Safeguarding Privacy, Ensuring Ethics: Exploring Implications of Data-Driven Workforce Planning in State Universities and Colleges

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Abstract*:* Organizations such as State Universities and Colleges (SUCs) recognize the critical importance of data-driven decision-making. Despite the promising benefits of data-driven decision-making, there are unavoidable ethical issues and privacy risks associated with access to workforce data. However, these risks have been limitedly researched particularly in the context of Higher Education Institutions (HEIs) such as SUCs. In line with this, this study sought to explore the implications of data-driven workforce planning in the context of SUCs. The researcher adopted the mixed method approach where a survey was conducted to ten (10) HRMO/HRDO in various SUCs in the Philippines. The survey aims to gather both qualitative and quantitative data regarding perceptions, and experiences towards data-driven workforce planning. The results showed that information on offered academic programs, faculty-student ratios, retirement and attrition rates, needs for skills and expertise, and enrolment projections can help predict and meet the demand for workforce in SUCs in a more accurate and tailored manner. With these data, SUCs perceived that Data Privacy and Consent, Anonymity and Confidentiality, and Consistency with Legal Requirements are among the top ethical considerations in data-driven workforce planning. Likewise, the Misinterpretation of Data, Privacy Violations, Data Security Breaches, and Legal and Regulatory Consequences, emerged as the top ethical dilemmas and data privacy implications. Therefore, SUCs need to establish policies taking into consideration the findings of this study to achieve the right balance between harnessing employee data for planning purposes and upholding ethical standards while ensuring strong data privacy controls.

1. Introduction

Data-driven decision-making has grown more and more necessary in recent years as businesses have realized how crucial it is to match their workforce strategy with their overall organizational goals. Because of several aspects such as policy changes, technological improvements, organizational expansion, and demographic shifts, workforce planning is one of the most complicated and challenging organizational components (1). For these reasons, people analytics and modern technologies like machine learning are being integrated into the traditional methods used in workforce planning (5)(6).

In the Philippines, State Universities and Colleges (SUCs) have a significant influence on the educational system and advance the goals of the country. For these organizations to guarantee ideal staffing levels and expertise alignment, effective workforce planning is crucial. There can be repercussions if staffing levels are not appropriate. In State Colleges and Universities, an inadequate number of teaching and non-teaching staff members can result in increased workloads, stress, and burnout, which ultimately could lead to lower productivity, low-quality work output, and inability to meet the goals and objectives of the SUC. However, overstaffing can result in underutilization of resources, decreased output, and needless financial burden. Consequently, to prevent wasting resources and inefficiencies, it is crucial to achieve the correct

balance between having enough employees to handle the workload and not overstaffing. In addition, there could be serious consequences for a State College or University if there is a mismatch in the expertise of the workforce. Instructional quality may suffer when faculty members teach subjects outside of their areas of specialization, which will have a detrimental effect on students' academic performance and learning experiences. SUCs in the Philippines must thus give careful consideration to workforce planning if they hope to avert these serious consequences.

Manual workforce planning without the use of a data-driven method would result in bias and subjectivity, as well as erroneous workload demand projections, which are drawbacks and constraints for an organization. Park and Park's (7) study highlights the shortcomings of manual forecasting techniques in gauging labor demand, particularly in unstable and dynamic settings. Furthermore, a data-driven approach to workforce planning can result in better decision-making and improved organizational outcomes, according to Bersin & Associates, a consulting firm that offers management services, research and analysis, and people management (8).

Despite the potential benefits of data-driven decision-making, there are inherent ethical concerns and privacy risks connected with unprecedented access to enormous workforce data. This is reinforced by Lisa Marie Giermindl et al's (2022) study, "The Dark Sides of People Analytics: Reviewing the Perils for Organizations and Employees". The study was able to map the existing area of people analytics and identify many risks associated with its use.

