Exploring Design Space of Collaborative Career-Seeking Experience for People on Autism Spectrum

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Abstract

Career searching can be overwhelming and difficult without knowing the proper directions and guidance, especially for those with Autism spectrum disorder (ASD). While recent advances in job search platforms have contributed to reducing the time and effort for job seekers in accomplishing their goals, these technologies do not provide specialized support for seekers in the Autism spectrum (ASD). In reality, only a fraction of ASD can land on their career path using such support while fighting against their unique disorders that affect their daily routine and social activities. In this position paper, we explore a new design space of collaborative career-seeking design for ASDs. In particular, we aim to explore how future designers can leverage technology and AI to motivate ASDs to effectively collaborate with their social capital (i.e., professional helpers such as career coaches and their near surroundings such as their family and friends) in their career-seeking process. ASD's employment searching process highly differs from people in the neurotypical spectrum (NTs). Therefore, designing an interactive system for ASD needs special considerations, and most of the existing interface/research has not explored this area sufficiently.

Keywords

Autism, job-seeking, group work, computer-supported cooperative work

1. Introduction

Employment is a crucial contributing factor to socioeconomic development and improving the quality of life for people in the autistic spectrum [1, 2, 3]. In the United States, 85% of people on the autism spectrum are unemployed. This rate contrasts with the overall US population with a 4.2% unemployed rate in 2021 [4, 5]. Prior research shows that an inclusive work environment that considers employees with disabilities or hires people on the autism spectrum is 30% more productive than those who do not hire them [4, 6]. Although the inclusion of the neurodiverse community at workplaces is treated as a competitive advantage, it requires significant human resource reform and particular infrastructure to access their talents [6]. As neurodiverse individuals may need exceptional guidance and support for their daily routine, it is essential to ensure a conducive experience for people with autism (ASD) throughout their career journey. Along with providing supportive facilities in the workplace, revisiting their job-searching process is a primary issue to consider.

The emergence of advanced AI-driven technology [7, 8, 9, 10, 11] has made the employment searching and hiring process more accessible for the majority of job seekers. As a result, plenty of job-searching tools and websites, such as LinkedIn, Indeed, Glassdoor, and Upwork, are being developed and used for job searches. These platforms broaden the professional network by allowing individuals to connect through the service providers. Users can search for jobs online, get training and apply for their desired positions with less effort through these applications. However, the designs of these technologies are generic and most of them do not provide specific features dedicated to supporting people with ASD. An ASD's employment searching process highly differs from an individual in the neurotypical spectrum (NT) [6, 10, 12]. ASDs can be vulnerable by themselves to multiple factors; such as difficulties in tracking things [13], their fragile attention that can be distracted easily [13], and difficulties in fluently interacting with strangers [14].

In this paper, we explore a set of potential design directions and ideas that can allow ASDs to better leverage their social surroundings–a group of people who are willing to support them, such as family, close friends, and career coaches–in seeking their job. Social aspects can play an important role in job searching, especially for an underserved population [9]. While there exists a rich body of supporting people with ASDs in motivating their career-related activities, we found little work focusing on helping people with ASDs to collaborate with their key surroundings in their job search. We hope the design space of *Collaborative Job Search for People with ASD* can provide insights to future designers who work on this design space.

The rest of the paper is structured as follows. Section 2 describes the preliminary design space in detail. Section 3 conveys some limitations of this research and lastly, we concluded with our future work directions.

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2. Design Space

We aim to design a collaborative job-seeking experience for people on the autism spectrum. In particular, we seek to understand how the new design can better help ASD to get advantaged by their key social surroundings in their job-seeking process.

In characterizing the targeted users, we focus on the people of ASD between Level 1 and Level 2, who may have challenges in having a job at a prestigious workplace while can still operate ordinary tasks. Challenges may include how to connect our target users with local businesses better so that our target users would be more likely to look for jobs in their current living areas. Local jobs are focused as we expect our target users to be less likely or do not wish to move out from their family and familiar social infrastructure [15, 16]. Many of them struggle to identify career opportunities, and building a collaborative job-searching design could practically help them and create an impact. As our exploration aims at collaborative job seeking, we introduce two more additional stakeholders other than job seekers with ASD: (1) professional career advisors and (2) seekers' families and their close social surroundings.

Since there can be multiple considerations in designing groupware for our problem, we thought emphasizing the following aspects could yield design requirements/guidelines that lead to success in their teamwork. Some possible considerations are as follows:

Division of roles between stakeholders: There can be varying roles and responsibilities among the stakeholders based on their unique situations for job search, which we are unaware of. Understanding the role of each user is essential for designing a collaborative platform. Every case is unique; for example, the role of a family member of job seeker A is not the same as the role of the parent of job seeker B. In a situation where everyone shares a common goal, the system can suggest its users adopt some generic guidelines for initiating the employment-seeking process. Expert career professionals can play a significant role here in specifying these guidelines. In other situations where individuals' cases are unique, the users can still share how they perform their tasks, their roles, and their concerns.

