

Main Report

Report On

**Enhancing Organizational Efficiency through IT Innovation: A
Case Study on Integrating Modern Collaborative Software at
ACI PLC, Bangladesh**

By

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An internship report submitted to the BRAC Business School in partial fulfillment of the requirements for the degree of Bachelor of Business Administration

**BRAC Business School
BRAC University
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Declaration

It is hereby declared that

1. The internship report submitted is my/our own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I/We have acknowledged all main sources of help.

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Subject: Submission of Internship Report titled “Enhancing Organizational Efficiency through IT Innovation: A Case Study on Integrating Modern Collaborative Software at ACI PLC, Bangladesh”

Dear Sir,

It is my extreme pleasure to submit my internship report as a partial requirement of the Bachelor of Business Administration program at BRAC Business School, BRAC University. This report has given a detailed report on ACI PLC, including its structure, management, marketing, financial and accounting, its operations management, information systems as well as its competitive positioning. The particular attention is paid to my experience as Data Analyst Intern in the Supply Chain Department, such as data management, data reporting, and operational decision-making.

This research shows how business management can be practically implemented and what role can be played in gaining knowledge about the efficiency of the organization, workflow analysis, and data-driven operations.

Sincerely Yours,

Farhan Sadik Talha

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Date:

Non-Disclosure Agreement

I, Farhan Sadik Talha, soberly state that the internship report, entitled Enhancing Organizational Efficiency through IT Innovation: A Case Study on Integrating Modern Collaborative Software at ACI PLC, Bangladesh has been prepared and updated by me after a three-month internship in ACI PLC, Bangladesh has been completed successfully. I testify by the report that this is just a report commissioned by me and it has not submitted under any other condition or use other than to meet my BBA program requirement at BRAC University.

Acknowledgement

I am deeply appreciative towards Allah (SWT) who has provided me with the strength and wisdom to finish this internship role, as well as research project. I believe that this opportunity is a major step in my academic and career path.

My utmost appreciation goes to my supervisor, Raad Ryasaat Khan who is a lecturer at BRAC Business School and guided me throughout my preparation of this report. He has been encouraging and giving constructive feedback and his perseverance and inspiration.

I would like to extend my utmost gratitude to my organization supervisor, Muktadir Haque, Manager of Corporate Supply Chain department at ACI PLC, Bangladesh who was consistently guiding and supporting me throughout my internship on many things that are included in the organization and which software are being used and also, I get to know new terms that are being used in this organization.

I would also like to thank all my seniors at ACI PLC, Bangladesh especially the indirect purchase team. Their support and the desire to help me during the internship were critical and assisted me in gaining an in-depth knowledge of the Supply chain systems and data analysis practices.

Executive Summary

The following internship report is a detailed discussion of ACI PLC one of the major conglomerates of Bangladesh with special reference to the Supply Chain Department where I worked as a Data Analyst Intern. The paper focuses on the efficiency in the operations of the organization, its management, marketing, financial and accounting systems, and the application of information systems in decision making.

The internship experience helped me to be involved in the data management and reporting process, which involves the collection, cleaning and analysis of operational data to aid with the workflow and performance analysis. The report shows that the participative leadership style and organized human resource management through recruitment, training, and performance appraisal programs by ACI PLC facilitate productivity and goal attainment in the various departments.

One of the major elements of the work was the analysis of employee productivity regarding software tools. The survey information and financial analysis of Office 2019 and Microsoft 365 proved that Microsoft 365 is superior in collaboration and automating workflow, but, at the same time, office 2019 is the most affordable to use regarding the overall reporting process. The trade-offs between the cost and productivity gains were measured using metrics like productivity indices, correlation insights, and ICER values.

The report also evaluates the marketing, financial and operational practice at ACI PLC with the emphasis on the incorporation of technology and the use of data informed decision-making in enhancing efficiency and competitiveness. On the whole, the internship experience was quite informative in terms of the operation aspects of large organizations involving the significance of proper data management, the use of cost-effective tools, and optimization of the workflow to promote the strategic goals of the company.

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Chapter 1: Overview of Internship

1.1 Introduction of Myself

I, Farhan Sadik Talha, a student of Bachelors of Business Administration (BBA), ID:21204156 from BRAC Business School (BBS) is an enthusiastic about the academic field on MIS at BRAC University. The curriculum of BRAC University combines theory and also with practice by having an internship feature in the last semester. The aim of this internship program is to narrow down the distance between the theoretical and practices, especially in the field of focus of the student. In order to meet the necessity of this program, I had to gain an internship experience in one of the most successful company in Bangladesh which is ACI PLC, Bangladsh. This report summarizes the facts about an internship as such, the task given, the lessons learned, and the reflections of the internship experience as a whole.

1.2 Internship Information

1.2.1 Period, Company Name, Department/Division, Address

The duration of the internship is three months, from 22/07/2025 to 21/12/2025. I was assigned to the Corporate Supply Chain department of ACI PLC, Bangladesh, a top public company in Bangladesh under the ACI PLC, Bangladesh, located at ACI Centre, 245, Tejgaon I/A, Dhaka-1208

1.2.2 The information of the supervisor in ACI PLC, Bangladesh

During the entire time of the internship, I managed to work under the supervision of Moktadir Haque, who is the manager of the indirect purchase team of corporate supply chain department. Being a highly qualified professional in role, and have the knowledge of dealing with data and working in supplier management very efficiently. My supervisor was very helpful towards me while doing any task and always guided me. Moreover, he always talked to me about what I should do next and which is done by which task in my daily tasks.

1.2.3 Job Scope-Job Description/Responsibilities

Being an data analyst intern in the supply chain department, my work was more of the observational, learning, and general assistance to the department. During the initial weeks, I spent undergoing the observations of the work processes and how the data are being handled and from where the data has to be collected by this department. I have monitored that from which source the data are being stored safely and made improvements on how to use this data for preparing savings reports and necessary analysis to improve supply chain activities.

1.3 Internship Outcome

1.3.1 Student's Contribution to ACI PLC

In the course of my internship in the Supply Chain Department of ACI PLC, my skills to make a direct contribution to the organization emerged because of the opportunities offered and restrictions related to the operational confidentiality. Since ACI is a big conglomerate with sensitive procurement, logistics, and inventory data, some internal systems especially those linked to strategic supplier data, pricing models and limited ERP packages could not be availed

to interns. Notwithstanding such rational restrictions, I was always interested in trying to bring value to the department and assist the supply chain workflow of the larger organization.

A major part of my work was focused on information preparation, cleaning, validation, and organization. I helped the team format and validate raw data obtained in different units, and these are procurement records, stock movement, and distribution schedules. Through the assurance that such datasets were error-free, consistent in their format and were to be analyzed, I assisted in minimizing bottlenecks among the team members who would need the correct data to make daily decisions regarding the day-to-day operations. I often looked at the discrepancies within data files, fixed discrepancies in product coding or supplier records, and indicated anomalous activity that might slow down reporting functions.

Since I became acquainted with the department operations, I was progressively assigned with increased responsibility. I assisted in tracking regular reporting schedules, internal spreadsheets, and supply chain KPIs including stock-outs, delivery lead times and purchase order statuses. I also helped in developing preliminary forms of data dashboards and summary sheets which were subsequently refined by senior analysts. These activities, despite being basic in nature, helped in making sure that the team was able to concentrate on the upper-level analysis, negotiations of suppliers, and planning of operations.

Besides doing the technical work, I ensured that I also participated in the departmental meetings, discussions of knowledge sharing and briefs with the team members. I kept notes, posed some clarifying questions and made some observations where necessary. The fact that I paid attention to details, wanted to learn and I was ready to help the team, helped me become a part of it and play an important role, albeit in a more supporting role. In general, as the scope of ACI operations was too large to measure my contribution, it was regular, dependable, and useful in the daily operations of the Supply Chain Department.

1.3.2 Benefits to the Student

My experience in the internship program at ACI PLC has been extremely enriching as it has not only helped me grow up professionally but has also helped me grow as a person, something that would have not been possible without the effects of academic learning. The internship in one of the largest conglomerates of Bangladesh enabled me to bridge the gap between the conceptual aspects of supply chain management, data operations and organizational decision-making.

Having become more engaged in data cleaning, verification, and reporting procedures, I could better understand how big organizations operate with huge volumes of operation data, and how the accuracy of the first steps could affect the decision-making process across the whole chain. I also understood the flow of the supply chain information between procurement and inventory management, distribution and retail, and the importance of data integrity in the information flow to predict the future, make plans, and be efficient. This experience made me appreciate the use of data analytics in the contemporary business world.

There are some other significant skills that were reinforced through the internship. I learned to be more analytical in my thinking and approach to problem-solving, especially in the situation with inconsistent or incomplete data. My skills in recording the processes, authenticating information, and sustaining the working process flow also improved considerably. At work, I communicated with supply chain managers and data analysts of experience and have gained more confidence on communicating, teamwork and time management. Their work patterns and decision-making models provided me with information about the skills that to be successful in a data-centric position.

On the whole, this internship re- solidified my desire to work in the field of supply chain analytics, data management and business intelligence. It instilled confidence and inspiration in me to go on with my self-development in these respects, and it offered a sensible base, which will inform my future academic and professional decisions.

1.3.3 Problems and Difficulties Faced During the Internship

Although the internship was mostly a positive and educative one, it was not without its difficulties. Among the initial challenges, there was the technical structure of data systems in this department. Since ACI has many divisions, each of which produces various datasets, the absence of standardization uniformly allowed confusion in some cases. Other files were in different formats or named differently or with old structures and as a result it was necessary to have to spend more time sorting and trying to comprehend flow of information.

The other problem was the limited access to some of the ERP modules and secret operational systems. This constraint was quite reasonable in terms of corporate security but did not allow me to observe some of the more technical processes behind procurement and logistics firsthand. I was therefore left with no other choice but to make use of secondary data or simplified processes left by supervisors which in some cases restricted my learning in the more advanced sectors.

It also happened that there were times when a lack of consistency in data, discrepancies in files of different departments, and manual operations slowed down my activities. The shift between the academic tasks where the data is usually clean and organized to real-world company data took time and patience. It was a learning curve to know how to work effectively within these limitations.

Lastly, it was difficult to adjust to the rapid workflow of the supply chain operations in the initial phases. Some of the reporting requirements or data requests were looking out of the blue and thus a swift turnaround and prioritization were necessary. I learned to cope with my tasks, adaptive changing priorities and stay calm under pressure with the help of my colleagues and supervisor.

1.3.4 Recommendations to ACI PLC, Bangladesh

According to my experience, I think that ACI PLC may slightly improve the internship program by using a more systematic onboarding system to the interns joining data-driven or technical departments like Supply Chain. It would be beneficial to provide a short orientation session on the internal data architecture, ERP workflows, and standard templates of reporting to make sure that the interns get used to it faster and shorten the time spent in the initial learning curve.

It would be also useful that the company would come up with a simplified documentation library, which will contain workflow diagrams, typical data formats, conventions to code product identifiers and sample reports. These resources would provide the interns with a better idea of how the tasks can be related to the overarching supply chain system and reduce confusion due to dissimilar datasets.

Each intern could have a special mentor or point-of-contact who would have been very helpful in the learning process. Frequent inspection or mid-term assessment would provide the interns with the constructive feedback, assist them in monitoring their progress, and define which areas would need improvement. Such an organized assistance would make the internship more active and effective.

Lastly, allowing interns to sit in on more cross-functional meetings, e.g. procurement meetings, warehouse planning meetings, sales-demand forecasting meetings, or logistics briefing meetings, would allow the interns get a better overview of how decisions about the supply chain are made in real time. Being exposed to such interactions would widen their outlook and would aid them know the impact of data on strategic and operational results throughout the organization.

