“Impact Investigation: The Development of an Automated Laptop Distribution System for Coventry University's Flying Start Programme for New Information Technology for Business (ITB) Students”

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ABSTRACT

This project aims to address the challenges faced by ITB students in acquiring laptops for their studies and the effects of this. The manual system for distributing laptops has proven to be inefficient, time-consuming and prone to errors. To solve this problem, a power automate program was developed to automate the process of laptop distribution. The program allows students to register their details and select their preferred laptop specifications, which are then confirmed by the relevant Staff/ Facilitators for double authentication. Laptops can only be collected at the university help desk, ensuring that they are distributed safely and efficiently. This project successfully addresses the challenges faced by ITB students and provides a streamlined and effective solution for laptop distribution.

Keywords: ITB, COVID-19, Laptop Distribution, Automated System, Power Automate, Visio, Automation, Laptop Rental

Acronyms:

ITB	Information Technology and Business
ALDS	Automated Laptop Distribution System
FSP	Flying Start Programme

2. INTRODUCTION

2.1 PROBLEM SUMMARY

The provision of course essentials to students such as new Information Technology for Business (ITB) university students is an essential aspect of the Flying Start Programme aimed at improving students' accessibility to learning resources. However, the current laptop distribution process is often inefficient and inaccessible at times, leading to delays and frustration among students. This problem highlights the need for a more effective and efficient system that can provide new ITB students with laptops in a timely manner.

Thus, the aim of this study is to investigate how an automated laptop distribution system can improve accessibility and efficiency in the process of providing laptops to new university ITB students. This study is interesting because it addresses a significant problem facing many ITB students today, and it proposes a solution that can have a significant impact on the lives of students and their academic success.

2.2 BACKGROUND AND CONTEXT OF THE PROJECT

Technology has become an essential part of the modern education system as shown through, Coventry's trailblazing digital content provision boosting student outcomes and engagement" **(Coventry and BibliU | BibliU News, 2022).** Laptops, in particular, have become an important tool for students to access information, complete assignments, and participate in online classes. The use of laptops in education has been shown to improve student engagement, academic performance, and overall learning outcomes.

The Flying Start Programme at Coventry University is dedicated to providing support to students and making education more accessible to everyone, regardless of background **(Coventry and BibliU | BibliU News, 2022)**. As part of their support services, the programme provides free laptops to ITB students for academic purposes.

One of the primary benefits of laptops in education is the ability to access a wide range of information and resources as laptops allow students to access digital textbooks and educational software, which can enhance their learning experience. Currently, Coventry University and its Flying Start Programme offer digital textbooks to over 30,000 students and staff at the university **(Coventry and BibliU | BibliU News, 2022)**. With the internet, students have access to a vast amount of information that can be used to complete assignments, research projects, and conduct independent studies.

Advantages of laptops in education such as participating in online classes and collaborating with classmates and flexibility to work on their schedule and pace. Online and hybrid learning has become increasingly popular with online course enrolments doubling in 2020, surpassing pre-pandemic gains and increasing by 32% the following year, peaking at 189 million reflecting the growing global acceptance of virtual learning with more online students taking higher education courses **(These 3 Charts Show the Global Growth in Online Learning, 2023)**. Moreover, distributing laptops allow students to join classes remotely, participate in group projects, and have online meetings which allow students to communicate with lecturers and classmates in real-time. The flexibility which comes with owning a laptop to work anywhere and at their own pace allows ITB students to complete assignments and projects at any time and place. As mentioned by Coventry university, as an innovative and enterprising institution, they may seek to incorporate emerging technologies into the student experience and deliver certain contact hours and assessments via online technologies and methods for all courses (whether on-campus, blended, or distance learning), **(Information Technology Management BSc (Hons) 2023/24, n.d.)**.This flexibility is particularly beneficial for students who

have busy schedules or who need to balance school with work or other responsibilities. Though, there have been several limitations and challenges faced by students in this process.

With the current education sector still attempting to diminish the post-COVID-19 pandemic effects, students may be facing challenges such as academic pressure, lack of access to resources, and limited social interactions. Generally, most of these challenges are caused by disparities of attainment when looking at factors such as adapting to online and hybrid learning, financial constraints and other socioeconomic factors. The aim of Coventry's Flying Start Programme is to make their education more accessible to their 11% POLAR4 Q1 students (a term referring to under-represented groups), **(Coventry and BibliU | BibliU News, 2022)**. These challenges faced by ITB students have prompted the need for a more efficient and accessible system for the laptop provision process. This project aims to develop a power automate workflow to address these challenges and improve the laptop distribution process for ITB students.

The potential impact of the proposed system for this project lies in addressing the difficulties that new students in Information Technology for Business face when trying to access laptops from the university through the flying start programme. This may have a negative influence on their education and make it more difficult for them to effectively complete their assignments. This system would consider its requirements and needs, simplifying and streamlining the process of acquiring a laptop with no delays.

The project will be critical for the new Information Technology for Business Students as it will provide them with the tools and resources they need to succeed in their studies. By recognising the potential of digital solutions, Coventry University improves the overall teaching and learning experience for the undergraduate student body and perhaps most importantly helps them save money as well **(Coventry and BibliU | BibliU News, 2022)**. The literature suggests that the proposed automated laptop distribution system is expected to increase student and teaching satisfaction by improving accessibility and efficiency for these students. The success of such a solution will be evaluated by tracking the increase in the number of students applying for and receiving laptops, as well as surveying the students and interviewing academics to determine their satisfaction with the new system.

2.3 AIMS & OBJECTIVES

With the previously mentioned issues considered, the purpose of the study seeks to establish a more complete and deeper understanding of how, given the FSP's current manual laptop distribution process for ITB students, there is a need for a more accessible and efficient laptop distribution (provision) process in place. Through this study, it is expected that valuable insights will be gained, which can justify the development of an efficient and accessible automated laptop distribution system tailored to meet the needs of new ITB students, faculty members, and other relevant staff.

As mentioned within the unpublished proposal **(Kimuli, 2023, p.1)**, to address the research, the following aims and objectives are set:

2.3.1 Aims:

The primary purpose of this research's aims is to guide the research process and ensure that the study is focused, targeted. The achievement of the research aims provide an answer to the research question and emphasizes what must be accomplished by the end of the research process within the parameters of the study **(Formulating Research Aims and Objectives, n.d.).**

The research aims include:

1. Designing and developing an automated laptop distribution system that can improve accessibility and efficiency in the process of providing laptops to new university ITB students in need.
2. Evaluating the effectiveness of the proposed automated laptop distribution system in addressing the challenges faced by ITB students in obtaining laptops and comparing results with the findings of the literature review, and to identify gaps in knowledge and areas for further research.
3. Discussing the implications of the results for the research question and to make recommendations for improving the automated laptop distribution system.

2.3.2 Objectives:

To achieve the aims the following SMART objectives have been identified:

1. **Specific:** Conduct research on automated laptop distribution systems, design and develop a tailored workflow, evaluate the system's performance, and propose recommendations for future development and development for new ITB students and staff.
2. **Measurable:** Analyse the results of the evaluation, identify patterns, trends, and areas for improvement, and compare the proposed system to existing manual methods.
3. **Attainable:** Gather relevant data and resources, and work collaboratively with ITB staff and students.
4. **Relevant:** Contribute to the field of ITB Education by providing a practical solution to improve accessibility and efficiency in providing laptops to new students.
5. **Time-bound:** Complete the research, development, and evaluation within the allocated timeframe and report findings and recommendations in the final dissertation.

As such, taking into account these aims and objectives, an attempt will be made to aid in the understanding of the effectiveness of the proposed solution and contributing to the field of technology in education.

2.4 RESEARCH QUESTIONS

Approaching this project, a decision had to be made to provide a suitable research question that addresses the underlying causes of the research's problem alongside a study of a wider range of issues related to the topic. The research questions chosen will explore the potential advantages of an automated system in addressing the challenges faced by ITB students in obtaining laptops.

The research questions (RQs) to be investigated include:

Primary Question:

- RQ1: How can an automated laptop distribution system can improve the accessibility and efficiency in the FSP process of providing laptops to new university ITB students?

Secondary Questions:

- RQ2: How can the effectiveness of an automated laptop distribution system be measured and evaluated, and what key performance indicators should be considered in determining its success in improving accessibility and efficiency in the laptop distribution process for new ITB students?
- RQ3: What are the potential challenges and limitations of developing an automated laptop distribution system in Coventry University's Flying Start Programme, and how can they be addressed?
- RQ4: How can the use of an automated laptop distribution system impact the overall satisfaction and experience of ITB students in the Flying Start Programme?

The inclusion of multiple research questions allows for a more comprehensive investigation of the topic and provides a framework for a more structured and focused study and can help to ensure that all relevant aspects of the research problem are addressed. In this case, the primary research question (RQ1) will benefit from having additional research questions as they could help to deepen the investigation and address potential gaps in the research.

For instance, RQ3 would allow for the research of potential barriers to development that may not have been considered, whereas RQ2 and RQ4 would aid in the evaluation of the effectiveness of the system in a more distinct way, by exploring the impact on student and staff satisfaction and conducting a system performance analysis, respectively.

Although, having several research questions can prove to be problematic as it may dilute the focus of the study and make it difficult to address each question in sufficient depth, striking a balance will ensure that each research question is relevant, focused, and manageable within the scope of the research. Ultimately, the decision of how many research questions used factored in the nature of the research problem, the available resources, and the research design.

3. LITERATURE REVIEW

3.1 INTRODUCTION

The COVID-19 pandemic has brought unprecedented challenges to the education sector worldwide, with most governments temporarily closing educational institutions to contain the spread of the virus **(Seturidze & Topuria, 2021)**. As a result, students have been forced to adapt to remote learning and online assessments. The ITB course at Coventry University is no exception, as students are faced with the challenge of completing their curriculum and preparing for final examinations in a short period of time. This has highlighted the need for an efficient and accessible laptop distribution system that can support students' remote learning needs. Recent developments have shown that universities are increasingly turning to digital solutions such as online textbooks and automated laptop distribution systems **(*Coventry and BibliU | BibliU News*, 2022)**.

Therefore, this literature review aims to examine the evolution of laptop distribution systems in higher education, with a particular focus on the development of such systems in the context of ITB courses. The review will critically evaluate previous studies related to automated laptop distribution systems and identify gaps in the literature. The primary research question is how an automated laptop distribution system can improve the accessibility and efficiency of laptop distribution for new ITB students in the Flying Start Programme.

3.2 ANALYSIS OF EXISTING STUDIES AND RESEARCH

The distribution of laptops specifically to new students in Coventry University's FSP for Information Technology in Business (ITB) has always been a manual process. This process has posed several challenges, including delays in laptop issuance and the high demand for laptops leading to a shortage. As such, there is a need for an automated laptop distribution system that can improve accessibility and efficiency in the process of providing laptops to new ITB students. The literature identifies several relevant studies and themes to demonstrate how automation can improve the efficiency of various systems and processes; however, authors may disagree on automation strategies or their suitability for a particular context. These studies will offer valuable insights into the design and development of automated systems.

As mentioned within the unpublished research proposal **(Kimuli, 2023)**, automation has enhanced the efficiency of various processes. This interest is particularly relevant in the field of computing, where **(Fröhlich et al., 2019)** also states that "automation is starting to accompany us in many forms of everyday life", demonstrating how automation is increasingly being used to streamline highly specialised tasks. This review focuses on the design and development of an automated laptop distribution system for new ITB university students. The solution for this project involves using Power Automate to develop the system, and this review will assess the feasibility and potential limitations of existing automated systems and the use of Power Automate for process automation will be necessary to identify the specific challenges related to the automated distribution of laptops.

3.2.1 An overview of automated information systems

Several studies have focused on identifying the benefits of automated information systems specifically automated distribution systems. Automated laptop distribution systems have gained increasing attention in recent years, and several studies have examined various aspects of these systems. However, the development of such systems in the context of the ITB course at Coventry University and their impact on student performance remains an under-researched area.

The study by **Harding (1994)** provides a comprehensive review of automated systems in the field of information science. The author examines various types of automated systems, including those used for data storage, retrieval, and analysis. The study highlights the benefits of automation in terms of efficiency, accuracy, and speed. However, the study does not focus specifically on the development of automated laptop distribution systems, nor does it address their impact on student performance.

