SC6

Disruptive Technologies Supporting Labour Market Decision Making

Grant Agreement number: 870702

Deliverable D5.3

Report on collected data during pilot including benchmarking – sociological report

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Project Identity

Status, Abstract, Keywords, Statement of originality

Dissemination level:	Public
Contractual date of delivery:	M42 31 July 2023
Actual date of delivery:	M42 31 July 2023
Work Package:	WP5 Deployment and validation cycle
Type:	R
Approval Status:	Approved
Version:	1.0

Abstract

The report presents the sociological evaluation of the functionalities of MyLabourMarket.com (MLM) developed by the HECAT team. Thus, the report complements D5.2 - the technical report on data collected during piloting. The evaluation is based on data collected during two rounds of fieldwork at public employment service (PES) offices in Slovenia. The MLM is benchmarked against existing statistical instruments in use at European PES as well as against an earlier version of MLM.

History

Version	Date	Reason	Revised by
0.1	01.04.2023	Creation of the initial document structure	Magnus Paulsen Hansen, Sabina Pultz & Maggie Müller
0.2	11.06.2023	First complete draft	Magnus Paulsen Hansen, Sabina Pultz & Maggie Müller
0.3	02.07.2023	Amended version with partner comments, reflection and edits	Magnus Paulsen Hansen, Sabina Pultz & Maggie Müller
1.0	31.07.2023	Final version	Magnus Paulsen Hansen, Sabina Pultz & Maggie Müller

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Executive Summary

This report presents the *sociological* evaluation of the functionalities of **MyLabourMarket.com** (**MLM**) platform developed by the HECAT team. Thus, the report complements D5.2 - the *technical* report on data collected during piloting. D5.2 shows the results about the implementation of UX methodologies for assessing technical useability. Whereas D5.2 is based on data collected by HECAT partner Tecnalia (D5.2 Report on data collected during and after pilot including benchmarking– Technical Report)[1], this report D5.3 is based on data collected by the RUC and SETU teams during two rounds of fieldwork at the two piloting sites in Slovenia – the public employment service (PES) offices in Ljubljana and Ptuj.

HECAT was built on the premise that its ethos of "working with, not on, the unemployed" would require a deeper understanding of the way in which technical devices and instruments are embedded in social, political and economic institutions and structures that inevitably will shape the life and logic of such devices (see Demazière & Delpierre, 2020). Disruption, in this perspective, thus, is not a matter of whether the technologies applied in MLM, such as artificial intelligence or gamification, are new and innovative. Rather, 'sociological' disruption is a matter of whether MLM is likely to transform existing ways of governing and making sense of the problem of unemployment, at the micro-level of encounters between clients and caseworkers as well as the macro-level of policymakers and research.

The functionalities in MLM are based on the idea of letting the unemployed see their own personal labour market to support her in finding her way into the labour market. Overall, MLM can be divided into four sets of functionalities. **1**) Explore Your Labour Market – presenting 'simple' labour market data such as wage level, employment rate, unemployment rate based on occupation and more 'advanced' data of job security and labour market liquidity; **2**) PEX – a model estimating the probability of re-entering the labour market based on a limited set of attributes of the individual unemployed; **3**) Career Opportunities – a tool based on machine learning enabling the unemployed to explore possibilities of changing occupation and location; and **4**) Bespoke Vacancies – a tool that lets the unemployed explore and filter current vacancies in terms of different job quality attributes.

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[1] HECAT public deliverables are available at https://zenodo.org/communities/hecat/

The report has a benchmarking function in two ways. First, MLM can be benchmarked against previous and existing instruments to support decision-making in casework or by the unemployed themselves. In the report D1.3 "Report ethical, social, theological, technical review of 1st generation PES algorithms and data use" mapped existing algorithmic profiling tools and concluded that they all shared the ambition of increasing efficiency through rationing care to those in risk of long-term unemployment while not being very accurate in predicting (Griffin et al., 2021). The MLM functionalities aim to open possibilities and perspectives enabling the unemployed to consider actions that is not simply about finding the first job available. In this way the functionalities aim to 'see the labour market' through the personal point of view of the unemployed and take into consideration a number of different issues related to what is a good job in the short and longer term, such as earnings, labour rights, working conditions, security, stability, working time, skills, distance to work, supply and demand, career development, etc.

Second, we benchmark the current version of MLM against the previous version. Before the current version was tested in March 2023, an earlier version of MLM was tested in September 2022. The feedback from the first round of piloting resulted in several changes. Thus, in the report we compare the findings from the two versions – MLM1 and MLM2. In the first round of fieldwork, we did 14 individual interviews with unemployed, 1 focus group with 8 unemployed and 6 individual interviews with counsellors. In the second round we did 10 interviews with unemployed and 5 with counsellors. Hence, in total we conducted 38 interviews with 45 participants. The participants vary in terms of gender and age (although the selection of caseworkers reflect that the majority are women). With regards to unemployed they also vary greatly in terms of educational and career background and duration of unemployment.

The report presents feedback from users on the four key functionalities as well as some general feedback cutting across the functionalities. The piloting of Explore Your Labour Market shows that there is potential in making this data available to unemployed users to provide them with a better understanding of their labour market. A remaining challenge is how to link "general" data on the labour market with the user's personal labour market. The historical nature of statistics implies that it does not show what is going on right now and the categories do not always reflect user's experience with the types of jobs available. Thus, it is extremely important that data is up-to-date and that users are somehow assisted in interpreting the trends in the graphs, i.e., that the graphs are projected to the present of the users. Similarly, users

need assistance in how to balance the statistical sources of knowledge provided with their own experiences. Often, there may be good reasons to rely on personal experiences rather than the numbers provided in MLM. Thus, the importance of explaining the benefits to users, as well as the limits to the statistical data, cannot be understated.

The users give mixed feedback in relation to the **PEX**. In general, counsellors report that they find the probability estimates meaningful and also aligned with existing practices at ESS but they also share some concerns showing unemployed citizens the probability scores as the communication of the results are crucial to ensure usability and ethics as well. Unemployed users have challenges understanding what the graph means, and an equal share of people find the information meaningful or irrelevant in terms of their own situation. One way to make the tool more dynamic and avoid the potential demotivating effects could be to include a comparative function similar to what was added in Explore Your Labour Market. Being able to compare two occupational targets can help to define a priority, or changing one parameter or another to see if it changes anything, for example aiming for a different career, taking a training course, etc.

The **Career Opportunities** functionality is largely evaluated as a potentially useful tool but at the moment it remains rather unclear, in particular to the unemployed users, how exactly to interpret and make use of the output. For instance, many users expected to see real vacancies on the map. Thus, the idea of making visible particular career paths rather than specific job openings could be explained better.

Piloting the **Bespoke Vacancies** functionality shows promising perspectives. End users overall find the idea of looking at the job market in terms of different types of job quality attractive. They also point out that the variables are not intuitively comprehensible, nor is it clear how certain jobs are characterised in relation to the job quality items and this leaves them with some sense of confusion and doubt.

One way to better let users engage with the results could be to let users do the vacancy scanning through the job quality items rather than choosing occupation in the beginning. In this way, it would be easier for users to see and play around with how the labour market looks like from the job quality perspective.

Generally, users, both unemployed and counsellors, have very different approaches to the usefulness of statistical data in the efforts to re-enter the labour market, some accommodating,

and others inherently sceptic and pessimistic. Interpreting this divide as one between those who know and those who are ignorant would be highly misleading. Working with users in HECAT embraces another approach. Rather, in developing further MLM, and similar instruments, this latter group should be approached as a great source for improvements.

Indeed, listening to users' feedback render visible a general challenge with all the functionalities of MLM and similar instruments: the data and classifications currently available are not produced to accommodate the needs of bureaucracies, not the unemployed and counsellors. Researchers in the HECAT project have worked from this point of departure trying to bend and modulate the data to personalise it and make it playable. However, the point of departure puts certain limits to this effort. Thus, a more radical recommendation to PES would be to start thinking about how to adapt the production line of statistical data to the needs of the end users. In other words, what data is needed to be able to visualize the personal labour market of the unemployed?

So far PES have been concerned with making visible the unemployed herself, for instance through profiling tools. The development and piloting of MLM points to the need for pointing the spotlight towards the dynamics of the labour market.

1 Introduction

1.1 Contribution to the HECAT project

This report presents the *sociological* evaluation of the functionalities of MyLabourMarket.com (MLM) developed by the HECAT team. Thus, the report complements D5.2 - the *technical* report on data collected during piloting. D5.2 show the results about the implementation of UX methodologies for assessing technical useability. Whereas D5.2 is based on data collected by HECAT partner Tecnalia (D5.2 Report on data collected during and after pilot including benchmarking– Technical Report), this report D5.3 is based on data collected by the RUC and SETU teams during two rounds of fieldwork at the two piloting sites in Slovenia – the public employment service (PES) offices in Ljubljana and Ptuj.

Although the scope of the ideas and visions behind MLM are European, the specific platform was built for the Slovenian labour market and PES through a collaborative effort across several disciplines (sociology, labour market research, computer science, social work, ICT), as well as national borders (Ireland, Slovenia, Spain, Denmark, France, Switzerland). The outcome is a tool with several rather heterogenous functionalities. Meanwhile, all of the functionalities are based on the idea of letting the unemployed see her own personal labour market to support her in finding her way into the labour market. However, they aim to do it in quite different ways. Overall, MLM can be divided into four sets of functionalities. 1) Explore Your Labour Market – presenting 'simple' labour market data such as wage level, employment rate, unemployment rate based on occupation and more 'advanced' data of job security and labour market liquidity; 2) PEX – a model estimating the probability of re-entering the labour market based on a limited set of attributes of the individual unemployed; 3) Career Opportunities – a tool based on machine learning enabling the unemployed to explore possibilities of changing occupation and location; and 4) Bespoke Vacancies – a tool that lets the unemployed explore current vacancies in terms of different job quality attributes. The four functionalities thus enable the unemployed (and their counsellor) to see their labour market in various ways depending on her needs and wishes – short- vs. long-term, earnings vs. broader job quality, stability vs. flexibility, etc. Although MLM is developed for PES and their clients, many of the functionalities may indeed be useful to any labour market participant with an interest in exploring new work opportunities.
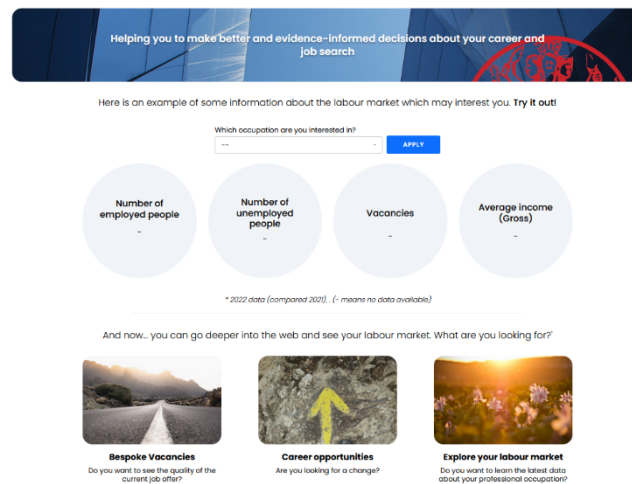
Figure 1: Frontpage of MLM

The report, and the fieldwork that informs it, builds upon previous sociological work in HECAT, in particular D1.1 "Detailed user context document" analysed the local Slovenian institutional, socioeconomic and cultural context that PES caseworkers operated within and upon (see Hansen and Pultz, 2021). In parallel to preparing for developing and piloting MLM the report also served the purpose of investigating to what extent the findings from the piloting sites would be generalizable to other contexts outside of Slovenia. In the report we concluded that while Slovenia has followed the reform path of most EU countries introducing activation and workfare measures its distinct history, socioeconomy and governance of PES may turn Slovenia into a 'least similar' case compared to many other countries. For instance, the level of discretion of caseworkers may be higher than in many other EU countries as well as the tendency to implement quid pro quo logics (such as sanctions in case of non-compliance) is more limited. Thus, when the reader asks whether MLM would work in her country the evaluations of MLM in this report, whether positive or negative, cannot simply be transferred. It will take a careful work of translation asking to what extent the variation in social, political and economic context may alter the potential dynamics and logic(s) of MLM.

