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Developing Guidance for Approaching a Professional Job/Thesis Project in Business Informatics

Metropolia University of Applied Sciences

Master's Degree

Degree Programme in Business Informatics

Master's Thesis

26.05.2024

Abstract

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Title:	Developing Guidance for Approaching a Professional Job/Thesis Search in Business Informatics
Number of Pages:	97 pages + 5 appendices
Date:	26 May 2024
Degree:	Master of Business Administration
Degree Programme:	Business Informatics
Instructor:	Zinaida Grabovskaia, PhL, Senior Lecturer

This Master's thesis focuses on developing a guidance for approaching a professional job/thesis project in Business Informatics (BI) on the example of international Master's students searching a job/thesis project in the field of BI.

The case organization is a Master´s Programme at one of Finland's most prestigious Universities of Applied Sciences. Even though the case organization has a range of current guidance on approaching a professional job/thesis project, practice reveals that Master's students, especially those unemployed and of foreign origin, may find it difficult to find a job or thesis project, and the documented guidance is currently missing within the case organization, on how to do it.

This study followed the Applied action research strategy supported by qualitative research methods as this involves developing a solution for an existing problem where the solution can be immediately applied in the practical world. After constructing the conceptual framework based on the literature review, the current state analysis is done that identified the limitations of the currently available guidance. The proposal is built focusing on the four key areas identified in literature review, namely, understanding BI as a professional area, exploring industry needs and job markets, understanding employability and its ways and the best practices in approaching a job/thesis project. The proposal is based on the data obtained from interviews with stakeholders, responses to a questionnaire, and combined with the literature findings and CSA data to build a "Self-help guide".

The outcome of this study is a set of guidelines on approaching a professional job/thesis search in BI, in the form of a self-hep guidance book. The outcome is significant for the case organization, as it should help to Master's students in BI when approaching a professional job/thesis project.

Keywords: Business Informatics, Industry needs, Employability, Best practices in job searching

Contents

1 Introduction

Migration and mobility of international talents have become significant factors for the growth and internationalization of organizations in Finland. Finland`s aging population is increasing and the working-age population is decreasing, leading to a labour shortage in the labour market, especially in the future. Currently, the population growth of the country is mostly based on immigration. According to an article published by Statistics Finland in September 2021, in 2021, 62% of people in the population are working age. Further, the projections state that, the percentage will decrease to 60% by 2040 and to 57% by 2060. Finland will get 20,000 foreign migrants this year and 15,000 migrants annually after that (Statistics Finland, 2021). Therefore, the government has taken important steps to boost the migration and retention of international talent in Finland (Ministry of Economic Affairs n.d., Talent Boost Programme). Amendment of law to ease entry and retention of international students (came in force on 13.04.2022; Ministry of Economic Affairs 13.04.2022) and the Talent Boost Program are examples of major initiatives on the government level. With the ease of immigration law for international students in April 2022, a record number of students moved to Finland marking a 54% growth compared to the previous year 2021, and this trend is expected to grow further. (Finnish Immigration Service 2022, A recorded number of international students move to Finland 2022).

Even though the country is experiencing positive outcomes in terms of attracting more international talent to counteract the looming labour shortage, it may still be quite challenging for international students to find employment in their profession in Finland. According to FINNWARDS (Minna 2021), out of all the international students in UASs in Finland, the second highest number of students are in the business field, while the ICT field stands first. Although finding a job may be difficult for all newcomers, students´ experiences show that the challenges of finding a professional job may be even tougher for business students than for ICT/engineering students. This may be due to the reason that most of the ICT jobs do not require fluency in Finnish language whereas most of the jobs in the business field need fluency in oral and written skills of Finnish language. For students finding a job is important as both, getting work experience in Finland as well as financial support while studying, and a student visa allows for 30 hours of work per week (since 13.04.2022).

Furthermore, the job search is important for international students not only for the sake of future occupation, but as part of the study process. For example, there is a requirement for Master's students in many Finnish UASs (including the Master's degree program in BI in Metropolia) that students are recommended to do a thesis project for a real-life company. This requirement pertains to the fact that Universities of Applied Sciences prepare the future workforce for the industry (unlike Finnish Universities that prepare their students for careers in teaching and research), and therefore the Finnish UASs foster industry connections right from the start. It leads to the situation when international students need to find a thesis project (ideally, a job) at a real-life company so that to successfully graduate. Considering the difficulties for the students to find a job/thesis project in Finland (e.g. due to language and other challenges), students will benefit from detailed, documented guidance on how to find a place for themselves in the Finnish job market. This Thesis takes up this challenge on the example of job search in the area of Business Informatics (BI).

This study investigates what is necessary to know for students & how to approach a professional job/ thesis project in Finland, particularly in the areas of BI. The thesis explores this topic on the example of the international Master's students at the Master´s Programme in Business Informatics at Metropolia UAS. The Thesis aims at developing effective guidance for them as self-help in finding a professional job/thesis project.

1.1 Business Context

The case organization of this thesis is Metropolia University of Applied Sciences located in Helsinki, Vantaa and Espoo, it is Finland's largest University of Applied Sciences among its 22 UASs (Study in Finland 2024). It offers studies in four fields, Business, Healthcare and Social Services, Culture and Technology. It has over 17,188 students with more than 1,000 experts in 2023. It was the most popular UAS in Finland in terms of applicants in 2022: 3.48 first choice applicants per study place in 2022. The university runs 76 degree programs, of which 17 are in English. (Metropolia, 2023).

The case unit of this thesis is the Master's degree program in Business Informatics (established in 2011) which consists of students with both business and IT/engineering backgrounds.

1.2 Business Challenge, Objective and Outcome

International students arriving in Finland come with the expectation to integrate and find a professional job during or after their studies. However, they face many challenges in this effort and a considerable part of students may eventually end up engaging in low-skilled jobs such as cleaning, restaurant work, newspaper/mail distribution, and food delivery. This is perceived as a waste of talent and creates a challenge for both, the students themselves and also for their learning organizations. It points to the need for a strong and field-specific orientation *for the job/thesis search* rather than a generalized, *one-size-for-all* approach. However, currently, the case unit of this Thesis is missing such documented guidance, nor any such guidance is available as a separate document in the case organization.

Accordingly, the objective of this thesis is *to develop guidelines for international Master´s students for approaching a professional job /thesis project search in the BI area in Finland* (on the example of the professional area of the case unit). The research questions will be: What kind of guidance should be created, so that the international Master´s students would know how *to* approach, in a step by step, practical way, a professional job/thesis project search in the BI area when studying in the BI Master´s program.

The expected outcome of the thesis is *a documented guidance for Master´s students in the BI area on how to approach a professional job/thesis project search when studying in the BI Master´s programme.*

1.3 Thesis Outline

The thesis scope is focused on international students who study in the Master's degree program in Business Informatics. The objective is to provide them with well-documented, field-specific guidelines on finding a professional job/thesis project in the area of BI to have an effective orientation for them at the start of their studies.

The study is conducted by initially focusing on the literature and best practices review to obtain background knowledge. It is followed by conducting the current state analysis to identify the current practices of the students, and the case organization. For this end, data collection is done by interviewing, issuing a questionnaire and examining the internal documents, systems and resources available at Metropolia. Then, in the next

stage, based on the gathered knowledge and data, a set of guidelines is built up with the collaboration of staff members at the case unit, on how to approach the search for a professional job/thesis project. The final guidance is created based on the validation discussion with key stakeholders. Based on that, the final proposal is produced as a well-documented guidance package.

This thesis is written in seven sections. Section 1 describes the introduction to the thesis by explaining the business challenge, thesis objective and outcome. Section 2 provides information on the research approach, research design, data collection and analysis methods used in the study. Section 3 explores the literature on existing knowledge and best practices about understanding BI as a professional area, exploring industry needs & job markets, understanding employability, and learning from available guidance best practices. Section 4 reports on the results of the current state analysis of the current practices of the students with success stories, and what is currently available guidance at Metropolia. Section 5 presents the development of the initial proposal for the guidelines. Section 6 reports on the validation and incorporate such feedback for the final set of guidelines. Section 7 concludes the thesis by providing a summary and discussing the results of the study.

2 Method and Material

This section addresses the research method and material used in the study. The section starts with inducing the research approach, and research design, and then followed by methods of data collection and data analysis used in this study.

2.1 Research Approach

There are diverse research families in research. According to the purpose of the study, research can be divided into Basic (Fundamental) and Applied research. Basic research focuses on improving the understanding of a specific phenomenon or discipline and it does not produce findings that have immediate applications. Whereas Applied research aims at finding practical solutions for an existing problem facing society or an organization and it generates findings that have practical application. (Dudovskiy n.d.).

Based on the methods of data collection, research can be categorized into Quantitative and Qualitative or Mixed. Quantitative research involves collecting and analyzing numerical data to examine the relationship between variables (Saunders et al. 2012, 162). Qualitative research uses various data collection methods and analytical procedures and thereby develops a conceptual framework with qualitative data to study participants' meanings and relationships between them. (Saunders et al. 2012, 163). Additionally, based on the type of data used in research, there may be two approaches to research; Field study and Desk study. Field study involves primary or new data collected through primary data collection methods such as surveys, interviews, observation, etc. and desk study is based on dealing with secondary data obtained through previously conducted studies. (Dudovskiy n.d.).

There are also several *research strategies* based on different research traditions. Experiments and surveys are connected with quantitative research, while archival research and case study strategies are used in both quantitative and qualitative research or in mixed approaches. Ethnography, Grounded theory, Narrative inquiry and Action research exclusively deal with qualitative research. (Saunders et al. 2012, 173.) In addition to that, Applied action research (Design research), a fresh alternative to the action research strategy also relates to qualitative research. Applied Action research aims for development or change (Kananen 2013, 9) where there is a phenomenon, a

process or a situation that the researcher wants to improve via development of change (Kananen 2013, 13). The objects often come from the world of work where the thesis research is employed or in training. Applied Action research does not have its own methodology, and it is a group of different research methodologies that are being used depending on a situation or an objective for development. Applied Action research is often a blend of qualitative and quantitative research (Kananen 2013, 13 & 20.)

Finally, the above research families and strategies use different research methods. Quantitative research uses questionnaires with closed-end questions, structured interviews and structured observations, and it analyses the data using statistical methods such as correlation and regression, mean, median, etc. Qualitative research utilizes interviews, questionnaires, workshops, observation, focus groups, games, role play, case studies, etc. All these methods can be both, primary data collection methods and secondary data if gathered indirectly, from available studies through books, journals, newspapers, magazines, online portals, available or open data collections, etc. (Dudovskiy n.d.)

This thesis comes under the Applied action research strategy as this involves finding a solution for an existing problem where the solution can be immediately applied in the practical world. The objective of this thesis also includes the development of field-specific outcomes (here, guidelines to find professional job/thesis project for international Master's students in the BI area). By developing the guidelines, the thesis researcher aims to improve the current situation and thus bring change to the current practice. This thesis uses a multi-method qualitative approach with a variety of qualitative methods such as interviews, questionnaires and document analysis.

2.2 Research Design

The research design of this thesis consists of five steps, as shown in Figure 1 below. As shown in Figure 1, the research design starts with step 1 of setting the thesis objective. At this stage, the business problem is identified and the objective is formulated.

Next, Figure 1 illustrates each step and utilized data resources as well as outcomes at each step.

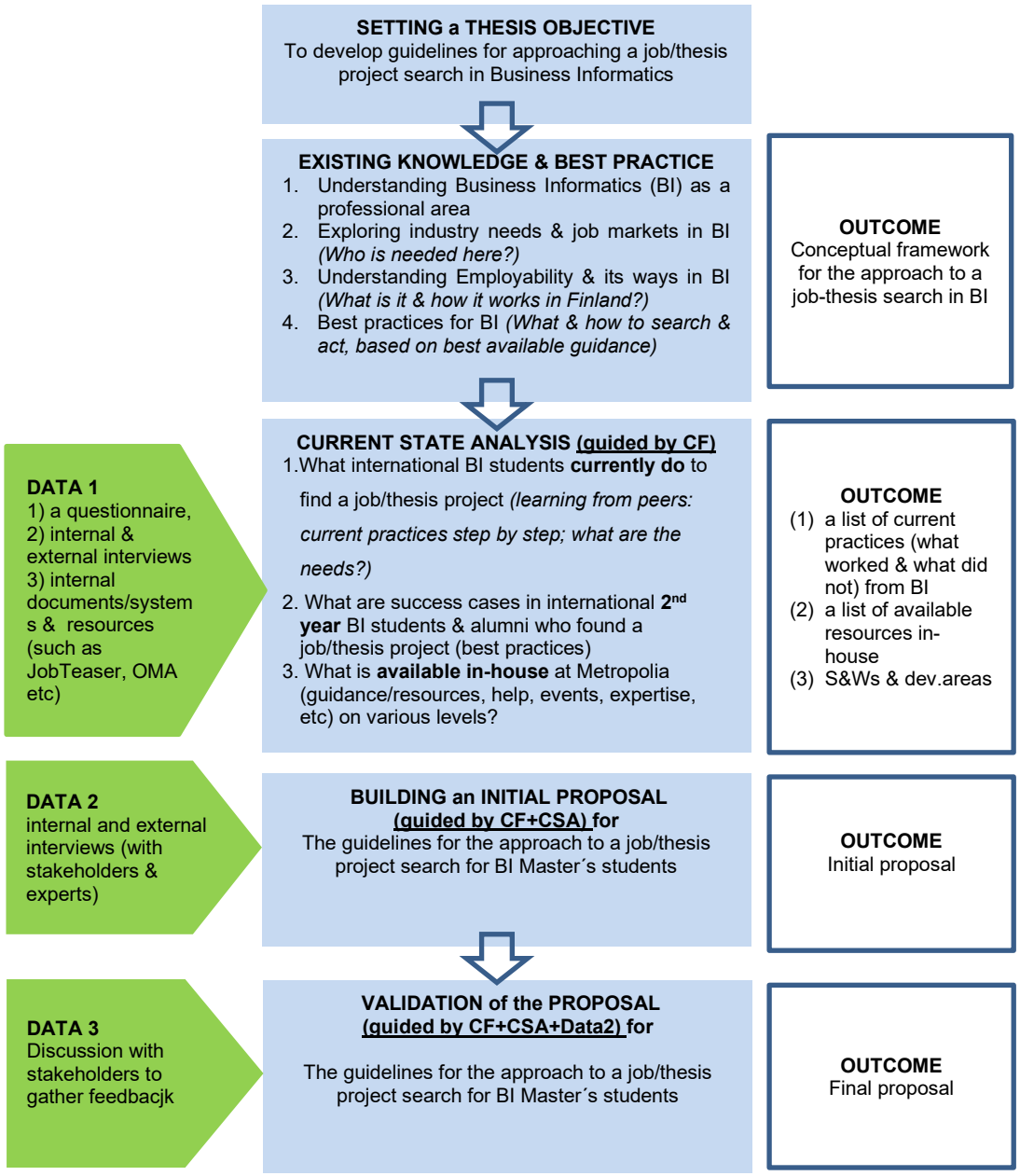


Figure 1. Research design of this thesis.

In step 2, literature and best practices review is conducted for existing knowledge and best practice in relation to: 1) understanding the BI professional area; 2) methods for exploring industry needs and job markets, particularly in the BI area, to identify what kind of business professionals are needed (to address the questions of what professionals are needed, and what kind of skills and talents they should possess), 3) the concept of employability and its ways, also in the BI area (to address the questions of what is the employability and how it works in Finland), and 4) exploring available guidance and best

practices on how to search, what to search for, and how to act when searching for a professional job/thesis project, also in the BI area. The outcome of this second step is a conceptual framework for guidance on the approach to a job-thesis search, especially targeted to the BI area.

After gaining knowledge on literature and best practices, in step 3, the current state analysis is done by analyzing the current practices in the case organization based on interviews, a questionnaire, and document analysis.

Step 4 is building the initial proposal on the guidelines for the approach to a job/thesis project search by international business students in the BI area. This step is done based on both outputs from the literature and best practice and the results from the current state analysis, as well as a new round of inputs from the internal stakeholders. The proposal is created in collaboration with stakeholders. For this step, Data collection 2 is gathered and analyzed in the form of discussions with the stakeholders.

In final step 5, the validation of the proposal is done by conducting a discussion with the stakeholders and the outcome of the validation discussion is gathered as input for building the final proposal. Based on the feedback and discussions, the final version of the guidelines is produced.

2.3 Data Collection and Analysis

This thesis is based on several data sources. Data was gathered and analyzed in three main data collection stages and they are shown in Table 1 below.

As shown in Table 1 below, Data 1 was collected to conduct the current state analysis to identify current practices at the case organization. This data collection came from interviews with faculty and students, a questionnaire and the analysis of internal documents/ resources available at the case organization.

The stage 2, collecting Data 2 was conducted for developing the initial proposal and for this, data was gathered by conducting interviews/ discussions with the stakeholders at the case organization.

In the third stage, Data 3 was collected when validating the initial proposal, by getting feedback by having discussions with the stakeholders.

As seen from Table 1 below, Data 1 for the current state analysis included 11 in-depth interviews with 2nd year international students in BI program, to explore the current practices they follow in searching for a professional job/thesis project and the success stories of those who were successful in finding the same. Additionally another 2 interviews were conducted with staff members who are experts in the field.

Data collection 1 (Data 1) was gathered and analyzed in relation to the following. 1) What 2nd year international students in BI program currently follow to find a professional job/thesis project? 2) What are the success cases in 2nd year BI international students and who found a professional job/thesis project? 3) What guidance they expect more? 4) What is available in-house at Metropolia on various levels?(guidance, events/programs, help, resources, expertise, etc.). Data is gathered in the form of 1) Internal interviews with the international students in BI program and staff members 2) A questionnaire/survey with the students 3) Internal documents and resources at Metropolia (Job teaser, OMA, etc.). The outcomes of this step are a list of current and best practices, the available guidance/resources/tools in-house, and the identified strengths, weaknesses and development areas.

Table 1. Details of Data collections 1-3 used in this study.

	Participants/role	Data type	Topic, description	Date, length	Documented as
	Data 1, Current state analysis				
1	Interviews with the students: - intern. 2nd year students	Online interviews 11	What internl. **2nd year** BI students **currently do** to find a job/thesis project (learning from peers: current practices step by step; what are the needs?) What are success cases in internl. **2nd year** BI students who found a job/thesis project (best practices)	March 2024, 30 -45 min each	Recordings & Field notes
2	A questionnaire with the students	Google form questionnaire	What internl**. 1st and 2nd year** BI students **currently do** to find a job/thesis project (learning from peers: current practices; what are the needs?)	March 2024	

3	Internal interviews with staff members	Online Interviews 2	What is **available in-house** at Metropolia (guidance/resources, help, events, expertise, etc) on various levels?	April 2024, 30-45min each	Recordings & Field notes
	Data 2, for Proposal building				
4	Internal interviews	Online Group interview 1	Development of guidance	May 2024	Recordings & Field notes
	Data 3, from Validation				
5	Feedbacks internal discussion/meeting	Online interview 1	Validation, evaluation, and final improvements	May 2024	Recordings & Field notes

In the CSA, the main source of data was in-depth interviews conducted with relevant stakeholders at each data collection stage. Interviews were conducted as online interviews and interview questions were mostly open-ended. Interviews were documented by recording them and taking field notes following the GDPR guidelines. Interview questions can be found in Appendix 2.

As shown earlier in Table 1, Data collection 2 involved a group interview with the relevant staff members at Metropolia, to obtain their ideas, suggestions for developing the initial proposal. In Data collection 3, one validation discussion was held with internal stakeholders.

In addition to the in-depth interviews, a questionnaire was issued to international students in business field in BI program, in order to collect data for the current state analysis. This was done in Data collection 1 stage and the questionnaire can be found in Appendix 3.

All textual data collected in three data collection stages were analyzed using Thematic analysis and based on that, the current state analysis is done. Findings from the current state analysis are discussed in Section 4 below.

3 Available Knowledge and Best Practice for Approaching the Job/ Thesis Project Search in Business Informatics

This section discusses available knowledge and best practice related to developing the approach to a job/thesis project search in Business Informatics. This section is divided into four parts. The first one focuses on identifying Business Informatics (BI) as a professional area. The second section explores the industry needs and job markets in BI. The third one investigates understanding employability and its ways in BI. The fourth section addresses the best practices for BI.

3.1 Business Informatics (BI) as a Professional Area

There are many definitions of Business Informatics as a professional field. According to Weber et al. (2022), "*Business Informatics* a sub-field of applied informatics, is an interdisciplinary field combining informatics and business management. It deals with the design and application of information systems in business contexts" (Weber et al., 2022).

Paul et al. (2023) define Business Informatics as "the combination of Management and Information Technology for better information and technological solutions for organizations and business houses. Business informatics combines and complements clearly the areas of informatics and business field studies. Informatics is fundamentally concerned with the technology of information and communication systems, while business studies aims on management functions".

According to Helfert, (2008), "Business informatics focus on supporting business activities by applying informatics principles and technologies. Business informatics focuses on the concept, development, implementation, maintenance and utilization of business information systems".

Lantow et al. (2021) believe that "*Business Informatics* is the scientific discipline combining computer science, business administration and information technology, and investigating related phenomena in their socio-economical context, including companies, organizations, administrations, and society in general. As a field of study, it is closely related to the fields of management science, organizational science, computer science, systems engineering, information systems, information management, social science, and economics information science". (Lantow et al., 2021)

Summing up, it can be said that, Business Informatics is a combination of information and communication technology and business fields. It is concerned with designing and utilizing information and communication systems within a business organization, to support and manage its business functions.

3.1.1 Master's Degree Programs in Business Informatics

Business Informatics has been taught at German Universities since the 1970s and is usually assigned to the faculties of Economics (Weber et al., 2022). The following table shows some of the Master's degree programs in BI offered by the universities in the European Union (EU) region.

As an example, these programs describe themselves in the following way (just as an example, as a random choice of program).

Table 2. Master's degree programs in BI offered by the universities in EU region (based on each university's program details.

Program	University	Focus of the Program
MSc in BI	Rostock University, Germany	Deals with developing, applying and using information and communication systems in business. (www.informatik.uni-rostock.de, n.d.)
MSc in BI	Reutlingen University of Applied Sciences, Germany	Deals with the conception, design, construction and application of computer-supported information and communication systems in organizations. (www.reutlingen-university.de, n.d.)
MSc in BI	Offenburg University of Applied Sciences, Germany	Focus on business analytics together with data science, advanced business intelligence and applied artificial intelligence as well as the support of business processes through operational information systems such as ERP systems (www.hs-offenburg.de, n.d.)
MSc in BI	Goethe University, Frankfurt, Germany	Deals with Information Systems, Simulation, Artificial Intelligence, E-Business, Process and Supply Chain Management, E-Finance (www.uni-frankfurt.de, n.d.)
MSc in BI	Mannheim University, Germany	It combines aspects of Informatics like IT and programming with aspects of Business Administration (www.uni-mannheim.de,n.d.)
MSc in BI	Baden-Wuerttemberg Cooperative State University, Stuttgart, Germany	Special emphasis is placed on on utilizing IT solutions from an economic point of view (www.cas.dhbw.de, n.d.)
MSc in BI	Munster University of Applied Sciences Germany	Deals with knowledge of IT (e.g. mobile engineering, big data, and IT management) and business (e.g. controlling, accounting, and organizational psychology), enabling to design and develop software, while understanding the business logic behind it as a business IT specialist. (en.fh-muenster.de, n.d.)
Masters in BI	University of Fribourg, Germany	Focuses on information management and decision support, computer science, and management. (www.unifr.ch, n.d.)

MSc in BI	University of Applied Sciences Emden-Leer, Germany	Emphasis on design and management of processes in the area of organizational development, software development, implementation, system operation and the management of relevant IT projects. (www.hs-emden-leer.de, n.d.)
Masters in BI	Dauphine University, Paris, France	Focuses on mastering software tools and gain a clear understanding of corporate organization and operations. (Dauphine-PSL Paris, n.d.)
MSc in BI	Vienna University of Technology, Austria	Consider business informatics as an engineering discipline, which mainly dedicates itself to analyzing, designing, implementing, and evaluating information systems in organizations (TU Wien Informatics, n.d.)
Masters in BI	Riga Technical University, Latvia	Aim is to prepare professionals with expertise in systems thinking and engineering sciences who are able to use, choose, develop, and acquire ICT solutions that enable enterprise development, designing information systems and project management (https://www.rtu.lv, n.d.)
MSc in BI	Utrecht University, Netherland	Focuses on the design and use of theories, methods, techniques, and tools from information and computing sciences, and on the application of these in business and organizational domains (www.uu.nl, n.d.)

Table 2 shows that, almost all the Master's degrees in BI in EU region shown here are Master's of Science degrees. Based on the BI program details of most universities, it can be mentioned that, their main focus is on to produce BI graduates who are experts in information systems and software tools, development and implementation and management of them in business organizations. Examples are; Reutlingen University of Applied Sciences, Germany, University of Fribourg, Germany, University of Applied Sciences Emden-Leer, Germany, Vienna Riga Technical University, Latvia University of Technology, Austria, Riga Technical University, Latvia and Utrecht University, Netherlands. Some universities such as Vienna University of Technology, Austria and Riga Technical University, Latvia directly emphasize their focus on BI Master's program from an engineering perspective. Offenburg University of Applied Sciences, Germany highlights its focus on business analytics, whereas other universities' programs show a balance of both IT/engineering aspects and business aspects.

3.1.2 Areas Included in Business Informatics

As discussed in Section 3.1, BI consists of both aspects of Information Technology and the business fields. Therefore, areas that fall under the domain of BI involve the intersection of business administration and information technology.

According to Bergener et al. (2019), BI should include the following areas as shown in Figure 2 below.

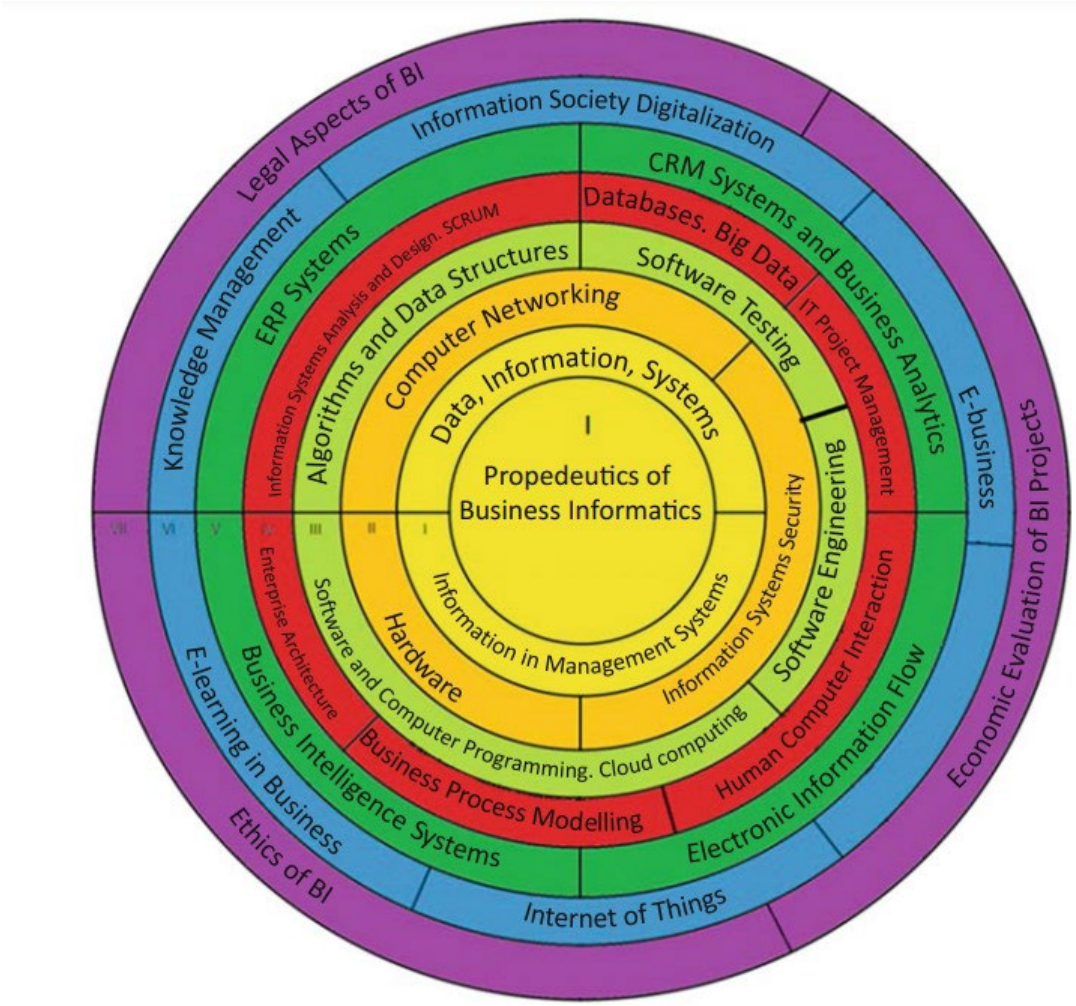


Figure 2. The structure proposed for Buisness Infirmatics as an acedemic discipline (Bergener et al., 2019).

Weber et al. (2022) defined BI as “a formation from economics and computer science, deal(ing) with the Information and Communication Systems (ICT Systems) used in the business. That means, design and implementation of ICT systems in business organizations”. It further explains that ICT systems deal with processing and communicating information, and one important goal of BI is to set up these ICT systems in companies and administrations in such a way that their application is efficient and profitable. Here, BI considers the technical components i.e., hardware and software of computers and networks and looks at the tasks that ICT systems can perform. These include applications in accounting, sales/distribution, HR and management (Weber et al., 2022).

Another main aspect of BI is *Information Systems*. Information systems are work systems, whose processes and activities are totally devoted to processing information through activities that include capturing, transmitting, storing, retrieving, deleting, manipulating, and displaying information (Alter, 2013). According to Hertfelt (2008), BI is not just a new term, but instead offers an engineering-oriented stream on information systems. In a history-based examination of BI done by Heinrich and his team (Heinrich and Riedl, 2013), they reported that “Based on an interpretive analysis of the data, we find that the design of information systems is deeply rooted in BI's history, and our results also show that there have always been close relationships with practice. As a consequence, we conclude that the success of BI as an academic community is inseparably associated with systems design, implementation, and engineering” (Heinrich and Riedl, 2013).

Business analytics is another important area in BI. Business analytics refers to technologies, systems, methods, and applications that capture, process, and analyze huge data to enable decision support or automation that adds value to the business (Weber, 2023). Paul et al. (2018) report that Big Data and its importance are rising due to several issues. First of all, the increasing number of data and contents, and the data in the right form and the right time to the right place. Hence in the context of BI, Big Data and Analytics play a leading role in managing a large amount and complex data.

Business intelligence is related to an accurate use of the data collected at a large scale. The main aspects of this adequate management is the accessibility and legibility of knowledge where available, and the creation of knowledge by automated or supervised processes (Marchand-Maillet and Hofreiter, 2014). Vít Pászto et al. (2020) describe that BI consists of two major areas which are developing separately but are closely related and also to some extent integrated within information systems architecture in organizations. The first area is *business solutions* as core information systems for support of business operations. The second area is *business intelligence*.

In addition to the above, Paul et al. (2018) also point to the associated areas of BI as follows: Enterprise Resource Planning, E-Business, E-Commerce, Digital Marketing and in respect of management, IT Governance, IT Policy, IT Management, Information Administration, and Information Management.

After getting an understanding of BI as a professional area, then the focus should be on exploring the industry and identifying what are the current industry needs and trends and analyze about the job market which will be discussed in section 3.2.

3.2 Exploring Industry Needs and Job Markets in BI

Analyzing the current job market and the industry and identifying industry and job market needs and trends is essential in job searching. The job market can be defined as the setting where job seekers can be identified as the supply for the market and the job vacancies offered by employers/companies can be identified as the demand (Eurofound, 2021). Understanding how the job market works for a particular industry and analyzing the current industry requirements and what skills employers require is a key to successful job searching. It results in better alignment between the applicant's skills and the employer's requirements.

3.2.1 What kind of Professionals are Needed in the Labour Market

Eurpean Commission's report on "2030 Digital Decade" (2023) reported that "As reliance on digital technology increases, the workforce must keep up with the evolving skills demand and the objective of regaining leadership. While the number of ICT specialists employed in the EU is growing, so is the number of companies operating in the ICT sector, and a majority of companies looking for ICT specialists continue to report substantial difficulties in recruitment. The lack of available staff with the right set of skills is hampering investments for 85% of EU firms, with SMEs struggling more often in filling ICT vacancies" (2030 Digital Decade, 2023, p.26).

The EU Commission (in its "Staff Working Document: Strategic Dependencies and Capacities", 2021) that accompanied "Updating the 2020 New Industrial Strategy by European Commission", highlighted that EU may face certain challanges in comparison with other global competitors for several high-tech skills relevant to some technologies as follows. Particular technologies where the EU's competitive position appears to be weaker compared to its global commercial competitors. Among those technologies are AI, High Performance Computing, Big Data, and Cloud. They further suggested that these key technologies in the digital ecosystem deserve particular attention as key

enablers and sources of transformation for many other ecosystems" (EU Commission Staff Working Document: Strategic Dependencies and Capacities, 2021).

A study prepared by a research team of Center for European Policy Studies (CEPS) for the Employers' Group of the European Economic and Social Committee reported the following findings. Broader application of ICT and new digital technologies such as data analytics, artificial intelligence (AI), cloud computing, Internet of things (IoT) and robotics are changing the labour markets. As previous industrial revolutions led to clear welfare gains and more jobs, digital skills will be in high demand in the labour markets of the future, and it creates new forms of employment. For instance, with the broader application of ICT and new digital technologies such as big data analytics, automation, virtual reality, artificial intelligence, cloud computing and the Internet of things, allow for the development of new, more complex and sophisticated products and services and business processes. The jobs created by these new technologies predominantly require high skills. These include jobs such as data scientists, cloud architects and security analysts. (Impact of Digitalization and the On-demand Economy on Labour Markets and the Consequences for Employment and Industrial Relations, 2017.)

A conference paper done on Digital Competencies in Business Informatics Curriculum by Tumbas et al. (2019) described: "Major developments in the labour market are caused by the development in information and communication technology. With cloud computing, mobile technologies, massive amount of data, social media, intelligent technologies (machine learning, internet of things, blockchain, big data, data intelligence) and software of all sorts, organizations rely more and more on well-qualified and highly-specialized IT professionals. Application of ICT in business changes the jobs, at the same time creating demand for complementary ICT skills" (Tumbas et al., 2019).

