The Potential Impact of Job Automation on Veterans in Vocational Rehabilitation Programs

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Objective: The study aimed to examine the potential impact of job automation on veterans in the largest U.S. vocational rehabilitation program, the Compensated Work Therapy (CWT) program.

Methods: Sixty-two CWT managers were surveyed about common jobs that veterans want and are placed in and about the anticipated impact of job automation on veterans in this program. Probabilistic estimates of job automation were applied to manager responses.

Results: The most common jobs veterans want or are placed in have high probabilities of being automated, including housekeeping/janitorial service (66% probability), administrative and clerical tasks (96%), food service (87%–96%), and warehouse positions (98%). Forty percent of managers anticipate that job automation will have negative impacts on job opportunities for veterans; another 15% believe that new jobs will emerge, but education and retraining will be needed.

Conclusions: For adults who need vocational rehabilitation, planning is needed to adjust to the changing landscape of work that automation presents.

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Advances in computing and robotic technologies have changed the way people live and work. Arguably, these technologies have improved quality of life as well as work efficiency and productivity. However, new technologies can disrupt existing systems. Job automation, with its potential to displace jobs, has been a long-standing concern. As new technologies become increasingly integrated into modern lives, job automation—defined as a job formerly performed by a human and now performed by computer-controlled equipment (1)—has become an important contemporary issue.

Job automation has been largely unexamined in the context of health care, and its potential impact on client rehabilitation is unclear. Health care focuses on providing comprehensive care and addressing social determinants of health, and employment is considered an important element of health and well-being (2). Many clients with psychiatric and physical disabilities are interested in employment, and studies have shown that vocational rehabilitation models such as supported employment may not only help clients obtain secure income and a stable job but also improve their mental health and quality of life (3, 4). However, many of the jobs available through vocational rehabilitation programs are either unskilled or skilled manual labor positions (5, 6), which may be susceptible to automation.

The U.S. Department of Veterans Affairs (VA) operates the largest national vocational rehabilitation program for veterans with mental illness or physical impairment, called Compensated Work Therapy (CWT; https://www.va.gov/health/cwt). The CWT program exists in all VA medical centers and partners with businesses and agencies to offer a range of services, including transitional work placements, supported employment, and other employment assistance to veterans and employers (7).

Here, we surveyed managers of CWT programs nationally to estimate the probability of job automation among the most common jobs in the program and to assess CWT managers' attitudes toward and preparedness for job automation.

HIGHLIGHTS

- This study surveyed managers of the Compensated Work Therapy (CWT) program, the largest U.S. vocational rehabilitation program.
- The most common jobs in the CWT program have a high probability of being automated.
- Forty percent of CWT managers anticipate a negative impact of job automation on the program.

TABLE 1. Most common jobs for veterans in the Compensated Work Therapy (CWT) program, according to 62 program managers

Most common jobs	Rated in top 4 jobs		Standard Occupational Classification codes	Probability of automation[a]
	N	%		
Jobs CWT veterans want				
Housekeeper, janitor, custodial services	43	69	37–2011	.66
Administrative assistant, clerical	22	36	43–6014, 43–9061	.96
Warehouse	20	32	43–5071	.98
Food service, kitchen work, cook	20	32	35–2021, 35–2014	.87–.96
Driver (sales, truck, patient transportation)	18	29	53–3031, 53–3032, 53–3022	.79–.98
Landscaping, grounds keeping, grounds maintenance	11	18	37–3011	.95
Logistics	7	11	13–1081	.01
Job placements for CWT veterans				
Housekeeper, janitor, custodial services	50	81	37–2011	.66
Food service, kitchen work, cook	26	42	35–2021, 35–2014	.87–.96
Warehouse	19	31	43–5071	.98
Administrative assistant, clerical	16	26	43–6014, 43–9061	.96
Landscaping, grounds keeping, grounds maintenance	13	21	37–3011	.95
Driver (sales, truck, patient transportation)	13	21	53–3031, 53–3032, 53–3022	.79–.98
Logistics	9	15	13–1081	.01
Security guard	8	13	33–9032	.84
Customer service, cashier, receptionist	8	13	41–2011, 41–4171, 41–2031	.92–.97

[a] Based on detailed probability calculations by Frey and Osborne (1).

METHODS

With approval from the CWT national office, we invited 200 CWT managers to complete an e-mail survey. The managers were asked in what state they worked, the number of veterans their program has served in the past year, and the number of veterans placed in jobs through their program in the past year. CWT managers were then asked, "In the past year, what are the top 4 most common jobs that veterans report they want?" and "In the past year, what are the top 4 most common jobs that your program has placed veterans into?" Managers were instructed to be as specific as possible in describing occupations (e.g., postal service clerk and bicycle repair shop assistant). Managers were also asked an open-ended question: "What thoughts, if any, do you have about the impact of job automation (i.e., robots/machines replacing human jobs) on the veterans you serve?" All responses were anonymous. Sixty-two CWT managers (31%) completed the survey. The information collected for the survey was deemed exempt from review by the VA's institutional review board.

Of the 62 CWT program managers surveyed, 11% (N=7) were from Texas, 5% (N=3) from New York, 8% (N=5) from California, 7% (N=4) from Alabama, and 5% (N=3) from Tennessee. The managers had served 282.5±309.0 (mean±SD) veterans in the past year and had assisted 113.3±126.8 veterans in finding employment in the past year.

The most common jobs that CWT managers reported their veterans want and have been placed in during the past year were coded and categorized into Standard Occupational Classification (SOC) system codes. The U.S. Department of Labor uses these codes to comprehensively classify occupations on the basis of a set of variables that include the knowledge, skills, and abilities required for a given occupation. We used the SOC system codes to determine the probability of job automation for each job that was reported. Our basis was probabilistic estimates, which have been computed by international experts with a Gaussian process classifier of 702 detailed occupations (1).