Chapter 2: Organizational Profile

2.1 Introduction

The purpose of this chapter is to provide the entire institutional profile of the host company of the current internship, i.e. ACI PLC. Being one of the biggest Conglomerates in Bangladesh offering multiple businesses such as pharmaceuticals, consumer goods, agribusiness, and retail logistics, ACI PLC is a great place to analyse company structure, management, marketing, operational and competitive positioning. As an intern in the Supply Chain Department in the position of a data-analyst, it is important to comprehend the organization context to make sense of the activities involved, evaluate the efficiencies of the system, and offer improvements that are applicable. The chapter aims to give the background of the company, compare its management and human-resource systems, investigate the marketing practices according to the divisions, analyze the available financial and accounting based on the publicly available information, examine how the company operates and uses information-systems and lastly assess its competitive environment. By such a thorough survey, the chapter prepares the groundwork of further discussion in other chapters, connecting the practices that are observed to theoretical concepts.

2.2 Overview of the Company

ACI PLC owes its inception to the local business of a multinational chemical company which started in Bangladesh in late 1960s. The local entity was reorganized into ACI Limited (today PLC) and started down the path of fast growth and diversification, after world-wide corporate restructuring in the early 1990s. It has developed over the years into a multidivisional conglomerate company out of what was once a single industry company, which has made a great contribution to the industrial development of Bangladesh. The current situation is that ACI PLC is one of the biggest companies involved in the services of pharmaceuticals, consumer brands,

agribusiness, and retail logistics, indicating a strategic intent to serve different segments of domestic demand (ACI PLC, 2024).

ACI has a number of core divisions in its present structure. Pharmaceuticals division is a developer and marketer of a wide range of medicine and healthcare products. Consumer Brands division deals with a variety of household, personal care, and fast-moving consumer goods (FMCG), and distributes basic products to both the urban and rural population. Agribusiness division provides agricultural inputs, seeds, fertilizers, animal-health products and farm mechanization services in an effort to boost the agrarian economy of Bangladesh and improve food security. In the meantime the Logistics department with the retail-chain business has a country-wide distribution and retail network which enables product availability in the country. This diversifying framework gives ACI a source of resilience against sectoral volatility as well as opportunity to have synergies upon division in purchasing, distributing and selling products.

The mission of ACI PLC focuses on enhancing the quality of life of its customers through innovative and high quality products and services, which are in line with its long-term vision of the sustainable growth, corporate responsibility, and market leadership (ACI PLC, 2024). The main values emphasized in it are integrity, customer-orientation, continual improvement, and social responsibility. The structure of the organization is aimed at sustaining the following ambitions: every division operates in a semi-autonomous way with a divisional management system, but is still connected to the standards of corporate governance and strategic control, providing the organization with flexibility and centralized responsibility (Daft, 2021).

2.3 Management Practices

Leadership Style

The type of leadership style at ACI PLC can be described as participative and democratic. Divisional and departmental managers often involve their divisions or departments in decision making processes, promote feedback and promote cross-functional interaction. Generally, in the

context of the Supply Chain Department, where I worked as an intern, managers were frequently requesting reports on how to use data to enhance procurement planning, inventory management and reporting processes. This participative approach resonates with the contemporary management standards, which focus on the collaborative form of problem-solving, empowering staff, and collective responsibility (Northouse, 2021). Through the use of open communication and the ability to promote the input of team members, leadership at ACI also enables operational efficiency but also motivates employees and makes them feel ownership. Consequently, the company seems to experience a better morale, a greater transparency within the processes, as well as an organizational culture of constant improvement.

Human Resources Planning and Development

The ACI PLC has a systematic and strategic human resource planning. Recruiting is done by using public advertisements of job, campus recruitment, and internal recruitment. In those positions that required a technical or analytical accountability, like the data analysis in supply chain, candidates are not only evaluated based on their academic qualifications but also on their skills in data management tools, their ability to think analytically, and their ability to solve practical problems. This is done to make sure that employees are a fit even on technical requirements as well as the organizational values.

The compensation practices at ACI are set to be competitive in the national market, which incorporates the base pay, performance bonuses and benefits including allowances and festival bonuses. This pay system will seek to attract and retain skilled staff besides aligning the interest of the staff with the corporate interest. Moreover, ACI believes in training and development. New employees typically have onboarding orientation and current employees receive recurring training on technical competencies, quality control, safety protocols, and, more recently, digital applications and information management systems. To interns, such as us, this translated to practical exposure to data workflow, software applications, and department operations, in terms of both learning and working requirements.

Performance appraisal is done annually as a combination of quantitative Key Performance Indicators (KPIs), qualitative supervisor appraisals or peer feedback as applicable. This combined appraisal enables ACI to evaluate each employee not only by their output indicators, but also by including aspects of teamwork, compliance with process, time management and general input to the departments achievements. The organization also ensures accountability and incentivizes continuous improvement of performance by making performance appraisal a basis of compensation and promotion decisions (Rahman and Uddin, 2020).

2.4 Marketing Practices

Since ACI PLC has a wide range of operations, marketing practices differ widely depending on the character of products, customers, and channels of distribution. The Pharmaceuticals division places great emphasis on professional outreach, medical representatives, and pharmacy and hospital based wholesale distribution, which puts strong emphasis on regulatory compliance, product efficacy, and quality assurance in marketing. The Consumer Brands division, in its turn, uses a mass-market strategy: regular product releases, extensive retail distribution, marketing campaigns, promotional offers, brand loyalty programs. These measures are to develop consumer confidence and ensure repeat buying in the urban and rural markets.

The Agribusiness division is focused on another type of customer - mostly farmers, rural dealers, and agricultural supply networks. The marketing in this case focuses on product utility, price, and improvement of the yield and after-marketing. Distribution is also enhanced by networks of dealers, regional dealers and direct supply of seeds and fertilizers, usually with field demonstrations or agronomic advice. In the case of retail logistics and the chain business, marketing strategy includes modern retail, reliability of supply chain, product assortment and periodical promotions to entice the urban middle-class consumers who prefer convenience and quality.

In the divisions, ACI also uses the combination of both traditional and modern media: traditional (TV, print, outdoor), modern (social media, online marketplace) and distributor networks, retail

channels. The development of new products is common, and the company is concentrated on innovation and its responsiveness to the tendencies of consumers. The quality, value and reliability are put into focus with regards to branding and advertising. Nevertheless, within the competitive market environment, the issues remain: the production cost increases, customers become more sensitive to prices, supply chain operations are interrupted, and more local and global brands enter the market. Market dynamics are highly dynamic and ACI should keep an eye on them to remain competitive especially in FMCG and agribusiness sectors.

2.5 Financial Performance and Accounting Practices

Due to unavailability of required data for analysis, publicly available data reveal that ACI PLC has a diversified revenue base in several divisions, which is beneficial in alleviating any risk in the sector. The revenues have been increasing over the years, especially in consumer goods and agribusiness - sectors that are still experiencing domestic demand. The profit margins would be different depending on the division, as the Pharmaceuticals and Consumer Brands would have better profit margins, whereas the agribusiness and retail divisions would have lower profit margins but would compensate by volume and breadth of distribution.

Regarding the accounting practices, the ACI is guided by accrual-based accounting and is accountable to the standard accounting principles, which is in line with the regulatory and corporate governance standards. The company also prepares their annual financial statements, makes full disclosure of assets, debts, sources of revenue, and contingent liabilities and it makes depreciation of fixed assets in accordance with the standard depreciation methods (ACI PLC, 2024). Such practices are an indication of transparency, regulatory and correct financial reporting. In the case of such an organization as ACI of such magnitude and complexity, the practices are critical to its ability to maintain investor confidence, real-time regulatory compliance and financial sustainability in the long-term.

2.6 Operations Management and Information System Practices

In its operations, ACI PLC has been showing strong integration of information systems specifically in supply chain management, procurement, inventory control and logistics. The Supply Chain Department, where the internship was carried out, is based on database-oriented processes, data analysis that is performed through the use of Excel, and centralized procurement tracking. Enterprise resource planning (ERP) systems, such as inventory levels, supplier deliveries, order processing, and distribution schedules, are handled by a combination of enterprise resource planning (ERP) systems and customized data dashboards. The hybrid approach is beneficial to the organization as it allows it to coordinate its extensive business activities in various divisions, the real-time flow of information, and decision-making processes. To explain, operational efficiency, and wastage are improved by data analytics (i.e., demand forecasting, stock replenishment, and a review of supplier performance).

The quality management, scheduling, allocation of resources and operations planning all have standardized procedures that are compliant with the best practices in the industry. The logistics network of ACI provides a product to be distributed in time, and its retailing division capitalizes on its effective supply-chain practices to keep its products available and replenish the shelves. The merging of information systems and operational processes highlights that the company places an emphasis on data-driven management which is also part of the factors that went directly to the tasks undertaken in the internship.

2.7 Industry and Competitive Analysis

ACI PLC is a firm that operates within a very competitive dynamic industry. A Porters five forces analysis shows that some critical competitive pressures exist. Competition among the current companies is stiff as there are a number of large local and multinationals in the pharmaceuticals, consumer goods, agribusiness inputs, and retail sectors. The entry barrier is medium since it is capital intensive, high standards in regulation (pharmaceuticals and agribusiness) and brand preferences. Suppliers- especially in the case of raw materials used in

the pharmaceutical and agribusiness have moderate bargaining power, especially in cases where raw materials are imported or in cases where the raw materials are rare. Buyers (consumers, distributors, retailers) enjoy a high bargaining power as a result of the presence of a competitive alternative and sensitivity to prices. Lastly, its threat of substitutes exists, particularly FMCG and retail where imported products, generic brands, and low-cost alternatives seek their consumers.

SWOT analysis was carried out to establish internal strengths and weaknesses of ACI PLC, external opportunities and threats that affect the competitive positioning of the company in the dynamic Bangladeshi market.

Strengths

There are a number of internal strengths that ACI PLC has which have made it maintain a high competitive edge in various industries.

- Diverse business portfolio ACI has diversified its portfolio by operating in pharmaceuticals, FMCG, agribusiness and retail and this helps reduce the dependence on a specific market and enables the organization to diversify risk in areas. This diversification improves revenue stability and also endurance to changes in the economy.
- Excellent brand equity: The firm has a good brand awareness and confidence among consumers in Bangladesh, especially of pharmaceuticals and consumer goods. This brand strength helps ACI to control customer loyalty and market share regardless of the stiff competition in the market.
- Large distribution and supply chain channel: ACI has established a countrywide distribution channel that is facilitated by a highly integrated supply chain network. This enables it to have efficient product availability, penetration of markets and operational efficiency among its divisions.

- Implementation of new information systems: The organization has invested in up to date operational and information systems, which facilitate evidence based decision-making, interdepartmental coordination, and enhanced reporting and control systems.

Weaknesses

Regardless of its strong points, ACI PLC has some internal threats that can restrain the operational performance unless addressed effectively.

- Slow pace of operation: Multiple-industry operation involves huge investment in infrastructure, technology, and human resources which tend to raise the general cost structure of the organization.
- Lack of self-sufficiency in the imports of raw materials: ACI has been highly dependent on imported raw material in pharmaceuticals and agribusiness and therefore it would be susceptible to exchange rate volatility and world supply shocks.
- Challenges in the management of various divisions: The broad spectrum of business units brings complexity in the management of business organizations and makes coordination, performance monitoring and standardization of processes more difficult.
- Risks to supply chain disruptions: Any disruption in logistics, transportation, or procurement would have a great effect on production and distribution because of the size of operations.

Opportunities

The external environment also offers a number of growth opportunities that ACI PLC can consider exploiting to consolidate its market.