As will be evident from the findings presented in D5.2 this question of the useability and value of MLM can, and should, be approached technically to answer questions such as: is the platform intuitive for the user? Is the platform compatible with existing systems in PES? Is the data reliable? Etc. However, at the same time, HECAT was built on the premise that its ethos of "working with, not on, the unemployed" would require a deeper understanding of the

way in which technical devices and instruments are embedded in social, political and economic institutions and structures that inevitably will shape the life and logic of such devices (see Demazière & Delpierre, 2020). Disruption, in this perspective, thus, is not a matter of whether the technologies applied in MLM, such as artificial intelligence or gamification, are new and innovative. Rather, 'sociological' disruption is a matter of whether MLM is likely to transform existing ways of governing and making sense of the problem of unemployment, at the micro-level of encounters between clients and caseworkers as well as the macro-level of policymakers and research. If there is a common lesson from the many attempts to introduce algorithmic profiling in PES so far it is that despite using cutting-edge technologies of artificial intelligence, big data, and machine learning the instruments seem to underpin existing institutional logics rather than disrupt them (Griffin et al., 2021, see also Haug, 2022).

However, we will only be able to provide tentative answers to whether MLM is disruptive in this latter perspective. In short, this is because the functionalities of MLM did not reach a stage development that allowed for proper real-life testing. In other words, no unemployed have been using MLM in their actual job search and no caseworkers, with a few exceptions, have been using MLM in their counselling. One explanation to the lacking useability of MLM is the difficulties of portraying the labour market and its dynamics with statistics and statistical categories in an intuitive/in a simple way.

In fact, this is perhaps one of the key findings of evaluating MLM: the statistics currently available have important limitations when it comes to understand the past, present and future dynamics of supply and demand in any labour market. MLM, and any other instrument based on statistical labour market data, will only be able to portray a fraction of the reality of the labour market and, most often, this portrayal will be somehow distorted due to the significant translation from whatever is going on in the labour market into statistical categories and numbers. For instance, occupational codes, despite adding endless layers of granularity, will never be able to fully capture the content of the work going on in the labour market. This raises a bigger question of whether PES and other policymakers should strive for more and better statistical data or make more room for other sources of knowledge such as the experience of caseworkers and indeed the unemployed themselves. However, while capacity to trial this in real time has not been reached, there are still important insights from the development stage reached and indeed, piloting efforts which can give clues and ideals for future avenues of work within this vein. Sitting together with users – unemployed and caseworkers – trying out the

various functionalities of MLM did provide us with clear indications to what users need and how MLM may accommodate those needs.

As the title indicates, the report also has a benchmarking function. We approach this in two ways. First, MLM can be benchmarked against previous and existing instruments to support decision-making in casework or by unemployed themselves. In the report D1.3 "Report ethical, social, theological, technical review of 1st generation PES algorithms and data use" mapped existing algorithmic profiling tools and concluded that they all shared the ambition of increasing efficiency through rationing care to those in risk of long-term unemployment while not being very accurate in predicting (Griffin et al., 2021). Leaving aside the problems of (in)accuracy, profiling unemployed people into two or more basic categories corresponds poorly with HECAT's ethos of 'working with' the unemployed and the idea of visualizing a personal labour market. Thus, what the MLM functionalities, at least, aim to do is to open possibilities and perspectives enabling the unemployed to consider actions that is not simply about finding the first job available. In this way the functionalities aim to 'see the labour market' through the personal point of view of the unemployed and take into consideration a number of different issues related to what is a good job in the short and longer term, such as earnings, labour rights, working conditions, security, stability, working time, skills, distance to work, supply and demand, career development, etc.

Given the stage of development of the functionalities of MLM we have not tested the *effects* of applying this alternative approach on e.g., job search activities, the encounters between client and caseworker and well-being and self-esteem of unemployed users. However, from the piloting we do get input on whether the concepts and ideas behind MLM resonate with caseworkers' and unemployed people's needs and whether MLM provides new perspectives compared to existing practices and thinking.

Second, we benchmark the current version of MLM against the previous version. Before the current version was tested in March 2023, an earlier version of MLM was tested in September 2022. The feedback from the first round of piloting resulted in several changes. Thus, in the report we will compare the findings from the two versions. As mentioned, despite improvements, the limited functionality prevented us from letting users try out MLM in a real-life-setting. Instead, our findings are based on showing and tentatively trying out the functionalities with caseworkers and unemployed in the framework of several interviews and focus

groups. This still gave some important insights to the ideas and concepts of MLM. We describe the methods applied in more detail in the next section.

1.2 How we conducted the testing

We tested MLM over the course of a week in September 2022 and during a week in March 2023. We were interested in understanding how unemployed people and caseworkers/counsellors experience using MLM including examining which features are more or less beneficial. Further, we were interested in knowing more about how they reflect on using such a platform. This included questions about what motivates unemployed people to use or not to use such a platform, what is considered meaningful when using it and what was important to them when searching for jobs.

We did focus groups and interviews with unemployed and counsellors in two local offices located in Ljubljana, the capital of Slovenia, and Ptuj, a smaller town located in the Eastern part of Slovenia. Interviews and focus groups were recorded and transcribed.

The fieldwork was carried out by 2-3 members of the Roskilde University team (authors of the report) and 3-4 members of the South East Technological University (SETU) team. Before the first round of fieldwork, the idea was to have two types of testing – one participating in focus groups with participants that had tried MLM in advance and interviews with participants trying MLM for the first time. However, due to delays in developing MLM only a couple of the counsellors had tried MLM beforehand.

Each interview was conducted by two researchers, one leading the interviewing and the other taking notes and pictures of what was happening on the screen. The interviewee sat in front of the computer in the local PES office trying out the various functionalities of MLM while the interviewer asked questions to the experience and meaningfulness of the tool. In both rounds of piloting MLM proved difficult to use without some guidance. Further, some of the functionalities contained bugs that inhibited users from getting meaningful and accurate results. Since the tool was not fully functional interviews were also oriented towards users' consideration for the concept and understanding of this.

All interviews followed a rather structured interview-guide, hereby ensuring all users were trying all functionalities and were asked the same questions. The interview guides for unemployed and counsellors can be found in Appendix 1 (first round of piloting) and 2 (second round of piloting).

Employment Services of Slovenia (ESS) helped out with the recruitment of participants. We strived for variation in gender and age, and with regards to unemployed, variation in education, occupation, digital literacy and duration of unemployment, and with regards counsellors, variation in experience, education and in the types of unemployed they would usually work with.

In the first round of fieldwork, we did 14 individual interviews with unemployed, 1 focus group with 8 unemployed and 6 individual interviews with counsellors. In the second round we did 10 interviews with unemployed and 5 with counsellors. Hence, in total we conducted 38 interviews with 45 participants. The participants vary in terms of gender and age (although the selection of caseworkers reflect that the majority are women). With regards to unemployed they also vary greatly in terms of educational and career background and duration of unemployment. Appendices 2.1 and 2.2 provide an overview of the characteristics of the participants. Interviews lasted from 1 to 1½ hour. Around 2/3 of the interviews were conducted at the Ljubljana site. Most of our interviews were conducted in English, some with a translator, and some in Slovenian with an interviewer from the University of Ljubljana.

Henceforth, we will be referring to the two versions and piloting rounds of MLM as MLM1 and MLM2.

1.3 Structure of the report

The report outlines the key functionalities of the MLM tool and summarizes the experiences and feedback from users when them in MLM version 1 and version 2. Thus, in the coming sections 2-5 we go through the four key functionalities Explore Your Labour Market, PEX, Career Opportunities and Bespoke Vacancies. In section 6 we outline some general feedback that cut across individual functionalities. We end each section with some key takeaways and recommendations.

1.4 Acknowledgements

2. Explore your labour market

Explore Your Labour Market is a function that let users explore and compare statistics such as employment, earnings, average duration of unemployment and job stability in specific occupations.
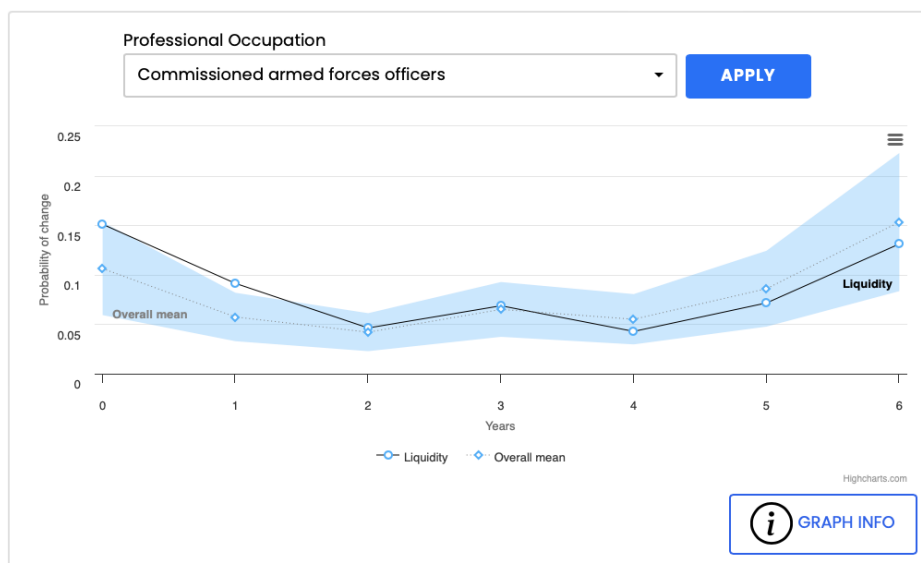

Figure 2: Screenshot of Labour Market Liquidity functionality

During the MLM1 piloting, the biggest issue that emerged through the piloting was the graphs. And this relates both to interpretation of the graphs but also a lack of understanding

about the reasons for receiving such information. In that sense, it echoes the general feedback related to the presentation of graphs as such (see section 6).