In contrast, the study on information in food supply chains examines the use of automated systems in the food industry **(The Institution of Engineering and Technology [IET], n.d.)**. The study explores how automated systems can be used to improve the efficiency and accuracy of food supply chains. The study highlights the benefits of automation in terms of reducing waste, increasing productivity, and improving quality control. However, this study does not focus on the development of automated laptop distribution systems or their impact on student performance.

Overall, the reviewed studies suggest that automation can improve efficiency and accuracy in various contexts. However, other studies have identified limitations and challenges associated with developing an automated laptop distribution system. For example, several challenges, such as the high cost of developing such a system and the need for ongoing technical support as well as hesitation from students to use an automated laptop distribution system due to concerns about privacy and security.

3.2.2 The evolution of technology in Higher Education

In the early days, laptops and E-learning tools weren't as common in higher education as they are today. As such, as technology has evolved, universities have recognised the importance of laptops in supporting student learning. In the context of this study, Coventry University's ITB course is one such course that has embraced the use of technology in its curriculum. The course provides students with a range of skills and knowledge in both IT and business, and the use of laptops is essential for its delivery.

The four studies selected for this sub-section provide valuable insights into the evolution of technology in higher education and its relevance to this dissertation's research question on the development of an automated laptop distribution system. **Norton (2013)** report on the online evolution of higher education highlights the growing importance of technology in the delivery of education and the need for institutions to adapt to the changing landscape of higher education. This is important context for understanding how an automated laptop distribution system might fit into the larger picture of university operations. **In comparison, Hiltz and Turoff (2005)** investigates the use of digital technology in higher education with a focus on the potential for technology to enhance student learning experiences instead. Both literatures identified the importance of developing effective strategies for online teaching and learning, including the need for interactive and collaborative learning environments. This is relevant because an automated laptop distribution system is a digital system that will have an impact on how students access and use technology in their education.

Alternatively, Rogers' (2001) study on the forced evolution of higher education also sheds light on the changing nature of higher education, with technology playing an increasingly important role in the delivery of education. This study emphasises the need for institutions to adapt to new technologies to remain competitive and relevant in the 21st century. This is relevant to understanding how a new automated laptop distribution system might be viewed by stakeholders who are accustomed to traditional ways of providing laptops to new students.

Finally, **Purohit's et al. (2021)** systematic literature review on the factors influencing graduate job choice is also relevant to this dissertation, as it highlights the importance of technology skills in the job market. With the growing demand for IT and tech-related jobs, it is essential for students to develop the necessary skills to succeed in the digital economy. While not directly relating to the research question, the study does highlight the importance of access to technology and its impact on employability, which is a broader context that is relevant to the potential impact of an automated laptop distribution system on student success.

Overall, these studies highlight the importance of integrating technology into higher education and the need for institutions to adapt to the changing landscape of education. While technology presents many opportunities for enhancing student learning experiences, it also poses significant challenges. Researchers have emphasised the need for effective strategies for integrating technology into teaching and learning environments and the importance of preparing students for the digital workforce.

3.2.3 The use of automated information systems in educational settings

Automated information systems have become increasingly prevalent in educational settings, with the potential to enhance learning outcomes and improve the efficiency of administrative processes. **Privateer (1999)** discusses the potential benefits of using technology in higher education, including the ability to customise learning experiences for individual students and the potential to improve communication between faculty and students. **Aoun (2017)** argues that advances in artificial intelligence will require higher education institutions to adapt and embrace technology in order to prepare students for the workforce of the future. Similarly, **Mirrlees and Alvi (2019)** explore the growth of EdTech and the automation of educational processes, with a focus on the implications for higher education institutions.

Despite the potential benefits, there are also concerns about the use of automated information systems in education. **Privateer (1999)** notes that there may be a tendency to focus on the technology itself rather than the desired learning outcomes, and warns that technology should not be viewed as a substitute for effective teaching. **Aoun (2017)** acknowledges the potential risks associated with automation and calls for a balance between human and machine learning, arguing that the role of higher education should be to cultivate human skills that cannot be automated. **Mirrlees and Alvi (2019)** also highlight the potential risks associated with automation, including concerns about privacy, data security, and the potential for bias.

There is a need for further research to fully understand the implications of using automated information systems in educational settings. **Privateer (1999)** calls for research that focuses on the impact of technology on learning outcomes, while **Aoun (2017)** emphasises the need to understand how technology can be used to enhance rather than replace human learning. **Mirrlees and Alvi (2019)** note the need for research that considers the broader social and economic implications of automation in higher education.

The literature outlined within this section suggests that there are both potential benefits and risks associated with the use of automated information systems in educational settings. While there is a need for further research, it is clear that the use of technology in higher education is likely to continue to grow and that institutions will need to carefully consider the implications for teaching and learning, as well as broader social and economic implications.

3.2.4 Previous studies on Automated Processes and Provision Programs within Higher Education

The ability to access information and participate in online learning has become a fundamental aspect of higher education. With the advent of technology-based courses, universities have had to provide their students with the necessary tools to support their learning.

As mentioned within the unpublished research proposal **(Kimuli, 2023)**, **Seturidze and Topuria (2021)** also proposed using Power Automate, a cloud-based workflow automation/ RPA tool, to develop a system for collaboration between universities and businesses. The study identified several factors that contributed to the success of the collaboration, including the sharing of expertise, the use of digital tools, the commitment to timely communication and feedback, and leveraging these tools and expertise to enable remote collaboration and overcome physical barriers. The use of Power Automate in the study relates to the topic of an automated laptop distribution system for new ITB university students in several ways, as seen in **Figure 1** below with the example given for an approval system workflow. Similarly, by automating the laptop distribution process, ITB students will have access to the necessary technology to participate in remote classes and collaborative projects as the study suggests that the system could facilitate communication and collaboration between ITB students and staff.

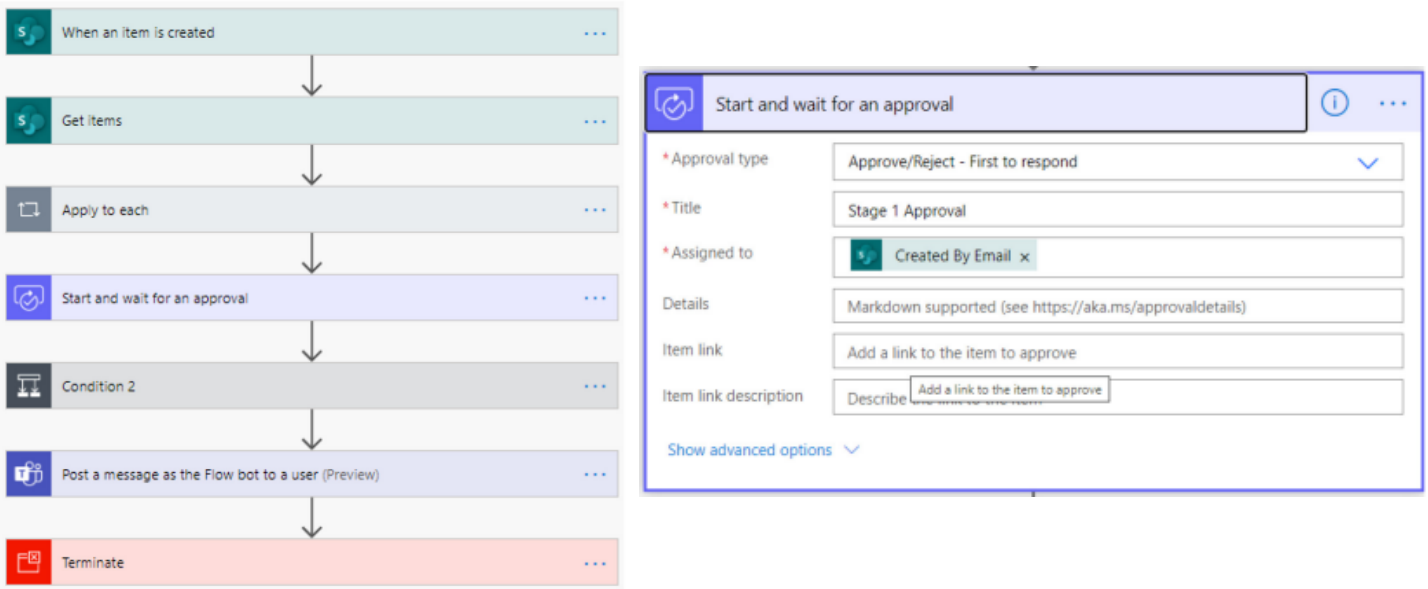


Figure 1: Example of an approval system workflow (Seturidze & Topuria, 2021). CC BY-NC.

3.2.4.1 CASE STUDIES:

Case Study 1: Coventry University's 'Flying Start' Student Support Package

A case study was conducted at Coventry University titled "A Flying Start for all undergraduate students" for providing an induction program for undergraduate students to improve their academic performance, retention, and satisfaction **(Simmons, 2019, pp. 123–128)**. One of the key components of the program was the provision of course essentials at no extra cost such as laptops (non-book items) and other resources to students **(Our Course Essentials | Coventry University, n.d.)**, which they could keep after completing their studies as seen in **Table 1** below. The laptops were pre-installed with relevant software and programs, including Microsoft Office and Adobe Creative Cloud, to support students in their studies.

Table 1: Coventry University's Flying Start' Package

Benefits | Faculty	Faculty of Engineering, Environment and Computing	Faculty of Arts and Humanities	Faculty of Business and Law	Faculty of Health and Life Sciences
eTextbook scheme	Yes	Yes	Yes	Yes
Other non-book items	Yes	Yes	-	Yes
Printing credits[2]	Yes	Yes	Yes	Yes
Grants (international travel and UK placement)	Yes	Yes	Yes	Yes
Mandatory UK Field trips[3]	Yes	Yes	-	Yes
Memberships	Yes	Yes	Yes	Yes
Starter kits tailored to your course	Yes	Yes	-	Yes

Note: From "Flying Start", by (Our Course Essentials | Coventry University, n.d.). CC BY-NC

The study evaluated the impact of the Flying Start program on students' academic performance and satisfaction by analysing various data sources, including surveys, focus groups, and academic records. The results showed that the program had a positive impact on students' academic performance and satisfaction. For instance, the percentage of students who achieved a first-class or upper second-class degree increased from 49% in 2013/14 to 63% in 2017/18, which was attributed in part to the support provided by the Flying Start program, including the provision of laptops **(Simmons, 2019, pp. 123–128)**. Furthermore, 92% of students surveyed reported that they were satisfied with the program, and 89% felt that the laptop provision was beneficial to their studies as show in **Figure 1** below.

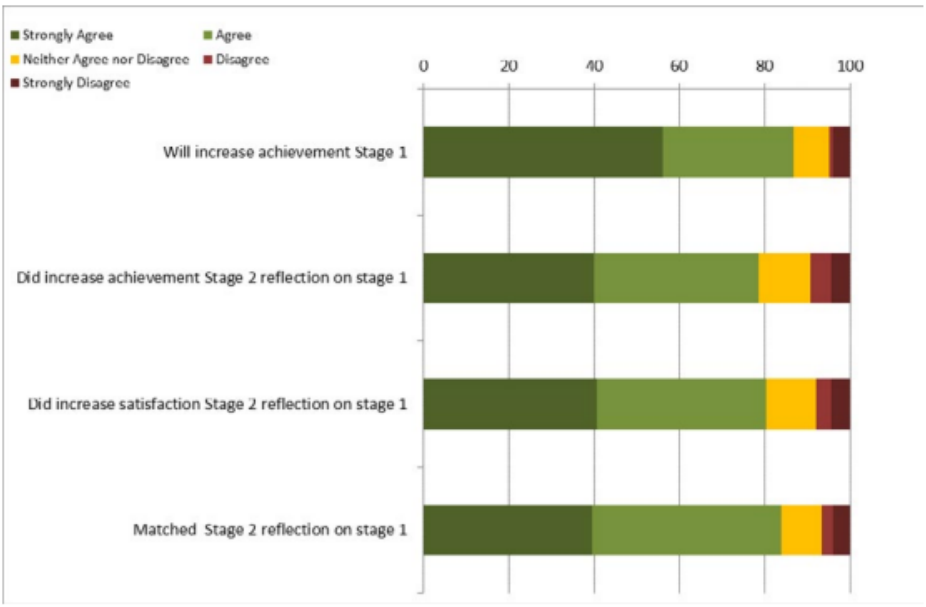


Figure 2: Student responses to questions on if the FSP resources provided met all of the requirements of the course and/or improved students' satisfaction and academic success (Simmons, 2019,p. 123–128). CC BY-NC.

