Impact of Data Democratization and Data Literacy on Employee Productivity

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Abstract

Background: The significance of Data democratization and Data literacy, as well as the importance of employee productivity, cannot be overemphasized in today's fast-paced and highly data-centric business environment. To better understand the relationship between these critical elements, the present study was undertaken to investigate the impact of various independent variables, including Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors on employee productivity.

Method: A thorough and comprehensive multiple regression analysis was performed to shed light on the interplay between these variables.

Results: The results of the analysis revealed that all independent variables had a substantial and statistically significant positive effect on employee productivity. The coefficients for Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors were 1.028746, 0.957032, 0.765698, 0.991522, 0.917948, and 1.034905, respectively. Additionally, the standard error, t-statistic, and Prob. values were also computed for each variable, providing robust evidence of the significance of the relationships between the independent variables and employee productivity. The partial regression coefficients reflect the impact of each independent variable on employee productivity while controlling for the effects of the other independent variables. This allows us to gain an understanding of the unique contribution of each variable to the explained variance in employee productivity.

Conclusion: The results of this study underscore the pivotal role that Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors play in determining employee productivity. The findings suggest that organizations can enhance employee productivity by focusing on these critical factors and creating a supportive environment that nurtures their growth and development. The present study provides valuable and insightful information into the relationship between employee productivity and various independent variables. While the results should be approached with a certain degree of caution, they point towards the potential for organizations to adopt a multi-pronged approach to improving employee productivity by focusing on Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors. Further research is necessary to validate these findings and to explore the causal relationships between these variables.

Introduction

Employee productivity is an important factor in the success of any modern business. In today's fast-paced and ever-changing business landscape, companies must find new and innovative ways to increase employee productivity if they want to remain competitive. One of the key drivers of employee productivity is job satisfaction. When employees feel fulfilled in their work and are motivated to perform at their best, they are more likely to be productive. To ensure high levels of job satisfaction, companies must create an environment in which employees feel valued, respected, and supported. This can be achieved through things like providing meaningful work, opportunities for growth and development, and fair and competitive compensation packages. Another important factor that contributes to employee productivity is the provision of adequate resources. This includes access to the right tools, technology, and equipment needed to perform their jobs effectively. Additionally, companies must provide their employees with the necessary training and support to ensure they have the skills they need to be productive. This can include training in the use of new technologies, as well as regular performance feedback and coaching. In order to maximize employee productivity, companies must also create a work-life balance that allows employees to maintain a healthy and fulfilling personal life. This can be achieved through flexible work arrangements, such as remote work, flexible schedules, and paid time off. Providing employees with the ability to manage their work and personal life effectively helps reduce stress and improves overall well-being, which in turn contributes to higher levels of productivity.

Technology has also played a significant role in increasing employee productivity in recent years. With the rise of cloud computing and mobile technologies, employees are now able to access and collaborate on work from anywhere, at any time. This has allowed for greater flexibility and has helped to break down traditional barriers that once limited productivity. Companies must embrace these technological advancements and provide their employees with the tools they need to be productive in this new digital landscape. Another important factor that contributes to employee productivity is the ability to effectively manage time. This includes the ability to prioritize tasks, manage multiple projects at once, and avoid distractions. Companies can help their employees develop these time management skills by providing training and resources, such as project management tools and productivity apps. Additionally, companies must foster a culture that encourages focus and reduces distractions, such as reducing interruptions during meetings and minimizing the use of email and other distractions during work hours. Finally, effective communication is critical to employee productivity. Clear and open lines of communication between employees and management helps to reduce confusion and ensures that everyone is working towards the same goals. Companies can improve communication by regularly holding team meetings, encouraging feedback and suggestions, and providing regular updates on company goals and progress.

Employee productivity is a critical factor in the success of modern businesses. Companies must create an environment that fosters job satisfaction, provides adequate resources, fosters a work-life balance, embraces technology, promotes time management, and encourages effective communication if they want to maximize employee productivity. By doing so, they can remain competitive in today's fast-paced business landscape and achieve long-term success.