- Expansions in the agribusiness industry: ACI has an opportunity to expand its agribusiness business over the next few years due to the growing demands in modern agricultural inputs and mechanization in Bangladesh.

- Growth of online retailing and e-commerce: The fast-mover online platform gives ACI the opportunity to grow its retail store using online platforms and data-driven customer experiences.
- Potential in pharmaceutical export: The developing pharmaceutical industry in Bangladesh presents ACI with a prospect of increasing its presence in foreign markets since the market meets international standards in quality and regulatory standards.
- New consumer groups: The increase in income level and urbanization is producing new groups of customers, which allows product diversification and offer premium products.

Threats

In addition to the opportunities, ACI PLC has various external threats that may affect its long term performance.

- Rising competition: Strong local companies and multinationals in pharmaceuticals, FMCG, and retail are placed in the market, which increases the pressure on prices and innovations in the market.
- Regulatory changes: The regular change in regulations of pharmaceutical, agricultural and trade can create higher costs of compliance and limitations to operation.
- Risk in terms of import cost: Exchange rate fluctuations as well as global economic instability may escalate the cost of procuring imported raw materials tremendously.
- Substitutes: Substitutes are available in the FMCG and retail markets as the consumers can access imported products, generic brands, and alternatives that are of lower costs, which escalates the threat of substitution.

On the whole, this SWOT analysis demonstrates that ACI PLC is currently in a good position to compete on the market because of its strong diversification, strong brand, operations-based approach to business, and management practices that are data-driven.

2.8 Summary and Conclusions

This chapter has provided a combined history, structure, management practices, marketing strategies, financial and accounting frameworks, operations management, information systems and competitive environment of ACI PLC. Its diversified nature in the fields of the industry, the participative leadership style, and strong human resource practices make the company one of the number of conglomerates in Bangladesh. It is able to manage complexity and scale due to its operational capabilities such as, data-driven supply chain management and integrated logistics. Meanwhile, the outward-looking of marketing strategies based on varying divisions and customer groups is a manifestation of strategic adaptability. Although financial, market issues have been an issue in terms of cost increase, competition and supply-chain vulnerability, ACI internal strengths have put it on a sound path of sustainable development.

In the case of an intern working in the Supply Chain Department, all these features of the organization directly shape work processes, reporting and decision-making logic. The culture of data-based operations and participative management created in the company creates an atmosphere in which interns can have a significant impact and learn.

2.9 Recommendations and Implications

Some recommendations can be identified based on the organizational analysis and internship experience. First, ACI must keep on enhancing its digital infrastructure particularly updating the antique data systems to more superior enterprise resource planning (ERP) systems in the different divisions. This will maximize the integration of data, minimize manual labor and reporting accuracy. Second, the firm must focus on frequent training and capacity-building of

employees across all levels, especially on the areas of data analytics, supply-chain optimization, and quality management to align with the changing requirements of the industry. Third, ACI marketing department must consider further into online marketing techniques - using social networks, online stores, and customer segmentation using data - to enter the market and connect with customers. Fourth, to cope with the fluctuations in raw material prices and reliance on imports, ACI may want to backward integrate or source the materials locally in places where possible. Lastly, due to market competition, it will be necessary to carry out consistent market research and product development to remain strong and maintain market share.

CHAPTER 3: PROJECT PART

3.1 Introduction

3.1.1 Background and Problem Statement

Digital transformation is an urgent factor of business, operational efficiency, cooperation and competitive advantage in the fast-paced modern business environment. Cloud-based productivity suites (including Microsoft 365 and Google Workspace) are becoming popular amongst organizations in various industries, providing real-time collaboration, workflow automation and data management options (Ayanwale, 2024; Pal et al., 2020). These new tools have revolutionized the way employees coordinate, analyze and report information which has greatly helped in reducing manual workload and errors and increasing the overall productivity.

Regardless of these developments, several of the established companies still use legacy software systems that in most cases do not have the features needed to facilitate effective and collaborative processes. A supplier corporate department of a leading conglomerate in Bangladesh, ACI PLC is one of them. At present, the department is operating with Microsoft office 2019 as the key productivity suite. Office 2019 has only the bare minimum tools to make document creation, data management, and reporting, but lacks cloud-based collaboration, version control automation, and sophisticated analytical functions. As a result, employees are exposed to manual data assimilation, avoidance of duplicate versions, procrastinated reporting and other inefficiencies which undermine the performance of operations.

The following are the challenges which are captured in this problem statement of this study:

Limited integration of IT innovations, such as the latest versions of software, leading to suboptimal resource allocation and system inefficiencies.

The absence of modern software programs in the internal supply chain processes of ACI PLC cannot allow the department to run efficiently and rapidly. Elevated levels of manual repetitions and version control challenges, as well as challenges in group reporting are applied to employees and all these factors reduce their productivity and pose an operational bottleneck. Moreover, these inefficiencies are only worsened by a lack of awareness and proactive attitude towards the adoption of IT innovation and, as a consequence, prevent the optimization of the processes and the use of the data in making decisions.

Studies have continuously shown that the implementation of modern and cloud-based productivity systems can enhance efficiency in the organization, minimise errors, and create a working environment where collaboration occurs (Powell et al., 2008; Vanderfeesten and Reijers, n.d.; Duso et al., 2025; Shao, 2025). Through the quantification of the productivity and financial costs of Microsoft 2019 upgrade to Microsoft 365, this research aims at offering empirical data to support the fact that the contemporary IT integration can streamline the work process, make it easier to work together and perform better in general in the department. The results will provide

practical recommendations to ACI PLC and other companies of similar nature in which legacy systems are still restricting business opportunities.

3.1.2 Research Objectives

The main purpose of the current study is to perform a quantitative analysis of the effect of moving to Microsoft 365 in the Corporate Supply Chain Department of ACI PLC in connection with the changes in the operational productivity and cost-efficiency. In particular, the research will have the following objectives:

1. Measure productivity differences: To compare and provide measurements of various tasks completed, how often spreadsheet errors occur, data validation efficiency and collaboration effectiveness between Office 2019 and Microsoft 365. This will involve the assessment of the impact of real-time collaboration, cloud storage, and automated workflow capabilities on the speed, accuracy, and efficiency of the department in general.
2. Compare costs: To discuss direct and indirect costs of providing Office 2019, such as license fees, IT support, and system maintenance and compare them to the cost of subscriptions and installation of Microsoft 365. The analysis aims to see how many finances can be influenced by the reevaluation towards a cloud-based productivity suite.
3. Assess the operational advantages: To learn whether the adoption of Microsoft 365 will alleviate the workloads of manual processing, reduce the number of errors, and enhance collaboration and data management, it is necessary to give quantifiable benefits in routine reporting and documentation processes.
4. Give recommendations based on evidence: To deliver practical advice on how to deploy the modern cloud-based productivity tools structurally and in stages so that minimum disturbance occurs, maximum uptake of modern tools, and long-term effects of the changes on workflow efficiency, data accuracy, and team coordination.

These goals are consistent with the problem statement of the study, which states that small-scale adoption of IT innovations results in the inefficiency of resource utilization and system inefficiencies, which leaves an insightful structure of a quantitative study

3.1.3 Significance

This study will be of relevance to ACI PLC and other organisations, which still operate on the legacy software systems in their day-to-day activities. Operatively, it responds to serious inefficiencies in internal supply chain operations, in which out-of-date software tools will interfere with timely reporting, collaborative decision-making, and documentation without errors. The analysis offers empirical support to inform management in adopting new, cloud-based productivity tools like Microsoft 365 by analyzing the productivity and cost implications.

In the academic world, the research makes some contribution to the knowledge of IT adoption and digital transformation within an organizational setting, especially in developing economies where legacy desktop software still prevails. It shows how the tools based on clouds can simplify the workflows, increase collaboration, and the overall data accuracy and performance. Also, the study identifies the value of bringing together IT solutions and formal training and workflow redesign to attain long-term operational gains.

The results of the undertaken research will be likely to be used in strategic planning and operational management to provide insights into the adoption of technologies that will improve efficiency, minimize errors, and facilitate the work-related environment as more collaborative.

3.1.4 Scope of the Study

The research specifically centers around the Corporate Supply Chain Department of ACI PLC, Bangladesh where the effects of Microsoft Office 2019 and Microsoft 365 on productivity and cost efficiency are compared. The scope includes:

- Operational productivity analysis: The time in which tasks are completed, spreadsheet errors, version control, and the efficiency of a collaboration in the reporting and data management processes.
- Cost assessment: It involves direct software costs (license/ subscription fee), maintenance costs and IT support, as well as determining financial impacts of moving to a cloud based system.
- Quantitative method: Applying survey-based Likert scale assessments, time-on-task data and error distributions to produce quantitative evidence on the adoption decisions of software.

The research is specific to office work and reporting activities in one department. It does not involve larger enterprise systems, production level operations and cross departmental software integration. Nonetheless, the lessons learnt can be extrapolated to other business operations in ACI PLC or other business organizations that use legacy office software. The research focuses on quantifiable results showing quantifiable efficiency, accuracy, and collaboration enhancement, which may be used to guide subsequent efforts of digital transformation.

3.2 Literature Review

The literature review includes the information presented by 20 recent open-access studies, which are arranged in thematic categories to create the conceptual background of the study.

3.2.1 Digital Transformation and Technology Adoption.

Theories of technology adoption, including Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) describe how the perception of users

and organizational readiness influence the process of digital integration (Granic et al., 2022). It has been shown that the use of Google Workspace improves the efficiency of collaboration and productivity (Ayanwale, 2024), which is why this research is interested in cloud-based tools.

Duso et al. (2025) give macro-level information that cloud adoption leads to labor productivity, and Shao (2025) and Manea et al. (2024) emphasize that digital transformation enhances agility and performance. Taken together, all these studies highlight the importance of the shift to cloud-enabled software replacing traditional desktop software in order to streamline the efficiency of organizations.

3.2.2 Workflow Systems and Collaboration.

According to Pal et al. (2020), Microsoft Teams and similar tools can enhance collaboration and communication by minimising the amount of time spent on organising. Barker Scott et al. (2024) will suggest a model to develop collaborative organizations with behavioral and structural preparedness. Vanderfeesten and Reijers (n.d.) also add that workflow systems improve the efficiency by formalizing the communication process and eliminating redundancy.

The deficiency of the built-in workflow systems in the case of the ACI PLC is a reflection of these international results, and the application of contemporary cooperative software may have the potential to cut a channel of communication and increase the level of coordination between various departments.

3.2.3 Data Management, Spreadsheet Reliability and Reporting Efficiency.

Research on spreadsheet reliability (Powell et al., 2008; Poon et al., 2024; Gaoual et al., 2025) demonstrates that the old tools result in the presence of errors and duplication of data, as well as inefficiency. Being a data analyst intern, these results can be seen in the real-life experience of ACI PLC in its manual data-handling process. Shabbir and Gardezi (2020) consider that the

incorporation of data analytics and knowledge management practices into practice can greatly enhance the performance, which becomes a possibility in the framework of modern computer infrastructure due to the automation of the work process and real-time confirmation.

Therefore, the implementation of the modern tools like Microsoft 365 or Google Workspace is not only a technical improvement but a transition towards accuracy and decision-making that is based on data.

3.2.4 Training, Change Management, and Digital Literacy.

The implementation of digital transformation initiatives is not always successful without suitable user training and change management (Handrich and Otterbach, 2024). Luna et al. (2025) emphasize the significance of the structured capacity-building programs which can provide the employees with the technical and adaptive skills. Al-Saudi and Flayyih (2024) also focus on the fact that the efficiency of office management is enhanced in case digital transitions are backed up with the extensive learning programs.