Summing up, with the wide application of ICT and innovative digital technologies such as big data analytics, automation, virtual reality, artificial intelligence, cloud computing and the Internet of Things(IOT), changes can be seen in current EU labour markets. Those advanced technologies have made it possible for more complex and sophisticated products and services. The jobs created with these new technologies require high skills. Therefore, employers need well-qualified and highly skilled specialists to perform their tasks. At the same time, employers face, it is highly challenging to find job applicants with such expertise.

3.2.2 Professional Role Profiles and their Relevant Competencies related to BI Professions

European Committee for Standardization (CEN) has developed European e-Competence Framework (e-CF), which describes the compentences in the ICT sector by developing European ICT professional role profiles. According to e-CF definition, ”Competence is a demonstrated ability to apply knowledge, skills and attitudes to achieving observable results” (European ICT Professional Role Profiles, 2023).

Among the 30 ICT professional profiles according to e-CF, there are profiles related to BI professions and those profiles are shown in Table 3 below. Further details on competences of each profession and their required proficiency levels can be found in Appendix 4.

Furthermore, European Commission has developed a kind of dictionary, describing, identifying and classifying professional occupations and skills relevant for the EU labour market and education and training which is called ESCO (European Skills, Competences, Qualifications and Occupations). It provides descriptions of 3,008 occupations and 13,890 skills linked to these occupations (ESCO, 2023). Out of the list, the professions related with BI and their relevant competencies listed by ESCO are shown in Appendix 5.

Table 3. BI Professional Roles based on e-CF (ecfexplorer.itprofessionalism.org).

Profession and Mission	Main Tasks	e-Competences	
Business Analyst Analyses the information and the processes needed to support business plans. Formulates functional and non-functional requirements of the business organization and advises on the lifecycle of the information solutions. Evaluates the impact in terms of change management.	1.Contribute to the preparation of the organization’s business plan 2. Analyse business requirements and design related processes 3.Support Digital Transformation, identifying areas for improvement in business processes 4.Provide possible ICT solutions compliant with the ICT strategy 5.Develop business cases related to the proposed solutions 6.Analyse required information and documents 7.Develop plan for continuity of operations	1.IS and Business Strategy Alignment 2.Business Plan Development 3.Information and Knowledge Management 4.Needs Identification	

Business Information Manager Aligns the Information System to the business strategy within their area/domain. Ensures continuous enhancement whilst accounting for user requirements, service quality and budgetary constraints.	1.Manage the information and communication technology development focused on user needs 2.Prepare for changes to the Information System influenced by technology updates or user needs 3.Formalise, consolidate and drive the development of the IS configuration 4.Evaluate the relevance of the Information Systems to users 5.Liaise between the user community and the IS infrastructure 6.Translate user requirements into functional specifications	1.IS and Business Strategy Alignment 2.Business Plan Development 3.Relationship Management 4.Business Change Management 5.Information Systems Governance	
Chief Information Officer Ensures the alignment of the Information Systems strategy with the business strategy. Provides leadership for the implementation and development of the organisations architecture and applications	1.Enable the company's digital strategy 2.Define and implement ICT strategy and ICT governance 3.Ensure the reliability, confidentiality, security and integrity of Information Systems 4.Ensure the quality and management of ICT customer-supplier relationships in particular contracts 5.Define and ensure compliance with Service Level Agreements 6.Ensure that ICT change management processes are implemented	1.IS and Business Strategy Alignment 2.Business Plan Development 3.Project and Portfolio Management 4.Relationship Management 5.Information Systems Governance	
Data Specialist Ensures asset protection through the provision of clean, consistent, quality assured data. Maintains the integrity of data, stores and searches data and supports presentation of data analysis	1.Define, build and optimise data models 2.Proactively protect confidentiality and security of data 3.Ensure data lifecycle support 4.Curate and archive data 5.Advise on appropriate data analytic methodology 6.Ensure data quality and integrity 7.Maintain data quality and compliance to legal standards	1.Application Design 2.Information and Knowledge Management 3.ICT Quality Management 4.Information Security Management	
Enterprise Architect Designs and maintains the holistic architecture of business processes and information systems. Maintains a holistic perspective of the organisation strategy, processes, information, security and ICT assets. Links the mission, strategy and business processes to the IT strategy. Ensures project choices are integrated consistently, efficiently and in a sustainable manner according to the enterprise's digital standards	1.Align digital and ICT strategies and planning with the organisation's business goals 2.Anticipate future business needs and plan for how architecture will support/enable it 3.Streamline business processes, functions, procedures and workflows and apply a consistent implementation approach 4.Manage stakeholder engagement in the development of new processes and systems and verifies feasibility 5.Conduct post-implementation reviews to evaluate benefits accrued from new processes and systems 6.Build and maintain standards and enterprise architecture model and principles, for example process mapping 7.Evaluate the impact of changes within the ecosystem of the organisation on the enterprise architecture	1.IS and Business Strategy Alignment 2.Business Plan Development 3.Architecture Design 4.Technology Trend Monitoring 5.Information Security Management	

Project Manager Defines, implements and manages projects from conception to final delivery. Responsible for achieving optimal results, conforming to standards for quality, safety and sustainability and complying with defined scope, performance, costs, and schedule. Deploys agile practices where applicable	1.Organize, coordinate and lead the project team 2.Maintain stakeholder engagement and communication 3.Supervise project progress 4.Coordinate, record and ensure quality compliance 5.Circulate and distribute information from the project owner 6.Ensure the project helps to support the organisation's wider goals 7.Comply with budgets and delivery times 8.Update the project according to changing circumstances	1.Product / Service Planning 2.Project and Portfolio Management 3.Risk Management 4.Relationship Management 5.Business Change Management	
Solution Designer Proposes and designs solutions in line with technical architecture which fit business requirements and support change	1.Examine and interpret business requirements 2.Establish solution intent 3.Align solution with technical architecture 4.Identify potential technical design risks 5.Supervise the built in quality 6.Operate within the budgetary framework to validate the financial impact of design decisions 7.Identify opportunities for innovation 8.Plan technology roadmaps	1.Application Design 2.Innovating 3.Information and Knowledge Management 4.Needs Identification	
System Analyst Analyses organisation requirements and specifies software and system requirements for new IT solutions. Ensures the technical design and contributes to the implementation of new and/or enhanced software provision. Provides solutions for the improvement of organisational efficiency and productivity	1.Analyse existing systems and business models 2.Recommend resolutions and improvements 3.Provide integrated solutions 4.Provide consolidate findings on components or processes 5.Author technical performance requirements 6.Ensure security by design 7.Maps and documents interfaces between legacy and new systems	1.Architecture Design 2.Documentation Production 3.ICT Systems Engineering 4.ICT Quality Management	

This table shows some BI professional role profiles obtained from the European ICT professional role profiles developed by the European Committee for Standardization in e-CF framework mentioned above. Those BI professions are Business Analyst, Business Information Manager, Chief Information Officer, Data Specialist, Enterprise Architect, Project Manager, Solution Designer and System Analyst. Each profession is provided with a job description, their main tasks and what kind of e-competences should be acquired, relevant to these BI professions. Refer to Appendix 2, for further details and proficiency level to be acquired on each e-competence.

3.3 Concept of Employability and Its Ways

Understanding the concept of employability and what are the ways of improving own employability is another important step in approaching employment. Employability concept has been defined by different bodies such as the European Centre for the Development of Vocational Training (CEDEFOP) and International Labour Organization (ILO) which will be discussed below.

3.3.1 What is Employability?

Employability is defined by the European Centre for the Development of Vocational Training (CEDEFOP) as ”a combination of factors (such as job-specific skills and soft skills) which enable individuals to progress towards or enter into employment, stay in employment and progress during their careers”. In the Europe 2020 strategy for more growth and jobs, higher employability is seen as a precondition for achieving an increased employment rate, whereby ‘employability’ is translated into: improving and adapting general and vocational training to new conditions and forms of work; the implementation of lifelong learning principles; the definition of specific targets for educational levels. (Eurofound,2019). It further explained in their Terminology of European Education and Training Policy document that, the employability of individuals depends on (a) personal attributes (including adequacy of knowledge and skills); (b) how these personal attributes are presented on the labour market; (c) the environmental and social contexts (i.e. incentives and opportunities offered to update and validate their knowledge and skills); and (d) the economic context (Terminology of European education and training policy A selection of 100 key terms, 2008).

Employability has been defined as: "A set of achievements, understandings and personal attributes that make individuals more likely to gain employment and to be successful in their chosen occupations". (European University Collage Association, 2016). It further explained that the concept of employability is linked to *soft skills*. Employers seek graduates who demonstrate a high level of skill in the areas outside of their specific expertise. Soft Skills can help students be poised for employability in an ever-globalized work-force.

International Labour Organization (ILO) defined Employability as the skills, knowledge and competencies that enhance a worker’s ability to secure and retain a job, progress at work and cope with change, secure another job if he/she so wishes or has been laid off, and enter more easily into the labour market at different periods of the life cycle. It further explained: ”Employability entails much more than the ability to get that first job. It is having the capacity to network and market oneself, navigate through a career and remain employable throughout life. It requires the ability to ask questions, acquire new skills, identify and evaluate options, understand rights at work including the right to a safe and healthy work environment, adapt successfully to changing situations, and the courage to innovate”. (Brewer, 2013.)

Summing up, employability can be described as a set of skills, knowledge, competencies, achievements, understandings and personal attributes that make a person to gain employment, retain that, make progress in that and be employable continuously. Here skills refer to not only technical skills, but soft skills as well which play an important role in all the mentioned stages of employment.

3.3.2 What are the ways of Employability?

According to ILO, ”Individuals are most employable when they have broad-based education and training, basic and portable high-level skills, including teamwork, problem-solving, information and communications technology (ICT) and communication and language skills. This combination of skills enables them to adapt to changes in the world of work”. In the same report, ILO further explained the factors behind Employability: ”A foundation of core skills, access to education, availability of training opportunities, motivation, ability and support to take advantage of opportunities for continuous learning, and recognition of acquired skills – and is critical for enabling workers to attain decent work and manage change and for enabling enterprises to adopt new technologies and enter new markets”. (Brewer, 2013).

European Union as well on their report on ”European Skill Agenda” highlighted that Education and Training is the most important way of creating and improving employability. ”Higher education is an essential vehicle to provide students with the skills they need in the future. Universities generate the advanced knowledge and skills that help society innovate to address its big challenges. They are empowering people with high-level skills that allow them to boost their professional, social and personal development”. It further reported that Entrepreneurial Aspirations as well contribute for the job creation and thereby create and improve employability. (Communication on a European Skills Agenda for sustainable competitiveness, social fairness and resilience, 2020).

Knight and Yorke (2003) describe that there are four ways of enhancing employability and they include: 1.Work Experience 2.Entrepreneurship ideas 3. Career Advise, and 4.Portfolios, Profiles and Records of Achievement.

When it comes to the employability of Business Informatics graduates, with reference to the European ICT professional role profiles (e-CF), Pejić Bach et al. (2018) highlight that

”On the contextual level, the ICT profiles originate from the need to achieve the respective graduate employability, which can be further perceived as a set of achievements, moreover skills, understood as personal attributes – “that makes graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy”. The same article pointed out that “However, competencies taught by universities may differ substantially from the actual competences that businesses need (Chapman & Lovell, 2006 as cited in: Pejić Bach et al. (2018).

Accordingly, the universities and other related institutions need to verify the effectiveness of current strategies used for enhancing employability skills (Andrews & Russell, 2012 as cited in: Pejić Bach et al. (2018) and to face the fact that both environment (Guthrie et al., 2008 as cited in: Pejić Bach et al. (2018) and students (Suša, 2014 as cited in: Pejić Bach et al. (2018) are rapidly changing” (Pejić Bach et al., 2018).

Summarizing, the following can be given as an examples for ways of employability. Having education and training, high levels of skills including soft skills such as teamwork and problem-solving, ICT skills, communication skills and language skills, continuous learning, recognition of prior skills and personal attributes such as motivation enable employability. Furthermore, past working experience, entrepreneurship ideas and career advice also contribute for a person’s employability. However, when it comes to BI graduates’ employability, the competencies students acquire through the universities may be substantially different from what the industry expects. Therefore, it is mentioned that universities should ensure the effectiveness of their current strategies to boost the employability of their students.

3.3.3 How it Works in Finland

In the country specific reports by European Center for the Development of Vocational Training (CEDEFOP), in case of Skills Forecast Finland, according to the report on 2023, the fastest growing sector in Finland for the period of 2021-2035 is the Information and Communication Sector. Furthermore, among the highest demand occupations during the same period, Science and Engineering professionals stood at the second place creating 49,000 new jobs, and Business and Administration professionals at the third position creating 45,000 new jobs in the labour market (2023 Skills Forecast Finland, 2023).

The ”Labour Market Information: Finland” by European Employment Services (EURES) highlighted that ”the population of Finland is approximately 5.5 million. The size of the country’s working-age population will decrease in the years to come due to an increasing rate of retirement. At the same time, the number of immigrants is growing and people are staying at work longer”. It further mentioned that the absence of suitable employees in Finland is often due to job seekers’ inadequate training or lack of relevant work experience or specialist skills (Labour Market Information, 2023). According to Employment in Finland-Statistics and Facts published by (Clousenitzer 2024) in Statista, the number of employed people is 2.62 million and the employment rate was 73.6% in 2023 and in general, it has increased over the decade of 2013-2023. However, it has slightly decreased from 73.8% in 2022. The unemployment rate in 2023 was 7.2% and it has increased compared to 6.8% in 2022.

The Ministry of Economic Affairs and Employment in Finland reports that ”Finland requires a skilled labour force for its wellbeing, competitiveness and success. Finland’s future is built on strong general education and skills acquired in vocational and higher education. Any competence can be valuable regardless of where it has been acquired: in studies, work or leisure time”. The Ministry promotes ways to identify and highlight the skills of working-age people in particular, supports career planning of job seekers, to enable studies and promotes the integration and employment of immigrants, which fall under responsibilities of the ministry in order to ensure and maintain a skilled labour force in the country (Ministry of Economic Affairs and Employment, 2023.).

In Finland, more specifically, the Talent Boost Program (Talentboost, 2023) is a major initiative by the Finnish government, that aims to improve Finland’s ability to attract foreign workforce to meet its labour needs. It is an intersectoral programme for work-based and education-based immigration, coordinated by The Ministry of Economic Affairs and Employment (TEM) together with The Ministry of Education and Culture. The Talent Boost Program describes its aims as follows: ”Finland needs talent. Skilled professionals are becoming increasingly significant in promoting competitiveness, and there is intense global competition for them. The measures taken under the Talent Boost programme aim to improve awareness of Finland around the world and attract international talent to Finland. There are also many international specialists who already reside in Finland and face challenges in finding jobs that correspond to their skills. Talent Boost aims to enhance the integration and employment of international specialists who

already reside in Finland, and the use of international talent in the business sector" (Talentboost, 2023).

To sum up, according to the forecasts, for the period of 2021-2035, the fastest growing sector in Finland is ICT sector. Science and Engineering professionals and Business Administration professionals stood at second and third place respectively, among the highest demanding occupations for the same period. Furthermore, there are predictions that, the working-age population in Finland will decrease and on the other hand the number of immigrants in the labour market will increase. It is also mentioned that there will be a lack of skilled job seekers with relevant work experience. Therefore, the government has taken steps to promote the identification of skills by supporting career guidance of job seekers, enabling acquiring knowledge and skills and integration and employment of immigrants through programs such as Talent Boost program.

3.4 Available Guidance and Best Practices When Searching for a Professional Job/Thesis

Guidance and best practices in searching for a professional job/thesis project in Finland are discussed by different organizations in Finland; they are shown in Table 4 below.

According to the table below, it is found that out of the universities in Finland, the University of Helsinki is the one, which is having a Guidance book on best practices of job searching in detail. Other than that, the Hanken School of Economics has guidance on career planning, tips on job searching with few links for career portals and tips for CV and cover letter.

Out of the University of Applied Sciences, Lapland and Tampere UASs have some common guidance on career planning, where to search for jobs, preparation of CV and cover letter, and interviews in detail a little bit but not that much compared to Helisinki university guidance. However, they are not in the form of a handbook/tool. Kajaani UAS has some guidance on career planning and where to search for jobs with few links but not many details. Other than that, no any other UAS is having a job-seeking guidance/guidance book. Normally, they have general career guidance services by the career guidance unit. For some UASs such as HAMK, Diaconia, Humak, Jyvaskyyla, LAB, Seinjoki and Novia, no specific information on career guidance can be seen.

When it comes to other bodies/sources, Job market finland, MiB International, info Finland and Expat Finland provide some guidance which are not very common on topics such as getting to know the employer before sending an application, how to overcome the language barrier, finding hidden jobs, identification of transferrable skills, and Finnish recognition of prior skills.

Table 4. Guidance and Best Practices in Searching for a Professional Job/Thesis Project in Finland.

Source	On what Matters the Guidance/Best Practices are Given
University of Helsinki https://studies.helsinki.fi/instructions/article/tips-job-search (University of Helsinki, 2024)	1. Self Relection as the initial step https://studies.helsinki.fi/instructions/article/tools-planning-your-career-and-future 2. Research on the sector, field of work and employers you are interested in. https://studies.helsinki.fi/instructions/article/tools-planning-your-career-and-future Recognize opportunities and demand for the skills (Understanding the job market) https://studies.helsinki.fi/instructions/article/tools-planning-your-career-and-future#paragraph-6937 Exploring job search channels https://studies.helsinki.fi/instructions/article/tools-planning-your-career-and-future#paragraph-6937 Using social media for job search –LinkedIn, X, Facebook 3. Document Preparation – CV and Application Letter. 4. Networking 6. Job interviews 7.Ask for the feedback after the interviews 8. As an international student, invest on learning the Finnish language. **A job seeking guidance book is available** https://studies.helsinki.fi/system/files/inline-files/job-seeking-guide.pdf
Hanken School of Economics	Guidance available on career planning https://www.hanken.fi/en/students/career-services/plan-your-career tips for searching with links to few career portals, tips on CV and cover letter https://www.hanken.fi/en/students/career-services/jobs-vacancies-and-career-portals/job-hunting-guide
Aalto university	General career guidance services are available**. No any guidance book with best practices in job searching** https://www.aalto.fi/en/biz-career-services
Tampere UAS	Some guidance is available in student handbook under Internship and Working Life chapter, where it talks more about general career guidance services and some guidance is available on Career planning and Job hunting. E.g To find jobs, provides links to JobTeaser and Job market Finland and under job searching skills few guidance on how to prepare for job searching and about job application documents, interviews and importance of using social media for job searching. Most guidance are specifically for Tampere UAS students https://www.tuni.fi/en/students-guide/han https://www.hanken.fi/en/students/career-services/jobs-vacancies-and-career-portals/job-hunting-guidedbook/tamk/internship-and-work-life

Kajjani UAS	Some guidance is available on Tips for Job Search and career planning on topics; Where to look for jobs with few links, Career planning with few links https://www.kamk.fi/en/Study-at-KAMK/Information-for-Students/Studying/KAMK-kaura-Career-Services
Lapland UAS	There are common instructions for job seeking under the following 1.Career planning 2. Preparing CV 3. Preparing Cover letter 4.Jon interview 5.Job seeking links https://www.lapinamk.fi/en/Students/Student-Support-Services/Job-seeking-and-career-planning
Haaga-Helia UAS	Gereneral career guidance is available and JobTeaser guidance is ther. There are mentoring programs connected with Alumni. **No any guidance book with best practices in job searching** https://www.haaga-helia.fi/fi/ura-ja-osaaminen
Arcada UAS	General career guidance services are available**. No any guidance book with best practices in job searching** https://start.arcada.fi/en/study-support/career-services
Laurea	General career guidance services are available**. No any guidance book with best practices in job searching** https://www.laurea.fi/koulutus/opiskelijana-laureassa/ohjausta-opiskelijalle/
Turku UAS	General career guidance services are available**.** Internship programs available**. No any guidance book with best practices in job searching** https://www.tuas.fi/en/study-tuas/studying-at-tuas/services-for-students/
HAMK	No specific information was found on career guidance services. https://www.hamk.fi/opiskelijalle/palvelut-opiskelijalle/opiskelijapalvelut/ , https://www.hamk.fi/opiskelijalle/palvelut-opiskelijalle/
Centria UAS	General career guidance services are available**.** There were some links to Find a job abroad and to make a portfolio**. No any guidance book with best practices in job searching** https://net.centria.fi/en/for-students/students-guide/career-and-work-life-services/
Diaconia UAS	No specific information was found on career guidance services. **No any guidance book with best practices in job searching.** https://www.diak.fi/en/studying/support-and-services/support-services/

Humak UAS	No specific information was found on career guidance services. **No any guidance book with best practices in job searching.** https://www.humak.fi/en/education/student-services
Jyvaskula UAS	No specific information was found on career guidance services. **No any guidance book with best practices in job searching.** https://www.jamk.fi/en/for-students/student-in-jamk-open-university-of-applied-sciences/benefits-and-services , https://www.jamk.fi/en/for-students/degree-student/student-services
South-Eastern Finland UAS (XAMK)	Student councelling is available. Internships for all degrees. XAMK Dunni job portal is available. Guidance on workplace Finnish training is available. **No any guidance book with best practices in job searching** https://www.xamk.fi/en/education/student-counselling-assessment/ , https://www.xamk.fi/en/services/students-are-an-asset-to-the-employers/
Karelia UAS	General career guidance services are available**. No any guidance book with best practices in job searching.** https://www.karelia.fi/en/career-planning/
LAB UAS	No specific information was found on career guidance services other than JobTeaser portal. **No any guidance book with best practices in job searching.** https://lab.fi/en/services
Oulu UAS	General career guidance services are available. **No any guidance book with best practices in job searching.** https://vanha.oamk.fi/opinto-opas/en/guidance-and-advice
Vaasa UAS	General career guidance services are available. **No any guidance book with best practices in job searching** https://www.vamk.fi/en/student/counselling/career
Seinajoki UAS	No specific information was found on career guidance services other than mentoring program. **No any guidance book with best practices in job searching** https://www.seamk.fi/en/aboutus/mentoring/
Savonia UAS	General career guidance services are available. **No any guidance book with best practices in job searching** https://www.savonia.fi/en/study-with-us/for-students/services-for-students__trashed/academics/
Satakunta UAS	General career guidance services are available**. No any guidance book with best practices in job searching.** https://www.samk.fi/en/for-students/student-guidance-counselling-and-well-being/guidance-to-support-your-career-planning/
Novia UAS	No specific information was found on career guidance services. **No any guidance book with best practices in Job Searching.** https://www.novia.fi/en/study/studentservices

Other Bodies Job market Finland https://tyomarkkinatori.fi/en/personal-customers/search-for-work/tips-for-finding-a-job	Guidance on best practices, 1.Before sending the application find more about the position and getting to know the employer 2.Job application documents 3.Job interviews
MiB International https://www.mothersinbusiness.fi/blog-int/2023/8/11/sharing-best-practices-how-to-navigate-the-finnish-job-marketnbsp (MiB - Mothers in Business, 2023)	Guidance on best practices, 1.Overcome the lack of language Looking for jobs in local companies with international footprint Learn the Finnish language and apply for jobs while learning Consider available tools and services by TE office 2. Find hidden jobs Write open applications for organizations you are interested to work, Actively connect with groups, associations and communities that are related to your field of interest, Actively use LinkedIn as a search engine, Do targeted networking as far as passible 3. Understand what role you can play with experience in home country Identify your transferrable skills and highlight them in CV and cover letter 4. Taking a step back and accepting a lower level job in your field is an excellent way to enter the job market 5. Accepting volunteering opportunities will be a good addition to the CV
infoFinland.fi https://www.infofinland.fi/en/work-and-enterprise/find-a-job-in-finland/tips-for-job-hunting (infofinland, n.d.)	Guidance on best practices, 1.Learn about the organization you are applying for 2.Strong networking as networks play a central role in Finnish working life 3.Maintain your skills by Continuous Professional Development (CPD) 4.Apply for work through labour hire agency will give the opportunity to find permanent employment 5.Attend recruitment events 6. Use job search services eg. International House Helsinki, TE office
Expat Finland https://www.expat-finland.com/employment/finding_work.html (expat-Finland, n.d.)	Guidance on best practices, 1.Assess Finnish recognition of your foreign qualifications https://www.expatfinland.com/employment/foreign_qualifications.html#general 2. Call the employer: Unless the ad specifically says *not* to call, telephone the contact person for extra information; this opportunity to make a positive impression can help later in the application process. Take notes, including the name of the person you spoke with, and refer to your notes when writing your cover letter. 3.Direct Submission of applications Go through Fonecta, or a similar business directory, looking for companies in the field and location you're interested in.

Out of the list of common best practices found, even though they are common, there are some important best practices among them like read career profiles related to your industry and explore the connection in between your major competent areas and career possibilities and making a phone call to the employer and show interest to be stand out from the crowd,which are normally not the practices of our students.

3.5 Conceptual Framework of The Thesis

Based on the available literature and the best practices discussed in this section, the Conceptual Framework of this thesis is presented in Figure 3 below.

As seen in Figure 3, the conceptual framework has four phases for developing guidance for approaching a professional job/thesis search in BI.

First phase is *Understanding the BI as a Professional Area*. Here, the areas included in BI have been identified as the first step in developing this guidance. These areas have been identified under three categories as IT related, Business field related and combination of both. Getting an understanding about the BI areas as the initial step is important, in order to develop the guidance.

Exploring the Industry Needs and the Job Market is the second step. This extensive search gives a sound understanding about European labour market and industry needs with relevant to BI professions. Through this search, it has been identified what are the professions related to BI and their job profiles as well as particular skills and competences required for those professions. These can be identified using European e-Competence Framework (e-CF) and European Skills Competences and Occupations (ESCO) classification. Having an understanding about industry needs/skill requirements and the behavior of the labour market is essential in building up this guidance.

The third phase is *Understanding Employability and its Ways in BI*. In this stage, getting an understanding about what is “Employability” and its ways are important to understand the employability of the BI graduates. How employability of BI works in Finland as well is crucial in this step. To get this understanding Talent Boost Program initiated by Finnish government and the labour market predictions relevant to the field can be considered.

Developing Guidance for Approaching a Professional Job/Thesis Search in Business Informatics (BI)	
<u>01. Understanding BI as a Professional Areas (areas included in BI):</u> 1. Areas related to IT field (ICT Systems, IS, Digitalization, IT Management Aspects) 2. Areas related to Business field (Business Process Modelling, E-Business, E-Commerce) 3. Combination of both (Business Analytics, Business Intelligence, ERP, Knowledge Management)	Weber et al., 2022. Heinrich and Riedl, 2013 Weber, 2023 Paul et al., 2018 Vít Pászto et al., 2020 Bergener et al., 2019
<u>02. Exploring Industry Needs and Job Markets in BI</u> 1. BI Professions and their Profiles (e-CF) 2. Skills relevant to BI Professions (ESCO)	ecfexplorer.itprofessionalism.org, n.d. ESCO, n.d.
<u>03. Understanding Employability and its Ways in BI</u> 1. BI Graduates' employability 2. Employability works in Finland • Talent Boost Program • Predictions on growth in demand for jobs in the field	Pejić Bach et al.,2018. Talentboost, n.d. Skills Forecast Finland, 2023
<u>04. Applying available Guidance/ Best Practices in Approaching for a Professional Job/Thesis Search in BI</u> •Evaluate yourself as the initial step to identify your skills, competences, strengths, weaknesses and career goals and develop a meta CV •Do a research on your industry, field of work and your interested employers by exploring job channels, networking, using social media and attending carrer events •Build a strong network as it plays an important role in job searching •Read career profiles related to your industry and explore the connection in between your major competent areas and career possibilities •Prepare CV and cover letters which are tailor-made addressing all the requirements, up-to-date, short, attractive and professional •Research on the company you are applying for when preparing application documents •Identify your transferrable skills and highlight them in the documents •To stand out from the crowd, use video CV or a portfolio •In the cover letter, refer to a possible telephone conversation/meeting •Promote yourself by making a phone call and building a connection with the employer •In job interviews, be well-prepared, research the company and the job requirements, practice how to market yourself and follow general interview etiquette •If no response after the interview, contact and ask the progress or feedback in case of a rejection •Try the option of being an entrepreneur •As an international student, invest in learning the Finnish language •To overcome the language barrier, looking for jobs in companies with an international footprint •To find hidden jobs, write open applications to companies you are interested •Assess Finnish recognition of your foreign qualifications •Take a step back and accept a lower level job, internship or volunteering opportunity in your field to enter the industry	University of Helsinki, 2024 Hanken ,n.d Lapland University of Applied Sciences, n.d MiB - Mothers in Business, 2023 Job Market Finland, 2023 infofinland, n.d. expat-Finland, n.d.

Figure 3. The Conceptual Framework for Guidance for Approaching a Professional Job/Thesis Search in BI.

Searching for *Available Guidance and Best Practices in Approaching for a professional Job/ Thesis Search* is the fourth phase which provides an orientation for developing this guidance.

In summary, all the above four phases together build up the conceptual framework for developing a guidance for approaching a professional job/thesis search, based on existing knowledge and best practices.

Guided by these identified phases in the conceptual framework, next section will focus on analyzing the current state of the case organization and its BI students' practices in approaching a professional job/thesis search.

4 Current State Analysis of Available Guidance at the Case Organization and the Current Practices Followed by the BI Master's Students in Approaching a Professional Job/Thesis Search in BI

This section discusses the current state of the services, tools and practices of the case organization, used in providing guidance for BI Master's students, as well as the current practices followed by the students themselves for approaching a professional job/thesis search in BI. First, this section introduces how the analysis was conducted by the researcher under Section 4.1. Then, Section 4.2 analyzes the currently available services, tools and practices of the case organization and discusses the current practices followed by BI Master's students for approaching a professional job/thesis project. Next, Section 4.3 provides the key findings from the current state analysis. Finally, Section 4.4 gives a summary of the results of the current state analysis with an overview of the strengths and weaknesses of the available guidance and what are the missing guidance of the case organization and the best practices followed by BI Master's students.

4.1 Overview of the Current State Analysis

The goal of the current state analysis (CSA) was to explore the currently available services, tools and practices of the case organization to support BI Master's students for approaching a professional job/thesis project and understand the current practices used by the students themselves regarding the same topic. The CSA has been done by conducting face-to-face interviews via zoom, issuing a questionnaire and exploring the relevant websites and internal documents of the case organization. The data gathered using the above methods corresponds to Data collection 1 of the thesis.

As the first step of the CSA, the case organization's website, internal documents and other related organization´s resources were explored to gather information on currently available services, tools and practices to help BI Master's students on their job searching journey. In addition to that, to collect further information, selected stakeholders who are experts in their role and involved in the current services/practices in the case organization were interviewed, and the data gatahred from them was analyzed.

Secondly, to understand and analyze the current practices of the BI Master's students in approaching a professional job/thesis search, 11 face-to-face interviews were conducted via Zoom, with eleven second-year BI Master's students. All these interviews were semi-structured, in-depth interviews, recorded after getting the prior consent from the

interviewees. Interview questions were prepared in advance, under the four key areas of the conceptual framework developed in Section 3, and each question was asked by looking from three perspectives, what is the current state, the ideas for improvements in the near future, and the needs, hopes and wishes for the expected guidance under each area of the conceptual framework.

As the third step, concurrently with conducting the interviews, a questionnaire was issued to both first-year, with the response rate appx. 50%, and second-year BI Master's students with the response rate appx. 50%, of which most of the questions were multiple choice and short-answer questions. These questions were similar questions to in the interview questions.

4.2 Currently Available Guidance of the Case Organization and Current Practices of BI Master's Students of the Case Unit for Approaching a Professional Job/Thesis Project

The case organization of this thesis is Metropolia University of Applied Sciences (UAS). The university offers 76 degree programs, out of which 17 are in English. According to 2022 statistics, the number of students at Metropolia were 17,188 and the number of tuition fee-paying international students from outside the European Union/European Economic Area region doubled, in comparison to the year 2021 (Metropolia 2022: Metropolis in Numbers).

This study is focused on Master's students in Business Informatics program at Metropolia UAS. The current program consists of appx. 75 students in the 1st year, and appx. the same number in the 2nd year, where appx. 12-15 are international students annually. (The numbers are approximate as the personal situations of the students are constantly changing over the academic year, with more students staring the year and then some going for a temporary leave of absence due to various personal sitaitions (e.g. health, employment, etc.) and some then retirning back. Thus, the number is constantly changing, and it is not possible to give a hard number for the whole year).

Even though one of the selection criteria of the BI Program is the possession of at least three years of work experience and as a result, the selected students are already experienced professionals, most of the international students have moved to Finland to

study here, by quitting their professions in home countries. Therefore, while studying or after the completion of studies, they expect to find a professional job in Finland.

Another important aspect is that the duration of the BI program is between 1,5 to 2 years, and one of those years should be used for doing the Master´s thesis. According to the current rules, Master's students at the YAMK level are required to complete a thesis project for a real company, also referred to as a "partner organization." Thus, choosing a thesis project on time becomes essential to finishing the Master's program timely. In this case, most of the international students face challenges in finding such a thesis project as they are new to the country.

These aspects highlight the need for having an effective Guidance for approaching a professional job/thesis project in BI. Thus, before developing such a guidance, the current situation and availbale resources needed to be investigated.

4.2.1 Commonly Available Guidance of the Case Organization for Approaching a Professional Job/Thesis Project

The case organization is committed to empowering the students to succeed in their professional endeavors (Metropolia 2022, Strategy 2030). Presently, the case organization provides a range of guidance in terms of services, tools and opportunities with the expectation of helping students to navigate the path to securing a meaningful employment in their chosen fields.

More specifically, the case organization provides the following resources, services and tools as guidance in common, for approaching a professional job/thesis search.

First, *(a) Metropolia JobTeaser* which operates as a job portal as well as a career center for students. Students can find this tool in Metropolia OMA workspace and in that, they can create their profile in detail and upload the CVs, which will add them to the JobTeaser Skill Bank. JobTeaser gives the opportunity to companies in Finland to create an account in JobTeaser for recruiting, with access to this Skills Bank, where they can find the profiles of the students who have uploaded their CVs. On the other hand, students themselves have a chance to search for available job vacancies using various filters such as their professional field, study level, duration of work experience, type of contract, city, working language, and by using the keywords for jobs/company names.

