewee gestures, body language and facial expressions could provide additional knowledge for the researcher. As the analysis were done by the interviewer herself, these elements were of interest and available through individual face-to-face interviews.

The interviewer style adopted was receptive; interviewee has large control in his/her answering. Unlike in assertive interviewing, the researcher does not try provoking the respondent, control the responses, or highlight absences or self-contradictions in the answers. (Brinkmann 2013) The qualitative interviews were viewed as a collaborative knowledge creating accomplishment; hence the receptive style was considered the most suitable.

3.2.3 Data collection

It was clearly understood from research design literature qualitative interviews that provide solid and relevant data allowing in-depth analysis and knowledge creation do not just happen. To ensure the success of development work, significant time was devoted to participant sampling, interview thematic planning, interview questions designing, and actual interview preparation. As a practical way to improve the development phase's rigor, a logbook in MS One Note format was kept recording questions and decisions made.

A combination of theoretical and purposive sampling techniques was used to choose the research sample. In theoretical sampling technique the sample is chosen based on emerging theory topics. In purposive sampling the researcher him/herself defines the characteristics relevant to the study and then selects participants based on these criteria. (Dawson 2019) In practice this meant that during Discovery and Define phases of the work, existing knowledge domain became clearer, the target audience emerged, and overall framework started to partially develop. This assisted in deciding what data to collect and from who. Theoretical sampling target emerged: the mid-career knowledge worker. Next step was to define through purposive sampling the selected participants for qualitative interviews. Purposive sampling allowed me to use my judgement to ensure gaining rich information from relatively small sample size when identifying and selecting participants. This sampling method, also called judgmental sampling, is one of the most used non-probability sampling strategies to identify the primary participants (Moser & Korstjens 2018). Final sampling was done through my work contact and their business associates. In defining potential sample participants, the following criteria were used:

- Participant has a work history of minimum 15 years AND
- Participant is planning to stay in workforce for a minimum of 10 years AND
- Participant is identifying himself/herself as Collaborative or Expert Knowledge Worker

Some might imply a strong potential sampling bias and unreliability of results when purposive sampling is being used. I would like to turn purposive sampling into a positive: the personal

relation ensured there was a level of trust from the very beginning of the interview and the discussion was able to go on deep, meaningful level from the onset.

The process to create the interview questions started with selection of interview themes. These originated from the knowledge basis. Next, a loose interview structure was prepared using language and terminology that 'made sense' to the respondents. Two semi-structured test interviews were conducted to understand if there was a need to revise the questions. In the revision process the original interview content seemed too long, terminology used was too intricate, and questions were not to the point enough. This resulted in vague answers. Also, it started to feel that interviews might not give concrete answers to research questions. I found myself at second diamond Develop / Deliver iterative phase, where my development work was being co-created and tested simultaneously by sample participants. The improved version of the interview was going to include shorter set of questions plus a beta version instrument to collect data from interviewees in a form of an Excel file. This instrument was going to give concrete suggestions on future proofing development areas for the interviewee. More details of this will follow in next chapter 4.

Recruitment was done with a personal phone call, in which the purpose of the work and interview request was explained to the potential participant. An online meeting appointment was set for 45 minutes with emailed invitation, MS Excel file to be used during the interview and a meeting link. A day before scheduled meeting a reminder text message was sent. All interviews were conducted within a week from initial contact. Each actual interview was conducted in MS Teams, using desktop. This allowed a big screen to be used, which facilitated non-verbal gesture observations. The interview consisted of mostly open-ended questions and hands-on Excel exercise about future skills. The questions were written on OneNote page in two columns: left side featured the research themes and right size the actual interview questions. It assisted me to have an overview of where I was on the conversational process and to not miss any relevant themes.

The purpose of Excel exercise was to understand what skills the participant considers critical in future world of work, and how easy or difficult they think those skills are to be gained. Excel consisted of a listing of all skills mentioned in the knowledge discussion in chapter XX, written on rows. Interviewee was asked to rate the importance of these skills to future-proof knowledge worker with Likert five-point scale of very unimportant, unimportant, neutral, important to very important. Step two in Excel exercise was to evaluate, considering the interviewees current work life, whether it would be easy or hard to acquire the skills. Intentionally the scale was kept dichotomous to press the respondents for clear answer. The Excel exercise was emailed back to interviewer who created more informative pivot table of the answers. This visually enhanced analysis outcome was shared with interviewee during the Teams meeting and used in the remaining discussion as an additional discussion generator. All

interviews were recorded and transcribed by using MS Office, ensuring quality in data analysis.

3.2.4 Data management plan

The data management plan for this thesis was created by utilizing Massachusetts Institute of Technology (hereafter MIT) data management plan guideline (MIT 2022). According to it four areas should be planned and described: (1) Project, experiment, and data description, (2) Documentation, organization, and storage, (3) Access, sharing, and re-use, (4) Archiving. These will be briefly discussed next.

(1) The project data consisted of both open and closed data. Knowledge basis open data was collected from online sources, both from free sites as well as through university restricted library sources. Qualitative interview data was classified as closed data: transcripts containing private natured opinions and discussions were not make public. All aspects of data management were the responsibility of the underwriter.
(2) Attention was put on selecting permanent format open data sources, either Adobe pdf-files or DOI url-sites. All data was saved into password secured personal computer, and weekly back-ups of full content were taken on USB-drive. Documentation of data was followed in a structured way. Each open data source was saved into directory following the paragraph numbering of final work and with file naming convention that indicated type of source, key content topic, year of publication, author, and qualitative description of the content for the context of the thesis. Example 1: R_Skill content_2003_Autor Levy Murnane_good.pdf (Research, part of Skills knowledge basis, year, authors Autor, Levy, Murnane, considered good source). Example 2: Rr_FOW_2020_WEF_very good.pdf (Research report, part of Context knowledge basis, year, author World Economic Forum, considered very good source). Naturally, all sources were recorded in the References section. Closed interview data was equally saved and backed-up with the previously mentioned pseudonymized naming convention F1, F2. They were saved both in .mp4 video and audio format and as transcribed Word document format. The actual names were kept in a separate OneNote file.
(3) The raw unprocessed data was not shared with anyone, and it was managed by me only. Exception being the future skills Excel exercise, where the interviewee co-created the content together with the underwriter and the data was transferred via email between interviewer and interviewee. Closed data was made available for the thesis supervisor to access through secured file sharing platform upon request. Pseudonymization of interviews ensured there was no reason to make the final thesis unpublic.

Thesis data will be archived in a personal computer for next 24 months. Complete set of material and data will also be saved in USB-drive. The written work will be made available in national Theseus portal.

