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The Way AI Technology Impacts the Employees at the USPS and the Corresponding Strategies

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Abstract. The effectiveness of the movement of goods is determined by the way transportation operates, which is an essential component of logistical management. The movement weight and delivery velocity are enhanced by advancements in managerial concepts and procedures, which include the degree of service, operational expenses, facility utilization, and energy conservation. Experience has shown that a robust system requires a well-defined logistics framework and appropriate transportation tools and methods to connect the generating processes. In the logistics and supply chain industry, human-computer interaction (HCI) is essential to the achievement of technological advances. The relationship is shifting as a result of the implementation of artificial intelligence applications (Internet of Items, independent transportation, tangible internet), which increase equipment independence and, consequently, shift the duty of human workers from primary management to supervisory, which is a significant aspect of social sustainable development. The article aims to use research and analysis methods to figure out how artificial technology impacts logistic technology, especially the work position of the USPS company's staff. There are also some strategies to deal with artificial intelligence's impacts on the staff's wages at USPS such as recruits the employees with more innovations consciousness and enhance their dedication extent and renovation ability.

Keywords: Artificial Intelligence, USPS, Innovation, Robot, Logistic

1. Introduction

The logistics industry has undergone a transformative shift in recent decades, driven by advancements in artificial intelligence (AI) and automation technologies. The movement of goods, a critical component of logistical management, now relies heavily on AI-driven systems such as the Internet of Things (IoT), autonomous transportation, and smart infrastructure. These technologies not only enhance operational efficiency but also reshape the dynamics of human-computer interaction (HCI), shifting human roles from direct operational control to supervisory and strategic functions. This evolution has profound implications for workforce structures, particularly in organizations like the United States Postal Service (USPS), where automation is increasingly integrated into daily operations. However, this technological progress has also raised concerns about its impact on employment.

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In the logistics and transportation industries, automated material handling equipment and autonomous vehicles have replaced manual labor in sorting, packaging, and delivery processes. The reason is that AI technology could change hiring practices and standards for workers' aptitudes, expertise, and dispositions. Automated material handling equipment is a huge threat to employees' wages in the logistics and transportation industries, for example, in United States Postal Service (USPS), the cost reductions are evident from the decline in the number of career workers, which fell from 623,128 to 497,157 between 2009 and 2018. At the same time, the total delivery points grew from 150.1 million to 158.6 million [1]. This shift highlights the tension between technological efficiency and workforce stability. The USPS plays a crucial role in serving the people in the United States, around 600,000 employees working hard to ensure reliable, budget-friendly, consistent, and secure. However, according to a 2019 press release from ABI Research, it is projected that by 2025, over 4 million commercial robots will be deployed across more than 50,000 warehouses globally. Furthermore, robotics are expected to enhance productivity, efficiency, and capacity by more than 10% in approximately 70% of instances [2].

Against this backdrop, this study investigates the impact of AI and automation technologies on USPS workers' job roles, as well as on firms' hiring practices, and strategic decisions through qualitative analysis and case studies. It aims to understand the complex interplay between technological advances in the logistics industry and the labour market and the impact of AI and automation on logistics industry operations. By focusing on the transformation of one institution, the USPS, in the midst of the wave of automation, this study provides insights into how public institutions are responding to the challenges of automation while balancing service obligations and workforce welfare. The research can inform regulatory frameworks to address wage disparities and skills gaps created by automation, and provide guidance to similar organisations in designing inclusive automation strategies and retraining employees.

2. USPS

2.1. Introduce of USPS

United States Postal Service (USPS) is committed to providing safe and affordable mail service to everyone in the country under the Universal Service Obligation (USO). With this considerable responsibility, USPS leadership must proactively incorporate technology into its operations. From its founding to the present, the organization has clearly demonstrated a commitment to innovation aimed at enhancing public service offerings while simultaneously minimizing operating costs. In the USPS Five-Year Strategic Plan for FY 2020 to FY 2024, the USPS outlined its strategic goals for 2024 [1]. The plan highlights the importance of investing in people and structure while prioritising customer satisfaction. In addition, other key goals include empowering, connecting, engaging, and empowering employees to deliver exceptional service and experiences to customers, accelerating innovation to deliver higher value, investing in future platforms, and seeking legislative and regulatory support. The organization operates an extensive network of over 200 mail sorting facilities that serve more than 156 million addresses [1]. Internet e-commerce sales have grown on average by 19 percent annually since 2000, leading to a significant rise in package volume. In recent years, the yearly volume of packages handled by USPS has surged by 29 percent, equating to an additional 900 million packages [3].