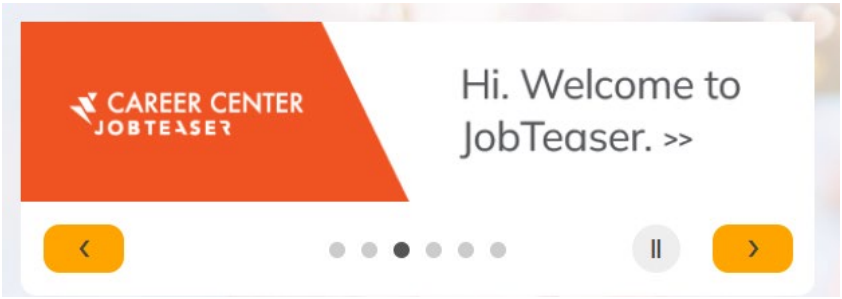
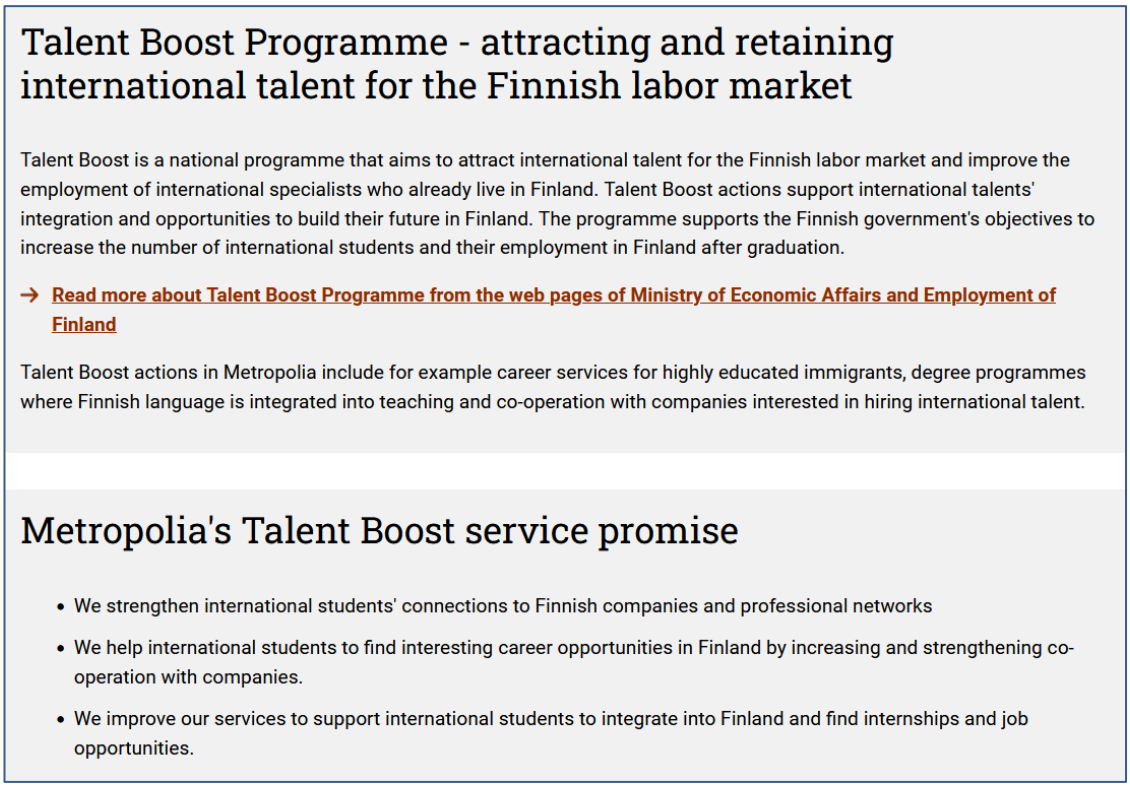


Figure 4. JobTeaser on the front interface of OMA, Metropolia´s LMS (A view from 6th May 2024).

JobTeaser's "Event" page provides detailed information on various career events such as career webinars, networking events, recruitment events, coaching events and workshops. Importantly, the "Advice" page of JobTeaser provides some common guidance through articles, on areas such as job searching, exploring the market, self-evaluation, networking, upgrading CV and cover letter and more including some articles to inspire the students in approaching a job. Moreover, the "Career Tips" page provides information on career development areas such as the job market in Finland, information on different industries, tips for job searching in Finland, recognizing professional skills, networking and more areas with some important links to detailed information. In addition to that, it gives some guidance on living in Finland, what to do soon after moving to Finland, and learning the Finnish language as well.

Secondly, (b) *Metropolia´s Talent Boost* programme is part of the national project initiated by the Ministry of Economic Affairs and Employment of Finland (Talentboost, 2023). At Metropolia, it resulted in multiple sub-projects and services (including those described here above and below, such as JobTeaser, SIMHE, A Bilingual Degree Programme in Nursing, Kielibuusti, etc). Figure 6 below tells about the relationships between the nationwide project "Talent Booast" and Metropolia´s related and ministry-financed sub-projects.



Talent Boost Programme - attracting and retaining international talent for the Finnish labor market

Talent Boost is a national programme that aims to attract international talent for the Finnish labor market and improve the employment of international specialists who already live in Finland. Talent Boost actions support international talents' integration and opportunities to build their future in Finland. The programme supports the Finnish government's objectives to increase the number of international students and their employment in Finland after graduation.

→ Read more about Talent Boost Programme from the web pages of Ministry of Economic Affairs and Employment of Finland

Talent Boost actions in Metropolia include for example career services for highly educated immigrants, degree programmes where Finnish language is integrated into teaching and co-operation with companies interested in hiring international talent.

Metropolia's Talent Boost service promise

- We strengthen international students' connections to Finnish companies and professional networks
- We help international students to find interesting career opportunities in Finland by increasing and strengthening co-operation with companies.
- We improve our services to support international students to integrate into Finland and find internships and job opportunities.

Figure 5. Talanet Boost and Metropolia´s Talent Boost (OMA, a view from 6th May 2024). (Metropolia -Talent Boost Program, 2020).

A new direction of Metropolia´s Talent Boost was a Metropolia Trainee Programme that was piloted in autumn 2023 for the first time ever. The idea is to “train the trainers”, i.e. to create traineership positons for international Bachelor´s students at every department of Metropolia who will train especially international students in findings jons and Finnish work culture. After a successful pilot in autumn 2023, another recruitment was announced for autumn 2024, as the project continues. Figure 6 below shows the deatios for this programme (available for Bachelor´s students only).

TOPIC: Metropolia Trainee Programme, Autumn 2024. Application deadline 19th may 2024.

Dear International Degree Programmes,

Metropolia Trainee Programme pilot in spring 2024 has been a huge success and we are happy to announce that the programme will get another round in autumn 2024! Please inform your international degree students about this great opportunity!

1. What is Metropolia Trainee Programme (MTP)?

This trainee programme is designed for international Bachelor´s degree students to

- gain valuable work experience from their field
- get opportunities to increase and practice their Finnish language skills
- get to know Finnish working culture and get career guidance on how to boost their opportunities to find a career path in Finland after graduation

Who can apply?

A suitable candidate for this trainee programme pilot ticks all the following boxes. The applicant(s')...

1. is a 2nd, 3rd or 4th-year international bachelor degree programme student from the field of business, culture or technology studying at Metropolia UAS.
2. has not yet completed his/her first 15 ECTS internship as part of his/her bachelor's curricula.
3. nationality is other than Finnish and the native language is other than Finnish or Swedish
4. has already completed at least 2 Finnish courses and is motivated to learn more and practice Finnish language skills in real work-life situations
5. is interested in learning more about Finnish working culture and getting career guidance during the trainee programme.
6. can commit to full-time work (36,25 hour/week) during the internship period: 2nd September to 1st December 2024

If you answered YES to all above, we are eagerly waiting for your application! / Odotamme innokkaasti hakemustasi!

2. How to proceed?
   1. Read more detailed information from the attachment: Metropolia Trainee Programme, Autumn 2024.
   2. Get familiar with intern positions offered by different Metropolia units and choose the one that interests you the most. NB! The Metropolia Trainee Programme is limited to one application per student.
   3. Submit your application via e-form **no later than 19th May 2024**. Note that the units can start reviewing the applications already during the application period and proceed to interviews with the most promising candidates. Therefore, please actively check your metropolia email during and after the application period!

Summary

- Application deadline: 19t May 2024
- Application is done via e-form
- Internship starts: 2nd Sep 2024
- Internship ends: 1st Dec 2024
- Internship requires full-time work (15 ECTS)
- Salary: € 1767,22 / month
- One student can apply for only one internship position

Do you have questions?

Don't hesitate to participate **Metropolia Trainee Programme Q&A session** online on **13th May 2024 at 11:00 - 12:00.**
Link to Q&A session

Metropolia Trainee Programme is developed as part of Talent Boost project.

Figure 6. Metropolia Trainee Programme for Bachelor´s students (OMA, a view from 6th May 2024).

Thirdly, *(b) CareerBot developed by 3AMK* which is a service to students to pursue their dream careers with the support of Artificial Intelligence (AI). This AI tool is developed through the collaboration of three universities of applied sciences (AMKs) namely Metropolia, Haaga-Helia and LAUREA UASs known as “3AMK Alliance”. The CareerBot

assists students in these three AMKs in a range of areas, starting from developing their careers from studies and skill verbalization up to thesis and employment search. “CareerBot” service uses the AI-trained language model which has been trained with millions of news articles and e.g. with ESCO-classification. Data sources include the job market data in Finland (such as Monster and TE-palvelut/employment services) with 1+ million job ads since January 2018, as well as the 3AMK course data for more than 15,000 courses and Theseus.fi thesis database since the year of 2010 (100 000+ theses available)” (3AMK, 2020). CareerBot provides students with five functions/services. One is *(i) Building the skills profile* and under this, it verbalizes the student’s skills with the help of AI. Then, it builds the skills profile with predictive search and based on the current CV of the student and the courses he/she has studied in 3AMK. Finally, the student will receive AI-generated recommendations for employment and skills that have demand in the labor market, based on the created skills profile. Secondly, students can *(ii) Search for jobs* based on their skills profile or by using keywords. It gives an understanding about what are the skills students are missing and what kind of courses students can follow to acquire them. The third one is *(iii) Search for courses that are necessary for skills improvement*. Students can search for these courses in all the three AMKs. Another function of the CareerBot is it help the students to *(iv) Visualization of their skills* based on skills mapping. Finally, with this students can *(v) Search for published theses* from the theses database using AI and key terms. The CareerBot tool can be found in OMA workspace and there are demos under each function showing how to make use of it.

The fourth service is *(c) Offering course modules related to Job Searching.* One course is the ”Boost Your Job Search”, a two credits course module specially designed for international students who are pursuing higher education. This course can be followed by BI Master’s students as an elective subject. This course provides detailed information about many topics related to job searching, such as the Finnish job market, hidden jobs, where to search for jobs, how to create an attractive CV and a cover letter in a professional way, the importance of networking, how to use Linkedin effectively in job searching and more. It supports the students specially the newly migrated international students, to have an important understanding of the Finnish job market and working culture including the mentioned areas above (Boost Your Job Search 2023; course materilas). In addition to that, there is another five credits course called ”Discover Your Career Path in Finland” which is done in cooperation of 3AMK (Haaga-Helia, Laurea and Metropolia) universities of applied sciences. Here is the description of this course:

3AMK intensive course: Discover your Career Path in Finland (5 ECTS)

Are you navigating the Finnish job market for the first time? Struggling to secure a work placement or job opportunity? Would you like to gain a profound insight into the Finnish job market and make your application documents stand out from the other applications?

This intensive course will give you a comprehensive insight into the different career paths and employment opportunities in Finland. It will also help you to meet challenges of the job search process. This course is designed specifically for international bachelor's degree students who are motivated to build their careers in Finland.

This is unique 3AMK collaboration course, which is coordinated by Haaga-Helia UAS.

- **Enrollment period:** 6th of May – 26th of May 2024
- **Schedule:** 27th of August – 31st of Otober 2024 | Contact studies at Haaga-Helia Pasila campus, independent virtual studies and possible visit to a company/organization/recruiment event (will be announced later).
    - Kick of: 27th of August at 3pm to 5:30 pmon Haaga-Helia Pasila campus. Participation on the kick-off in person is obligatory.
    - Independent work: 28th of August – 11th of October on Moodle platform
    - Intensive week: Workshops in Haaga-Helia Pasila campus on Mon, Wed and Fri during week 42 (14th – 18th of October)
- **Learning platform:** Haaga-Helia's Moodle, log in with Haaga-Helia user ID | If you do not have active Haaga-Helia user ID, you will receive it after the enrollment period.

More information and instructions on how to enroll can be found on the 3AMK website.
Please note: The course is not part of the Master's studies i.e. no credits are awarded towards the degree, but the course can still be useful.

Figure 7. Example of the course that aims to develop the job search skills (Internal OMA announcement, 6 May 2024).

> *"Both of the course modules have more or less similar content and additionally the latter course is implemented including an intensive week of workshops in the Autumn semester". (Interviewee A)*

Fifth, *(d) Job fairs and networking events organized by the case organizaiton*. The case organization organizes these kind of events from time to time and at these events, students get the opportunity to get to know about the companies in Finland and their operations, to meet the company officials and sometimes the industry experts and get to know about the available vacancies of such companies.

Sixth, *(e) Career development events/programs and vacancies advertised in OMA (LMS, Metroplia´s Learning Management System).* The case organization keeps informing the students via OMA about upcoming career development events and programs such as workshops, networking events, job fairs, mentoring programs and competitions. These

events/programs are held and/or organized on campus as well as beyond the campus, and by both the case organzaiton itself as wellas by external organizations (for example, by IHH, International Hourse of Helsinki). This information is displayed under the ”Events” section in the OMA workspace and on the university notice boards and sends e-mail to the students as well. At the same time, the case organization supports also ”Vacancies” in OMA where responsible instructors (typically, one contcat person from each of the four departments) places relevant job/traineeships/intership etc. vacancies from the compamies that are contacting Metropolia for distributing such information.

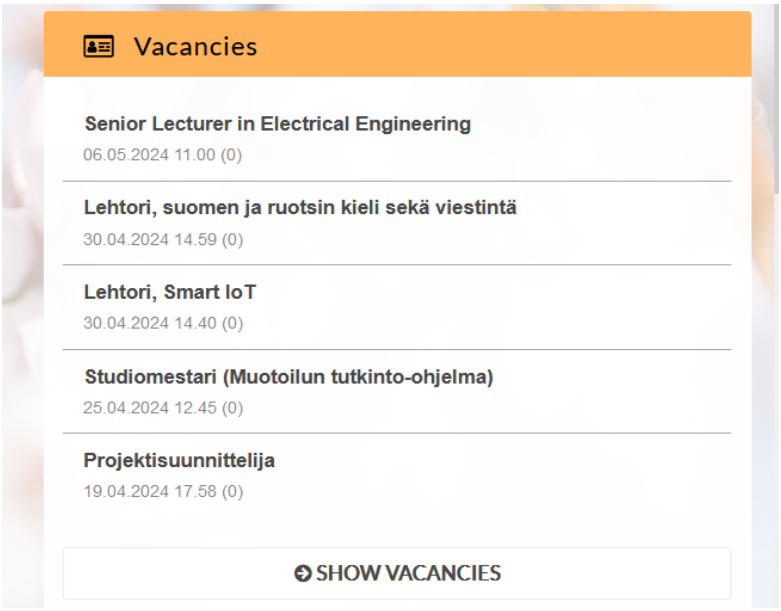


Figure 8. Example of “Vacancies” on the front interface of OMA, Metropolia´s LMS (internal vacancies in two languages are shown immediately, and external vacancies can be found under the link “Show vacancies”). (A view from 6 May, 2024).

Additionaly, individual programmes (for example, BI Master´s programme) also publish similar information that reaches them via own channels. One example of the programme-level efforst is described below (on the example of BI Master´s programme).

Seventh, along with these current practices, however, *(f) Centralized career guidance services* for Master´s students did not exist in the case organizatin until very recently. The case organization did not have a common career guidance team, but since March 2024, it has appointed a career guidance specialist responsible for doing the relevant planning by the end of 2024 on the whole organziation level, and expects to launch its services in a broader way in the near future, as currently they are examining the setup and setting plans on services to offer and recruiting more experts in the field.

> *”We don't have centralised career services yet, but a lot is done within the programmes. Some programmes have integrated career and job counselling into their courses, some offer various workshops and personal guidance. Personal guidance is available in many programmes, for example from study advisors or placement coordinators. Many teachers make use of alumni in their teaching, and recruitment events are also organised. One of the goals to my work is to clarify and harmonise the provision of guidance to make it more visible to students. I aim to plan career services in general in Metropolia so that it would be more visible and more available and at the same time (to explore) how we can specifically help students with different degrees”. (Interviewee B)*

Eighth, *(g) The graduates are allowed to study further free of charge for a period of four semesters.* The case organization offers the opportunity to graduates to pursue studies free of charge in the ”Open university of applied sciences” for four semesters after graduation. This is done to widen the opportunities to boost their professional competences further, if desired, and be helpful and connected to alumni.

> ”*The graduated students can utilize this invaluable opportunity to further improve their skills and knowledge as well as undertake some courses to acquire knowledge and skills needed for their aimed career path”. (Interviewee A)*

Nineth, in addition to the guidance mentioned above, *SIMHE (Supporting Immigrants in Higher Education) Career Services* are available in the case organization. This is part of the nationwide project supported by the Ministry of Education and Culture, which includes 10 higher education institutions from different parts of Finland. Their services are aimed at immigrants in Finland, who have a university degree abroad or Finland or who are interested in pursuing higher education in a university in Finland or who are currently working or unemployed. They do not offer their services for immigrants who have already enrolled into the higher education system in Finland. But SIMHE offers the tailor-made services for individual who are still outside the higher education system, and include helping to choose a study/career path that best fits to their background and needs, to identify their own skills, strengths and potential areas for growth and to consider opportunities to get a job in their field or alternatives for expanding their skills. It can help, for example, the family members of the international students, among other customer groups:

> *“Even though it does not provide services to the immigrants that are already part of the Finnish higher education system, if you are unemployed after being graduated and if you are a customer of the unemployment services, then they will direct you to get the services of SIMHE”. (Interviewee A)*

Tenth, *other efforst.* Additionally, there are many good example of stand-alone fforst by the case organizaitn. For example, exploring the needs via targeted surveys is a good example of the case organization´s efforts to study and understand the students' needs and thoughts regarding their transition into working life. Most recently, there was a survey called "Survey of Path to a Diverse Worklife Project" done by the case organization's Social Services and Healthcare Studies (2024). The survey targeted the Social Services and Health Care students of the case organization. In that survey, there was a section on "Equality of Internships and Transition into working life". Under that section, students were asked to rate the case organization's efforts on helping the students to find an internship place and the equality of such service and to show students' ideas and thoughts on how the case organization could promote the equality of internships and transitions into working life. Even though this example comes from one discipline, it shows that other programs of the case organization how to pay attention on approaching a professional job in the field by students. (Importantly, similar questions are also part of the end-of-studies survey called "AVOP Survey" conducted by the Ministry of Education and Culture on all the graduating students. Via this survey, the Ministry gathers information and becomes acquinted with the situation in the area of work placement and related services in each UAS in Finland).

Summing up, the case organization currently offers a wide range of valuable guidance/services and has many useful and up-to-date tools and services available equaly to all students. *Metropolia JobTeaser, CareerBot, Course modules aimed at career development, organizing job fairs and networking events, informing the students about career development events/programs and vacancies* are those services and BI Mater's students can make use of these in approaching a professional job/thesis search. In addition to that, if still unemployed after graduating, there is an opportunity *for Metropolia´s graduates to sharpen the skills and knowledge further by being an open university student for four semesters (for free)* and obtaining *the services of the SIMHE* when being a customer of unemployment services. At the same time, there was only one service identified as missing, and this is *the Caree guidance service for Master´s students* (which is especially experienced by the internationl students who are experiencing problems in finding jobs/thesis projects, which is discussed in more detail in the next section).

Thus, it can be concluded that there is a wide range of common guidance, tools and services currently available at the case organization. The next sectin dicusses how the

availbale services, tools and resources are perceived by the international students of the BI Master´s Programme at the moment of conducting this surrent state analysis.

4.2.2 Available Guidance and Services from BI Master's Programme

At the Programme level, individual Programmes at Metropolia make own efforts helping thei own Master's students in finding thesis projects and professional jobs in their fields. On the example of the Master´s Programme in Business Informatics (Metropolia Business School), the BI team offers the following guidance/services to their students as a help in approaching a professional job/thesis search.

BI Programme *(a) provides information on its field-specific job postings* and these can be full time or part time jobs, summer trainee jobs and internships. Figure 9 below shows one such offering with the shper email form the employing organziation. From this email, it is obvsious that the employing organizatins are also interested to find suitable candidates and are making considerable efforst to promote their vacancies, also directly to the higher education institutions with suitable talents. Such ofering are onle several a year, unfortunately, and based on the Programme´s own contacts in the industry. One example is below:

From: (Name of the Master´s degree supervisor)
Sent: 5. toukokuuta 2024 11.02
Subject: URGENT! A Summer trainee position - A Communication intern / 'Master's Degree Programme in Business Informatics - Student information'

URGENT! A Summer trainee position - A Communication intern

Dear BI students,
notice this vacancy for **the Summer trainee position**! Notice also the tel. contact opportunity! passed on to us by the organization directly.
Kind regards,
Name of the Master´s degree supervior

Hei Xxxx ja muut Metropoliassa

Haemme ELY-keskukseen englanninkielistä harjoittelijaa kolmeksi kuukaudeksi syyskuusta eteenpäin. Katsoin koulutusohjelmianne, ja ajattelin, teidän oppilaitoksellanne voisi olla sopivia kandidaatteja. Jos mahdollista, jaattehan alla olevan ilmoituksen tai linkin (https://www.emaileri.fi/g/l/367224/0/0/7842/2650/2) eteenpäin.

Rekrytointi tehdään nyt toukokuussa, deadline hakemuksille on 16.5. Paikka on palkallinen ja harjoittelijatuki ei ole edellytys harjoittelulle. Olemme julkaisseet tänään Aarresaaressa ilmoituksen paikasta, mutta jaamme sen myös verkostomme kautta. Kiitos, jos voitte olla avuksi!

Terveisin,
Xxxxxx
Maahanmuutto ja kotoutuminen -ryhmä
Uudenmaan Elinkeino-, liikenne- ja ympäristökeskus

We are looking for a communication intern for the integration support project at kotoutumisentukena.fi website development project

We are looking for a communication intern proficient in English to join a kotoutumisentukena.fi development project. The three-month position starts in autumn 2024. This internship opportunity offers you a chance to enhance your skills and learn about online services and communication tasks. It also provides valuable experience working in government administration and supporting immigrant integration in Finland.

Kotoutumisentukena.fi is a web service that brings together integration support activities organised by different organisations. The original target audience of kotoutumisentukena.fi was professionals working in the integration sector. The service is undergoing a redesign in 2024. The purpose of the redesign is to expand the service to anyone who has moved to Finland and who wishes to find activities in support of their integration process. English is being added to the language options. This redesign will be carried out through co-development and user-centred design methods. This will be accompanied by a new communication and marketing plan to reach the service's expanded user base.

During your internship, you will collaborate with the team on the redesign of kotoutumisentukena.fi. Your tasks may include, but are not limited to:

- Planning and producing communication strategies and marketing content for various communication channels.
- Participating in user testing of the web service to ensure the functionality and usability of the service.
- Organising and conducting workshops in which we develop the web service together with users
- Collaborating with different stakeholders and networks.
- The opportunity to work on other tasks related to immigrant integration based on the unit’s needs and your interests.

We offer you the opportunity to expand your skills in communication and web service development as part of a passionate development team. You will with the chance to connect with professionals working in integration. The internship offers remote work opportunities.

Are you the enthusiastic and proactive intern we're looking for? Join us in making a meaningful impact and developing a web service that supports integration!

We encourage applicants of different ages, genders, as well as individuals from linguistic, cultural, or other minority backgrounds to apply.

What we expect from the applicant?

We expect you to have an interest in web service development, communication, and themes related to integration.

We hope that you are eager to learn, and that you possess strong writing skills. You should have excellent proficiency in English and sufficient proficiency in Finnish to navigate common everyday situations. Our primary working language with you will be English. Some basic Finnish language skills and the motivation to develop them further as a part of a Finnish-speaking work environment are

considered advantageous.

The applicant must be a student.

Field of study for applicants:
Communication, marketing, social sciences, humanities, or another relevant field.

Number of interns: 1

Desired internship period: 3 months starting from September.

Employer-paid gross salary without ancillary costs / month:
€xxxx-€xxxx depending on completed studies. The internship grant provided by the university is not a prerequisite for the internship, but please let us know if you have the opportunity to receive it. If you have the grant, the Uusimaa Centre for Economic Development, Transport and the Environment (ELY Centre) will pay the salary for the third month of the internship and cover the difference between the internship grant provided by the university and the gross salary for the first two months. The salary is determined for all interns based on the stage of the intern's studies. If you have attained under 150 ECTS credits, the salary is €xxxxx per month. If you have attained at least 150 ECTS credits or more, the salary is €xxxx per month.

More information about the position:
Senior Planning Officer Xxxxx by email xxxxxx or **by phone xxxxx on 6 May from 3 pm to 4 pm** and **13 May from 1 pm to 2 pm.**

Please send a free-form application and CV to *(email)*@ely-keskus.fi **by May 16 2024.**

Figure 9. Example of an intern position announcement from the Master´s degree program (OMA, internal communication).

Similar offerings may also come about when the BI programme has invited industry guests who sometimes share vacancies of their organizations.

The BI team *(c) Keeps informing the students about career development related programs and events*, such as workshops like ”Career Bootcamp”, networking events like ”Meet and Greet”, job fairs like ”Contact Forum”, mentoring programs like ”Suomen Mentorit” and competitions like ”Talent Hackathons” and ”Project Management Championship”, etc. These events/programs are held and/or organized on campus as well as by external parties. The BI Programme communicates with the students about these, especially via email, and encourages them to participate in such programs/events.

Furthermore, *(d) Organizing guest lectures related to industrial topics* and *(e) Organizing industrial/company visits*. So that, students get updated about the industry trends, provide them with insights to practical applications of studied concepts in real industrial world and opportunities to broaden their networks. All these things will make closer them to the industry which will be beneficial in approaching a professional job/thesis project.

The BI team (f) *Invites alumni members to share their stories about thesis writing and job searching.* Organizing this kind of sessions, inspire the students in searching for a thesis project/professional job and shares advice on how to approach their thesis writing, and at the same time allows expanding the network.

Moreover, the BI Programme always *(g) Promotes and encourages the students to find a feld-related thesis project in a business organization* as part of thesis writing. This is because the BI Programme past experience and its alumni's experiences show that thesis projects conducted for companies are the finest way to gain professional experience and the most effective path to approaching a professional job in the field.

In case no industry based projects are found by some students, (h) then, the BI Programme *directly organizes the thesis offerings based on internal needs and projects for BI students*. Examples are below:

December 2023

TO THE ATTENTION of INTERNATIONAL STUDENTS:

Dear BI International students,

BI Programme offers 3 thesis topics for you. Please contact us & describe your expertise in detail, if interested:

• **TOPIC 1: "Building an app and gathering data for addressing the needs of foreign students in BI when relocating to study in Finland".** (This is an expansion of the ongoing project, and we are looking for specific expertise that we are currently missing). This project is to be done in cooperation with a professional Relocation manager. We want to look in-depth into the data collection in relation to experience and needs of BI students when relocating to a new place of studies. It makes sense to consider this topic in case you are observant, service-oriented, and analytical; ideally, you have some previous experience in either a similar area, or in IT, or in business analytics, and you see yourself at the interjection of Relocation services + business analytics in the future.

•The topic will involve multiple interviews; deep and thorough document analysis including analysis of data and analysis of information, strong skills in info and data search and analysis, and building an app architecture. You should be able to commit & finish your part of this project work fast (latest by June 2024, and preferably earlier).

• **TOPIC 2: "Conceptualizing a Digital Recruitment Platform for MBA students".** This is a revision of the idea discussed earlier (2021), how to help our BI students to reach to employers and project owners. The BI programme has a need to revise and develop clear specifications for developers for such a digital recruitment place & consider all aspects of regulations. In this assignment, we are looking for a student who is interested specifically in either (a) the technical side or/and (b) the GDPR side.

• **TOPIC 3: "Recommendations for selecting AI tools for R&D projects".** Due to the growing speed of AI tools development, UAS students & companies need guidance on the selection of reliable AI tools for doing R&D projects (for example, in the context of UAS). Many tools (such as ChatGPT) cannot be considered fully reliable. The thesis will critically analyze the available tools and will produce a taxonomy of selected tools and recommendations on which tools can be reliably used for which purposes in the context of R&D projects in UAS. It makes sense to consider this topic in case you are: independent and have good time-management & self-organization skills; analytical and strong

in navigating among uncertainty and is able to do information analysis on a mass scale; already strong in AI tools, or ready to invest significant time & effort in mastering them to a good professional level.

• NOTE, in case you commit to any of the projects above, you will need to finish the projects, as many of them are locked to those people who volunteered to participate & have specific deadlines (so there will be no one to catch up after you).

• Evaluate your commitment, and consider carefully your personal and professional plans & if ready, get into contact.

Looking forward!

BI team

Figure 10. Example of the thesis topics offered by the BI Programme based on internal needs (OMA, internal communication).

Finally, (i) the BI Programme constantly updates the BI curriculum so that to follow the industry trends in BI area (visible in the BI Curriculum), and also offers certification opportunities - either in cooperation with Metropolia (as for “Project Management” PRY Certification), or individually, as for “MS Power BI” certification via the specially launched “Learning Community of Power BI” and offering its students relevant profesisonal certifications. This initiative helps to provide access to BI students to the most wanted professional certification in the area of Business Analysitcs, for example. Figure 11 shows the announcement about “Power BI” certification and preparing for it via the “Learning Community” launched specifically for this purpose.

Sent: Tuesday, December 19, 2023
Subject: "Learning Community of Power BI" - a re-start towards 1 February class (MODULES 1-2) / 'Master's Degree Programme in Business Informatics - Student information')

"Learning Community of Power BI" - a re-start towards 1 February class (MODULES 1-2)

Dear BI students,
those who are interested to get closer acquainted with Power BI and/or earn **a "MS Power BI, Data Analyst" professional certification PL-300.**

TODAY, our "Learning community of Power BI" gets reactivated! We have a new community leader, Sofia Konttinen, who will be guiding you - in a flipped classroom manner - towards the certification in spring 2024. Sofia welcomes you to join now!

What is a flipped classroom?

A flipped classroom means a type of learning when you come to classes PREPARED, based on the materials given to you beforehand. In class, you discuss your results, achievements and challenges, and do practical tasks, based on your homework thoroughly done in advance.

NEXT CLASS: 1 February 2024, Thurs evening, at 18-19.30 pm ONLINE

YOUR HOMEWORK: to master and internalize **MODULES 1&2** from the Moodle course. They will be the topic of your 1st class meeting.

WHAT TO DO: (1) read and internailize all the available materials for MODULES 1&2 in the Moodle course, and (2) do the relevant "MS Learn" modules with the tasks. The class materials have videos (developed earlier by Anna) that will guide you how to enroll and use "MS Learn" modules. (3) read

through the additional materials: there are YouTube videos and other supporting materials, in abundance. Explore & train before the class! Sofia will answer your questions & offer some additions.

WHY IT IS IMPORANT NOW: in support to your big-big course on "Business Analytics for Strategic Insights" (10 ECTS). Moreover, it makes sense to master Power BI now as it can be helpful in several of your mandatory courses (and not only for Jimmy, but also for reporting in Kevin´s class in spring 2024 & reporting in Pia´s class in "Digital Marketing & Sales Automation" in autumn 2024), and also your theses.

HOUSEHOLD RULES: (1) come to classes prepared! (2) before asking a question in a Whatsapp group, search for the answer in the existing materials/discussions; someone has probably asked it already, (3) respect the time & effort of the community leader; respect & respect & gratitude (it is done on a fully volunteering basis), (4) strive for passing the certification! If passed, it will bring you 5 ECTS, 1 course (via "Professional Edge" course).

DEADLINE for this round: aim to pass the certification by 23th June 2024 (deadline for available certificates). If we are successful, there are more chances that we can get the next bunch of certificates.

HOW TO GET to the Moodle course:

Learning community of Power BI was designed for students who are interested (and want to develop knowledge and skills) in Business Analytics. The learning community aims to improve "MS Power BI" skills, and try and obtain PL-300 certification (https://learn.microsoft.com/en-us/certifications/exams/pl-300/). The Learning Community was first conducted in summer-2023 and consisted of 5 weekly meetings, self-learning and helping each other during the learning path in summer 2023. The final meeting was held on 1st September and was focused on the exam procedure.

Learning community materials include access to **6 "MS Learn" packages** for self-learning that cover theory and some labs for practice. These packages are complimented with extra materials for deeper learning of each topic. The materials also include video recordings of 5 meetings/demos with the lecturer´s input (by Anna Vinogradova, the community leader-2023) and demonstrations of Power BI features.

At the Learning community, students learn: (1) how to get and prepare data in Power BI, (2) how to design and develop a data model, (3) how to visualize data and (4) manage workspaces. The students also got to know (5) Power Query tricks, difference between merge and append queries, DAX structure, and some more.

These materials may be useful to you in two ways:

1) you may get acquainted with Power BI, and doing analytics and visualizations there (for expanding own horizons; no Exam).

2) you may train purposefully towards PL-300 certification for “Data Analyst” (you will get graded, 5 ECTS, if pass). NOTE, this is a good option for either very persistent students, who are ready to self-study towards a certification, or those with previous experience in Power BI as they need less training. Here, we can offer you a Voucher for the Exam valid till 23th June 2024.

HOW TO GET the Voucher for free access to PL-300 “Data Analyst” Exam:

The students who pass the Pre-assessment with 80% of scores get a Voucher Code (you can try as many timers as needed, and most of our students have got these scores). Pls contact Zinaida for getting the Voucher; out of 30 available earlier, we still have 15 pieces; and they are waiting for the first 15 students (”first come, first served”).

Welcome to join the Learning Community for the last meeting on 23rd May, 18-19.30 online!

BI team & Sofia

Figure 11. Example of additional offering by BI Programme to boost professional skills and competences of its BI studnets (OMA; internal communication).

Thus, the above efforst show that, at the Programme level, the BI Programme offers a wide range of help and makes a considerable level of effort to help their students to

approach a thesis project/ professional job in the BI field, as well as offer additional activities (such as certifications) that boost professional “value” of its studmnets on the job market. So, the students should actively utilize those opportunities to gain the maximum benefit of them.

