"We try to empower them" - Exploring Future Technologies to Support Migrant Jobseekers

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ABSTRACT

Previous work on technology in Public Employment Services and job market chances has focused on profiling systems that are intended for tasks such as assessing and classifying jobseekers. To integrate into the local job market, migrants and refugees seek support from the Public Employment Services (PES), but also non-profit, non-governmental organizations (herein referred to as *third sector organizations*, or TSOs). How do design visions for technologies to support jobseekers change when developed not under bureaucratic rules but by people interacting directly and informally with jobseekers? We focus on the perspectives of TSO workers assisting migrants and refugees seeking support for their job search. Through interviews and a design fiction exercise, we investigate (1) the role of TSO workers, (2) factors beyond those used in profiling systems that they consider relevant, and (3) their ideal technology. We describe how TSO workers contextualize formal criteria used in profiling systems while prioritising jobseekers' personal interests and strengths. Based on our findings on existing tools and methods, and imagined future technologies, we propose a software-based project that expands existing job taxonomies into a coordinated resource combining job characteristics, required competencies, and soft skills to support multiple informational tools for jobseekers.

1 INTRODUCTION

In Germany as in many other countries, a variety of non-profit and non-governmental organizations which are often run by volunteers provide job market integration assistance to migrants and refugees. One of their main services is providing assistance in the interaction with Public Employment Services (PES). We refer to these organizations as third sector organizations (TSOs). [34].

Approaches, methods and technologies used in PES and TSOs differ vastly from each other. PES across different European countries have deployed algorithmic decision-making (ADM), or *profiling* systems [3, 5, 59] which have various intended uses, including supporting job counsellors in assessing and classifying jobseekers' chances on the job market, as well as assisting decision-making regarding the allocation of resources such as funding for skills training. Researchers, civil rights groups and media outlets have critically discussed important issues around such technologies and their use in PES. Saliently, it has been argued that jobseekers often do not fit into preconceived categories and that inequalities get perpetuated through denied access to certain resources based on profiling outcomes [3, 48, 59, 69].

Previous research has discussed the perspective of PES counsellors [5, 59]. Our own previous work [63] has centered the perspectives and needs of jobseekers to re-imagine (algorithmic) decision-making processes in European PES. In this paper however, we set the focus on a different stakeholder group, namely the TSOs that fill an advocacy and support role for unemployed migrants in Germany.

We regard TSO workers as experts in supporting jobseekers to navigate both integration into the German job market, and the governmental PES infrastructure itself. Through interviews, we probe the practices of these experts in order to understand their perspective on the role of existing technologies in PES and job search. Through design fictions, we begin to imagine future technologies built from their perspective. It is important to note that TSOs have their own institutional logics which may be in conflict with jobseekers' personal perspectives, for example, prioritising success metrics (like number of people employed) over the job search priorities of the jobseekers [53]. We discuss this issue in Section 7.

Our research questions are:

(1) What role do the TSO workers play in job search for migrants and refugees?
(2) Which factors do TSO workers deem important for job search and how do they compare to factors ADM systems use for calculation?
(3) What do TSO workers see as an ideal technological approach to helping jobseekers with their job search?

We conducted 13 expert interviews with TSO workers and a design fiction exercise that resulted in 11 design proposals. We found that TSO workers take into account some of the criteria used by PES ADM systems to predict job market success, but that they contextualize them to derive recommendations suited to the jobseekers' individual needs. Moreover, they focus extensively on qualifications beyond formal criteria, taking into account so-called soft skills, empowering jobseekers through information, and prioritising jobseekers' personal interests and strengths.

After describing existing tools and techniques currently in use, we discuss the ideal future technologies that our participants imagined. Important aspects of these technologies are their capacity to help overcome language barriers, allowing jobseekers to explore their personal interests and strengths, and enabling jobseekers to complete more steps in their job search independently.

Together, our findings indicate that one of the most salient challenges for TSO workers is the high number of existing jobs and the impossibility of knowing all skills and prerequisites needed for each of these jobs. Personality and aptitude tests for job search are available, but they are seen as unhelpful by the TSO workers. We therefore propose a specific technological project in which an improved and richer taxonomy of jobs, including their associated features, is established. Multiple kinds of informational tools for jobseekers should be included, such as the mapping of personality and aptitude test results to specific jobs.

2 RELATED WORK AND BACKGROUND

Data-driven and algorithmic tools for the profiling of jobseekers are currently in use or have been in use in many regions worldwide, including the European Union. Reasons stated for introducing them include increasing efficiency and effectiveness of counselling, and standardising distribution of funding [3, 55]. Intended uses for these profiling tools include the assessment of jobseekers, allocation of resources, and evaluation of further steps in job search. Previous research on this topic has analyzed and criticized the impact of such systems in their respective national context. Criticism includes that due to time constraints and monitoring of decisions, systems have been or might operate on an almost automated basis despite being framed as decision support systems [3, 69]. Previous qualitative research found that the design of systems impact counsellors' choices significantly [4, 5, 59, 69]. We discuss this issue and its impact on jobseekers in the following section.

2.1 Profiling systems and their social impact

The way in which profiling is conducted differs across countries, with some using ADM systems during in-person counselling conversations, whereas other countries provide an online questionnaire that jobseekers fill out on their own [31, 79] or a combination of both. Germany currently still uses mostly caseworker-based profiling, where a jobseeker's strengths and potential are elicited during an in-person interview [25]. The profiling process is supported by software in which results are documented [21], and in certain cases, counsellors use an additional software tool to calculate labour market chances, which has been criticized due to a lack of transparency regarding the calculation method [2, 76].