The strength of this study lies in its comprehensive evaluation of the Flying Start program, which included multiple data sources and analysed both academic performance and satisfaction. Additionally, the study provides evidence that the provision of laptops can have a positive impact on students' academic performance and satisfaction as seen in **Figure 1** above, especially at Coventry University since the study collected and analysed data from the university, although further research is needed to examine whether similar results would be found presently.

Table 2: What percentage of students registered to use FSP items and how much they were used

		Stage 1 2018- %	Stage 2 2018- reflecting on their 1st year in 2017-18 %		All applicable students in 2017-18			
		Strongly agree Items WILL help improve achievement	Strongly agree items DID help achievement	% used items in private study every/ most weeks	%registered for Kortext ebooks	mean pages read by those who did register	% registered for online shop	% spent by those who did register
Gender	Female	4	3	4	5	-2	8	1
	Male	-2	-4	-3	-8	7	-9	-1
Entry Quals	A Level	1	1	1				
	Access	6	5	13				
	BTEC	1	2	-1				
Fee Status	Home	1	3	2	1	0	3	2
	Overseas	-13	-10	-10	-8	-5	-7	-4
Ethnicity	Asian	1	-3	-4	-3	21	1	-2
	Black	9	1	1	-10	0	-1	-2
	Chinese	-15	-6	-10	-14	-38	-5	-6
	White	-1	3	4	7	-2	4	4
English as first Language	Yes	1	2	3				
	No	-1	-4	-2				
Deprivation decile	1 to 3	2	-1	2	2	-2	1	2
	4 to 6	2	3	-1	0	-16	3	2
	7 to 10	-4	0	3	13	-2	-1	2
Enrolment date	On time				2	-2	1	2
	1 week late				-23	0	-18	-12
	2 week late				-14	-50	-5	1

Note: From "A Flying Start for all undergraduate students", by Cox, V, Brabban, P & Badesha, D, 2013, Teaching and Learning Excellence - The Coventry Way, p. 123. CC BY-NC.

Another strength of the study is shown in the information provided in **Table 2** as it highlights the relationship and themes between student usage of FSP items and their reported improvement in achievement. While there is a statistically significant relationship between usage frequency and reported improvement, the correlation is weak. Additionally, certain student groups, such as males, overseas students, Asian students, and Chinese students, reported lower percentages of improvement and lower usage frequencies. This suggests that efforts should be made to increase awareness and accessibility to encourage usage among all student groups, particularly those who may be less likely to engage with the system. Furthermore, key themes and factors were explored concerning these results such as decolonising the curriculum may influence the accessibility of certain items to specific groups and late-enrolling students were also found to be less likely to register and use the FSP resources, indicating a need for additional support for these groups **(Simmons, 2019, pp. 123–128)**. Overall, this information emphasises the importance of promoting and facilitating student engagement with the system, particularly for underrepresented groups, to maximise the potential benefits for all students.

One potential weakness of this study was that it did not specifically focus on the automated laptop distribution system, but rather the impact of the overall program that included laptop provision. Therefore, it is important to consider the specific impact of the automated laptop distribution system on the FSP process in the current study. Overall, the study suggests that the provision of laptops can have a positive impact on students' academic performance and satisfaction and the development of an automated laptop distribution system in the FSP has the potential to provide solutions to weaknesses highlighted in this case study for both students and the staff members. By reducing the time required to process applications and reducing the workload of the course staff members, a faster and more streamlined distribution process can ultimately improve accessibility for students and free up time for the team to focus on more complex tasks and provide additional support to students.

Case Study 2: Automation of a Business Process Using Robotic Process Automation (RPA)

Aguirre and Rodriguez's (2017) case study on the Automation of a Business Process Using Robotic Process Automation (RPA) is relevant to the dissertation topic of developing an automated system within Higher Education using power Automate (an RPA). The study also highlights the potential benefits of implementing RPA technologies in streamlining administrative processes. In the case study, RPA was used to automate a repetitive and time-consuming processes such as validating the sale of insurance premiums and keeping employee records up-to date **(Aguirre & Rodriguez, 2017)**, resulting in improved efficiency and cost savings.

This case study can be linked to the provision of services and resources to students within higher education institutions. With the increasing number of students in higher education, administrative processes such as student enrolment, financial aid processing, and record-keeping have become more complex and time-consuming. By implementing RPA or similar automation technologies, institutions can improve the speed and accuracy of these processes while reducing the workload on administrative staff as seen in **Figure 3** below.

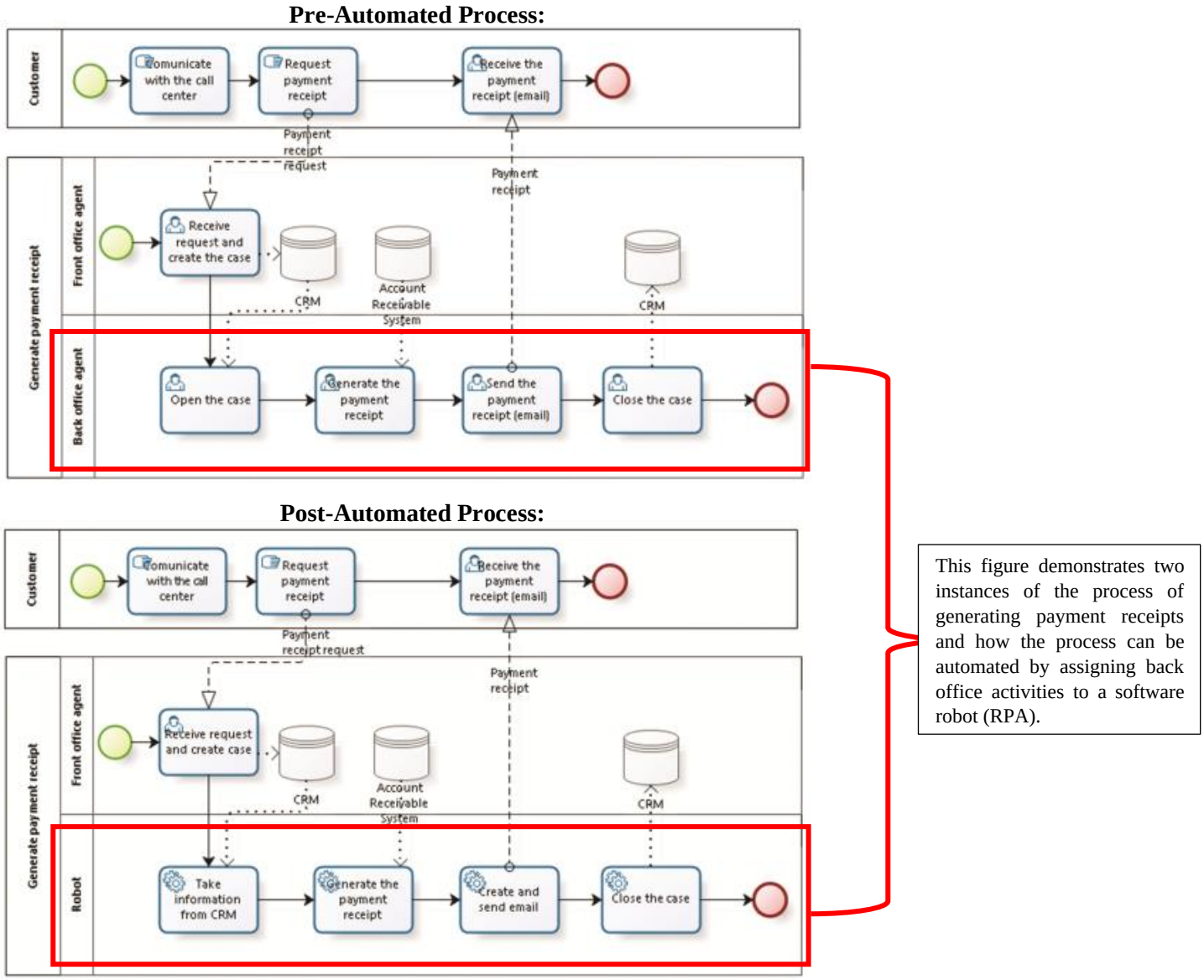


Figure 3 Generate payment receipt (Aguirre & Rodriguez, 2017, p. 5). Copyright 2017 by Springer International Publishing AG.

This case study provides useful insights into the potential benefits of implementing automation technologies in administrative processes such as validation and updating within higher education institutions. An example of this is the productivity improvement shown in **Table 4 (Aguirre & Rodriguez, 2017)** below, displaying how the group with RPA could manage 21% more cases compared to the group without RPA. Further research is needed to examine the feasibility, challenges, and effectiveness of implementing RPA in a higher education context, which could contribute to the development of more efficient and effective provision programs for students.

Table 3: RPA implementation results

Group with RPA	Number of Agents	22
	Mean case duration (seconds)	431
	Total number of cases	7163
	Cases per agent	326
Group without RPA	Number of Agents	13
	Mean case duration (seconds)	440
	Total number of cases	3505
	Cases per agent	270

Note: From "Automation of a Business Process Using Robotic Process Automation (RPA): A Case Study", by Aguirre, S., & Rodriguez, A. W, 2017, p. 6. Copyright 2017 by Springer International Publishing AG.

Despite the study being limited to the focus of one specific process within a financial institution and does not examine the potential challenges or limitations of implementing a RPA tool in a broader context, such as within a higher education institution. The strengths of this case study include the use of a real-world example to demonstrate the benefits of RPA tools, which will be considered later on.

3.3 JUSTIFICATION OF THE RESEARCH TOPIC

The effectiveness of laptops in improving teaching and learning has been widely researched in the academic community. This dissertation aims to explore the effectiveness of automated laptop distribution systems and provide insights on how technology can be utilised to enhance student learning outcomes and bridge the digital divide in education.

3.3.1 Theme 1: Effectiveness of Laptops on Learning and Teaching

In **Fried's (2008)** study, the impact of in-class laptop use on student learning was investigated. The findings suggested that in-class laptop use was associated with lower academic performance, especially when students were engaged in non-academic activities. This study highlights the importance of establishing clear guidelines and rules for the use of laptops in the classroom. Alternatively **Barak et al.'s (2006)** study, suggests that wireless laptops were used to promote active learning in large lecture halls. Despite both literatures having contrasting views, the study found that students who used laptops during class were more engaged in learning and had higher academic achievement than those who did not use laptops. This research emphasises the potential of laptops to improve student learning outcomes when used appropriately. **Gulek's (2005)** study which on explored the impact of laptop use on student achievement found that students who used laptops had higher academic achievement than those who did not use laptops providing evidence to support the effectiveness of laptops in improving student learning outcomes.

Based on these literature reviews, it is clear that the effectiveness of laptops on teaching and learning depends on how they are used. Therefore, the development of automated laptop distribution systems must consider guidelines and rules for the use of laptops to ensure their effective use in enhancing student learning outcomes. This research will provide insights into the design and development of automated laptop distribution systems that can improve accessibility and efficiency in laptop distribution for new ITB students, contributing to the wider goal of bridging the digital divide in education.

3.3.2 Theme 2: Importance of Accessibility and Equity in Higher Education

Within recent years, attention has been drawn to the importance of accessibility and equity in higher education, with technology playing a crucial role in facilitating access and promoting equity. **Herold (2016)** highlights the potential for technology to bridge the gap between students who have access to resources and those who do not, citing examples such as online learning platforms and digital textbooks. **Becker et al. (2017, p.34)** also emphasise the importance of equitable access to technology, stating that "ensuring that all students have access to the same digital tools and resources will be a key factor in closing the digital divide".