The USPS is currently grappling with significant productivity challenges attributed to various factors, including workforce shortages, unfavorable weather conditions, unexpectedly high demand, and labor disputes (USPS, 2019). The USPS appears to be falling behind its private sector

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competitors in the parcel delivery market, such as FedEx, UPS, and DHL. With rising public expectations demanding delivery times between one and three days nationwide, USPS struggles to meet its standard, so there has been consideration for automating particular operations within its vast system [1]. In today's world, most mail and parcels are handled by 8,500 automated machines nationwide. These devices utilize barcodes for sorting, which can be added by the sender or generated through mail processing equipment [3].

2.2. USPS automation development process

In the context of operational enhancement through automation technologies tested across several pilot programs by the USPS Office of Inspector General (USPS OIG), automation efforts have been around for nearly forty years, with initial trials involving electric carts designed to transport mail along wired paths on the floors. By 2016, autonomous tugs were introduced at their Pennwood Place facility near Pittsburgh. Further advancements came in 2018 with deploying autonomous mobile robots (AMRs) across twenty-five processing plants from various vendors [4]. In addition to using sensors and advanced technology, AMRs are evaluated based on operating costs, efficiency, and service capability improvements. As a result of controlled pathways that reduce potential jams or accidents involving personnel, AMRs are highly effective in indoor environments such as distribution centers or sorting facilities. Moreover, there's an ongoing assessment regarding AMR utilization for residential deliveries. However, outdoor applications present complex obstacles due to unpredictable scenarios beyond current capabilities [4].

The USPS identified various tasks and technologies suitable for automation within its operations, which include the hitching of containers, sorting and transferring packages, as well as loading and unloading mail from trucks [4]. Furthermore, certain technologies have the potential to enhance mail and package delivery processes. It might involve hybrid systems where an Automated Mobile Robot (AMR), loaded with packages, follows a human carrier or utilizes a "Robovan," which is designed to transport AMRs that assist in delivery efforts [4].

2.3. Impact of the introduction of automation

The adoption of Autonomous Mobile Robots (AMRs) in logistics aims to achieve dual objectives: enhancing operational efficiency (e.g., faster sorting, reduced human error) and strengthening service quality and market competitiveness. However, this technological shift introduces a paradox: while AMRs promise long-term labor cost savings, they require significant initial investment in hardware, software integration, and system calibration. For instance, the upfront costs of deploying AMRs in sorting centers include robotic units, sensor networks, and custom programming, which can strain budgets for organizations like USPS. Yet, as technology matures and economies of scale take effect—such as volume purchasing discounts and iterative improvements in hardware design—AMR solutions become more cost-effective. Over time, the declining cost-to-value ratio positions AMRs as a pivotal tool for reducing labor expenditures, particularly in tasks characterized by repetition, physical exertion, or high-frequency operations.

An automation trial conducted by USPS showed that significant savings were achieved by replacing human operators driving powered industrial vehicles such as forklifts with their automated counterparts. An automation trial conducted by USPS revealed notable savings achieved through replacing human operators driving powered industrial vehicles such as forklifts with their automated counterparts. The data presented illustrates a reduction amounting to $281,289 annually, where there is a decline equivalent roughly to 14% compared to figures from previous years' records between

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2016-2017 at Pennwood Place Sorting Center located in Pennsylvania, which include overtime expenditure dropdowns reaching around $68,173, translating into nearly 19% (Figure 1-2) [5].

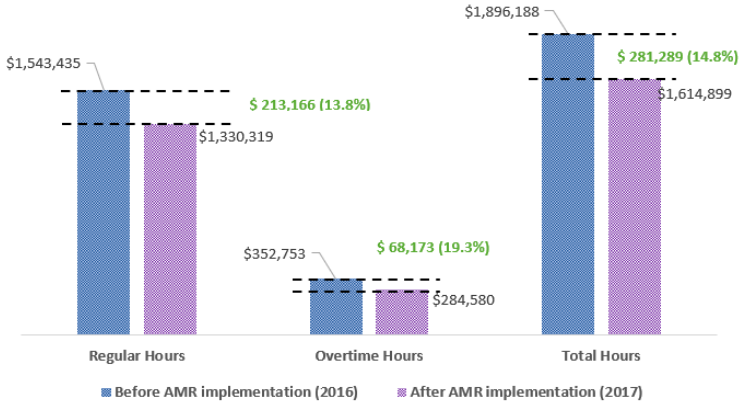

Figure 1. Comparison of data before and after the use of AMRs at the Pennwood Place Sorting Centre in Pennsylvania from 2016 to 2017