Many of the users had a general idea about how to look at the graphs, and for instance they are connected to a decline in the number of employed in 2020 with covid-19. However, the overall understanding of why such information is relevant was not clear:

> "[This] tells me number of employed in a sector in a year. What happens in the sector. I can understand it, but it's not interesting. In my sector I see what happens, but seeing the graph is not interesting." (unemployed, MLM1)

So even though the graph is not seen as interesting, there is an understanding of what the graph shows. Others are even less positive, and doubt that any unemployed would ever use the tool:

> "Depends on who the information is intended for. As an unemployed, I don't consider this very useful. (…) If I put myself in a position as a jobseeker, this is not relevant for me. Even if you go for a specific occupation. For me what happened from 2018-2021 is irrelevant - so the past. What I am interested in is the current situation, and what training is available (…) This portal is not useful for a jobseeker. There is another page 'My work" which is posting vacancies." (unemployed, MLM1).

This implies that the unemployed has acquired knowledge, which they often consider to be solid and valid, of their job market and the job market for their occupation. In this way, unemployed often have an idea of the volume of jobs. These beliefs are often deeply rooted and serve as important reference points for their job search. This raises a number of questions: what is the value of a second source of knowledge, under what conditions can statistics be valued in relation to lived experience, etc.? The unemployed participant thus points to an important tension in statistical data with the "position of the jobseeker". Projecting into the future is not part of a time-dependent trend. This means that the foundations of occupational projections are based on a completely different logic to that of the statistical time series.[2] Thus, the importance of explaining the benefits to users as well as the limits to the statistical data cannot be understated.

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[2] We thank Didier Demazière for raising this point.

Another unemployed emphasized the same thing and sees the opportunity to look back in time only relevant for researchers; *"You have to see what is happening right now. I don't like to see from before. Maybe if I'm a researcher I have the graph, but I would like to see the instantly chances."* (unemployed, MLM1). However, another unemployed user in MLM2 piloting has pointed to the usefulness of using the average earnings statistics when negotiating salary at job interviews.

Most of the interviewed users expressed the need for descriptions about why the information is interesting, and how it can be used in their own job search. In connection with this, several of the users requested the possibility to compare several of the graphs and functions; *"So because there is information about employed and unemployed, it could be an idea to show it in the same charts, so you can compare them directly. It makes more sense"* (unemployed, MLM1), which the counsellors also agree with *"I would like to see comparison, so you know what to choose. As least 2 sectors or occupation, both of them"* (counsellor, MLM1). This functionality was added in MLM2. Most users responded positively to the possibility of comparing occupations.

With regards to the sub-functionality showing the stability of different occupations in the labour market is on the one hand understandable and relevant to many users; *"It is useful because it is stability of employment - how long you are employed and how likely you are to get sacked."* (unemployed, MLM1).

For some it is a generational question whether the stability of employment is interesting or not:

> "It makes sense (…) everybody wants something that is stable. For young it may not be so important because they switch job quickly, but for the older people who searching for security in employment it's important." (unemployed, MLM1).

In addition, some connects the stability of employment to job quality:

> "[Entering/leave jobs] It's interesting because of the competition on the labour market. It may reflect the quality of the job" (unemployed, MLM1).

On the other hand, almost all of the interviewed had trouble with understanding the more

complex graphs (Stability and Liquidity):

> "[Stability] I don't really understand? At first sight I don't understand it. It's very complicated, and I don't think I would use it. I don't understand the ratio between cancelled and closed job and what it shows" (unemployed, MLM1).
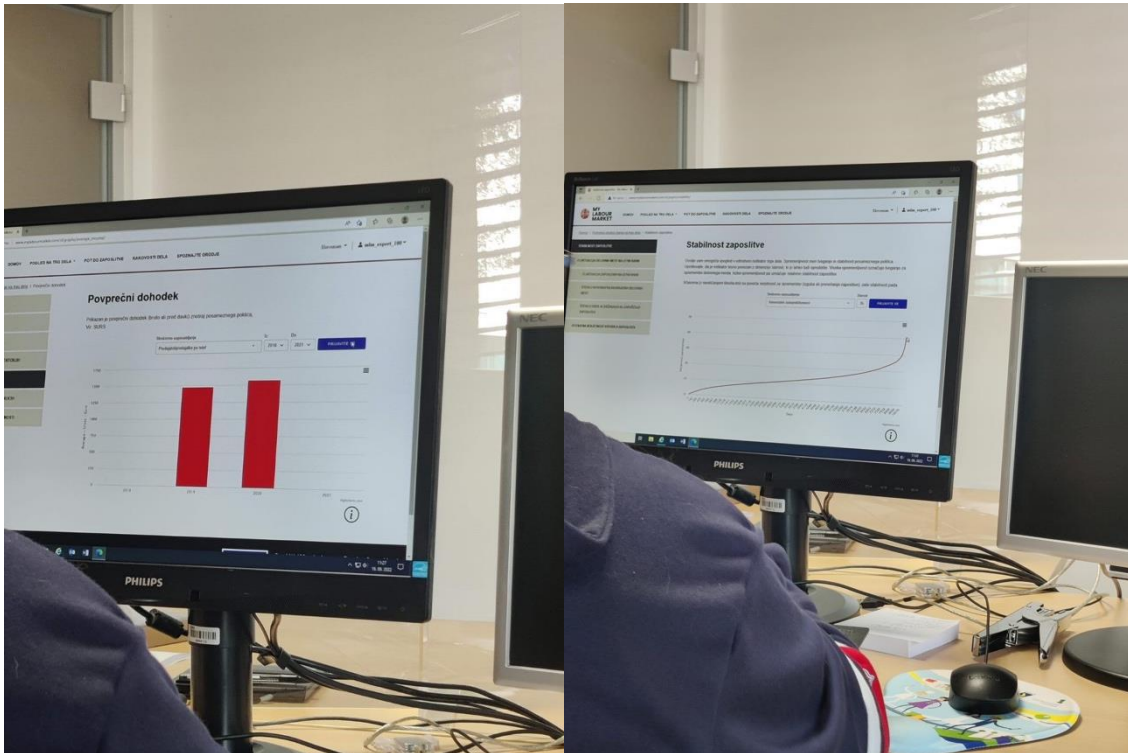
Figure 3: Figure 3: Unemployed participant using the Explore Your Labour Market function, MLM1

Users thus needed further explanation about how to understand the information presented, but nonetheless, overall endorsed the vision behind the information:

> "I was disappointed. The graphs are not understandable. They are not help-ing. Using such detailed dates is not good. Actually, I don't understand in general. [Gets explanation about what stability of employment means] Yes, then it would be helpful." (counsellor, MLM1).

Thus, it is worth highlighting that both unemployed and counsellors found it difficult to grasp the graphs. Another unemployed gets the graph explained by the interviewer:

"I understand now, but it is not obvious. You have to think about what it means, and it's difficult to find for an average user. If I wanted to interpret that, I need time to read it and understand it. This just say the likelihood of change, but what is that? And this is the number of what? [Days] Arh, okay. So a lot of information I'm not getting from here, but from you." (unemployed, MLM1)

As an ongoing issue throughout the tool, there was a need for further explanation of how the different functionalities were connected, and how to interpret the graphs. Thus, the presentation of the data could be more intuitive and explicit:

"If it was presented in a better way, it would be useful. It would be great to have an explanation about the outlier, for example that there was corona [COVID-19 pandemic] in 2020." (counsellor, MLM1).

"I don't know what the graph means. There's a lot of big words. Very professional scripts. Maybe put it in more human-language. For example, 'the graph shows that every year' ..." (counsellor, MLM1).

Even with the explanations from the interviewer, some still doubt whether the information is relevant on a personal level, which connects to the general feedback regarding uncertainty about who the tool is for:

"Hard to tell what it is [the graph]. Not sure if it's important to one person, maybe in general, but not for unemployed. Maybe for counsellors for overview." (counsellor, MLM1).

"I have an idea that this statistical information is more useful on the nation level. Not for job searchers, but more for job counsellors. For me this data is not important." (unemployed, MLM1).

Key takeaways

The piloting of Explore Your Labour Market shows that there is potential in making this data available to unemployed users to provide them with a better understanding of their labour market. Two main challenges remain. The first is to link "general" data on the labour market with the user's personal labour market. Here, the historical nature of statistics as well as the statistical occupational categories themselves seem to alienate many users from the data. It does not show what is going on right now and the categories do not always reflect user's experience with the types of jobs available. Thus, it is extremely important that data is up-to-date and that users are somehow assisted in interpreting the trends in the graphs, i.e., that the graphs are projected to the present of the users.

The second challenge is to assist users in how to balance the statistical sources of knowledge provided in Explore Your Labour Market (and in fact in the other functionalities of MLM) with their own experiences. Often, there may be good reasons to rely on personal experiences rather than the numbers provided in MLM. For instance, some jobs may be difficult to place in the occupational categories or the specific local context may deviate from the averages provided. On the other hand, the statistics may in fact provide a more accurate presentation of the users' labour market. For instance, in terms of salary expectation and job stability. Thus, the importance of explaining the benefits to users, as well as the limits to the statistical data, cannot be understated. Rather than letting users do their own validity tests, we suggest that the uncertainty and potential inaccuracies are made more visible to the users. For instance, "red flags" could appear when results are based on small n. In this way, the tension between personal experiences and numbers could be mitigated, herby inviting users to cautiously use the statistical data.

3. PEX

PEX estimates the probability of exiting the unemployment system based on several indicators (see screenshot below). From all the MLM functionalities it resembles existing profiling instruments the most. The estimation is based on Survival analysis thorough variational

bayes. From MLM1 to MLM2 the main difference is that the graph has been simplified and also the interpretation is written in prose and thus more accessible than before.

Figure 4: Figure 4: Screenshot of PEX (Average Time Unemployed)

The probability of exiting unemployment (PEX) was discussed in the HECAT team at various instances. The focus was on whether this part of the tool should be available to counsellors only, to unemployed and counsellors or to none of the two groups. The overall discussion was about how the results may lead to (de)motivation for ones' further job search, and whether it thus should be presented for the counsellors only, so they can use it to make predictions and prioritize their work. For a few of the unemployed the idea of seeing one's probability of existing unemployment is interesting, but is seen as more relevant for the counsellors;

"It's interesting for me. Even with the situation on the labour market, this is a long period of unemployment. It could be information for the counsellor, to tell the person to switch interest to something else. For me, it would be a signal to switch instead of wasting a lot of time." (unemployed, MLM1).

Even though the information is interesting, it is hard to figure out how to fill the form, the graph and data is hard to understand and is not viewed as important;

"I don't understand it. I don't understand what I just put in. It's interesting but not important. The information may show me that I would have to search for a job for a longer time. Maybe if you have two options to be employed, you can go with the option that is employable before." (unemployed, MLM1)

"So, there are several pieces of information going in the chart, and it's not clear enough so it should clearly state what is on axis Y and X as well, and what each line represents. (unemployed, MLM1).