ADM systems frequently consider the factors education level, field of education, and age. The currently suspended system in Austria [58] also considers job market information, nationality, and gender, which has led to criticism regarding the reinforcement of intersectional inequality [48]. Some countries use questions on "soft factors" such as job search behavior, and perceived obstacles to job search, such as self-reported mental health issues [31, 79].

Petersen et al. [59] found that some of the factors counsellors use for assessing jobseekers' chances are currently not used for calculation, including informal knowledge such as impressions obtained from meetings with jobseekers, in which they perceive information not captured in formal data, such as a person smelling of alcohol.

Outcomes of jobseeker profiling differ across countries, e.g. in the Netherlands, a percentage is calculated in order to determine which jobseekers get invited to face-to-face counselling conversations [79], whereas in the currently suspended Austrian profiling system, a jobseeker's assignment to a category influences their access to funding [3].

In some countries, like Sweden and Austria, counsellors can change a classification if they think a factor which is not included in the profiling system is important, such as motivation. This action might be impacted by e.g. short time slots allocated to counselling conversations (only 10 minutes in some offices in Austria) [3, 5], or monitoring of changes, such as in the discontinued system in Poland, where in 99.4% of the cases, PES counsellors accepted the profile indicated by the system [55]. In Denmark, counsellors use their informal knowledge to operate "grey areas" in which jobseekers do not completely fit into one category. Assignment to a certain category has an impact on obligations a jobseeker has towards the Danish PES and which sanctions can be imposed on them [59].

In light of the challenges surrounding the use of ADM in PES highlighted by previous research, as well as the doubts raised by various researchers about the effectiveness of ADM in predicting social outcomes [8, 12, 52], it is clear that a shift away from the focus on predicting social outcomes of individuals is required.

2.2 Access to the job market for refugees in Germany

In Germany, refugees are impacted by laws that forbid them from working until a certain time period has passed, missing diplomas and work certificates, or experiencing problems with the recognition of degrees [70, 71]. Law changes in regard to asylum and bans on employment since 2016 were supposed to lower bureaucratic hurdles concerning access to work for refugees [9], but uncertainties due to complex regulations, bureaucratic rules, and residency status remain [29, 30, 71]. As Gericke et al. [35] argue, state-recognized educational and professional qualifications and academic titles are often more important for initial access to work than practical skills

in the highly-formalized German labour market. Foreign educational qualifications and titles often do not correspond to German standards or are not recognized, depending on the country of origin [29]. In a study conducted by Flake et al. [30], internships emerged as the most important way to enter the job market.

Refugees to Germany are legally entitled to a number of measures from the PES, such as courses to learn the German language as well as law, culture and history [22]. Specialized work-related language courses, professional training, and other types of support are also available from local PES offices to find appropriate employment [29].

However, traumatic experiences and other psychological factors can seriously impact employability. A study by Schröder et al. [62] with refugees from Syria, Iraq and Afghanistan currently residing in Germany shows that approximately 75% of the participants reported having experienced different types of violence. Participants who reported these experiences also reported physical and psychological ailments twice as much as participants who had not experienced violence or trauma. Another similar study in Germany by Nesterko et al. [54] found that around 35% of the respondents suffered from PTSD. Similarly high numbers were found in other studies both in Germany and other countries [17, 37, 66, 68]. In addition to being offered employment-related services, many refugee jobseekers would need access to psychological services to support them in their efforts to enter the German job market.

2.3 Social Capital provided by TSOs

In view of the specific challenges faced by refugee and migrant jobseekers entering the German labour market, support provided by TSOs is vital. Services provided by TSOs can include job search specific assistance, such as help with administrative matters that arise in dealing with public authorities (in the following: "administrative matters") and the provision of job counselling services [42]. Some organizations offer psycho-social support or refer refugees to other organizations that do [71]. Their role can also include support related to social capital in the sense of "access to and use of resources embedded in social networks" [46]. Social capital allows migrants and refugees to profit from experiences of relatives, friends, or people from the same country, especially if these have been in Germany longer [35]. For instance, interview findings described by Etzold [29] show that more than half of those who enter Germany as asylum seekers obtain their first job through informal means, such as recommendations through acquaintances or relatives.

In this sense, TSOs in Germany have been described as providers of *"job market relevant social capital"* [73]. Through these organizations, migrants and refugees can find assistance in legal matters related to residency status or non-recognition of their degrees. Moreover, many refugees rely on volunteers, organizations or friends when writing job applications. Clients of volunteer-run organizations often end up working as interpreters for such organizations. By doing so, they use their language skills and are able to help other migrants [74].

3 METHOD

We used two methods to investigate our research questions: interviews and design fictions with 13 individuals working in TSOs

(either volunteer-run or state-funded) geared towards migrants. Overall, we conducted 13 semi-structured expert interviews and received 11 design fictions. Ten of our interviews were conducted on-site, and three via Zoom by two of the authors. The interviews that took place face-to-face were conducted either in the offices and localities of our participants or in the first author's office. After the interviews, we asked participants to fill out a form for demographic information and provided the design fiction material which included instructions and additional information on existing profiling systems. The participants then had the opportunity to clarify any open questions with the interviewer.

For the interviews and design fiction exercise participants received 50€. Some participants preferred to complete the design fiction exercise digitally and sent it to us via e-mail instead of using the prepaid envelope we provided. One of the participants preferred to finish the design fiction immediately after the interview. This participant wrote down his design fiction ideas and discussed them with one of the authors after the end of the interview. One participant decided to not complete the design fiction once the interview was done and in turn refused to accept the payment.