The CWT managers' reports about the potential impact of job automation were also qualitatively analyzed. We (J.T., K.M.) inductively developed a codebook on the basis of a review of each manager's response, compilation of the authors' notes, and discussion among the authors about coding labels and definitions. After finalizing the codebook, the two first authors independently coded each manager's response and compared the consistency of their coding (81% agreement); all discrepancies were resolved by the third author (E.E.). The number of responses categorized by each code was summarized and interpreted.

RESULTS

Table 1 describes the most common job categories that CWT program managers reported veterans want and are placed in and shows the calculated probability for future automation of jobs in each category. The two most common job categories veterans wanted were the housekeeping, janitorial, custodial service category and the administrative assistant and general clerical services category, both of which have high probabilities of future automation (66% and 96%, respectively). The other common jobs categories that veterans want all had probabilities of more than 75% of being automated, except for logistics (e.g., supply

technician and logistics clerk), which had only a 1% probability of automation. The two most common job categories that veterans were placed in were housekeeping, janitorial, and custodial services and food service, kitchen work, and cook (87%–96% probability of being automated), and all other common job categories had probabilities of more than 75% of being automated.

When CWT managers were asked what impact job automation may have on the veterans they serve, open-ended responses were coded into one of five categories: no concern or little impact (37%, N=23), vaguely negative (21%, N=13), specifically negative (19%, N=12), belief that new jobs will emerge (15%, N=9), and neutral or data missing (8%, N=5). (A table in the online supplement provides sample responses coded in each category.) Most CWT managers (52%, N=32) indicated that they believed that job automation would have little impact on veterans, and many believed new jobs would emerge but emphasized the need for research and retraining. As one CWT manager insightfully stated:

> The populace always responds by finding…remaining and new niches. The nature of work may change, but there will always be a need for people to perform duties. We should work with local resources to identify trends and available resources for training to ensure we can provide the best opportunities to our veterans who seek competitive employment in the community.

In contrast, 40% (N=25) of managers believed that job automation would have a negative impact on veterans. Some managers said that certain jobs would be negatively affected, such as retail services and industrial jobs. As one CWT manager said:

> Many manual labor jobs…have the potential to disappear when automation increases. These jobs are important to the veteran population, as they often correlate with their [military occupational specialty] MOS/military experience and are often the jobs available after a veteran experiences substance abuse or has legal involvement. The loss of these jobs would require a significant shift in the jobs veterans look for and in the training they'll need.

One CWT manager made an important point about what approach should be considered:

> If more focus is placed on providing short-term training opportunities that compliment [sic] these new systems (such as maintenance and repair on these systems), we can slow the impact on what this is doing to the overall workforce.… Society has to change with the times, and [it is] better to be proactive versus reactive.

DISCUSSION AND CONCLUSIONS

To our knowledge, this study is the first that has examined the potential impact of job automation on VA vocational rehabilitation programs. The most common jobs that veterans in the CWT program want or are placed in are highly likely to be automated in the future. The probability of job automation among nearly all the most common jobs that veterans want or are placed in is greater than 60%. The job category that veterans both most commonly want and are placed in is housekeeper and janitorial service, which has a 66% probability of being automated. Other jobs desirable among veterans have even higher probabilities of being automated, such as warehouse positions (98%), administrative and clerical tasks (96%), and food service (87%–96%). As technology advances and the potential for job automation becomes a reality, it will be important for CWT programs to plan for the obsolescence of the most common jobs that are available for veterans seeking vocational rehabilitation.

Programs like CWT are subject to the workforce needs of the market economy; that is, they serve the vocational rehabilitation needs of individuals with disabilities but also operate in coordination with employers' needs. Programs may need to adapt to and evolve with the changing needs of employers as job automation becomes more efficient and cost-effective for business operations from the perspective of employers (8). Efforts to expand job opportunities beyond low-skilled labor in vocational rehabilitation also should be encouraged. The lack of job opportunities in the marketplace may limit the capabilities of vocational rehabilitation to improve health and may further disincentivize veterans with disabilities to seek employment (9). One study found that even perceptions of poorer job security due to job automation risk are associated with poorer employment and health outcomes (10).

New jobs may emerge as other jobs become obsolete. Education and retraining of adults for these new jobs is important, but the time and resources available to do so for large segments of the population may be limited (11). Of the CWT managers surveyed, 40% anticipated that job automation will have a negative impact on job opportunities for veterans in the program, and many CWT managers reported specific types of jobs, such as those involving manual labor, they believe will be affected. CWT managers who responded were more optimistic than the general public; global surveys have found that more than 70% of adults in developed countries believe that job automation will make it more difficult for people to find jobs (12). CWT managers did not report the types of retraining that should be available for specific types of jobs, perhaps because future types of work are hard to predict. Some CWT managers shared that job automation has been a pattern throughout human history, and they expressed confidence that humans will adapt successfully as they have before. But as one manager said, it is important to be "proactive versus reactive," although specifics on how to be proactive were not offered. Together, these findings highlight the need for attention and planning for the rapidly changing landscape of work for adults who need vocational rehabilitation.

This study had several limitations, including that the survey data based on managers' self-report were susceptible to memory biases and that probability estimates of job automation relied on calculations with no specific timelines (1). It is unknown whether these findings are applicable to vocational rehabilitation programs other than the CWT

program. Nonetheless, we found that managers in the CWT program we surveyed were aware that job automation may have a major potential impact on their programs, but precise solutions to prepare veterans for success in vocational rehabilitation programs in the near future need to be developed.

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