Big data has become a significant force in the current business world, and its impact is growing every day. In this essay, we will explore the definition of big data, its significance in the modern business landscape, and how companies are using it to make informed decisions and gain a competitive advantage. Big data is a term used to describe the vast amounts of data that are generated and collected every day from a variety of sources. This data includes information from

social media, internet searches, online transactions, and other digital sources. The volume of big data has grown exponentially in recent years due to the increasing use of technology, and it is estimated that 90% of all the data in the world was generated in the past two years.

The significance of big data in the current business world lies in its ability to provide insights into customer behavior, market trends, and operational efficiencies. Companies can use big data to analyze and make sense of the vast amounts of information they collect, which can then be used to inform decision making and drive business growth.

One of the most significant benefits of big data is its ability to help companies personalize their offerings to meet the needs of individual customers. By analyzing customer data, companies can gain a better understanding of customer behavior, preferences, and needs. This information can then be used to tailor products and services to meet the specific needs of individual customers, which can help improve customer satisfaction and increase sales. Another benefit of big data is its ability to identify new business opportunities. Companies can use big data analytics to identify trends and patterns in customer behavior, which can help them identify new market segments or areas for growth. This can help companies make more informed decisions about investments and product development, which can drive business growth and increase profitability.

Big data is also helping companies improve their operational efficiency by providing insights into their operations. For example, companies can use big data to monitor and analyze their supply chain operations, which can help them identify inefficiencies and areas for improvement. This can help companies reduce costs, improve delivery times, and enhance customer satisfaction. The use of big data in the current business world is also helping companies to stay competitive by providing a new source of competitive advantage. Companies that are able to effectively leverage big data to make informed decisions and drive growth are more likely to be successful than those that do not. This is because big data provides companies with a unique source of insights and information that can help them make informed decisions and stay ahead of the competition.

However, there are also challenges associated with big data that companies must be aware of. One of the biggest challenges is the issue of data quality. Companies must ensure that the data they collect and analyze is accurate and relevant if they want to make informed decisions. Additionally, companies must also be mindful of privacy and security concerns when collecting and analyzing customer data. Big data has become a significant force in the current business world and its impact is growing every day. Companies that are able to effectively leverage big data to make informed decisions and gain a competitive advantage are more likely to be successful in today's fast-paced and ever-changing business landscape. By being aware of the challenges associated with big data and taking steps to mitigate them, companies can use big data to drive business growth and achieve long-term success.

Data literacy and data dimerization

Improved decision-making is one of the key ways in which data literacy and data democracy can impact employee productivity. When employees have access to data and the skills to interpret it, they are able to make decisions that are based on facts and evidence, rather than just intuition or gut feelings. This leads to more informed and data-driven decision making, which can result in more efficient and effective use of resources. One of the key benefits of data-driven decision making is that it enables employees to make informed choices about which resources to allocate to different projects or tasks. For example, if data shows that a certain marketing campaign is not performing as well as expected, employees can use that information to make decisions about whether to continue the campaign or redirect resources to a different approach. This can result in a more efficient use of resources, which can help to increase productivity.

Moreover, decision making through data literacy can help to minimize the risk of making incorrect or ineffective decisions. When employees have access to accurate and relevant data, they are better equipped to understand complex situations and make decisions that are based on the best available evidence. This can help to reduce the risk of making decisions that are misguided or not aligned with the organization's goals. Data literacy and data democracy can also help to foster a culture of continuous improvement within an organization. When employees have access to data and the skills to interpret it, they can use that information to identify areas for improvement and make data-driven decisions about how to make changes. This can lead to ongoing improvements in processes and practices, which can result in increased productivity over time.