However, the COVID-19 pandemic has highlighted the extent of the digital divide and the challenges it presents to higher education. **Piyatamrong et al. (2021)** noted that while the pandemic has accelerated the adoption of technology in higher education, it has also exposed the unequal distribution of resources and the challenges faced by students who lack access to reliable internet and digital devices. This has led to concerns about the potential for technology to exacerbate existing inequalities in higher education.

Pick and Azari (2008) argues that the digital divide is influenced by socioeconomic, governmental, and accessibility factors, with low-income and marginalised communities often facing the greatest barriers to access. In order to address these issues, it is essential to consider not only the availability of technology, but also issues such as affordability, digital literacy, and infrastructure.

Overall, the literature highlights the importance of ensuring equitable access to technology in higher education. As such, the development of an automated laptop distribution system has the potential to

promote accessibility and equity by providing all new ITB students with the necessary digital resources to support their learning.

3.3.3 Theme 3: Socio-economic issues in Higher Education

The third theme focuses on the socio-economic issues previously mentioned within higher education and how they relate to the dissertation topic. Several studies have explored the impact of socio-economic status on students' academic performance and the sense of belonging in higher education. **Ahn and Davis (2020)** found that students from low socio-economic backgrounds were less likely to feel a sense of belonging in their institutions. **Sims et al. (2008)** also suggested that e-learning can perpetuate cultural and socio-economic elitism, as students from disadvantaged backgrounds may not have access to the necessary technology or resources. This is highlighted by **Berry (2021)** who outlines the unique challenges and opportunities that Black students in particular face within higher education in accessing technology.

Alternatively, Crawford (2014) found that socio-economic differences can also impact university outcomes such as drop-out rates, degree completion, and degree class attendance. This literature suggests that socio-economic factors should be taken into consideration when implementing new technologies, such as automated laptop distribution systems, to ensure that they do not perpetuate inequalities in higher education. Then again, **Wang et al. (2020)**, outlines how algorithmic decision-making, such as the use of automated laptop distribution systems, may also raise issues of fairness and equity in higher education. This study suggests that any development of new technology, such as automated laptop distribution systems, must be done with a particular focus on addressing the barriers faced by marginalised students.

Generally, a re-occurring similarity between these themes is the need for effective performance metrics to evaluate the success and performance of the proposed automated system. As such, several studies have proposed key performance indicators (KPIs) for evaluating such systems. For example, **Pick and Azari (2008)** proposed KPIs related to accessibility, efficiency, and user satisfaction, linking to additional proposed KPIs related to waiting time, service quality, and student satisfaction mentioned within the study's objects.

3.4 TECHNICAL REVIEW:

As mentioned within the unpublished research proposal **(Kimuli, 2023)**, the current manual laptop distribution system used by the ITB department is ineffective. The section identifies the need for an automated laptop distribution system to address the problems associated with the current manual system. Thus, it is important to understand the limitations of the current system to inform the development of an automated system that will incorporate the theoretical framework and result in a more efficient and accessible automation system.

The current manual laptop distribution system used by the ITB department involves a lengthy and inefficient process in which new ITB students without a laptop have to email course directors, wait for an approval, and then collect the laptop from the ITB office. This process is time-consuming and often results in delays in students receiving their laptops, which can hinder their academic progress linking back to the digital divide topic discussed.

3.4.1 Limitations of the Current Process:

The current process has several limitations concerning its efficiency and effectiveness. Firstly, the manual process is highly dependent on manual data entry and approval, which can lead to errors and delays. Previous literature has identified that manual data entry and approval processes can be prone to errors and inefficiencies, leading to delays and reduced productivity. In this instance, the manual process involves course directors manually sending out notifications and reminders regarding collection time slots for receiving the laptops, which can be time-consuming and prone to errors as seen in **Figure 4.**

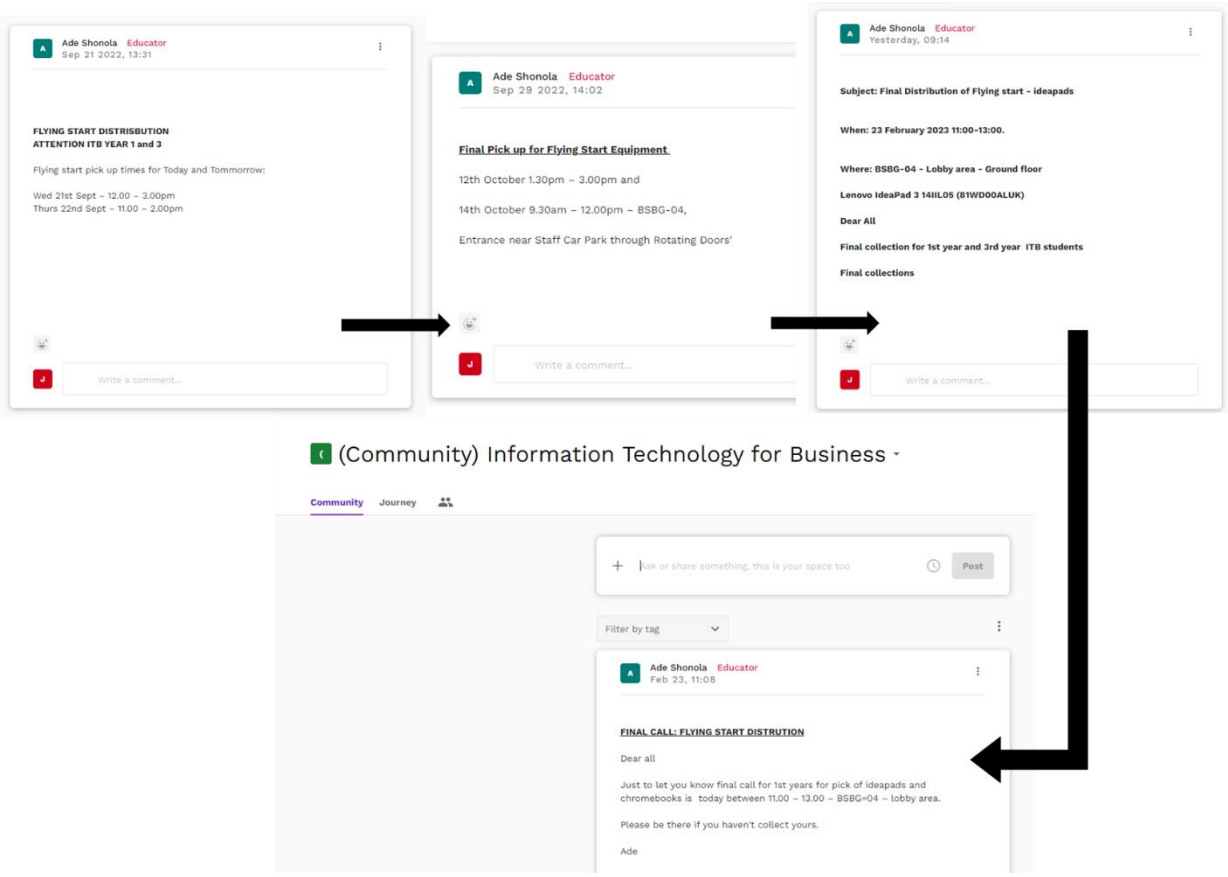


Figure 4 Manual ITB Flying Start Laptop Distribution Process Timeline

Figure 4 shows the lack of scalability in the manual process, as it requires a significant amount of time and resources to process laptop requests, which can be overwhelming when dealing with a large number of requests and enquiries. Prior research has shown that manual processes can result in long processing and waiting times, especially when dealing with a high volume of requests, leading to delays and bottlenecks, reducing the systems efficiency. The current process also lacks transparency, as it is difficult to provide timely updates to students and track when and where laptops are available for collection. These studies have identified the importance of transparency and communication to ensure smooth and efficient processes as the review has shown that lack of transparency can lead to frustration and dissatisfaction among key stakeholders.

3.4.2 Proposed Solution:

Through the development of the ALDS, the researcher can help to address the challenges and inefficiencies identified in the current process. This technical review allowed for the examination of the current state of the current laptop provision(distribution) process in place and how the automation technologies previously mentioned such as robotic process automation (RPA) can be used to improve the efficiency and effectiveness of the process.

Through exploring different approaches to automation, the feasibility of the proposed solution to develop an ALDS using Power Automate is justified. This solution can automate the approval process, reduce manual data entry, and provide timely updates to students regarding the status of their requests. Additionally, the proposed solution can scale to handle a large number of laptop requests and streamline the laptop distribution process for both students and the ITB department.

By automating the verification and approval process, the system can reduce the time required for students to receive their laptops, which can improve accessibility and reduce the negative impact on academic performance. Automation can free up resources and reduce the workload of the ITB staff to focus on more complex tasks and provide additional support to students. Although automation may reduce personal interaction, the system can be designed in a way that provides personalised interaction with students. For example, an automated system can be designed to provide notifications and updates to students throughout the distribution process, keeping them informed and engaged.

3.4.3 Deduction:

Overall, the manual process for laptop distribution has several limitations that can affect the efficiency and effectiveness of the laptop distribution process. To address the main research question (RQ1), the literature demonstrates how the proposed solution can significantly improve the efficiency and effectiveness of the current manual process with its potential to reduce human errors, increase accessibility, and improve transparency. As such, by implementing this solution, ITB can streamline the laptop distribution process and improve the overall student experience.

3.5 SUMMARY OF LITERATURE REVIEW FINDINGS

To conclude, this review has examined previous studies related to automated information systems and provision programs within higher education. Thus, a through a critical examination of related research designs, methodologies, and theories, strengths and weaknesses of previous studies were identified as well as gaps in the literature.

The technical review focused on the current manual laptop distribution system used by the ITB department and its limitations, such as being highly dependent on manual data entry and approval, lacking scalability, and lacking transparency.

In addressing this gap, this dissertation aims to develop and evaluate an automated laptop distribution system using Power Automate for the FSP at ITB. By doing so, this research will contribute to the existing literature by providing insights into the effectiveness of automated laptop distribution systems in a higher education context.

3.6 CONCLUSION

Overall, an ALDS for the FSP at Coventry University has the potential to provide numerous benefits for both students and the relevant staff such as improved efficiency and accessibility. The review examined existing literature related to automated laptop distribution systems and identified key themes and topics related to the research question.

The review found that the manual process is highly dependent on manual data entry and approval, which can lead to errors and delays, and is not scalable, which can result in delays and bottlenecks. Furthermore, the manual process lacks transparency, making it difficult to provide timely updates to students and track when and where laptops are available for collection.

To address these limitations, an automated laptop distribution system using Power Automate is proposed. This system has the potential to improve efficiency, scalability/accessibility, and transparency while reducing errors and delays. However, it is important to consider the potential drawbacks of automation and ensure that the system is designed in a way that prioritises student satisfaction and provides a user-friendly experience. Thus, the success of this system depends on the proper development and management of the technology.

Overall, this literature review provides a foundation for the development of an automated laptop distribution system at ITB and highlights the need for further research to fully understand the potential impact of such a system on student success and satisfaction.

3. RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The study's objective involves comparing two groups: one that receives laptops through the previous methods and another that receives laptops through the new automated system. A quasi-experimental design allows for the comparison of groups that were not assigned at random, in this case based on the laptop distribution method. This design will allow the study to determine whether the new method improves accessibility and efficiency in laptop distribution for new ITB university students. Generally, this research design is well suited to resolving the study's research questions and aims.

3.1 RESEARCH PHILOSOPHY AND STRATEGY

The selection of a research philosophy is a critical step in developing the research design and laying the groundwork for the research question by identifying the philosophical positions underlying it. The research onion framework has been employed as a guide to determine the research philosophy and strategies employed in the study. The choices considered regarding the research design have been highlighted in red on the diagram below and will be comprehensively discussed in the relevant sections.