3.2.5 Description of data analysis

There are numerous, diverse and nuanced qualitative analyses approaches available; analytic induction, cognitive mapping, discourse analysis, grounded theory, narrative analysis, phenomenology, and template analysis to name a few (Dawson 2019). For the purpose of this thesis thematic analysis was selected for several reasons. Firstly, thematic analysis concentrates on detecting and describing ideas within data rather than quantifying words and phrases (Ozuem, Willis & Howell 2021). Secondly, thematic analysis is considered inductive, building on theory rather than testing theory, moving from specific observations to broad generalizations. This development work is not a fixed pre-existing theoretical framework that is tested but rather a living canvas that is complemented with research findings. Thirdly, thematic analysis is considered an accessible form of analysis for less experienced researchers. It does not require strong and strict knowledge of theoretical and technological approaches, as for example grounded theory does. (Braun & Clarke 2006)

The data analysis started by familiarizing myself with the data: cleaning the automated transcribed data to easier to understand format, reading through the transcripts several times, keeping notes of my own thoughts and initial observations, gaining a generic understanding of the data. I decided that there was no need for respondent validation in terms of them checking the transcripts, as the actual process of transcribing was done by voice recognition software and after checked by me.

Next, objective was to reduce large quantity of relevant data to smaller portions of meaning. The raw data was organized to more meaningful groups by using codes. As I had certain clear questions in mind when looking for answers in the dataset, coding was done through theoretical thematic analysis. It permits to code around certain features of the data, not full set of data. I used manual word-based coding where I highlighted data with different colors to identify different codes.

Having generated comprehensive list of data codes, they were sorted into potential themes. This was done in MS Excel software by using colored rows and columns that allowed easy visualization. First, each code was written in a row. Notes were formed into initial bigger themes with unified color. Also, some quotations were inserted to Excel to keep additional data material visible in one location.

1. Drivers of change	F1	F2	F3	F4	F5	M1	M2	M3	M4	M4
Digitalisation	1	1	1		1	1		1		
Technology		1		1	1	1				
Pandemic			1		1		1			1
Working remote			1	1	1		1			1
Constant change	1	1			1					
Need to upskill / reskill	1	1	1		1					
Continuous learning		1								
Non-linear, non-typical jobs	1									
Change of industry/business in career	1									
Polirization of work				1						
Work life balance changing							1			
Internationalization				1						1
Financial constraints								1		
Aging of people								1		
Lack of experts, expertise									1	
New generation coming in with different mind set, requirements									1	

Figure 5: Example of thematic coding

After initial identification of themes, they were reviewed to ensure nothing was left out of the analysis. First step was to read through all coded Word transcript extracts for each theme to ensure they form a coherent pattern. Second step was to validate the main developed themes against the whole data set, to see they work in the context of the complete data set. Additionally, at the same time a review was done to see if there were any additional data within themes that possibly needed re-coding. This is part of organic nature of thematic analysis: codes can and should evolve over the coding process since insights develop and changes, whilst attention should be paid not to employ endless re-coding. (Braun & Clarke 2006)

Upon refinement of final themes, clear definitions and names were given to them. I tried to identify the essence of each theme and be ready to write a detailed analysis of each individual theme on its own. This final step of thematic analysis – producing the analysis – is following in the next chapter 4.

3.3 Implementation of development work

The development project was carried out between March 2021 and December 2022, presented through the Double Diamond framework phases:

- Challenge: context of Future of Work, what will it mean for knowledge worker, how to remain employable, how-to better future-proof yourself?
- Discover: acquisition and writing of theoretical knowledge: March–May 2021, August-November 2022
- Define: Planning of development task: October-November 2022

- Develop: Execution of interviews, co-creation of framework with participants: November 2022
- Deliver: Results analysis and reporting: November-December 2022
- Outcome: Finalizing of framework and conclusions: December 2022

Short description of the four-stage development process for the thesis will be given next:

Discovery: in the initial stage of discovery, focus was on reading scholarly and business articles about the new future of work, which then led to article topics such as how skills will be the new currency in labor market, and how people can potentially become obsolete in the new job market. Source availability was significant. In Google Scholar search engine, the number of articles with exact phrase 'future of work' resulted over 24,9000 hits initially in 2021, and by one year later in 2022 over 45,400 hits. In Finna.fi search service platform same search enquiry resulted in 649,000 articles (2021) and 726,000 articles (2022). Concurrently, it became very evident that this topic was addressed seriously globally. Every possible NGO, institution, governmental body, consultancy firm had made reports, analysis, programs about the transformed world of work and its implications to individuals. During the exploratory phase questions started to emerge: where will I be in this new future of work with my competence and experience? Will I be a winner or a loser? How could I better prepare myself to remain employable in the future? Other experienced mid-career professionals around me had alike thoughts.

Define: the discussions with colleagues and other mid-career professionals and insights from written sources were used as boosters to identify the challenge that was going to be developed. The masses of information started to form a clearer picture on what the work shall be focusing on. It was obvious the thesis would need to have clearly defined boarders on this vastly complex and broad topic. I chose to focus on an individual and his/her own sphere of influence. Through the literature two topics were more manifested than others in my view: need to be self-directed in one's own development and the new skills imperative for new world of work. These two topics would produce the foundation of the knowledge basis. In addition to knowledge sharing, I wanted to be able to offer something more concrete to individuals matching the thesis context. My wish and expected outcome were to be able to offer a future-proofing framework for knowledge workers that would allow them to be better equipped in developing their professional selves and to seize future career opportunities. The divergent thinking phase was over, it was the end of the first diamond. This phase was discussed through knowledge basis in chapter 2.

Develop: this phase opened the second diamond that is focused on convergent thinking, taking focused action. Development part of the thesis was deployed: qualitative interviews were conducted to gain deep insights on knowledge topics and to seek new possible

alternatives for the framework development. Interviewees were contributing to co-creation of the skills identification tool that was part of the proposed framework. Focus of interviews was not on getting answers right but to be open to many possibilities and learnings, even failures. As a matter of fact, two initial test interviews resulted in a different and improved version of the interview structure and content. An unexpected but very positive and welcomed development for the underwriter. Develop phase was discussed in more detail in chapter 3.

Deliver: the learnings and insights from all interviews and hands-on co-creation exercises were included into the proposed framework design. This delivery phase of the second diamond materialized with a concrete output: a self-directed learning framework for future-proofing your knowledge-worker self. This phase will be discussed in more detail in chapters 4 and 5.

4 Results

Analysis of the qualitative interviews and co-creation exercise are discussed in this chapter. Appendix 1 features the interview structure and questionnaire. Three main pillars of the knowledge basis were discussed each in its own entity during the interview. For each pillar a theme of discussion topic was selected, which allowed natural discussion and flexibility to deviate from interview structure and questions. The qualitative method allowed detailed accounts of participant's experiences and thoughts to be discovered.