3.1 Interviews

We conducted exploratory expert interviews [15] with the purpose of "[obtaining] additional unknown or reliable information, authoritative opinions, [and] serious and professional assessments on the research topic" [44]. When defining expertise, we posit that our experts hold "knowledge that something is the case or knowledge how to do something" [43]. We view our participant's expertise mainly as a result of their experiences, independent of the power or status they hold [6]. Nevertheless, we acknowledge that some of these experts possessed a noticeable status within their communities, and held distinct connections to administrative powers of the districts they operate in [6]. We were particularly interested in their process knowledge, meaning their insights into courses of actions, interactions, organizational constellations, and incidents [15]. As such we conducted semi-structured interviews in order to capture their hands-on experience in assisting migrant jobseekers in their navigation of the German labour market, their perceptions of the current job seeking process in Germany and how future technologies can positively impact this process.

The interviews took place from June 2022 to September 2022. Twelve interviews were conducted in German, and one was conducted in English, following the participants preference. For this interview, a translated interview guide was used. One interview was conducted with two participants as they requested to be interviewed together. The duration of the interviews were planned to take around 45-60 minutes. Most interviews fell into this range, with two interviews lasting around two hours. We used three interview guides, chosen depending on the services of the organization: organizations that offer only job counselling, those that only help with administrative matters, and those that do both. One of our participants was not only a volunteer at his organization, but also a former client of the German PES himself. The interview guide was adapted to allow him to share his own experiences.

We located and contacted our participants in different ways. These included internet searches, publishing a flyer in a mailing list,

and recommendations from counsellors we already interviewed. After getting the contact information, we got in touch either by mail, telephone calls, or going to their office.

3.2 Design Fictions

Design fictions [14] have received interest in HCI and other disciplines. Previous research has used design fiction to elicit domain-specific insights from users, asking them about their opinion on the introduction or existence of specific technologies, services, and systems, e.g. in the areas of healthcare [51, 56], sustainability [23, 60, 77], and regarding specific technologies such as wearables [57, 78], virtual reality [40, 49], and personal assistants [61, 67].

Bleecker [13] argues that "Design fiction is about creative provocation, raising questions, innovation, and exploration." A variety of media can be used including text, objects, graphics and sketches [39]. In this paper, we follow Lindley and Coulton [47] who define design fiction as "(1) something that creates a story world, (2) has something being prototyped within that story world, (3) does so in order to create a discursive space." Design fiction rejects seeing complex social, cultural or political phenomena as technological problems to be solved, instead allowing the designer and audience to imagine the implications of technology [7].

Participants were given written instructions to complete the design fiction exercise which asked to assume that they are in the year 2050 and that the world and technology have changed drastically. In this setting, they should imagine that they have an object, which could also be a software or an app, that they can use to help jobseekers. The participants were then asked to describe this object textually and/or graphically, facilitated by suggested questions, including the following: How does this object look like? How does it interact with you and the jobseekers? How can it help you? How is this help being realized? Participants were asked to not let themselves be constrained by boundaries of current technical possibilities and to freely use their fantasy. The setting of the year 2050 was chosen in order to evoke a scenario in which technology could be drastically changed from the present, but in which the role of jobs, jobseeking, and job counselling may still reflect the current world.

We chose to combine two methods in our research design to find out about both current practices and imagined future technologies. To learn about current practices, we conducted the interviews which were focused on the TSO counsellors' experiences, and current methods and technologies they use. The interviews were followed by the design fiction exercise, which was intended to explore possible alternatives to existing profiling approaches used by PES [39, 40]. The interviews were also intended to ease the participants into the idea generation process of the design fiction, by prompting them to recall past experiences and access knowledge from their long-term memory [45]. We asked participants to complete the design fictions on their own, in order to allow them to generate ideas on their own terms and without the pressure caused by time constraints [50].

3.3 Demographics

Demographic and work-related information was collected via a form. The organizations had clients from diverse population groups.

Some of them offered counselling for all jobseekers, some for those from a certain region (e.g. Ukraine, Latin America), and three of our female participants worked for organizations that exclusively counsel women. Five of our participants identified as male and seven as female. Five had migration experience, with some migrating to Germany more recently (within the last ten years), and one having migrated to Germany in her teenage years a few decades ago. The countries the participants migrated from were Jordan, Tunisia, Syria, Argentina, Lebanon and Ukraine. Six of our participants worked in their organizations 30-40 hours per week in a paid position, while the rest spent significantly fewer hours, such as 2-4 hours or irregular intervals, in an unpaid position or irregularly paid position. The paid positions were financed by the German government, humanitarian organisations (some of them religious) or through donations.

All participants indicated that jobseekers become aware of their organization's services through referrals from other organizations, friends, and acquaintances. Other ways that were mentioned were through the organization's own website, flyers or posters. One organization advertises their services in public spaces.

4 DATA ANALYSIS

To analyze our data, we used a semantic approach to reflexive thematic analysis (RTA) as developed by Braun and Clarke [19] and Braun et al. [20]. RTA allowed us to capture and explore TSO workers perspectives and understandings of the job counselling process and administrative matters [24], while acknowledging that those perspectives and understandings are shaped by our participant's culture, language and political interests [75]. The basis for the inductive codes were the transcribed interviews, notes taken during and after the interviews, and the design fictions. The first author coded the material and proposed candidate themes. These themes were then discussed in an open discussion among all authors.

5 ETHICS AND POSITIONALITY STATEMENT

All data gathering and processing complied with the applicable laws (in particular GDPR), our universities' regulations, and the ACM Code of Ethics, including obtaining participants' freely given informed consent prior to the interviews, data anonymisation, and secure storage. IRB approval was not required by our universities.