Improved decision-making is a key way in which data literacy and data democracy can impact employee productivity. By enabling employees to make more informed and data-driven decisions, organizations can achieve greater efficiency, minimize risk, and foster a culture of continuous improvement. All of these factors can contribute to increased productivity, which can help organizations to achieve their goals and stay competitive in today's fast-paced business environment. Increased collaboration is another important way in which data literacy and data democracy can impact employee productivity. When employees have access to the same data and can interpret it in the same way, they are better equipped to work together effectively to solve problems and achieve goals. This can help to improve communication and collaboration among employees, which can have a positive impact on productivity.

One of the key benefits of increased collaboration is that it can help to reduce misunderstandings and miscommunications. When everyone has access to the same data, they can all see the same information and interpret it in the same way. This can help to reduce confusion and ensure that everyone is on the same page, which can improve the efficiency and effectiveness of team-based work. Data literacy and data democracy can also help to foster a culture of trust and collaboration within an organization. When employees have access to data and the skills to interpret it, they can work together more effectively to identify and solve problems. This can help to build trust and create a more collaborative working environment, which can increase productivity by encouraging employees to work together towards a common goal. Another benefit of increased collaboration is that it can help to promote innovation and creativity. When employees have access to the same data, they can use that information to identify new opportunities and come up with innovative solutions. This can help to drive creativity and innovation, which can have a positive impact on productivity and competitiveness.

Increased collaboration is a key way in which data literacy and data democracy can impact employee productivity. By facilitating better communication and collaboration among employees, organizations can improve efficiency, build trust, and promote innovation and creativity. All of these factors can contribute to increased productivity, which can help organizations to achieve their goals and stay competitive in today's fast-paced business environment.

Enhanced innovation is another important way in which data literacy and data democracy can impact employee productivity. When employees are data literate and have access to data, they are better equipped to identify new opportunities and trends, which can lead to more innovative and creative solutions. This can have a positive impact on productivity and competitiveness, helping organizations to stay ahead of the curve and achieve their goals. One of the key benefits of enhanced innovation through data literacy is that it can help organizations to identify new markets or customer segments. When employees have access to data, they can use that information to understand customer behavior and identify new opportunities for growth. This can help organizations to stay ahead of the curve and achieve success in new markets, which can increase productivity and competitiveness.

Another benefit of enhanced innovation is that it can help organizations to optimize processes and practices. When employees have access to data and the skills to interpret it, they can use that information to identify inefficiencies and make data-driven decisions about how to improve processes. This can result in more efficient and effective processes, which can increase productivity and competitiveness. Data literacy and data democracy can also help organizations to stay ahead of trends and anticipate future changes. When employees have access to data and the skills to interpret it, they can use that information to identify emerging trends and make predictions about future developments. This can help organizations to stay ahead of the curve and prepare for future changes, which can increase productivity and competitiveness.

By enabling employees to identify new opportunities and trends, organizations can achieve greater innovation and creativity, which can help to increase productivity and competitiveness. All of these factors can help organizations to achieve their goals and stay ahead of the curve in today's fast-paced business environment.

Better understanding of customers is another important way in which data literacy can impact employee productivity. When employees are data literate, they can use data to better understand customer behavior and preferences, which can result in more personalized and effective customer engagement. This, in turn, can lead to increased customer satisfaction and loyalty, which can increase productivity and help organizations to achieve their goals. One of the key benefits of better understanding of customers through data literacy is that it can help organizations to provide more personalized and relevant customer experiences. When employees have access to data and the skills to interpret it, they can use that information to understand customer preferences and tailor their engagement accordingly. This can help organizations to build stronger relationships with customers and increase customer satisfaction and loyalty, which can have a positive impact on productivity.

Another benefit of better understanding of customers is that it can help organizations to identify areas for improvement. When employees have access to data and the skills to interpret it, they can use that information to identify areas where customer experiences can be improved. This can help organizations to make data-driven decisions about how to optimize customer experiences, which can result in increased customer satisfaction and loyalty, and ultimately, increased productivity.