4.1 Participants of development work

In total, ten knowledge worker individuals were interviewed. Each participant was asked to provide background on their education, work experience, employment status, and current occupation. Also, interviewees were asked to position themselves into Davenport's Knowledge Worker segmentation model to ensure the correctness of purposive sampling. Details of participants are listed in table below.

Gender	Highest level of formal education	Employment status	Occupation	Years in current role	Years in working life	Knowledge Worker type
F1	M.Sc.	Full-time employee	Executive Assistant	23	25	Collaborative
F2	MBA	Self-employed	Adult trainer/coach	17	30	Collaborative

Gender	Highest level of formal education	Employment status	Occupation	Years in current role	Years in working life	Knowledge Worker type
F3	M.Sc.	Full-time employee	Lecturer	3	30	Collaborative
F4	BBA/BA	Full-time employee	CRM Manager	1.5	17	Collaborative/Expert
F5	BBA	Between jobs	-	-	35	Collaborative/Expert
M1	M.Sc. Mechanical Engineering	Full-time employee	Snr. Business Development Manager	1	20	Collaborative
M2	Doctor of Laws	Full-time employee	Ministerial Advisor	6	20	Collaborative/Expert
M3	M.Sc. Earth Science/ Geologist	Self-employed	Head of Process Engineering	15	19	Collaborative
M4	BBA	Full-time employee	Sales Manager	5	30	Collaborative
M5	M.Sc. Social Science	Full-time employee	Legal Analysis Expert	1	25	Collaborative

Table 1: Participants of development work

The work experience average in years was 25 years, hence it was conclusive participants belonged to target group. Everyone identified themselves as Collaborative or Expert Worker, another criterion for participation.

4.2 Theme 1 – Painting the Future of Work scene for mid-career knowledge worker

One of key aspects in adult learning is the internalization of learning reasons and motivations, adults need to diagnose their learning needs, know why they are learning something new. Self-directed learning is about an individual reflecting and anticipating on future opportunities and challenges and being an active initiator on learning. First theme was created to understand these aspects within the sample group. How the sample knowledge workers saw the future of work (hereafter FOW), their own position in this changing work

landscape and whether they identified a need for professional development through adult learning?

Respondents were asked four questions in total:

1. What drivers of change do you see that affect the FOW for knowledge workers?
2. Considering all the changes around us, how does the FOW look to you compared to now?
3. Where will you be working in 10 years' time, in what type of role, in what type of work set-up?
4. Are you concerned about your own employability and skill set in relation to FOW?

First three questions were unassisted questions, where no additional background information was given. Question two and question three were complementing each other and answers to those questions were analyzed together. Aim of these two questions was to make respondents think outside the box and towards the future. Before question four FOW facts slide was screen shared with the respondents to give concrete information generated from studies, surveys, and reports on topic of FOW.

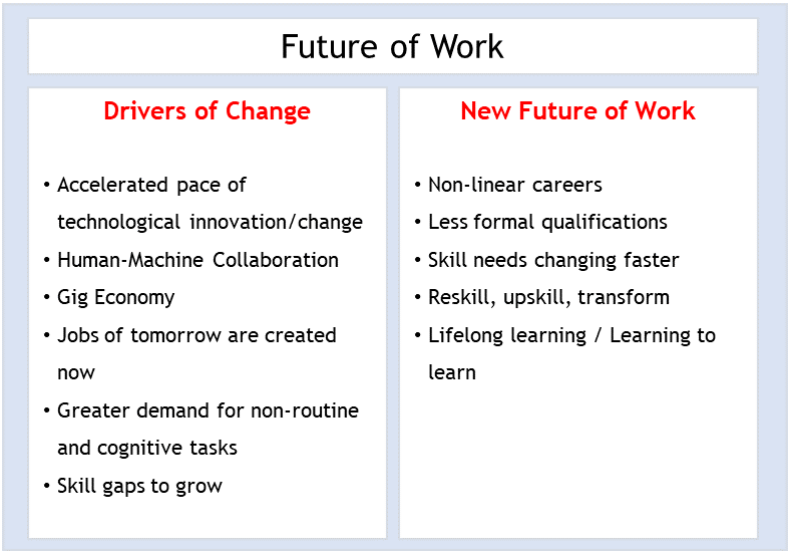

Figure 6: Future of Work context slide used in interviews

Question 1: 'What drivers of change do you see that affect the FOW for knowledge workers?'

Overall, the respondents were attuned that work environment is changing. Technological change and digitalization were most common answers, seven out of ten mentioned these as drivers of change. Second most mentioned driver of change was related to remote working, half of respondents stated it. Third most mentioned driver of change was constant change in

the work that results in the need to upskill, reskill, and continuously learn. This was mentioned by four respondents. Other mentions were internationalization of work, scarcity of resources in terms of both monetary and available human talent, polarization of work and changing mindset of people towards better work-life balance. Noticeable was that every respondent mentioned several drivers, indicating that this topic is something respondents have thought of. Remote work as drivers of change was in my view expected post Covid-time.

Questions 2: 'Considering all the changes around us, how does the FOW look to you compared to now? and Question 3: 'Where will you be working in 10 years' time, in what type of role, in what type of work set-up?'

Half of respondents viewed in general the future to be similar without any major changes to their own professional environment, whilst the other half considered FOW to look very different to their professional self. Despite sample size being small and this not allowing reliable gender analysis and comparison, it could be worth mentioning as a curiosity that status-quo respondents were all men, whilst all women expected their FOW to be dissimilar to now.

Certainly, each respondent identified features they view to be different in their own FOW. Only two out of ten visioned a full-time employee role, whilst eight respondents predicted freelancing, entrepreneurial or gig-economy mixed employment. At the moment the employment status of respondents was completely opposite; two are self-employed and eight fulltime employees. To me the shift in thinking is quite interesting; respondents are seasoned mid-career individuals that have worked most of their career in secure permanent positions and now towards their end part of career they vision a different type of less structured and predictive employment. Six out of ten respondents viewed that their job expertise and knowledge will remain equally competitive in the future world of work. At the same time five out of ten respondents view that individual must be adaptable and willing to learn all the time in FOW context. Flexible, location independent work was viewed more common in the future by four respondents. One could assume remote working has become a new norm and next step after this is completely flexible working location. Single responses included opinions about individuals having more power in job market; having difficulty finding right and suitable human resource to fill positions; uncertainty in budgetary constraints of employer and what it will mean for an individual; and more polarized work environment with more skills and less skilled participants.

From these first three question responses it was evident that sample respondents were aware of the changing work life and its new requirements for individual knowledge workers. Wide variety of responses indicated that each respondent has their own narrative through which they look at the changing world of work.

Question 4: 'Are you concerned about your own employability and skill set in relation to FOW?'