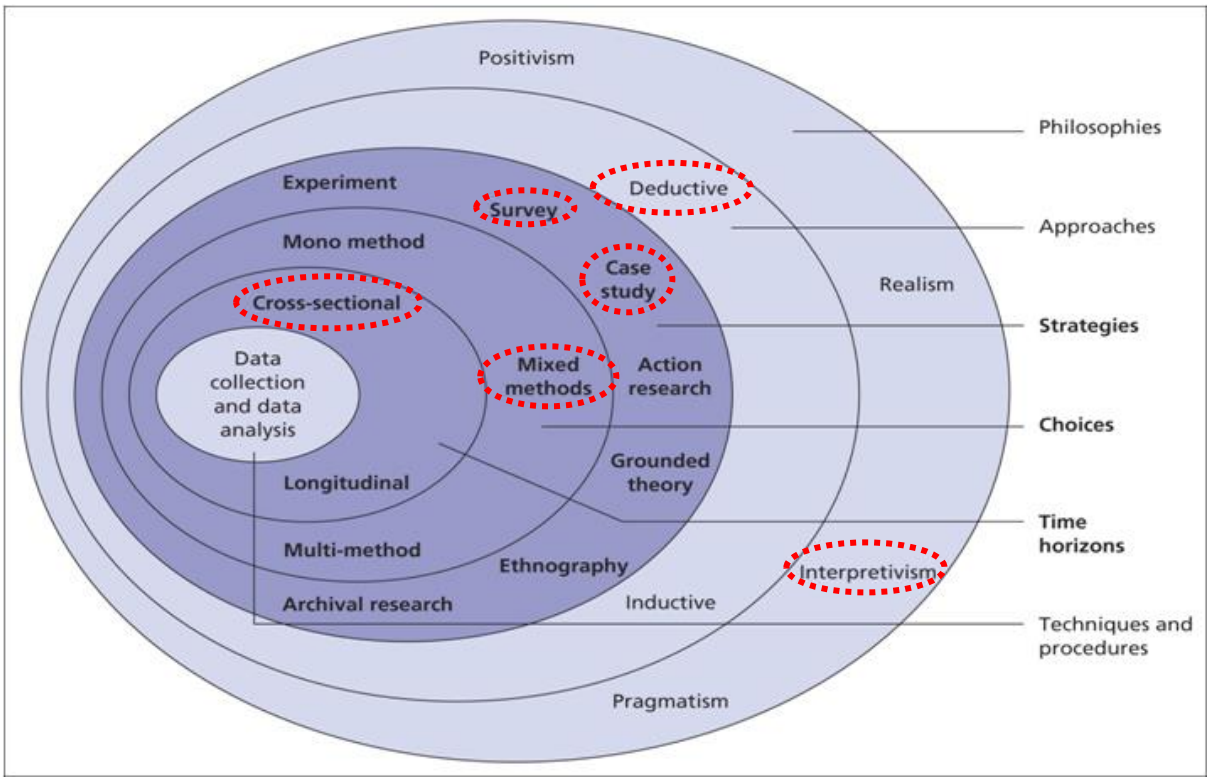


Figure 5 Research Onion

3.1.1 Research Philosophy:

The qualitative data collected through surveys and interviews will be analysed using a thematic analysis, an approach is well-suited for the Interpretivism model and case study strategy as it allows for the identification and analysis of recurring patterns in the data, providing a comprehensive understanding of the experiences and perceptions of ITB students. Interpretivism was chosen as it allows for a subjective interpretation of social singularities and focuses on understanding the meaning behind human actions and experiences. The goal is to gain an in-depth understanding of the experiences and

perceptions of ITB students regarding the Flying Start Programme's current laptop distribution process and the proposed automated system.

3.1.2 Research Approach:

Following the research plan from the unpublished proposal **(Kimuli, 2023)**, the research approach for this study is deductive top-down approach as seen in **Figure 2** below, where the research begins with testing a hypothesis that predicts the impact of the automated laptop distribution system on ITB students' academic performance and overall satisfaction with the Flying Start Programme. The research will involve designing a survey or questionnaire with closed-ended questions that measure specific variables such as students' satisfaction with the quality and reliability of the laptops and their usage of the laptops for academic purposes.

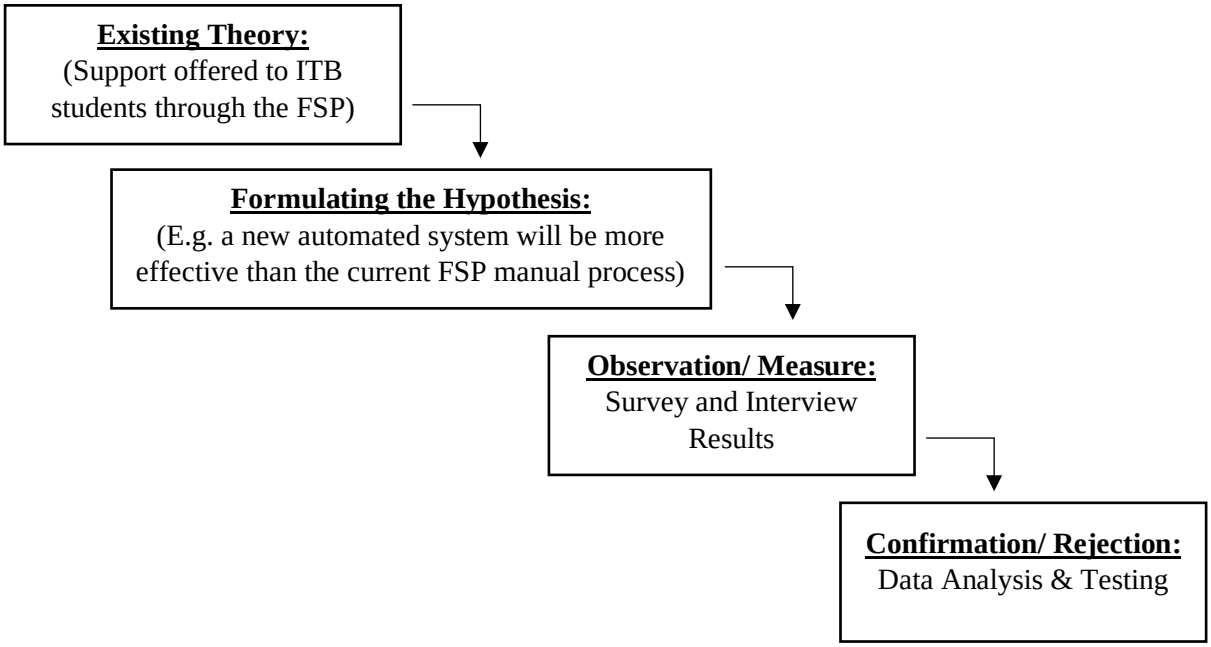


Figure 6 Deductive approach applied to study

3.1.3 Research Strategy:

The research strategies adopted for this study will be case study and survey based, respectively. A case study design is selected as it allows for the deeply understand a specific context, not to generalise to a population compared to sampling the aim to collect as much data as possible about the context of study **(McCombes, 2023)**. The case study approach will enable a thorough investigation of the process and the impact of the proposed automated system on the distribution process. Additionally, the case study approach allows for a detailed analysis of the context in which the study is taking place, providing valuable insights into the unique aspects of the Flying Start Programme at ITB.

3.1.4 Research Choices:

Following the research plan from the unpublished proposal **(Kimuli, 2023)**, the research approach for this study will involve a mixed-methods approach. The mixed-methods framework allows for a thorough grasp of the laptop distribution process as well as the proposed automated system by validating the study findings and provide a more in-depth knowledge of the issues at hand. By combining qualitative and quantitative insights, it offers a more complete picture of the problem being studied and strengthen the credibility of the conclusions **(McCombes, 2023)**. The use of surveys and interviews provides the collecting of a diversified range of perspectives, providing a comprehensive insight into the study.

3.1.5 Time horizon:

This level refers to the time frame for data collection and analysis. The time horizon selected is cross-sectional, which involves collecting data from participants at a single point in time. The reason for selecting a cross-sectional time horizon is that the focus of the research is to investigate the current state of the automated laptop distribution system at ITB University. Therefore, it is appropriate to collect data from participants at a single point in time to obtain a snapshot of the system's current state. This approach allows for an analysis of the data collected to provide insight into the effectiveness of the system and to identify areas that need improvement. Additionally, the cross-sectional time horizon allows for a more efficient and cost-effective method of data collection, as it eliminates the need for repeated measurements over time.

3.2 DATA COLLECTION AND ANALYSIS METHODS

During the initial stages, research and data will be collected regarding the current laptop provision process in place, its efficiency and effectiveness as well as the opinions of the students and staff involved in the process. Whether in the academic world trying to conduct research or developing a new system/product, data collection is needed to help make better decisions **(Simplilearn, 2023)**. The Information gathered during this stage will directly affect the design of the new system developed later.

The chapter establishes the reliability and credibility of the research and provides a clear understanding of the steps taken to reach the study's conclusions by providing a detailed account of the research methods and methodology. In the research planning process, Regardless of the topic under study or preferred method for defining data, accurate data collection is essential to maintaining the integrity of research because errors are less likely to happen when the right data gathering tools are used (whether they are brand-new, updated versions of them, or already available) **(Simplilearn, 2023).**

3.2.1 Tools & Techniques:

3.2.1.1 User Online Surveys

As mentioned in the unpublished proposal by **Kimuli (2023)**, a user survey will be conducted. JISC Online surveys which is currently used by 88% of UK higher education institutions, will be used due to the secure and strict information security standards followed (ISO27001) to ensure data collected is processed in compliance with GDPR **(About Online Surveys | Online Surveys, n.d.)**. The survey was administered and distributed online to ITB via Aula, Teams and other platforms. Given the time and resource limitations faced when producing a dissertation, online surveys allow you to contact people all over the world without having to travel anywhere **(Dissertation Questionnaire | Using a Dissertation Survey | Research Tips, 2020).**

3.2.1.2 Semi-structured Interviews / Written Interviews

The study involved conducting semi-structured / written interviews using MS Teams with the faculty members, and course directors to understand their experiences and perspectives on the current laptop distribution system within a predetermined thematic framework. The data collected through the interviews helps identify the major challenges faced by the different user groups. Although the open-ended nature of the interviews puts them at risk of research biases such as the Hawthorne effect, observer bias, recall bias, and social desirability bias, the exploratory nature of the research questions will help guide the research **(George, 2022)**.

3.2.1.3 DESCRIPTIVE STATISTICS

A data analysis will be conducted using descriptive statistics. Descriptive statistics are a collection of methods such as mean, median, and mode, range, standard deviation, and variance used to summarise and describe the main features of the data. By providing an overview of the distribution of responses to each question in the survey, as well as to identify any outliers or unusual responses, a comprehensive understanding of the data will be achieved to aid in answering the research questions. The analysis will be conducted using statistical software to ensure accuracy and reliability.

3.2.2 Measures:

The study included a combination of open and closed questions to gather both quantitative and qualitative data from the surveys and written interview questions. Closed questions provide structured responses that are easy to quantify and analyse statistically. They are useful for obtaining specific information and can help identify patterns or trends in the data. Open-ended questions allow respondents to provide more detailed and personal responses, providing deeper insights into their experiences and perceptions. They also allow for unexpected responses and can help identify new themes or issues not previously considered. By using both types of questions, researchers can gain a more complete understanding of the topic being studied.

3.2.2.1 Unipolar Scales Questions:

This study used unipolar scale questions in surveys which only have one end labelled in which participants mark their response on the line. Unipolar scales are used in research to assess a performance of a particular attribute, such as usage or satisfaction, and respondents' views, beliefs, and opinions. Unipolar scales enable efficient and accurate data collection, revealing the automated laptop distribution system's effectiveness. An example of a question that was applied was: **“**How important would receiving additional support resources/ equipment such as a laptop be for your course?”

3.2.2.2 LIKERT QUESTIONS:

This study measured participants' opinions of the Flying Start Programme and the proposed automated laptop distribution system using Likert scale questions. Participants were asked to rate their agreement or disagreement with statements concerning the FSP and the proposed system and will use a five-point Likert scale from "strongly agree" to "strongly disagree." which give participants more nuance while still providing a clear and simple response format.