Data literacy can also help organizations to better understand customer behavior and preferences across different channels and platforms. When employees have access to data and the skills to interpret it, they can use that information to understand how customers engage with different channels and platforms, and tailor their engagement accordingly. This can help organizations to provide a more consistent and seamless customer experience, which can increase customer satisfaction and loyalty, and ultimately, increase productivity. In conclusion, better understanding of customers is an important way in which data literacy can impact employee productivity. By enabling employees to better understand customer behavior and preferences, organizations can provide more personalized and effective customer engagement, which can result in increased customer satisfaction and loyalty. All of these factors can contribute to increased productivity, which can help organizations to achieve their goals and succeed in today's fast-paced business environment.

Improved performance management is another key way in which data literacy and data democracy can impact employee productivity. When employees have access to data and the skills to interpret it, they can track their progress against goals and make data-driven decisions about how to improve their performance. This can result in better performance and increased productivity, helping organizations to achieve their goals and succeed in today's fast-paced business environment.

One of the key benefits of improved performance management through data literacy is that it can help employees to better understand their strengths and weaknesses. When employees have access to data and the skills to interpret it, they can use that information to identify areas where they need to improve, and develop a plan to address those areas. This can help employees to focus their efforts on the areas where they can have the greatest impact, which can result in better performance and increased productivity.

Another benefit of improved performance management is that it can help organizations to identify areas for improvement in their processes and practices. When employees have access to data and the skills to interpret it, they can use that information to identify inefficiencies and make data-driven decisions about how to improve processes. This can result in more efficient and effective processes, which can increase productivity and competitiveness.

Data literacy and data democracy can also help organizations to track progress against goals and measure the impact of initiatives and projects. When employees have access to data and the skills to interpret it, they can use that information to track progress against goals and measure the impact of initiatives and projects. This can help organizations to make data-driven decisions about how to allocate resources and optimize performance, which can result in better performance and increased productivity. Improved performance management is another important way in which data literacy and data democracy can impact employee productivity. By enabling employees to track their progress against goals and make data-driven decisions about how to improve their performance, organizations can achieve better performance and increased productivity.

Model

We suppose in multiple regression model that our target factor is a linear combination of many predictor variables. We may describe the model as follows if x_{nj} is the jth predictor for observation n:

$$y_n \ = \beta_0 + \beta_1 x_{n1} + \cdots + \beta_D x_{nD} + \epsilon_n.$$

This may be expressed more concisely as

$$y_n = \boldsymbol{\beta}^\top \mathbf{x}_n + \epsilon_n.$$

When dealing with matrices rather than sums, it is simpler to minimize this loss function. With, define y and X.

$$\mathbf{y} = \begin{bmatrix} y_1 \\ \dots \\ y_N \end{bmatrix} \in \mathbb{R}^N, \quad \mathbf{X} = \begin{bmatrix} \mathbf{x}_1^\top \\ \dots \\ \mathbf{x}_N^\top \end{bmatrix} \in \mathbb{R}^{N \times (D+1)},$$

The loss function may be written similarly as:

$$\mathcal{L}(\hat{\boldsymbol{\beta}}) = \frac{1}{2}(\mathbf{y} - \mathbf{X}\hat{\boldsymbol{\beta}})^{\top}(\mathbf{y} - \mathbf{X}\hat{\boldsymbol{\beta}}).$$

Following the, we applied the following multivariate regression model to test the hypotheses:

$$Productivity_i = \alpha + \beta_1 Dem_i + \beta_2 Lit_i + \beta_3 HR_i + \beta_4 Ind_i +$$
$$\beta_5 Mng_i + \beta_6 Org_i + \varepsilon_i$$

The descriptions of the variables are provided in table 1. The dependent variable *productivity* denotes the Employee productivity.