As earlier mentioned, this question was imposed to respondents after FOW fact slide was presented and described to them: the slide information is collected from multiple international studies and reports done by authorities and organizations such as World Economic Forum, European Union, International Labor Organization, and topics were considered as researched facts on FOW. During the sharing of information, it was visible, through facial expressions and body language such as leaning towards the screen, how each respondent was genuinely interested in the globally acknowledged facts.

Six out of ten respondents state they are 'not' concerned about their future employability and skill set in relation to FOW, two responded 'yes' and two stated 'partially yes'. Considering 50% of respondents in previous question viewed their professional future should be similar to today's situation, the result was not overly surprising.

Respondents who were not concerned about their future employability gave varying range of reasons for this opinion. Five out of six respondents stated personal characteristics such as flexibility, good attitude, curiosity, and willingness to learn new things as reasons. These soft skills are critical in new FOW, so in that respect the participants are demonstrating right traits of future skill sets. Four out of six respondents viewed their current knowledge and experience is keeping them competitive in future.

Respondents that had future employability concerns were stating following reasons: how would potential employers perceive the past short work experiences and changing positions or lack of career progression, ageism, and would individual's expertise or skill set be enough in the future work landscape and would there be enough work.

The mechanism of asking a simple yes or no answer about the respondents' self-view on future employability and skill set was providing many insightful comments and add-on opinions to previous questions. One clear theme emerged from many responses: believing in the right positive attitude towards change, being adaptable and keen to learn.

Respondent A: ''I think for example about skills gap: I think that's also a lot to do with like your attitude and willingness to be flexible and to learn new things. So, in that way I think there still will be a role for me in the coming years to make myself useful.''

Respondent B: ''You need to learn. You can't just be employed by one company your whole life and not learn anything outside of that company… I think I also do have the mindset of learning new things, but without that I think you would definitely be worried.''

Respondent C: ‘’So it's not possible anymore to just, you know, study and graduate and then forget all about education and then just work. You need to be upskilling and reskilling during your entire career.’’

4.3 Theme 2 – What should be learned – identification of requirements?

This section of the interview was an interactive, co-creation phase where the interviewer and interviewee worked together to pilot the skills identification tool that is part of the proposed framework.

Respondents were asked four questions in total:

1. In general, what skills are important to future-proof knowledge workers? Could you rate each skill in range 1-5? (1 being very unimportant, 2 unimportant, 3 neutral, 4 important, 5 very important)
2. Considering your current work life, would you say it would be easy or hard to acquire these skills? (1 being easy, 2 hard)
3. What are your thoughts regarding the results?
4. Do you get encouragement from your current employer to acquire any of these skills?

When embarking on this section of the interview, the participant was asked to open previously shared excel file (appendix 2) and input his/her own answers into the file. After question one and question two the completed excel file was sent back to the interviewer. All participants filled excel files and all requested data. The interviewer inserted results into pivot table that has skills summarized into groups, which was then screen shared to the participant (appendix 3). A discussion took place to gain more insights of the opinions, attitudes and thinking of the participant through question three. Question four was asked to potentially bring discussion points into Conclusion chapter.

Question 1: ‘In general, what skills are important to future-proof knowledge workers? Could you rate each skill in range 1-5? (1 being very unimportant, 2 unimportant, 3 neutral, 4 important, 5 very important)’

Participants were not aware of the underlying dataset of the model. They were given a list of 38 skills that were identified by EU Commission (2011), ILO (2021) and the National Foundation for Educational Research in UK (2020) as essential or core skills for an individual in the future work context.

Questionnaire was using Likert scale. The sum of Importance rating from ten participants provided outcome displayed in Figure 7. Maximum total sum could be 50. At this level the data looks somewhat unconclusive. Some generic findings can be made though: communication is considered the most important skill, followed by Resilience/Stress

tolerance, Creativity and innovative thinking, and Technology use, monitoring and control. Job specific knowledge and abilities were on the bottom of importance range. Respondents' opinions seem to again be very similar to research findings about importance of being a generalist – a jack of all trades – rather than being tied to a specific job knowledge.

Skills	TTL
Communication	48
Resilience / Stress tolerance	46
Creativity and innovative thinking	46
Technology use, monitoring and control	46
Active learning / Motivation to learn	45
Problem-solving and decision-making	45
Analytical and critical thinking	45
Foreign languages	45
Conceptual thinking / Strategic thinking	45
Adaptability / Flexibility	44
Relationship skills	44
Emotional intelligence	44
ICT skills/e-skills	44
Collaboration and teamwork	44
Information exploring and managing	42
Conflict resolution and negotiation	42
Ethics / Social responsibility / Integrity	41
Planning and organizing	41
Autonomy	41
Economic awareness	41
Leadership and social influence	40
Service orientation / Customer handling	40
Career management / Self-management	39
Environmental awareness	39
Negotiation / Persuasion	39
Self-control	39
Impact / Influence others	39
Systems analysis and evaluation	38
Self-efficacy / Self-confidence	37
Efficiency	37
Concern for order, quality, accuracy	35
Achievement orientation	34
Job specific knowledge abilities	34
Developing others	34
Legislative and regulatory awareness	33
Physical abilities	32
Job specific technical abilities	31

Skills	TTL
Commercial / Organizational awareness	30
Total Sum of Importance	**1529**

Figure 7: Importance of skills in context of FOW (total sums)

Once the dataset was put into the skills identification tool/model, a more meaningful view of individuals' personal sentiments starts to emerge. Thirty-eight skills are clustered into Hard and Soft skills as identified in the knowledge basis chapter of this development work. Skills are further categorized in sub-groups originating from the reputable source reports. Data shows immediately how soft skills are considered more important over hard skills in FOW. Highest importance is given to skills focusing on relationship and people management. Cognitive skills group including thinking capabilities and self-management is considered equally important. Third group of soft skills with an average of over 4 is personal effectiveness group including resilience, flexibility, and creativity. Hard skills seem to be less important, with exception of technology and ICT skills and language skills. One could state that without these two hard skills categories it is nearly impossible for a knowledge worker to perform in today's work environment.

