Expanding VIAble Employment for Adults with Autism: A Systems Approach to Increase Nonprofit Sales

(Technical Report)

Perception and Cognition in People with Autism Spectrum Disorder: An Analysis of Workplace Infrastructure

(STS Research Paper)

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On my honor as a University student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments.

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Introduction

People with disabilities face both internal and external barriers to employment that hinder them from acquiring and maintaining gainful employment. The Deputy Director of Frist Center for Autism and Innovation, Tim Vogus, describes how because people with Autism Spectrum Disorder (ASD) tend to be task oriented, they often struggle with the soft skills that many managers deem essential to a job (Blankenship, 2023). One of the primary characterizations of ASD is a lack of communication and general social skills (Centers for Disease Control and Prevention 2022). However, discrimination also greatly prohibits people with ASD from accessing integrated workplaces. The US Equal Employment Opportunity Commission reported that the "number of [Americans with Disabilities Act] charges about autism specifically has more than doubled since 2015" (Cooper & Mujtaba, 2022, p. 20).

Because of these barriers to employment, people with ASD are largely underrepresented in the labor market. A study on assistive technologies reported that only 37% of young adults with intellectual disabilities have paid employment, and half of those make below minimum wage (Collins, Ryan, Katsiyannis, Yell, & Barrett, 2014). According to the US Department of Labor 2022 unemployment statistics, the unemployment rate for those with a disability was twice as high as those without (US Department of Labor, 2023). Additionally, the percentage of young adults who have held a job between the ages 21 to 25 for people with ASD is significantly lower than the national average, and it is the lowest rate of employment across all disabilities at about 58% (Roux, Shattuck, Rast, Rava, & Anderson, 2015). Specifically for people with intellectual disabilities, the work they are able to find is often part-time with poor wages (Chen, Leader, Sung, & Leahy, 2015, p. 116). Although a common misconception is that underemployment is

because people with disabilities are less interested in finding work, “about two-thirds of unemployed people with a disability are willing to work,” but because of discrimination in the hiring practice and workplace, they are unable to find work (Lindsay, Cagliostro, Albarico, Mortaji, & Karon, 2018, p. 635). Another study found that of people with disabilities of an employable age, up to 80% were interested in finding work. Notably, they were also found to be interested not just in working, but in working “mainstream” jobs in an integrated environment (Manas, 2008, para. 2). Opportunities for gainful employment are extremely limited for those with ID, even though they make up a valuable potential labor force. My technical topic focuses on using supply data forecasting and user interface design to increase opportunities for employment for people with ASD, and secondarily analyzes how current workplace design impacts people with ASD.

Technical Topic

One organization in Virginia striving to create opportunities for gainful employment for people with ID, specifically those with ASD, is the VIA Center for Neurodevelopment. VIA has a small candle making business called VIAble Ventures, a for-profit subsidiary that sells cosmetic products like candles and bath salts, all of which are made by “Artisans with Autism.” The program acts not only as a way to provide a steady source of income for adults with neurological disorders, but also as a way to train them and give them the skills they need to enter the workforce.

By increasing online sales and revenue, the business can better meet its long-term goal of expanding employment opportunities to adults with ASD in the local area. Currently, VIAble

Ventures is sustaining itself with profits from the local Charlottesville Farmers Markets that occur almost every Saturday during the fall. However, this sales method relies heavily on volunteer availability and seasonality. Therefore, this project is focusing on growing their online sales traffic via identifying sales trends and forecasting areas of improvement to the client. This will require a wide range of technical interventions, including looking at website analytics, analyzing historical sales data, developing a forecast based on past sales and seasonal demand, redesigning the website to improve usability, and devising creative ways to market VIAble Ventures' products.

This is a unique project in the sense that VIA's existing model will be expanded to increase the number of individuals with ASD they are able to employ, instead of designing and implementing a new employment program from scratch. By developing targeted strategies to increase sales in the current off season months and simplifying user experience on the website, VIAble Ventures will be able to employ more people with autism to help them gain employment skills and earn a stable income. Therefore, the work is successful if online sales, specifically in late winter and early spring, significantly increase compared to last year. VIAble Ventures is an example of a sheltered workshop, a workplace designed specifically for people with ASD, and typically only employing people with specific disabilities. Although sheltered workshops are beneficial, especially for people with more severe ID who may not feasibly be able to work in an integrated environment, for many people with ASD, working in a sheltered workshop hurts their ability to transition to an integrated workplace (Nevala et.al, 2019). In fact, one occupational workshop supervisor remarked that people with intellectual disabilities would "come back like a boomerang" from the open labor market (Woynarowska, 2021 p. 359). Thus a more holistic area

of research is how to better design inclusive workspaces with the unique needs and abilities of people with ASD.