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Most of the reviewed literature cited privacy and data protection concerns (10–12). Some research directly addressed the topic of worker surveillance, constant tracking, and algorithmic control (13,14). Furthermore, these studies demonstrate that frequent tracking, collection, and exploitation of sensitive data can lead to workers feeling controlled (14,15). When employees feel constantly monitored and controlled, they may perceive a lack of trust from their employers, which can lead to a decrease in their motivation and engagement. Another peril raised is the issue of implicit algorithmic bias in people analytics (16,17). This bias can arise from poorly trained algorithms or inherent, yet subtle, human bias present in the training data. As a result, the presence of bias in the algorithms used for people analytics can have negative implications for decision-making processes within organizations. Lack of algorithmic transparency is another issue raised (15,16). This means that the functioning of the algorithms is not fully transparent or understandable. The non-transparent functioning of algorithms used in people analytics can lead to questions about the fairness and reliability of the decision-making processes. Adverse effects on workplace ethics and personal integrity are another potential risk raised in the reviewed literature (15,16). Increasing datafication and the use of nudging techniques in people analytics can have adverse effects on employees' virtue ethics and personal integrity. Lastly, the risk of error variance and potential reductionism was pointed out also as another potential risk. Error variance refers to the variability or inconsistency in the data used for people analytics, which can lead to inaccurate or unreliable results. However, these risks have been limitedly researched and future researchers need to understand and address these risks to improve the effectiveness and ethical implications of people analytics.

In light of these facts, the goal of this research will focus on pinpointing the key ethical considerations and data privacy implications when data-driven workforce planning is implemented in the context of State Universities and Colleges.

To accomplish this goal, the research involves identifying first what historical data can be used for workforce planning; identifying the ethical considerations and data privacy implications in data-driven workforce planning; and offering recommendations for organizational policies that balance data utilization for workforce planning while upholding ethical standards and ensuring robust data privacy protocols.

By achieving these objectives, this paper aspires to provide a comprehensive understanding of the ethical complexities that surface when data becomes the cornerstone of workforce planning strategies. Ultimately, it strives to offer insights and recommendations that can guide organizations in fostering a symbiotic relationship between data-driven innovation and ethical responsibility.

Lastly, this study is believed to contribute to the limited pieces of literature on exploring the risks and ethical implications of data-driven workforce planning in the Philippine SUCs setting.

2. Methods

Anchored to the objectives of this study, the researcher adopted the mixed-method design where both qualitative and quantitative data were collected, where a survey was conducted to ten (10) Human Resource Management Directors or Officers in various SUCs in the Philippines.

2.1. Materials
Questionnaire: The questionnaire includes both open-ended and closed-ended questions designed to gather respondents' perspectives on what workforce data can be utilized for workforce planning, as well as the ethical issues and data privacy implications associated with data-driven workforce planning.

2.2 Data Gathering Procedure
Survey: The survey was conducted through a researcher-made questionnaire. Respondents of the survey were selected through convenience or volunteer sampling where respondents are chosen based on the availability and willingness to participate in the survey. Therefore, only those SUCs who are available and willing to participate in the survey are selected as respondents.

2.3 Analysis
Descriptive Statistics: To analyze the gathered numerical data, percentage, mean, and rank were used.
Thematic Analysis: To analyze the qualitative data gathered, thematic analysis was used. Through thematic analysis, different themes were uncovered from the gathered data relevant to the top ethical considerations and data privacy implications in data-driven workforce planning.

3. Results and Discussion

This results and discussion section encapsulates the findings gleaned from the investigation, providing insights into the facets of historical data relevance, ethical dilemmas, and privacy concerns encountered in data-driven workforce planning. Moreover, it offers distinct recommendations poised to guide the formulation of ethical policies within SUCs, fostering a symbiotic balance between data utilization and the ethical necessities of privacy and integrity.