Skills groups	TTL
Generic Hard skills	**4,0**
Technology use, monitoring and control	4,6
Foreign languages	4,5
ICT skills/e-skills	4,4
Economic awareness	4,1
Environmental awareness	3,9
Systems analysis and evaluation	3,8
Legislative and regulatory awareness	3,3
Physical abilities	3,2
Specific Hard skills	**3,3**
Job specific knowledge abilities	3,4
Job specific technical abilities	3,1
Soft Skills - Relationship and service skills group	**4,3**
Communication	4,8
Emotional intelligence	4,4
Relationship skills	4,4
Collaboration and teamwork	4,4
Ethics / Social responsibility / Integrity	4,1
Service orientation / Customer handling	4,0
Negotiation / Persuasion	3,9
Soft Skills - Cognitive skills group	**4,3**

Skills groups	TTL
Active learning / Motivation to learn	4,5
Analytical and critical thinking	4,5
Conceptual thinking / Strategic thinking	4,5
Conflict resolution and negotiation	4,2
Planning and organizing	4,1
Career management / Self-management	3,9
Soft Skills - Personal effectiveness skills group	**4,2**
Resilience / Stress tolerance	4,6
Creativity and innovative thinking	4,6
Adaptability / Flexibility	4,4
Self-control	3,9
Self-efficacy / Self-confidence	3,7
Soft Skills - Achievement skills group	**3,9**
Problem-solving and decision-making	4,5
Information exploring and managing	4,2
Autonomy	4,1
Efficiency	3,7
Concern for order, quality, accuracy	3,5
Achievement orientation	3,4
Soft Skills - Impact and influence skills group	**3,6**
Leadership and social influence	4,0
Impact / Influence others	3,9
Developing others	3,4
Commercial / Organisational awareness	3,0

Figure 8: Importance of skills groups in context of FOW

Question 2: 'Considering your current work life, would you say it would be easy or hard to acquire these skills? (1 being easy, 2 hard)'

In the first phase of the co-creation, a view of the most important skills to be developed emerged from the data. Next, the model considers the current effort level of acquiring a particular skill. Respondents were asked to rate in simple closed question format if acquiring the skill is easy or hard in their opinion. This rating together with answers from previous question give a new dimension in understanding what to learn. By merging them together an individual can identify:

A) what are the most important skills areas to develop for him/her?
B) what skills areas he/she thinks are easy to develop?
C) what skills areas he/she thinks are difficult to develop?

Figure below is a presentation of total respondent group. Same grouping and importance average ranking are used as in figure x. Percentage of 'easy to acquire' and 'hard to acquire' responses are available for each skills group. Suggestion could be made that the individual, or in this case the sample group, should focus on Relationship and service skills group, as:

A) its average of importance 4,3 is the highest, and
B) sixty-nine percent of respondent answers viewed the Relationship and service skills to be easy to acquire.

For example, Cognitive skills were considered to be more difficult to acquire, 52% of respondents rated them easy, 48% hard.

SKILLS	Av. of Importance	Easy	Hard
Generic Hard skills	4,0	53 %	48 %
Specific Hard skills	3,3	70 %	30 %
Soft Skills - Relationship and service skills group	4,3	69 %	31 %
Soft Skills - Cognitive skills group	4,3	52 %	48 %
Soft Skills - Personal effectiveness skills group	4,2	62 %	38 %
Soft Skills - Achievement skills group	3,9	62 %	38 %
Soft Skills - Impact and influence skills group	3,6	50 %	50 %
Effort of Acquiring Skills	**4,0**	**59 %**	**41 %**

Figure 9: Effort of Acquiring Skills in group level

Next action is to drill even more into the details. Where should an individual focus on within the skills category? By looking at the data in detailed skill level, conclusions on efficient learning goals can be made. Efficient in terms of individual's own accord. Again, the results in the figure relate to total respondent group. In this example communication skill is rated with highest average of importance and, also most respondents view acquiring this skill to be easy.

SKILLS	Av. of Importance	Easy	Hard
Soft Skills - Relationship and service skills group	**4,3**	**69 %**	**31 %**
Communication	4,8	70 %	30 %
Emotional intelligence	4,4	70 %	30 %
Relationship skills	4,4	80 %	20 %
Collaboration and teamwork	4,4	70 %	30 %
Ethics / Social responsibility / Integrity	4,1	60 %	40 %
Service orientation / Customer handling	4,0	70 %	30 %
Negotiation / Persuasion	3,9	60 %	40 %

Figure 10: Effort of Acquiring Skills in detail

Question 3: 'What are your thoughts regarding the results?'

This was a moment of self-reflection, an important part of adult learning process (Kolb 2013). Firstly, respondents were intrigued about the tool and how it produces simple level conclusions on topics of learning attention. Generic consensus was on the realization of soft skills ruling over hard skills. This was the only general result that could be drawn from the answers. All rest was individual's own experience and reflection, ten different stories in total.

For example, one participant was surprised to see her low importance on Personal effectiveness, raising a concern for herself about being aware of it in the time of remote work: ''Personal effectiveness skills I think that needs to go up a lot more when we go into working more remotely and working more on our own, yes, and from different places than the other team.''

Another interviewee reflected as: ''I do recognize myself in that I demand from myself, and I demand from my subordinates. I do for example put focus on being able to think autonomously, direct work autonomously and provide logical reporting and analysis that's important for myself. I use a whip on myself if I can't do it, and I expect that from my coworkers as well.''

Third concluded: ''I think that it's very telling. I think we can't run who we are and that kind of reflects how I see things. You know, I put values in very intuitively but now when I see the outcome over here, I would reaffirm them… Be able to be creative and having these kind of generalist skills is very important. It has to do also with the fact that we are then able to have shorter term works and being able to change from one work to another and also to a new sector… I really think that what is required in the future is more generalist skills compared to specific skills. I actually see that there is a very big risk for individual specifying him or herself just to have certain skill sets that you have. You are stuck with those, and you are not able to make any career moves after that. Strongly recommend at least to my kids to aim for being a generalist.''

It is important to consider that the actual results of the interviews are not the focus of this analysis but the applicability of the model. By using the tool an individual can approach somewhat difficult and abstract topic of learning and make it into something more concrete. It allows each adult learning himself to better understand his own learning goals in an easy to understand, numerical way.

Question 4: 'Do you get encouragement from your current employer to acquire any of these skills?'

The purpose of this question was to utilize the responses in the conclusion part of the thesis. The thesis itself is focused on individual's position as a self-directed learner, being in control.

However, I was interested to understand how the individual assess employer's role as a supporter in their learning. Four respondents viewed that their employer encourages learning new skills, four did not. Two participants did not have an employer to rate. What was coming through in the open-ended answers is the responsibility of learning being that of the individual, despite if the employer supports it or not.

Respondent D: ''Yes, they have been very positive about that. This is a matter for me too, sign up and make it happen. It's your own prioritization in a way.''

Respondent E: ''I am always taking my own initiative to go forward on this. I have never counted on the employer to do anything on this part. I would say that in the end of the day on bottom line, it's the employee's responsibility.''

Respondent F: ''I think it really starts to change. Right now, there's more focus and it is more available too. But still, it also goes more and more to you. You have to be in control yourself. It was earlier 'OK, now we have a course, you're in this course and you will be going on it this day'. Now you drive it yourself.''