Characteristics of communication between stakeholders: Each stakeholder may have different information needs. The focus would be on what types of communication occur between these stakeholders (i.e., communication between ASD and Experts, ASD and family, ASD and ASD), the characteristics of each type of communication, and how it can be improved. ASDs can share their experiences of the whole employment search process with other ASD individuals or discuss the problems they faced while searching. Similarly, family personnel who have already helped their ASD friend/family member to get a job can share their experience with other ASD members (outside of their family) and guide them. Assuming these different stakeholders can perform all possible communications and connect to each other through a single platform. In that case, the platform will create an extensive network where everyone could benefit from each other.

How AI can mediate the communication and information exchange throughout the process: AI can facilitate multiple support depending on stakeholder dynamics and communication needs. For example, there might be cases when professionals or career experts want to share some sensitive information with parents/family members, but they don't want to deliver that information by themselves. AI can work as a medium between this kind of communication and provide necessary suggestions specific to personnel. Another example is, going through each of the job deadlines one by one which can be cumbersome for users to track, and ASDs would not be willing to do that by themselves. An intelligent calendar itself can manage this tracking by updating all information on past/upcoming deadlines and sending reminders to users. Language barriers can be an issue in stakeholder communication. However, AI can instantly translate and interpret hundreds of languages. A real-time transcription feature will be helpful in this scenario while chatting or conversing.

Job search stage-wise design The baseline design will include some generic features that can be similar to the design for neurotypical people. For example, users may be able to search for a job, create a repository/project, apply for jobs, schedule interviews, update materials, etc. Such a stage-wise design can inherit the properties of generic design but it can also be evolved based on the three stakeholders' unique needs. A customized chatbot or assistant is helpful for tracking all application statuses, and upcoming schedules and managing personal resources. Sometimes, parents may want to have a certain degree of control over their child's resources or work on their behalf through an entire application process. The system can allow configuring of such permissions so that multiple users can work together on a single project. Prominently highlighting the nearest deadlines, distinguishing the jobs advertise that already have passed, and filtering the most suitable options are some features that have been considered valuable for future assistive design in the past literature [11, 17]. Asking preset questions about application submission and interview experiences [11], suggesting training materials for skill development, and engaging users in the self-profile-assessment process can also be effective for career building.

Adaptive information selection and presentation between stakeholders: Another perspective we think important is to understand what information can be shared or not. For example, users may need some as-

sistance to improve their resume and they need to compare it with others. However, they may not want to share resumes and application materials directly with other groups. A smart system can group similar types of resumes and pull them anonymously by hiding personal information or generating a template resume using only essential information. Similarly, users should be able to ask questions/post comments anonymously if they wish. Aside from such privacy-related considerations, the system can also adaptively present information depending on the readers' cognitive ways of interpreting information. For instance, ASDs suffer from their cognitive limitations and there are several guidelines explaining how the typeface and information should be visualized [18, 19]. It is highly recommended to consider each design in a more presentable way.

Most of all, we expect researchers to work on the problem space of collaborative job search for people with ASDs would need to conduct a formative study with their expected stakeholders. For example, we find the current literature is missing (1) an understanding of the challenges ASDs face using everyday technology (e.g., LinkedIn) and (2) an identification of how a new design can facilitate their social interaction to improve their career-seeking experiences.

3. Discussion

Our proposed work will allow us to understand the challenges that people with ASD would face in shaping their careers and develop a novel tool to help the ASDs better leverage their social capital to establish their self-realization. However we may face some limitations in particular scenarios, for instance, some ASDs may not have any supporting peers to help their job-seeking process. Especially families of low socioecological status can be limited in helping job seekers on the spectrum for the lack of time, low digital literacy, or other restricted factors. We look forward to overcoming these issues and devising future design considerations to develop better accessible tools in the context of collaborative career-searching experiences for the autism community. To make a more tangible impact in practice, we believe further research and deployment should follow.

4. Conclusion

While extensive research [20, 21, 22, 10] is going on designing AI-driven assistive technology, little is known about the most efficient and effective ways to support adults with autism to obtain and maintain employment [23]. In this position paper, we have discussed our preliminary design spaces and possible research scopes. We would like to further extend our research to create an intelligent system that can empower people with ASD in several alternative ways. Our future research directions may include

1. Motivating a better awareness about neurodiverse hiring from employers' perspectives to help them extend hiring ASD hiring,
2. Helping the new design of volunteer-sourced design that helps a group of social volunteers to help people with ASD to seek a job,
3. Providing a set of intelligent further features that can help people with ASD to make more informed decisions on choosing the jobs and preparing the interviews,
4. Extending the design with underrepresented and vulnerable people beyond ASDs.

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References

[1] J. Latham, B. D. Davis, The socioeconomic impact of chronic pain, Disability and Rehabilitation 16 (1994) 39–44.