To ACI PLC, this means that any proposed system upgrade must have a phased training program, mentoring and continuous support- so that employees can know how to use the new systems effectively.

3.2.5 Organization Impact and Performance Outcomes.

It is always discovered that an organizational agility, satisfaction, and overall performance are improved with the impact of digital transformation (Barbu et al., 2024; Manea et al., 2024; Feng and Ali, 2024). According to the Journal of Technology Transfer 2023 article, digitalization enhances internal cooperation, as well as relations between organizations. These observations are

confirming the strategic significance of IT innovation to sustainable organizational development and competitiveness.

3.3 Methodology

This chapter is aimed at introducing the research methodology chosen to complete the quantitative study of software efficiency and cost implications in the Corporate Supply Chain Department of ACI PLC. This paper will compare the operational and financial results between Microsoft Office 2019 and Microsoft 365, and the role that switching to a cloud-based and subscription-based platform has the potential to impact productivity, reduction of errors, and collaboration in the department. The methodology of a quantitative research study gives a structured literature of how data collection, analysis, and interpretation processes should be in order to make sure that results are reliable, valid, and replicable (Creswell and Creswell, 2018).

This chapter presents the research design, operational variables definition, hypotheses establishment, method of data collection, the tools, data analysis method, ethical issues, and limitations that may arise due to the research. Every part is well organized to show the rationale of the study design and the measures taken to make sure that the results are true to the relationship between selection of software platforms and the productivity outcomes.

The research design adopted is comparative research, with specific objectives of the research concentrating on measurable variables which include time taken to complete tasks, spreadsheet errors, collaboration problems, and perceived productivity. It also incorporates a cost-benefit analysis, in terms of licensing, maintenance and IT support costs of the two software systems. Through using the quantitative methods, the study aims at generating the empirical data that may help the organization to make specific decisions about the digital transformation, resource allocation optimization, and operational efficiency of the department (Duso et al., 2025; Shao, 2025).

Moreover, the chapter is practical, which means that the research methodology is applicable in the real-world situation of ACI PLC, where internal supply chain reporting is greatly dependent on spreadsheet-related documentation, collaborative reporting, and data validation in time. Through the methodical approach of covering both financial and productivity aspects, the chapter of the methodology provides the strong base when data analysis and interpretation will be performed, and eventually, it can be supported with the recommendation to implement in the software environment modernization.

3.3.1 Research Design

The research design is a quantitative comparative research design and will be used to empirically study the dissimilarities in the cost efficiency and productivity of the Microsoft Office 2019 and Microsoft 365 in the Corporate Supply Chain Department of ACI PLC. The main goal of the quantitative design is to receive numerical evidence, which can provide a objective and objective answer to the workflow efficiency and reporting correctness and cost differences in terms of each environment using the software. The quantitative methodology is common because of the opportunity to test pre-determined hypotheses and evaluate relationships among variables as well as provides the possibility to statistically study the indicators of organizational performance (Granic et al., 2022; Manea et al., 2024). Consequently, this methodology is especially applicable to managerial decision-making in the area of investments in digital transformation.

Two operational conditions that are well-defined are compared in the research design. The former is a reflection of the current software infrastructure of the department: Microsoft Office 2019, a perpetual, offline, desktop-based productivity suite that lacks cloud collaboration, automated co-authoring, and real-time data synchronisation. Based on initial observation and

organizational records, this version is linked to manual reporting procedures, duplication of work, and increased susceptibility to spreadsheet errors - both of which are well-reported in the literature regarding legacy systems and the reliability of spreadsheets (Powell et al., 2008; Poon et al., 2024). The second condition is a hypothetical upgrade of Microsoft 365, which is a cloud-based subscription-based productivity environment that can provide various advanced features, such as real-time collaboration, online storage, version history, automated validation, and interdependent applications, including Microsoft Teams and Power Automate. It has been demonstrated that these functionalities can be beneficial in the context of workflow organization and team coordination in contemporary organizations (Pal et al., 2020; Ayanwale, 2024).

In the framework of this design, the study will examine the potential impact of a change in Microsoft Office 2019 into Microsoft 365 on the quantitative variables of time taken to complete the tasks, the frequency of errors in spreadsheets, time-related delays in collaboration, and the time-related allocation of expenses. These productivity and cost indicators have been at the heart of digital transformation measurement, particularly in the sectors where precision and data exchange-in-a-timely manner have a direct impact on organizational performance (Barbu et al., 2024; Shao, 2025). Through the comparison of these indicators, the study will be able to approximate the possible ROI that comes with the adoption of cloud-based platforms.

It is also effective in the research design that is capable of capturing the productivity difference as reported by employees. Likert-scale surveys will enable the workers to measure how they feel their efficacy when tackling job elements like data reporting, document preparation, and information sharing- all the elements that are fundamental to the working processes of the Corporate Supply Chain Department. Quantitative responses generate scales that are measurable contributing to the overall productivity index so that the analysis can triangulate between direct measures on the time-based metric and self-report measures of the efficiency level.

Moreover, the quantitative comparative design will allow incorporating cost modelling as the main topic of the present research. Literature material on the subject of digital transformation stresses that software upgrades must not be considered solely based on the enhancement of features but also on the long-term financial uptake potential (Duso et al., 2025; Feng and Ali, 2024). Microsoft office 2019 will involve a single licensing fee and recurring technical support fee, and Microsoft 365 will imply regular subscription fees at the expense of decreased maintenance load and allows adopting efficiencies in the cloud-based infrastructure. Quantitative comparison of these cost structures would be used to ensure that the study has financially significant implications on the strategic planning of ACI PLC.

All in all, this research design makes the study stronger, as it gives it a structured and empirical basis on the ground of which cost-benefit analysis and productivity comparison may be implemented. The study comes up with evidence-based findings on whether the upgrade to Microsoft 365 on the basis of performance differences between the two software systems is a value addition to the digital investment of the Supply Chain Department of ACI PLC.

3.3.2 Operational Clarifications of Variables.

In order to be clear, consistent and replicable, operational definitions of both the independent and dependent variables are adopted in this study. The important methodological step of quantitative research is operationalization because it enables the abstract idea like the productivity or efficiency in collaboration to be transformed into measurable values (Braun and Clarke, 2006; Barbu et al., 2024). All the variables utilized by this research are established in accordance with the existing literature on digital transformation, workflow systems, and productivity measurement.

Independent Variable

The independent variable in this study is the software platform, which the employees used in the Corporate Supply Chain Department of ACI PLC use to perform routine reporting, documentation, data consolidation, and shared workflows. Such a variable is the central technological situation that is being compared and has a direct impact on the operational performance, the creation of errors, and the efficiency of collaboration. The independent variable will be operationalized in terms of a binary categorical variable in quantitative terms to enable the comparison of two different technological environments.

- **Versions of Software condition 1: Microsoft Office 2019**

The current system that is used in the department is Microsoft Office 2019. This version is defined as a traditional and device-dependent model of productivity that is not very well integrated. Its core attributes include:

- **Perpetual Desktop License**

Office 2019 is a one-time purchase software that is installed on a device basis. Although this saves on the recurrent subscription costs, it also leads to the lack of the continuity of features updates, which restricts its ability to adapt to the changing workflow demands in the digital world. The inflexibility of this licensing model is subject to many long-term inefficiencies of organizations that are being digitalized (Manea et al., 2024).

- **No Cloud Operational Environment**

The platform does not have default cloud integration and only is local storage. Consequently, files are not mobile and need to be manually backed up, which contributes to the rise of risks related to data fragmentation, discrepant file versions, and reliance on hardware stability. It has been researched that non-cloud systems are the source of inefficiencies in inter-departmental cooperation (Vanderfeesten & Reijers, n.d.).

- **Lack of Real-Time Co-Authoring.**

Office 2019 lacks real-time co-editing of documents- this is a major shortcoming in case teams need to have synchronized reporting or shared spreadsheet creation. Employees are forced to use the sequential editing which can result in delays and a higher probability of editing an old version of the document.

- **Manual Version Control Processes.**

Because there is no built-in version management system, the employees are relying on manual version naming systems (e.g., finalv3, updatedfinal, etc.) and email distribution. This practice, as Powell et al. (2008) emphasize, is susceptible to human error specifically and in most cases results in wrong document consolidation or even loss of updated information.

- **High Dependence on Documents Exchange via email**

The sharing of documents in office 2019 is mostly provided by email attachments. The process builds paralleling file copies, heightens risks of duplication, and adds to the longstanding communication lines. The research of organizations shows that email-dependent processes have a significant impact on the administration workload and efficiency of tasks (Barker Scott et al., 2024).

- **Vulnerability to Spreadsheet Duplication and Overwrite errors.**

When used in a supply chain context where spreadsheets are widely used as a main tool to support day-to-day reporting, the absence of real-time synchronization significantly increases the number of cases of overwriting and data inconsistency errors. Previous studies have demonstrated that systems which are based on local file management have significant spreadsheet-based errors (Powell et al., 2008; Poon et al., 2024).

These features make Office 2019 a manifestation of an aged productivity paradigm, which inhibits collaborative efficacy and increases the operational friction in organizations that have quickly started to digitalize in many aspects.

- **Versions of Software condition 2: Microsoft 365**

Microsoft 365 is a suggested new system upgraded at ACI PLC, which is a cloud-based integrated productivity platform designed to support collaborative and automated workflow.

- **Cloud- Based Subscription Model**

Microsoft 365 is a subscription service, which means that it has constant upgrades, unlocks new features, and receives additional security patches. This will guarantee continued technological relevance with the trends of digital transformation in the world (Shao, 2025). It is also possible to easily scale up and down with the subscription model depending on the expansion of the organization.

- **Co-located Collaboration Tools**

Microsoft 365 has Teams, OneDrive, SharePoint, and Planner that facilitate communication, file sharing, and coordination of project activities. These applications help in centralizing workflow management and minimizing fragmented communication lines that had very much depended on email. Research indicates that these platforms considerably help to improve coordination within a team and make the process of information exchange in an enterprise much more efficient (Ayanwale, 2024).

- **Co-Editing of Document in Real-Time**

This option allows several workers to work on the same document at the same time so that they would see the changes instantly and to avoid conflicts of versions. Real-time co-authoring within departments that normally have tight reporting deadlines will directly make it easier to have faster turnaround time and more accurate reporting.

- **Automated Version Management and Updates**

Microsoft365 saves iteration of documents automatically and keeping a complete version history. This does not require a manual system of naming and reduces the number of mistakes that occur on the old documentation. Studies have highlighted that automated

version control systems are important in information delay reduction and increasing the workflow reliability (Pal et al., 2020).

- **Intrinsic Data Checking and Workflow automation**

The suite facilitates the automation of the advanced workflow with the help of Power Automate and enhanced data validation in cloud-enabled Excel. Those features decrease the amount of repetitive manualities and decrease the number of errors in data entries and enhance the overall accuracy of the operations, of which is a significant benefit in supply chain reporting settings where accuracy is crucial.

- **Improved Organization Agility and Co-ordination.**

It is emphasized in the literature that cloud-based solutions such as Microsoft 365 can help organizations to better adjust to fluctuations in workload, requirements of cross-functional collaboration, and informational updates (Shao, 2025). These advantages are very compatible with the requirements of ACI PLC to streamline the internal processes and eliminate friction in the day to day operations.

- **Binary Coding of the Independent Variable.**

To carry out a statistical analysis, the independent variable will be coded as:

0 = Microsoft Office 2019

1 = Microsoft 365

This binary coding allows the following types of comparative statistical tests to be conducted: mean difference analysis, correlation tests, and productivity indexes comparison between the two software environments.