3.3 SURVEY DESIGN

As previously mentioned, for the purpose of this study a survey questionnaire was developed in the primary phase to gather feedback from new and former ITB students, existing students and potentially faculty members/ course directors, and relevant FSP staff/ facilitators. The survey's aim is to obtain valuable insights into the challenges faced by students in the current laptop distribution process, as well as their opinions on the proposed solution. The feedback gathered from this survey identifies areas of improvement for the proposed automated laptop distribution system and ensure that it is tailored to meet the needs of the relevant students.

3.3.1 Survey Structure

The survey questions are the core of the survey and are essential for collecting data that answer the research questions, therefore the questions had to be unbiased and not leading. The survey was structured into five sections as seen below, with an introduction/terms and conditions page and a thank-you page. The survey was developed using an online survey platform and was hosted on the platform's website. Participants were also made aware that their participation in the survey was entirely voluntary and that they could opt out at any time. For ethical reasons, it was critical to ensure that participants have been fully informed and have given their consent.

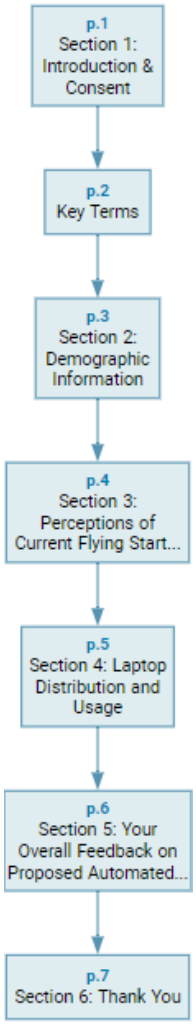


Figure 7: Survey Structure

Section 1: This section sets the tone for the survey and gives context for participants, including information about the survey's purpose, any incentives for participating, and instructions on how to complete the survey. A consent form which states the purpose of the survey and how the information obtained would be used will be included to ensure that participants' privacy and data protection rights are respected.

Section 2: This page contains important definitions of key terms and concepts that will be used throughout the survey. We understand that some of the language used in the survey may be technical or unfamiliar, so we have provided these definitions to help ensure that everyone understands the questions being asked.

Section 3: This section of the survey included questions that gathered demographic information such as the participant's age, gender, and educational background. Demographic questions are important because they provide context and background information about the participants. This information can be used to analyse the data and identify any patterns or trends based on demographics.

Section 4: This section of the survey, students will provide their level of agreement or disagreement with several statements related to the FSP and the proposed ALDS. They'll read each statement carefully and select the option that best reflects their opinion. The responses will provide valuable insight into how the development of an ALDS may impact the accessibility and efficiency of the laptop distribution process and the overall experience of ITB students.

Section 5: The section includes questions that sought to understand the participants' current laptop usage and experience, including the operating system used, the frequency of use, and the types of activities performed. These questions will also include questions about the participants' preferences and expectations for an automated laptop distribution system.

Section 6: This section will seek to identify the key features that participants would value when selecting a laptop distribution system. This section will also include questions intended to gather participants' views on the potential benefits and drawbacks of an automated laptop distribution system. Moreover, open-ended questions will be used that allow participants to provide additional feedback and comments on the survey's topic will be included.

Section 7: This section acknowledges the student's participation and the time sacrificed to contribute to the data needed for the study.

Overall, the online survey was critical for gathering data on the target population's preferences and expectations for an automated laptop distribution system, as well as their perspectives on the system's potential benefits and drawbacks. The chosen section topics cover all the main tasks that students perform during the laptop distribution process to compare the use of the current system by students and the requirements to develop a better system. By examining this data, the study aimed to develop a better understanding of the needs and preferences of ITB undergraduate students at Coventry University by collecting data through this survey, which will assist with the development and development of an effective automated laptop distribution system for new students.

The survey used to collect data from students is included in **Appendix B**.

3.3.2 Participants

The sample group comprised 20 current and former students of ITB University. Convenience sampling was used to randomly choose participants for the study. The survey was distributed through online platforms, including Aula, Outlook, Teams, LinkedIn, and physical copies of the questionnaire. Participants were approached in person and asked if they would be interested in filling in the survey. To improve external validity, participants were selected from different demographics and stages of their academic journey. The survey was open for three weeks, and participants filled it in from different locations to avoid situation effects. The sample frame was drawn from a diverse population to avoid sampling bias.

The study included postgraduate and 3rd year students to nullify the Hawthorne effect. Their past experiences were useful in understanding the research topic, and their responses were not affected by the study's results, as it did not apply to them. The three main threats to external validity, including situation effects, sampling bias, and Hawthorne, were taken into account while selecting the participants.

3.3.3 Survey Pilot Study

Prior to the full survey launch, a pilot study was conducted for this dissertation. The survey was sent to a small group of participants in the pilot study, including five final-year students and past graduate students from the researcher’s course, who were required to complete it and provide feedback on the clear communication and consistency of the questions. All testing participants were made aware that their responses would be included in the study if the survey test went well and the questionnaire design did not require any changes. This condition was consented upon by all four test respondents.

The pilot study was a success, and no adjustments to the survey were required. As a result, the trial responses were included in the final results.

3.3.4 Survey Distribution

The online survey was promoted to new Information Technology for Business (ITB) university students by emailing the survey link to all registered students and asking them to complete the survey. In addition, the survey was advertised on the ITB course's Aula Forum, where students could access the survey link directly. The student survey was open for 21 days to ensure that students had enough time to complete the survey as seen in Figure 8 below.

Survey launchpad

Survey status	OPEN
Opening date/time	29 Mar 2023, 21:00 (BST) *2 weeks, 3 days ago* Change open date
Closing date/time	18 Apr 2023, 23:59 (BST) *2 days, 21 hours from now* Change close date
Maximum responses	50
Survey contact	kimulij@uni.coventry.ac.uk
Public survey name	Flying Start Programme's Laptop Distribution Process Feedback Survey - 303COM | Jeremiah Kimuli
Survey short name	flying-start-programmes-laptop-distribution-process-feedb
Public URL	https://coventry.onlinesurveys.ac.uk/flying-start-programmes-laptop-distribution-process-feedb

Figure 8 Distribution Settings for the Flying Start Programme's Laptop Distribution Process Feedback Survey

The survey was initially sent to the ITB student mailing list, ensuring that all new ITB university students have an equitable chance to participate. Second, during the first two weeks of the academic term, the survey was distributed to guarantee that all students have had an equal chance to receive a laptop through the current manual distribution process. Third, the survey was anonymous, allowing participants to answer honestly without concern of repercussions. Fourth, demographic questions included in the survey to allow for weighting to account for any biases that may emerge. The sample size will be big enough to provide a representative view of the population.

3.3.5 Sampling Strategy

The sampling technique used in this study is non-probability/ self-selected sampling method to recruit participants who are difficult to reach or may be underrepresented in the sample, such as students who are not regularly attending lectures. This technique was chosen because it targets a particular set of individuals associated with the Flying Start Programme or the ITB course.

The technique provided a targeted and relevant sample because the research question focuses on the future effect of an ALDS system on new ITB university students. This sample of students consisting of **25 respondents** was attained by recruiting participants through online platforms and other online forums previously mentioned, as well as through flyers and posters displayed on campus. This approach enabled the collection of a diverse range of perspectives and experiences, leading to a more comprehensive understanding of the impact of the automated laptop distribution system on new ITB students. Although non-probability sampling techniques may have some inherent biases, this research uses several measures to reduce bias and guarantee a representative sample.

3.4 ETHICAL CONSIDERATIONS

This study was reviewed and approved using Coventry University's formal Research Ethics procedure as seen in **Appendix A (Ref: P148581)**. Both surveys were hosted by Online Surveys (formerly Bristol Online Surveys), a Coventry University-approved survey tool. The first page of the surveys contained a Participant Information Statement, and all participants accepted the Confirmation of Informed Consent before proceeding with the survey. Before the meeting, all participants were given a Participant Information Sheet and an Informed Consent Form, and they agreed to participate by signing the Informed Consent Form. The online focus group meeting was video recorded and later transcribed into text format, after which the recording was destroyed. To ensure confidentiality, all transcribed data was anonymised. Student Questionnaire (as shown **Appendix B**), Interview and Survey Consent Form (as shown **Appendix C**), and Written Interview Questions (as shown **Appendix D**) contain blank samples of these documents.

4. RESULTS AND DISCUSSION

4.1 INTRODUCTION

The results and discussion section will discuss and analysis the data collected obtained through the primary research in order to answer the research questions posed in the earlier chapters. In this section, the findings will be presented through the questionnaire, interviews (see transcript in Appendix E), and observations below. The analysis will be structured according to the objectives of the study with an overview of the sample demographics, results, including statistical analyses and graphical representations and implications of the results with future recommendations for further research in this area with a particular focus on the key topics investigated.

Although the aim of the study was to gather responses from 30 ITB students, a total of 20 responses were collected within the timeframe of the study. This sample size was deemed adequate for gaining a general understanding of the perspectives and experiences of ITB students, especially given the study's time and resources constraints. For example, the National Student Survey (NSS) managed to collect data from 40 students, which accounted for 74% of ITB students asked. It is worth noting that all final year ITB students (54 total students) were asked to complete the NSS (Information Technology Management at Coventry University | Discover Uni, n.d.), which indicates that a sample size of 20 is still significant for a smaller-scale study such as this one.

The research-based objectives mentioned which will be reflected on, are as followed:

1. Evaluate the effectiveness and performance of the proposed system in terms of accessibility and efficiency, and compare it to existing manual methods, using the results to answer the research questions **(Analysed in question 6)**.
2. Propose recommendations for the future development and implementation of automated laptop distribution systems for new Information Technology for Business Students **(Analysed in question 12-15)**.
3. Research into existing automated laptop distribution systems and their impact on accessibility and efficiency in higher education **(Analysed in question 7).**
4. Assess contribution to the field of ITB Education by providing a practical solution to improve accessibility and efficiency in providing laptops to new students **(Analysed in question 13)**.

4.2 STAFF INTERVIEWS

In this section, the researcher reports on the staff interview conducted as part of the study. The interview was conducted through Microsoft Teams interview with a representative from Flying Start. Although, attempts were made to schedule other interview unfortunately due to external factors from the relevant staff members and the study's time constraints the interview that was conducted gathered key insights on the development of the Flying Start program, as well as to understand the perspectives and experiences of the staff involved in the program. The following sections provide a summary of the key findings from the interview.

4.2.1 Teams Meeting with Flying Start Project Owners:

This section covers the interview transcript between the researcher and the flying start project owner Dal Badesha about the support provided to students during the transition period from college to university life, specifically through the Flying Start program.

Dal Badesha, a representative of the Flying Start program at the University, explained that the program provides a wealth of resources within the library catalogue, including thousands of e-books, databases, and journals. Additionally, she explained how the Flying Start demonstrates how to use BibliU, sends emails regarding various links to video tutorials, and liaises with modular leaders which relates to the idea of universities increasingly turning to digital solutions previously mentioned in the literature review **(*Coventry and BibliU | BibliU News*, 2022)**. She added that the program is designed to support students during the transition period from college to university and to help them take their first steps in reading and understanding their subject. According to Dal, the program provides an essential starting point for students and helps to increase their satisfaction with their university experience. The researcher, Jeremiah Kimuli, suggested that the program needs to be more visible and accessible to students from the start as seen in **Figure 9**, as it can be overwhelming for students to receive a barrage of emails and information during welcome week. He suggested that separating the Flying Start program from other notifications or including it in an accessible place like the student portal would make it more visible and beneficial for students. The interview thus touches upon the theme of student support during the transition period and the importance of making university resources accessible to students. Dal agreed and acknowledged that there is an overload of information during the early weeks of the university, but they try to be involved in the welcome week and keep onboarding sessions until a couple of weeks in.

Ohm, I feel like there might need to be a a difference system in a place because you see how you join university and there's a whole collage of emails that like you you didn't know existed in the 1st place. So I think kind of becomes a whole bundle. So I'm trying to see how we can.

Uh, separate the flying start per say, from just sending an e-mail notification or just making sure like on our law on or some sort of way that the flying start is always a visible, accessible program for students to see. Oid this can help me start university this way per se because when I started like I said I only found out in my 4th year of university. But I wouldn't say it's your fault.

Dal Badesha 10:18
Yeah.