3.1 What are the historical data that can be used for workforce planning?

In figuring out what historical data can be used for workforce planning in SUCs, the survey started by asking the respondents what historical workforce data are available in their respective SUCs. Responses can be gleaned in Figure 1.
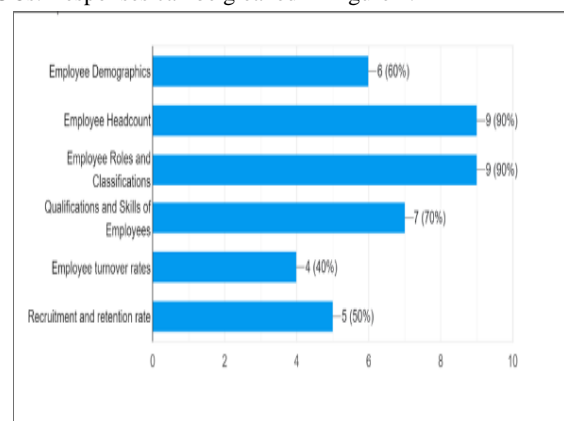

Fig 1. Historical Workforce Data Available in SUCs

Figure 1 presents an overview of the historical workforce data available within State Universities and Colleges in the Philippines. The responses indicate a diverse range of historical workforce data collected by SUCs. The high percentage (90%) of respondents acknowledging the significance of tracking employee headcount over time, as well as roles and classifications, emphasizes the importance of comprehensive workforce data management within SUCs. This suggests a strong need for continued investment in systems and processes that facilitate the effective tracking of these workforce metrics. The acknowledgment by a majority of respondents (70%) regarding the importance of tracking employee qualification and skills underscores the recognition of competencies and expertise as crucial factors in workforce planning. This implies a need for strategies that align with the development and utilization of skills and qualifications for the betterment of the workforce. The emphasis on demographic information by a significant number of respondents (60%) signals an awareness of the importance of understanding the workforce composition in terms of age, gender, and other demographic factors.

This implies a recognition of the diverse nature of the workforce and the potential need for targeted initiatives or policies. The acknowledgment by a substantial portion of respondents (40% and 50%) regarding the importance of tracking turnover rates, recruitment, and retention rates suggests a recognition of the dynamic nature of the workforce. This implies a need for strategies to manage turnover effectively, optimize recruitment processes, and enhance retention efforts.
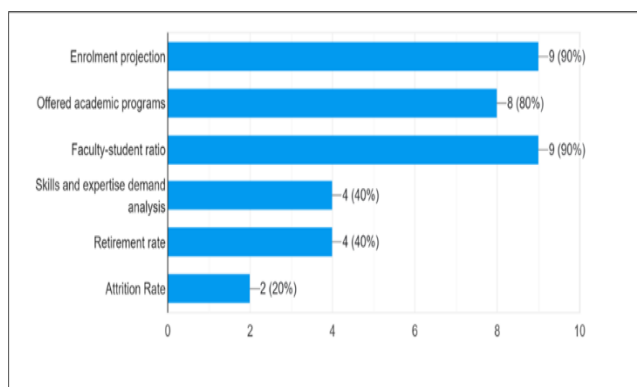

Fig 2. Data Utilized by SUCs to Forecast Demand for Academic Personnel

As shown in Figure 2, the responses gathered provide a comprehensive view of the various data utilized to forecast the demand for Academic or Teaching Staff/Employees within State Universities and Colleges (SUCs). In terms of enrolment projection, this data is consistently mentioned across all respondents. Forecasting based on projected enrolment numbers is a fundamental metric for anticipating future staffing needs, and aligning staffing levels with student numbers. Linked closely with enrolment projections, the variety and nature of academic programs offered directly influence staffing demands. Different programs may require specific expertise and staffing configurations.