The difficulty with understanding the graphs makes it hard to visualize using the tool alone or in counselling; "*The graphs are very similar. I don't see how this is useful for my clients. Too complicated and hard to understand.*" (counsellor, MLM1).

The counsellors emphasize doubts about how the information will be received and how unemployed would use PEX at home;

"If he sees a number, it can make him demotivated. It depends on your probability. (…) Would be most relevant for younger, but for older they come with a baggage, and it might be harder for them to find it helpful." (counsellor, MLM1).

"Useful for people who are fresh in the market. I don't know for people who has been unemployed for 5 years to see they will get employed after 30 days. If they use it at home, they won't like it. If there isn't results after 30 days, then they would be like 'you told me 30 days'." (counsellor, MLM1).

The results of PEX are an estimation, which is also written on the page. Yet, both some

counsellors and unemployed indicated that this should be clearer in the description.

> "It would be nice to know it's not fix date. I read that (..) I understood the text, but not the graph. It's motivating because it's not exact date, so it could be motivating. I love it to know that there is a 90% chance within two month. For others, with a chance for longer unemployment, maybe it would be demotivated." (unemployed, MLM1).

As for the rest of MLM, the wishes for comparison between occupations is also emphasized in regard to PEX. For some, PEX is useful in counselling and together with the counsellor in order to make an employment plan.

> "It would be more useful if one line was printer, a second and third line showed another occupation so you can compare. Just one line per occupation. So taking in to consideration that this is for the counsellors, I think that it would be easier if there were a comparison, and the counsellor and the unemployed would be able to make the plan together." (unemployed, MLM1)

Despite changes, there are many repetitions in the finding from MLM1 to MLM2. One of the key findings from the first round of piloting concerned the difficulties with understanding the graph makes it hard to visualize using the tool alone or in counselling. By all users, it is emphasized that the usability of the PEX comes down to how it is explained. It is very important that the graph is communicated in a way that is customized to the individual. As counsellor 4 explains, some are too worried about being able to find a job, while others are not worried enough. In other ways they do evaluate the unemployed citizens' likelihood of needing no, little or more support from the PES in order to find a job and in that sense this functionality is aligned with an already existing practice at ESS:

> "Yeah, that we did information about how long people are unemployed, it's already kind of in our action plan, because the longer the people are unemployed, more we work with them and try to get them some programs or education or... So, it's important information. We use it a lot. Okay. So, I think the probability, sometimes with, there are different kinds of people, people that are

not worried at all and people who are too much worrying about how to get...
Yeah, okay. So, with, you can use it with both groups, but it's the way you explain it. (counsellor, MLM2)

Elaborating on this point it is important that the probability estimates do not work in a discouraging way:

"This information can give client hope. Hope, but if they can get a job in 290 days, then that will be disappointing. Okay. If they don't. Yes. And then they come to you and... Here, right here. 290 days, but I still can't get a job". (counsellor, MLM2)

This counsellor has some worries about how such information will be received by unemployed people, and they would be reluctant to share a result with an unemployed citizen showing it would take 290 days to find a new job. The counsellor concludes; "Perhaps I won't show my clients this".

In our interviews we also asked counsellors about the possibility of clients using the functionality at home by themselves and the reception was mixed but some of them were accepting.

"And what do you think if the client has access to this at home and can calculate? Yes, this is okay for them. If they want this information, they will get you" (counsellor, MLM2)

Key takeaways

The users give mixed feedback in relation to the **PEX**. In general, counsellors report that they find the probability estimates meaningful and also aligned with existing practices at ESS but they also share some concerns showing unemployed citizens the probability scores as the communication of the results are crucial to ensure usability and ethics as well.

Unemployed people mostly spend some resources understanding what the graph means, and an equal share of people find the information meaningful or irrelevant in terms of their own situation.

One way to make the tool more dynamic and avoid the potential demotivating effects could be to include a comparative function similar to what was added in Explore Your Labour Market. Being able to compare two occupational targets can help to define a priority, or changing one parameter or another to see if it changes anything, for example aiming for a different career, taking a training course, etc. Thus, we recommend that the future tool display the previous occupation (or the wished for occupation) and one of the neighbouring occupations to see if the outlook in this neighbouring occupation is better.

4 Career Opportunities

Career Opportunities is a tool that support users in thinking about alternative career paths. The tool combines data forecasting demand for labour with different occupation based on a survey with employers with detailed data for the occupation (working time, languages) deriving from historic data on job vacancies in Slovenia. Applying a Decision Support System DSS – DEX methodology the tool identifies and presents proximate occupations on a map based on the past experiences and future wishes of the user. The main difference between MLM1 and MLM2 is the visualization of results in the map.

Figure 5: Screenshot of Career Opportunity tool

When testing Career opportunities in MLM1 the understanding of the purpose was not clear and was challenged by the fact that the functionality was not working properly when testing.

The lack of understanding and the way the form is filled out made it hard to play around and interact with the tool;

> "The results are not presented in an understandable matter. For instance, you need license to be a lower employed logistics, so this category is only relevant for some. I would love to have the comparison - 'so what if I did get this type of license or that?' As it is now you don't want to play around with it." (counsellor, MLM1).

It was both the presentation of the results, but also the form and the data users fill in, that made it less interactive. It does not provide information about whether the user needs more qualifications or education, or how lack of skills can be achieved.

> "It should be more intuitive to delete wishes etc. If you haven't told me [what the functionality was about], I wouldn't have figured it out. Submit form: I understand you want to help people with what other opportunities they have." (unemployed, MLM1)

> "In this kind of search, it would be interesting to put in our education and experience, then based on that you get employers who have job openings. (unemployed, MLM1).
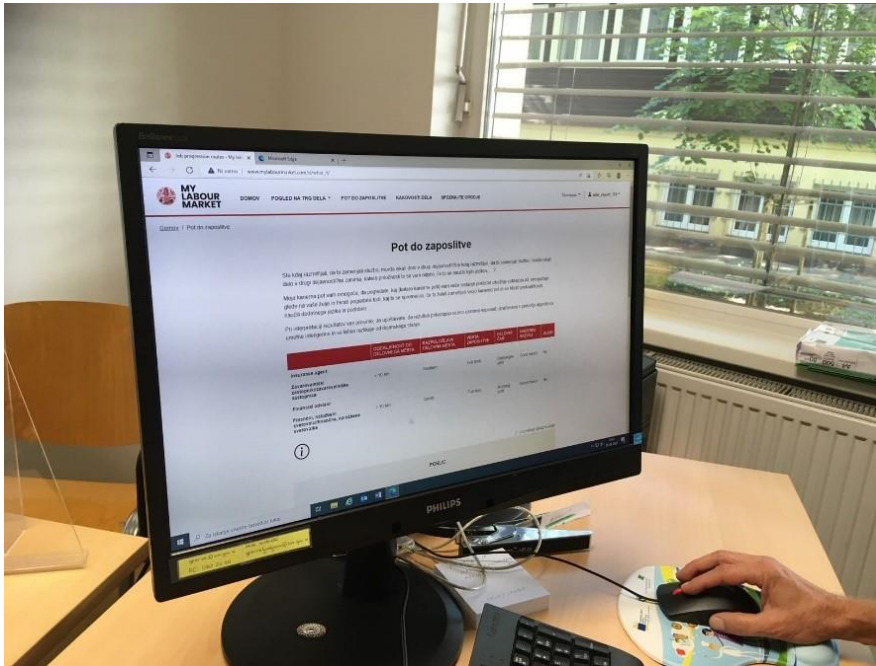
Figure 6: Unemployed participant trying out Career Opportunities function (called "Job Progression Routes" in MLM1), MLM1

However, the vision behind the functionality still made sense;

> "Ok. AI is used to make predictions. This is interesting; it gives you opportunity to play: What do you want to be today?" (unemployed, MLM 1)

> "So, is this if you want a new career? It's nice to play around with what to do. I don't understand the distance to the job but... It is good to know how many jobs that are there and if I have to learn more, do some training. This would be very good, so I can see if I can do it or not." (unemployed, MLM1).

Thus, the presentation of the results and the data users fill in, in total, makes Career Opportunities less intuitive compared to other functionalities.

From MLM1 to MLM2 there has been some improvements that is reflected in the fact that in the second round of piloting users do not complain about the possibilities in terms of choosing or deleting languages. Further, from MLM1 to MLM2 a map has been implemented showing estimated forecast of occupations around the country.

Some users comment that it is helpful to be able to choose between part time and full time within a certain occupation

> "It does give me the option for social work and counselling professionals, which is great. And also, part-time work in that field, which is great, which is actually kind of interesting". (unemployed, MLM2)

On the negative side, users also note that it is sometimes vague in terms of what options have been chosen what you are viewing.

> "I like the options. I like the drop-down menu and everything. But when you have these sort of... When I select these professions, they should... I know certain websites where this happens in that way. So, I could... Relating to that. So, when I click on an option like web developer, there should be... This would be my preference. If there would be a sort of... Down here, that it would be listed. Because... So, like a web developer, writer, translator. So, it would be more clear what I selected. In some way, I think that should be more clear. Because here, like I selected four things. Yeah. And I can't see which of these things is selected. So, I think that's important." (unemployed, MLM2)

Similar difficulties were expressed in the first piloting where guidance throughout the tool becomes essential for engaging.

> "It should be more intuitive to delete wishes etc. If you haven't told me, I wouldn't have figured it out. Submit form: I understand you want to help people with what other opportunities they have. (unemployed, MLM1)

Another identified problem is that when you change your options it is not clear how that affects the results.

> "Perhaps it would be good if it would be in, I don't know, in a column, so that they would see right away where the difference is. Yeah. Yeah. Because otherwise, if they just make a quick look, they might not even notice what's the difference" (unemployed, MLM1)

This refers to a type of usage that seems useful according to several users: if I change a parameter, what happens? It's a use that's very close to the questions, dilemmas and choices that people make when they're looking for a job. However, for it to be useful, that users have a clear vision of the results of the options you are considering.

In both the first and second piloting round users expressed difficulties with understanding why they were shown *distance to job.*

> "So, is this if you want a new career? It's nice to play around with what to do. I don't understand the distance to the job but... It is good to know how many jobs that are there and if I have to learn more, do some training" (unemployed, MLM1)

While MLM1 only showed career opportunities on a table, including *distance to job*, MLM2 both showed a map visualizing the different career opportunities in various cities as well as a table. In the second piloting, it was perceived as a problem that the map does not contain actual vacancies. The users expect to see links to actual vacancies, and they get a little disappointed when this turns out not to be the case.