JK Jeremiah Kimuli 10:18
I see, but it's a. It's a thing where I I want. I don't want students to be in the same situation where they're not able to find out of such an amazing program that the only find out later on because I feel like if I knew about it from the start, it would have been so beneficial for me to do it. Yeah, increase my uni satisfaction as a student.

Dal Badesha 10:18
Yeah, that's a really good point that you make. Would like services we we try to be involved in the welcome week. But again as you pointed out, there's so much for a student to take on board. So any kind of inductions or anything in those early weeks there's it's an overload of information. So yeah, I I do agree there needs to be something and that's why we we keep our onboarding sessions to until a couple of weeks in and then we liaise with the modular leaders and say well, can we come in?

Do you module and and deliver the training just a quick 15 minutes though we don't. We wanna keep that attention span, but if there's something more automated, I I completely agree. And we were working with the outlook team and trying to get links in and as a team we kind of try and put the links into the relevant books at the beginning of the module. So again liaising with the module leads will say well, can we, so you've selected this title for this model you delivering.

JK Jeremiah Kimuli 10:19
Yeah, yeah.

Yeah.

Dal Badesha 10:19
Before we started, can we just promote that to the top of your module page so students have that there at all times, but again, not all courses are the same. So if you have non book items as you did and you weren't informed about those or you didn't know, then yeah, you you know you, you you do lose o by not having access to that. So you know automated system would would be great and we had previously when we had a different system called Moodle.

You had your course landing pages and we had a link on there which it was just a button that said blind start. So you clicked it and it took you straight into the list of items selected for your course. So it would have said, you know, these are these are the list. Here's your Chromebook or whatever it was that you got and and it would have informed you on that. So I do believe that it's some sort of automated system would be great and more so than what we've got now.

JK Jeremiah Kimuli 10:20
Yeah.

Dal Badesha 10:20
You try to kind of get in where whenever we hear something's happening, we kind of say we want to be part of that, but it's not always possible. But yeah, you can come up with something that would be great.

JK Jeremiah Kimuli 10:20
Yeah, don't. What do you what do you believe is the biggest challenges for students during this transition period from that, would you say that?

Dal Badesha 10:20
I think it's again, students have so much to take on boarding those early weeks so.

Figure 9: Extract of Teams Interview Transcript

Overall, the interview highlights the importance of providing support and resources to students during the transition period from college to university life, particularly during challenging times like the COVID-19 pandemic. It also emphasizes the need for effective communication and visibility of such programs to ensure that students can easily access them and benefit from them. These themes are relevant to my dissertation, which focuses on the impact of support programs on student retention and success in higher education.

The full transcript can be found in **Appendix E**.

4.3 STUDENT SURVEY

Like the structure of the interviews in the previous section, the key sections covered in the questionnaire from the survey structure (**Figure 7**) included:

1. Gathering demographic data such as age, gender, and educational background **(Section 3)**.
2. Students' level of agreement or disagreement with several statements related to the FSP and the proposed ALDS **(Section 4)**.
3. How the overall ITB Student Experience and accessibility and efficiency of the laptop distribution process will be affected by development of an ALDS. **(Section 5)**.
4. Students' current laptop usage and experience and preferences or expectations for an automated laptop distribution system **(Section 6)**
5. Key features that participants would value using a laptop distribution system and views on the potential benefits and drawbacks of an automated laptop distribution system (**Analysed in Section 7)**.
6. Additional feedback regarding the survey's topic through open-ended questions.

These topics were chosen because they cover all the main tasks that students perform and requirements of a future ALDS system. The Likert data will later be used to separate the results and create a descriptive statistical analysis.

4.3.1 Section 1: Consent

To begin, as mentioned in the ethics considerations section, a consent form which stated the purpose of the survey and how the information obtained would be used (shown in **Appendix C**) was read and confirmed as seen in **Figure 1**. This was to ensure participants' privacy and data protection rights are respected.

Figure 10: Respondents confirmation of consent to participating in the survey

4.3.2 Section 2: Demographic Information

4.3.2.1 Q2: Respondents Profile

The demographic Information section of the questionnaire focused on collecting background information on the population.

Question 2: What is your gender?

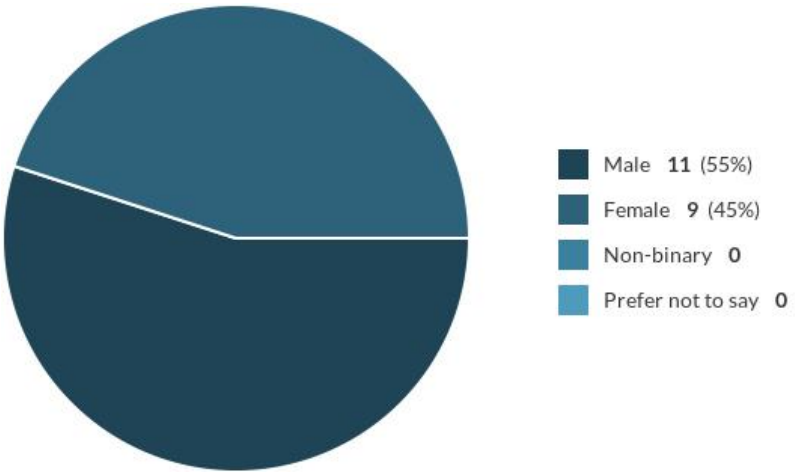


Figure 11: Gender of Respondents

The data presented in **Figure 11** above shows that 55% of respondents identified as male, while 45% identified as female. No respondents identified as non-binary or preferred not to say. As seen in **Table** 1, the mean rank for gender was 1.45, with a variance of 0.25 and a standard deviation of 0.5.

Rank value	Option	Count
1	Male	11
2	Female	9
3	Non-binary	0
4	Prefer not to say	0

Mean rank	1.45
Variance	0.25
Standard Deviation	0.5
Lower Quartile	1.0
Upper Quartile	2.0

Table 4: Descriptive Statistics for the Gender Distribution

4.3.2.2 Q3: COURSE OF STUDY:

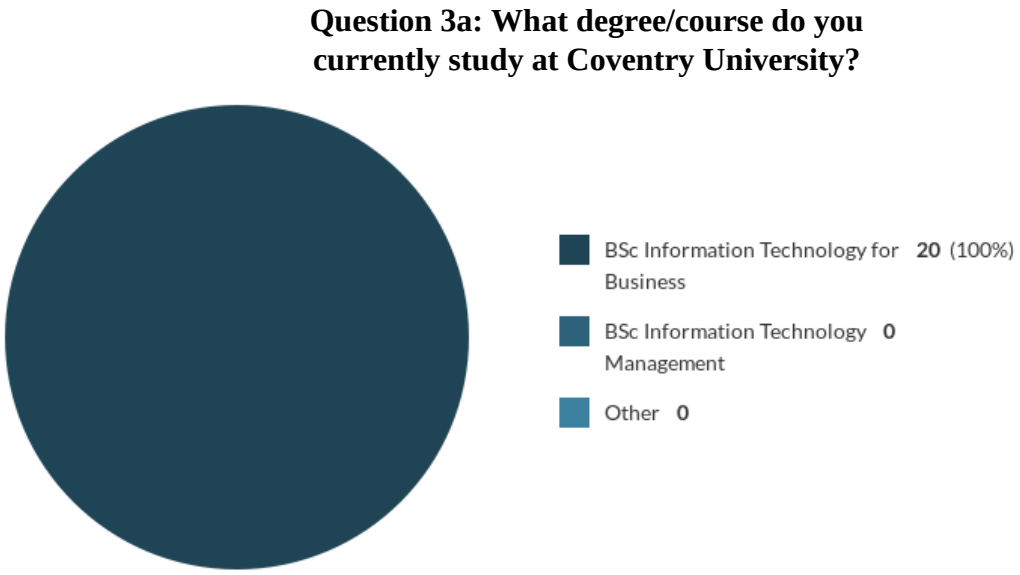


Figure 12: Courses which respondents study or previously studied

Considering the focal point of the study in terms of the scope, all 20 respondents indicated that they were currently studying BSc Information Technology for Business at Coventry University as shown if **Figure 12** above. This was highly beneficial as it cemented the reliability of the results collected. No respondents were studying the new BSc Information Technology Management course equivalent of the ITB course or other courses.

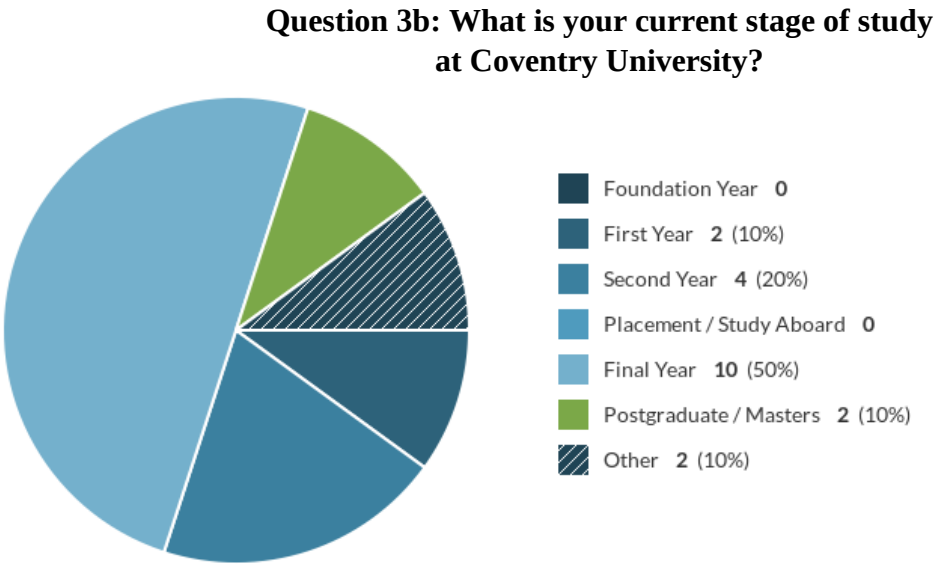


Figure 13: Respondents year of study in higher education

This Figure 13 validates the responses collected revealed that of the 20 respondents studying BSc Information Technology for Business which was relevant to the scope of the research, 10% were in their first year, 20% were in their second year, 50% were in their final year, and 2 were postgraduate or Masters students. Additionally, 2 respondents indicated that they were in other stages of study, such as completing a gap year or studying at another university. The mean rank for stage of study was 4.6, with a variance of 2.04 and a standard deviation of 1.43. This information provides insights into the distribution of students by stage of study within the BSc Information Technology for Business program at Coventry University.

4.3.2.3 Q4: Employment Status

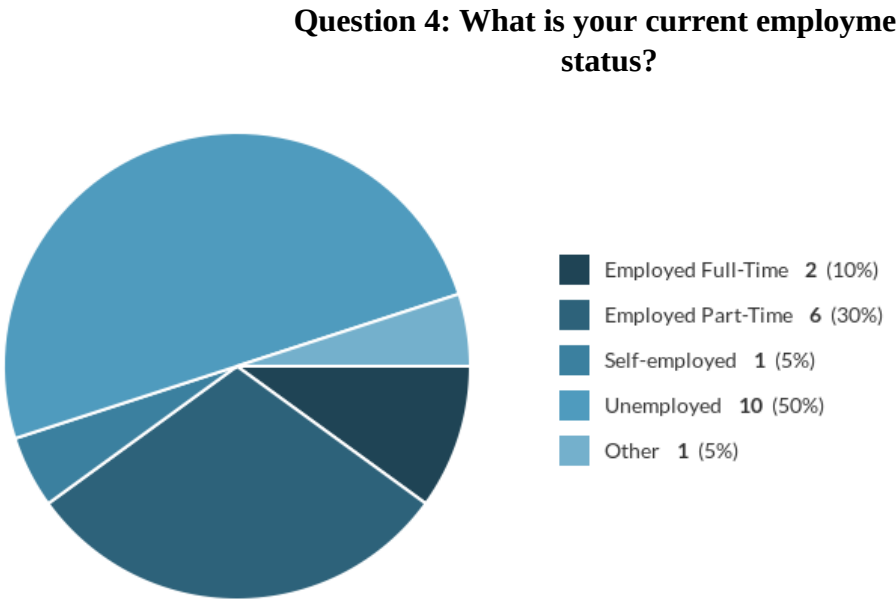


Figure 14: Respondents Current Employment Status

The responses were separated further as seen in **Figure 14** where in terms of the employment status, most respondents 50% indicated that they were currently unemployed, while 30% were employed part-time and a further 10% were employed full-time. One respondent indicated that they were self-employed, and one indicated that they were a student in the other response section. As show in **Table 2** below, the mean rank for employment status was 3.1, with a variance of 1.39 and a standard deviation of 1.18.