4.4 Theme 3 – How should be learned?

Third theme in the development work was to gain visibility on individuals past learning strategies and experiences, attitudes, and opinions about own adult learning. The purpose was to identify key patterns in adult learning process, to identify different settings, forms and modes of learning, and to discover barriers to learning and development. At the end of the interview future operational strategies to knowledge development were also discussed.

Respondents were asked three questions in total:

1. Think back to a time when you identified a professional learning need,
    - what can you tell me about what triggered that experience?
    - who initiated the learning need?
    - how did you go about addressing that learning need and what activities did you engage in?
    - how satisfying was this learning experience and were there concrete benefits of learning to you?
2. What are the challenges in adult learning in your opinion?
3. Thinking what we discussed about the FOW, drivers of change and future requirements of skills, what concrete actions will you plan or need to take to best manage for the changing world of work and future proofing your knowledge worker self?

First question advanced organically. Some respondents gave answers naturally to almost all sub-questions, whilst some needed more exact probing to direct them to concrete answers. Question two and question three were unassisted.

Question: '1. Think back to a time when you identified a professional learning need…what can you tell me about what triggered that experience?

The learning needs arrived from multiple diagnosis per respondent. No specific source surfaced as the most common driver for learning. Four out of ten respondents stated their learning to be triggered by a want for self-development, either as a person or a professional. Three respondents mentioned career change as a driver for learning, whilst other three respondents mentioned wanting to be more competitive at current work. Learning hard skills was mentioned by three individuals, learning soft skills by another three individuals. Mid-life crisis was viewed by one respondent to be the initiator for learning. In today's materialistic environment it was somewhat surprising to notice that monetary advance was not mentioned even once as a motive for professional development and learning.

Question: '1. Think back to a time when you identified a professional learning need, who initiated the learning need?

The results clearly indicated that respondents were the drivers of their own learning. Nine out of ten respondents shared an example narrative, in which they had identified their own learning need and had initiated their own individual learning experience. One respondent shared a different story in which the learning, in a form of formal qualification, was a perquisite for a career transition and given as a mandatory requirement for the transition. Fitting to the theory of adult learning, the overall result demonstrated that adults are responsible for their self-driven learning.

Question: '1. Think back to a time when you identified a professional learning need...how did you go about addressing that learning need and what activities did you engage in?

Respondents identified learning strategies autonomously through their own decisions and actions. Eight out of ten identified independently what activities to perform and which resources to use. Two out of ten respondents utilized company provided solution for their learning. Additionally, results showed two learning settings to be most common among respondents: formal institution setting and informal setting in combination of each other. Eight out of ten respondents used structured curriculum driven external training in their learning, which they considered to be an effective learning setting to gain new knowledge and skills. Four participants out of these eight gained a new education degree. Informal setting was mentioned by seven respondents, both by learning from peers or incidental learning through own work.

Question: '1. Think back to a time when you identified a professional learning need…how satisfying was this learning experience and were there concrete benefits of learning to you?

Each respondents mentioned numerous benefits of learning. Most mentioned benefit was feeling of personal growth and self-satisfaction by seven out of ten respondents. Four out of ten mentioned feeling of achievement and being in control of own life. Gaining capabilities as new skills or new knowledge was identified by three respondents. Being able to perform better at work due to learning was viewed by three interviewees as a concrete benefit. Two respondents cited a very tangible benefit of obtaining a new job because of the learning. Only one interviewee felt the learning was a negative burdensome experience, which was hard, and outcome was not as expected. Four out of ten respondents mentioned it felt very satisfying to be able to help other work stakeholders because their new skills or improved self.

It is worth to mention that the above results are symbolic of one learning experience. Results are not demonstrating a comprehensive and exclusive description of learning experience for the respondents. Yet, it is indicatively validating the researched theory on adult learning, as described in the knowledge section of this work. The interviews confirmed SDL learning process where the individual determines the need to learn, then makes decisions what and how to learn, and deploys the plan.

Question: '2. What are the challenges in adult learning in your opinion?

Only one respondent viewed there are no challenges in adult learning. The rest were not of the same opinion. Not having time was considered the most common challenge with learning and development, seven out of ten respondents mentioned it. Since all respondents are in their mid-life with families, children, hobbies and demanding work life, the result is not surprising. Second most common challenge nominator was the respondent himself/herself, mentioned by five respondents. Examples were how to stay motivated to learn; how to stay alert and on top of individual learning needs; how to remain open to new ideas and not block them, weakening of cognitive skills making learning new things more difficult. Three respondents mentioned employer as a potential restrictive factor to learning: lack of support from employer towards structured adult learning, employer not enabling systematic on-the job learning opportunities, employer not valuing learning and improved knowledge of individual. Individual financial limitations were mentioned only once. Positive observation in a way that it feels learning is considered an individual right available to everyone notwithstanding the financial situation of the learner.

Question: '3. Thinking what we discussed about the FOW, drivers of change and future requirements of skills, what concrete actions will you plan or need to take to best manage for the changing world of work and future proofing your knowledge worker self?

It was evident from the responses that individuals were considering adult learning and development as an on-going process, rather than one-off event. Only one respondent cited he does not consider taking any additional actions to enhance his own future proofing, he was comfortable with his current skill set. Other nine interviewees had several notions to improve their position in the changing world of work. All of them mentioned acquiring new soft or hard skills and knowledge. Noteworthy is that all respondents talked about **new** skills or knowledge, not enhancing existing skill set. Four respondents plan to gain this through formal institutional qualification, such as education degree. Three individuals forecasted to manage their future proofing by changing an occupation or a company.

The aim of collecting responses from the purposively selected sample group was to test the proposed framework, gain better understanding of adult learning and to co-create and improve the framework. The development work outcome is shared in the following Chapter 5.

5 Conclusion and reflection

5.1 Framework for self-directed learning to future-proof knowledge worker

The overall development work started as a somewhat abstract unknown entity rising from my own reflections on mid-career knowledge workers competitiveness in the job market and in relation to FOW. According to Moilanen et al. (2022) the goal of development task should support the operations in practice and results should be measurable. In this development work the context is different to more traditional development task that involves partner company project. The key purpose of development task was though clear. The development goal was to provide a framework for mid-career knowledge workers that can create action and can assist them in their proactive management of career in FOW. The work did not impose an exact measurable goal to be obtained. Some might think this as a weakness in development work design. In my view it is not. The purpose was to create something new, a thinking laboratory for many, an action creating canvas. The created framework is presented in figure 11.