Due to the importance of researcher reflexivity in RTA, which influences the data analysis process, we want to describe our background and how it relates to the participants in our research project. We are a group of researchers working within European Computer Science departments on AI Ethics and adjacent fields. Our disciplinary backgrounds are diverse, and include Data Science, Psychology, Sociology, Politics, Machine Learning, and Cultural Studies. We have a shared research interest in the sociotechnical nature of technologies and the discussion of how technology can be designed based on the needs of people impacted by it.

We were born in China, Canada, Russia, Argentina, and Germany, and all of us have migration experience, but not in the context of being refugees. One of the authors has done an internship in a TSO, with a focus on oral and written translation, filling out documents and aiding in further matters concerning German bureaucracy. Due

to this experience, she shares a similar background with some of the participants.

6 FINDINGS

6.1 Interviews

The interviews were summarized into four themes. Our participants described factors they take into consideration when assessing which job is suitable for the person they are advising and for assessing what their chances of finding a new job are. The interviews also focused on the approaches they use when working with clients.

6.1.1 Using standard, formal criteria. TSO counsellors work, to some extent, with and on the same factors that PES counsellors and systems use: the opportunities and challenges afforded by age, knowledge of the German language, job experience, and education level. They also take into account the de-facto challenges posed by care obligations (real or perceived consequences on availability and flexibility) and religion (employer reluctance to hire Muslim women wearing a headscarf in customer-facing jobs such as retail or hospitality).

In advising clients, our participants often face dilemmas. One example is the ambiguous role of apprenticeships. On the one hand, apprenticeships are highly valued in the German job market that relies strongly on qualifications and their formal certification, and being in an apprenticeship can help the apprentice secure a longer-term residence permit [16, 28]. On the other hand, average apprenticeship earnings are less than half of a full-time position at minimum wage [32, 36, 38], which deters many migrants and refugees who have to provide for their families, and jobseekers perceived as "too old" (beyond mid-20s) or holding a current residence permit with a short remaining duration may not even be considered by employers.

6.1.2 Valuing qualifications beyond formal criteria. Once formal conditions are clear, the TSOs workers look for criteria for successful job search that are often not taken into consideration in ADM systems. These include so-called soft skills, especially the willingness to learn, and motivation.

Participants mentioned communication skills and openness towards other people the most. When it comes to jobs with customer contact, several participants mentioned that their clients sometimes reject these jobs even if they have good communication skills due to experiences of racism. Others had rejected such jobs because they were frustrated by their slow progress in learning the German language. One participant mentioned that jobs in accountancy were very popular with his clients for a while because these preferred a job with numbers instead of language. Some clients give up learning German and decide to pursue jobs that are typically labeled as "low-skilled" and do not require language proficiency.

Additional influencing factors that were mentioned include motivation and willingness to learn more about jobs, as well as the mindset that one has towards job applications and work in general. One participant gave the following example:

> So when you approach this with an "I don't care, the main thing is to find work-" attitude, yes of course, then you're more likely to find jobs where you're completely interchangeable and replaceable. Or if you

instead somehow approach work with a desire and apply for jobs that you are interested in and so on.

The ability to work in a team, friendliness, flexibility and resilience were deemed important as well. One of our participants mentioned that she asks her clients whether they like to work individually or in groups and whether they prefer a more dynamic working environment or a more systematic one.

Informal job experience, such as having helped out in a family car shop or having cared for children, was also valued by our participants. In the highly formalized German job market, informal job knowledge is usually insufficient to find employment, but can be a good starting point for choosing further steps. One participant gave the example of a Syrian woman who did not have any formal degree or apprenticeship, but had worked with special-needs children in Syria, so she was able to secure funding for training to become a nursing specialist.

6.1.3 Empowering jobseekers through information. Our participants mentioned that jobseekers need information and knowledge to enter the German job market. In this context, one phrase was mentioned in several interviews: "help for self-help" (German: "Hilfe zur Selbsthilfe"). As one participant put it: "Not that we overburden him [a jobseeker] but that we offer him help where he needs it and there, what is so beautifully understood by this funny term empowerment, demand from him what he can also do himself." Another participant compared the role of TSOs to guardrails for jobseekers:

> The idea is always [...] to try to empower the clients to go the way themselves, supporting them with information. [...]. And then it doesn't matter whether the client is speeding on the left lane at 160 or creeping along the right lane at 60, but at least the rough direction is clear. And if they get too far off course, you're the guardrail and can hopefully help them find their way back to the original course.

This supporting information can take the form of answering questions related to the entire process of job search such as "Where can I find a German course? How can I get funding? How do I get my certificates recognized? What are my legal rights?". In particular when it comes to writing application letters, one of our participants mentioned the importance of empowerment, because employers value greatly the ability to work independently. One participant mentioned supporting jobseekers by informing them about labour laws, as she hopes to help them better understand both their own and their employer's obligations. She mentioned that there are violations from both sides, such as turning up late for work, but also unlawful firing of people.

It was mentioned that information available on jobs differs across professions, e.g. health sector jobs have good information available, while others do not. In many interviews the sheer number of existing types of jobs and the impossibility to provide information on all of them was mentioned as a problem. There are projects through which jobseekers can gain insight into different jobs by going to participating companies. Another way our participants support jobseeekers is by organising internships and by providing

information through activities and events for networking or getting advice.

Social capital is used in the sense of offering or disseminating information through social media channels or personal networks of the organization's volunteers, by connecting the jobseeker to a person who works in a similar job, or by recommending jobseekers to a potential employer. Jobseekers sometimes call their TSO advisor after a few months to tell them about their progress in a new job. Some of the organizations offer a type of mentoring for longer-term assistance in job search. The organizations also communicate with each other forming a wider network that allows them to refer jobseekers to other organizations if their needs are not within the organization's competencies.