Further, a key metric highlighted by most respondents, the faculty-student ratio is pivotal in determining the adequate staffing levels needed to maintain educational standards and cater to student needs. Moreover, as noted by several respondents, skills and expertise demand analysis involves analyzing the specific skills and expertise demanded within different academic areas. This analysis aids in tailoring hiring strategies to meet specialized requirements. Lastly, as mentioned by a few respondents, retirement rate and attrition rate factor in the expected exits of employees due to retirement and attrition, influencing the need for new staff hires to maintain operational continuity.
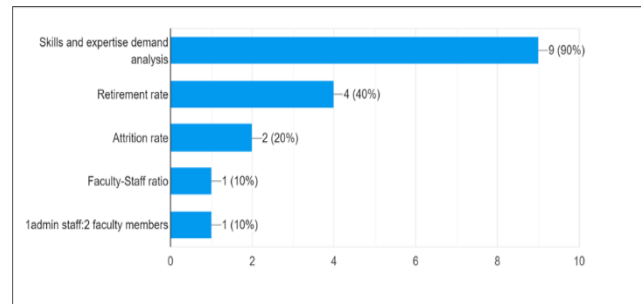

Fig 3. Data Utilized by SUCs to Forecast Demand for Non-Academic Personnel

As shown in Figure 3, the responses gathered provide insights into the specific data utilized to forecast demand for non-academic personnel within SUCs. Skills and expertise demand analysis is consistently highlighted across almost all respondents (90%). It suggests a focused approach to assessing the specific skills and expertise required within non-academic roles, tailoring workforce planning to meet these specific needs. Moreover, the retirement rate and attrition rate, mentioned by multiple respondents (40% and 20% respectively) indicate the expected exits of employees from the non-academic workforce due to retirement and attrition. Understanding these rates aids in forecasting vacancies and planning for replacements. Lastly, the faculty-staff ratio was mentioned by one respondent (10%), indicating a perspective on aligning the non-academic workforce concerning the academic faculty. As mentioned by one respondent one (1) admin staff is to two (2) faculty members.

With these data in the SUCs, the implications suggest a call for continuous efforts to implement and enhance data management in such a way that SUCs will have a strong understanding of the characteristics and distribution of the current workforce. This is critical because Ann Cotten (15) points out that a strong understanding of the current workforce's characteristics, capabilities, and distribution is required to project how the workforce will change over the planning horizon, as well as to develop effective gap-closing strategies. Furthermore, with this type of workforce data and the advancement of technology and data-driven workforce planning, having a solid data privacy framework is critical (16).

3.2 What are the ethical considerations and data privacy implications in data-driven workforce planning?

The thematic analysis of the responses provides the uncovered ethical considerations perceived by respondents when using employee data for workforce planning purposes. There are 12 themes identified but only the top 5 themes were presented in Table 1 with corresponding ranks based on the perception of the respondents, one (1) being the topmost consideration and 5 being

the least consideration.

Table 1. Overview of the Top 5 Emerging Themes on the Ethical Considerations in Data-Driven Workforce Planning in SUCs

Theme(Ethical Considerations)	Description	Rank
Data Privacy and Consent	obtaining informed consent before collecting, storing, or using personal data for workforce planning and ensuring that the data is collected transparently	1
Anonymity and Confidentiality	ensuring that identity is concealed from others and safeguarding sensitive information to prevent unauthorized access, disclosure, or use.	2
Consistency with Legal Requirements	ensuring that workforce data usage aligns with local, national, and international laws and regulations governing data privacy, and labor practices	
Data Security	safeguarding digital information from various threats including cyberattacks, data breaches, and unauthorized alteration and destruction.	3
Education and Training	providing education, awareness, and training to all personnel involved in workforce planning about the ethical considerations and best practices for handling employee data	4
Ethical Oversight	establishing an oversight committee for reviewing and approving the use of workforce data in an ethical and compliant manner	5

As shown in Table 1, Data Privacy and Consent (Rank1), emerged as the foremost concern. This theme emphasizes the paramount importance of ensuring data privacy and obtaining consent from employees for the ethical use of their data in workforce planning. Further, Anonymity and Confidentiality (Rank 2) and Consistency with Legal Requirements (Rank 2), share the second rank. This theme emphasizes the significance of maintaining anonymity, and confidentiality and aligning practices with legal frameworks. This further underscores the need for confidentiality in handling employee information while adhering to established legal standards.