4.2.3 Description of Own Practices by the BI Master’s Students in Approaching a Professional Job/Thesis Search – Analysis based on the Questionnaire

In addition to the interviews, a questionnaire was issued separately for first year and second year BI Mater’s students, to understand more precisely the distribution of the current practices followed by them in approaching a professional job/thesis search. The total number of responses was 13 which consisted of six responses from the 2nd year students and seven responses from the 1st year students. It make the response rate around 50% for each year. Although these responses are nor respresetative enough for making any reliable conclusions, the analysis is given below. Insights from this round may be used to conduct a more representative survey in the future.

(a) First, the figure below shows the *BI professional areas* of respondents in each group. In the 2nd year group, most of the respondents belonged to the general business field. In the 1st year group, the distribution was quaite similar, with one student from the IT field (engineer).

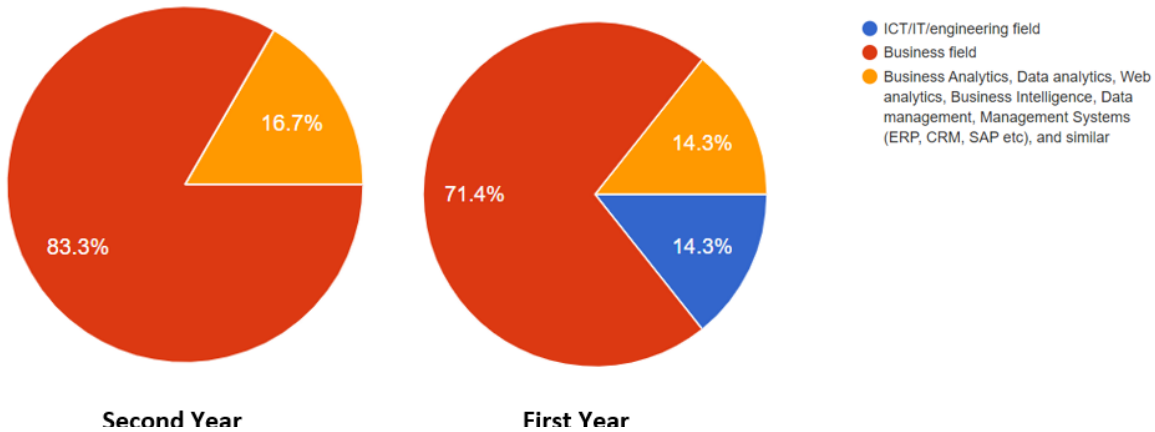
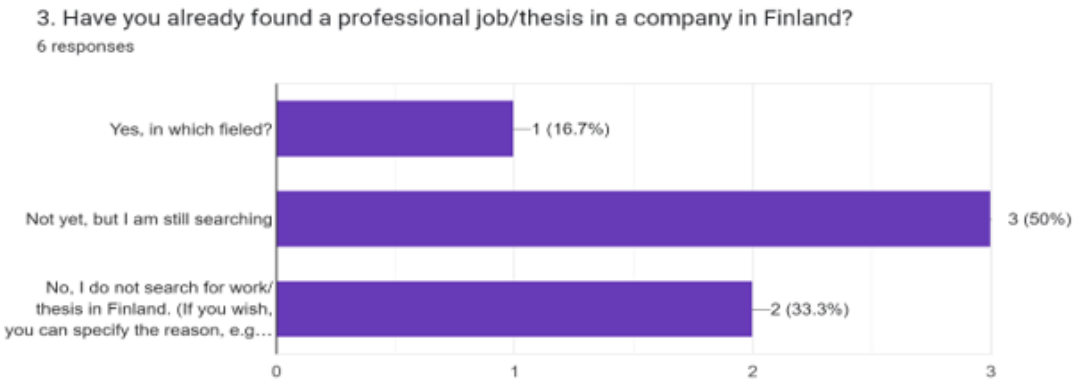
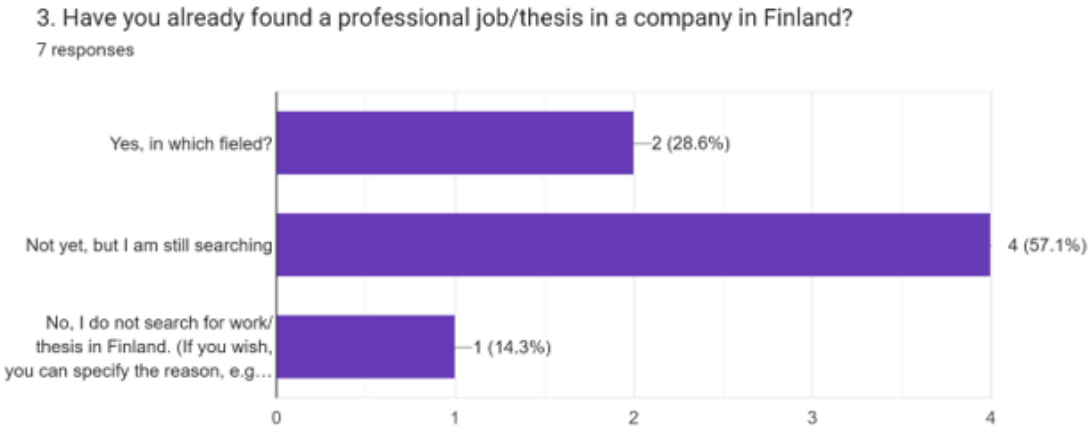


Figure 12. BI Professional Areas of the respondents (2nd and 1st year BI Master´s students who reponded).

(b) Second, the current situation with the job search also looked quaite similar in both groups, with the students who are still searching for a job/thesis being in the majority.



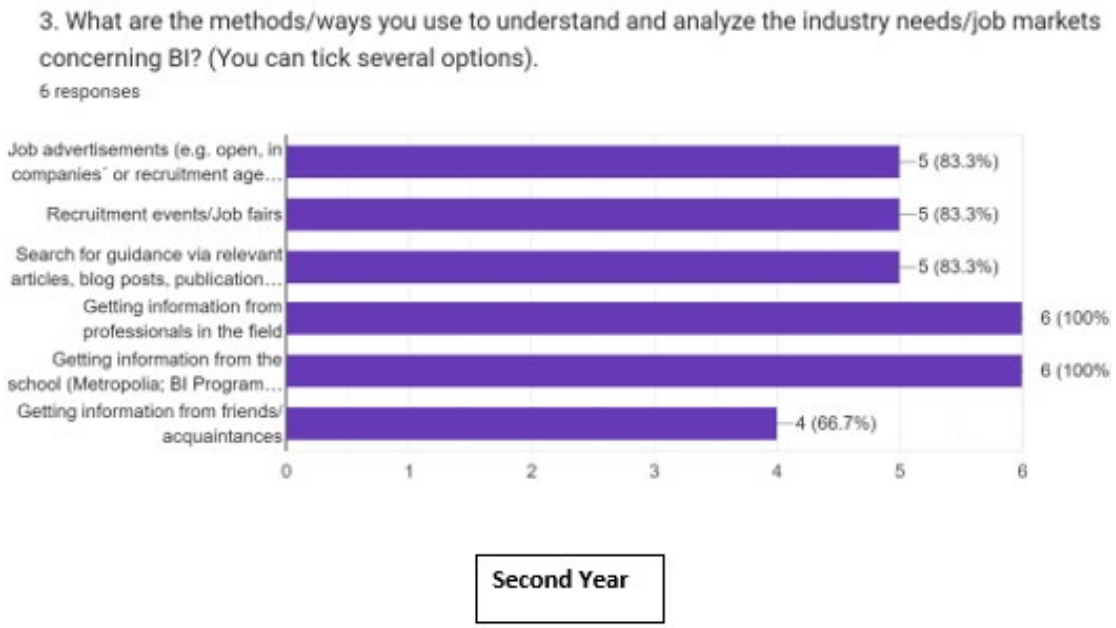
Second Year



First Year

Figure 13. Currrent situation of the of the job searching (2nd and 1st year BI Master´s students who reponded).

(c) Third, when analyzing the industry needs and job markets, the 2nd year students seemed more experienced and knpwledgeble in utilizing the full range of availbale opportunities, and also valuing the information coming from professionals in the field and information from the university. While the 1st year relied more on the job fairs/recruitment events. The below figure shows the comparison between the groups.



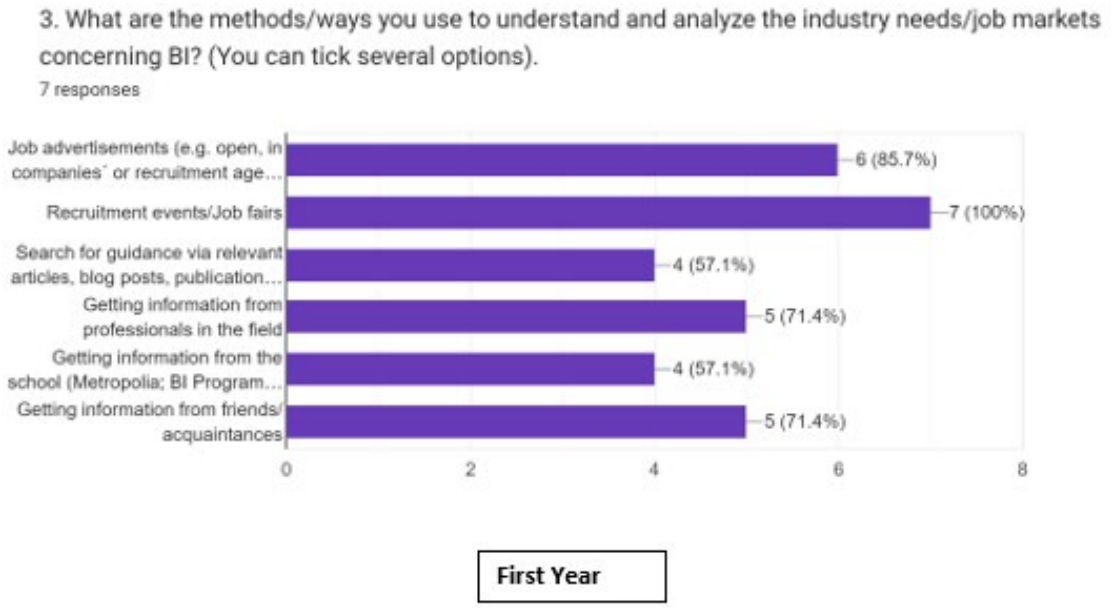
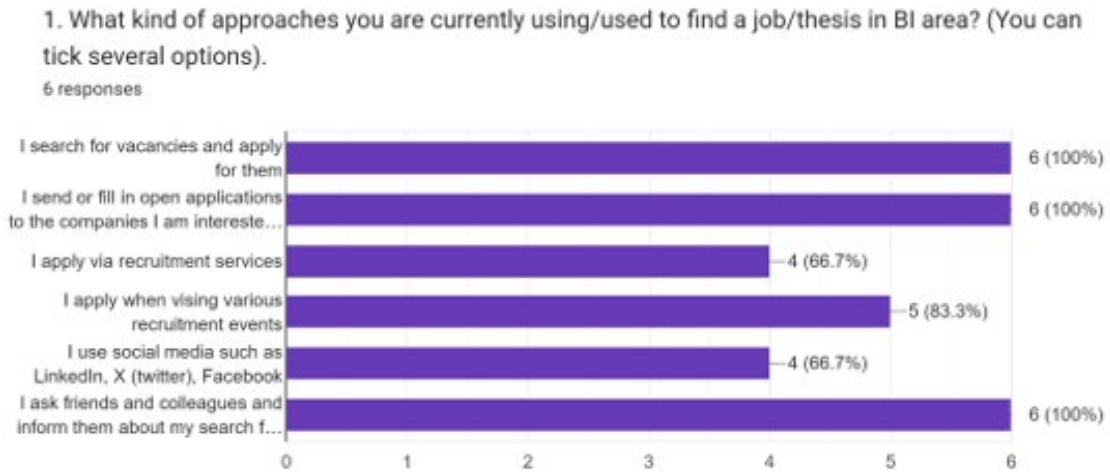
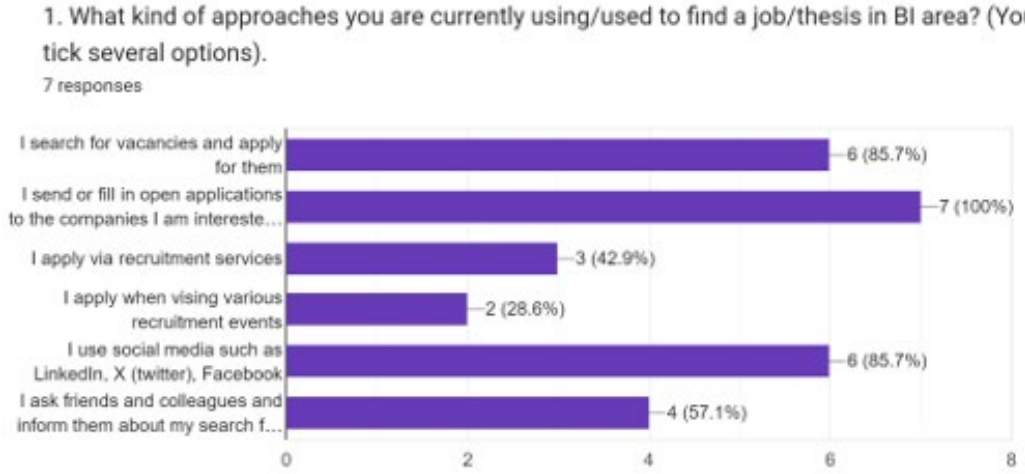


Figure 14. Preffered methods to understand and analyze industry needs and job markets (2nd and 1st year BI Master´s students who reponded).

(d) Fourth, the students also showed a slight difference in approaching the job/thesis search in the BI area.



Second Year



First Year

Figure 15. Preffered approaches to find a job/thesis search in the BI area (2nd and 1st year BI Master´s students who reponded).

Figure 15 shows that the 2nd year students rely on applying via searching for vacancies and apply via open vacancies on companies´ web-sites for them, as well as asking from friends/colleagues about jobs/thesis projects. The 1st year students do almost the same, but also rely on the use of Social media (e.g. suh as LinkedIn for job/thesis searching). While asking form student colleagues and friends is somewhat less popular.

(e) Fifth, when asked about the sources they use to find vacancies, both groups mostly pointed to LinkedIn and the next mostly popular choice was the TE-services job advertisements. Additionally, Metropolia´s JobTeaser and advertisements published by City offices, Helsinki, Vantaa and Espoo were also among them.

Moreover, out of the above job sources, most of the respondents have mentioned Linkedin as the most effective source among the Social media channels, and then the references shared to students by other persons. Among the events, the students mentined the recruitment events and their relevant websites such as Barona, Dunnitori, Work in finland, as well.

4.2.4 Perceptions of Current Case organziation´s Practices by the BI Master's Students in Approaching a Professional Job/Thesis Search

The perceptions by the BI Master´s students about the current case organziation´s practices were categorized under four focus areas. First, the findings related to the current guidance and practices on *1) Understanding BI as a Professional Area*. Second, the findings related to the current guidance and practices on *2) Identifying Industry Needs and Job Markets*. The third one is the findings related to the current guidance and practices on *3) Understanding Employability and its Ways*. Each category is discussed under the headings namely, A.State of Current Guidance, B. Current State of Own Practices by the students, C.Expected Guidance, and D.Suggestions by the students. Additionally, the fourth one, the findings related to *4) Applying of Available Guidance and Best Practices* in Approaching a Professional Job/Thesis Search in BI. These findings point to the areas that need to be considered when developing the guidance/proposal.

Table 5. Key findings from the current state analysis of available services, tools and resources at the case organization and the students´ preferred practices.

Category	A. State of Current Guidance/Services	B. Current State of Own Practices by the Students	C. Expected Guidance (Responses to questionnaire are shown below seperately in the form of graphs)	D. Sugges-tions by the students
1.Understanding BI as a professional area	Efforts can be seen at the BI Programme level e.g: Organizing industrial visits,	Most of the students have a general understanding of BI as a professional area.	Guidance on identifying career paths in BI, what should learn more to improve the relevant BI areas, what	Introduce an introductory session on "Understanding BI as a

	guest lectures on industrial topics	But only a few students have a fairly good knowledge of their professional career aspirations in BI and the career path for that.	technical skills should acquire more	professional area". The Master's program should be designed with more IT-related and less business related modules for business field students.
2.Identifying Industry Needs and Job Markets	Both Metropolia´s and BI Programme´s level guidance/services are available. e.g. Job fairs, networking events, informing job vacancies, organizing industrial visits, guest lectures on industrial topics But some efforts are less effective (e.g. Job fairs)	Most of the students have a moderate level of understanding of industry needs and job markets (specially, they are aware about the technical skills needed in general)	Guidance/information on current industry needs and trends, and about the job market for BI	Organize a few guest lectures on current industry needs/trends and the situation of the job market for BI. Organize mentorship programs with BI alumni
3.Understanding Employability and its ways in BI, in Finland	There is availbale common guidance (e.g. "Boost Your Job Search" and "Discover Your Career Path in Finland" course modules). Also, BI Programme -level guidance e.g.: encourages to find thesis project in a company	Most of the students have a good level of understanding of employability and its ways in BI and in Finland	Guidance on how to build up strong *networks* and where to find them. Guidance on what knowledge and skills should further develop to improve employability and sources of them	Students expect Metropolia to form partnerships with companies to have for internships for students

Under the first one, *1) Understanding BI as a professional area*, currently available guidance at the case organization can be seen under the BI Programme level. More specifically, the BI students mentioned the company visits related to the industry and the guest lectures focusing on industrial topics as examples of the BI Programme efforts to improve the *understanding of BI as a professional area* by the students. The responses in the questionnaire show that the students have a general understanding of BI as a professional area in terms of business field, engineering/IT field, and as a combination of both. However, they need further guidance on what kind of professions they can target based on their backgrounds, which BI areas they should further improve, and what kind

of BI related technical skills they should acquire. This figure shows the responses in questionnaire on what are *the Guidance students expect.*

Second Year

First Year

Figure 16. Guidance needs to improve the BI professional areas.

The above figure shows, the students in both the years mostly need the guidance on technical skills development related to BI. Then they need guidance on available resources and further education, certifications and training to improve BI areas.

In support of the questionnaire, the interviews showed a similar result. As sugessions under Category *1) Understanding BI as a professional area*, the students proposed to have a short introductory session about BI professions and how it works in Finland, to include more data analysis applications in the BI Programme, and to design the program with more IT/data analysis course modules and less business related modules for business field students.

> *"It is better if they can have a small course/introductory session on what are BI professional areas demanded in Finland and what type of applications used here. Because, those things are different here from what we are familiar in our home countries and it will give the confidence to us or it may show some path at the beginning and give us a clear idea about BI as a professional area and how it works in Finland". (Interviewee 6)*

> *"The program taught us Power BI as a data analysis application. But, I think it should introduce more applications to the course like this".(Interviewee 8)*

> *"I feel the program should design for business field students in a different way. Currently, it includes more business related modules. But, I think for business field students, there should be more compulsory courses on IT/data analysis to improve their knowledge and understanding on BI". (Interviewee 10)*

However, Under the second category, *2) Identify the industry needs and the job market,* the students expect guidance from the case organization regarding the BI industry and the job market. The following figure shows the responses for the survey on expected guidance on industry needs and job markets, summarizing the results form the questionnaire.

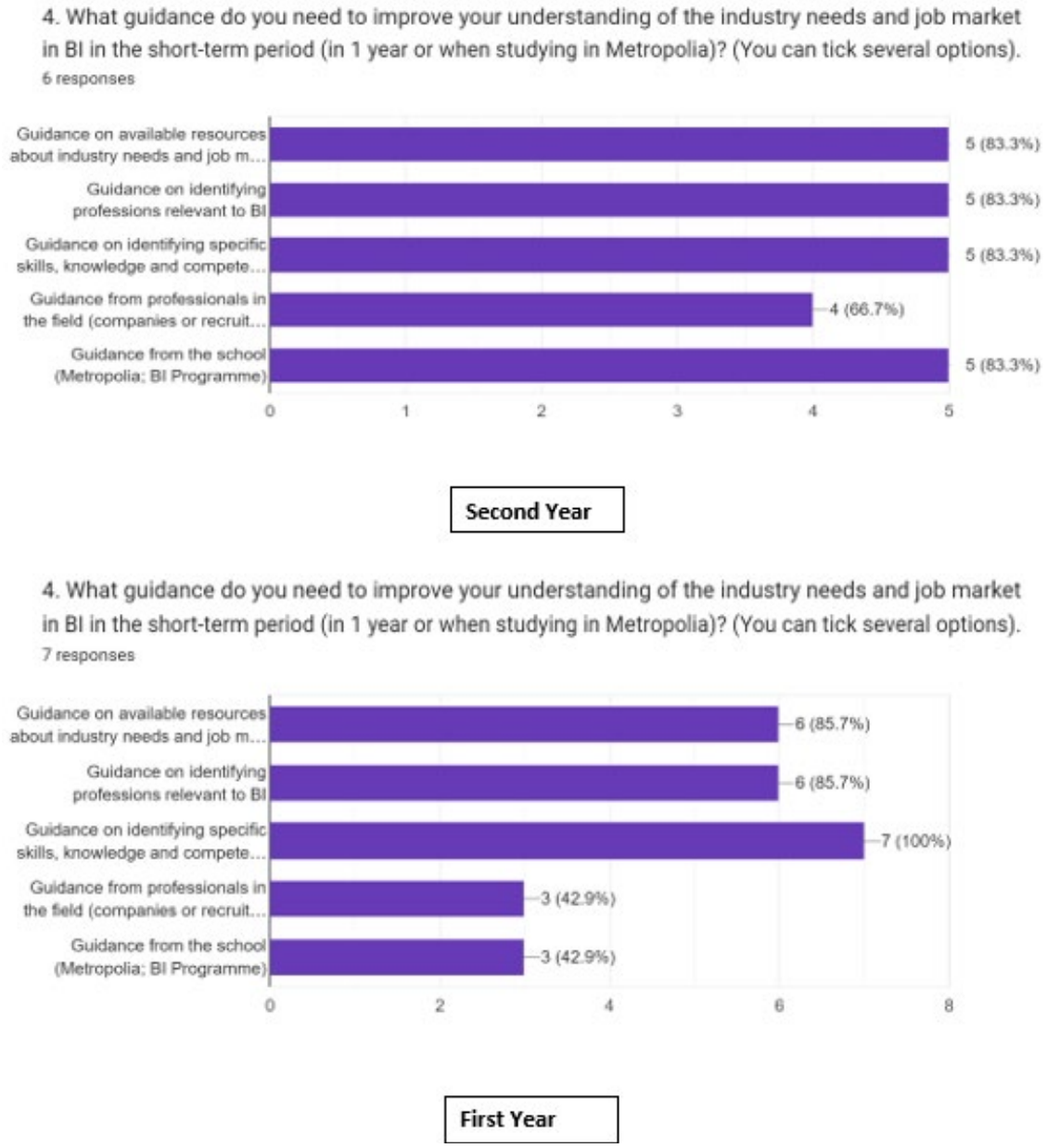


Figure 17. Responses for the questionnaire-Expected Guidance on industry needs and job markets in BI

The above figure shows that, most of the students, expect guidance on identifying industry specific skills, knowledge and competences; and then also guidance on available sources about industry needs and job markets, and identifying professions related to the industry.

In addition to that, based on the interviews under the second category, *2) Identify the industry needs and the job market,* the case organization provides its guidance and services by organizing job fairs and networking events, and informing the students about

such kinds of events outside the campus as well. The students use the JobTeaser tool works as a job portal to find vacancies. They also noticed that the BI Programme informs about job vacancies, and organizes industrial visits and guest lectures to improve the understanding about industry needs and job markets. In identifying the the industry needs and labour market, students mostly have a general understanding about the technical skills the industry is demanding.

> *"The industry is expecting us to have technical skills such as PowerBI, Python, R Language. They are not asking for basic knowledge but we should have expertise knowledge/experience on these". (Interviewee 7)*

> *"According to my knowledge, I think, to find a job in this industry we should have knowledge and skills of PowerBI, SQL, Tableau, Python, ERP systems like SAP." (Interviewee 5)*

The students also stressed that they value the guidance from the BI Programme. One of the interviewees also highlighted the importance of the guidance receiving from the university as follows.

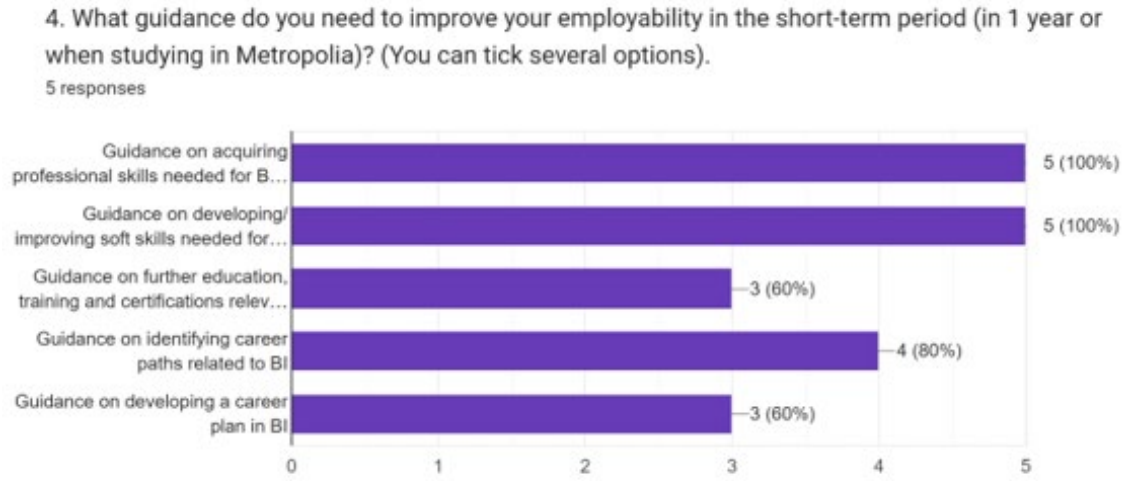
> *"I have a general idea of what kind of skills BI industry is asking like analytical skills and knowledge and experience of data analysis applications. I got to know about these basically from the job advertisements and also I read if I found any articles/documents about the industry. However, I believe the ideas/information we get from those may be different in the real industry context. But, we can always rely on what our university informs/teaches us. So, it is better if they also can keep aware us of the trends and requirements in the industry". (Interviewee 10)*

As suggestions for *the Guidance*, they propose to have guest lectures by industry experts and mentorship programs with BI alumni.

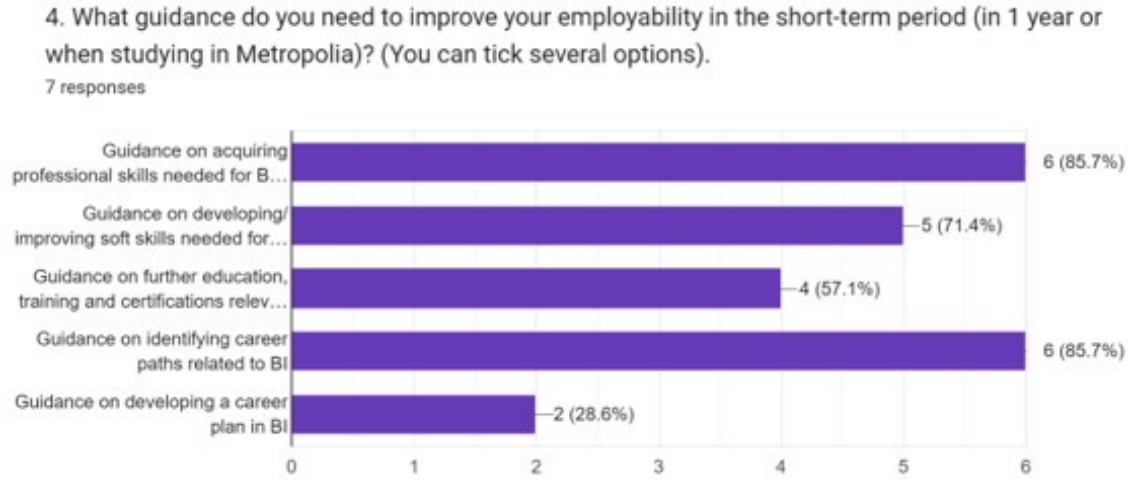
> *"Business informatics has so many things that you can not specifically say. So, the industry is the same. Therefore, it would be better, if our department could organize few guest lectures about the BI industry, its current trends and needs, and about the market for BI". (Interviewee 3)*

> *"I think the best way to know about the industry is from the professionals who are already in the field. We already have such kind of professionals, that is our alumni. Therefore, if we get an opportunity to connect with them like a mentoring program, that would be more beneficial. If a student can get one of the alumni members as his coach/mentor, then he will be able to get more familiar with the industry". (Interviewee 10)*

In the third category *3) Understanding employability and its ways,* the students felt that both general and department wise guidance are available. The two course modules “Boost your job search” and “Discover your career path in Finland” were mentioned as commonly available guidance and the fact that the BI Programme always encourages students to find a thesis project related to the industry in a business organization, as it paves a strong foundation to find employment in BI. Based on the responses to the questionnaire, most of the students have a good level of understanding about employability and its ways in BI. As the guidance they expect as for improving their employability, the responses to the questionnaire is shown in the below figure.



Second Year



First Year

Figure 18. Response to Questionnaire for “Expected Guidance to improve employability”.

The above figure shows that, to improve own employability, students expect guidance on acquiring professional skills, specially the technical skills, needed in BI. Then, they need guidance on acquiring soft skills and identifying caeer paths in BI. Next, they would appreciate guidance on further education, training and certifications, and guidance on developing career plans.

Based on the responses to the intrviews, as the suggestions to *the Guidance in improving employability,* they proposed the university to have partnerships witn business organizations to get internships for them.

> *“Some universities have internship programs for Master’s students as a part of their study program. So it is great if our university also have that kind of arrangement”. (Interviewee 3)*

This was suggested by most of the other interviewees as well.

Finally, as for the fourth category *4) Applying the available guidance and best practices*, it can be said that, every student utilizes some of the guidance available/services provided by the case organization for a professional job/thesis search, but only few students make use of them actively and effectively. As explained in Section 4.2.3 above, most of the students use/have used Metropolia JobTeaser to find job vacancies and they apply for the vacancies sent by the case organization through email. They also attend the job fairs informed by the case organization. In addition to that, most of the students have obtained the certifications in “Project Management” and “Hubspot Marketing” of which the examinations were arranged free of change by the case organization and they do not take much time to prepare (unlike the free-of-change “MS Power BI Data Analyst PL-300” certification, that requires considerable effiort to get and thus much less popular among the students, in opposite to what they themselves described as their professional needs).

Thus, the students know about availbale guidance/services and some have gained benefits of them, few students have effectively utilized them. As explained in Section 4.2.3 , Interviewee 2 got his/her internship through a job vacancy published in JobTeaser and then got his/her permanent job also via the network he/she built up through the industrial visit organized by the BI Programme. Furthermore, by joining as student

ambassadors, both the Interviewee 2 and 4 have been able to build up and expand their networks. At the same time, except for two students, no other students were aware about the CareerBot AI tool. The two students (Interviewee 5 and 7) who experienced it, have found it as a good option to evaluate themselves as well as to find job vacancies, but they still preferred personal guidance from industry professionals than that kind of a tool.

In addition to that, during the interviews, some students mentioned some loopholes/barriers they faced when using some guidance/services. One student mentioned that, even though they had used JobTeaser earlier very oftenly, now they do not use it much as most of the job advertisements are in Finnish language. Other students also noted that most of the vacancies in JobTeaser require fluency in Finnish language as an eligibility criteria (Interviewee 4, 6, 7, 10, 11).

> *"In my first year, I mostly used JobTeaser to find the vacancies. But, most of them are in Finnish. I translated them and applied by spending lot of time. While doing it, sometimes I was thinking, whether the idea/meaning I got through translation is correct or not, so am I preparing the application documents in the right way with required information or not, and I didn't receive a single response for the applications I sent. That made me eventually quit using JobTeaser in my job searching". (Interviewee 6).*

Then, the students who have followed the course module of "Boost Your Job Search" mentioned that the course is good to have a general understanding about the Finnish job market, the way it works, and how to prepare job application documents in an attractive and effective way. But they need more BI specific knowledge through such a course (Interviewee 4, 5, 6, 7, 10).

> *"I followed the "Boost Your Job Search" course. It was really good as I got to know about the importance of networking, about the hidden jobs and how to write a cover letter in the right way. But, all these are common/general guidance and I need more BI industry specific information and guidance. If the same course could add that part too, I think it would be so beneficial for us". (Interviewee 4)*

Then, some students mentioned that the job fairs are less effective and feel like a waste of time. Out of them, the business field students had the idea that, in most of the job fairs held at Metropolia, most of the companies were in IT/engineering field (Interviewee 3, 4, 5, 6, 7, 11).

> *"I have attended few job fairs held at the university. In those, the only thing most of the participated companies were doing is asking us to scan the QR*

code displayed in a table and find the job vacancies. So, I got the feeling that there is no need to attend for the job fairs and, if we could have the names of those companies, we can find the job vacancies without spending our time at such job fairs". (Interviewee 11).

Summing up, it can be mentioned that, the case organization offers a range of general guidance and also by the BI Programme, even though it does not have any centralized career guidance services yet. Most of the students utilize the lion´s share of those services/guidance, whereas a few students use them very effectively and actively. Meanwhile, from the students` point of view, they see or they have experienced some loopholes/areas to be improved in the available guidance. Top of all, based on their responses, it is clear that they need more specific guidance related to the BI industry in order to achieve their career goals as for most of them BI is a new professional area. Morever, the country and the business culture is not familiar for them, and how the industry is operates often differ from their home countries.

4.2.5 Analysis of Own Best Practices by the BI Master's Students when Approaching a Professional Job/Thesis Search – Analysis based on the Interviews

To understand what are the current practices followed by the BI Master's students, face-to-face online interviews were conducted with eleven BI Master's international students who are studying in the 2nd year. The following table shows some background details of the interviewees.

Table 6. Summary of background details of the interviewees (BI Master´s students).