Table 1. Variables and descriptions

| Dependent variable	Variable name	Symbol	Description	
	Productivity	*Productivity*	Employee productivity was measured through various methods such as self-reported productivity metrics, supervisor ratings, or task completion rates.	
Independent variables	*Variable name*	Symbol	Description	Expected sign
	Data democratization	*Dem*	Data democratization was measured by conducting surveys or interviews with employees to understand their access to data, their usage of data, and the ease of obtaining data.	Positive (+)
	Data literacy	*Lit*	Data literacy was measured by testing employees' understanding of data-related concepts and their ability to interpret data-driven information.	Positive (+)
	HR factors	*HR*	HR factors were measured through surveys and interviews with HR professionals and other relevant stakeholders to understand the impact of HR policies and practices on employee performance.	Positive (+)
	Individual factors	*Ind*	Individual factors were measured through surveys and interviews with employees to understand their personal attributes and how they impacted their job performance.	Positive (+)
	Managerial factors	*Mng*	Managerial factors were measured through surveys and interviews with supervisors and other relevant stakeholders to understand how management practices influence employee performance.	Positive (+)
	Organizational factors	*Org*	Organizational factors were measured through surveys and interviews with employees to understand the impact of organizational culture, structure, and practices on employee productivity.	Positive (+)

Results

Figure 1. stacked scatter plot.
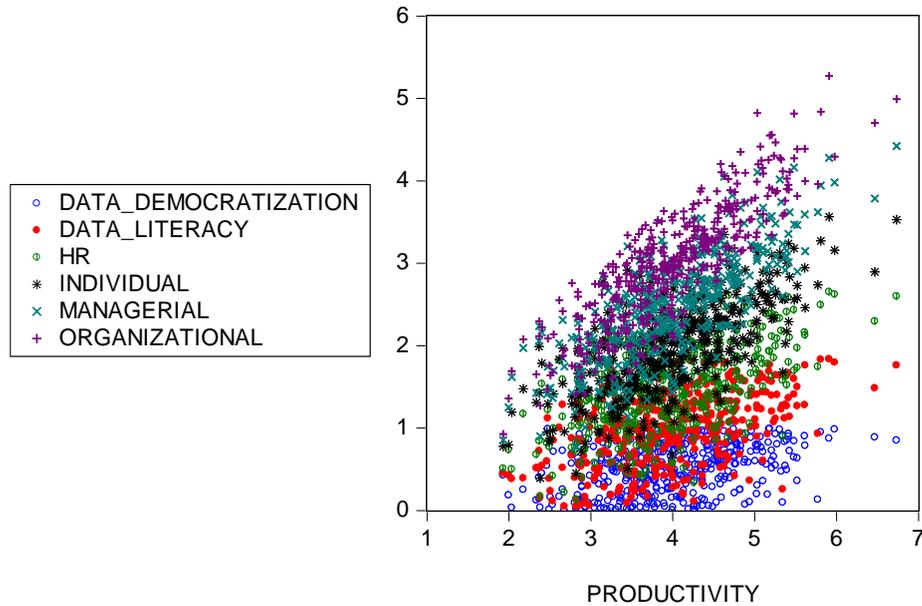
Table 2. Regression results

| Variable	Coefficient	Std. Error	t Statistic	Prob
Data democratization	1.028746	0.069750	14.74895	<0.01
Data literacy	0.957032	0.071611	13.36423	<0.01
HR factors	0.765698	0.068705	11.14475	<0.01
Individual factors	0.991522	0.067432	14.70409	<0.01
Managerial factors	0.917948	0.071368	12.86210	<0.01
Organizational factors	1.034905	0.068947	15.01010	<0.01

This table presents the results of a multiple regression analysis examining the relationship between employee productivity and various independent variables (Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors). The dependent variable, employee productivity, is being explained by these independent variables. Each independent variable has a coefficient that represents the estimated effect on employee productivity. For example, a one unit increase in Data democratization is associated with an estimated increase of 1.028746 in employee productivity. The standard error is a measure of the precision of the coefficient estimate. The t-statistic and Prob. values are used to test the hypothesis that the corresponding independent variable has no effect on employee productivity. The t-statistic measures the number of standard deviations that the coefficient estimate is from zero, and the Prob. value represents the p-value, which is the probability that the observed coefficient would have been obtained by chance if there were no real relationship between the dependent and independent variables.