The "help for self-help" principle is often applied for resumes. One of the organizations offers information events regarding job applications, as the structure and content of resumes may differ from those that are standard in jobseekers' countries of origin. All organizations offer individual help with resume writing. One participant mentioned that in 80% of the cases, she helps clients make a new resume or alter their existing one. When she helps jobseekers with their resume, they sit in front of the computer together and she types, while the jobseekers tell her what they have done in their life, and they compare that to the existing resume and discuss. Her goal is to enable the jobseekers to use an online tool for resume building. Another participant who also uses online tools argued that resumes are "so complicated here in Germany, so strict." One of the organizations has a link list with jobs in specific sectors, which they give to jobseekers once they have finished writing their resume.

6.1.4 Exploring personal interests and strengths. One of the most important aspects of the counselling is the exploration of personal interests and strengths. Some jobseekers approach TSOs with a clear idea in mind, others look for guidance on suitable jobs. These are explored through different approaches, e.g. by asking about hobbies. One situation was described as follows:

> We asked him: Do you have any hobbies? Do you like to do anything? He couldn't answer. But when we asked him, it turned out that he is very athletic, yes, he does a lot of sports. That was at least a point of contact. And we then agreed to move forward [...] that we said we would check out what vacancies there might be as a sports specialist.

A similar approach was described by another participant: she described talking "about life in general" to find out what her clients' "true interests" are.

All participants mentioned that jobseekers' wishes are prioritized over suggestions from the counsellor. One participant explicitly said "I definitely don't say what job [...] is suitable, that's up to them to decide," and recommends doing an internship to get some deeper insight if there are doubts. If a person is interested in a job, then they look at job advertisements and the required skills and competencies for the job together. During one interview, it was mentioned that if jobseekers have a specific job they would like to pursue but cannot find employment due to reasons such as language skills, the counsellor tries to find similar jobs.

In one interview it was mentioned that the participant tried to use the online tests provided by the German PES but did not find them helpful:

> It's not really intended for people who can't speak German very well. [The tool's output indicated simply that] he can work very independently, that he is very communicative and that he can react very well in conflict situations. But all of that, I would say, doesn't point in a professional direction yet.

She called the tests a "waste of time," compared them to assessment centre tests, and stated that, due to the way questions are formulated, a rich vocabulary in German is required. She also mentioned that she tried to use tests on commercial websites but found the descriptions of jobs were too short to use during counselling. Instead, she started using competency cards with her clients, which are explained below.

Participants described a range of methods and approaches that they use during job counselling to explore personal interests and strengths:

Competency cards (German: Kompetenzkarten) [10, 11]: The cards are available in different languages (among them Arabic, Farsi and Russian) and cover the areas of social, personal, technical and methodological competency (e.g. ability to work in a team). Each card includes a picture, a translation of the competency into different languages, and a description in plain language. There are also references to further information on the respective competency. Some of the cards have a red border which indicates that they can be specifically used in the profiling phase in the German PES. The participant said she lets the jobseekers pick out three cards and explain why they think they have this competency.

Videos: During several interviews, it was mentioned that there are videos of certain jobs that can be shown to jobseekers, such as videos about what an electrician or mechanic does at work.

Life profile (German: Lebensprofil) [41]: This is a biography-oriented analysis aimed at taking a structured and comprehensive look at the past. It covers stages and activities alongside the career (e.g. volunteering and family work) and provides an overview of what has been learned in each case. Competencies can be derived from the life profile. Women who come for counselling are asked to talk about their life experiences and prior activities, including their refugee experience, or divorce, for instance. The counsellor then derives competencies from this. The TSO considers competencies to be transferable from private life to professional life. One of the participants said she encourages "women to distance themselves from outside pressure and focus on their inner self."

Photo interest test: (German: Foto-Interessen-Test) [64, 65]: This set of photographs contains around 130 photos of different jobs that are used as a basis for conversation with jobseekers. The original test is computer-based and the jobseeker uses mouse clicks to profess either no interest, average interest, or high interest. Our participant uses these in a paper-based format in cases were there might be language difficulties and no interpreter is available.

6.2 Design Fictions

Many of the design fiction ideas were inspired by existing technology or by science fiction. The imagined technologies contain

suggestions for altered versions of existing services, slightly improved versions of existing tools (such as providing government service through an app in multiple languages) as well as suggestions for technologies that mirror the services currently provided by the TSO counsellors themselves. The technologies' functions are reminiscent of the counsellors' currently used approaches of empowering jobseekers through information and exploring personal interests and strengths.

Smart glasses: This design fiction conceptualised glasses for jobseekers that are able to parse what they are interested in, what brings them joy and what sparks their curiosity by reading along while the jobseeker is reading a newspaper, watching a movie or gauging reactions to certain events. The inspiration came from Google glasses.

Virtual Reality (VR) glasses: The VR glasses are used to look at the tasks of jobs a jobseeker is interested in. It should evoke the feeling of going to work and "looking over someone's shoulder." as the person in the VR video explains what they are doing, how this relates to other parts of the company and why the task is important. Prerequisites needed to learn and execute the tasks and how an apprenticeship is structured should be explained. If someone is interested after the VR experience, they should be recommended instances where they can apply for this job, such as companies for apprenticeships, or schools. There should also be a function to contact someone to ask more questions. Furthermore, there should be information on how many job openings there are for this job and what the expected wage is. For communication, different languages should be available. There should be a playful approach to the VR environment and it should always be possible to talk to a human. Before using the VR glasses, there should be a questionnaire on interests and strengths, and job experience. It should also be possible to generate a resume.

App: One participant conceptualised an app with contact information on counselling services in the jobseeker's own language (depicted in Fig. 1).