Interviewee	Previous Profession/ Field (IT, Business, Combination of both, Other)	Current Situation of Approaching a Job/ Thesis Project	Duration in the Process of Job Searching	No. of Job Applications Sent at the time of the interview (Approx.)	No. of Interviews Invited for
1	IT	Is still searching for a job	1.5 years	80	8
2	Other	Employed	1 year and 4 months	119	5
3	Other	Employed (Skilled job outside BI)	1 year	Over 100	4
4	Combination of both	Found a thesis project	6 months	30	5
5	Business	Is still searching for a job	1.5 years	Over 200	0

6	Business	Found a thesis project	1.5 years	35	0
7	Business	Found a thesis project	1.5 years	Over 100	0
8	Business	Currently not searching for jobs (Concentrate on finilizing the thesis)	3 months (before starting the thesis)	30	0
9	IT	Employed since 2018		Over 100 (Before 2018)	Moved here with the job
10	Business	Is still searching for a job	1 year	15	0
11	Business	Is still searching for a job	1 year	50	0

The following shows the analysis of identified current best practices of them based on their responses at the interviews.

One of the best practices identified is *(a) Concern about the quality of the job applications rather than the quantity*. When sending job applications, it is important to consider about the quality of the documents such as CV and cover letter. It should be carefully checked whether the documents are fully and clearly addressed the requirements/information mentioned in the job advertisement. It is worth to spend some considerable time in preparation of the required documents and send few quality applications rather than sending hundreds of careless applications.

> *"My main approach is quality over quantity. So I'm not sending as much as possible applications. It just takes time and it's useless. (Interviewee 1)*

The next one is *(b) Networking.* It plays a crucial role when approaching a professional job in Finland. It is an effective strategy in landing a job and it expands the career development opportunities. Building up networks in the field, actively engaging with them and continuously expanding the network may put one in a successful position during the job hunt and beyond.

> *"I think lots of things in Finland built on trust and they just don't know you and they just don't trust you. My approach is to talk to people and build networking. Because I think this is the best possible way to find a job in Finland. I try to visit companies of my interest, if there is an event/program related to our field and also I participate for webinars or events related to my field or in data analysis in general. At those events, I try to build up connections and later I communicated with them mostly through LinkedIn. Likewise, I am trying to build up and expand my network. I know that there are people who found jobs here without any network connections but*

> *according to my statistics, most of the people were able to get the job through networking. So, I believe applying for jobs with a recommendation from a person who can influence the company, and who is believed by the company is the most effective way of finding a job". Through one of my networks, I was invited for an interview even though I was not successful. (Interviewee 1)*

> *"I want to emphasize the importance of networking based on my experience. Because the Finnish business culture operates in a high level of trust. In my company, I think we need people. But it's difficult for them to really trust the applicants that are from job websites or just a walk-in applicant. So you will only get in, if somebody they trust recommends you. Of course, there are success stories of those who use LinkedIn or other online job portals and they were able to get a job. But based on my own experience and the experience of some people I know, you have to know someone who could vouch for you and recommend you to companies so that the trust would be extended to you. (Interviewee 2)*

> *"I submitted a few applications for a thesis work. I was able to build a network and tried to approach the person and then he tried to help me to submit that to the company. And luckily, through the power of networking, I was able to get in". (Interviewee 4)*

> *"To improve networking, the best thing is to join the communities related to our field. Normally, I google and find such communities, then I join them and try to participate in their events. If I feel some community doesn't suit me then I quit but keep on searching for new ones and join them". (Interviewee 5)*

> *"I found my thesis project through networking". (Interviewee 7)*

Another best practice is *(c) Communicating with the company people before and/or after sending the job application.* In most of the job advertisements, it has been mentioned the contact details of a person from HR or a senior person related to the published position. Contacting such person and show them that we are really interested in that position, some times would be benefical in the selection process.

> *"If they have a phone number to call them, and the best way I think, to send your application and then call them. Another kind of best practice for me, for example, if I see an interesting job and then I see that they require Finnish language, before sending the application I just get in touch with HR and ask them like, I have power BI skills, but I noticed that you want someone who speaks Finnish, Do you think that still can apply if I do not speak Finnish but I am learning, and usually they reply to me. I know it feels weird because it is a different type of culture and for me it feels like I am kind of an annoying person to call them, but actually I had nice talk with them. Even one of the managers I talked, asked for my name again and told me that they will keep my CV in the database and inform me if any suitable position become vacant". (Interviewee 1)*

> *"I know one girl. That is how she got her job. She applied and nothing happened for even after two months passed the deadline. Then she called them, and then they invited her for an interview and then she was able to get her job. Of course, it depends on the interview and what types of questions they will ask and the way of responding to them. But, you never know, she was able to make an interview because of the phonecall she made and then she was lucky to have the job". (Interviewee 10)*

Next one is *(d) Keep on learning and adding skills.* Continuous learning and adding required skills to your profile is essential for approaching a professional job as it improves your competitiveness, adaptability and career possibilities.

> *"As I got to know about what are the demanding skills from my network, I try to complete those courses and obtain the certificates. For example, Power BI Certification and Google Data Analytics Certification". (Interviewee 1)*

Here, the skills refer to technical skills and soft skills as well. Two interviewees highlighted the importance of having soft skills and how it contributed to his/her success.

> *"Forget about technical skills, they can be learned in a very short time, but the soft skills will take longer time to acquire. Technical skills can only get used at some point, but it will be your soft skills that will sustain how far you will go in your field. In my case of being a trainee and then getting a permanent position, I believe soft skills played an important role. According to my manager, what is most important is the cultural fit, because the organizational environment is quite diverse. You must be able to quickly adjust to the work environment in terms of how the team works and in terms of how the team communicates. Other soft skills would be, attention to detail, organizing skills and communication skills. You must know how to manage a meeting, how to manage other stakeholders". (Interviewee 2)*

> *"It is the soft skills that works more, I think at least I have seen it even where I work now, it is not like the resume or the CV that matters most, but obviously it should be attractive to select for an interview . But then when you go for the interview, it is the soft skills that matters more. How you speak, how you talk and how you impress them. That matters a lot. My both managers who hired me has told me that you have really good positive kind of talk which made us employ you.". (Interviewee 3)*

Another best practice is *(e) Try to understand the industry needs and trends.* Understanding industry needs and current trends is crucial in landing a job, as it helps students to align their skills, experiences, talents and career goals. With that they can find the gaps between the industry requirements and what they possess, what areas they need to brush up and the need to upscale on certain areas.

> *"I use my network to understand the current industry needs and trends. I have joined to a mentoring program and I always ask from my mentor about the industry situation and get updated. Also I communicate with people in the communities/groups I have joined in my field". (Interviewee 1)*

(f) Joining mentoring programs is another best practice. Here, you get a professional in your same field as a mentor. Participating in mentoring programs would be highly beneficial in approaching a job, as it offers mentees with valuable insights, access to job prospects, career coaching, networking opportunities, skill development and help for cultural integration. Mentoring relationships can be identified as a unique and invaluable tool for individuals seeking for professional job/thesis search in Finland.

> *"I have joined a mentoring program and it is one of the best actions I have taken in job searching journey. My mentor is a professional in my field who is in the position of a hiring manager as well. He helped me to understand my skill gaps, to expand my network and to get to know about the industry and the job market to some extent". (Interviewee 1)*

> *"I recommend being involved in mentoring programs, because I am in one program and it get introduced you to people from the industry and from other networks also. Therefore, it gives you some better opportunities to get closer to the industry". (Interviewee 2)*

Another practice followed by an interviewee, who has been able to find a job in his/her previous profession was (g) *If you are interested in some job, keep on looking for it and chase it.*

> *"If you want a specific job, then you look a lot for it. Like I wanted this job in my previous profession, I kept looking on the relevant websites. I kept calling them. Even though, I got rejections, I kept applying again. Finally, they called me for the interview and I got selected. My manager told me that I saw your motivation and interest in this job and that is why I wanted to invite you for the interview". (Interviewee 3)*

Next best practice is *(h) Effective usage of social media.* Here, the main example is LinkedIn. Utilizing LinkedIn and other social media platforms effectively, can greatly improve your job hunt by growing your network, exhibiting your expertise, keeping up with industry developments, and putting you in touch with companies and job openings.

> *"Let's say I found this job from LinkedIn. So I would go to that particular company website and from there really look through the company profile, background and then zoom in rather to the specific job requirements. From there, you can of course somehow get the big picture of what the industry or the job requires or calls for. I further explore the site and try to find some professionals work there and search for them in LinkedIn and try to get connected with them and have some communication. And I meet up with*

> *them in person as for their availability, which would be beneficial for me to buid up my network". (Interviewee 4)*
>
> *"I have joined some groups in LinkedIn related to BI areas. In those communities, I can see their conversations regarding the industry and also I have the opportunity to ask questions from them and they answer and give suggestions". (Interviewee 7)*

Another one is *(i) Make use of available resources and opportunities at the university.* The university proides a range of guidance as tools, services and opportunities as discussed in 4.2.1. Effective use of them will take the students closer to achieving their career goals.

> *"I work as a student ambassador at our university, which offers me some working experience as a part-time work. But rather than that, it gives me the opportunity to meet people which expands my network". (Interviewee 2 and 4)*
>
> *"I got my first internship from the Metropolia JobTeaser. I also landed another interview from a job post from that portal. Also, I attended company visits organized by our BI department. One of such visits was to the company I am currently working and the network I built up through that visit is one of the main reasons for my presence here". (Interviewee 2)*
>
> *"I followed the Boost Your Job Search course, which provided me with insights on how to create an attractive CV and cover letter, importance of tailoring them for different job postings by analyzing the company background, culture,tone and the job requirements". (Interviewee 6)*

(j) Make sure to customize the CV and cover letter according to the job posting is another best practice. Sending tailored CV and cover letters for various job openings will greatly improve your job search by showcasing your suitability, enthusiasm, significance, and flexibility to prospective employers. By customizing your documents to each job opportunity's unique requirements, improves your chances of getting interviews and eventually landing the position you want.

> *"I try to customize my CV, specially the cover letters when I send the applications. It takes a lot of time to analyze about the company and the job requirements. Even though still I couldn't get any interviews, I think sending hundreds or thousands of the same application to different job postings is useless and sending a few applications which are customized would be beneficial" (Interviewee 8)*

Another one *is (k) Having a mindset of being a fresh graduate or an undergraduate who is always hungry to learn and willing to fail*. Being eager to learn and prepared to make

mistakes may be very helpful while looking for a job since it fosters a growth mindset, differentiation, resilience, adaptability, and continual improvement. It can also help with networking and personal development.

> *"I have failed several times, it is quite embarrassing, but I think it is part of professional growth. If you are not ready to fail, then you will not be able to learn the lessons and go forward to gain success. I approached this job searching as a fresh undergraduate, not as somebody who has worked for 20 plus years in my home country. I tried to adopt the attitude of a new student, so hungry for growth, so hungry for new information and willing to fail to learn and willing to be embarrassed (Interviewee 2)*

Next one is *(l) Try every option you have*. Make use of every opportunity you have such as attending job fairs and networking events, sending open job applications, communicating with colleagues and relevant people and these practices make you at least one step closer to achieving your career goals.

> *"I found my previous job by attending a job fair which was organized by Microsoft" (Interviewee 9)*

> *"I was everywhere. I used LinkedIn, Indeed and all sorts of job searching sites. Then I used the old-fashioned way of asking people are there any vacancies in their companies and then networking also. I attended job fairs and networking events. Still I continue those practices till I find a job" (Interviewee 11)*

To summarize, it is evident that - according to the students´ perceptions - out of the best practices followed by the students, they belive that *networking* plays a crucial role. According to their perceptins, most of the students who have found employment or a thesis project seemed to have found it through networking. At the same time, their interviews also confirm the importance of utilizing *available guidance* from the case organization, *acquiring/developing soft skills*, and joining *a mentoring program*.

There was also a perception that but the currently available guidance at the case organization is scattered and not centralized and with the establishment of *Career guidance services* the students will be able to obtain the services in a broader way.

4.2.6 Summary of the Current State Analysis Results related to Approaching Job/Thesis search in the case organizaiton and the case unit (BI Programme)

As the summary of the current state analysis, the main strenghths/available guidance and weaknesses/limitations of the currently available guidance and practices identified through the analysis are mentioned in the below table.

Table 7. Stenghths/Available Guidence and Weaknesses/Limitations.

<table>
<tr><th>Strengths/Available Guidance</th><th>Weaknesses/Limitations</th></tr>
<tr><td>A range of Support/Guidance is available in following areas,
1. Understanding BI as a Professional Area
2. Exploring Industry Needs and Job Markets in BI
3. Understanding Employability and its Ways in BI

<u>Common Guidance</u>
a. Metropolia JobTeaser
b. Metropolia Talent Boost
c. CereerBot AI tool
d. Course modules on understanding Finnish job market and best practices to find employment
e. Job fairs and networking events
f. Information about vacancies and career development activities (OMA)
g. Possibility to stay as an open university student for one year after graduation
h. SIMHE services

<u>Guidance from BI Department</u>
a. Communicating about thesis projects/job offerings
b. Providing information on field-specific job & thesis postings
c. Informing about career development-related programs and events
d. Organizing guest lectures related to industrial topics and industrial visits
e. Promoting/encouraging to find a field-related thesis project in a business organization
f. Offering BI-substance courses and certifications in the BI Master´s program</td><td rowspan="2">The available guidance is scattered; and currently, no centralized Career guidance services are available

a. Most job vacancies are in Finnish
b. Most students are not aware of this
c. Most students are not aware of this
d. Students want more industry-specific knowledge
e. No worth coming
f. –

g. Support available after graduation
h. Support available after graduation and becoming a customer (in special cases)

Students expect more industry-specific guidance combined with available common guidance and have suggestions for the areas below:
1. Understanding BI as a Professional Area
• Introduce an introductory session on ”Understanding BI as a professional area”
• The Master’s program should be designed with more IT-related and less business-related modules for business field students
2. Exploring Industry Needs and Job Markets in BI
• Organize a few guest lectures on current industry needs/trends and the situation of the job market for BI.
• Organize mentorship programs with BI alumni
3. Understanding Employability and its Ways in BI
• Students expect Metropolia to form partnerships with companies to have for internships for students</td></tr>
<tr><td>Own Best Practices of BI students in Searching for Employment/Thesis Project,
• Concern about the quality of the job applications rather than the quantity
• Networking through social media, mentorship programs, industrial visits, job fairs in order to understand the industry needs and job markets
• Communicating with the company people before and/or after sending the job application
• Keep on learning and adding skills
• Understand the importance of soft skills
• Keep on looking and chasing after your dream job</td></tr>
</table>

• Make use of available resources and opportunities at the university (Join as an ambassador, follow job teaser portal, take Boost your job search course) • customize the CV and cover letter according to the job posting • Having a mindset of being a fresh graduate or an undergraduate who is always hungry to learn and willing to fail • Try every option you have	

The above table shows that the case organization supports the students in approaching a professional job/thesis search even though it does not have centralized career guidance services yet. It shows that, there is a range of guidance available at Metropolia especially at the department level under the three main areas of understanding BI as a professional area, identifying industry needs and understanding employability and ways of improving it.

However, from the BI Master's student point of view, there are some limitations, specially in commonly available guidance such as job advertisements in JobTeaser are mostly in the Finnish language, some students are not aware of opportunities available and they see the job fairs are not worth for coming as the companies just show the QR codes without giving detailed explanations about the opportunities available. Additionally, they are expecting more industry-specific guidance than common guidance.

Furthermore, the table shows a list of best practices followed by BI students in their job searching journey. Moreover, it shows the suggestions given by students, about what guidance they expect from the case organization such as Introduce an introductory session on "Understanding BI as a professional area", organizing a few guest lectures on current industry needs/trends and the situation of the job market for BI, organize mentorship programs with BI alumni and they expect the university to form partnerships with companies to have for internships for students.

The available guidance and current practices can be categorized under four areas, *(1) Understanding BI as a Professional Area (2) Exploring Industry Needs and Job Markets in BI (3) Understanding Employability and its Ways in BI* and *(4) Best Practices in Approaching for Professional Job/Thesis Project in BI.*

Based on the identified weaknesses and needs in these four areas, the next steps will be focused on building the Proposal for Guidance to BI Master´s students.

5 Building Proposal for Guidance for Approaching a Professional Job/Thesis Project in BI

This section focuses on building an initial proposal for developing the guidance for finding a professional job/thesis project in BI. At the same time, through this section, data gathered through the discussions with stakeholders regarding the proposal building, and Data collection 2 is taken into consideration. This section is divided into four subsections, describing the overview of the proposal, findings from data collection 2 in relation to conceptual framework and results of CSA, and the draft of the initial proposal at the end.

5.1 Overview of the Proposal Building Stage

This section provides an overview of the initial proposal building. The proposal building is based on the conceptual framework, the results of the current state analysis, and a new round of inputs form the stakeholders. The proposal building consists of four steps.

The first phase includes the merging of four main themes and ideas captured from the literature review and best practices (shown in the CF, conceptual framework) and results of the current state analysis (such as the weaknesses in the currently available guidance). The four main areas are *(1) Understanding BI as a Professional Area (2) Exploring Industry Needs and Job Markets in BI (3) Understanding Employability and its Ways in BI* and *(4) Best Practices in Approaching Professional Job/Thesis Project in BI.*

In the second phase, based on the above inputs, currently available guidance at the case organization, identified best practices of the BI students and what guidance they expect further (Data 1) and literature review findings and best practices in CF, and based on the findings by the thesis writer herself by exploring, the draft initial proposal is developed.

In the third phase of the proposal building, the draft initial proposal under merged four themes is presented to the stakeholders for discussion. In this phase, three stakeholders participated in the initial proposal building (the head of BI Master's programme and the two key stakeholders in the career development area working at the case organization). Their inputs around the four focus areas are gathered for building the initial proposal.

Finally, in the fourth phase, based on the suggestions by stakeholders in phase three (Data 2), the draft initial proposal was updated, and the initial proposal is finalized and prepared for validation in Section 6.

5.2 Findings from Data 2 (pulling together CSA, CF and Data 2)

Data 2 consists of suggestions/insights from the stakeholders in building the initial proposal. The stakeholders give their suggestions and ideas under the main themes of the proposal developed based on the conceptual framework and the CSA findings, Data 1. The main themes of the proposal developed based on the conceptual framework and CSA findings which used as a platform in gathering Data 2 is shown below.

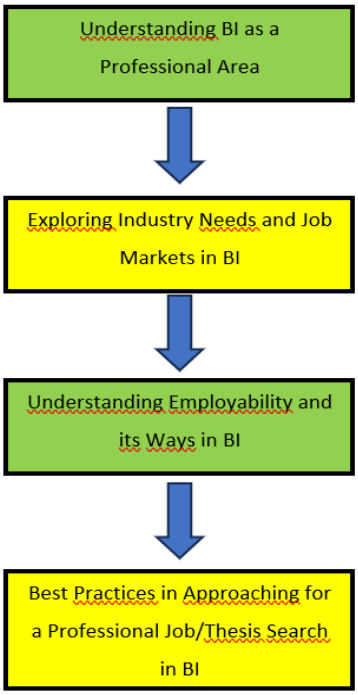


Figure 19. The main themes of the proposal.

As seen in the above figure, the outline of the proposed guidance is based on four main themes developed in the conceptual framework and the findings of the CSA. They are *(1) Understanding BI as a Professional Area (2) Exploring Industry Needs and Job Markets in BI (3) Understanding Employability and its Ways in BI* and *(4) Best Practices in Approaching for Professional Job/Thesis Project in BI.*

Data collection 2 concentrates on inputs from the stakeholders in building the proposal. Their insights/suggestions under key focus areas of the proposal based on the conceptual framework and the CSA findings are summarized in the table below.

Table 8. Summary of the stakeholders´ inputs for the Guidance building.

	Suggestions from the Stakeholders (Data 2)
1.	Reduce the general guidance content to highlight the BI-specific guidance
2.	Reflect the latest tools and resources, considering the discontinuation of certain tools like the career bots
3.	Consider adding a point on professional growth and personal branding for students with prior work experience.
4.	Add a point on learning the industry-specific language, terms and jargon to get closer to the industry
5.	Include the importance of sharing knowledge among the students as they are mainly from two different fields, business and IT/Engineering.
6.	Include a point to maintain a database of companies when searching for job ads
7.	Provide a strong beginning in which users feel the value of the guidance
8.	Add a table of contents to make it easier for readers
9.	Suggestion to revise the guidance annually by discussing with relevant stakeholders.

As seen in the above table, the stakeholders suggested reducing the general guidelines, as the students can easily find them by just exploring the internet within a few minutes and asked to highlight the BI-specific guidelines, as the objective of the thesis is to provide guidance to find a job/thesis project in BI and the students expect more industry-specific guidance rather than common guidance. Therefore, it is suggested to keep the links for common guidance without explaining them in detail.

Next suggestion is to include the tools and resources in the guidance in an updated manner by considering the tools that are expected to discontinue their operations in near future. For, example the operation of the CareerBot AI tool will be stopped in the future and most probably there will be another tool coming into operation.

Another suggestion is to add a point on professional growth and personal branding for students by equipping with their prior work experience and professional qualifications they have already obtained. Because, all the BI Master’s students already have some profession and it may be different from BI. However, they should consider how to form a

new professional brand by combining the knowledge, skills and maybe certifications they obtained through the BI program and utilize that brand in job searching.

Next suggestion is to add a point on the importance of learning industry-specific languages, terms and jargon. Then, the other professionals in the field will recognize them as a part of their professional field. Students can learn them through networking and communities related to the field and they can research by themselves as well.

Including the importance of sharing knowledge among the students is another suggestion. As they are from different fields, Business or IT/engineering or a combination of both which ultimately represent the BI field together, sharing knowledge of each will result in new blood and more insights on BI field.

Next suggestion is when searching for job vacancies, it is better to maintain a database of companies which students found relevant job vacancies and they can even categorize them such as large-scale, medium-scale, and start-ups. This kind of database will help them in their continuous job searching.

Another suggestion is to add a table of contents, so that it will be easier for readers, if they want to refer to some specific sections, rather than going through the whole document.

The next one is having a strong beginning for the guidance, so that readers will have the trust and tend to read it to the end.

Finally, they suggested revising the guidance once in a year by appointing relevant resource persons and having a meeting to discuss what is the latest guidance available in-house and externally and if any outdated guidelines are included in the guidance. Based on the discussion the guidance should be updated with the latest and removing the outdated ones.

5.3 Building the Initial Proposal

The initial proposal is developed under the four key focus areas namely *(1) Understanding BI as a Professional Area (2) Exploring Industry Needs and Job Markets*

in BI (3) Understanding Employability and its Ways in BI and *(4) Best Practices in Approaching for Professional Job/Thesis Project in BI.* The needs to be addressed, weaknesses/limitations in currently available guidance and the suggestions by the key stakeholders under each focus area are considered in developing this proposal.

5.3.1 Understanding BI as a Professional Area

Based on the conceptual framework and the CSA, the first focus area of the proposed guidance is to understand BI as a professional area.BI is a combined discipline of both IT and business fields. As most of the BI Master's students are from either the IT/engineering field or the business field, it is important to understand BI professional areas as the initial step in approaching a professional job/thesis project in BI.

A . BI professional areas can be identified under three categories.

a. BI professional areas related to IT field

   e.g. ICT Systems, IS, Digitalization, IT Management Aspects

b. BI professional areas related to the Business field

   e.g. Business Process Modelling, E-Business, E-Commerce

c. BI professional areas related to a combination of both IT and Business fields

   e.g. Business Analytics, Business Intelligence, ERP, Knowledge Management

B. To improve the understanding of BI professional areas,

a. It is important to participate in industrial visits and guest lectures on industrial topics organized by the BI department.

b. Refer highly recognized academic materials in BI. e.g.. Basics in Business Informatics (text book) by Weber, P., Gabriel, R., Lux, T. and Menke, K. (2022). Both the printed version and the e-book are available at Metropolia library

c. Get the insights from industry professionals

Further Guidance Needed by Students - on what kind of professions they can target based on their backgrounds, which BI areas they should further improve, guidance on technical skills development related to BI and further education, certifications and training to improve BI areas

5.3.2 Exploring Industry Needs and Job Markets in BI

The second focus area is to explore and analyze what are the current industry trends, what are the requirements in BI industry and get to know about the job market for BI in Finland.

In understanding the industry needs, it is important to identify the job roles relevant to particular BI professions and the skills needed in those professions. For this following guidance can be proposed.

A. European Committee for Standardization (CEN) has developed European e-Competence Framework (e-CF), which describes the compentences in the ICT sector by developing 30 European ICT professional role profiles. Among those, there are profiles related to BI professions. (will put Table 4 in section 3 and Appendix 1 for reference under this)

B. European Commission has developed a kind of dictionary, describing, identifying and classifying professional occupations and skills relevant for the EU labour market and education and training which is called ESCO (European Skills, Competences, Qualifications and Occupations). It provides descriptions of 3,008 occupations and 13,890 skills linked to these occupations. (Out of the list, the professions related with BI and their relevant skills listed by ESCO are shown in Appendix 2)

C. Collect information on industry and employer needs by analyzing job advertisements. Job postings can be found in multiple channels such as company websites, recruitement company websites, social media like LinkedIn and Facebook, job fairs/recruitment events, Metropolia JobTeaser and job postings emailed by BI department.

Being aware of the skill and competency portfolio that employers require, as well as the most frequently requested ones, can be obtained by analyzing the relevant job postings. The know-how of the current professional standards in the industry is beneficial when looking for employment.

The mostly used sources to find job vacancies are LinkedIn, Indeed, TE-services job advertisements, recruitment websites Barona, Dunnitori, work in Finland, Academic work and company websites. More information on sources to find job vacancies can be obtained in “Boost your Job Search” and “Discover your Career Path in Finland” course modules offered by Metropolia and through TE-office as well.

D. Effectively utilize currently available guidance from Metropolia.
   Attending Job fairs and networking events organized (internal) and informed (external) by university, analyze job vacancies informed and participate in industrial visits and guest lectures on industrial topics organized by the BI department.

E. Getting information from the professionals in the field

F. Search for information via BI industry-related articles, blog posts and publications

G. Getting information from friends and acquaintances

To know about the job market for BI in Finland the above D, E and F can be used. In addition to that “Boost your Job Search” and “Discover your Career Path in Finland” course modules offered by Metropolia provide a good understanding about the Finnish job market in common.
Here, the following key points should be kept in mind.

a. The most jobs are hidden and not published and mostly filled through recommendations
b. The Finnish job market is highly depending on trust

Further Guidance Needed by Students – BI specific guidance on industry needs and job market and about resources available to find information. Any professional body in BI is available?

5.3.3 Understanding Employability and its Ways in BI

The third focus area is understanding your own employability and its ways in BI. Under this, students highlighted the most important factor to be considered is “Networking plays a crucial role in approaching employment in Finland”. In the guidance, networking is pointed out as an important source of sharing information on finding resources such as industry professionals, sources of information about hidden jobs and industry and career related events and industry trends and needs, which will contribute a job seeker to move one step closer to approaching a job.

To understand employability in Finland, the “Boost your Job Search” and “Discover your Career Path in Finland” course modules offered by Metropolia provide a common understanding about employability in Finland.

To improve your own employability,

A. Try to find a thesis project relevant to BI field in a business organization. Use Linkedin and networking to find such a project. If it is unsuccessful, stay alert on emails sent by the BI department on thesis offerings by the external companies or have the opportunity to grab a thesis project offered by Metropolia with relevant to the BI field.

B. Improve the technical skills

C. Improve the soft skills

D. Obtain the knowledge of areas need further improvement

E. Obtain relevant certifications. Use available resourcses and opportunities provided by the university to obtain such certifications free of charge. E.g. PM certificiation, Hubspot cerification, make use of Power BI learning community to obtain Microsoft Power BI certification

Further Guidance Needed by Students –how to build up strong *networks* and where to find them, what knowledge and skills should further develop to improve employability

based on his/her background and sources of them. (where to find useful courses at free of charge or at a lower cost)

5.3.4 Best Practices in Approaching a Professional Job/Thesis Search in BI

For this part, the best practices in searching for a job/thesis project are developed step by step. As this area contains more common guidance as well and students are in a position to find those common guidance with a little effort by exploring the internet, only the links are shown related to common guidance found through existing knowledge.

The best practices are shown step by step as follows.

A. Initial self-assessment

B. Research the industry

C. Identify job opportunities

D. Keep on improving skills and knowledge

E. Preparation of job application documents

F. Job interviews

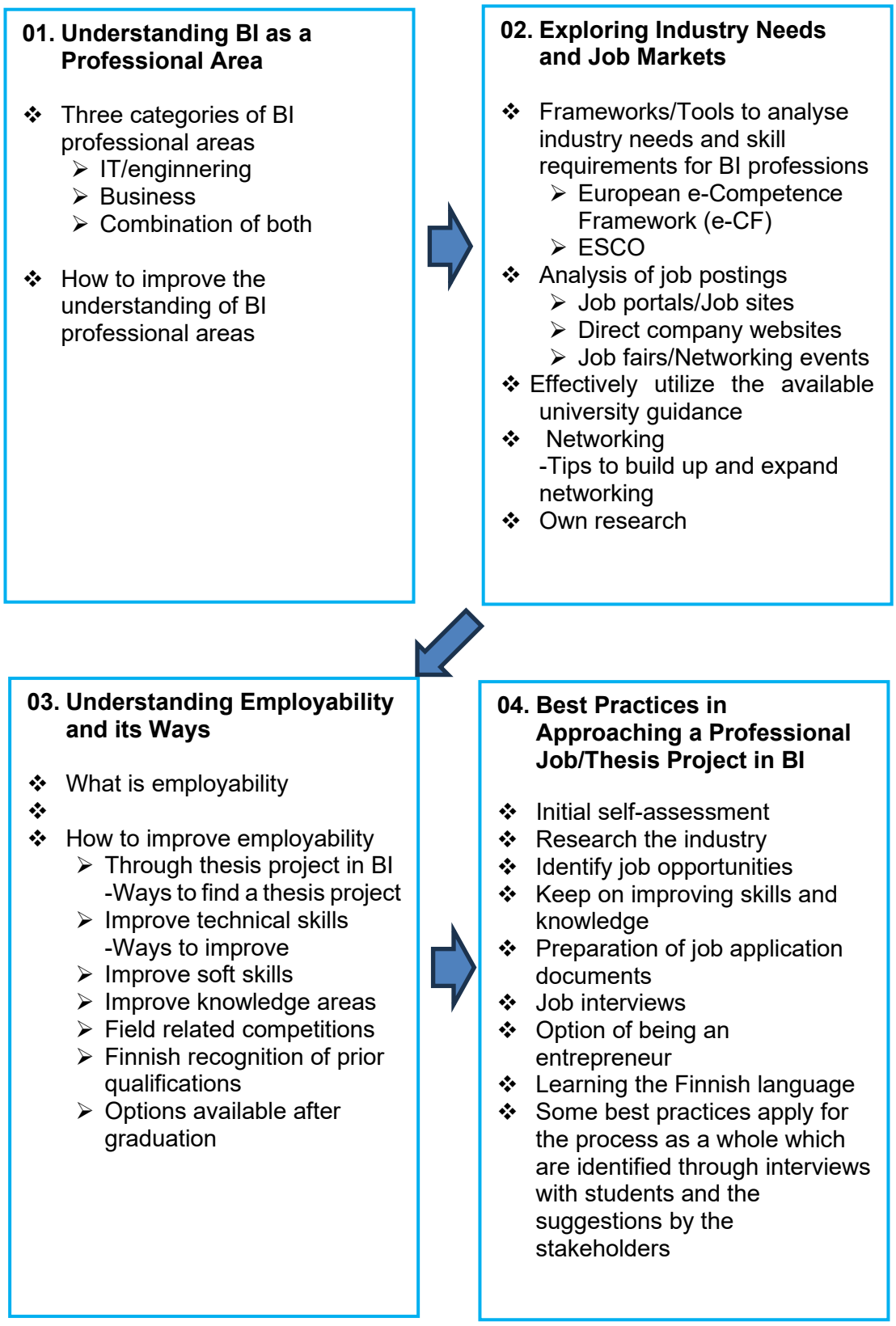
G. Option of being an entrepreneur

H. Learning the Finnish language

I. Some best practices apply for the process as a whole which are identified through interviews with students and the suggestions by the stakeholders

5.4 Summary of the Initial Proposal

Figure 20. Elements of the Initial Proposal.



As shown in the figure above, content of the initial proposal is divided into four key focus areas , 1) Understanding BI as a professional area. 2) Exploring industry needs and job markets. 3) Understanding employability and its ways and, 4) Best practices in approaching a professional job/tesis project in BI. The proposal is developed including the practical guidance with example links the students can refer for such guidance and factual material to aid students in their quest under each four areas.

The proposal begins with some highlighted points to keep in mind before starting the job searching journey and throughout the way of it. a). Soft skills are really important in landing a job and continuing your career. b). Keep on learning and adding skills and, c).Try to build an effective and strong network and continuously expand it.

Then, it is moving to four key focus areas identified in the proposed approach mentioned above. The four focus areas are described sepertely and complemented with prcticl tips and links to obtain the guidance or find the sources/resources in that particular area. For, example in first area, there are tips and links for ways to improve understanding of BI professional areas, second area provides tips and links for searching for job vacancies, networking and how to utilize the available university guidance and third area gives tips and links on how to improve students' employability. Finally, the fourth area contains the best practices in job searching in step by step with relevant links and tips. Here, the most commonly available guidance which can be found through internet with less effort are not explained in detail and provided with links to refer.

In addition to the above, the guidance includes the stories reated to best practices of BI students, got to know through the interviews.

The next section focuses on the validation of the initial proposal and the final proposal.

6 Validation of the Proposal

This section reports on the results of the validation of the proposal developed in Section 5 and points to further developments to the initial Proposal. At the end of this section, the Final proposal is presented.

6.1 Overview of the Validation Stage and Findings of Data Collection 3

The validation of the proposal was done by having a discussion with an expert in the BI field who is a staff member of the the case organization, employed as a senior lecturer and the Head of Program in BI department. The data collected in the validation discussion forms Data Collection 3 of this thesis.

The stakeholder provided the feedback on the initial proposal and also offered some suggestions for improvement. The key suggestestin related to: (a) dissimunation of the Guide to the students; (b) maintaining regular updates to the content and especially the links, so that to provide up-to-date information, and (c) launching an activity in relation to providing mentoriship which was identified as a desirable area of development by BI students, and was later also dicussed and suppprted by the faculty members with partical sugesitons who will participate in mentoring, how it will be organized and how supported.

Furthermore, a positive feedback on the initial proposal was given and the stakeholder agreed and validated the approach to the proposal and the guidance as the outcome of this study for Master's students in BI.