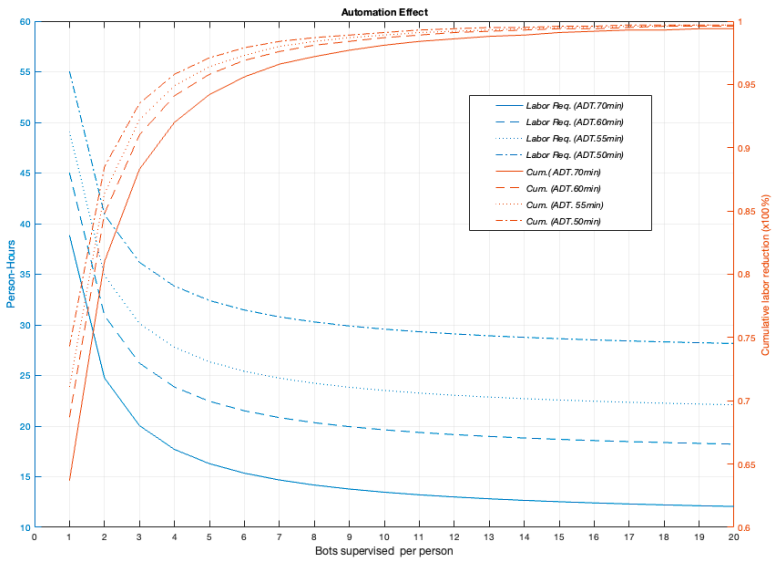

Figure 2. Labour cost changes

Against a backdrop of robots increasingly taking on high-quality work (e.g. precision sorting requiring technical calibration) and low-skill repetitive work (e.g. routine material transport), employers have tended to adopt a 'hybrid labour model' combining low-paid workers with robotic assistance, prioritising cost efficiencies over labour costs. This shift also challenges traditional labour structures. For example, PIV drivers experience productivity bottlenecks that cause delays when AMRs are running slow or experiencing connectivity issues. Such incidents highlight the need for seamless integration of humans and machines to avoid operational inefficiencies. The USPS acknowledges this challenge and stresses the importance of educating employees on how AMR can augment, rather than replace, their roles, such as reducing physical loads and redirecting the workforce to higher-value tasks such as quality control or customer service.

In addition, USPS recognises that employee buy-in is key to the success of automation. To dispel scepticism, the company has prioritised greater transparency about its technology strategy, including

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communicating the rationale for adopting AMR and offering skills enhancement programmes to help employees transition into supervisory or technical support roles, for example, developing training modules to familiarise employees with robot monitoring interfaces, troubleshooting basic faults and interpreting real-time performance data [6].

The case of the US Postal Service illustrates that logistics automation is not a simple labour replacement, but a complex process of role redefinition. Organisations must balance cost-effectiveness with workforce stability in different ways. First, non-repetitive tasks can be targeted for human-machine collaboration, leveraging human problem-solving skills to compensate for machine deficiencies (e.g., adaptive decision-making in unpredictable environments). Second, invest heavily in retraining programmes to align employee competencies with evolving technological needs and reduce anxiety about technological obsolescence. In addition, companies can promote transparent dialogue with trade unions to develop a common strategy for automation that ensures compliance with regulatory requirements and protects workers' interests.

3. Strategies

Numerous strategies are employed to address the automation challenges in the logistics and transportation sectors. These include enhancing the innovative capabilities of technicians and boosting human work efficiency. As automation gradually replaces human forces, companies need innovative talents to research and develop more efficient automation tools [7,8].

For the United States Postal Service (USPS), an organization centered around innovation, staying abreast of disruptive technologies is essential for adapting to evolving customer demands. The USPS is well - positioned to utilize new technologies to enhance its operational efficiency. Given the organization's emphasis on its workforce, it is crucial to maintain high levels of employee engagement by involving staff in technological decision - making processes. This collaborative approach allows employees to contribute to shaping the future workplace. Moreover, as a technology - focused entity, the USPS should fully utilize its computing expertise and resources. This utilization will facilitate better management of technical projects and promote collaboration among its centers of excellence, where tech teams serve as subject - matter experts and disseminate knowledge across the organization.

The USPS developed a technology - selection framework aligned with the future of work by analyzing technology implementation, its impact on key performance indicators, and employee engagement. This framework was primarily formulated by studying the experiences of other organizations, incorporating elements related to both the USPS's past successes and challenges. The resulting structure emphasizes disruptive and sustaining innovation to prepare for emerging technologies, prioritizes employee empowerment to enable adaptation to change, and includes a clear strategy for collaboration among technology professionals. The effectiveness of this framework is maximized when supported by all levels of management, ensuring a balance between overall strategic direction and employee motivation [9,10].