Dependent Variables

The dependent variables are the measurable variables who show the effects of the software platform on employee performance and operational efficiency in the Corporate Supply Chain Department of ACI PLC. These variables represent the most important dimensions of productivity, quality of data, and collaborative effectiveness three dimensions which were found to be crucial in the reporting and documentation processes within the department. All the variables are measured on the basis of the standard performance indices that are commonly used in research of digital transformation, workflow automation, and office productivity (Zayas-Caban et al., 2021; Handrich and Otterbach, 2024).

Dependent variables to be assessed will include the following:

1. Productivity Level

Productivity can be described as the rate at which staff members are able to accomplish routine reporting and documentation processes of the supply chain. The issue of productivity is especially significant in terms of ACI PLC, where daily, weekly, and monthly reports have a repeat nature, and the amount of data consolidation across various functions is high.

A. Minutes to Takes to Complete Daily Reporting Tasks.

This measure records the time that the employees are taking to complete repetitive jobs like:

- Consolidation of sales data daily.
- Stock variance reporting
- Tracking shipment or vendor updates.
- Internal Excel-based dashboards preparation.

Reporting activities are commonly performed with several manual operations in Microsoft Office 2019, which include the download of some attachments, combination of spreadsheet files, and the validation of data by hand. According to the literature, legacy, non-automated systems considerably contribute to increasing the time taken to complete the tasks as a result of manual

consolidation and the necessity to check the accuracy of the data (Powell et al., 2008; Manea et al., 2024).

Through Microsoft 365, cloud-based synchronization, shared workbooks, and automated validation, such durations of tasks are predicted to be less.

B. Time Wasted on Version conflict of Files (Hours Per Week)

This measure is used to measure the delays caused by circumstances in which:

- Employees operate on obsolete files.
- Different versions are edited by two or more users simultaneously.
- The papers must be circulated numerous times through e-mail to be revised.

It has been observed that version conflicts are the most frequent productivity obstacles in organizations that operate non-cloud based spreadsheets (Poon et al., 2024). Co-authoring in Microsoft 365 is projected to save this time significantly.

C. Manual Steps to Data Consolidation.

The more manual tasks such as transfer of data, changes to formats, checking data accuracy, cross-checking of emails, the less productive and the higher chances of a mistake. Zayas-Caban et al. (2021) note that one of the main predictors of the enhanced productivity in automation of the digital workplace is a decreased number of steps in the manual workflow.

2. Data Accuracy

The accuracy of data is a very important key performance indicator of the supply chain operations since mistakes in the Excel files or reporting templates can directly influence the

forecasting, inventory planning and decision-making. This dependent variable determines the impact of the software environment in the probability of errors and data discrepancies.

A. Percentage of Files with Errors in Spreadsheets

This indicator evaluates the percentage of spreadsheets which contain:

- Formula errors
- Broken links
- Incorrect cell references
- Inconsistent data entries
- Duplicated records or incompatible formats.

The literature has shown that spreadsheets that are manually controlled (as in such systems as Office 2019) demonstrate a much greater level of error (Powell et al., 2008; Gaoual et al., 2025). In comparison, shared workbooks, in-built validation rules, and Power Automate workflows of Microsoft 365 are likely to decrease the number of errors.

B. Redundant Data Records or Overwritten Documents.

Duplicate entries are due to the manual merging of many copies of the same document particularly whereby team members of the same team have different copies. Overwriting is whereby an older file is overwritten by a newer one without adequate tracking of the versions.

The ability of cloud-based version management (such as in Microsoft 365) has been found to alleviate the problem of duplication because it ensures documented histories of documents and logs of user access (Ayanwale, 2024; Pal et al., 2020).

3. Collaboration Efficiency

The efficiency of collaboration is an indicator of how the teams can cooperate effectively, exchange information, and finish their tasks without difficulties. Since the supply chain department regularly communicates with procurement, warehousing, distribution, and finance, it is necessary to coordinate effectively.

A. Interruptions on Document sharing.

This indicator encompasses incidences like:

- The files are unreadable because of incompatibility with the format.
- Huge excel files are too large to email.
- Missing attachments
- Shared drive restrictions - user locked the file.

Such disruptions are more likely to happen with legacy and non-cloud systems (Vanderfeesten and Reijers, n.d.).

The cloud storage of Microsoft 365 will focus on minimizing failure in sharing.

B. Occurrence of Versions of Conflict in the Team Reporting.

Conflicts occur when:

- The various copies are updated by the different team members.
- The process of consolidation is manual.
- Contradicting figures are in final reports.

It is acknowledged that cloud-based co-authoring and centralized file access represent the appropriate methods of reducing the number of conflicting versions (Handrich and Otterbach, 2024).

Summary of Operationalization of Dependent Variable

Dependent Category	Variable	Measurement Indicator	Measured Improvement Under Microsoft 365
Productivity		Task duration, conflict time	Less time, less manual processes
Document accuracy		Frequency of error, repeat entries	Less error, consistencies
Collaboration efficiency		Sharing interruptions, version mismatch	Smoother collaboration, fewer disruptions

These variables reflect the operational components which are affected most closely by the digital productivity tools and are consistent with the empirical data pointing to the fact that the contemporary cloud-based ecosystems enable efficiency and enhancements in organizational performance (Shao, 2025; Barbu et al., 2024).

3.3.3 Hypotheses

The research hypotheses are developed on the existing literature on digital transformation, adoption of clouds, workflow automation, and productivity at the workplace. They represent quantifiable expectations in understanding how Microsoft 365 is likely to affect operations performance in comparison with Microsoft office 2019 in the Corporate Supply Chain Department of ACI PLC.

The hypotheses are based on the empirical evidence that the cloud-based platforms can be used to enhance collaboration, lessen the manual workload, decrease human error rates, and increase the responsiveness of organizations (Ayanwale, 2024; Pal et al., 2020; Shao, 2025).

The available evidence is consistent that the advancement of contemporary cloud-based software in digital offices is anticipated to be of high quality, so the hypotheses are formulated in a directional (one-tailed) manner.

Hypothesis 01: MS 365 will have a strong influence in enhancing the productivity of employees in terms of time of completing tasks when compared to Microsoft office 2019.

The hypothesis rests on the fact that the use of cloud-based productivity tools optimizes the flow of tasks, minimizes unnecessary activities, and can also shorten the reporting process due to the automation of processes and real-time teamwork (Zayas-Caban et al., 2021; Manea et al., 2024).

In the ACI PLC workflow, the present productivity limitation is represented by the manual consolidation, reliance on emails, and Office 2019 files that are device-bound. The co-authoring and centralized file access features of Microsoft 365 and integrated communication (Teams, SharePoint) are anticipated to greatly minimize:

- Minutes of time necessary to complete each task in the reporting.
- The number of hours lost per week because of version conflict.
- Aggregation steps that are required to be done manually.

In this way, Hypothesis 01 is a test that shows the existence of a positive productivity increase alongside the implementation of Microsoft 365.

Hypothesis 02: Microsoft 365 will lead to a very low number of spreadsheet mistakes and inconsistencies of data as compared to Microsoft Office 2019.

The presence of the spreadsheet error is largely known as a structural risk in non-cloud Microsoft Office setups as a result of:

- Manual formula adjustments

- Spreadsheet duplication
- Overwritten versions
- Bad links in files that are stored locally (Powell et al., 2008; Poon et al., 2024)

Since the reporting on supply chain of ACI relies heavily on the use of Excel files, accuracy is directly linked to the operational outcomes e.g. forecast reliability and variance reports.

The Microsoft 365 is likely to minimize the number of errors by:

- Built-in validation rules
- Collaborative work book synchronization.
- Automated version history
- Workflow checks, based on Power Automate.
- Deletion of copies of files.

Findings of previous researchers validate the fact that, with cloud-enabled spreadsheet environments, the number of inconsistencies in data and their accuracy increase (Gaoual et al., 2025; Luna et al., 2025). Therefore, Hypothesis 02 analyzes the possibility of Microsoft 365 to bring statistically significant error reduction relative to Office 2019.

Hypothesis 03: Microsoft 365 will lead to cost efficiency in the long-term despite the increase in short-term licensing cost because of productivity and reduction in errors.

Though Microsoft 365 is a subscription solution where one has to make recurring payments, the literature indicates that the application of the cloud eventually leads to favorable economic results in terms of productivity and reduced operational friction (Duso et al., 2025; Barbu et al., 2024).

When using Office 2019 in the ACI case, the charges to consider are:

- Lasting time wasted in reporting.
- More work of the operations.
- Manual error correction
- Minimal automation and need of human repetition.

Compared to Microsoft 365, the cost-saving mechanisms that it provides include:

- Shorter reporting cycle time.
- Reduced reprobates due to erroneous data
- Enhanced team coordination
- Reduced maintenance cost of IT by automatic updates.

The growth of labor productivity and the reliability of workflow in increase usually benefits directly on the cost savings in the long run, as it is noted in digital transformation research (Shao, 2025; Feng and Ali, 2024).

Hypothesis 033 will assess the presence of these economic benefits that are measurable and quantifiable.

Hypothesis Statement Direction Expected.

Hypothesis	Statement	Direction Expected
H1	Microsoft 365 - reduced time to get tasks done	Positive improvement.
H2	Microsoft 365 - reduction of spreadsheet errors and data inconsistencies	Positive change
H3	Microsoft 365, long-term cost effectiveness	Positive improvement

All these hypotheses are entirely consistent with the realities of ACI PLC operations and the literature at large that shows that digital platforms based on cloud have strong performance benefits.

3.3.4 Data Collection Methods

The researcher uses a systematic quantitative data collection plan that will produce quantifiable data regarding the differences in cost and productivity of Microsoft Office 2019 and Microsoft 365. The data collection method incorporates various tools and data sources to ensure varied productivity measurements, cost variables, errors rate, and collaboration measures related to the day-to-day work of supply chains at ACI PLC. In line with methodological suggestions on research on organizational performance, the methodology focuses on objectivity, replicability, and gathering of numerical data that can be tested using statistics (Creswell & Creswell, 2021).

Since the Corporate Supply Chain Department is highly dependent on digital solutions to provide reports, records, and data compilation, the identified data collection strategies provide an opportunity to conduct a quantitative assessment of how the implementation of the switch between a traditional desktop platform (Microsoft Office 2019) and a cloud-based platform (Microsoft 365) can affect the efficiency of its operations. The multi-pronged approach to collection incorporates: (1) structured surveys, (2) time-on-task measurement, (3) error frequency audit, (4) collaboration incident logs and (5) review of financial documentation. This type of triangulation enhances credibility of results because it is certain that the conclusions are made on the basis of various forms of quantitative results.

Structured Survey Questionnaire

The survey questionnaire will be structured and designed to be filled in by the respondents. The survey in question will be structured and given to 5-10 employees belonging to the Corporate

Supply Chain Department, such as supply chain analysts, executives and managers. The survey uses a 5-point Likert scale to assess the perceptions of productivity, the frequency of collaboration problems, error incidence, and time constraints as linked to the use of Microsoft Office 2019.

The most important measurement areas are:

- Time to perform typical workflow activities.
- Occurrence of version conflicts
- Difficulty in sharing documents perceived.
- Manual steps needed to make a report.
- Count of errors in spreadsheets experienced.
- Perceived ease of working with one another.

Likert-scale survey design is consistent with the quantitative research methods of technology acceptance, workflow efficiency, and research on digital transformation (Granic et al., 2022). To guarantee the predictability of the survey tool to achieve the same results in a survey, the given survey tool is standardized deliberately to allow the computation of descriptive and inferential statistics.