6.2 Final Proposal

The final proposal is based on the findings of the conceptual framework developed from existing knowledge and best practices in Section 3, the available guidance of the case organization, what are the limitations/weaknesses in such guidance, what kind of guidance the BI students expect further and the best practices of the BI students in job/thesis project searching identified through interviews which form Data collection 1 in Section 4, the suggestions by stakeholders in building the proposal which is Data collection 2 in Section 5, the own findings of the thesis writer through exploring and finally

the suggestions/recommendations given in validation which is Data collection 3 in this Section 6. The approach for the final proposal is shown in Figure 21 below.

Figure 21. The approach for the final proposal.

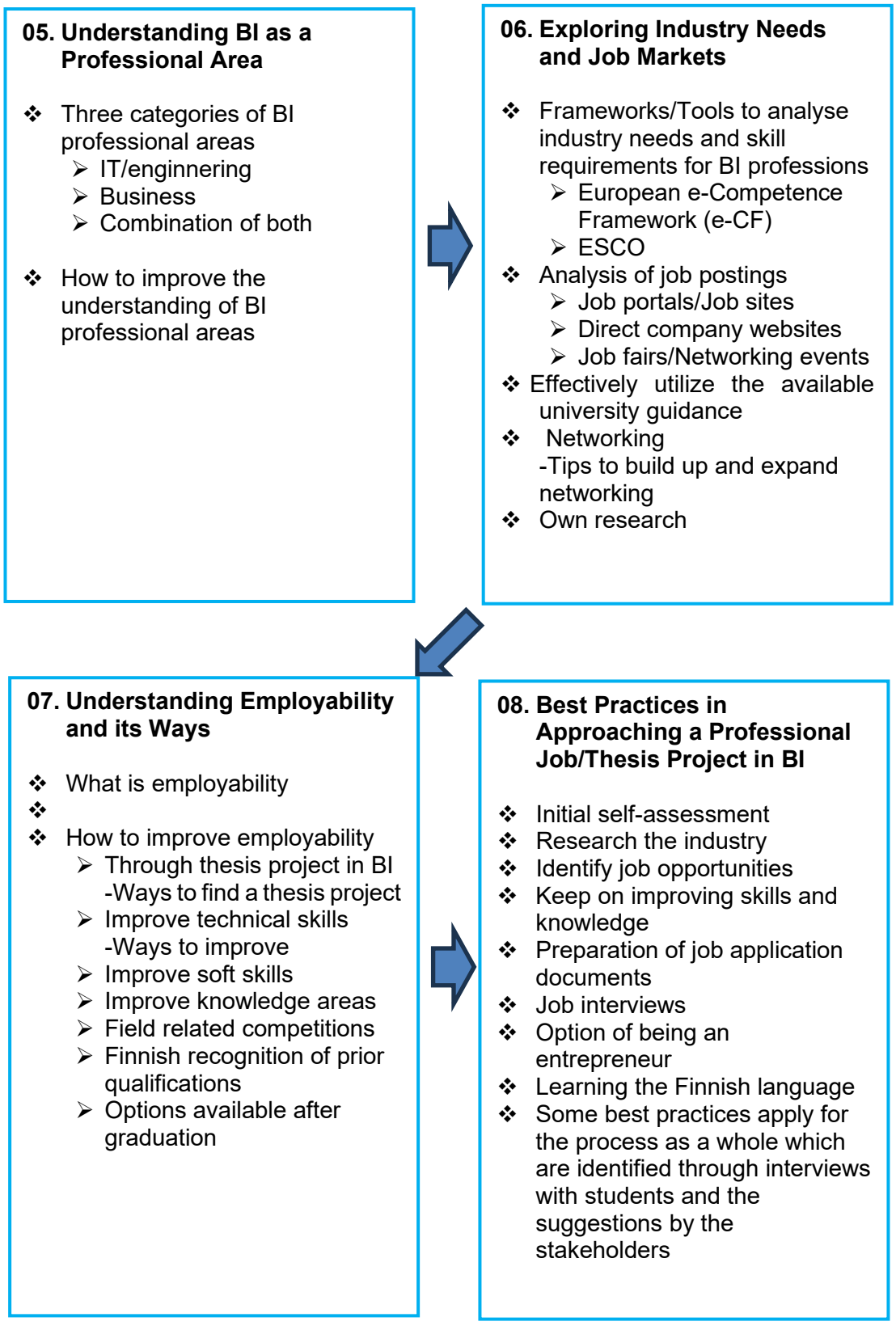
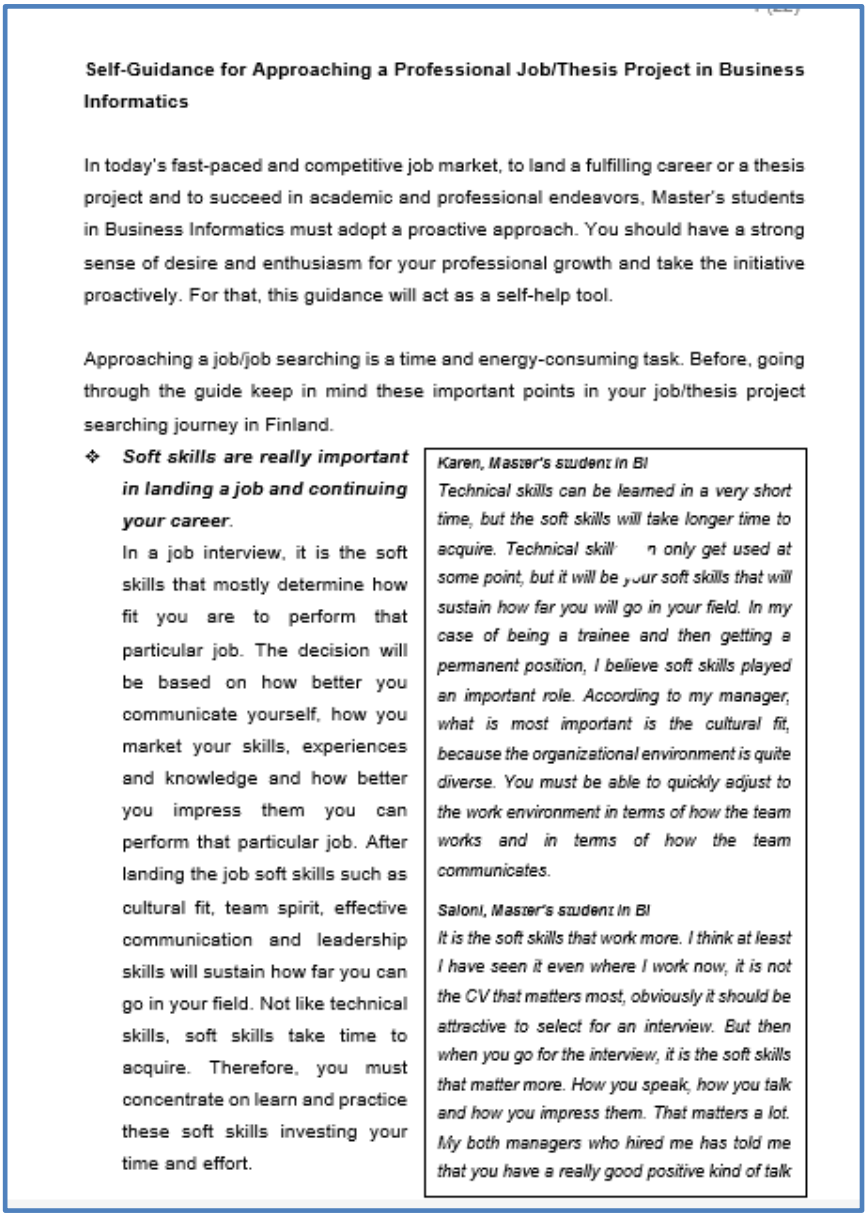


Figure 21 shows the approach to final proposal by incorporating the suggestions/ recommendations given in validation of the initial proposal. The title page of the final proposal/developed self help guidance is shown in the below figure.

Figure 22. Title page of the final proposal of the Self-help Guide developed for BI Master's students in approaching a professional job/thesis project in BI (Apeendix 6).



Self-Guidance for Approaching a Professional Job/Thesis Project in Business Informatics

In today's fast-paced and competitive job market, to land a fulfilling career or a thesis project and to succeed in academic and professional endeavors, Master's students in Business Informatics must adopt a proactive approach. You should have a strong sense of desire and enthusiasm for your professional growth and take the initiative proactively. For that, this guidance will act as a self-help tool.

Approaching a job/job searching is a time and energy-consuming task. Before, going through the guide keep in mind these important points in your job/thesis project searching journey in Finland.

- ***Soft skills are really important in landing a job and continuing your career***.

  In a job interview, it is the soft skills that mostly determine how fit you are to perform that particular job. The decision will be based on how better you communicate yourself, how you market your skills, experiences and knowledge and how better you impress them you can perform that particular job. After landing the job soft skills such as cultural fit, team spirit, effective communication and leadership skills will sustain how far you can go in your field. Not like technical skills, soft skills take time to acquire. Therefore, you must concentrate on learn and practice these soft skills investing your time and effort.

Karen, Master's student in BI
Technical skills can be learned in a very short time, but the soft skills will take longer time to acquire. Technical skill[illegible]n only get used at some point, but it will be your soft skills that will sustain how far you will go in your field. In my case of being a trainee and then getting a permanent position, I believe soft skills played an important role. According to my manager, what is most important is the cultural fit, because the organizational environment is quite diverse. You must be able to quickly adjust to the work environment in terms of how the team works and in terms of how the team communicates.

Saloni, Master's student in BI
It is the soft skills that work more. I think at least I have seen it even where I work now, it is not the CV that matters most, obviously it should be attractive to select for an interview. But then when you go for the interview, it is the soft skills that matter more. How you speak, how you talk and how you impress them. That matters a lot. My both managers who hired me has told me that you have a really good positive kind of talk

The self-help guide developed for BI Master's students in approaching a professional job/thesis project in BI field, of which the title page is shown in Figure 22, applies the approach identified through this thesis in a practical way with four key focus areas.

1) *Understanding BI as a Professional Area,* which is done by identifying main categories of BI professional areas; IT/engineering, Business field and a combination of both. The guidance includes the ways to improve this understanding gor example, by refering highly reconized text books in BI, participating in industrial visits and guest lectures on industrial topics organized by department.

2) *Exploring Industry Needs and Job Markets*, that is done by refering to standard frameworks/tools describing BI professions like e-CF and ESCO which based on EU sources, analyzing job advertisements, utilizing networks, effectively utilizing available university guidance and by doing own research. The relevant information in detail and links are provided in the guidance.

3) *Understanding Employability and its Ways*, that is done by initially understanding the term Employability and then the ways to improve employability such as Find a thesis project in BI field, improve the technical skills, soft skills and knowledge areas, Finnish recognition of the prior skills and considering options after graduation. The sources and links to improve the employability are provided in the guidance.

4) *Best Practices in Approaching a Professional Job/Thesis Project in BI*, under this area, the best practices in job searching are listed step by step. The most common guidance such as career planning, job application documents, job interviews are not provided with details but relevant links are there as those information is easily available in the internet. But, the BI specific guidance/best practices are provided with relevant information and links.

6.3 Recommendations /Action Plan

As suggested by stakeholders in Data collection 2 in building the initial proposal, the developed guidance should be updated annualy. For this, a discussion should be held with appointed relevant stakeholders and decide on what are the latest guidance available and are there any guidance which are outdated. Based on the discussion, the guidance should be updated by adding latest guidance and by removing the outdated ones.

The next section provides the summary of the thesis and evaluate the outcomes together with the reliability and validity of the study.

7 Conclusion

The findings of this thesis are discussed and summarized in this part. It begins by summarizing this thesis. Second, depending on the objectives and outcomes of this investigation, thesis evaluation is examined. Lastly, a discussion of thesis evaluation based on the reliability and validity of the study methodology and findings.

7.1 Executive Summary

In recent years, it was observed that there are lot of international students migrating to Finland for higher educatin studies, and it is expected that this trend will grow in coming years. These international students come with the hope of finding a professional job in their fields during or after the studies. However, despite the labour shortage in Finland and efforts by the government to retain international talents, international Master's students find it is really challenging to find a job or a thesis project.

In this thesis, it was observed that most of these challanges stem from students' lack of awareness of the industry and requirements of local employers, organizational culture, how to improve employability, what are the best practices to follow in job searching and from where and how to find such information. Therefore, there is a need to identify what is necessary to know when searching for employment/thesis project & how to do it, where to obtain this relevant knowledge/help, and how to apply this knowledge for boosting employability. That makes the need behind this thesis.

The objective of the thesis is to develop the guidelines for the Master´s students in BI for finding a professional job/thesis project which can be used as a self-help tool by the students. The approach for such guideline is based on four key focus areas. 1) Understanding BI as a professional area. 2) Exploring industry needs and job markets. 3) Understanding employability and its ways and, 4) Best practices in approaching a professional job/tesis project in BI.

The case organization of this thesis is the international Master's program in Business Informatics at Metropolia University of Applied Sciences. After setting the objective and drafing a research design, thes thesis explored availbale knowledge and best practices in approaching a job/thesis project in BI area, and split them into four key focus areas.

Here, the thesis researcher explored both literature sources as well as the published tips on job searching, specially with reference to the university of applied sciences and universities in Finland and some job searching/career platforms. The conceptual framework is developed as the outcome of this analysis.

The study was conducted with three Data collection rounds. After conducting the literature review, the current state analysis was done to identify the currently available guidance of the case organization and the current practices of the BI Master's students in approaching for a job/thesis project, what guidance they further expect and what are the limitations/weaknesses of the currently available guidance of the case organization. This was done by exploring the internal documents, systems and tools of the case organization, conducting interviews with international Master's students in BI and specialists in the field who are employees of the case organization and by issuing a questionnaire to international Master's students in BI. These data sources formed Data collection 1.

Then based on findings of the conceptual framework and the current state analysis and the findings by the thesis researcher, the initial proposal was developed. The approach to the initial proposal was based on the four key areas mentioned earlier, 1) Understanding BI as a professional area. 2) Exploring industry needs and job markets. 3) Understanding employability and its ways and, 4) Best practices in approaching a professional job/tesis project in BI. At this stage, discussions with stakeholders were conducted who are experts in the field and works at the case organization and they contributed with their suggestions in building the initial proposal. These data sources shaped Data collection 2.

After developing the initial proposal, it was produced for validation by an expert in the BI field which represented Data collection 3. With the feedback obtained through the validation, the final proposal/ self-help guidance was developed. Thus, the outcome of this study is a set of guidelines based on four key areas. They are significant for the case organization as they should help as a self-help guidance to Master's students in BI when approaching a professional job/thesis project.

7.2 Next Steps and Recommendations toward Implementation

When, implementing the proposal, that means, make available the developed guidance for the use of BI Master's students, it is recommended to have revision of this guidance periodically. Thereby, the students will have an up to date guidance in their hand, which makes their job searching journey a relaiable one.

For this, it is recommended to update the guidance annually. As the first step, a group of stakeholders who are experts in the field and employed at the case organization should be appointed as responsible persons of this task. Then, they should gather annually to discuss what are the latest relevant guidance available in-house and externally in addition to the developed guidance and what are the outdated guidance or toos which have discontinued their operations which are included in the guidance. Finally, they should add the latest relevant guidance and remove the outdated once and update this self-help guidance.

7.3 Thesis Evaluation

This section evaluates the thesis's performance in relation to its initial objective and the degree to which it addresses the issue it set out to address. Following this, a reflection is made of the validity and reliability of the research methodology and findings.

7.3.1 Outcome Vs Objective

The objective of this thesis was to develop set of guidelines for Master's students in BI, to approach a professional job/thesis project in BI which can be used as a self-help tool by them. The thesis is aimed to do this on the example of international students of Master's in BI. The outcome of the the thesis was the guidelines to approach a professional job/thesis project in BI. By following the research design in Section 2.2, the researcher was able to gather data from various stakeholders and develop the outcome relevant for the case organization. Therefore, it can be mentioned that, this thesis achieves its target because, upon comparing its outcome to its objective, it is evident that the two align. However, when doing the data collection, the interviews were limited to internal stakeholders and it can be mentioned that if there were some external resource persons specially in proposal building and validation, they may contribute to

this in a different angle. Anyway, the stakeholders participated in proposal building and validation are experts in the field even though they are internal staff and therefore, it can be mentioned that this thesis is align with its planned objective.

7.3.2 Reliability and Validity

When conducting the thesis, with the purpose of producing a high-quality research and an output, important research criteria like validity and reliability, relevance, and logic were taken into consideration and made evident throughout the research process in this thesis.

According to Yin (2009), to ensure the validity of data used in a research three aspects need to be considered, *Construct validity, Internal validity* and *external validity*. Construct validity is verified by using different data sources such as in-depth interviews, group interviews, a survey and observations. Internal validity was addressed by two approaches: first, the clear formulation of the business challenge that this Thesis is solving; and second, building a research design that aims to develop a guidance based on Applied action research strategy combined with qualitative research. External validity was ensured by identifying the existing knowledge and best practices in job searching in BI, using credible and reputable literature sources which are mostly based on European Union and European Commission and by referring to best practices published by relevant organizations such as university of applied sciences and universities.

In qualitative research, reliability guarantees that the findings and methodology are transparent, well communicated, and replicable for other researchers. The reliability of this research was ensured by getting the participation of the stakeholders of the case organization in each stage of the data collection as they are the most knowlegable in the case organization and have the most interest towards the practical outcome of the research.

Furthermore, in data collection through interviews and discussions all of them were conducted by zoom and they were recorded by getting the prior consent. Field notes were taken in addition to the recordings to address any technical issues and researcher often repeated what was written in the field notes during the interview to ensure, it is the correct input given by them. The outcomes of the data 1-3 collections were transparent, well-explained in this thesis, and significantly aided in constructing the planned objective

for the case organization. This was done to increase the validity of this thesis and prevent bias in the research.

This thesis satisfies the logical standards of an academic work since each section builds links systematically on the conclusions of the previous section. The logcal way was ensured throughout the study by initially establishing the thesis objective and then planned the process up to the outcome by the way of research design. During the study the steps in this research design was followed in order.

7.4 Closing Words

Master's students in BI program, especially the international students who are unemployed, find it is challenging to landing aprofessional job/thesis project in their field due to various barriers. Apart from the language barrier, which can be overcome to some extent by targeting companies with interational touch, it can be seen that, most of the international students lack awareness of the industry requirements and trends, how the job market works, what are the best practices to follow to understand the industry and to improve the employability as the country, culture and the working environment are new for them. Even though the case organization already have some guidance and support in common as well as in department level, they are scattered and there is no clear guidance with a structured approach , which can be used as a self-help tool by the students in their job searching journey.

This study's aim was more urgent and practical. The outcome of this thesis that was developed by encorporating of many people in a co-creative and collaborative manner, aimed to assist those students who are now lacking some fundamental orientation in this area. The thesis researcher herself was missing this guidance when she started searching for a professional job/thesis project around one year ago.

It is hoped that this self-help guidance, developed based on a well-designed approach, as the outcome of this study will provide students with a good foundation for understanding the highly competitive Finnish job market and help them make better use of their professional profiles. The researcher believes and hopes that this will lead to a quicker and more fruitful outcome to their professional job/thesis project search!

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WRITTENSTATEMENT
on the use of AI-based tools in this thesis
by Wasana Ellawala, the student of BI Master´s Degree Programme
Thesis title: Developing Guidance for Approaching a Professional Job/Thesis Project in BI

According to the *"Guidance for addressing the use of AI-based tools in studies at Metropolia Business School (for written submissions)"* from August 2023, I make this statement on the use of AI-based tools in my submitted Master´s thesis.

1) Which AI-bases large language models or other AI-based tools I used
   .
   ChatGPT

2) In which parts of the thesis which tools were used, and for which tasks *(please make a list)*
   I used ChatGPT as the last option, in cases it was difficult to find some high quality sources in literature review. Here, I used ChatGPT only to find the references/web links for quality sources and then I went through those web links and found the required details by myself

3) What portion of the text was helped with these tools, for each use

   Less than 10%

4) Which prompts were asked, exactly *(please indicate the page number in the text where used)*
   I did not use the ChatGPT texts in writing the thesis

5) Here, I describe what continues an ethical and reliable use of AI-based tools that I used *(use, for example, the recommended documents from "MBS Guidance" referred to above)*

6) Here, I describe how ethically and reliably I used the AI-based tools in my thesis submission

As explained above, I used the ChatGPT support to find links for sources, when it was difficult for me to find them by myself.Other than that, I did not use any information provided by the ChatGPT with relevant to the things I searched.

This written statement makes part of my thesis and is done to help in evaluation and assessment.

____27.05.2024_____

(Data and place)

_____

(Signature)

Interview Questions - Developing Guidance for Approaching a Professional Job/Thesis Search in BI

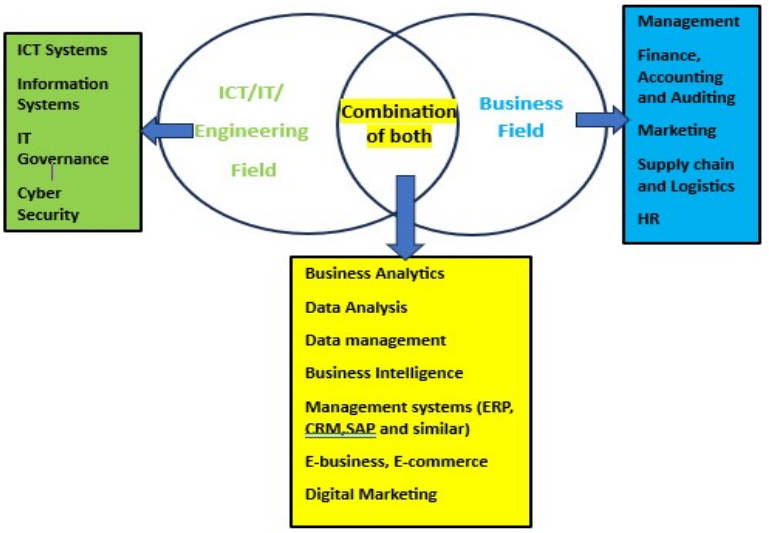
01. Background Information

1. When did you come to Finland?
2. What was your profession in your home country?
3. Have you already found a professional job/thesis search in a company in Finland, after you moved here?
4. If yes, is it in the same field as your previous profession or if it is different, what is the field?
5. How long are you/were you in the process of job searching?
6. What are your career aspirations within the BI industry?

02. Understanding BI as a Professional Area

1. In which area you belong in BI?
   a. ICT/IT/engineering field
   b. Business field
   c. Business Analytics, Data analytics, Web analytics, Business Intelligence, Data management, Management Systems (ERP, CRM, SAP etc), and similar
   d. Other

2. This figure shows the Areas Included in BI



Based on your career aspirations,

i. Where do you feel strong/what make your core competence? (Mention 3 areas)
ii. Where do you feel still need to grow (Mention 3 areas)

3. What kind of guidance you expect, in understanding/improving BI as a professional area?

03. Exploring Industry Needs and Job Markets

1. What kind of knowledge and understanding do you have with relevant to industry needs and the job market for BI?

2. What are the methods/ways you use to understand and analyze the industry needs/job markets concerning BI?

3. What guidance do you need to improve your understanding of the industry needs and job market in BI?

04. Understanding Employability and its Ways in BI

"Employability" means "A combination of factors (such as job-specific skills and soft skills) which enable individuals to progress towards or enter into employment, stay in employment and progress during their careers" (European Centre for the Development of Vocational Training-CEDEFOP).

" **Employability** entails much more than the ability to get that first job. It is having the capacity to network and market oneself, navigate through a career and remain employable throughout life". (International Labour Organization).

1. Are you familiar with how employability works in Finland?
2. List three (3) areas where you are strong in terms of own employability (for example, the areas that you can indicate in your CV, references, etc)
3. List three (3) areas where you set a plan to develop in terms of own employability. (Please only list your short-term, realistic goals in order of priority; doable in 1 year or when studying in Metropolia)
4. What guidance do you need to improve your employability?

05. Best Practice in Approaching a Professional Job/Thesis Search in BI area

1. What kind of approaches you are currently using/used to find a job/thesis in BI area?
2. Where do you search to find the vacancies? (Sources, Websites)
3. Based on your experience what are the most useful sources or ways to search?
4. What creates problems when finding employment?
5. What are your approaches to overcoming those barriers?
6. What are the best practices you follow in job searching/applying process?
7. What are your approaches in building professional network?

8. What is your experience in using social media as a source of job searching?
9. How many applications have you sent (approximately) and over which period before you got an interview invitation?
10. How many job/thesis interviews have you attended in Finland?
11. What are the lessons you learned from facing the interviews?
12. What kind of guidance you need in the process of searching a job/thesis search in BI?

Questionnaire on Developing Guidance for Approaching a Professional Job/Thesis Search in Business Informatics (BI)

01. Background Information

1. When did you move to Finland? Year & month _____

2. What was your profession/professional field in your home country?
   ……

3. Have you already found a professional job/thesis in a company in Finland?
   a. Yes. In which field?
      ……
      ……
   b. Not yet, but I am still searching
   c. I do not search for work/thesis in Finland. If you wish, you can specify the reason (e.g. you do a thesis for the previous employer; you fully focus on your studies, etc.)
      ……
      ……
      ……
      ……
      ……

02. Business Informatics (BI) as your Professional Area

1. Which area do you belong in BI?
   a. ICT/IT/engineering field
   b. Business field
   c. Business Analytics, Data analytics, Web analytics, Business Intelligence, Data management, Management Systems (ERP, CRM, SAP etc), and similar
   d. If something else, what _____

2. List three (3) areas where you are professionally strong in Business Informatics? (for example, the areas that you can indicate in your CV, references, etc)
   1……
   2……
   3……..

3. List three (3) areas where you set a plan to develop in relation to in Business Informatics? (please only list your short-term, realistic goals in order of priority; doable in 1 year or when studying in Metropolia)
   1……
   2……
   3……..

4. What guidance do you need to improve in these BI professional areas in the short-term period (in 1 year or when studying in Metropolia)? (You can tick several options). (pls add multiple choice answers)

a. Guidance on skills development (such as specific applications, e.g. Power BI, Tableau, ClickView, etc; ICT skills, programming languages, or/and other skills relevant to BI)
b. Guidance on resources to improve your relevant BI areas
c. Guidance on further education, training, certification
d. Other, please specify:
……
……
……
……
……

03. Exploring Industry Needs and Job Markets

1. How do you rate your knowledge and understanding of industry needs and current trends in the job market in relation to BI? On a scale of 1-5:
   a. 1 very little or no knowledge
   b. 2 Basic level
   c. 3 Moderate level
   d. 4 Adequate knowledge/understanding
   e. 5 Deep, almost professional knowledge/understanding

2. What are your career aspirations within the BI industry within the next year? (you can tick several options). For example:

   a. Find a job, in which area _____
   b. Find at least an entry level position in the industry (for example, a summer job or internship)
   c. Find at least an unpaid internship or an unpaid thesis
   d. To develop knowledge and skills further before entering the industry
   e. Other, please specify:
   ……
   ……
   ……

3. What are the methods/ways you use to understand and analyze the industry needs/job markets concerning BI? (you can tick several options). (pls add multiple choice answers)
   a. Job advertisements (open, in companies´ or recruitment agencies´ web-sites)
   b. Recruitment events/Job fairs
   c. Search for guidance via relevant articles, blog posts, publications in the internet
   d. Getting information from professionals in the field
   e. Getting information from the school (Metropolia; BI Programme)
   f. Getting information from friends/ acquaintances
   g. Other, please specify:
   ……
   ……

……
……
……
……

4. What guidance do you need to improve your understanding of the industry needs and job market in BI in the short-term period (in 1 year or when studying in Metropolia)? (you can tick several options) (pls add multiple choice answers)

a. Guidance on available resources about industry needs and job markets (relevant articles, blog posts, publications in the internet)
b. Guidance on identifying professions relevant to BI
c. Guidance on identifying specific skills, knowledge and competences relevant to BI
d. Guidance from professionals in the field (companies or recruitment agencies´)
e. Guidance from the school (Metropolia; BI Programme)
f. Other, please specify:
……
……
……
……

04. Understanding Employability and its Ways in BI

1. Are you familiar with how employability works in Finland? (e.g. requirements to a CV, requirements to professional background, “hyvä typpi” personality, the “hidden” job market, networking in important role, etc)
   a. Very little or no knowledge
   b. Basic knowledge
   c. Moderate knowledge
   d. Adequate knowledge/understanding
   e. Deep, almost professional knowledge/understanding

2. List three (3) areas where you are strong in terms of own employability (for example, the areas that you can indicate in your CV, references, etc)
   1……
   2……
   3……..

3. List three (3) areas where you set a plan to develop in terms of own employability. (Please only list your short-term, realistic goals in order of priority; doable in 1 year or when studying in Metropolia)
   1……
   2……
   3……..

4. What guidance do you need to improve your employability in the short-term period (in 1 year or when studying in Metropolia)? (you can tick several options) (pls add multiple choice answers)
   a. Guidance on acquiring professional skills needed for BI (such as specific applications, e.g. Power BI, Tableau, ClickView, etc; ICT skills, programming languages, or/and other skills relevant to BI)

b. Guidance on developing/improving soft skills needed for BI (such as analytical skills, problem solving skills, communication and people skills, etc.)
c. Guidance on further education, training and certifications relevant to BI
d. Guidance on identifying career paths related to BI
e. Guidance on developing a career plan in BI
f. Other, please specify:
……
……
……
……
……
……

05. Best Practice in Approaching a Professional Job/Thesis Search in BI area

1. What kind of approaches you are currently using/used to find a job/thesis in BI area?
   a. I search for vacancies and apply for them
   b. I send or fill in open applications to the companies I am interested in
   c. I apply via recruitment services
   d. I apply when vising various recruitment events
   e. I use social media such as LinkedIn, X (twitter), Facebook
   f. I ask friends and colleagues and inform them about my search for a job/thesis
   g. Other, please specify:
   ……
   ……
   ……
   ……
   ……

2. Where do you search to find the vacancies? (Specify the sources/websites)
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……
   ……

3. Based on your experience what are the most useful sources or ways to search from the above?
   ……
   ……
   ……
   ……
   ……
   ……
   …….

4. How many applications have you sent (approximately) and over which period before you got an interview invitation?
   a. I sent 1 to 10 applications over the period of ___ days before I got an interview invitation
   b. I sent 1 to 50 applications over the period of ___ days before I got an interview invitation
   c. I sent 1 to 100 applications over the period of ___ days before I got an interview invitation
   d. Other: How many applicants have you sent & over which period of time before you got an interview invitation?

5. How many job/thesis interviews have you attended in Finland?
   a. 1 interview over the period of ___ months
   b. 2 interviews over the period of ___ months
   c. 3 interviews over the period of ___ months
   d. Other: How many interviews & over which period of time?

6. What guidance do you need to improve your practices for job/thesis search in the short-term period (in 1 year or when studying in Metropolia)? (you can tick several options) (pls add multiple choice answers)
   a. Guidance on preparing CV and Cover letters
   b. Guidance on building professional networks
   c. Guidance on job searching strategies
   d. Guidance on sources to find available vacancies on jobs/internships/thesis projects
   e. Guidance on sources to find information on recruitment events, networking events
   f. Assistance with interview preparation
   g. Other, please specify:

      .....
      .....
      .....
      .....
      .....

   Thank you for your participation

Competences of BI Professions and their Required Profeciency Levels according to e-CF Framework

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Competent and careful. Recognised and respected.

European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.1 : IS and Business Strategy Alignment					
	A.3 : Business Plan Development					
Enable	D.10 : Information and Knowledge Management					
	D.11 : Needs Identification					
Manage	E.5 : Process Improvement					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) with the aim to increase visibility and accessibility of the e-Competence Framework. It is part of ITPE's

Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for the construction and implementation of long term innovative IS solutions.
Level 4	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.

A.3 Business Plan Development

Addresses the design and structure of a business or product plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with business risk and technology strategies. Communicates and sells business plan to relevant stakeholders and addresses political, financial, and organisational interests.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to provide analysis of market environment etc.
Level 3	Provides leadership for the creation of an information system strategy that meets the requirements of the business (e.g. distributed, mobility-based) and includes risks and opportunities.
Level 4	Applies strategic thinking and organisational leadership to exploit the capability of Information Technology to improve or transform the business.

D.10 Information and Knowledge Management

Identifies information and knowledge relevant to the organisation and develops processes and structures to manage it. Creates information structure to enable the exploitation, optimisation and sharing of information. Understands appropriate tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information asset.

Level 1	-
Level 2	-
Level 2	Analyses business processes and associated information requirements and provides the most appropriate information structure
Level 3	Integrates the appropriate information structure into the corporate environment.
Level 4	Correlates information and knowledge to create value for the business. Applies innovative solutions based on information retrieved

D.11 Needs Identification

Actively listens to internal/ external customers, articulates and clarifies their needs. Manages the relationship with all stakeholders to ensure that solutions and services are

in line with business requirements. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centered system design. Advises the customer on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.

Level 1	-
Level 2	-
Level 2	Establishes reliable relationships with customers and helps them clarify their needs.
Level 3	Exploits wide ranging specialist knowledge of the customers business to offer possible solutions to business needs. Provides expert guidance to the customer by proposing solutions and supplier.
Level 4	Provides leadership in support of the customers' strategic decisions. Helps customer to envisage new ICT solutions, fosters partnerships and creates value propositions.

E.5 Process Improvement

Measures effectiveness of existing or new ICT process approaches (Waterfall, Agile, DevOps etc.). Designs and implements process or technology changes supporting the organization through a continuous learning process. Assesses and addresses risks involved in process change.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to research existing ICT processes and solutions in order to define possible innovations. Makes recommendations based on reasoned arguments.
Level 3	Provides leadership and authorises implementation of innovations and improvements that will enhance competitiveness or efficiency. Demonstrates to senior management the business advantage of potential changes.
Level 4	-

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.1 : IS and Business Strategy Alignment					
	A.3 : Business Plan Development					
Manage	E.4 : Relationship Management					
	E.7 : Business Change Management					
	E.9 : Information Systems Governance					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) with the aim to increase visibility and accessibility of the e-Competence Framework. It is part of ITPE's

Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for the construction and implementation of long term innovative IS solutions.
Level 4	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.

A.3 Business Plan Development

Addresses the design and structure of a business or product plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with business risk and technology strategies. Communicates and sells business plan to relevant stakeholders and addresses political, financial, and organisational interests.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to provide analysis of market environment etc.
Level 3	Provides leadership for the creation of an information system strategy that meets the requirements of the business (e.g. distributed, mobility-based) and includes risks and opportunities.
Level 4	Applies strategic thinking and organisational leadership to exploit the capability of Information Technology to improve or transform the business.