Moreover, Data Security (Rank 3), is positioned third. This theme highlights the critical need for robust data security measures to protect employee data from breaches or unauthorized access, ensuring its integrity and confidentiality.

Additionally, the theme Education and Training (Rank 4), underscores the importance of providing education and training to employees and stakeholders involved in handling workforce data. It stresses the need for awareness and competency in ethical data practices. Positioned fifth, the theme of Ethical Oversight (Rank 5), emphasizes the necessity for governance structures and oversight to ensure ethical practices throughout the handling of employee data. Other themes emerged are non-discrimination, access control, data minimization, retention and deletion, redress mechanism and provision of counseling.

These rankings collectively stress the importance of respecting employee privacy, ensuring legal compliance, fostering data security, promoting fairness, and providing support mechanisms for employees while handling their data for workforce planning purposes.

Table 2. Overview of Top 5 Emerging Themes on the Ethical Dilemmas and Data Privacy Implications in Data-Driven Workforce Planning in SUCs

Theme (Ethical Dilemmas and Data Privacy Implications)	Description	Rank
Misinterpretation of Data	when data are analyzed inaccurately this can lead to incorrect conclusions and incorrect decision making	1
Privacy Violations	collecting and using personal information without proper consent or transparency can infringe on employees' privacy rights	2
Data Security Breach	when unauthorized individuals or entities gain access, acquire, or otherwise compromise sensitive or confidential information stored electronically which can lead to consequences	
Legal and Regulatory Consequences	failure to comply with the laws and regulations governing the collection and analysis of data could face legal and financial consequences	3
Lack of Transparency	when the method and criteria for workforce planning are not transparent, employees may feel that decisions about their careers are made in a biased or unfair manner	4
Stigmatization	the use of employee data to identify performance issues or health concerns may lead to stigmatization, potentially impacting an employee's mental health and well-being	
Loss of Control	employees may feel a loss of control over their data and career decisions when data-driven algorithms play a significant role in workforce planning	5

As gleaned in Table 2, the thematic analysis ranks potential ethical dilemmas and data privacy implications foreseen by respondents

regarding the use of employee data in workforce planning. Positioned first is the theme, *Misinterpretation of Data (Rank 1)*.

This theme emerged as the most concerning ethical dilemma. It highlights the risk of misinterpreting or misusing employee data, leading to incorrect assumptions or decisions in workforce planning. Positioned second, the theme *Privacy Violations (Rank 2)*, emphasizes the concern about potential breaches of individual privacy which may lead to identity theft, underscoring the importance of respecting employees' private information during data utilization. Tied to the third position, the themes *Data Security Breach (Rank 3)* and *Legal and Regulatory Consequences (Rank 3)*, highlight the risk of data breaches and the subsequent legal consequences if employee data is compromised, emphasizing the need for robust security measures and compliance with regulations. Positioned fourth, the theme *Lack of Transparency (Rank 4)*, underscores the importance of transparent communication about how employee data is used in workforce planning, emphasizing the need for clear and open practices to build trust. Sharing the fifth position, the themes *Stigmatization (Rank 5) and Loss of Control (Rank 5)*, highlight concerns about potential stigmatization or loss of control over one's data. This includes fears of being negatively labeled or losing autonomy over how their information is utilized. Other themes emerged are discrimination and unintended consequences.

These rankings collectively reveal various ethical dilemmas and potential privacy implications associated with the use of employee data in workforce planning. They underscore the importance of accurate interpretation, privacy protection, data security, transparency, and avoidance of unintended consequences or discrimination when utilizing employee data for planning purposes.

The aforementioned results depicted in Table 1 and Table 2, was being supported by the identified major data privacy concerns in human resource technologies by Ramesh Nyathani (16) which includes: data security, access control, compliance with regulations, algorithmic bias, and data minimization.