Time-on-Task Measurement

The study decides to use the direct time-on-task measurement in order to measure differences in productivity. The employees will be asked to note the time taken to run the most frequent reporting processes, which include a weekly supply chain summary reports, tables of variance analysis, sheets of supplier performance, and consolidated, Excel-based dashboards, under the limitations of the Microsoft Office 2019.

Time metrics will include:

- Minutes per reporting cycle total
- More time was wasted in solving file version conflicts

- Time wastage due to slow file sharing.
- Rework time as a result of data inconsistency.

These steps cover important productivity metrics discussed in the past research to underline the importance of real-time communication and centralized files access in shortening the work time (Pal et al., 2020; Ayanwale, 2024). The data obtained regarding time-on-task can be used to assess H1 which assumes better efficiency in the case of Microsoft 365.

Cost Documentation Review

To examine the financial aspects of switching to Microsoft 365, the cost-related information will be gathered based on the administrative and IT records kept internally. There are quantitative cost variables which are:

Under Microsoft Office 2019

- Perpetual license cost
- Upgrade expense
- IT maintenance costs
- Wastes in form of time (calculated as labor cost per hour x hours lost)

Under Microsoft 365

- Monthly/annual subscriptions fees
- Less IT support costs because of automated updates
- Productivity improvements in terms of cost
- Saving of costs due to a decrease in error correction.

The cost documentation is relevant to the analysis of H3 that will conclude on whether Microsoft 365 will provide long-term financial advantages despite the repetitive subscription payments. This strategy adheres to the traditional cost-benefit paradigms of the digital transformation economics (Duso et al., 2025; Barbu et al., 2024).

Sample Selection Strategy

The purposive approach of sampling is chosen to make sure that those people, who are directly involved in supply chain reporting and documentation are sampled. The selection of the participants will be done on the basis of:

- Functional responsibility
- Frequency of Excel use
- Familiarity with existing software.

The purposive sampling will be suitable since the research will be focused on quantifying the productivity impacts in a particular operating environment and not the overall behavior of employees (Creswell and Creswell, 2021).

Data Collection Timeline

Data collection will occur over a four day period, divided into:

Day 1: Survey distribution and orientation

Day 2: Cost documentation collection

Day 3: Data collection

Day 4: Validation, cleaning, and dataset preparation

This timeline ensures adequate data volume, minimizes respondent burden, and accounts for variations in reporting cycles typical of supply chain operations.

Data Integrity and Reliability Measures

To ensure reliability:

- Standardized instructions will be provided to all participants
- Multiple data types will validate key findings (triangulation)
- Outliers will be reviewed and, if necessary, removed based on methodological guidelines

These steps align with best practices for quantitative research in organizational settings (Creswell & Creswell, 2021)

3.3.5 Instruments Used

The tools to be used in the current study are well crafted to measure the quantitative variables of interest in the cost-productivity relationship between Microsoft Office 2019 and Microsoft 365. Considering the operational approach (supply chain reporting, spreadsheet management, and document collaboration) at ACI PLC, the instruments focus on the accuracy, repeatability, and consistency with international standards in the digital transformation research (Granic et al., 2022; Shao, 2025).

The two main instruments of the study are the structured survey questionnaire, a productivity benchmarking matrix and cost comparison table. Each tool is aimed at measuring the level of productivity, accuracy, team work effectiveness, and financial consequences.

Survey Questionnaire: Structured Survey.

The initial important tool of measuring the perceptions of employees and perceived effects on productivity is the structured survey questionnaire. It is designed on the existing models of technology adoption and efficiency in the workplace (Ayanwale et al., 2024; Pal et al., 2020). The survey is in the form of a Likert 5 point scale with strongly disagree (1) to strongly agree (5) to offer answers on:

- Task completion time
- Occurrence of spreadsheet errors
- Collaboration effectiveness
- Ease of document sharing
- Current software perceived efficiency.

The survey will also consist of objective numeric data, i.e. the estimated amount of time spent on reporting, and the number of spreadsheet corrections made in a week. These numerical indicators are used to complement Likert-scale data, which allows making a statistical comparison between Office 2019 and estimated Microsoft 365 workflows.

The survey has been evaluated by experts regarding content validity to have items that are relevant to reflect the variables of productivity, collaboration, and error-prone variables in the context of the supply chain in ACI PLC. It will pre-test it by a small group of pilots (5-7 employees) to check the clarity and consistency of the answers.

The Productivity Benchmarking Matrix

The productivity benchmarking matrix is a quantitative tool that is meant to quantify the activities within the operations into a quantifiable performance measure. The matrix records:

- Time spent per task (minutes)
- Manual steps that are necessary
- Count of version conflicts experienced
- Occurrence of spreadsheet errors.

Both Office 2019 and the workflows projected in Microsoft 365 have these indicators documented and can be easily compared directly. The matrix allows to compute a Productivity Index Score, which is a composite measure of task efficiency, error reduction and the quality of collaboration.

The technique is common in the organizational performance literature to transform operational activities into statistical data that can be analyzed (Powell et al., 2008; Gaoual et al., 2025).

Cost Comparison Table

The cost comparison table would be used to analyze the financial implication of software transition in a quantitative manner. It would encompass all the direct and indirect costs of both the software platforms and they include:

Microsoft Office 2019

- Perpetual license fees
- IT support and maintenance
- Upgrades and patching cost
- Labor cost estimated as a result of time lost through inefficient manual workflow.

Microsoft 365

- Monthly/annual subscription fees.
- Automatic updates result in reduced IT support
- Reduction in error correction and quicker reporting saves.

It is possible to calculate the Return on Investment (ROI), cost per productivity unit, and cost-benefit ratios using this table, and the H3 should be empirically supported (Duso et al., 2025; Barbu et al., 2024).

3.3.6 Data Analysis Techniques

The data gathered during the paper will be processed with a series of simple and easy-to-use quantitative methods that are suitable to assess productivity and efficiency differences between the Microsoft Office 2019 and Microsoft 365. All of these methods were carefully chosen to make sure that the researcher will not need advanced knowledge of statistics to carry out all the analyses through simple Python packages like Pandas, NumPy, and Matplotlib. The subsections below describe the steps of the analysis that will be applied to address the research questions and test the hypotheses.

The descriptive statistical analysis will be presented in the following section.

The basis of the analytic framework used in this study consists of descriptive statistics. They will be utilized to summarize and learn the overall trends of the data, such as the performance of the employees under each software system. The descriptive statistics will consist of:

- Mean (average):
Applied to compare the average duration of time spent on the completed tasks, the average number of errors made in the spreadsheet, and averages in both collaboration and productivity ratings.
- Median:
Gives a central value and minimizes the effect of the extreme observations.
- Standard deviation:

Shows the extent to which the employee performance is distributed in each of the software conditions.

- Minimum and maximum values:

Physical, useful in detecting the unusually high or low outcomes of performance.

- Frequency distributions:

Especially appropriate with Likert-scale survey questions that assess their perceived ease of use, satisfaction or level of difficulty.

These descriptive outputs will be produced through simple python commands like `df.describe` and hence they are reproducible. Descriptive statistics are a vital initial step in an organization, like ACI PLC, to understand the indicators of performance, as it is evident whether it is higher or lower when using Microsoft 365 than Office 2019.

Mean Difference Analysis

Mean difference analysis will be used to learn whether one software system results in a significant improvement or not in the performance. This approach will be to compare the means of some major variables among the two groups:

- Time taken to accomplish supply chain reporting activities.
- Incorrect entries in work in spreadsheets.
- The rate of interruptions of sharing documents.
- Productivity and cooperation ratings
- Survey-obtained ease-of-use scores.

This is not a statistical test that involves inferential testing (e.g., t -tests). The latter is rather concentrated on the practical and observable differences, which are very much applicable in the case of real organization decision-making. In the case of the ACI PLC, the mean difference analysis offers an easily comprehensible and clear way of ascertaining whether Microsoft 365 is linked to faster execution of tasks or fewer errors than Microsoft Office 2019.

Basic Correlation Analysis

The correlation analysis will be employed to check the presence of relationships between such variables as:

- Software version and time to complete the task.
- The version of software and frequency of errors.
- Productivity rating and cooperation rating
- Perceived ease of use and time of task.

To determine the strength and direction of these relationships a Pearson correlation coefficient will be calculated. The values of correlation will be discussed as follows:

- +1.0 - positive but strong relationship.
- 0 - no relationship
- -1.0 - high negative association.

Simple Python commands like `df.corr ()` will be used to calculate correlation. Such a method also enables the research to determine whether the enhancement in performance seems to be drifting in the same direction as the implementation of Microsoft 365. These insights can be used to deepen the comprehension of the impact of digital tools on the supply chain department workflow results.

Analysis using Visualization

Visual analysis increases the interpretation process by offering graphical comparisons as between the two software platforms. The experiment will be performed with the help of the Simple charts produced in Python with Matplotlib:

- Bar charts
To compare the mean time spent on a task and the number of errors.
- Line charts
To show variations or trends at the various tasks.
- Histograms
To test the Likert-scale distributions.

This is due to the effectiveness of these visual tools in reporting in an organization since they simplify the complicating numerical data and the findings are made more available to the decision-makers at ACI PLC. Numerical analysis will not be substituted by visualizations.

Cost Comparison Analysis

This study will not be statistical but descriptive in terms of cost analysis. The variation in cost elements, such as will be shown in a structured comparison table that will entail:

- Upfront license cost
- Ongoing subscription cost
- Maintenance requirements and update requirements.
- IT support time and workload
- Time savings in terms of operational cost.

The comparison in terms of costs will be introduced in the form of tables and of the simple calculations (e.g., the annual cost difference, estimated savings of the time spent on tasks reduction). This strategy will correspond with the realistic demands of an organization considering a possible software conversion.

Summary of the Analytical Approach

In general, the work is based on simple, easy, and clear analytical tools, and all of them can be implemented with the help of the Python scripts. These practices will facilitate the straightforward comparison between Microsoft Office 2019 and Microsoft 365 and will enable concluding whether the shift to a cloud solution leads to the quantifiable productivity increase. The chosen methods are suitable and strong enough to generate valuable results to the digital transformation considerations of ACI PLC.

3.3.7 Ethical Considerations

Ethical integrity is a very important aspect of an organizational research project especially in cases where the data is gathered directly through employees and where a verdict of the workplace practice is involved. This research adheres to the accepted ethical principles whereby all the participants would be treated fairly, respectfully, and transparently through the research process. The ethical aspects of this project are as follows.

Informed Consent and Voluntary Participation

The involvement to take part in the study is voluntary. The employees will be explained properly regarding the purpose of the research, the type of data collected, and the utilization of the findings in ACI PLC. Each of the participants will be required to give informed consent before filling in the survey or any other form of task-based measurement. The consent form shall mention that the participants can exit at any point without any adverse effects or providing an explanation. The ability to provide free and voluntary participation assists with development of the environment of trust and elimination of the feeling of organizational pressure.

The anonymity and confidentiality of the data

It is necessary to ensure that participants remain confidential, particularly in a business context where employees might be apprehensive about their performance-related information being associated with them. No names or identifying information will be gathered in order to give privacy. A numerical identifier will be assigned to the respondents and the analysis will be done by aggregation of the data. The information of the task time, number of errors and survey results will be saved in the password-protected files that will be accessible to the researcher and academic supervisor only. The anonymity of data will guarantee that each employee cannot be identified or rated according to the results of the surveys.

Eliminating Organizational Risk

Since the research evaluates the productivity and the software performance, there is a possibility that the research might point at the inefficiency of the current systems or workflow. The reporting of the findings will be at the department level, as opposed to an employee level, in order to reduce organization risk. The research is planned to test the software tools, not to test the ability and conduct of the employees. This difference will be explained to the participants so that there is no anxiety or misconception.