E.4 Relationship Management

Develops positive business relationships in a diverse stakeholder environment facilitating multi-disciplinary team collaboration. Maintains regular communication with colleagues, customers, partners and suppliers, displaying empathy with their different contexts and perspectives. Ensures that different stakeholder needs, concerns or complaints are understood and addressed in accordance with organisational policy.

Level 1	-
Level 2	-
Level 2	Accounts for own and others actions in managing a limited number of stakeholders
Level 3	Provides leadership for large or many stakeholder relationships. Authorises investment in new and existing relationships. Leads the design of a workable procedure for maintaining positive business relationships.
Level 4	-

E.7 Business Change Management

Assesses the implications of digital transformation, potential digital disruption and change. Defines the requirements and quantifies the business benefits. Manages change taking into account structural and cultural issues. Maintains business and process continuity throughout change, monitoring the impact, taking any required remedial action and refining approach.

Level 1	-
Level 2	-
Level 2	Evaluates change requirements and exploits specialist skills to identify possible methods and standards that can be deployed
Level 3	Provides leadership to plan, manage and implement significant ICT led business change
Level 4	Applies pervasive influence to embed organisational change.

E.9 Information Systems Governance

Defines, deploys and controls the management of information systems and services and data in line with the business imperatives. Takes into account all internal and external parameters such as legislation and industry standard compliance to influence risk management and resource deployment to achieve balanced business benefit.

Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for IS governance strategy by communicating, propagating and controlling relevant processes across the entire ICT infrastructure.
Level 4	Defines and aligns the IS governance strategy incorporating it into the organisation’s corporate governance strategy. Adapts the IS governance strategy to take into account new significant events arising from legal, economic, political, business, technological or environmental issues.

IT Professionalism Europe

Competent and careful. Recognised and respected.

European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.1 : IS and Business Strategy Alignment					
	A.3 : Business Plan Development					
Manage	E.2 : Project and Portfolio Management					
	E.4 : Relationship Management					
	E.9 : Information Systems Governance					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) with the aim to increase visibility and accessibility of the e-Competence Framework. It is part of ITPE's

A.3 Business Plan Development

Addresses the design and structure of a business or product plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with business risk and technology strategies. Communicates and sells business plan to relevant stakeholders and addresses political, financial, and organisational interests.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to provide analysis of market environment etc.
Level 3	Provides leadership for the creation of an information system strategy that meets the requirements of the business (e.g. distributed, mobility-based) and includes risks and opportunities.
Level 4	Applies strategic thinking and organisational leadership to exploit the capability of Information Technology to improve or transform the business.

E.2 Project and Portfolio Management

Implements plans for a program of change. Plans, directs and manages a single or portfolio of ICT projects or services to ensure co-ordination and management of

Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for IS governance strategy by communicating, propagating and controlling relevant processes across the entire ICT infrastructure.
Level 4	Defines and aligns the IS governance strategy incorporating it into the organisation’s corporate governance strategy. Adapts the IS governance strategy

	to take into account new significant events arising from legal, economic, political, business, technological or environmental issues.
Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for the construction and implementation of long term innovative IS solutions.
Level 4	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.

interdependencies. Orchestrates projects to develop or implement new, internal or externally defined processes to meet identified business needs. Defines activities, responsibilities, critical milestones, resources, skills needs, interfaces and budget, optimises costs and time utilisation, minimises waste and strives for high quality. Develops contingency plans to address potential implementation issues. Delivers project on time, on budget and in accordance with original requirements taking into account changing circumstances. Creates and maintains documents to facilitate monitoring of project progress.

Level 1	-
Level 2	Understands and applies the principles of project management and applies methodologies, tools and processes to manage simple projects, Optimises costs and minimises waste.
Level 2	Accounts for own and others activities, working within the project boundary, making choices and giving instructions, optimising activities and resources. Manages and supervises relationships within the team; plans and establishes team objectives and outputs and documents results
Level 3	Manages complex projects or programmes, including interaction with others. Influences project strategy by proposing new or alternative solutions and balancing effectiveness and efficiency. Is empowered to revise rules and choose standards. Takes overall responsibility for project outcomes, including finance and resource management and works beyond project boundary.
Level 4	Provides strategic leadership for extensive interrelated programmes of work to ensure that Information Technology is a change enabling agent and delivers benefit in line with overall business strategic aims. Applies extensive business and technological mastery to conceive and bring innovative ideas to fruition.

E.4 Relationship Management

Develops positive business relationships in a diverse stakeholder environment facilitating multi-disciplinary team collaboration. Maintains regular communication with colleagues, customers, partners and suppliers, displaying empathy with their different

contexts and perspectives. Ensures that different stakeholder needs, concerns or complaints are understood and addressed in accordance with organisational policy.

Level 1	-
Level 2	-
Level 2	Accounts for own and others actions in managing a limited number of stakeholders
Level 3	Provides leadership for large or many stakeholder relationships. Authorises investment in new and existing relationships. Leads the design of a workable procedure for maintaining positive business relationships.
Level 4	-

E.9 Information Systems Governance

Defines, deploys and controls the management of information systems and services and data in line with the business imperatives. Takes into account all internal and external parameters such as legislation and industry standard compliance to influence risk management and resource deployment to achieve balanced business benefit.

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.7 : Technology Trend Monitoring					
	A.9 : Innovating					
Enable	D.10 : Information and Knowledge Management					
	D.11 : Needs Identification					
Manage	E.1 : Forecast Development					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) with the aim to increase visibility and accessibility of the e-Competence Framework. It is part of ITPE's

A.7 Technology Trend Monitoring

Investigates latest ICT technological developments to establish understanding of evolving technologies. Encourages and explores internal and external sources (including e.g. research activities, patents, start-up activities, digital communities) for innovative ideas and opportunities. Devises innovative solutions for the adoption or integration of existing or new technology and/or ideas into existing products, applications or services or for the creation of new ones.

Level 1	-
Level 2	-
Level 2	Detects signs of change to provide supervision and analysis of current and trend-setting ICT technological developments. Establishes relationships with relevant communities.
Level 3	Validates new and emerging technologies, coupled with expert understanding of the business, to envision and articulate solutions for the future. Creates the organisation wide trend monitoring processes.
Level 4	Plans and leads an organisational structure and support system for systematic technology watch. Advises and influences strategic decisions envisioning and articulating future ICT solutions.

A.9 Innovating

Devises creative solutions for the provision of new concepts, ideas, products or services. Deploys novel and open thinking to envision exploitation of technological advances to address business / society needs or research direction.

Level 1	-
Level 2	-
Level 2	-
Level 3	Applies independent thinking and technology awareness to lead the integration of disparate concepts for the provision of unique solutions.
Level 4	Provides strategic leadership for the introduction of new concepts. Guides innovation approaches and leads the cultural change to innovation.

D.10 Information and Knowledge Management

Identifies information and knowledge relevant to the organisation and develops processes and structures to manage it. Creates information structure to enable the exploitation, optimisation and sharing of information. Understands appropriate tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information asset.

Level 1	-

Level 2	-
Level 2	Analyses business processes and associated information requirements and provides the most appropriate information structure
Level 3	Integrates the appropriate information structure into the corporate environment.
Level 4	Correlates information and knowledge to create value for the business. Applies innovative solutions based on information retrieved

D.11 Needs Identification

Actively listens to internal/ external customers, articulates and clarifies their needs. Manages the relationship with all stakeholders to ensure that solutions and services are in line with business requirements. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centered system design. Advises the customer on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.

Level 1	-
Level 2	-
Level 2	Establishes reliable relationships with customers and helps them clarify their needs.
Level 3	Exploits wide ranging specialist knowledge of the customers business to offer possible solutions to business needs. Provides expert guidance to the customer by proposing solutions and supplier.
Level 4	Provides leadership in support of the customers' strategic decisions. Helps customer to envisage new ICT solutions, fosters partnerships and creates value propositions.

E.1 Forecast Development

Interprets market needs and evaluates market acceptance of products or services. Assesses the organisation's potential to meet future production and quality requirements. Applies relevant metrics to enable accurate decision making in support of production, marketing, sales and distribution functions.

Level 1	-
Level 2	-
Level 2	Exploits skills to provide short-term forecast using market inputs and assessing the organisation's production and selling capabilities.
Level 3	Acts with wide ranging accountability for the production of a long-term forecast. Understands the global marketplace, identifying and evaluating relevant inputs from the broader business, political and social context.
Level 4	-

Dimension 1	Dimension 2	Dimension 3

A.6 Application Design

Analyses, specifies, updates and makes available a model to implement applications in accordance with IS policy and user/customer needs. Selects appropriate technical options for application design, optimising the balance between cost and quality. Designs data structures and builds system structure models according to analysis results through modelling languages. Ensures that all aspects take account of interoperability, usability, accessibility and security. Identifies a common reference framework to validate the models with representative users, based upon development models (e.g. iterative approach).

Level 1	Contributes to the design and general functional specification and interfaces.
Level 2	Organises the overall planning of the design of the application.
Level 2	Accounts for own and others actions in ensuring that the application is correctly integrated within a complex environment and complies with user / customer needs.
Level 3	-
Level 4	-

D.10 Information and Knowledge Management

Identifies information and knowledge relevant to the organisation and develops processes and structures to manage it. Creates information structure to enable the exploitation, optimisation and sharing of information. Understands appropriate tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information asset.

Level 1	-
Level 2	-
Level 2	Analyses business processes and associated information requirements and provides the most appropriate information structure
Level 3	Integrates the appropriate information structure into the corporate environment.
Level 4	Correlates information and knowledge to create value for the business. Applies innovative solutions based on information retrieved

E.6 ICT Quality Management

Implements ICT quality policy to maintain and enhance service and product provision. Plans and defines indicators to manage quality with respect to ICT strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

Level 1	-

Level 2	Communicates and monitors application of the organisation's quality policy.
Level 2	Evaluates quality management indicators and processes based on ICT quality policy and proposes remedial action.
Level 3	Assesses and estimates the degree to which quality requirements have been met and provides leadership for quality policy implementation. Provides cross functional leadership for setting and exceeding quality standards.
Level 4	-

E.8 Information Security Management

Manages information and systems security policy accounting for technical, human, organisational and other relevant threats, in line with the IT and business strategy and reflecting the risk culture of the organisation. Deploys and manages the operational and specialist (for e.g. forensics, threat intelligence and intrusion detection) resources needed to ensure the capacity to manage security incidents, and makes recommendations for the continuous improvement of security policy and strategy.

Level 1	-
Level 2	Systematically scans the environment to identify and define vulnerabilities and threats. Records and escalates non- compliance.
Level 2	Evaluates security management measures and indicators and decides if compliant to information security policy. Investigates and instigates remedial measures to address any security breaches
Level 3	Provides leadership for the integrity, confidentiality and availability of data stored on information systems and complies with all legal requirements.
Level 4	-

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.1 : IS and Business Strategy Alignment					
	A.3 : Business Plan Development					
	A.5 : Architecture Design					
	A.7 : Technology Trend Monitoring					
Manage	E.8 : Information Security Management					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) with the aim to increase visibility and accessibility of the e-Competence Framework. It is part of ITPE's pledge to the Digital Skills and Jobs Coalition to promote this European standard to different users across the EU.

Sources: CEN/TC 428, the 'e-Competence Framework' - EN 16234-1:2019, 2019 and CEN Workshop agreement, 'European ICT Professional Role Profiles', CWA 16458-1, 2018, 'IT Professionalism Europe – www.itprofessionalism.org'

A.1 IS and Business Strategy Alignment

Anticipates long term business requirements, influences improvement of the organisation's process efficiency and effectiveness. Determines the IS model and enterprise architecture maintaining consistency with organisational policy and ensuring a secure environment. Recognises potential risks and business requirements to assure resilience in the alignment of systems and services to the business strategy. Makes strategic IS policy decisions for the enterprise, including sourcing strategies.

Level 1	-
Level 2	-
Level 2	-
Level 3	Provides leadership for the construction and implementation of long term innovative IS solutions.
Level 4	Provides IS strategic leadership to reach consensus and commitment from the management team of the enterprise.

A.3 Business Plan Development

Addresses the design and structure of a business or product plan including the identification of alternative approaches as well as return on investment propositions. Considers the possible and applicable sourcing models. Presents cost benefit analysis and reasoned arguments in support of the selected strategy. Ensures compliance with business risk and technology strategies. Communicates and sells business plan to relevant stakeholders and addresses political, financial, and organisational interests.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to provide analysis of market environment etc.
Level 3	Provides leadership for the creation of an information system strategy that meets the requirements of the business (e.g. distributed, mobility-based) and includes risks and opportunities.
Level 4	Applies strategic thinking and organisational leadership to exploit the capability of Information Technology to improve or transform the business.

A.5 Architecture Design

Level 1	-
Level 2	Systematically scans the environment to identify and define vulnerabilities and threats. Records and escalates non- compliance.
Level 2	Evaluates security management measures and indicators and decides if compliant to information security policy. Investigates and instigates remedial measures to address any security breaches

Level 3	Provides leadership for the integrity, confidentiality and availability of data stored on information systems and complies with all legal requirements.
Level 4	-

Specifies, refines, updates and makes available a formal approach to implement solutions and services, necessary to develop and operate the IS architecture, taking into account the requirements from business, management and data and information infrastructure. Identifies change requirements and the components involved: hardware, software, applications, processes, services, information and technology platform. Takes into account interoperability, reversibility, scalability, usability, accessibility and security, including the need to account for the development and management of vulnerability within existing and emerging technologies. Maintains alignment between business evolution and technology developments and services to ensure capacity of IT solutions according to SLA.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to define relevant ICT technology and specifications to be deployed in the construction of multiple ICT projects, applications or infrastructure improvements.
Level 3	Acts with wide ranging accountability to define the strategy to implement ICT technology compliant with business need. Takes account of the current technology platform, obsolescent equipment and latest technological innovations.
Level 4	Provides strategic leadership for implementing the digital enterprise strategy. Applies strategic thinking to discover and recognize new patterns in data sets and new ICT systems, to achieve business benefits.

A.7 Technology Trend Monitoring

Investigates latest ICT technological developments to establish understanding of evolving technologies. Encourages and explores internal and external sources (including e.g. research activities, patents, start-up activities, digital communities) for innovative ideas and opportunities. Devises innovative solutions for the adoption or integration of existing or new technology and/or ideas into existing products, applications or services or for the creation of new ones.

Level 1	-
Level 2	-
Level 2	Detects signs of change to provide supervision and analysis of current and trend-setting ICT technological developments. Establishes relationships with relevant communities.

Level 3	Validates new and emerging technologies, coupled with expert understanding of the business, to envision and articulate solutions for the future. Creates the organisation wide trend monitoring processes.
Level 4	Plans and leads an organisational structure and support system for systematic technology watch. Advises and influences strategic decisions envisioning and articulating future ICT solutions.

E.8 Information Security Management

Manages information and systems security policy accounting for technical, human, organisational and other relevant threats, in line with the IT and business strategy and reflecting the risk culture of the organisation. Deploys and manages the operational and specialist (for e.g. forensics, threat intelligence and intrusion detection) resources needed to ensure the capacity to manage security incidents, and makes recommendations for the continuous improvement of security policy and strategy.

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.4 : Product / Service Planning					
Manage	E.2 : Project and Portfolio Management					
	E.3 : Risk Management					
	E.4 : Relationship Management					
	E.7 : Business Change Management					

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A.4 Product / Service Planning

Analyses and defines current and target status. Estimates cost effectiveness, points of risk, opportunities, strengths and weaknesses, with a critical approach. Creates structured plans; establishes time scales and milestones, ensuring optimisation of activities and resources. Manages services portfolio and change requests. Defines delivery quantity and provides an overview of additional documentation requirements. Specifies correct handling of products in accordance with current legislation.

Level 1	-
Level 2	Systematically documents standard and simple elements of a product.
Level 2	Exploits specialist knowledge to create and maintain complex documents.
Level 3	Provides leadership and takes responsibility for, developing and maintaining overall plans.
Level 4	-

E.2 Project and Portfolio Management

Implements plans for a program of change. Plans, directs and manages a single or portfolio of ICT projects or services to ensure co-ordination and management of

Level 1	-
Level 2	-
Level 2	Evaluates change requirements and exploits specialist skills to identify possible methods and standards that can be deployed
Level 3	Provides leadership to plan, manage and implement significant ICT led business change

Level 4	Applies pervasive influence to embed organisational change.

interdependencies. Orchestrates projects to develop or implement new, internal or externally defined processes to meet identified business needs. Defines activities, responsibilities, critical milestones, resources, skills needs, interfaces and budget, optimises costs and time utilisation, minimises waste and strives for high quality. Develops contingency plans to address potential implementation issues. Delivers project on time, on budget and in accordance with original requirements taking into account changing circumstances. Creates and maintains documents to facilitate monitoring of project progress.

Level 1	-
Level 2	Understands and applies the principles of project management and applies methodologies, tools and processes to manage simple projects, Optimises costs and minimises waste.
Level 2	Accounts for own and others activities, working within the project boundary, making choices and giving instructions, optimising activities and resources. Manages and supervises relationships within the team; plans and establishes team objectives and outputs and documents results
Level 3	Manages complex projects or programmes, including interaction with others. Influences project strategy by proposing new or alternative solutions and balancing effectiveness and efficiency. Is empowered to revise rules and choose standards. Takes overall responsibility for project outcomes, including finance and resource management and works beyond project boundary.
Level 4	Provides strategic leadership for extensive interrelated programmes of work to ensure that Information Technology is a change enabling agent and delivers benefit in line with overall business strategic aims. Applies extensive business and technological mastery to conceive and bring innovative ideas to fruition.

E.3 Risk Management

Implements the management of risk across information systems through the application of the enterprise defined risk management policy and procedure. Assesses risk to the organisation’s business, including web, cloud and mobile resources. Documents potential risk and containment plans.

Level 1	-
Level 2	Understands and applies the principles of risk management and investigates ICT solutions to mitigate identified risks.
Level 2	Decides on appropriate actions required to adapt security and address risk exposure. Evaluates, manages and ensures validation of exceptions; audits ICT processes and environment.

Level 3	Provides leadership to define and make applicable a policy for risk management by considering all the possible constraints, including technical, economic and political issues. Delegates assignments.
Level 4	-

E.4 Relationship Management

Develops positive business relationships in a diverse stakeholder environment facilitating multi-disciplinary team collaboration. Maintains regular communication with colleagues, customers, partners and suppliers, displaying empathy with their different contexts and perspectives. Ensures that different stakeholder needs, concerns or complaints are understood and addressed in accordance with organisational policy.

Level 1	-
Level 2	-
Level 2	Accounts for own and others actions in managing a limited number of stakeholders
Level 3	Provides leadership for large or many stakeholder relationships. Authorises investment in new and existing relationships. Leads the design of a workable procedure for maintaining positive business relationships.
Level 4	-

E.7 Business Change Management

Assesses the implications of digital transformation, potential digital disruption and change. Defines the requirements and quantifies the business benefits. Manages change taking into account structural and cultural issues. Maintains business and process continuity throughout change, monitoring the impact, taking any required remedial action and refining approach.

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.6: Application Design					
	A.9 : Innovating					
Enable	D.10: Information and Knowledge Management					
	D.11 : Needs Identification					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) to enhance the visibility and accessibility of the e-Competence Framework (e-CF). It is part of ITPE's pledge to the Digital Skills and Jobs Coalition to promote this European standard across the EU.

Sources: CEN/TC 428, 'e-Competence Framework' - EN 16234-1:2019 and CEN Workshop Agreement 'European ICT Professional Role Profiles' - CWA 16458-1, 2018, 'IT Professionalism Europe – www.itprofessionalism.org

A.6 Application Design

Analyses, specifies, updates and makes available a model to implement applications in accordance with IS policy and user/customer needs. Selects appropriate technical options for application design, optimising the balance between cost and quality. Designs data structures and builds system structure models according to analysis results through modelling languages. Ensures that all aspects take account of interoperability, usability, accessibility and security. Identifies a common reference framework to validate the models with representative users, based upon development models (e.g. iterative approach).

Level 1	Contributes to the design and general functional specification and interfaces.
Level 2	Organises the overall planning of the design of the application.
Level 2	Accounts for own and others actions in ensuring that the application is correctly integrated within a complex environment and complies with user / customer needs.
Level 3	-
Level 4	-

A.9 Innovating

Devises creative solutions for the provision of new concepts, ideas, products or services. Deploys novel and open thinking to envision exploitation of technological advances to address business / society needs or research direction.

Level 1	-
Level 2	-
Level 2	-
Level 3	Applies independent thinking and technology awareness to lead the integration of disparate concepts for the provision of unique solutions.
Level 4	Provides strategic leadership for the introduction of new concepts. Guides innovation approaches and leads the cultural change to innovation.

D.10 Information and Knowledge Management

Identifies information and knowledge relevant to the organisation and develops processes and structures to manage it. Creates information structure to enable the exploitation, optimisation and sharing of information. Understands appropriate tools to be deployed to create, extract, maintain, renew and propagate business knowledge in order to capitalise from the information asset.

Level 1	-
Level 2	-

Level 2	Analyses business processes and associated information requirements and provides the most appropriate information structure
Level 3	Integrates the appropriate information structure into the corporate environment.
Level 4	Correlates information and knowledge to create value for the business. Applies innovative solutions based on information retrieved

D.11 Needs Identification

Actively listens to internal/ external customers, articulates and clarifies their needs. Manages the relationship with all stakeholders to ensure that solutions and services are in line with business requirements. Proposes different solutions (e.g. make-or-buy), by performing contextual analysis in support of user centered system design. Advises the customer on appropriate solution choices. Acts as an advocate engaging in the implementation or configuration process of the chosen solution.

Level 1	-
Level 2	-
Level 2	Establishes reliable relationships with customers and helps them clarify their needs.
Level 3	Exploits wide ranging specialist knowledge of the customers business to offer possible solutions to business needs. Provides expert guidance to the customer by proposing solutions and supplier.
Level 4	Provides leadership in support of the customers' strategic decisions. Helps customer to envisage new ICT solutions, fosters partnerships and creates value propositions.

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European e-Competence Framework

Dimension 1	Dimension 2	Dimension 3				
		e-1	e-2	e-3	e-4	e-5
Plan	A.5: Architecture Design					
Build	B.5: Documentation Production					
	B.6 : ICT Systems Engineering					
Manage	E.6: ICT Quality Management					

This e-CF Explorer is an initiative of IT Professionalism Europe (ITPE) to increase the visibility and accessibility of the e-Competence Framework (e-CF). It is part of ITPE's pledge to the Digital Skills and Jobs Coalition to promote this European standard across the EU.

Sources: CEN/TC 428, 'e-Competence Framework' - EN 16234-1:2019 and CEN Workshop Agreement 'European ICT Professional Role Profiles' - CWA 16458-1, 2018, 'IT Professionalism Europe – www.itprofessionalism.org

A.5 Architecture Design

Specifies, refines, updates and makes available a formal approach to implement solutions and services, necessary to develop and operate the IS architecture, taking into account the requirements from business, management and data and information infrastructure. Identifies change requirements and the components involved: hardware, software, applications, processes, services, information and technology platform. Takes into account interoperability, reversibility, scalability, usability, accessibility and security, including the need to account for the development and management of vulnerability within existing and emerging technologies. Maintains alignment between business evolution and technology developments and services to ensure capacity of IT solutions according to SLA.

Level 1	-
Level 2	-
Level 2	Exploits specialist knowledge to define relevant ICT technology and specifications to be deployed in the construction of multiple ICT projects, applications or infrastructure improvements.
Level 3	Acts with wide ranging accountability to define the strategy to implement ICT technology compliant with business need. Takes account of the current technology platform, obsolescent equipment and latest technological innovations.
Level 4	Provides strategic leadership for implementing the digital enterprise strategy. Applies strategic thinking to discover and recognize new patterns in data sets and new ICT systems, to achieve business benefits.

B.5 Documentation Production

Produces documents by integrating information and maintaining compliance with relevant requirements. Selects the appropriate style and format by determining the media type and presentation mode of the documentation. Creates templates for document-management systems. Ensures that documentation complies with customers', technical and ICT application development process needs and that existing documents are valid and up to date. Provides support for the development of interactive documents.

Level 1	Uses and applies standards to define document structure.
Level 2	Ensures that documentation is complete, correct and provided in a suitable place and format.
Level 2	Adapts the level of detail to meet the needs of the targeted population.
Level 3	-
Level 4	-

B.6 ICT Systems Engineering

Builds the required networks/network connections, components and interfaces. Follows a systematic methodology to analyse and engineer infrastructure platforms or solutions for cloud, IoT and other technologies to meet business and technical requirements. Builds system structure models and conducts system behaviour to integrate physical devices, networks, hardware and/or software components. Ensures information security, data protection and energy efficiency. Performs tests to ensure requirements are met.

Level 1	-
Level 2	-
Level 2	Ensures interoperability of the system components. Exploits wide ranging specialist knowledge to create a digital infrastructure that will satisfy the system constraints and meet the customer's expectations.
Level 3	Handles complexity by developing standard procedures and architectures in support of cohesive product development. Establishes a set of system requirements that will guide the design of the digital infrastructure. Identifies which system requirements and which functions should be allocated to which elements of the system and/or layers of the infrastructure.
Level 4	-

E.6 ICT Quality Management

Implements ICT quality policy to maintain and enhance service and product provision. Plans and defines indicators to manage quality with respect to ICT strategy. Reviews quality measures and recommends enhancements to influence continuous quality improvement.

Level 1	-
Level 2	Communicates and monitors application of the organisation's quality policy.
Level 2	Evaluates quality management indicators and processes based on ICT quality policy and proposes remedial action.
Level 3	Assesses and estimates the degree to which quality requirements have been met and provides leadership for quality policy implementation. Provides cross functional leadership for setting and exceeding quality standards.
Level 4	-

Professions related to BI and their relevant Competencies listed by ESCO

Occupation	Description	Essential Skills and Competences	Essential Knowledge	Optional Skills and Competences	Optional Knowledge
Business analyst/ *Alternative Labels* Business development analyst/ business strategy analyst/ business strategy consultant/ management consultant/ organizational developer/ standardization expert / standardization manager/ standardization expert	Research and understand the strategic position of businesses and companies in relation to their markets and their stakeholders. They analyse and present their views on how the company, from many perspectives, can improve its strategic position and internal corporate structure. They assess needs for change, communication methods, technology, IT tools, new standards and certifications.	advise on efficiency improvements, align efforts towards business development, analyse business plans, analyse external factors of companies, analyse financial performance of a company, analyse internal factors of companies, build business relationships, conduct qualitative research, conduct quantitative research, identify undetected organisational needs, interpret financial statements, liaise with managers, make strategic business decisions, perform business analysis	business analysis, market research, risk management, scientific research methodology	advise client on technical possibilities, advise on communication strategies, advise on financial matters, advise on organisational culture, advise on personnel management, advise on risk management, define organisational standards, interview people, keep updated on the political landscape, propose ICT solutions to business problems, report analysis results, seek innovation in current practices, shape organisational teams based on competencies, support implementation of quality management systems	business intelligence, business law, business process modelling, business strategy concepts, corporate law, financial statements, market entry strategies, organisational policies, quality standards
Business Consultant *Alternative Labels* Business process consultant	Business consultants analyse the position, structure and processes of businesses and companies and offer services or advice to improve them. They research and identify business processes such as financial inefficiencies or employee management and devise strategical plans to overcome these difficulties. They work in external consulting firms where they provide an objective view on a business and or company's structure and	advise on efficiency improvements, advise on financial matters, advise on personnel management, align efforts towards business development, analyse business objectives, analyse business plans, analyse business processes, analyse business requirements, analyse external factors of companies, analyse financial performance of a company, analyse internal factors of companies, analyse the context of an organisation, build business relationships, conduct qualitative	business analysis, business processes, consultation methods, strategic planning	advise client on technical possibilities, advise on communication strategies, advise on environmental risk management systems, advise on risk management, advise on sustainability solutions, define organisational standards, interview people, report analysis results, seek innovation in current practices	business incubation, business intelligence, business law, business process modelling, business strategy concepts, corporate law, financial statements, human resource management, market entry strategies, organisational policies, quality standards

	methodological processes.	research, conduct quantitative research, identify undetected organisational needs, interpret financial statements, liaise with managers, make strategic business decisions, perform business analysis			
Business Intelligence Manager *Alternative Labels* Business intelligence analyst/ business intelligence consultant/ business intelligence manager/ business intelligence specialist/ business research analyst/ business research consultant/ competitive intelligence manager/ market intelligence manager/research consultant/ strategic business and intelligence manager	Business intelligence managers gain knowledge of the industry, the innovative processes therein, and contrast them with the operations of the company in order to improve them. They focus their analysis in the supply chain processes, warehouses, storage, and sales as to facilitate communication and revenue improvement	advise on efficiency improvements, align efforts towards business development, analyse the context of an organisation, create a work atmosphere of continuous improvement, develop company strategies, develop revenue generation strategies, ensure compliance with policies, gather technical information, identify undetected organisational needs, implement strategic planning, improve business processes, integrate strategic foundation in daily performance, interpret business information, liaise with managers, manage business knowledge, manage project metrics, monitor company policy, perform business analysis, perform data analysis, provide improvement strategies, track key performance indicators	business analysis, business management principles, company policies, corporate social responsibility, organisational policies, statistical analysis system software, statistics, strategic planning	advise on tax policy, analyse production processes for improvement, analyse supply chain strategies, deliver business research proposals, identify suppliers, keep updated on innovations in various business fields, make strategic business decisions, manage budgets, monitor customer behaviour, perform business research, perform market research, recommend product improvements, train employees, use consulting techniques	business intelligence, continuous improvement philosophies, data mining, data models, project management, risk management, sales strategies, supply chain management
Lean Manager *Alternative Labels*	Lean managers plan and manage lean programs in different business units of an organisation. They drive and	act reliably, adjust priorities, advise on efficiency improvements, analyse business processes, analyse production	5S methodology, SMED, continuous improvement philosophies, leadership	analyse internal factors of companies, assess quality of services, consult information sources, develop	Agile project management, accounting, hoshin kanri strategic planning, logistics mass customisation, s

Continuous improvement manager/ kaizen manager/ lean coach/ lean director/ lean engineer/ lean expert/ lean facilitator/ lean project manager/ manufacturing excellence manager/ operational excellence manager/ process excellence manager	coordinate continuous improvements projects aimed at achieving manufacturing efficiency, optimise workforce productivity, generate business innovation and realise transformational changes impacting on operations and business processes, and report on results and progresses to the company management. They contribute to the creation of a continuous improvement culture within the company, and they are responsible for developing and training a team of lean experts.	processes for improvement, apply change management, define organisational standards, encourage teams for continuous improvement, identify improvement actions, identify process improvements, lead process optimisation, liaise with managers, manage a team, manage corrective actions, manage medium term objectives, manage production changeovers, motivate employees, report on overall management of a business, set quality assurance objectives	principles, lean manufacturing, production processes, project management, root cause analysis, six sigma methods, team work principles	corporate training programmes, hire human resources, identify necessary human resources, manage personal professional development, manage resources, perform data analysis, revise quality control systems documentation, schedule production, use methods of logistical data analysis	upply chain management
Logistics Analyst *Alternative Labels* analyst of logistics/ distribution analyst/ distribution and logistics analyst/ distribution and logistics consultant/ distribution consultant/ logistics analyst/ logistics and distribution analyst/ logistics and supply chain analyst/ logistics consultant/ supply chain analyst/ supply chain consultant	Logistics analysts streamline product manufacturing, transportation, storage and distribution. They assess production and supply chain problems to determine economically efficient solutions. They assists company managers in decision-making processes and direct programs designed to provide subcontractors, managers and customers with logistic technology.	analyse relation between supply chain improvement and profit, analyse supply chain strategies, analyse supply chain trends, analyse transport business networks, consider economic criteria in decision making, create freight rate databases, detect bottlenecks, develop efficiency plans for logistics operations, enhance production workflow, liaise with logistics management teams, maintain logistics databases, manage logistics pricing systems, mitigate waste of resources, perform system analysis, review distribution management procedures, suppor	green logistics, supply chain management, theory of constraints	assess risk factors, communicate analytical insights, execute analytical mathematical calculations, have computer literacy, perform ICT troubleshooting, perform data analysis, plan schedule, use different communication channels	evolution of economic forecasts, lean manufacturing, online analytical processing

		t development of annual budget, use methods of logistical data analysis, use specific data analysis software, use spreadsheets software			
Data Analyst *Alternative Labels* data storage analyst/ data warehouse analyst/ data warehousing analyst	Data analysts import, inspect, clean, transform, validate, model, or interpret collections of data with regard to the business goals of the company. They ensure that the data sources and repositories provide consistent and reliable data. Data analysts use different algorithms and IT tools as demanded by the situation and the current data. They might prepare reports in the form of visualisations such as graphs, charts, and dashboards.	analyse big data, apply statistical analysis techniques, collect ICT data, define data quality criteria, establish data processes, execute analytical mathematical calculations, handle data samples, implement data quality processes, integrate ICT data, interpret current data, manage data, normalise data, perform data cleansing, perform data mining, use data processing techniques, use databases	business intelligence, data mining, data models, data quality assessment, documentation types, information categorisation, information confidentiality, information extraction, information structure, query languages, resource description framework query language, statistics, unstructured data, visual presentation techniques	create data models, deliver visual presentation of data, gather data for forensic purposes, manage cloud data and storage, manage data collection systems, manage quantitative data, report analysis results, store digital data and systems, use spreadsheets software	Hadoop, LDAP, LINQ, MDX, N1QL, SPARQL, XQuery, cloud technologies, data storage, database, information architecture, online analytical processing, web analytics
Data Scientist *Alternative Labels* data engineer/ data expert/ data research scientist/ data scientist/ research data scientist	Data scientists find and interpret rich data sources, manage large amounts of data, merge data sources, ensure consistency of data-sets, and create visualisations to aid in understanding data. They build mathematical models using data, present and communicate data insights and findings to specialists and scientists in their team and if required, to a non-expert audience, and recommend	apply for research funding, apply research ethics and scientific integrity principles in research activities, build recommender systems, collect ICT data, communicate with a non-scientific audience, conduct research across disciplines, deliver visual presentation of data, demonstrate disciplinary expertise, design database scheme, develop data processing applications, develop professional network with researchers and	data mining, data models, information categorisation, information extraction, online analytical processing, query languages, resource description framework query language, statistics, visual presentation techniques	apply blended learning, create data models, define data quality criteria, design database in the cloud, integrate ICT data, manage ICT data architecture, manage ICT data classification, manage data, perform data mining, teach in academic or vocational contexts, use spreadsheets software	Hadoop, LDAP, LINQ, MDX, N1QL, SPARQL, XQuery, business intelligence, data quality assessment, unstructured data

	ways to apply the data	scientists, disseminate results to the scientific community, draft scientific or academic papers and technical documentation, establish data processes, evaluate research activities, execute analytical mathematical calculations, handle data samples, implement data quality processes, increase the impact of science on policy and society, integrate gender dimension in research, interact professionally in research and professional environments, interpret current data, manage data collection systems, manage findable accessible interoperable and reusable data, manage intellectual property rights, manage open publications, manage personal professional development, manage research data, mentor individuals, normalise data, operate open source software, perform data cleansing, perform project management, perform scientific research, promote open innovation in research promote the participation of citizens in scientific and research activities, promote the transfer of knowledge, publish academic research, report analysis results, speak different languages, synthes			

		ise information, think abstractly, use data processing techniques, use databases, write scientific publications			
ICT Business Analysis Manager *Alternative Labels* ICT business analysis manager/ ICT business analysis managers/ ICT commercial analysis manager/ IT business analysis director/ IT business analysis manager /IT commercial analysis manager/ lead IT business analyst	ICT business analysis managers identify areas where information system changes are needed to support business plans and monitor the impact in terms of change management. They contribute to the general ICT functional requirements of the business organisation. ICT business analysis managers analyse business needs and translate them into ICT solutions	analyse business requirements, coordinate technological activities, create business process models, define technical requirements, design process, implement strategic planning, improve business processes, make strategic business decisions, manage ICT project, perform business analysis, propose ICT solutions to business problems, provide ICT consulting advice, provide cost benefit analysis reports, track key performance indicators, write work-related reports	ICT security legislation, business process modelling, business processes, decision support systems	adapt to changing situations, apply change management, communicate with customers, execute analytical mathematical calculations, perform data mining, provide training on technological business developments, use different communication channels	ICT market, business strategy concepts, data mining, information extraction, systems development life-cycle, visual presentation techniques
ICT business analyst *Alternative Labels* business process specialist/ ICT business analyst/ ICT business analysts/ IT business analyst	ICT business analysts are in charge of analysing and designing an organisation's processes and systems, assessing the business model and its integration with technology. They also identify change needs, assess the impact of the change, capture and document requirements and then ensure that these requirements are delivered whilst	analyse business processes, analyse business requirements, analyse the context of an organisation, apply change management, create business process models, define technical requirements, identify customer requirements, identify legal requirements, implement strategic planning, interact with users to gather requirements, propose ICT solutions to business problems, provide	business process modelling, business requirements techniques, legal requirements of ICT products, product usage risks analysis	design process, execute analytical mathematical calculations, manage ICT project, provide user documentation	ICT market, business ICT systems, business intelligence, business strategy concepts, cloud technologies, decision support systems, information architecture, information categorisation, information extraction, innovation processes, internal risk management policy, organisational

	supporting the business through the implementation process.	cost benefit analysis reports, translate requirements into visual design			resilience, systems development life-cycle, unstructured data, visual presentation techniques

Final Proposal

SELF-GUIDANCE FOR APPROACHING A PROFESSIONAL JOB/THESIS PROJECT IN BUSINESS INFORMATICS

In today's fast-paced and competitive job market, to land a fulfilling career or a thesis project and to succeed in academic and professional endeavors, Master's students in Business Informatics must adopt a proactive approach. You should have a strong sense of desire and enthusiasm for your professional growth and take the initiative proactively. For that, this guidance will act as a self-help tool.