Robots: The same participant also imagined a humanoid robot with Amazon's Alexa-like qualities. This robot acts as a personal assistant and helps with filling out forms and going to counselling conversations, not only in the PES but also in other public authorities. It should also have the function to indicate employment possibilities and teach the jobseeker about the new culture they are living in, including work culture, and offer advice in other areas of life, such as kindergarten and residency-status issues (depicted in Fig. 1). Another design fiction imagined robots helping with writing job applications, and accompanying jobseekers to job interviews, thus lessening the workload of counsellors. They were also imagined to offer more "objective" job placements, since they could process more data than current profiling systems, and thus possibly eliminate the impression of arbitrariness, which is often criticized by jobseekers.

Platform: This design fiction described a platform available as an app which allows contact to psychologists and specialists for different sectors with strong social skills when jobseekers need advice and support.

Dictionary: This technology was conceptualised as a dictionary similar to the Babelfish in "Hitchhiker's guide to the galaxy." At its core, the idea is to help jobseekers with communication in different
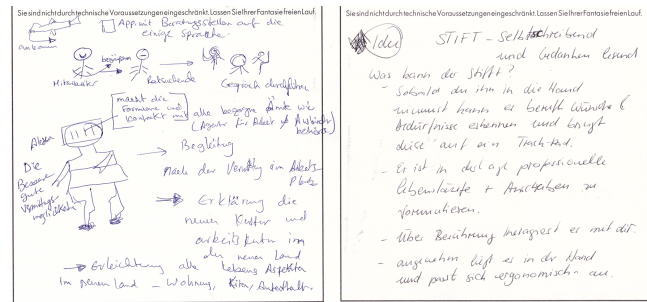
Figure 1: Left: Drawings and descriptions for an app with contact information for counselling services and a robot acting as a personal assistant, Right: Ideas for a self-writing and thought-reading pen

languages, allowing them to understand any language that they are hearing. The participant also mentioned that the first steps are already being taken nowadays with apps that allow for simultaneous translation, and that the technology could, once it becomes less error-prone, be combined with a hearing aid.

Server: This design fiction was inspired by stem cell donations. There should be a central server somewhere in the world, analogous to a stem cell bank. With a cotton swab, skills, strengths, and weaknesses should be captured in digitized form and sent to this central server. The skills are not entered into the system by a human. If the employer is looking for an employee who fits a certain position, such as being able to work under pressure, having knowledge of a certain topic, being reliable, motivated or goal-oriented, then the employer does not need to look on their own anymore. If an employer connects their organizational structure to the server, the employer and potential employees are notified with a message indicating that being introduced to each other would be helpful for both sides. The notification is anonymous and automatized. This procedure cannot be influenced in any way such as through advertising or by rival companies. Both sides (employer and jobseeker) should have the possibility of doing a national or international search. If both sides have consented to getting introduced to each other, then the contact information is revealed.

Helmet with sensors: One person described a helmet or a net of sensors, put on the head of a person. The sensors are able to accurately measure brain waves of a person so that talents, inclinations, interests, values, favorite activities, and the ideal job can be determined. Then, free job openings are searched for on the internet.

Self-writing and thought-reading pen: This technology features a pen that can recognize professional wishes and needs and puts them on a track pad. It is also able to formulate professional resumes and cover letters. Interaction should be possible through touch gestures (depicted in Fig. 1).

The other design fiction included general ideas for computer-supported services for migrants, such as fostering emotional intelligence, language skills, intercultural competencies, and knowledge about labour laws through digital tools.

In the design fictions, we identified two themes ("Empowering jobseekers through information" and Exploring personal interests

and strengths") that corresponded with those identified in the analysis of the interviews as described in Sections 6.1.3 and 6.1.4. The theme "Technology is objective view" was additionally identified after the analysis of the design fictions. We describe these findings in the following subsections.

6.3 Empowering jobseekers through information

The above-described imagined technologies focus on heightening the autonomy of jobseekers, which is in line with the value of empowerment and "help for self-help" that was expressed in the interviews. They can be split into two categories which support different ways of gaining independence: first, technologies that support jobseekers in practical tasks related to job search. This includes the VR glasses that help with writing resumes and cover letters, the humanoid robot, and the self-writing and thought-reading pen. The second category is technology that provides information related to jobs and job search. The VR glasses are an example, as they offer jobseekers recommendations for companies, apprenticeships, or schools, but also information on expected wage. In the interviews, it became apparent that wages play a role in the selection of jobs, especially the trade-off between long-term prospects through apprenticeships or short-term needs of earning money to support their family.

Although there are those technologies that consider human contact to be important, e.g. the platform which allows contact to psychologists and other specialists or the VR glasses that enable jobseekers to contact someone to ask further questions, there are also technologies like the humanoid robot in which the human factor is minimized. The robot is imagined to act as a personal assistant or mentor and to offer help with tasks that are currently done by TSO counsellors, such as help with filling out forms, teaching about the new culture, or information on residency status.

Many technologies consider communication and receiving information in one's own language as empowering, such as the dictionary which offers simultaneous translation to jobseekers or the app with information on counselling services in the jobseekers own language. This connects to the interviews, as it was mentioned that knowledge of the German language impacted the jobs available to migrants and refugees due to language prerequisites, but also communication with PES counsellors and employers.

6.4 Exploring personal interests and strengths

The topic of job satisfaction through the ability to explore personal interests and strengths also occurred frequently in the design fictions, as the following excerpt from the description of the smart-glasses design fiction illustrates:

> I would say that if more people find out what truly makes them happy [...] then the job market would completely change. People who are happy with their decisions, have less problems with violence and dissatisfaction, external validation or feelings of loneliness. I really think that this type of person is more efficient and motivated in their job.