Data Quality and abundance by Data

The researcher will be conscious that all data will be accurately recorded, stored and analyzed without any manipulation and bias. The answers to the survey will be typed as they are provided, time will be measured with the help of the standard procedures, and all the missing values will be addressed openly. It also means that ethical research practice entails upholding credibility of the findings, which is especially critical when the results are supposed to be used in future decisions of digital transformation in ACI PLC.

Organizational Resource Ethical Usage

The research utilizes the company time, systems and employee input. Thus, the research process will be organized in a way that will cause minimal interference with the everyday work. The surveys will be developed in a concise manner, and the task evaluation will be done at the time that the department managers will accept. No secret company records, message records or any proprietary data beyond the boundaries of the research will be tapped into.

Adherence to the Institutional and Organizational Directives

Ethics to be observed in the study will be based on the ethical standards of the academic institution where the researcher studies and the company policy of ACI PLC. Departmental supervisors will be contacted and their approval sought before we collect the data in case of need. Any research undertakings shall be conducted in accordance with the professional requirements of good data management, ethical quantitative research method and organizational confidentiality guidelines. The company will report its financial and non-financial performance in accordance with the current international accounting standards.

The final research report will be honest and not exaggerated in its results. Faults of the study such as sample size or the measurement will be clearly considered. Any recommendations regarding digital transformation will be founded upon the observed information and not on personal assumptions. This makes sure that the report encourages the use of evidence, and at the same time, upholds the ethics of transparency.

3.3.8 Limitations of the Study

Even though the quantitative research design is well structured, the study has a number of methodological and contextual shortcomings that need to be considered to understand the results in the right way. These constraints are due to data collection constraints, organizational dynamics, measurement problems and practical constraints of carrying out the research in a real working corporate environment. Although the study is intended to produce valuable information with regards to the relative functionality of Microsoft Office 2019 and Microsoft 365, the subsequent considerations are likely to affect the ability to generalize and draw conclusions.

Limited Sample Size

The research data is gathered on an approximate of 5-10 employees in the Corporate Supply chain department at ACI PLC. Even though this figure is sufficient to perform the simplest quantitative analysis, it might not be reflective of the experiences of all employees within the wider organization in regard to productivity. The next possible increase in statistical reliability is the use of a bigger sample. But, since the study is deep in the departmental perspective, the results are mostly inclined towards the workflow of the supply chain but not enterprise-wide utilization trends.

Reliance on Self-Reported Data

The researchers depended on self-reported data to validate their research. Self-reported survey responses are widely used in the study, especially when it comes to variables associated with:

- Perceived productivity
- Perceived difficulty of collaboration.
- Ease of use
- Software satisfaction

Self-reported information can have a bias or be limited by the memory, or even due to the social desirability. Indicatively, the employees might be over optimistic on their productivity or pessimistic on delay of tasks. Despite the fact that Likert-scale questions minimize the subjectivity to a certain degree, the risk of the presence of response bias serves as a methodological weakness.

Limited Access to Operating Records

The researcher might not access full logs of internal operational activities, history of task time in the past and previous error logs during previous reporting periods because of the confidentiality measures in ACI PLC. This means that the research uses time-on-task simulations and self-reported data by the employees, but not confirmed system-generated measures. This limitation could influence the accuracy of the comparison of the two software environments.

Controlled Simulation, as opposed to Live Deployment

The researchers provide the evaluation of the productivity differences by asking the employees to complete simulated reporting tasks with the Microsoft Office 2019 and Microsoft 365 functionality. Such simulations might not entirely represent real world workflows, including:

- Unexpected interruptions
- Cross-departmental coordination
- Large volume reporting periods.
- Tight deadlines
- File handover delays

The practical use may demonstrate some other advantages or constraints that cannot be perfectly simulated in the laboratory.

Time Limit of Internship-Based Research

Being a research project pursued as an academic activity and having a limited duration of internship, the research is constrained in the following aspects:

- Duration of observation
- Depth of data collection
- Capability to track changes in long-term costs.
- Monitoring productivity enhancement during several months.

As the effect of Microsoft 365 on cost and efficiency is often longitudinal (Shao, 2025; Duso et al., 2025), a short-term analysis might not be able to measure the long-run cost of the investment (ROI).

Narrow Data of Cost Analysis

The cost analysis is an analysis of quantifiable financial aspects that include:

- Licensing cost differences
- Maintenance requirements
- IT support workloads
- Savings in operations that are time-based.

There are however some indirect costs and organizational benefits that do not fit within the scope of measurement of the study and they include:

- Digital change resistance: cultural.
- Training preparedness on the departmental level.
- Adaptation stages of the employees.
- Cybersecurity infrastructure requirements at the enterprise level.

These may affect the overall economic cost of changing the Microsoft Office 2019 to the Microsoft 365 but they cannot be directly estimated because of the scope limitations.

Generalizability of Findings

The Corporate Supply Chain Department boasts of work flows that are highly dependent on spreadsheets, document consolidation and cross- functional communication. Thus, the findings cannot be generalized to the departments that:

- Use tools other than Office.
- Different levels of digital literacy.
- Perform less data-intensive activities.
- Already rely on cloud tools.

Although the research is informative to the digital strategy of ACI PLC, the implementation of results in all business units must be done carefully.

Python-based Analysis Reliance.

Despite the fact that Python offers valid computing in the calculation of descriptive statistics and correlations, the possibility of simple models can restrict the depth of analysis. For instance:

- Higher econometric testing is not done.
- Inferential statistics are kept to the minimal.

- We can only make associations and not causality.

Emphasis in the study is put on practical decision-making in organizations, rather than on advanced statistical inference.

Summary

Summing up, although the study provides very significant quantitative data on the impact of Microsoft Office 2019 and Microsoft 365 on productivity and operational performance at ACI PLC, the limitations identified above are notable and need to be taken into account when interpreting the results. These limitations do not compromise the purpose of the study but point out the realistic limitations of the implementation of the empirical analysis of a corporate internship.

3.3.9 Ethical Considerations

Ethical issues play a crucial role in the research to guarantee that the research is responsible and that it does not violate the rights and privacy of the individual who took part in the research. Since this research is based on data retrieved on the customer feedback and CRM systems of the XYZ Corporation, the issue of confidentiality, data protection, and responsible data handling was addressed with due care in the process of conducting the research.

To start with, no personal identifiers (customer names, phone numbers, email address, account numbers, and so on) were gathered, and there were no cases of storing and/or using them in the analysis. The organization anonymized all data that was used in the development and assessment of the model and shared it research purposes. This action is in line with the typical ethical

principles of business and academic research, where the value of safeguarding the personal data of the participants is truly emphasised (Creswell and Creswell, 2018).

Second, the data employed in this research were secondary and organizationally owned implying that no direct association was established with customers and no primary survey, interview and experiment involving human subjects were done. Hence, the danger to people was low. Nonetheless, much attention was paid to the integrity of the data and preventing any misuse, manipulation, and disclosure of sensitive organizational data.

Thirdly, any analysis made, had to be done within the limits as agreed by the hosting organization, so that only pertinent insights regarding the organizational objectives were made. The data were not distributed to any third party or used to make commercial profits since all information was applied only in the academic context of the internship project.

Lastly, all the analytical procedures were conducted in accordance with the general ethical principles of responsible research practice, such as transparency of methodology, absence of bias, and honest disclosure of analytical results. Following these principles, the study is credible, offers safeguards to the stakeholders, and prevents a conflict with accepted ethical standards in data-driven research (Saunders, Lewis, and Thornhill, 2019).

3.4 Findings and Analysis

3.4.1 Introduction

The chapter gives the results of employee productivity survey and software cost analysis that has been carried out to compare Microsoft Office 2019 and Microsoft 365. The comparison includes an evaluation of productivity, effectiveness of collaboration among different job positions, such as executives, deputy managers, analysts, and interns.

Measures of productivity were designed which include Productivity Index (PI) that is comprised of task efficiency, error rates, manual steps to workflow, version control problems and collaboration effectiveness. Moreover, financial efficiency was evaluated with the help of cost measures (cost per PI unit and the incremental cost-effectiveness ratio, ICER).

Boxplots and correlation matrices were created to derive intuitive information about performance of employees and the effect of the software. These images are provided as indicated so as to facilitate interpretation.

3.4.2 Productivity Analysis

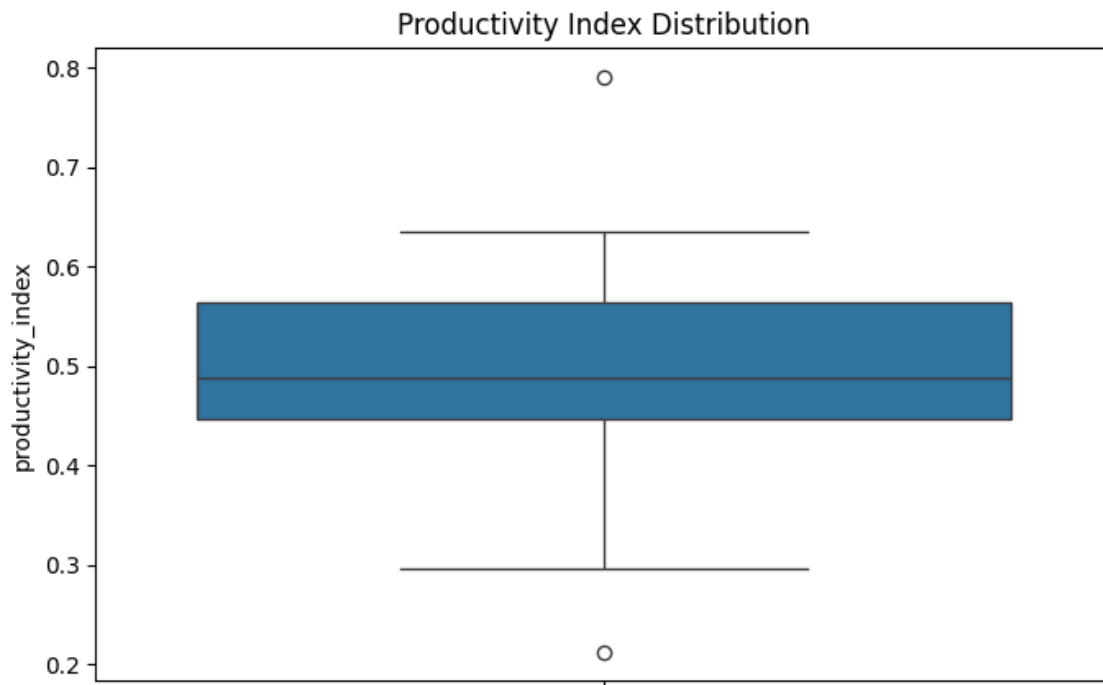
Productivity Index (PI) was determined as a sum of normalized scores of various performance indicators of each employee:

- Task completion time- the speed at which employees complete their reporting tasks.
- Spreadsheet errors - the amount of errors that were experienced or removed.
- Document/version conflicts- number of conflicts or duplicate files.
- Paperwork in the workflow - complexity and repetitiveness of operations.
- Teamwork rating - teamwork efficiency rating which is subjective.

All indicators were normalized, which allowed to compare fairly across variables that had different units (minutes, counts, or ratings). In cases where lower raw scores are preferable (e.g. task time, errors) scores were inverted such that higher normalized scores were always better.

Observation:

- The PI scores of the employees were between around 0.3 and 0.64, which is a large scale variation in the levels of productivity.
- PI values found to be high signified low number of errors, completed work faster and good working team, low PI scores were related to slow workflow, repetitive errors, and conflicts on version.