Building a Workplace Accessible to Everyone

There are numerous benefits of hiring people with disabilities in an integrated workplace, both for the employer and the employee. For example, a study of janitors with intellectual disabilities found that there was a 34% retention rate after 1 year compared to a 10% retention rate for non-disabled employees (Lindsay et al., 2018). Additionally in another article, Dr. Jeffery Anderson, professor of radiology at the University of Utah stated that because of the short range overconnectivity of the neural networks in the brains of people with ASD, they often perform better than average on tasks that require a lot of focus with a single brain region involved (Rossi, 2022). As for the benefits to the employee, a study of adults in the UK with ASD found that, based on the World Health Organization quality of life measure, employment was a significant positive predictor of quality of life (Mason et al., 2018). Because of the increase in financial independence, participation in society, and autonomy, gainful employment also increases social acceptance for people with ASD (Chen et al., 2015).

Despite these benefits, the design of the workplace itself inhibits people with ASD from maintaining gainful employment in an integrated environment. An institutional ethnographic study conducted in a Government of Canada department found that the common "understanding of disability and accommodation" frames disability as a "personal problem" to avoid changing the workplace environment (Deveau, 2011, p.162). However, by using an infrastructure framework as outlined in Susan Leigh Star's (1999) article, "The Ethnography of Infrastructure,"

the root cause of this struggle can be better addressed. The infrastructure theory suggests that there is a community of practice, i.e., the group of people who operate in the space of the infrastructure and thus interact with it either consciously or unconsciously. As people join this community of practice, they learn how to use the infrastructure, oftentimes simply by operating within the scope of the infrastructure, thus asserting one primary characteristic of infrastructure as *learned as membership* (Star, 1999). A study on workplace design conducted at the University of Sargodha found that in order to improve workplace infrastructure, designers must have an awareness of "how behavior itself drives workplace performance" (Khan, Azhar, Parveen, Naeem, & Sohail, 2011, p. 120). This reinforces the idea that the ease in which infrastructure can be learned as membership is dependent on who the infrastructure was designed for.

This indicates a need to improve the design of the workplace infrastructure so it fits this characteristic for all members in the community of practice. Currently, many workplace accommodations are additive, but a systematic review of current scientific literature and previous quantitative and qualitative studies asserts that although there is evidence that workplace accommodations can help people with physical disabilities, there is actually less evidence that accommodations benefit employees with cognitive disabilities (Nevala, Pehkonen, Koskela, Ruusuvuori, & Anttila, 2014). A study conducted with qualitative research and semi-structured interviews of employed people with ASD in Australia and Sweden found that the "structure of the physical environment" was key to maintaining successful employment, citing strategies to change the work environment such as clearly communicating job expectations, chain of command, and potential work disruptions with the employee in advance (Dreaver et al., 2019). One narrative literature review investigating key themes in Human Resource Development also offered specific infrastructure and job design improvements that can from the ground up improve

how employees with ASD can operate within their work environment: light and noise reduction, more structured tasks and clearly defined schedules (Johnson, Ennis-Cole, & Bonhamgregory, 2020). One successful example of this is at Walgreens distribution centers, which are integrated workplaces that have successfully redesigned interfaces and increased the adjustability of individual workstations to function for both people with and without disabilities (Wells, 2008).

Research Question And Methods

Given the current disconnect between the work environment and the abilities of people with ASD, a question for further study would be: How do people with ASD's perception and information processing differences impact their ability to operate in a traditional workplace? In order to improve current workplace infrastructure, it's important to first understand exactly how people with ASD are interacting with their environment, otherwise the ultimate solutions implemented still may not support full integration of people with ASD. As asserted in Star's article, it is essential to analyze the underlying infrastructure that supports the workplace environment to best create an environment that seamlessly supports all employees. To investigate this question, I will conduct a literature review using forward searching to compile studies from occupational journals about current workplace accommodations that exist and how they were designed, as well as psychological and medical journals that detail the cognitive capabilities of people with ASD. I will use thematic coding to identify trends specifically about how current workplace accommodations do or don't align with the abilities of people with ASD.. Synthesizing the information from these sources will allow for a full understanding of how workplace infrastructure as Star defines it, can be designed to seamlessly allow for positive

employment outcomes for people with ASD. Ultimately, successful workplace infrastructure will be infrastructure that can be *learned as membership* for all employees.

Conclusion

People with ASD are severely underemployed and underpaid, due to both internal and external factors. Since there are benefits to being employed generally, and specifically for people with ASD, it is essential to increase opportunities for gainful employment. By increasing sales for a local sheltered workshop, VIAble Ventures at the Virginia Institute of Autism, there will be more demand and opportunity to employ more people with ASD. Locally, this will have a large impact on the quality of life of the potential employees, there already are people wanting to work at VIAble Ventures, they just cannot afford to employ them. Additionally, by synthesizing research on the current state of workplace accommodations, I can determine how to best design workplace infrastructure in a way that allows all employees to learn the infrastructure just by operating in the space of the infrastructure.

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