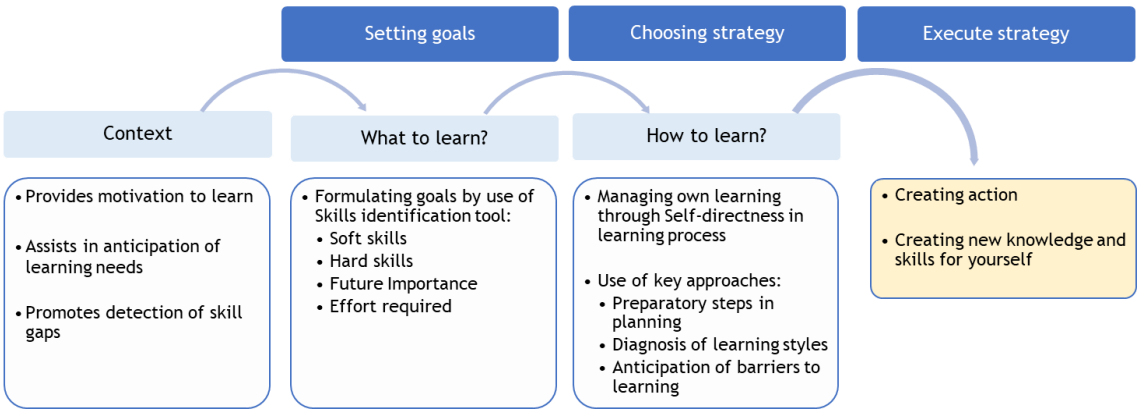

Figure 11: Knowledge Worker's self-directed learning framework for 'Future of Work' era

5.2 Usability of the proposed framework

The development work was set about constructing a conceptual self-directed learning model for future proofing yourself in the new world of work, drawing on theory and co-creation development. First pillar is the context of Future of Work, second pillar is the element of what to learn, and third pillar is the element of how to learn. These three pillars are contributing to and reinforcing the other. The analysis outcome and results of qualitative interviews demonstrated that the proposed self-directed learning model can support and assist the knowledge worker in managing and developing their future readiness for the needs of new world of work.

As Knowles et al. (2005) suggest, adults have readiness to learn when new social or life roles are imposed upon them. Motivation to learn could be realized through the 'context' element of the model, when participants are directed to think of what the FOW will be, first unassisted and then through assisted content.

The second element 'what to learn' is emerging through co-creation. Model focuses on identification of future skills, the most important part of knowledge worker's competence. The hands-on exercise allows each respondent to find in a concrete manner skills area(s) which they personally view to be most important for himself/herself. Additionally, the co-creation tool identifies in simple manner skills that are according to the individual efficient to acquire, over more difficult ones. Knowing that lack of time is considered a significant challenge in adult learning, having a way to identify efficient learning opportunities is a benefit of the model.

The third element 'how to learn' is established through recognizing key characteristics, tools and principles of two key adult learning theories, andragogy and self-directed learning, via the theory part of this work. Through the responses it was visible that sample participants recognize a personal responsibility to update their knowledge for on-going career growth.

Further, it was clear that participants were already self-directed learners who, by definition, exercise full control over all learning decisions (Tough 1971). Knowledge basis clearly demonstrated that SDL delivers concrete strengths in successful career management and fostering long-term career success.

There is so much to do and learn, but individuals' resources are limited. Therefore, the proposed framework focuses in my view on most relevant aspects of the proactive management of career in the new world of work. What the model conveys to other knowledge workers is a concise knowledge basis on self-directed learning that hopefully facilitate and improve their own learning journey. The skills identification tool can be used iteratively. Learning and future proofing yourself is a constantly changing and evolving phenomenon that should be led. The framework hopefully cultivates this for the mid-career knowledge worker individual.

5.3 Ethical and privacy issues of the development work

The ethical issues of this development work were considered before the work commenced, during the work and after. Identifying and recruiting potential respondents occurred according to selected sampling technique, which ensured it was done ethically and not randomly. Participation in development work was based on voluntariness. Each potential respondent was informed about the development goal, development method (face-to-face Team interview) and purpose of the collected data. Also, the fact that finished work will be published in Theseus website was shared with them. Each respondent gave informed verbal consent to participate in it. They did not know who else was going to be interviewed, only the total number of interviews to be done. It was important the work was made with high moral standards and honesty. Especially, when the development work was done with a small number of individuals who shared their own individual story with me. Anonymity, a cornerstone of research ethics (Oliver 2003, 77) and confidentiality of the results were promised to each interviewee beforehand. At the start of the interview a permission to record interview was asked, and only then recording took place. At the end of interview participants were asked if they have any questions or concerns, to evade possible uncertain feelings. Further, none of the respondents requested to receive the transcript, hence they were not shared.

Data privacy issues were discussed in more detail in chapter 3.2.3. Thesis data will be archived in a personal computer and USB-drive for next 6 months. The development work raw data will not be made public or shared.

5.4 Areas for further development

The development work consisted of two parts:

1. Theoretical framework assisting knowledge workers to become more future proof by providing the individual with a conceptual knowledge model i.e., adult learning theories.
2. Hands-on skills identification tool at its initial phase, as beta version, that was tested and further co-created with the participants.

In my view, especially the skills identification tool has got potential to be improved through iteration and further development.

First most noticeable development aspect is the size of data sample that is used in the tool. In current beta version the tool is used by an individual, for his/her own purpose. It does provide visibility to the future areas of improvement; it does provide a possibility for own reflection and action planning. This was the very purpose of this development work.

The tool can also serve a bigger purpose. The tool can be used in different angles: company, team, industry, private life as a person or family unit, and so forth. The tool could be used by companies to identify the views of its workforce towards skills development and use the results to tailor training programs, for example, on areas that are showing highest importance among staff. Instead of involving lengthy development discussions, a workforce of any size could quickly input their opinions into the tool and company would immediately gain understanding of the situation and develop action points. On team level manager could ask subordinates to perform the rating and with results for example identify areas that his/her team considers to be important and in which the manager possible performs low. In which case the manager could consider improving his/her own skills to become a better manager. Additionally, the tool can be enhanced with a multitude of different data filter topics, for example industry, and to perform large scale data collection. Industry information could be benchmarked to understand future trends and read emerging weak signals in terms of people's mindset as well as skills expectations. These examples are just a small part of all the different ways the tool could be used, once enhanced, and developed.

On more operational aspect the presentation of the tool can and should be improved in the next iteration. How the tool was set up in the development work was not visually optimized, it used MS Excel. Instead, more advanced and more interactive tool such as MS PowerBI could be very beneficial for easier understanding of the results and comparison of data. Another concrete idea for development.