Approaching a job/job searching is a time and energy-consuming task. Before, going through the guide keep in mind these important points in your job/thesis project searching journey in Finland.

- ***Soft skills are really important in landing a job and continuing your career***.

  In a job interview, it is the soft skills that mostly determine how fit you are to perform that particular job. The decision will be based on how better you communicate yourself, how you market your skills, experiences and knowledge and how better you impress them you can perform that particular job. After landing the job soft skills such as cultural fit, team spirit, effective communication and leadership skills will sustain how far you can go in your field. Not like technical skills, soft skills take time to acquire. Therefore, you must concentrate on learn and practice these soft skills investing your time and effort.

Karen, Master's student in BI

Technical skills can be learned in a very short time, but the soft skills will take longer time to acquire. Technical skills can only get used at some point, but it will be your soft skills that will sustain how far you will go in your field. In my case of being a trainee and then getting a permanent position, I believe soft skills played an important role. According to my manager, what is most important is the cultural fit, because the organizational environment is quite diverse. You must be able to quickly adjust to the work environment in terms of how the team works and in terms of how the team communicates.

Saloni, Master's student in BI

It is the soft skills that work more. I think at least I have seen it even where I work now, it is not the CV that matters most, obviously it should be attractive to select for an interview. But then when you go for the interview, it is the soft skills that matter more. How you speak, how you talk and how you impress them. That matters a lot. My both managers who hired me has told me that you have a really good positive kind of talk

- **Keep on learning and adding skills**

  Continuous learning and adding required skills to your profile is essential for approaching a professional job as it improves your competitiveness, adaptability and career possibilities and thereby your employability. This can be done while you are pursuing studies as an undergraduate but never stop after your graduation and keep on improving your knowledge, technical skills and soft skills in required areas.

- **Try to build an effective and strong network and continuously expand it**

  An effective and strong network equips you with invaluable information in gaining industry insights and understanding the job market and working culture.

It expands your professional relationships in the field and provides mentorship. Most importantly, as most of the jobs are hidden in Finnish labour market and not advertised, through networking you can obtain information on such hidden jobs. Therefore, building and growing your network is essential for navigating the job market.

Moving to the guidance, as a Master's student, you should consider having an organized approach in searching for a professional job/thesis project in your field, Business Informatics (BI). This guidance suggests you to focus on 04 main areas in your job/thesis searching journey, as a BI student:

1. **Understanding BI as a Professional Area.**
2. **Exploring Industry Needs and Job Markets in BI**
3. **Understanding Employability and its Ways in BI**
4. **Best Practices in Approaching a Professional Job/Thesis Project in BI**

01 : Understanding BI as a Professional Area

BI is a combined discipline of both IT and business fields. As most of the BI Master's students are from either the IT/engineering field or the business field, you need to understand BI professional areas, as the initial step in approaching a professional job/thesis project in BI. BI professional areas can be identified under three categories.

d. ***BI professional areas related to IT field***
   e.g. ICT Systems, IS, Digitalization, IT Management Aspects

e. ***BI professional areas related to the Business field***
   e.g. Business Process Modelling, E-Business, E-Commerce

f. ***BI professional areas related to a combination of both IT and Business fields***
   e.g. Business Analytics, Business Intelligence, ERP, Knowledge Management

- To improve the understanding of BI professional areas, you need to:
  - Participate in industrial visits and guest lectures on industrial topics organized by the BI department.

- Refer highly recognized academic materials such as text books, articles and blogs in BI.
  e.g. **Basics in Business Informatics** (text book) by Weber, P., Gabriel, R., Lux, T. and Menke, K. (2022). Both the printed version and the e-book are available at Metropolia library
- Get insights from industry professionals

02 : Exploring Industry Needs and Job Markets in BI

Under this, you need to explore and analyze the BI industry and identify what are the *current industry trends*, what are the *requirements by employers* and get to know about the *job market for BI* in Finland.

❖ In understanding the above, it is important to identify the *job roles relevant to particular BI professions* and the *skills needed in those professions*. These guides will help you.

- **European e-Competence Framework (e-CF)**
  - ✓ Developed by the European Committee for Standardization (CEN)
  - ✓ Describes the competences in the ICT sector by developing 30 European ICT professional role profiles. https://ecfexplorer.itprofessionalism.org/.
  - ✓ Among those, there are profiles related to BI professions. (Refer to *Appendix i*)
- **ESCO (European Skills, Competences, Qualifications and Occupations)**
  - ✓ Developed by The European Commission
  - ✓ A kind of dictionary, describing, identifying and classifying professional occupations and skills relevant for the EU labour market and education and training
  - ✓ It provides descriptions of 3,008 occupations and 13,890 skills linked to these occupations. https://esco.ec.europa.eu/en/about-esco/what-esco.
  - ✓ Out of the list, there are professions related to BI and their relevant skills (Refer to Appendix ii)

- **Analysis of job postings** is the most common strategy for gaining insights into current industry trends and needs. So, you should start your practical search for available jobs/thesis projects from all possible channels. For example,

  - Job Portals / Recruitment Agencies
    - ✓ LinkedIn – One of the most effective job searching channels. You should be actively and effectively use this social media platform to get the advantage.
    - ✓ TE-palvelut – Finnish state authority that organizes and produces employment and economic development services https://paikat.te-palvelut.fi/tpt/
    - ✓ EURES – European Employment Services by European Labour Authority https://eures.europa.eu/
    - ✓ https://www.workinfinland.com/en/open-jobs/
    - ✓ https://jobsinhelsinki.com/
    - ✓ https://jobsinespoo.com/
    - ✓ https://jobsinvantaa.com/
    - ✓ https://thehub.io/
    - ✓ https://fi.indeed.com/
    - ✓ https://academicpositions.fi/
    - ✓ https://www.glassdoor.com/index.htm
    - ✓ https://www.kuntarekry.fi/
    - ✓ https://tyopaikat.oikotie.fi/
    - ✓ https://laura.fi/
    - ✓ https://www.jobly.fi/
    - ✓ https://www.academicwork.fi/
    - ✓ https://www.adecco.fi/avoimet-tyopaikat/
    - ✓ https://atalent.fi/
      - ✓ https://barona.fi/
      - ✓ https://biisoni.fi/
      - ✓ https://www.manpower.fi/
      - ✓ https://www.experis.fi/
      - ✓ https://inhunt.fi/
      - ✓ https://www.nico.fi/ - Recruitment specialist in IT field
  - Search **direct company websites** for job ads
  - Attend to **job fairs** and **networking events.** For example,

- ✓ Contact Forum – Finland's largest career and recruitment event for university students. Conducts in January at Messukeskus, Helsinki. https://contactforum.fi/en/
- ✓ Job fairs and networking events conducted by the city offices
  - Helsinki https://tyollisyyspalvelut.hel.fi/
  -Vantaa https://tapahtumat.vantaa.fi/
  - Espoo https://www.espoo.fi/en/recruitment-events-espoo
- ✓ European Job Days- Conducts Europe-wide recruitment fairs online. This is run by EURES and the European Commission. https://europeanjobdays.eu/en/events

❖ **Effectively utilize the available guidance of your university**.

➢ **Metropolia JobTeaser**

This operates as a job portal and a career center for students. You can find this tool in Metropolia OMA workspace and in that you can search for available job vacancies using various filters such as their professional field, study level, duration of work experience, type of contract, city, working language, and by using the keywords for jobs/company names.

> ***Karen, Master's student in BI***
> *"I got my first internship from the Metropolia JobTeaser. I also landed another interview from a job post from that portal.*

JobTeaser's "Event" page provides detailed information on various career events such as career webinars, networking events, recruitment events, coaching events and workshops.

"Advice" and "Career Tips" pages give you information and common understanding about job market in Finland, information on different industries, and guidance on job searching with some important links to detailed information.

https://metropolia.jobteaser.com/

➢ Take the **"Boost your Job Search"** course and/or **"Discover Your Career Path in Finland"** course

You can take these courses as extra elective courses which give you insights into many topics related to job searching, such as the Finnish job market, hidden jobs, where to search for jobs, and many other topics. Both courses

are specially designed for international students and have more or less similar content. But, additionally the latter course is implemented including an intensive week of workshops.

- ✓ Boost your Job Search – Two credits course conducted in the Autumn and Spring semesters
- ✓ Discover Your Career Path in Finland – Five credits course conducted in the Autumn semester

- Attend job fairs and networking events organized by the university
- Participate in industrial visits and guest lectures on industrial topics organized by the BI department
- Effectively utilize the job vacancies informed by the BI department
- Actively participating in career development events and programs informed by the university/BI department which are held and/or organized on campus as well as beyond the campus. For example, workshops, networking events, job fairs, mentoring programs and competitions.
  - ✓ Oftenly check OMA workspace
  - ✓ Keep in touch with your Metropolia e-mail
  - ✓ Check on the university notice boards

❖ **Utilize your network** and know about the industry and job market through:

- Industry experts
- Your colleagues
- Acquaintances
- Your friends in the field
- BI alumni

Networking is an effective strategy in searching for a job/thesis project and it expands your career development opportunities. Building up networks in the field, actively engaging with them and continuously expanding the network may put one in a successful position during the job hunt and beyond.

Through networking, you will be able to grow your information and understanding about the Finnish job market, working culture, integration and the country as well.

Keep in your mind that, in Finland, most jobs are hidden and not published. So, having a strong network and sharing information and sources within the network will show you those hidden opportunities.

Tips to build up and expand your network

> ***Mhyles, Master's student in BI***
>
> *Let's say I found a job ad from LinkedIn. So I would go to that particular company website and then zoom in to the specific job requirements and company profile. From there, you can get the big picture of what the industry or the job requires. I further explore the site and try to find some professionals who work there and search for them in LinkedIn and try to get connected with them and have some communication. And I meet up with them in person as for their availability, which would be beneficial for me to build up my network.*
>
> ***Saim, Master's student in BI***
>
> *I have joined some groups in LinkedIn related to BI. In those communities, I can see their conversations regarding the industry and also I have the opportunity to ask questions from them and they answer and give suggestions.*

- ✓ Use **social media channels** such as *LinkedIn, Facebook, Instagram* and *X.*

  Utilizing LinkedIn and other social media platforms effectively, can greatly improve your job hunt by growing your network, exhibiting your expertise, keeping up with industry developments, and putting you in touch with companies and job openings. You should actively use them, to get these benefits.

  -When you participate for industrial visits, guest lectures on industrial topics and guest lectures on thesis writing by BI Alumni members, try to make connections with them, for instance, you can politely ask them to connect on LinkedIn. Do the same, when you attend any career events like job fairs, networking events and workshops, try to build up connections with people who are working in the field or HR people.

  -Specially, on LinkedIn you can join LinkedIn groups related to BI and thereby link with industry experts. For example, *Business Analyst Professional - BA, Analysis, Data Analyst, Data Scientist, AI and Power BI.*

  -Join some Facebook groups. For example, *Business Analyst*, *Business Analyst Communit*y and *International Working Women of Finland.*

- ✓ Join **mentoring programs**

Here, you get a professional in your same field as a mentor. Through the mentor, you will be able to get insights into current situation of the industry and job market, access to job prospects, career coaching, networking opportunities, skill development and help for cultural integration. For example,

Anna, Master's student in BI

I have joined a mentoring program and it is one of the best actions I have taken in job searching journey. My mentor is a professional in my field who is in the position of a hiring manager as well. He helped me to understand my skill gaps, to expand my network and to get to know about the industry and the job market to some extent

Karen, Master's student in BI

I recommend being involved in mentoring programs, because I am in one program and it get introduces you to people from the industry and from other networks also. Therefore, it gives you some better opportunities to get closer to the industry.

- Suomen Mentorit https://suomenmentorit.fi/
- EntryPoint by City of Espoo https://www.espoo.fi/en/working-life/espoo-talent-hub/entrypoint-mentoring-programme
- PMI Finland Mentoring program by Project management Institute, Finland https://pmi-fi.org/mentoring-program

- ✓ Join some extracurricular activities at your university.
  - Join as a **student ambassador** (Stay alert with your emails for the announcement)
  -Join as a **study tutor** (Stay alert with your emails for the announcement)
  -Join **METKA** student union

Mhyles, Master's student in BI

I work as a student ambassador at our university, which offers me some working experience as a part-time work. But rather than that, it gives me the opportunity to meet people which expands my network

- ✓ Join some communities and groups related to your field or provide career services to expand your network. Mostly, these communities/groups often conduct career development events and some send monthly

Anna, Master's student in Business Informatics

"To improve networking, the best thing is to join the communities related to our field. Normally, I google and find such communities, then I join them and try to participate in their events.

news bulletins, mentioning their monthly programs/events. For example,

- For **Financial Management Experts** https://taloushallintoliitto.fi/

-**Women in Tech** https://womenintech.fi/

-**Herizon.** A non-profit organization empowering **women in the tech industry** https://herizon.io/

-**Awesome Marketers** -for Marketing field peoplehttps://awesomemarketers.fi/

-Shortcut Talent Community. Shortcut is a non-profit organization that focuses on professional integration, career transformation and entrepreneurship in Finland. https://theshortcut.org/for-individuals/talent-community/

-**Talent Vantaa Network** https://www.vantaa.fi/en/talentvantaa

- ✓ Participate in events organized by the companies in your interest like webinars, conferences and networking events and try to build up connections

- ✓ Talk to your colleagues. Because the level of awareness about the industry and the country and how things work (in the case of international students) differs from person to person. Additionally, as you and your collegues are either from Business field or IT/engineering field or a combination of both which ultimately represent the BI field together, sharing knowledge of each will result in new blood and more insights on BI field. It will create a win-win situation for all.

For more guidance on Networking:

- ➢ Take the courses "**Boost your Job Search**" and "**Discover your Career Path in Finland**"
- ➢ Refer to the chapter " Find the Best Way for You to Network" in Job Seeking Guide (PDF) by University of Helsinki https://studies.helsinki.fi/system/files/inline-files/job-seeking-guide.pdf

❖ **Read career profiles** related your field and explore the connection between your major areas and career possibilities https://toissa.fi/ -Stories of national alumni

❖ **Do your own research**

Try to stay updated by yourself. Read articles, blog posts or any news related to the current industry and job market.

03 : Understanding Employability and its Ways

What is Employability?

"*It is a combination of factors (such as job-specific skills and soft skills) which enable individuals to progress towards or enter into employment, stay in employment and progress during their careers*" – defined by European Centre for the Development of Vocational Training (CEDEFOP)

"*Employability entails much more than the ability to get that first job. It is having the capacity to network and market oneself, navigate through a career and remain employable throughout life. It requires the ability to ask questions, acquire new skills, identify and evaluate options, understand rights at work including the right to a safe and healthy work environment, adapt successfully to changing situations, and the courage to innovate*". - (Brewer, 2013.)

***To improve your employability*:**

- Try to **find a thesis project relevant to BI field in a business organization**. When searching for thesis projects, give the priority like this.
  - Try to find a thesis project **relevant to BI field** in a **business organization** in **Finland.**
  - If not**,** try to find a thesis project outside Finland, maybe in your home country but **highly relevant to BI field** and which **can be applicable in Finland** as well.
  - If not, try to grab a thesis project **offered by your university with relevant to BI field.**

Ways to Find a Thesis Project, For example**:**

- Use job searching portals and search for "Master's Thesis in Finland". Specially you can use LinkedIn for this purpose.
- Utilize your networking

> ***Saim, Master's student in BI***
> *I found my thesis project through networking*

- Stay alert on emails sent by the BI department on thesis offerings by external companies and by the university itself.
- Specially in the case of international students, for the safe side, before you move to Finland, discuss with your employer or any other business organization in your home country about a thesis topic related to BI field and the possibility of conducting it in distance.

❖ **Improve your technical skills**

First, follow these steps,

- You should analyze the industry as explained in Step 2 and identify what are the industry needs and requirements in terms of technical skills, in relation to your career aspirations in BI. For example:
  Power BI, Machine Learning, SQL, R language, Java, JavaScript, Python, Tableau, Azure and ERP systems like SAP
- Then, you should do a self evaluation and analyze yourself to identify what are your strong areas and what are your weak areas, in terms of the required technical skills.
- Next step is to make your effort to acquire those required technical skills which you are lacking or need to improve.

To acquire the technical skills:

- Utilize your institutional resources and support
  - ✓ Use **CareerBot** functions to identify your skill improvements and recommendations for them.
    Under *Building the skills profile* function, it verbalizes your skills with the help of AI. Then, it builds the skills profile of you with predictive search and based on the current CV of you and the courses you have studied in 3AMK. Finally, the student will receive AI-generated recommendations for employment and skills that have demand in the labor market, based on the created skills profile.
    Under the function *Search for courses that are necessary for skills improvement*, you can search for these courses in all the three AMKs. Another function of the CareerBot is it helps you to *Visualization of your skills* based on skills mapping

  - ✓ Search actively for relevant courses, follow them and develop your skills
    In addition to the core course modules, you should cover 10 credits of elective studies. But, there is no limit you can take extra elective courses that you think you need to improve your technical skills.
    If you are new to some area, take initial courses and understand your strengths and weaknesses and your own potential and decide on development direction for yourself.

Search actively in OMA and contact your study coordinator, if you need any support. For example, use the following links to find relevant courses.

1. **Study Guide** https://opinto-opas.metropolia.fi/
2. **Campus online** https://campusonline.fi/en/
3. **3 AMK** https://www.3amk.fi/en/welcome-to-3amk-fi/

Examples for the courses you can select to improve your technical skills:

Study Guide Elective Studies - Information and Communications Unit's NonStop virtual Courses which can be offered free for Metropolia's Degree Students and Co-Educational Institution Student

4. ***Power BI*** *(5 credits)*
5. ***Introduction to Artificial Intelligence*** *(3 credits)*
6. ***Artificial Intelligence with Python*** *(3 credits)*
7. ***SQL Basics*** *(3 credits)*
8. ***Introduction to JavaScript*** *(5 credits)*

Study Guide – Summer Studies – ICT Summer School

9. ***Introduction to Machine Learning*** *(3 credits)*
10. ***Learning Python through Coding Music*** *(3 credits)*

3AMK courses

11. ***AI in Work Life*** *(5 credits)*
12. ***Managing CRM Processes*** *(5 credits)*

Campus Online Courses

13. ***Project Management*** *(5 credits)*

✓ **Obtain the certifications.**

Effectively utilize the opportunity to obtain highly recognized certifications in the field at no cost.

14. **Microsoft Power BI Certification**

Knowledge of Power BI is the most common technical skill requirement that can be seen in almost all of the job vacancies related to BI. So, gaining the highly recognized Microsoft Power BI certification will improve your employability to a great extent.

> ***Anna, Master's student in BI***
>
> *I'm happy that I was able to get this Microsoft Power BI certification, especially for free from our campus which is highly demanding skill in BI industry.*

The BI department has implemented a supportive platform for this, called ***"Power BI Learning Community"***. You can join that and equip yourself with more knowledge and training in practical applications of Power BI, before facing the certification examination.

15. Hubspot Certification

This is highly suitable for students who pursue Digital Marketing as their career path. Under the compulsory course module of "Digital Sales and Marketing Automation", you must obtain Hubspot Outbound Certification, to pass the course. However, within the duration of the course, you can use Hubspot to obtain other relevant digital marketing Hubspot certifications.

- ✓ Get the advice/support from the BI department

  After completing a course, if you feel, you need to further improve some area/s related to that particular course or you need to gain more advanced knowledge/skills relevant to that area, you can always discuss it with your course instructor and get advice on what you should do to obtain such knowledge/skills. Moreover, after doing an active search and analysis if you need further guidance on what areas you should improve and what are the sources to obtain such knowledge/skills, you can ask for help from the department by contacting the study coordinator/head of the program.

- ➢ Explore the external sources to acquire the required skills. For example, you can browse the web and search for some courses, programs and certifications and utilize your network to get the information on those. For example,

  Google Data Analytics course

❖ **Improve your soft skills**

Soft skills improve your capacity to collaborate effectively, adjust to changes, find solutions to issues, and make a constructive contribution to the workplace. Because these abilities are critical to preserving a positive and productive work environment, employers place a high value on them when recruiting people.

Not like technical skills, soft skills cannot be improved within a short period. It takes time, your effort and practice.

Example for soft skills need to improve your employability:

Analytical mindset, Effective communication, Team spirit, Problem solving, Adaptability and flexibility, Leadership, Negotiation skills

- **Obtain knowledge of areas that need further improvement**

  Here you can follow the same guidance explained above in “Improve your technical skills”.

  An example for obtaining certifications under this is, you have the opportunity to get the **Project Management Certification** free of charge through the university.

- Learn the **industry specific languages**

  Getting know the industry specific languages, terms and jargon is really important. Then, the other professionals in the field will recognize you as a part of their professional field. You can learn them through networking and communities related to the field and you can research by yourself as well. When developing your CV and cover letter and also in your social media profiles like LinkedIn, use that language and termas and then it will be visible for the professionals in the field.

- **Professional Branding**

  You can promote yourself with professional branding, by equipping with your prior work experience and professional qualifications you have already obtained and then consider how to form a new professional brand by combining the knowledge, skills and maybe certifications you obtained through the BI program and utilize that in job searching. Here, you can identify your transferrable skills and highlight them in job application documents and social media profiles, specially Linkedin

- Participate in **competitions related to the field**. These will improve your skills and provide networking opportunities. For example,
  - **Hackathons.** In Hackathons**,** few companies will participate in the program and each company gives you a business challenge to solve in teams. This is a good opportunity to recognize employers and on the other hand, employers also recognize students with special talents and skills. For example,
    - ✓ **Talent Hackathon Vantaa –** organized by the city of Vantaa and normally conducted in February/March. https://tapahtumat.vantaa.fi/
    - ✓ **Garage Hackathon –** will inform by the BI department
  - **Project Management Championship**

- **Assess Finnish recognition of your foreign qualifications**

- The Finnish National Agency for Education https://www.oph.fi/en/statistics-and-publications/publications/recognition-foreign-qualifications-finland

❖ **Options available after graduation**, to improve your knowledge, technical skills, and soft skills and thereby your employability. If you are still searching for a job after graduation, use the following opportunities.

- Become an open university student at Open University of Applied Sciences and pursue studies which are needed to improve your knowledge and skills, at no cost, for a period of four semesters. Refer *Free Open Studies* in Metropolia Alumni page. https://www.metropolia.fi/fi/asiakastyot-ja-palvelut/metropolia-alumnit
- Become a customer of unemployment services and through TE-office, you can request for SIMHE career guidance services. Their services are aimed at career guidance and counseling for highly educated immigrants in Finland. https://www.metropolia.fi/en/rdi/rdi-projects/simhe
- Become a customer of unemployment services and through TE-office, you can request for training at **Saranen** which is a consulting company, that provides services for both employers and job seekers. For job seekers, among the other services, they have two types of training programs. Recruitment Training Programs (involves a cost) and intensive training programs at no cost. https://www.saranen.fi/en/

Take the courses "Boost your Job Search" and "Discover your Career Path in Finland", to get more insights into how employability works in Finland.

04 : Best Practices in Approaching a Professional Job/Thesis Project in BI

We suggest you to follow the below-mentioned best practices in your job/thesis project searching journey.

❖ Initial Self-Assessment

❖ Develop a meta-CV based on your self-assessment

❖ Do research on the industry, field of work and the employers you are interested in
Here, you can follow the guidance given in **02. Exploring Industry Needs and Job Markets** in this document**.**

- ❖ Based on the industry research and your self-evaluation, identify the job opportunities you have or in which area in the BI industry you can excel

- ❖ Meanwhile, keep on improving your soft skills, technical skills and knowledge areas, to improve your employability.

  Here, you can follow the guidance given on "*Ways to Improve your Employability"* in **03. Understanding Employability and its Ways in BI** in this document**.**

- ❖ Start applying for suitable vacancies based on your working experience, knowledge and skill profile.

- ❖ Prepare the job application documents CV and Cover Letter
  - ✓ You can use attractive and professional templates for this. Explore the internet to find a suitable one. For example,
    -Canva https://www.canva.com/templates/
    -Europass https://europass.europa.eu/en/create-europass-cv
  - ✓ To stand out from the crowd,
    -Use Video CV
    -Compiling a portfolio https://tyomarkkinatori.fi/en/personal-customers/search-for-work/tips-for-finding-a-job

- ❖ **Keep a record of job vacancies you applied**.

- ❖ Face the Job interviews in a well prepared manner

For guidance on the best practices on above steps,

- ➢ Take the courses "**Boost your Job Search**" and/or "**Discover your Career Path in Finland**"
- ➢ Get support/advice from your career guidance services which will be available soon
- ➢ Use the following links on guidance given by other UASs or universities
  - ✓ Helsinki University-Tools for Planning Your Career and Future https://studies.helsinki.fi/instructions/article/tools-planning-your-career-and-future
  - ✓ Helsinki University - Job Seeking Guide (PDF) https://studies.helsinki.fi/system/files/inline-files/job-seeking-guide.pdf
  - ✓ Hanken Schhol of Economics https://www.hanken.fi/en/students/career-services/plan-your-career
  - ✓ Tampere UAS https://www.tuni.fi/en/students-guide/han
  - ✓ Lapland UAS https://www.lapinamk.fi/en/Students/Student-Support-Services/Job-seeking-and-career-planning
  - ✓ Kajaani UAS https://www.kamk.fi/en/Study-at-KAMK/Information-for-Students/Studying/KAMK-kaura-Career-Services
- ➢ Use the following links on guidance given by other bodies/career guidance sites
  - ✓ Job Market Finland https://tyomarkkinatori.fi/en/personal-customers/search-for-work/tips-for-finding-a-job

- ✓ MiB International https://www.mothersinbusiness.fi/blog-int/2023/8/11/sharing-best-practices-how-to-navigate-the-finnish-job-marketnbsp
- ✓ infoFinland.fi https://www.infofinland.fi/en/work-and-enterprise/find-a-job-in-finland/tips-for-job-hunting
- ✓ Expat Finland https://www.expat-finland.com/employment/finding_work.html

➢ After graduation, if you are still in the journey, become a customer of unemployment services and through TE-office, request for SIMHE career guidance services

❖ Try the option of **being an entrepreneur**

If you have an innovative business mindset, make your efforts to become an entrepreneur. Finland is a country that has many supportive platforms for entrepreneurs or start-ups.

➢ Take the elective course on …….. 10 credits at Metropolia

➢ Get the information and advice from the city offices. Refer their web pages

- ✓ Helsinki https://www.hel.fi/fi/yritykset-ja-tyo/yritykset-ja-yrittajat, https://www.hel.fi/fi/yritykset-ja-tyo/mika-on-business-helsinki
- ✓ Vantaa https://business.vantaa.fi/fi/perusta-yritys https://www.vantaa.fi/en/employment-and-entrepreneurship
- ✓ Espoo https://www.espoo.fi/fi/business-espoo-yritysten-parhaaksi

❖ As an international student, invest in learning the Finnish language

➢ Take language courses of your university as extra elective subjects

Learn the language through **Kielibuusti** https://www.kielibuusti.fi/en/learn-finnish

Here you can do the self-study of Finnish language with the provided materials. It provides language materials in common as well as field-specific study materials, where it includes the Business field. Other than the study materials it provides information on language learning tips and advice, location details of institutions offering Finnish language courses and about language tests.

➢ Participate in language cafes. For example,

- ✓ Tandem language exchange in Helsinki https://www.tandem.net/en/language-exchange/finland/helsinki
- ✓ International Meetup Café Lingua Helsinki https://www.meetup.com/International-Meetup-Cafe-Lingua-Helsinki/
- ✓ Facebook group – Café Lingua Helsinki https://www.facebook.com/groups/CafeLinguaHelsinki/
- ✓ Language cafes conducted by HelMet Libraries (public libraries)

Get information from your nearby HelMet library

- After graduation, if you are still searching for jobs,
  Register as a customer in Unemployment Services and apply for Finnish language course through TE-office, which can be considered as one of the most effective Finnish language course to learn the common language.
- Practice by yourself.
  For example, you can use the **Duolingo** app

To overcome the language barrier,

- Looking for jobs in international companies and local companies with international footprint
- Learn the language

Refer Metropolia JobTeaser *Career Tips* page to get some guidance on learning the Finnish language https://metropolia.jobteaser.com/en/handbook?school_id=6830

❖ If you are interested in some job, keep on looking for it and chase it

> ***Saloni, Master's student in BI***
>
> *If you want a specific job, then you look a lot for it. I wanted this job and I kept looking on the relevant websites. I kept calling them. Even though, I got rejections, I kept applying again. Finally, they called me for the interview and I got selected. My manager told me that I saw your motivation and interest in this job and that is why I wanted to invite you for the interview*

❖ Take a step back to enter the field

Even though your are an expert in your profession in your home country, it is okay to take a step back and accept/search for a lower level job in your field, compared to earlier, to enter into the industry. For example,

- Summer jobs are a good example for first contact with the Finnish job market
- Paid/unpaid internships
- Accepting volunteering opportunities in the field

- Communicating with the company people before and/or after sending the job application.

  In most of the job advertisements, it has been mentioned the contact details of a person from HR or a senior person related to the published position. Contacting such person and show them that you are really interested in that position, sometimes would be beneficial in the selection process.

  Furthermore, you can obtain further information regarding the job vacancy and get some idea about the organization and make some connection with them.

  Refer to the chapter of ”Phone Calls” in Job Seeking Guide (PDF) of University of Helsinki https://studies.helsinki.fi/system/files/inline-files/job-seeking-guide.pdf

> ***Anna, Master's student in Business Informatics***
>
> *If they have a phone number to call them, and the best way I think, to send your application and then call them. Another kind of best practice for me, for example, if I see an interesting job and then I see that they require Finnish language, before sending the application I just get in touch with HR and ask them like, I have power BI skills, but I noticed that you want someone who speaks Finnish, Do you think that still can apply if I do not speak Finnish but I am learning, and usually they reply to me. I know it feels weird because it is a different type of culture and for me it feels like I am kind of an annoying person to call them, but actually I had nice talk with them. Even one of the managers I talked, asked for my name again and told me that they will keep my CV in the database and inform me if any suitable position become vacant*

- Having a mindset of being a fresh graduate or an undergraduate who is always hungry to learn and willing to fail. Being eager to learn and prepared to make mistakes may be very helpful while looking for a job since it fosters a growth mindset, differentiation, resilience, adaptability, and continual improvement. It can also help with networking and personal development

> ***Karen, Master's student in BI***
>
> *I have failed several times, it is quite embarrassing, but I think it is part of professional growth. If you are not ready to fail, then you will not be able to learn the lessons and go forward to gain success. I approached this job searching as a fresh undergraduate, not as somebody who has worked for 20 plus years in my home country. I tried to adopt the attitude of a new student, so hungry for growth, so hungry for new information and willing to fail to learn and willing to be embarrassed.*

Try every option you have. Make use of every opportunity you have such as attending job fairs and networking events, sending open job applications directly to companies even though there are no vacancies, communicating with colleagues and relevant people and these practices make you at least one step closer to achieving your career goals.