> "Okay, so these aren't actually vacancies. So, that should be explained better, I think. So, this is... It tells both your real and simulated." (unemployed, MLM1)

The same unemployed also points out that it is unclear what the purpose is

> "I'm not sure, but showing it on a map like this makes it more confusing, because it doesn't make sense what it is that it's showing or... Well, no, the map is fine. I don't mind the map. The map is good. I guess it's just the whole tool should be just explained better, I think, what it's supposed to mean, what it's supposed to do. I don't know, maybe just me, but I just don't get it at this point". (unemployed, MLM2)

Several users pointed out that it was a problem that education in itself did not go into the platform:

"Then I went to Career Opportunities. And again, I had problems regarding finding experience, not experience, but formal education. Because it didn't cover education itself". (counsellor, MLM2)

For some professional field, specific openings are not necessarily what is most interesting, rather getting particular career paths pointed out is more helpful:

"Because I know that regarding graphic design, there are a lot of candidates on the labour market. I also work with this type of candidates. And I know they have problems getting a career in that profession. So, they are not trying to find vacancies themselves. Because normally, somebody that is good in career in graphic design or something similar, really knows about what the options on the labour market are. But wants to know more about the options, what he can become for him. So, that's why career opportunities may be a better option for them than vacancies. For somebody working, let's say, as a skilled nurse, career opportunities probably wouldn't be the best option. But vacancies would be. Yeah. Because they know what the options are. They just want to know if there is something that has an easier timetable or better pay checks or something similar". (counsellor, MLM2)

In general, a pattern in the data is that people within more entrepreneurial professions tend to create their own jobs and hence the broader labour market dynamics are of interest. To people who work within a very structured profession such as the health system, they are more interested in getting to know the particularities of a position.

Users find this part of the MLM platform for identifying wider and longer-term labour market dynamics than for shorter-term job-hunting. Thus, the vision behind Career Opportunities is met with sympathy from many users, but the results shown often make them feel that the tool, when used, is not personalizing results. The suggestions are sometimes quite far from what is feasible and realistic:

"I'm not sure how a web developer, writer, translator could become an electrical engineer. Maybe? The technical one that you chose, possibly. So, this is being... the AI is basing this on the technical abilities that I have based on the fact that I'm doing web

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development. Possibly, yeah. So, it's also showing things that probably require a lot more training or some qualifications that you don't have at the moment, but... (…) But I don't... this is a lot... this is not the same, you know, like application program or just becoming an electrical engineer, civil engineer. You need a college degree to just shift. Yeah. Okay. So, this should be like maybe, maybe sort of... Well, first of all, it's not exactly in the same category, but maybe it should be explained that if you... Or maybe like another... like it's a different way of explaining it that for this, for this you maybe need less extra education, but for this you need a lot more education to be able to do it." (Counsellor, MLM2)

Key take-aways

The **Career Opportunities** functionality is largely evaluated as a potentially useful tool but at the moment it remains rather unclear, in particular to the unemployed users, how exactly to interpret and make use of the output. For instance, many users expected to see real vacancies on the map. Thus, the idea of making visible particular career paths rather than specific job openings could be explained better.

Users would also like some indication of exactly what it would require for them to be able to make a career shift. Highly regulated professions such as teachers and doctors are mentioned as potential pathways for candidates that do not have the required education. End users would like some estimate of how close/far away they are from being eligible to apply for proposed professions. From the point of view of unemployed users, the priority is to find a job and improving knowledge of the labour market is subordinate to that. Thus, a key takeaway is that the fundamental meaning of MY labour market is that it is not only that everyone has a vision of one's labour market but also that this vision, in essence, is utilitarian, i.e., indexed to job hunting.

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5 Bespoke Vacancies

The idea behind Bespoke Vacancies was to develop a job search tool that takes into account the unemployed need and wishes in terms of what is a good job for them. Bespoke Vacancies, thus, enable the user to look for jobs that fit the wishes of the user in terms of different types of job quality, such as Autonomy and control, meaningful work, training opportunities at work, working time, and physical and mental work environment.

Figure 7: Bespoke Vacancies

In MLM1 users tried out a very preliminary version of Bespoke vacancies, then labelled Job quality. For both counsellors and unemployed this function was hard to understand in terms of what job quality even means, but also the language used in the tool and the results were too difficult and abstract. This also relates to a lack of trust in the data received, and doubts about how such data is gathered:

> "I don't know what it is meant for. Meaningfulness of work? What is that? There is no information. I tried it out, but it meant nothing for me. [explained] It's hard to put on a profession, because it's more about the company. [Do you trust the results?] No." (counsellor, MLM1).

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"What does it mean? It's like job quality. In Slovenian it's like work quality, and not job. Okay, so these are the elements of quality that I think is important. (…) Autonomy and supervision? I have no idea what that is. What is the idea here? " (unemployed, MLM1).

Almost all of the interviewed users had trouble with what to select and how to interpret the used words; "*What do I have to put in here? [km] If I want to drive to work or what? This page here, I don't think I understand it correctly.*" (unemployed, MLM1).

One of the key findings from the first piloting was that users expected to see real vacancies when using the job quality function.

"Can you click on positions? Because if you can, that should be the first page. Because of the vacancies. In the end of the day, we are all looking for a job. Then you could have options to look at the statistics; for this position the statistics are. It would be useful to have the jobs here and gather it all." (unemployed, MLM1).

However, despite confusion others indicated that they liked searching for available vacancies selecting by means of their understanding of job quality rather than by positions and qualifications.

"I think it is good they give you a lot of results and a lot of difference. But I'm confused by this one, I don't know why it is in there, maybe because of autonomy or... but it's good to have different types of profession. It's really good there is a lot of variations, and I like there are different opportunities, because maybe there might be something I would be interested in or could apply for, not sure, but maybe as a personal assistant I could do that, maybe I need more qualification but maybe I could work as it." (unemployed, MLM1).

"It has opened my perspective for some things I didn't even think of. I wouldn't even look for this [type of job]. I would even consider some of them." (unemployed, MLM1).

However, both counsellors and unemployed found this function hard to understand in terms of what job quality even means, but also the results and language are too difficult and abstract. Additionally, job quality is for some more related to the workplace than to a profession.

> "I don't know what it is meant for. Meaningfulness of work? What is that? There is no information. I tried it out, but it meant nothing for me. [explained] It's hard to put on a profession, because it's more about the company." (counsellor, MLM1).

Although, the functionality still did not manage to provide proper results the introduction of the map and, at least in theory, of real vacancies resulted in much more positive feedback from MLM2. In general, the users provide promising feedback on the idea of job search based on what they associate with job quality. Many users describe this section and the categories as innovative.

If explanations about new categories/concepts are provided, many users really see promising and innovative perspectives in this section:

> "I think this is very important. I think this is great because I've never seen something like this anywhere else in that sense. Like, meaningful work, I think this is great. Like, all of these options are great. If they were explained better, they'd be great. Because I've never seen this anywhere else in that sense. Flexible working, like, yeah, it's really good options. I've never seen them anywhere else in that sense". (unemployed, MLM2)

As mentioned, in the first piloting resulted in many users questioning whether some of the categories associated with job quality as being too general. Similar remarks were made in the second piloting:

> "Yeah, but the question that I have is just would anybody say this is not important for them? And I suppose the same with the psychosocial risk. Yeah. Like, nobody wants to be working in a stressful environment". (counsellor, MLM2)

The users express some mistrust in data and how it was developed. This was also a problem identified in the report drawing on data from the first round of piloting:

> "So, do the jobs self-report these things or is it sort of checked in some way? Yes, where the knowledge comes from. Yeah, where does the data come from? This is like meaningful wo or this has limited psychosocial risk? Yeah. Or is there data available for all these things? Do the employers give data? I think that's a thing that can be problematic sometimes. That employers, like, this is great if the data is accurate and it is actually a representation of what the employers are, that the jobs are like, what the employers are like, what their jobs are like. But I'm not sure if all of these forms of data are actually available from the employers. Do the employers give out that data? Because if it's not, then it's not helpful" (unemployed, MLM1)

Bespoke Vacancies is a functionality that provide the user with actual vacancies and is a new feature in MLM2 combining job quality with real vacancies to accommodate user feedback from MLM1.

One of the decisive features of this section is that it is designed in relation to professions rather than education. Hansen & Pultz (2021) do remark that employments are less directly linked to educational backgrounds in a Slovenian context compared to other countries, however, this took some time to figure out for many users. On top of that, the users spend some energy in deciphering which categories are used to describe professions as is evident in this quote:

> "Aha... So it's more of the job rather than your education... Ok, job, yes... Yes, ok... And two others that you might... Yes, and then... And then... Social worker... Like a social worker... That... I was writing pro bono for... Organization, human organization... Who has... Safe houses... So... Social worker... How can I... How... Can I write social?
>
> Interviewer: Click that...
>
> Aha... And then you should be able to... Ah, yes, yes... Thank you very

much... So it would be one of these four... Social workers? Probably just a little cynical... Social worker and counsellor... Aha, yes... Ah, social worker? Yes, social worker and counselling professionals... And counselling professionals... Yes, that's I think that..." (unemployed, MLM2)

Key take-aways

It is clear from the piloting that the **Bespoke Vacancies** functionality shows promising perspectives. End users overall find the idea of looking at the job market in terms of different types of job quality attractive.

They also point out that the variables are not clearly defined, nor is it clear how certain jobs are characterised in relation to the job quality items and this leaves them with some sense of confusion/unclarity.

One way to better let users engage with the results could be to let users do the vacancy scanning through the job quality items rather than choosing occupation in the beginning. In this way, it would be easier for users to see and play around with how the labour market looks like from the job quality perspective. Another way to enhance a playful approach could be to clarify that whereas some job quality items are indeed universal (e.g., a safe working environment) others depend on the individual person's preferences (e.g., part time vs. full time).

6 General feedback on MLM

Despite the deficiencies and critique, it is important to note that both unemployed and counsellors during both rounds of piloting were generally supportive of the *vision* and *ideas* behind the MLM tool.

The vision behind receiving data and statistical information about the labour market is for some of the unemployed trying out MLM1 a way to gather new information, which put them in a position to make informed choices about alternative paths into the labour market;

> "If this was my first meeting with my counsellor and everything was new to me, then yes it would change my understanding (…) This information will give me some idea of how safe it is for me to take some options or not." (unemployed, MLM1)

Some, however, do not see statistical data as relevant in their own job search; *"Statistical things are not important in my job search. It's interesting, but I will just search for a job. If I had more time, I may look at it, but I will normally just look for job vacancies"* (unemployed, MLM1).

The counsellors in general agree, with precaution, that the information received at MLM is relevant for unemployed, and something that unemployed usually are interested in. When asked about the use of the tool by the unemployed, they said; *"The unemployed, they want to know where there is work, while the person deciding for education or a student, they look at income etc."* (counsellor, MLM1), and further; *"(…) especially people who search for jobs, (..) they are really interested in where the jobs are, how many etc."* (counsellor, MLM1).

The tool and the information received is, however, hard to interpret for both counsellors and unemployed, which overshadows the vision and ideas with MLM and makes it hard to understand and, in consequence, engage with the results and information given. This becomes visible in users not understanding the graphs or why they should be interested in the statistical

information given by the tool; *"I wouldn't look at the graph. (..) Maybe on some pages you look at the graph, but when searching for a job, this is not important."* (unemployed, MLM1). Although the interviewed users in the piloting differ in age, experience with technology etc., for almost all the participants the graphs were hard to understand and interact with. This relates to the differences in both the Y/X-axis and scales from feature to feature, which makes it hard to interpret the graphs and compare them. Although some of the scales and features of the graphs were updated from MLM1 to MLM2 to make them easier to read, the need for even simpler and aligned scales remains an important focal point for future revisions.