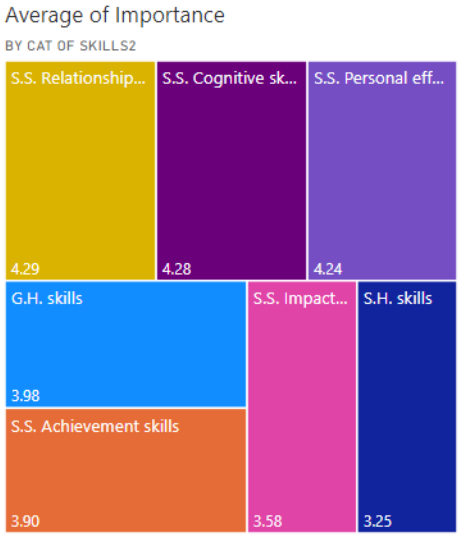

Figure 12: Development idea for more visual presentation of skills identification tool

5.5 Own reflections on development work process

The whole development work process followed organically and unassisted the Double Diamond process flow of Discovery, Define, Development, and beta version Delivery. The Discovery and Define phases took longer than anticipated, as the amount of secondary data was enormous. It took time to comb through it and define what was relevant for the development task. Development phase was satisfying to execute. Qualitative interviews yielded very good insights about knowledge workers' experiences, perceptions, and recollection of events. The thematic analysis allowed identification of recurring points of view, and many themes did emerge. Especially the validation of skills identification tool usefulness through positive feedback from participants was extremely rewarding. Participants expressed through their opinions that the tool was perceived useful, easy-to-operate and simple enough product to assist them to understand more of what to learn in the context of FOW. Something that was not an important part of the original model became a key element through co-creation experiences. After Development phase the Delivery in a form of proposed framework became naturally. Naturally, this is the moment when yourself as an individual feel most vulnerable. As a creator I have not deployed a project for a partner company. I have created a conceptual model arriving from my own ideas, visions and premises about what is important in the Future of Work for mid-career knowledge worker. Like myself.

As the concluding claim of this thesis, I hope my model will have its second life in the future when someone else will iterate the process and arrive at the outcome phase with an improved version of my model.

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Figures

Tables

Appendices

Appendix 1: Interview structure and questionnaire

Welcome

Show structure of Interview Miro board

Background - Respondent level Information

A) Gender
B) Name
C) Highest level of formal education
D) Years in work life
E) Employment status (employee, entrepreneur, full/part time)
F) Occupation
G) Years in current role
H) Own definition of Knowledge Worker

THEME 1 - PAINTING THE SCENE FOR MID-CAREER KNOWLEDGE WORKER / STRATEGIC VISION

1. What drivers of change do you see that affect the FOW for knowledge workers?
2. Considering all the changes around us, how does the FOW look to you compared to now?
3. Where will you be working in 10 years' time, in what type of role, in what type of work set-up?

Show Future of Work slide

4. Are you concerned about your own employability and skill set in relation to FOW?
    1. If yes, in what aspect there is a concern?
    2. If no, the effect of change seems to be significant according to several studies? Why are you not concerned?

THEME 2 - WHAT SHOULD BE LEARNED? / IDENTIFICATION OF REQUIREMENTS

Excel exercise

1. In general, what skills are important to future-proof knowledge workers? Could you rate each skill in range 1-5? (1 very unimportant, 2 unimportant, 3 neutral, 4 important, 5 very important)
2. Considering your current work life, would you say it would be easy or hard to acquire these skills? (1 being easy, 2 hard)

show results

3. What are your thoughts regarding the results?
4. Do you get encouragement from your current employer to acquire any of these skills?

THEME 3 - HOW SHOULD BE LEARNED / IMPLEMENTATION OF INDIVIDUAL DEVELOPMENT NEEDS

- Think back to a time when you identified a professional learning need, what can you tell me about what triggered that experience?
- What are the challenges in adult learning in your opinion?
- Thinking what we discussed about the FOW, drivers of change and future requirements of skills, what concrete actions will you plan or need to take to best manage for the changing world of work and future proofing your knowledge worker self?

Wrap up

Thank you for participation

Appendix 2: Skills Identification tool workbook

Skills of Future	Importance	Range of Importance	Effort	Range of Effort
Environmental awareness		1 Very unimportant		1 Easy
Foreign languages		2 Unimportant		2 Hard
Technology use, monitoring and control		3 Neutral		
Creativity and innovative thinking		4 Important		
Self-control		5 Very important		
Relationship skills				
Information exploring and managing				
Conceptual thinking / Strategic thinking				
Impact / Influence others				
Economic awareness				
Adaptability / Flexibility				
Negotiation / Persuasion				
Job specific technical abilities				
Legislative and regulatory awareness				
Systems analysis and evaluation				
Emotional intelligence				
Planning and organizing				
Career management / Self management				
Resilience / Stress tolerance				
ICT skills/e-skills				
Physical abilities				
Ethics / Social responsibility / Integrity				
Collaboration and teamwork				
Developing others				
Commercial / Organisational awareness				
Efficiency				
Autonomy				
Job specific knowledge abilities				
Concern for order, quality, accuracy				
Leadership and social influence				
Self-efficacy / Self-confidence				
Active learning / Motivation to learn				
Service orientation / Customer handling				
Analytical and critical thinking				
Communication				
Problem-solving and decision-making				
Conflict resolution and negotiation				
Achievement orientation				

Appendix 3: Results summary of categorized skills groups

Category of Skills	Skills of Future	Values Av. of Importance	Values Effort
G.H. skills	Economic awareness		
	Environmental awareness		
	Foreign languages		
	ICT skills/e-skills		
	Legislative and regulatory awareness		
	Physical abilities		
	Systems analysis and evaluation		
	Technology use, monitoring and control		
G.H. skills Total			
S.H. skills	Job specific knowledge abilities		
	Job specific technical abilities		
S.H. skills Total			
S.S. Achievement skills	Achievement orientation		
	Autonomy		
	Concern for order, quality, accuracy		
	Efficiency		
	Information exploring and managing		
	Problem-solving and decision-making		
S.S. Achievement skills Total			
S.S. Cognitive skills	Active learning / Motivation to learn		
	Analytical and critical thinking		
	Career management / Self management		
	Conceptual thinking / Strategic thinking		
	Conflict resolution and negotiation		
	Planning and organizing		
S.S. Cognitive skills Total			
S.S. Impact and influence skills	Commercial / Organisational awareness		
	Developing others		
	Impact / Influence others		
	Leadership and social influence		
S.S. Impact and influence skills Total			
S.S. Personal effectiveness skills	Adaptability / Flexibility		
	Creativity and innovative thinking		
	Resilience / Stress tolerance		
	Self-control		
	Self-efficacy / Self-confidence		
S.S. Personal effectiveness skills Total			
S.S. Relationship and service skills	Collaboration and teamwork		
	Communication		
	Emotional intelligence		
	Ethics / Social responsibility / Integrity		
	Negotiation / Persuasion		
	Relationship skills		
	Service orientation / Customer handling		
S.S. Relationship and service skills Total			
Grand Total			