[2] C. R. Webb, M. Wrigley, W. Yoels, P. R. Fine, Explaining quality of life for persons with traumatic brain injuries 2 years after injury, Archives of Physical Medicine and Rehabilitation 76 (1995) 1113–1119.

[3] A. Ohl, M. Grice Sheff, S. Small, J. Nguyen, K. Paskor, A. Zanjirian, Predictors of employment status among adults with autism spectrum disorder, American Journal of Occupational Therapy 71 (2017).

[4] R. D. Austin, G. P. Pisano, Neurodiversity as a competitive advantage: Why you should embrace it in your workforce, 2017. URL: https://hbr.org/2017/05/neurodiversity-as-a-competitive-advantage.

[5] U. D. of Health Human Services, Data statistics on autism spectrum disorder, 2021. URL: https://www.cdc.gov/ncbddd/autism/data.html.

[6] M. Mahto, S. Hatfield, B. Sniderman, S. K. Hogan, A rising tide lifts all boats - creating a better work environment for all by embracing neurodiversity, 2022. URL: https://www2.deloitte.com/us/en/insights/topics/talent/neurodiversity-in-the-workplace.html.

[7] S. R. Hong, M. M. Suh, N. Henry Riche, J. Lee, J. Kim, M. Zachry, Collaborative dynamic queries: Supporting distributed small group decision-making, in:

Proceedings of Conference on Human Factors in Computing Systems, CHI '18, 2018, p. 1–12.
[8] S. R. Hong, M. M. Suh, T. S. Kim, I. Smoke, S. Sien, J. Ng, M. Zachry, J. Kim, Design for collaborative information-seeking: Understanding user challenges and deploying collaborative dynamic queries, in: Proceedings of the ACM on Human-Computer Interaction, volume 3, CSCW, 2019.
[9] T. R. Dillahunt, A. Lu, Dreamgigs: Designing a tool to empower low-resource job seekers, in: Proceedings of the Conference on Human Factors in Computing Systems, CHI '19, 2019, p. 1–14.
[10] M. Fabri, Participatory design with autistic adults – involving, supporting and empowering communities, 2020. URL: https://www.emeraldgrouppublishing.com/topics/blog/participatory-design-autistic-adults.
[11] E. Wheeler, T. R. Dillahunt, Navigating the job search as a low-resourced job seeker, in: Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems, CHI '18, 2018, p. 1–10.
[12] J. Davies, B. Heasman, A. Livesey, A. Walker, E. Pellicano, A. Remington, Access to employment: A comparison of autistic, neurodivergent and neurotypical adults' experiences of hiring processes in the united kingdom, Autism (2023). doi:10.1177/13623613221145377.
[13] K. Koldewyn, S. Weigelt, N. Kanwisher, Y. Jiang, Multiple object tracking in autism spectrum disorders, Journal of Autism and Developmental Disorders 43 (2012) 1394–1405.
[14] N. I. of Mental Health, Autism spectrum disorder, 2023. URL: https://www.nimh.nih.gov/health/topics/autism-spectrum-disorders-asd#part_145439.
[15] V. Martin, M. J. Lanovaz, Program evaluation of a community organization offering supported employment services for adults with autism, Research in Autism Spectrum Disorders 82 (2021).
[16] J. D. Westbrook, C. Nye, C. J. Fong, J. T. Wan, T. Cortopassi, F. H. Martin, Adult employment assistance services for persons with autism spectrum disorders: Effects on employment outcomes, Campbell Systematic Reviews 8 (2012) 1–68.
[17] J. Sarrett, Interviews, disclosures, and misperceptions: Autistic adults' perspectives on employment related challenges, Disability Studies Quarterly 37 (2017). doi:10.18061/dsq.v37i2.5524.
[18] C. 2021, Guide to an accessible submission, 2021. URL: https://chi2021.acm.org/for-authors/presenting/papers/guide-to-an-accessible-submission.
[19] W. process, Web content accessibility guidelines, 2023. URL: https://www.w3.org/WAI/standards-guidelines/wcag/.
[20] N. S. Dalton, Neurodiversity & HCI, in: Proceedings of Conference on Human Factors in Computing Systems, CHI EA'13, 2013, p. 72–75.
[21] V. G. Motti, Designing emerging technologies for and with neurodiverse users, in: Proceedings of the 37th ACM International Conference on the Design of Communication, SIGDOC '19, 2019.
[22] H. Zheng, V. Motti, Weli: A smartwatch application to assist students with intellectual and developmental disabilities, in: Proceedings of the 19th International ACM SIGACCESS Conference on Computers and Accessibility, ASSETS '17, 2017, pp. 355–356.
[23] A. J. T. D. Johnson, Dark clouds or silver linings? a stigma threat perspective on the implications of an autism diagnosis for workplace well-being, Journal of Applied Psychology 101 (2016) 430–449. doi:https://doi.org/10.1037/apl0000058.