Especially the lack of comparison makes it harder and the user less motivated for playing around with different opportunities and scenarios and thus interact with the tool.

Not only the interpretation of the results is hard, but also understanding for whom the tool is for is difficult;

> "I find the app more useful for people with higher education (..) one thing is to use the app, but I think they [people with higher education] use time to analyse the market, to search for information, more than people switching between retail stores." (unemployed, MLM2)

Generally, this understanding connects to a lack of explanations throughout the tool;

> "In all the graphs I'm missing a simple explanation or an example. Something is in hundreds and some is in thousands. (..) I don't know how it would be with people with lower education, they haven't worked with graphs." (counsellor, MLM2)

The visions and ideas of the tool rely on the understanding of the tool and the information provided which for most of the users in the piloting needed explanation throughout the interviews. This is emphasized through observations, where it becomes clear that the value of the tool is based on support and review of the tool before use;

"The majority of people wouldn't use this at home, however when I was looking for work and coming to the employment services, and someone took an hour to go through the tool it would have some value." (unemployed, MLM2)

More specifically the general feedback received from the piloting is that the drop-down menus are too diverse and hard to navigate. Often it changes from sector to occupation, and the statistical definitions of the sectors and occupations are not intuitive, in particular for the unemployed who often struggled to figure out which sector or occupation she belongs to.

In the MLM2 version some of the bugs were solved in MLM2. Also, the use of categories in drop-down menus were aligned. However, still, the use of the ISCO occupation continues to challenge, especially, the unemployed who are not familiar with labour market statistics and struggle commanding the large number of options to choose from. The ISCO codes are quite far from lay terms and for ordinary people it is difficult to use the ISCO codes:

"This is because this is the official classification. But this is just used for professionals that are working in the field that are investigating these things but people in real life don't use that. I would say that even those that are working in HR departments don't use this. Yeah. So, what does this mean? Education not elsewhere classified? I think it's like teacher training". (counsellor, MLM2)

To some of the counsellors it is interesting to see well-known labour dynamics represented in the graphs. The graphs displaying stability or turnover, the picture adds up according to this counsellor:

"Do you think people are looking for stability in their job? Or are they looking for stability in their life? I don't meet clients that are interested in having one job forever. Okay. But they don't want to be in short-term contracts like, I don't know, two, three years.

They want something longer, but not forever. Okay. So finding that balance. I think that in general, I think that the statistic is showing like seven, eight years.

It's the average year where people start to look at their career and want some advancement and change.

Yeah. I think you will see that then in the statistics as well. Towards the end, you can see retirement. Interesting". (counsellor, MLM2)

In the MLM2 piloting, many users still understand the value of a data-driven overview of current labour market trends. There are however still some challenges in terms of users understanding the platform and its aim and purpose. Overall users report that it is necessary to consult the HECAT team in order to navigate and interpret the information of the platform. There are still some fundamental challenges such as a general reluctance to trust the information the platform produces as well as challenges in terms of understanding the graphs, the numbers and how these pieces of information are derived. However, each graph is supported by a text-based explanation plus an information button which provides further explanation, data sources and other useful information.

Overall, the users tend to have sufficient IT skills to use such a tool. In general, the users interviewed report that they use the internet and various Slovenian pages where vacancies are uploaded in their job search prior to engaging with the platform. Some also use more old-fashioned ways such as going store to store to hand out CVs, though these seemed to be mainly the young one's searching for a student job.

The expectations to MLM varied a lot. Some didn't have any expectations, while most had an expectation to find useful vacancies. Most of the counsellors already tried the first version of MLM and hence had experience with the platform. The counsellors that have used MLM before identified the improvements. Visually, most believe that version two of MLM is better, it is simpler and more user-friendly.

The counsellors are concerned with how the platform can help them in their work. For those seeing MLM for the first time it is not clear what the platform can be used for. After testing and trying MLM2 it still is not clear what they should use it for, which is emphasized when the results are not realistic or usable. Overall, some of the improvements most notable from MLM1 to MLM2 is the integration of a map. Also, being able to compare professions across average pay is viewed as useful.

Across the individual functionalities on MLM2 there are some problems, one is that the same information has to be filled in several times and to many users, this is experienced as a waste of time and enough to leave the platform:

> "If I have to put in the data every time, the data that is not relevant, I will conclude that the tool is not meant for me. Therefore, I will not use it." (counsellor, MLM2)

Overall, the landing page was well received showing useful information that invites users to engage with the platform:

> "That is actually useful, yeah. That's very useful. Especially the average income, the amount of vacancies, number of unemployed people, what is... Yeah, we don't have any number on that at the moment." (counsellor, MLM2)

Some occupations show no variation, and this is a problem. Now users show understanding when they meet problems because they know it is an early version, but they also voice that it takes very little for people to lose interest in a website or platform.

Key take-aways

Users, both unemployed and counsellors, have very different approaches to the usefulness of statistical data in the efforts to re-enter the labour market, some accommodating, and others inherently sceptic and pessimistic. Interpreting this divide as one between those who know and those who are ignorant would be highly misleading. Working *with* users in HECAT embraces another approach. Rather, in developing further MLM, and similar instruments, this latter group should be approached as a great source for improvements.

Indeed, listening to users' feedback render visible a general challenge with all the functionalities of MLM and similar instruments: the data and classifications currently available are not produced to accommodate the needs of bureaucracies, not the unemployed and counsellors. Researchers in the HECAT project have worked from this point of departure trying to bend and modulate the data to personalise it and make it playable. However, the point of departure puts certain limits to this effort, as evident in the ISCO codes. Thus, a more radical recommendation to PES would be to start thinking about how to adapt the production line of

statistical data to the needs of the end users. In other words, what data is needed to be able to visualize the personal labour market of the unemployed?

So far PES have been concerned with making visible the unemployed herself, for instance through profiling tools. The development and piloting of MLM points to the need for pointing the spotlight towards the dynamics of the labour market and while it also shows the limits to what the existing pool of data can shed light on.

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Appendix 1.1. Interview guides Piloting September 2022

Interview guide, unemployed individual interview

We are part of a research project HECAT dedicated to understanding big data and algorithm usage within Public Employment Services (PES) which is funded by the European Commision. The primary aim is to develop an ethical algorithm and platform for use by PES and unemployed to assist with decision making and distribution of meaningful resources. We aim to develop a tool that will enable PES to work *with* unemployed people and not *on* them. We call the tool MyLabourMarket, and we would like to interview you for approximately 1,5 hours in order to test the tool and its features, and also hear about your experience and insights to both the useability and meaningfulness of the tool. All material will be anonymized. Do you have any questions before we begin?

Introduction

- Can you briefly introduce yourself: Name, age, nationality, where you live, educational and professional background?
- How did you become unemployed? Did you work before, what kind of job?
- What is your experience using internet in relation to your job search?
- Are you usually interested in getting and finding information, general or specific, about the labour market? If so, how do you find this information? Do you in general find it easy to find this form of information?
- How often do you use digital tools/the internet for preparing for or during a meeting with your counsellor?

Seeing the tool

- Please visit *Mylabourmarket.com* – Based on the first impressions, what kind of information do you expect to get from the tool?
- First, we would like you to have a look at your labour market at the bottom of the site. Choose your Professional Occupation and press apply.
  - o What do you think about the data you receive? Are there any information that you find useful in your own job search?
- Please try and register to login
  - o How do you think about the possibility to register? Are there any information that you don't understand, are missing or feel unnecessary to put in in order to register?

Using the tool

Now we would like to ask you to try some of the different features in the tool.

Basic Labour Market

- Try to enter *See the Labour Market* and tap *Basic labour market.* We want to ask you to step by step go through the different opportunities on the page and please tell us what the different graphs show you and how you experience the meaningfulness of the data you receive. Please try and play around with different years and occupations/sectors but keep it close to your own wishes for future jobs.
    - *Employed*
    - *Unemployed*
    - *Vacancies*
    - *New entrants per annum by economic sector*
    - *New entrants per annum by occupation*
    - *Average duration of unemployed*
- Of the data you received by clicking around on *Basic Labour Market* what data and information do you see most relevant in your own job search and why?
- Would you use the data and information in meetings with your counsellor?

Advance Labour Market

- Please enter *Advance Labour Market.* Again, try and play around with different years and sectors/occupations close to your own wishes for future jobs. Please tell us how you interpret the different graphs showed to you
    - *Employment stability*
    - *Turnover of jobs per annum*:
        - *Rate of turnover of employees in existing jobs per annum*
        - *Net jobs created/destroyed per annum*
        - *Net people entering or leaving the employment*
- Of the data you received by clicking around on *Advance Labour Market* what data and information do you see most relevant in your own job search and why?
- Would you use the data and information in meetings with your counsellor?

Probability of exiting unemployment – if accessible for unemployed

- Please go to *Estimated Probability of entering employment from unemployment*, and fill in all the details and press apply. Please feel free to try with different variables.
- How do you feel about being shown yours or others probability of exiting unemployment?
- What do you think about the different variables that determined the probability of exiting unemployment?
- When looking at the graph, how did you interpret it? Does it give you any new information?
- Would you use this data in meetings with your counsellor?

Job progression routes

- Now go to *Job Progression Routes* and try to fill out the form – be free to try with different experiences/progression wishes/locations/working hours etc.
- What do you think about the variables you put in the form?

- What do you think about the results?
- Being able to play with and seeing different job progression routes, what would that mean for your future job search?
- Can you imagine using this data and information in meetings with your counsellor? If yes, how? If no, why not?

Job quality

- Please go to *Job quality* and fill your professional occupation, your location and your wishes for distance to work. Press *+ More filters*
- What is your first impression concerning job quality? What kind of information do you expect to get through this page?
- What is your first impression of the different variables? Have you thought about what job quality means to you before, and if so, have you thought about similar criteria or is there anything new you haven't thought about before or something missing in terms of what job quality means to you?
- Please, try to fill out the form and press send. What do you think about the results?
- Has the information given you any insights regarding your (future) job search? Why/why not?
- Would you use the data and information in meetings with your counsellor? Why/why not?

Reflections

- After trying out MyLabourMarket, do you look different at your own situation regarding the labour market? If so, how, and why?
- Looking at the data and information you received through MLM, how confident are you in the way it portrays your labour market? Do you have any doubts or anything you don't understand?
- Are there any insights that you would like to have? For instance, by revealing discrimination based on age/gender etc.?
- Would you use the information and data you received through MLM in the next meeting with your counsellor? Why/why not?

We don't have any more questions. Are there any aspects that we have not talked about, but you find important? Do you have any questions? Thank you so much for your time and contribution!