In this case, all independent variables have a low Prob. value (0.0000), indicating that there is strong evidence against the null hypothesis (i.e., that there is no relationship between the independent and dependent variables). This suggests that all independent variables are significantly related to employee productivity. Overall, this table provides evidence that Data democratization, Data literacy, HR factors, Individual factors, Managerial factors, and Organizational factors all have a positive impact on employee productivity.

The Jarque-Bera test is a statistical test used to check the normality assumption of a data set. The results in displayed in figure 2. The test statistic is based on the skewness and kurtosis of the data. In this case, the p-value for the Jarque-Bera test is 0.12. The p-value is the probability of obtaining a test statistic as extreme as, or more extreme than, the observed value, assuming the null hypothesis is true. In this case, since the p-value (0.12) is greater than the commonly used significance level of 0.05, we fail to reject the null hypothesis and conclude that there is not enough evidence to suggest that the data does not follow a normal distribution.

It is important to note that the coefficients reported in this table are partial regression coefficients. This means that they reflect the effect of each independent variable on employee productivity while controlling for the effects of the other independent variables. This allows you to see the unique contribution of each variable to the explained variance in employee productivity. It is also important to mention here that this table provides only a snapshot of the relationships between the independent and dependent variables, and does not account for other factors that may affect employee productivity. It is possible that there are other variables not included in the analysis that could also be related to employee productivity. Finally, it is important to note that a high t-statistic and low Prob. value do not necessarily mean that the relationship between the independent and dependent variables is causal. Correlation does not imply causation, and further research would be needed to determine the causal relationships between the variables. Overall, the table provides valuable insights into the relationships between the independent variables and employee productivity, but it should be interpreted in the context of other relevant information and with a critical eye.

Figure 2. Jarque-Bera test
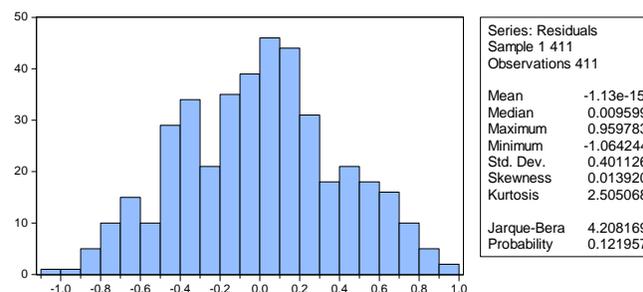
Conclusion

One of the biggest challenges that organizations face in boosting employee productivity is poor communication. When communication between employees and management is lacking, it can lead to confusion, frustration, and decreased motivation. This can result in employees feeling unappreciated or undervalued, which can decrease their productivity levels. To combat this, organizations need to establish clear lines of communication and encourage open dialogue between employees and management. Regular feedback and goal setting sessions can also help to keep employees engaged and motivated. Another challenge that organizations face is a lack of employee engagement. When employees feel disengaged from their work, it can result in decreased productivity levels. Engaged employees are more likely to take ownership of their work and take an active role in their own development. To increase employee engagement, organizations need to

provide opportunities for employee development and growth. They can also encourage employees to take an active role in their own development by offering training programs, mentorship opportunities, and other resources.

Workplace stress is another challenge that organizations face in boosting employee productivity. Stress can have a negative impact on employees' mental and physical health, leading to decreased productivity levels. To combat this, organizations need to create a supportive work environment that reduces stress levels. This can be achieved through a variety of means, including offering flexible working arrangements, promoting work-life balance, and providing access to support services. A lack of diversity and inclusion can also be a challenge for organizations looking to boost employee productivity. When employees feel that their perspectives and experiences are not valued, it can result in decreased motivation and engagement. To combat this, organizations need to create a workplace culture that values diversity and encourages employees to bring their unique perspectives and experiences to the table. This can be achieved through diversity and inclusion training programs, employee resource groups, and other initiatives.