While this study may contribute valuable insights into data-driven workforce planning ethical and data privacy implications, it is essential to acknowledge the limitations that affect the interpretation and generalizability. On the limitation of the study, this study relied on responses from a relatively small sample of SUCs. This may impact the generalizability of the findings to the entire population of SUCs in the Philippines, as the perspectives and practices of non-participating institution might differ. Further, this study relies only on survey method to collect data. While this method provides valuable insights, the method has its inherent limitations which can be overcome by using interviews or focus group discussions. Lastly, the study is constrained by a limited exploration of existing literature on the subject due to time and resource constraints. Thereby the need for more extensive literature review for future research.

3.3 What recommendations can be offered for SUCs' policies that balance data utilization for workforce planning while upholding ethical standards and ensuring robust data privacy controls?

Based on the presented results highlighting various ethical considerations and potential ethical dilemmas and privacy implications in data-driven workforce planning, the following recommendations are offered for SUC policies to balance data utilization with ethical standards and robust privacy controls.

1. SUCs shall develop a comprehensive policy that prioritizes data privacy and consent, ensuring explicit consent from employees for data usage in workforce planning. Further, clear guidelines on data collection and classification (such as personal, sensitive, not sensitive, etc.), storage, and usage to safeguard individual privacy shall be implemented.

2. SUCs shall implement a robust data validation and verification process to verify the accuracy and reliability of data before incorporating it into decision-making to reduce the chance of misinterpretation. Further, SUCs shall have a peer review and collaborative analysis among experts to validate findings and interpretations.

3. SUCs shall put strong data security procedures in place to guard against breaches and illegal access. This involves encryption, access controls, routine audits, and continuous monitoring.

4. SUCs shall establish policies promoting transparency in data usage for workforce planning. Further, clear communication to employees about how their data is used, providing avenues for inquiries, and accountability mechanisms for data handling practices shall be ensured.

5. SUCs are encouraged to set up a governance structure or committee for ethical oversight, ensuring adherence to ethical standards in data utilization. This includes regular assessments, ethical reviews, and oversight committees to monitor compliance with policies.

6. SUCs shall provide ongoing education and training programs for employees involved in data handling. This ensures awareness of ethical considerations, privacy controls, and regulatory compliance, fostering a culture of ethical data use.

7. SUCs shall ensure alignment with legal requirements and regulations governing data privacy and employee rights. Regularly update policies to comply with evolving legal frameworks.

8. SUCs shall establish mechanisms for employees to address concerns or seek redress regarding data usage. Avenues for individuals to report concerns, request data corrections, or seek resolution for privacy-related issues shall be provided

9. SUCs shall develop policies that emphasize data minimization, collecting only necessary information for workforce planning purposes. Implement clear guidelines for data retention and deletion to avoid storing data longer than required.

10. SUCs shall continuously review and update policies based on feedback, technological advancements, and evolving ethical standards. Embrace a culture of continuous improvement in data handling practices.

4. Conclusions

In conclusion, the diverse historical workforce data collected by SUCs could lay a solid foundation for informed decision-making, strategic planning, and policy formulation within SUCs. On the side of workforce planning for Academic Personnel in SUCs, the consistent emphasis on enrolment projection offered by academic programs, and faculty-student ratios signifies their critical role in determining staffing needs within SUCs. Additionally, the consideration of skills analysis and rates of retirement/attrition underscores a more subtle approach to anticipate and address workforce demand in response to evolving academic needs and staff dynamics. On the side of workforce planning for Non-

Academic Personnel, the consistent emphasis on skills and expertise demand analysis underscores the criticality of understanding the specialized requirements within requirements within non-academic roles. Moreover, the consideration of retirement and attrition rates provides a forward-looking view, allowing institutions to anticipate vacancies and succession planning within non-academic staff.

The thematic analysis of ethical considerations and potential privacy implications in data-driven workforce planning raised issues such as data privacy violations and misinterpretation of data to stigmatization and other unintended consequences. This highlights the critical need for organizations, particularly State Universities and Colleges (SUCs), to navigate the delicate balance between harnessing employee data for planning purposes and upholding ethical standards while ensuring robust data privacy controls. Therefore, there is a need for SUCs to establish policies taking into consideration the findings of this study.

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