In the interviews, we noted that the exploration of strengths and interests is currently conducted mostly through methods like the competency cards or the life profile. In contrast, many technologies in the design fictions do not include human-to-human interaction. Examples of such technologies are the smart glasses that can parse what jobseekers are interested in, the server which uses a cotton swab, the sensor helmet or the self-writing and thought-reading pen. The smart glasses are imagined to be worn by jobseekers when they are reading a newspaper or consume other content, while taking their reaction to this content into account, so there is no type of interaction involved. "Automatic extraction" of interests and strengths is also conducted through the cotton swab and the helmet's sensors.

6.5 Technology is objective view

In the interviews it was mentioned that migrant and refugee jobseekers can be subjected to discrimination due to their skin color or religion. The imagined technologies describe ways in which human intervention in the hiring process is minimized in order to avoid such discrimination. An example is the server which uses an algorithm to match a jobseeker and potential employer in an anonymised and automated way. Another imagined way to avoid discrimination can be seen in one robot design which was conceptualised as being more "objective" in the profiling process through its capability to process more data than is possible in current profiling systems and, more importantly, by upholding an impression of rational decision-making associated with a judgement rooted in data. By doing so, the robot would avoid the impression of arbitrariness which is often associated with human decisions on resource allocation in the PES.

The participant described his thoughts on this robot design:

> There is the situation, that they [the jobseekers] often think, partially due to a lack of knowledge, partially due to bad experiences or something, that they are treated badly. And if there is a seemingly neutral entity, like an AI-based robot, then this attribution is gone for the moment. This means the human can also feel more comfortable, even though at the end he will be helped just as little [as by another human].

This shows another aspect to human-machine interaction: From his account we can infer that the participant does not necessarily think that the robot would be bias-free, but that the jobseekers interacting with it might feel more comfortable due to it being non-human.

7 DISCUSSION

Counsellors see themselves as supporting jobseekers in various ways such as providing them with information, enabling them to explore their own interests and strengths, and writing job applications. The principle of "help for self-help" was mentioned frequently during the interviews. However, this principle may sometimes go against the jobseekers' wishes, as some counsellors might prioritise their own judgement or assessments concerning the best possible outcome for jobseekers. This became apparent through statements such as the wish of preventing jobseekers from being "stuck in dead-end-jobs" and helping them find a better long-term option, whereas the jobseekers might be satisfied with their job or have chosen it to

support their family in their home country. This highlights a difference between counselling in TSOs and the German PES. In previous work [63], we found that the German PES focuses on securing job placements in a short amount of time rather than centering their counselling around long-term prospects. For example, one of the jobseekers who participated in that study complained about being offered supermarket jobs despite having a university degree. On the other hand, participants also reported consulting PES counsellors for help and advice on finding a suitable job and navigating the German education system.

The largest differences between TSO counsellors and PES counsellors seems to be the time that they were able to dedicate to each jobseeker (long-term relationship building), and the freedom to choose any method or tool that they like, as PES counsellors may be obligated to use a specific profiling tool. Another difference is that TSOs appear to offer more translation and interpretation services: in our previous work [63] a participant mentioned difficulties communicating their needs and desires to PES counsellors due to language barriers. TSOs, in contrast, are frequently helped by volunteers, often former clients, who provide interpreting services. Through TSO counselling, jobseekers are able to explore their possibilities without sanctions or obligations.

TSO counsellors take formal factors into account, which are also present in current PES systems, such as age, education level, and job market demand. Additionally, they place importance on jobseekers' soft skills, individual circumstances, and interests, which are deemed important for job satisfaction. The exploration of such factors is specifically useful in cases in which accreditation of education is denied and the goal is to find transferable competencies.

On the whole, by not using profiling systems, TSO counsellors may have greater freedom to address and respond to the needs of an individual jobseeker. Currently, they rely mainly on paper-based and interview-based methods, and only rarely use computational tools. This raises the questions (a) whether counsellors are able to focus more on the individuals needs and wishes *because* they rely on human connection instead of technological tools and formalised criteria, (b) whether TSOs currently cannot afford such technology, or (c) whether technological aids fitting the counselor´s expectations and working practices are yet to be developed.

The TSO counsellors' design fictions provide some clarification regarding these questions. We note that many of the imagined technologies would enable jobseekers to do on their own the tasks that the counselors are currently doing together with them, which is in line with the value of empowerment that was expressed in the interviews. In some of the design fictions, technology is presented as a more *objective* tool for job search than methods which are perceived as utilising more human input. It is assumed that discrimination due to personal characteristics such as race and religion can be avoided through anonymisation or digitisation of processes and by reducing PES employee intervention. A slightly similar concept to the imagined server is already in use in Luxembourg, where the job portal serves as a platform to publish all profiles of jobseekers automatically in anonymised form, meaning that personal characteristics such as name, gender, and address are omitted [1].

Language skills were mentioned as being important for finding and keeping employment, but also for counselling conversations. One of our participants relies on picture-based methods when no interpreter is available, while other participants use competency cards which have pictures and text in several languages. Many of the imagined technologies focused on mitigating communication problems, e.g. by offering simultaneous interpretation, exploration of jobs in different languages, or accompanying jobseekers to counselling conversations.

Social capital was described as important in the interviews. Networking and establishing new contacts are possible through connecting the jobseekers to specialists, employers and other organizations, and jobseekers can network among each other at special events conducted by TSOs. In addition, TSOs offer information on German (work) culture, and assist in dealing with public authorities and filling out forms.