Interview guide, unemployed focus group

We are part of a research project HECAT dedicated to understanding big data and algorithm usage within Public Employment Services (PES), which is funded by the European Commission. The primary aim is to develop an ethical algorithm and platform for use by PES and

unemployed to assist with decision making and distribution of meaningful resources. We aim to develop a tool that will enable PES to work with unemployed people and not on them. We call the tool MyLabourMarket, and we would like to interview you for approximately 2,5 hours with small breaks in order to understand and hear about your experience with the tool and its features, and also hear about your insights to both the useability and meaningfulness of the tool. Please feel free to discuss the different features of the tool, and you don't have to agree with each other. All material will be anonymized. Do you have any questions before we begin?

Introduction

- Can you briefly introduce yourself: Name, age, nationality, where you live, educational and professional background, how long you been unemployed?
- What is your experience using internet in relation to your job search? Are you usually interested in getting and finding information, general or specific, about the labour market? If so, how do you find this information? Do you in general find it easy to find this form of information?
- How often do you use digital tools/the internet for preparing for or during a meeting with your counsellor?

Seeing the tool

Showing Mylabourmarket.com

- Based on the first impressions, what kind of information did you expect to get from the tool?
- When seeing the first page, have you tried to choose your Professional Occupation?
    - If yes, what do you think about the data you receive? Are there any information that you find useful in your own job search?
    - If no, what was the reason you didn't try it out?
- Registration
    - How do you think about the possibility to register? Are there any information that you don't understand, are missing or feel unnecessary to put in in order to register?

Using the tool

Now we would like to ask you about some of the different features in the tool.

Basic Labour Market

- Through *See the Labour Market* and *Basic labour market* you can explore some basic things about the labour market in general, and more specific related to your economic sector and/or professional occupation.
- How did you experience going through the different sections?
    - *Employed*
    - *Unemployed*

- o *Vacancies*
- o *New entrants per annum by economic sector*
- o *New entrants per annum by occupation*
- o *Average duration of unemployed*
- Of the data you received by clicking around on *Basic Labour Market* what data and information do you see most relevant in your own job search and why?
- Would you use the data and information in meetings with your counsellor?

Advance Labour Market

- Further, you can enter *Advance Labour Market.* It shows you:
  - o *Employment stability*
  - o *Turnover of jobs per annum*:
    - ▪ *Rate of turnover of employees in existing jobs per annum*
    - ▪ *Net jobs created/destroyed per annum*
    - ▪ *Net people entering or leaving the employment*
- What is your first impression about this section? Is it information you've been interested in knowing more about in your job search?
- How you interpret the different graphs shown to you?
- Of the data you received by clicking around on *Advance Labour Market* what data and information do you see most relevant in your own job search and why?
- Would you use the data and information in meetings with your counsellor?

Probability of exiting unemployment – if accessible for unemployed

- How do you feel about being shown yours or others probability of exiting unemployment?
- What do you think about the different variables that determined the probability of exiting unemployment?
- When looking at the graph, how did you interpret it? Did it give you any new information?
- Would you use this data in meetings with your counsellor?

Job progression routes

- Have you tried out putting different experiences/progression wishes/locations/working hours etc.? What do you think about the variables you put in the form?
- What do you think about the results being shown?
- Being able to play with and seeing different job progression routes, what would that mean for your future job search?
- Can you imagine using this data and information in meetings with your counsellor? If yes, how? If no, why not?

Job quality

- What was your first impression concerning job quality? What kind of information did you expect to get through this page?
- Have you thought about what job quality means to you before using the tool, and if so, have you thought about similar criteria or is there anything new you haven't thought about before or something missing in terms of what job quality means to you?
- What did you think about the results given to you?
- Has the information given you any insights regarding your (future) job search? Why/why not?
- Would you use the data and information in meetings with your counsellor? Why/why not?

Reflections

- After trying out MyLabourMarket, do you look different at your own situation regarding the labour market? If so, how, and why?
- Looking at the data and information you received through MLM, how confident are you in the way it portrays your labour market? Do you have any doubts or anything you don't understand?
- Are there any insights that you would like to have? For instance, by revealing discrimination based on age/gender etc.?
- Would you use the information and data you received through MLM in the next meeting with your counsellor? Why/why not?

We don't have any more questions. Are there any aspects that we have not talked about, but you find important? Do you have any questions? Thank you so much for your time and contribution!

Interview guide, counsellor

We are part of a research project HECAT dedicated to understanding big data and algorithm usage within Public Employment Services (PES) which is funded by the European Commission. The primary aim is to develop an ethical algorithm and platform for use by PES and unemployed to assist with decision making and distribution of meaningful resources. We aim to develop a tool that will enable PES to work *with* unemployed people and not *on* them. We call the tool MyLabourMarket, and we would like to interview you for approximately 1,5 hours in order to test the tool and its features, and also hear about your experience and insights to both the useability and meaningfulness of the tool in your work. All material will be anonymized. Do you have any questions before we begin?

Introduction

- Can you briefly introduce yourself: Name, age, nationality, where you live, educational and professional background?
- How long have you been working as a counsellor?
- What is your experience using internet/other tools in relation to your work?
- Are you usually interested in getting and finding information, general or specific, about the labour market? If so, how do you find this information? Do you in general find it easy to find this form of information?
- How often do you use digital tools/the internet for preparing for or during a meeting with an unemployed?

Seeing the tool

- Based on the first impressions, what kind of information do you expect to get from the tool?
- When seeing the first page, did you try to choose your Professional Occupation?
    - If yes, what do you think about the data you receive? Are there any information that you find useful in a job search?
    - If no, what was the reason you didn't try it out?
- Registration
    - How do you think about the possibility to register? Are there any information that you don't understand, are missing or feel unnecessary to put in in order to register?

Using the tool

Now we would like to ask you about some of the different features in the tool.

Basic Labour Market

- Through *See the Labour Market* and *Basic labour market* you can explore some basic things about the labour market in general, and more specific related to your economic sector and/or professional occupation.
- How did you experience going through the different sections?
    - *Employed*
    - *Unemployed*
    - *Vacancies*
    - *New entrants per annum by economic sector*
    - *New entrants per annum by occupation*
    - *Average duration of unemployed*
- Of the data you received by clicking around on *Basic Labour Market* what data and information do you see most relevant in a job search and why?
- Would you use the data and information in meetings with an unemployed

Advance Labour Market

- Further, you can enter *Advance Labour Market.* It shows you:
    - *Employment stability*
    - *Turnover of jobs per annum*:
        - *Rate of turnover of employees in existing jobs per annum*
        - *Net jobs created/destroyed per annum*
        - *Net people entering or leaving the employment*
- What is your first impression about this section? Is it information you've been interested in knowing more about?
- How you interpret the different graphs shown to you?
- Of the data you received by clicking around on *Advance Labour Market* what data and information do you see most relevant when searching for a job and why?
- Would you use the data and information in meetings with an unemployed?

Probability of exiting unemployment

- How do you feel about being able to see probability of exiting unemployment for your clients?
- What do you think about the different variables that determined the probability of exiting unemployment?
- When looking at the graph, how did you interpret it? Did it give you any new information?
- Would you use this data in meetings with an unemployed?

Job progression routes

- Have you tried out putting different experiences/progression wishes/locations/working hours etc.? What do you think about the variables you put in the form?
- What do you think about the results being shown?
- Being able to play with and seeing different job progression routes, what would that mean for the way you do counselling in the future?

- Can you imagine using this data and information in meetings with a client? If yes, how? If no, why not?

Job quality

- What was your first impression concerning job quality? What kind of information did you expect to get through this page?
- How do you usually talk about job quality with your clients?
- What did you think about the results?
- Do you think the information given through job quality will give any insights regarding your clients (future) job search? Why/why not?
- Would you use the data and information in meetings with your clients? Why/why not?

Reflections

- After trying out MyLabourMarket, do you look different at the labour market?
- Looking at the data and information you received through MLM, how confident are you in the way it portrays your labour market? Do you have any doubts or anything you don't understand?
- Are there any insights that you would like to have? For instance, revealing discrimination based on age/gender etc.?
- Would you use the information and data you received through MLM in the next meeting with clients? Why/why not?

We don't have any more questions. Are there any aspects that we have not talked about, but you find important? Do you have any questions? Thank you so much for your time and contribution!

Appendix 1.2. Interview guides Piloting March 2023

Interview guide for PES counsellor

We are part of a research project HECAT dedicated to understanding big data and algorithm usage within Public Employment Services (PES) which is funded by the European Commission. The primary aim is to develop an ethical algorithm and platform for use by PES and unemployed to assist with decision making and distribution of meaningful resources. We aim to develop a tool that will enable PES to work *with* unemployed people and not *on* them. We call the tool MyLabourMarket, and we would like to interview you for approximately **1,5 hours** in order to test the tool and its features, and also hear about your experience and insights to both the useability and meaningfulness of the tool. All material will be anonymized. Do you have any questions before we begin?

If it is a counsellor whom we have already interviewed previously, questions need to be rephrased accordingly and the questions in the introduction (except the first) can be skipped.

Introduction

- Can you briefly introduce yourself: Name, age, nationality, where you live, educational and professional background?
- How long have you been working as a counsellor?
- What is your experience using internet/other tools in relation to your work?
- How do you find finding information, general or specific, about the labour market? Do you in general find it easy to find this form of information?
- What kind of digital tools/the internet for preparing for or during a meeting with an unemployed?

Baseline questions before trying MLM

- Baseline questions regarding Job quality:
    - What are the most important things and concerns for your clients when they look for a job? (e.g. wages, location, job type etc.?)
    - Have your clients normally thought about what qualities they value in a job? Can you name some? Which qualities are normally the most important?

- o How often do you discuss job quality with your clients? How do you address what may seem to be unrealistic expectations regards job quality?
  - o How difficult or easy do you think it is to find information about what qualities different jobs can contain? How do you find such information?
- Baseline questions regarding My future job:
  - o Do you often talk about changing careers or trying other sectors with your clients?
  - o How do you guide them in this? What information about other sectors or workplaces do you rely on? (e.g. the internet, through other tools etc.)

Frontpage:

- Please visit Mylabourmarket.com – based on first impression, what kind of information do you expect to get from the page?
- Have you seen it before?
  - o If so, which functionalities have you tried and how has it helped you or not helped you in your counselling? What kind of information was nice to receive, what information did you already have and what information did you find unnecessary?
  - o What do you think about that opportunity to register?
    - ▪ Now please try and move around on the page and let's try some of the different functionalities – Please let us know if anything is more or less intuitive.

Quality vacancies

- What do you expect it can be used for?
- What do you think of when it says quality vacancies?
- When looking at the various filters, do you recognize somethings that you find important for your clients when they're searching for a job? Which filters do you perceive as more relevant? Which are less relevant in your clients job search? What filters haven't you thought about before and why not?
  - o Please try and prioritize the various filters from most relevant to least relevant.
- Please try and fill out the form imitating one of your typical clients.
  - o How easy or difficult is it to fill out? Is there anything that isn't clear?
  - o What do you think of the results?
  - o Try changing the filters and zoom in and out. Could the new results change your ideas of what is feasible and desirable for your client?
  - o Has the information given you any insights you can use as a counsellor? Why/why not?