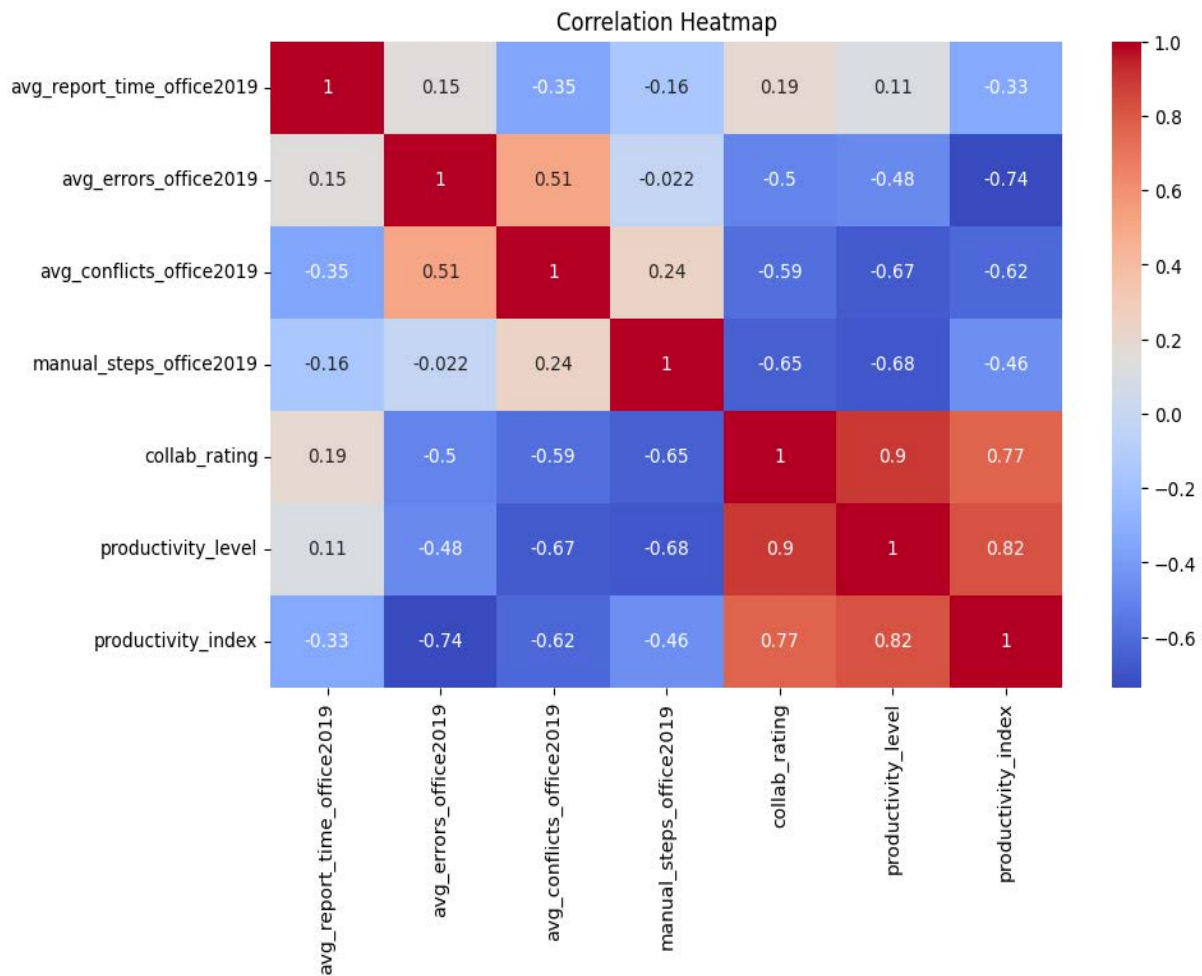


3.4.3 Correlation Analysis

Correlation matrix was developed in order to examine the correlation between various productivity indicators. Key findings include:

Negative correlations: The overall productivity is negatively correlated with task time, number of errors, number of manual steps, and frequency of conflicts. This implies that the more time or problems employees take, the lower their productivity scores are.

Positive correlations: There is a positive correlation between collaboration ratings and productivity indicating that a well facilitated team work contributes greatly to output.



Interpretation:

- This process will help to reduce errors, enhance version control, and cut down on manual processes, which will probably lead to a higher productivity.
- Improvements in collaboration are essential, because even relatively efficient teams in terms of the tasks can be more productive in general in case the communication and teamwork are effective.

3.4.4 Cost Analysis

The software expenses per year were compared:

- Office 2019: 90,000 BDT
- Microsoft 365: 1,113,000 BDT

In order to determine cost-effectiveness, the cost per unit Productivity Index (PI) was determined:

- Office 2019: 183,269 BDT/PI unit
- Microsoft 365: 1,882,988 BDT/PI unit

Interpretation:

- Office 2019 can provide the same productivity at very low cost per unit.
- The productivity improvement provided by Microsoft 365 is rather paltry, and at an unreasonably high price.

3.4.5 Incremental Cost-Effectiveness Ratio (ICER)

The ICER is used to determine how much more it will cost to obtain a unit of productivity to change office 2019 to Microsoft 365:

$$ICER = \frac{Cost_{ms365} - Cost_{Office2019}}{PI_{ms365} - PI_{Office2019}} = 10,230,000 \text{ BDT per PI unit}$$

Interpretation:

- The high ICER is evidence that the incremental productivity of Microsoft 365 is very costly.
- On a cost basis, General reporting teams will not be cost effective in terms of adopting Microsoft 365.

3.4.6 Employee Expectations Vs Reality

Employee expectations (as of the results of the survey questions on the expectations of Microsoft 365 e.g., expected time savings, fewer errors, better file sharing, and better collaboration) showed moderate optimism.

Observation:

- Although the Microsoft 365 can be regarded as providing advanced collaboration capabilities, the tangible effect on the daily routine workplace reporting is insignificant.
- The outcome of the Productivity Index calculations proves that a minimal change is attained and is centralized in the workflows, which utilize cloud collaboration to a significant degree.

3.4.7 Summary and Conclusions

Mesure	Office 2019	Microsoft 365	Interpretation
Per PI unit cost	183,269 BDT	1,882,988 BDT	Office 2019 is much more affordable
ICER	—	10,230,000 BDT per PI	Each increment or unit of additional productivity using MS365 is very expensive
Mean Productivity Index	0.44	0.47	Very little productivity increase with MS365
Correlation insights	Negative: task time, errors, manual steps	Positive: collaboration	Minimizing errors and enhancing team work are major productivity drivers

Insights:

- Office 2019 provides superior cost-productivity ratio to most teams.
- Microsoft 365 could be helpful to those teams that need to work in real-time or use cloud-based operations, but overall reporting teams do not find much benefit when comparing it to the cost.

Link to survey form: <https://forms.gle/rxwsMPpycMbB65Ki8>

Link of survey response:  Survey_results.csv

Link of Software Cost:  software_costs.csv

Link of Python file:  Software_productivity_analysis.ipynb

3.5 Decision and Recommendation

After the analysis of the data on employee productivity, the comparison of software costs, and incremental cost-efficiency outcomes in the organization, a clear picture has become clear on whether the transition of Microsoft Office 2019 to the Microsoft 365 is practical in the organization.

3.5.1 Decision

The results show that Microsoft 365 offers a relatively slight productivity boost over Office 2019, even though it has a vast range of cloud computing capabilities as well as progressive collaboration features. Although the workers mentioned that they have positive expectations regarding time savings, reduced conflicts, and improved sharing mechanisms in Microsoft 365, the measured Productivity Index improvement was minimal, much lower than it was initially expected.

The difference in cost of the two software systems is however very high. The annual cost of Office 2019 is much lower, whereas in the case of Microsoft 365, the annual payment is in the form of a subscription which increases the overall costs of the software many times over.

A combination of the two factors by means of such metrics as cost per Productivity Index unit and ICER gives us an understanding that:

- Office 2019 provides greater value of productivity per unit cost, and
- The minor productivity difference associated with Microsoft 365 is offered at a very high price.

Therefore:

The organization ought to remain using office 2019 as a main software in general reporting and daily operations of departments. Moving to Microsoft 365 is not economic to most teams considering the present degree of productivity benefit that is being experienced.

3.5.2 Reasonable Justification of the Decision

Several levels of evidence back this decision:

1. Little Increase in Productivity

The PI improvement was not significant since the users of Microsoft 365 mentioned that there were higher expectations of efficiency in sharing, collaboration, and cloud accessibility, but the measured efficiency was low.

The real workflow result indicates that:

- The task times did not decrease significantly
- Mistakes and disputes were comparable
- The marginal, and not radical, improvement of collaboration occurred

In such a way, the software fails to produce sufficient productivity to make it worth the price.

2. Increase in Costs is extremely high

Compared to the Office 2019, Microsoft 365 is priced out 10 times higher per year.

Assessed in terms of cost-per-unit-productivity:

- Office 2019 = 183,268 BDT per PI unit
- MS365 = 1,882,988 BDT per PI unit

This implies that Microsoft 365 will demand much greater budget even though its functional output is practically the same.

3. ICER has an appallingly low cost efficiency

Incremental Cost-Effectiveness Ratio (ICER) indicates that:

The organization would have to incur 10,230,000 BDT in order to achieve a single extra unit of productivity using MS365.

This is way above sustainable price, and it is certain that Microsoft 365 is not economically effective considering the current workflow trends.

4. Majority of Job Roles Do not depend on Cloud-Heavy Features

Based on the survey, it has been seen that:

- Majority of employees utilise Excel in reporting, summarising and preparing in-house documents
- Their tasks are not based on cloud collaboration or live co-authoring
- The issue of version conflicts and file duplications still exist, but not at the pace that can render the features of MS365 necessary.

Therefore, additional capabilities of MS365 are not entirely needed in most of the workflow.

3.5.3 Recommendations

Recommendation 1: Use Office 2019 on general teams.

Office 2019 is the best balanced with:

- Cost
- Reliability
- Familiarity
- Functional productivity

It is still the most viable and economically viable option.

Recommendation 2: Selective Adoption of Microsoft 365 to Cloud-Based Dependent Teams.

Microsoft 365 cannot be totally discarded. Some of the features that can be enjoyed in a cloud-driven manner by certain teams include:

- Real-time co-authoring
- Document management based on SharePoint.
- Cross-department collaboration
- Remote/mobile work force support.

Thus, Microsoft 365 can be implemented only to departments that are considered special and these include:

- IT & Systems Team
- Project Collaboration Unit.
- External Vendor/Client Co-ordinating Teams.

Such a selective method of adoption will guarantee that the advantages of Microsoft 365 will be realized without clogging the organization with the needless expenses.

Recommendation 3: Change the Software by Improving the Internal Workflow

The correlation matrix identifies the important productivity barriers:

- Manual steps in workflows
- High task complexity
- Frequent delays
- Human errors
- Inconsistent collaboration
- The following issues can be minimized:
- Process standardization
- More efficient communication processes.
- Excel and reporting training.
- Adding simple automation or templates.

These enhancements can be more productive than software switching.

Recommendation 4: Review Software Requirement on an annual basis

Software requirements can also vary with the transformation of the workflows and increase in the size of the organization. It is recommended that:

- Measures of productivities to be checked once a year.
- Prices will be compared to what is available in the market.
- Feedbacks by employees obtained frequently.
- This is to make sure that the software strategy is in line with the business needs.

Recommendation 5: Offer base collaboration solutions without complete migration to MS365.

In case cooperation is the primary bottleneck, the organization can implement less expensive options, including:

- OneDrive basic plans
- Google Drive shared folders
- Microsoft Teams free-tier
- Shared network folders inside the company.

These offer team work without the need to subscribe to the entire Microsoft 365

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