Finally, organizations can face challenges related to technology and digital transformation. In today's rapidly changing business landscape, companies need to be agile and able to quickly adapt to new technologies and trends. However, this can be a challenge for organizations with legacy systems or outdated technology. To stay competitive, organizations need to invest in technology that supports their goals and helps them remain at the forefront of their industry. Additionally, they need to provide employees with the training and resources they need to effectively use new technologies and keep their skills up to date.

Despite the many benefits of data literacy and data democratization, there are also a number of challenges that organizations must overcome in order to fully realize these benefits. Some of the key challenges include a lack of data literacy skills among employees, resistance to change, limited access to data, and a lack of data governance and security. One of the biggest challenges of data literacy and data democratization is a lack of data literacy skills among employees. Despite the increasing importance of data in today's business environment, many employees lack the skills and knowledge to effectively use and interpret data. This can make it difficult for organizations to fully realize the benefits of data literacy and data democratization, and can result in inefficiencies and incorrect decisions. Another challenge is resistance to change. Many organizations are set in their ways and may be resistant to change, particularly when it comes to adopting new data-driven processes and practices. This resistance can make it difficult for organizations to fully embrace data literacy and data democratization, and can result in slow adoption and limited impact.

Limited access to data is another challenge that organizations must overcome. In many cases, data is siloed within different departments or functions, making it difficult for employees to access the data they need to make informed decisions. This can result in inefficiencies and incorrect decisions, and can limit the impact of data literacy and data democratization. Finally, a lack of data governance and security is a challenge that organizations must overcome in order to fully realize the benefits of data literacy and data democratization. When data is not properly governed and secured, it can result in data breaches and other security incidents, which can harm an organization's reputation and financial stability. Organizations must therefore implement strong data governance and security practices in order to protect sensitive information and fully realize the benefits of data literacy and data democratization.

References

[1] R. T. Yoder, "Digitalization and data democratization in offshore drilling," in *Offshore Technology Conference*, 2019.

[2] R. Mclaughlin and C. Young, "Data democratization and spatial heterogeneity in the housing market," 2018. [Online]. Available: https://www.jchs.harvard.edu/sites/default/files/media/imp/a_shared_future_data_democratization_spatial_heterogeneity.pdf.

[3] V. Bandari, "Integrating DevOps with Existing Healthcare IT Infrastructure and Processes: Challenges and Key Considerations," *Empirical Quests for Management Essences*, vol. 2, no. 4, pp. 46–60, 2018.

[4] D. S. Sawicki and W. J. Craig, "The Democratization of Data: Bridging the Gap for Community Groups," *J. Am. Plann. Assoc.*, vol. 62, no. 4, pp. 512–523, Dec. 1996.

[5] J. C. Alexander and G. P. Joshi, "Smartphone Application-based Medical Devices: Twenty-first Century Data Democratization or Anarchy?," *Anesth. Analg.*, vol. 123, no. 4, pp. 1046–1050, Oct. 2016.

[6] N. Tzenios, "The Impact of Health Literacy on Employee Productivity: An Empirical Investigation," *Empirical Quests for Management Essences*, vol. 3, no. 1, pp. 21–33, Nov. 2019.

[7] V. Bandari, "Exploring the Transformational Potential of Emerging Technologies in Human Resource Analytics: A Comparative Study of the Applications of IoT, AI, and Cloud Computing," *Journal of Humanities and Applied Science Research*, vol. 2, no. 1, pp. 15–27, 2019.

[8] G. Halkos and D. Bousinakis, "The effect of stress and satisfaction on productivity," *International Journal of Productivity and Performance Management*, vol. 59, no. 5, pp. 415–431, Jan. 2010.

[9] J. Hanaysha, "Testing the effects of employee empowerment, teamwork, and employee training on employee productivity in higher education sector," *International Journal of Learning and Development*, 2016.