- What do you think of showing the various vacancies through a map? How easy or difficult is it to understand?
- Would you use the information in meetings with your clients? If so, how and why or why not?

My future job

- What do you think it can be used for?
- What do you think about the various filters?
- Please fill out the form having in mind the same 'typical client'
  - Describe what you see? What do you make of the result?
  - How easy or difficult is it to understand the map and what it shows?
  - Spider Chart:
    - How do you interpret the spider chart?
    - how intuitive is the results? Are you able to find the information you need to understand it?
  - Have the results provided you with any useful information about the labour market? If so, how?
  - Would you use the information in meetings with your clients? If so, how and why or why not?

Labour Market Trends

- What do you expect this function can be used for?
- What do you think about getting information about general labour market trends? Have you been interested in such information before, if so, has it been possible for you to find it before? Where?
- Please go through the different opportunities and tell us what the different graphs show you and how you experience the meaningfulness of the data you receive. Try and keep it close to your own clients wishes and let's see if it can help you with some new insights.
  - What information do you see as most relevant in relation to your client's job search?
  - Could you see yourself use the information in meetings with your clients? If so, how and why or why not?

PEX

Reflections

- How intuitive did you find the various functionalities? Was it easy to find the information that you needed?
- After trying out MyLabourMarket, do you look different at your counselling in relation to the labour market? If so, how, and why? Anything new that you haven't thought about before?
- Looking at the data and information you received through MLM, how confident are you in the way it portrays your labour market? Do you have any doubts or anything you don't understand?
- My workspace: When choosing to register, the user can become an advance user and the idea is that they can get advice from a counsellor. How would you use such function? What do you see as positive or negative when using in such way?

Interview guide for unemployed in Slovenia

We are part of a research project HECAT dedicated to understanding big data and algorithm usage within Public Employment Services (PES) which is funded by the European Commission. The primary aim is to develop an ethical algorithm and platform for use by PES and unemployed to assist with decision making and distribution of meaningful resources. We aim to develop a tool that will enable PES to work *with* unemployed people and not *on* them. We call the tool MyLabourMarket, and we would like to interview you for approximately **1,5 hours** in order to test the tool and its features, and also hear about your experience and insights to both the useability and meaningfulness of the tool. All material will be anonymized. Do you have any questions before we begin?

Introduction

- Can you briefly introduce yourself: Name, age, nationality, where you live, educational and professional background?
- How did you become unemployed? Did you work before, what kind of job?
- What is your experience using internet in relation to your job search?
- Are you usually interested in getting and finding information, general or specific, about the labour market? If so, how do you find this information? Do you in general find it easy to find this form of information?
- How often do you use digital tools/the internet for preparing for or during a meeting with your counsellor?

Baseline before trying MLM

- Baseline questions regarding Job quality:
    - What are the most important things for you when you look for a job? (e.g. wages, location, job type etc.?)
    - Have you thought about what qualities you value in a good job? Can you name some? How do you weigh your different needs and what is most important?
    - How have the qualities you value in your work life changed through your life?
    - Are you able to find information about what qualities different jobs can contain when you search for jobs? How do you find such information?
- Baseline questions regarding My future job:
    - Do you often think about changing career or working in different sectors?
    - How do you find information about other sectors or workplaces than the ones you've been in before and already know? (e.g. the internet, through other tools etc.)

Frontpage:

- Please visit Mylabourmarket.com – based on first impression, what kind of information do you expect to get from the page?
- Have you seen it before? (most likely not)
    - If so, which functionalities have you tried and how has it helped you or not helped you in your job search? What kind of information was nice to receive, what information did you already have and what information did you find unnecessary? Did you register? What did you think about being able to register?
    - If not, you have the possibility to register – what do you think about that opportunity?
        - Now please try and move around on the page and let's try some of the different functionalities – Please let us know, if anything is more or less intuitive.

(We want the user to move around by themselves, BUT we also want them to try out all functionalities.) Begin each sequence with asking "why did you chose this function?"

Quality vacancies

- What do you expect it can be used for? / What do you expect of when it says quality vacancies?
- When looking at the various filters; do you usually consider these when searching for a job? Which filter(s) do you perceive as the most relevant? Which are less relevant (or do not make sense) in your job search? What filters haven't you thought about before and why not?
    - Please try and prioritize the various filters from most relevant to least relevant.
- Please try and fill out the form.
    - How easy or difficult is it to fill out? Is there anything that isn't clear?
    - What do you think of the results?
    - Has the information given you any insights regarding your job search? Why/why not?
    - What do you think of showing the various vacancies through a map? How easy or difficult is it to understand?
    - Try changing the filters and zoom in and out. Did the new results change your ideas of what is feasible and desirable for you?
    - Would you use the information in meetings with your counsellor? If so, how   and   why   or   why   not?

My future job

- What do you think it can be used for?
- What do you think about the various filters?
- Please try to fill out the form – try to include your longer term career wishes
    o Describe what you see? What do you make of the result?
    o How easy or difficult is it to understand the map and what it shows?
    o Spider Chart:
        ▪ How do you interpret the spider chart?
        ▪ how intuitive is the results? Are you able to find the information you need to understand it?
    o Try changing some of the filters – how does it affect the available positions?
    o How has the results giving you new information about the labour market?
    o Would you use the information in meetings with your counsellor? If so, how and why or why not?

Labour Market Trends

- What do you expect this function can be used for?
- What do you think about getting information about general labour market trends? Have you been interested in such information before, if so, has it been possible for you to find it before? Where?
- Please go through the different opportunities and tell us what the different graphs show you and how you experience the meaningfulness of the data you receive. Try and keep it close to your own wishes for future jobs, and lets see if it can help you with some new insights.
    o What information do you see as most relevant in relation to your own job search?
    o Would you use the information in meetings with your counsellor? If so, how and why or why not?

PEX

Reflections on MLM

- How intuitive did you find the various functionalities? Was it easy to find the information that you needed?
- After trying out MyLabourMarket, do you look different at your own situation regarding the labour market? If so, how, and why? Anything new that you haven't thought about before?

- Looking at the data and information you received through MLM, how confident are you in the way it portrays your labour market? Do you have any doubts or anything you don't understand?
- My workspace: When choosing to register, you can become an advance user and the idea is that you can get advice from a counsellor. How would you use such function? What do you see as positive or negative when using in such way?

Appendix 2.1 Characteristics of interviewed in piloting of MLM 1, September 2022

Unemployed Interview	sex	Age	Date	Education	Residence	Duration of unemployment	Job experience
Unemployed1	M	48	23.9.22	Graphic technician	Ljubljana	3 months	Own company, project management
Unemployed2	M		23.9.22	Secondary school; Energy, law	Ljubljana		Worked in PES
Unemployed3	F	56	19.9.22	English and Italian	Ljubljana	/	Self employed, translator
Unemployed4	F	30	21.9.22	Kindergarten teacher	Ptuj	Recently unemployed	Kindergarten teacher
Unemployed5	F	26	19.9.22	Needs to finish last year of high school	Ljubljana	5 years	Work a little: bar, waiter
Unemployed6	M	62	21.9.22	Elementary school	Ptuj	6 years (disability status)	Metal worker, casting, polishing
Unemployed7	F	24	21.9.22	Secondary school	Ptuj	Few months	Shop Assistant + Assistant pre-school childcare
Unemployed8	F	47	19.9.22	Fashion designer	Ljubljana	Since covid-19	Had a restaurant for 12 years
Unemployed9	F	30	19.9.22	Art teacher	Ljubljana	Since covid-19, wants to study MA art therapy	Art therapy, volunteer at youth centre
Unemployed10	M	50	20.9.22	Commercial technician	Ljubljana	3 years	Insurance
Unemployed11	M		20.9.22	Economic and computer science	Ljubljana	1 year	Small jobs related to computer science
Unemployed12	F	23	20.9.22	Grammar school + courses in nail stylist	Ljubljana	1,5 year	Nail stylist
Unemployed13	M	59	21.9.22	Graphic	Ptuj	1 year	
Unemployed14	F	46	21.9.22	Management in public service	Ptuj	1 year	Public Administration

Focus group, Ljubljana					
Interview	**Sex**	**Age**	**Experience**	**Duration of unemployment**	**Residence**
Unemployed15	F	29	Spanish teacher	2 years	Ljubljana
Unemployed16	M		Manager	4 months	Ljubljana
Unemployed17	F	36	Physicist, web design (multiple)	Several years (5)	Ljubljana
Unemployed18	M	56	Program activation	Several years (12)	Ljubljana
Unemployed19	M	53	Freelance tour guide	Since covid-19	Ljubljana
Unemployed20	M	43	Graphic design	3 months	Ljubljana
Unemployed21	M		Working w. Erasmus/education	3 months	Ljubljana
Unemployed22	F	44	Shop assistant		Ljubljana

Counsellors							
Interview	**Sex**	**Date**	**Work-place**	**Education**	**Group of unemployed**	**Employed in years**	**Experience with using technology**
Counsellor1	F	22.9.22	Ljubljana			30 years	Only basic, for advanced, she forwards to younger colleagues
Counsellor2	M	22.9.22	Ljubljana		Unemployed (youth, long term and general)	8,5 years	Use it a lot, but depends on the client
Counsellor3	F	22.9.22	Ljubljana	Social worker	Young unemployed	8 years	Don't use it a lot
Counsellor4	F	21.9.22	Ptuj		Long-term and general / 50 + long term	15 years/1,5 year	
Counsellor5	F	20.9.22	Ljubljana		In-depth counselling long term	6 years	
Counsellor6	F	22.9.22	Ljubljana	Social worker		6 years	Uses different sites for vacancies, what the employers seek etc.

Appendix 2.2 Characteristics of interviewed in piloting of MLM 2, March 2023

Unemployed						
Name	Age	Sex	City	Educational background	Professional background	Duration of unemployment
Unemployed23	33	m	Ljubljana	None	Translator, Web developer, Operates 2 blogs at the moment (spiritual practices)	8 years
Unemployed24	54	m	Ljubljana	University degree in Philosophy and sociology of culture	Worked pro bono for several human organizations + digitalization of sources in an organisation	10 years
Unemployed25	51	f	Ljubljana		Retail	15 years
Unemployed26	27	f	Ptuj	High school	H	
Unemployed27	22	f	Ljubljana	Bachelor in translation, studying masters in translation	-	*student*
Unemployed28		m	Ljubljana	-	-	
Unemployed29	43	m	Ljubljana	Metallurgist, Metal engineer		5-6 years
Unemployed30	26	f	Ljubljana	Studies Sinology (without student status)	Bookstore, clothes shop (student work)	*student*
Unemployed31	53	f	Ptuj			
Unemployed32		f	Ljubljana		Sales and marketing	2 years

Counsellors					
Name	**Sex**	**City**	**Educational background**	**Group of unemployed**	**Employment period**
Counsellor2	m	Ljubljana	Philosopher		8,5 years
Counsellor4	f	Ptuj			
Counsellor8	f	Ljubljana			Since 2016
Counsellor9	f	Ptuj	Sociologist	Young people with disabilities	23-24 years
Counsellor10	f	Ljubljana			33 years