The minimization or removal of the human factor might also be influenced by the hope of TSO counsellors that jobseekers will be able to do more tasks on their own to strengthen their self-confidence and agency, which in turn would enable the counsellors to focus more on other roles their organizations can fulfill. This includes helping build social capital by offering networking events, and providing contact to German culture.

7.1 Recommendations

In order to take part in the creative process of the design of future technologies to support migrant jobseekers, we brainstormed ideas for potential prototypes based on the participants' design fiction outcomes. Through a synthesis of their concrete ideas and an analysis of overarching themes, we considered potential ideas for specific technology proposals with regards to four questions: (1) how does it build on tools that the counsellors already use and consider useful?; (2) how does it address the needs and desires expressed by counsellors'?; (3) is it currently possible to create?; (4) is it advisable to create, from a technology ethics perspective?

The specific visions described by our respondents are not (entirely) feasible given the current state of the art in technology. Additionally, suggestions for mind reading type technologies such as the stem-cell server and sensor helmet bring to mind clear surveillance and human rights concerns if implemented outside of our described "ideal" scenario. Based on our findings, however, and taking into account these four considerations, we would like to propose a specific technology as a focus for future work, which is not the only possible technological outcome of our findings. We hope to convey through this example how the interviews, design fiction exercises, and analyses described in this paper can inform specific technological design.

The counsellor's imagined technologies indicated a desire for technologies that empower jobseekers through information, along with a prioritization of finding the right match of interests and strengths to career path. Additionally, we considered the identified theme of technologies as "objective"; as being able to conduct certain tasks as good, or better than counsellors. Considering this in conjunction with the interviews, we were able to identify a clear role where computational technology could indeed do something that the counsellors stated they cannot do, namely "knowing all of the jobs." Specifically, the counsellors expressed (a) that they "just can't know all of the jobs," that (b) existing tests on personality, aptitude, soft skills are not only disjointed from one another, but

also of limited use for job counselling purposes, and (c) that there are job taxonomies available which are, however, fractured and limited.

We propose to put the already existing resources into a richer ontology database that maps existing professions to relevant competencies, interests, and needs. This should be purpose-built for jobseekers and the counsellors who support them, meaning the factors that the counsellors identified in the interviews (section 6.1) of relevant qualifications beyond formal criteria, and relevant personal interests and strengths, should be included in the ontology. On top of this database, several services could be offered: a more centralized online tool for enhanced skill assessment, job matching and job exploring, a resume builder, and other tools for counsellors to use with jobseekers. There are currently 324 accredited apprenticeable professions in Germany [33], apart from jobs being perceived as low-skilled and those done by university graduates, which makes it a considerable — but feasible — undertaking to gather information on each of those. Methods for monitoring and updating the database would also need to be built in to the process because job categories can shift quickly and often. This system could build on offers such as the EU's ESCO (https://esco.ec.europa.eu/), but enhance it by knowledge drawn from the expertise and needs of on-the-ground participants such as TSOs and jobseekers themselves.

8 SUMMARY AND CONCLUSIONS

We described the outcome of 13 interviews and 11 design fictions. Our interview findings include that TSO counsellors consider, to some extent, the same factors that are used in PES profiling systems, such as age and education level. Once these conditions are clear, the counsellors consider further criteria such as "soft skills," including the willingness to learn and motivation. Informal job knowledge serves as a starting point for choosing further education or an apprenticeship necessary for the highly-formalized German job market. Apart from offering information on questions related to the entire process of job search to empower the jobseekers, they also offer help with writing job applications. Particular importance is placed on the exploration of interests and strengths of jobseekers, which are elicited through various paper- and interview-based methods.

The design fictions contain many ideas for altered versions of existing services, and some were inspired by existing technology, others by science fiction. Many of these technologies would enable the jobseekers to do tasks on their own which are currently offered as a service by TSOs. This can be interpreted as hoping to empower the jobseekers by enabling them to act more independently and in their own language.

We then demonstrated how the perspectives of our respondents can inform design for specific new, and feasible, technologies. We outlined a proposal for technology that better incorporates multiple stakeholder perspectives than current systems that rely heavily on "official" views. In particular, existing resources such as personality and aptitude tests, as well as information on jobs, should be put into a richer database, which maps existing professions to relevant competencies. On top of this database, several services should be offered, among them a more centralized online tool for enhanced skill assessment and exploration of jobs.

Above all, counselling as well as technology should not focus on imposing profiling classifications on jobseekers, but on empowering them. This concept was neatly summarised by one of the participants: *"The idea is always help for self-help. So in the sense of, not that we take something from the client, but that we try to empower the clients to go the way themselves, supporting them with information."*

9 LIMITATIONS AND FUTURE WORK

We have focused solely on organizations based in Berlin, due to the location of the authors and further access questions. Berlin is by far the largest German city and its population is diverse [18], which could mean that there might be more opportunities to use social capital than elsewhere. Further research could focus on TSOs in other parts of Germany or other countries, and show the differences. In addition, not all TSOs we conducted interviews with were financed in the same way. We focused more on the services the TSOs offered, than the differences between financing models and their consequences for counselling. Moreover, almost all imagined technologies were conceptualised as being independent of counselling sessions. If such technologies were to be developed, the jobseeker view would need to be included, but PES counsellors' views on such technologies should be elicited as well.

Regarding resume writing, we are continuing to develop a co-creative resume writing tool which gives contextualised suggestions and is based on large language models [26].

Finally, it should not be forgotten that some problems need to be addressed on the policy level, such as matters regarding residency status. In Germany, the "opportunities right of residence" law (German: "Chancen-Aufenthaltsrecht" [27, 72]) which took effect in December 2022, aims at improving conditions for "well integrated" and for qualified individuals. In future work, such legal and policy changes should be considered in tandem with technological proposals.

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