[10] I. M. Nurun Nabi and H. A. A. Dip TM, "Impact of motivation on employee performances: a case study of Karmasangsthan bank Limited, Bangladesh," *Arabian J Bus Manag Review*, vol. 7, no. 293, p. 2, 2017.

[11] A. Ferreira and T. Du Plessis, "Effect of online social networking on employee productivity," *S. Afr. J. Inf. Manag.*, 2009.

[12] E. E. Yamoah, "Relationship between compensation and employee productivity," *Singaporean Journal of Business, Economics*, 2013.

[13] D. McNeese-Smith, "Increasing employee productivity, job satisfaction, and organizational commitment," *Hosp. Health Serv. Adm.*, vol. 41, no. 2, pp. 160–175, Summer 1996.

[14] R. Gould, "Data literacy is statistical literacy," *J. Educ. Behav. Stat.*, vol. 16, no. 1, pp. 22–25, 2017.

[15] M. Frank, J. Walker, J. Attard, and A. Tygel, "Data Literacy - What is it and how can we make it happen?," *J. Community Inform.*, vol. 12, no. 3, Sep. 2016.

[16] V. Bandari, "The Impact of Artificial Intelligence on the Revenue Growth of Small Businesses in Developing Countries: An Empirical Study," *Reviews of Contemporary Business Analytics*, vol. 2, no. 1, pp. 33–44, 2019.

[17] S. Racherla, "Personalized Employee Training Based on Learning Styles Using Unsupervised Machine Learning," *RCBA*, vol. 2, no. 1, pp. 1–11, Oct. 2019.

[18] E. B. Mandinach and E. S. Gummer, "A Systemic View of Implementing Data Literacy in Educator Preparation," *Educ. Res.*, vol. 42, no. 1, pp. 30–37, Jan. 2013.

[19] T. Koltay, "Data literacy: in search of a name and identity," *Journal of Documentation*, vol. 71, no. 2, pp. 401–415, Jan. 2015.

[20] M. Shields, "Information Literacy, Statistical Literacy, data Literacy," *IASSIST Q.*, vol. 28, no. 2, p. 6, Aug. 2005.

[21] R. Schneider, "Research Data Literacy," in *Worldwide Commonalities and Challenges in Information Literacy Research and Practice*, 2013, pp. 134–140.

[22] A. Wolff, D. Gooch, J. J. Cavero Montaner, U. Rashid, and G. Kortuem, "Creating an Understanding of Data Literacy for a Data-driven Society," *JoCI*, vol. 12, no. 3, Aug. 2016.

[23] E. S. Gummer and E. B. Mandinach, "Building a Conceptual Framework for Data Literacy," *Teach. Coll. Rec.*, vol. 117, no. 4, pp. 1–22, Apr. 2015.

[24] T. Koltay, "Data literacy for researchers and data librarians," *Journal of Librarianship and Information Science*, vol. 49, no. 1, pp. 3–14, Mar. 2017.

[25] K. Haldorai, W. G. Kim, S. G. Pillai, T. (eliot) Park, and K. Balasubramanian, "Factors affecting hotel employees' attrition and turnover: Application of pull-push-mooring framework," *Int. J. Hosp. Manage.*, vol. 83, pp. 46–55, Oct. 2019.

[26] S. Li, C. J. Rees, and M. Branine, "Employees' perceptions of human resource management practices and employee outcomes," *Empl. Relat.*, vol. ahead-of-print, no. ahead-of-print, Aug. 2019.

[27] B. Ahmad, H. Tariq, Q. (derek) Weng, S. S. Shillamkwese, and N. Sohail, "When a proximate starts to gossip," *Empl. Relat.*, vol. 41, no. 5, pp. 851–875, Aug. 2019.

[28] N. Lin-Hi, L. Rothenhöfer, and I. Blumberg, "The relevance of socially responsible blue-collar human resource management," *Empl. Relat.*, vol. ahead-of-print, no. ahead-of-print, Jul. 2019.