Mail processing efficiency represents a critical area for innovative technological progress. Over the years, significant advancements driven by mechanization and automation have been witnessed. The journey began with the introduction of cancellers, devices designed to invalidate postage on letters, eliminating the need for manual stamp - cancelling. Subsequently, letter and package sorters, along with automated address readers, were introduced, transforming operational capabilities. In the 1980s, the integration of sorting equipment and ZIP coding systems led to unprecedented levels of automation, reducing manual intervention and enhancing mail processing efficiency. In the 1990s, sorting capabilities were further refined to the individual delivery point level [1]. Today, as

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traditional letter volumes decline and package deliveries increase, continuous innovations aim to automate the handling of larger flat mail and packages at every stage of the complex sorting and distribution network, driving the USPS closer to achieving unparalleled efficiency.

4. Conclusion

Artificial intelligence (AI) remains a topic of considerable controversy and uncertainty, exerting both positive and negative impacts on the wages of USPS employees. Nevertheless, it is anticipated that with the passage of time and the advancement of science and technology, AI and humans will coexist harmoniously. In the transportation and logistics industries, individuals will enhance their work and creative abilities to develop increasingly advanced AI technologies, such as unmanned driving and robot - based delivery systems. As AI technology matures, it will make transportation and logistics operations more convenient and efficient.

To address the issues of income decline and unemployment associated with AI, companies need to foster a strong innovative spirit and develop the capacity to cultivate professional talent. The USPS is actively shaping an ideal future work environment through innovation initiatives, employee empowerment strategies, and enhancements to its technology platforms. By maintaining a strategic focus on these areas, the USPS aims to create a collaborative and interconnected workforce, leveraging its strengths to realize the envisioned workplace of tomorrow.

References

[1] Craig, Lev. “What Is Artificial Intelligence (AI)?” TechTarget, 2024, www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence.

[2] Klumpp, Matthias, and Henk Zijm. “Logistics Innovation and Social Sustainability: How to Prevent an Artificial Divide in Human–Computer Interaction.” Journal of Business Logistics, vol. 40, no. 3, 31 Jan. 2019, pp. 265–278, https: //doi.org/10.1111/jbl.12198. Accessed 30 Sept. 2020.

[3] Chinoracký, Roman, and Tatiana Čorejová. “Impact of Digital Technologies on Labor Market and the Transport Sector.” Transportation Research Procedia, vol. 40, 2019, pp. 994–1001, https: //doi.org/10.1016/j.trpro.2019.07.139.

[4] Abduljabbar, Rusul, et al. “Applications of Artificial Intelligence in Transport: An Overview.” Sustainability, vol. 11, no. 1, 2 Jan. 2019, p. 189, researchbank.swinburne.edu.au/file/c75f3eaf-1b83-4e3f-8a67-a726cf719e4e/1/2019-abduljabbar-applications_of_artificial.pdf.

[5] Singh, Prashant, et al. “Blockchain and AI Technology Convergence: Applications in Transportation Systems.” Vehicular Communications, vol. 38, Dec. 2022, p. 100521, https: //doi.org/10.1016/j.vehcom.2022.100521.

[6] Liu, Luying. “The Future of Labor Markets: The Evolution of AI and Changing Human Roles.” Geographical Research Bulletin ONLINE, vol. 2, 2023, pp. 238–246, www.jstage.jst.go.jp/article/grb/2/0/2_238/_pdf/-char/ja, https: //doi.org/10.50908/grb.2.0_238.

[7] Lawson, Angela Dawn. “Deploying the Right Technology : A Framework for Digital Strategy and Selection at the United States Postal Service to Shape the Future of Work.” Dspace.mit.edu, 2020, dspace.mit.edu/handle/1721.1/126905.

[8] Nguyen, Anh. How Artificial Intelligence Can Affect Postal and Parcel Industry. 2020, www.theseus.fi/bitstream/handle/10024/354064/Thesis_Nguyen_Anh.pdf?sequence=2.

[9] Cronkhite, Isaac Sebastian. “Evaluate Innovative Strategies Leveraging Existing USPS Capabilities and Resources to Advance as a Vital 21st Century Service Organization.” Dspace.mit.edu, 2015, dspace.mit.edu/handle/1721.1/99048.

[10] Jaller, Miguel, et al. Jobs and Automated Freight Transportation: How Automation Affects the Freight Industry and What to Do about It a White Paper from the National Center for Sustainable Transportation. 2022, escholarship.org/content/qt0vk5t0rw/qt0vk5t0rw_noSplash_08e96e0b97fb5a6dfe07ffc44af46c7d.pdf, https: //doi.org/10.7922/G2SX6BHW.