Rank value	Option	Count
1	Employed Full-Time	2
2	Employed Part-Time	6
3	Self-employed	1
4	Unemployed	10
5	Other	1

Mean rank	3.1
Variance	1.39
Standard Deviation	1.18
Lower Quartile	2.0
Upper Quartile	4.0

Table 5: Descriptive Statistics for Respondent Employment Distribution

4.3.2.4 Q5: Ethnic Breakdown

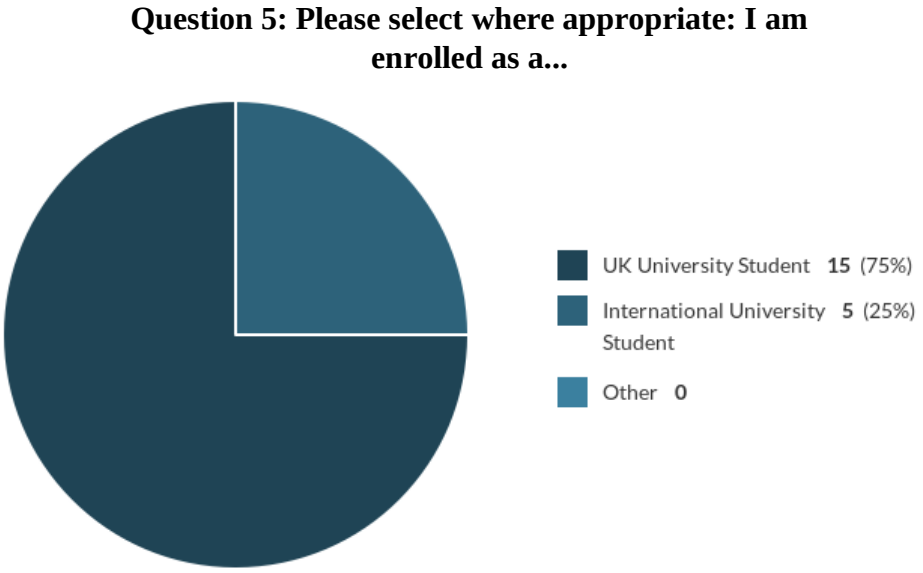


Figure 15: Ethnic Breakdown of the Sample

To access the ethnic spread of the sample the question in Figure 15 above was asked. The majority of respondents (75%) identified as UK university students, while 25% identified as international university students. No respondents identified as other.

Rank value	Option	Count
1	UK University Student	15
2	International University Student	5
3	Other	0

Mean rank	1.25
Variance	0.19
Standard Deviation	0.43
Lower Quartile	1.0
Upper Quartile	1.25

Table 6: Descriptive Statistics of Sample Ethnic Distribution

While the mean rank for enrolment status was 1.25 and a variance of 0.19 indicates that the enrolment status rankings were relatively consistent across the sample group, the standard deviation of 0.43 suggests that there was some variability in enrolment status rankings among the participants. Overall, these statistics show in **Table 6** provide some insight into the enrolment status distribution of the sample group and can be used to help understand the characteristics of the study population.

Section 2 of the survey provided a comprehensive picture of the demographic and educational backgrounds of the respondents. The findings suggest that the majority of respondents are studying BSc Information Technology for Business at Coventry University and are in their final year of study. Additionally, the majority of respondents are UK university students, and a relatively high percentage of respondents are currently unemployed. These findings are useful for research as it gives an understanding of the characteristics of students studying IT-related subjects at Coventry University.

4.3.3 Section 3: Perceptions of Current Flying Start Programme & Laptop Distribution

This section analyses the responses to a series of Likert scale questions regarding the Flying Start Programme and laptop distribution system. Participants were asked to rate the importance of various aspects of the programme on a scale of 1 (not at all important) to 5 (extremely important). The mean rank, variance, and standard deviation were calculated for each question, and the lower and upper quartiles were determined.

4.3.3.1 Q6: Importance and Efficiency of Flying Start Programme and Laptop Distribution

FSP Laptop Provision and Academic Performance

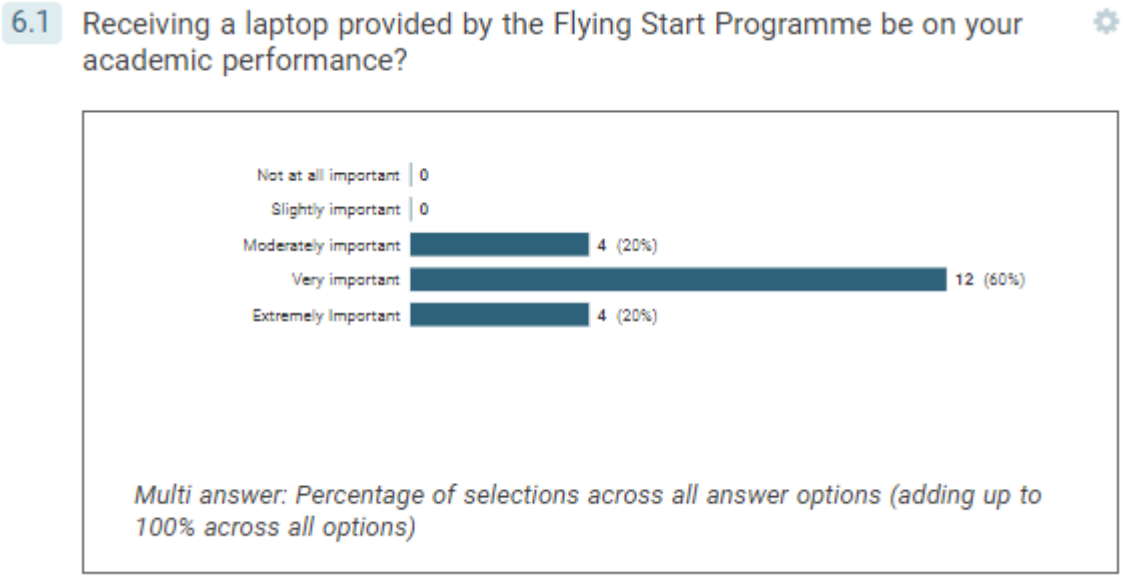


Figure 16: Impact of FSP Laptop Provision on academic performance

Participants rated the importance of receiving a laptop provided by the Flying Start Programme on their academic performance as very important as seen in **Figure 16.** Out of the 20 respondents, 4 (20%) indicated that it was very important, while 12 (60%) indicated that it was extremely important. This suggests that a majority of respondents place a high value on having access to a laptop through the Flying Start Programme, and believe that it would significantly impact their academic performance.

Access to online resources and learning platforms to support studies

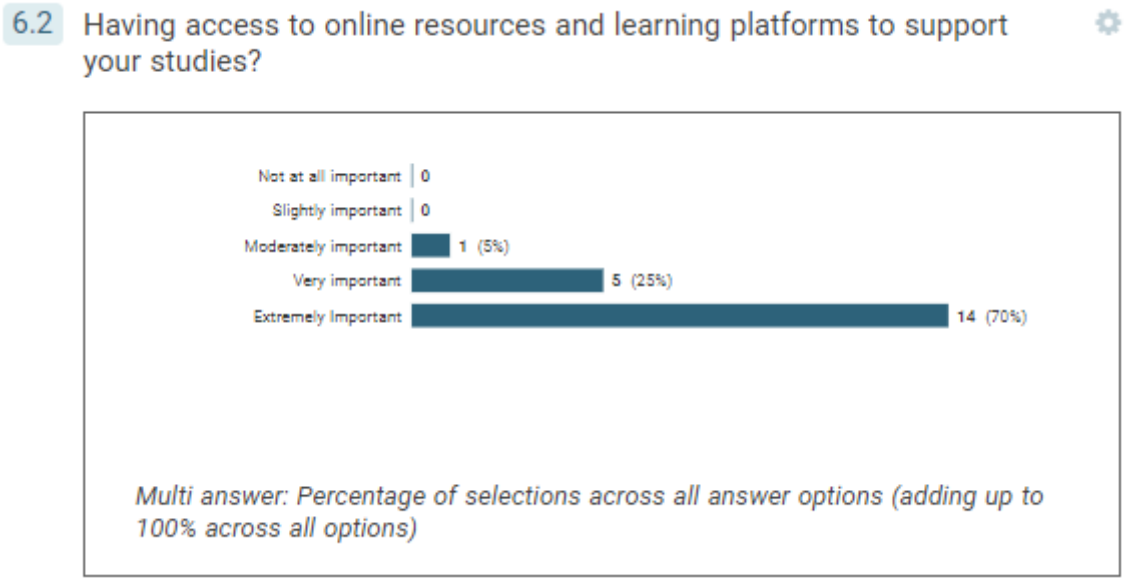


Figure 17: Impact of access to online resources and learning platforms to support studies

This question asked respondents to rate how important having access to online resources and learning platforms to support their studies would be. Out of the 20 respondents, 5 (25%) indicated that it was very important, while 14 (70%) indicated that it was extremely important. This indicates that the vast majority of respondents view access to online resources as a crucial component of their academic success.

Efficiency and accessibility in the FPS' Laptop Provision Process

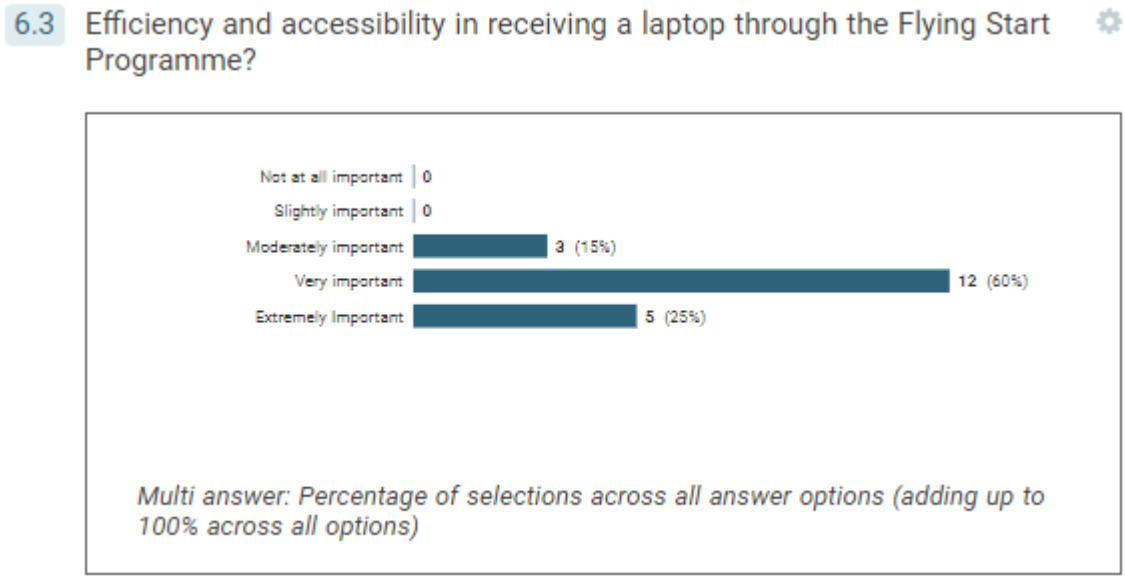


Figure 18: Impact of Efficiency and accessibility in the FPS' Laptop Provision Process

The respondents were also asked to rate how important efficiency and accessibility in receiving a laptop through the Flying Start Programme is to them as seen above in Figure 18. Out of the 20 respondents, 12 (60%) indicated that it was very important, while 5 (25%) indicated that it was extremely important. This suggests that respondents highly value an efficient and accessible system for receiving laptops through the Flying Start Programme.

Receiving regular updates/ communication about the status of FSP application

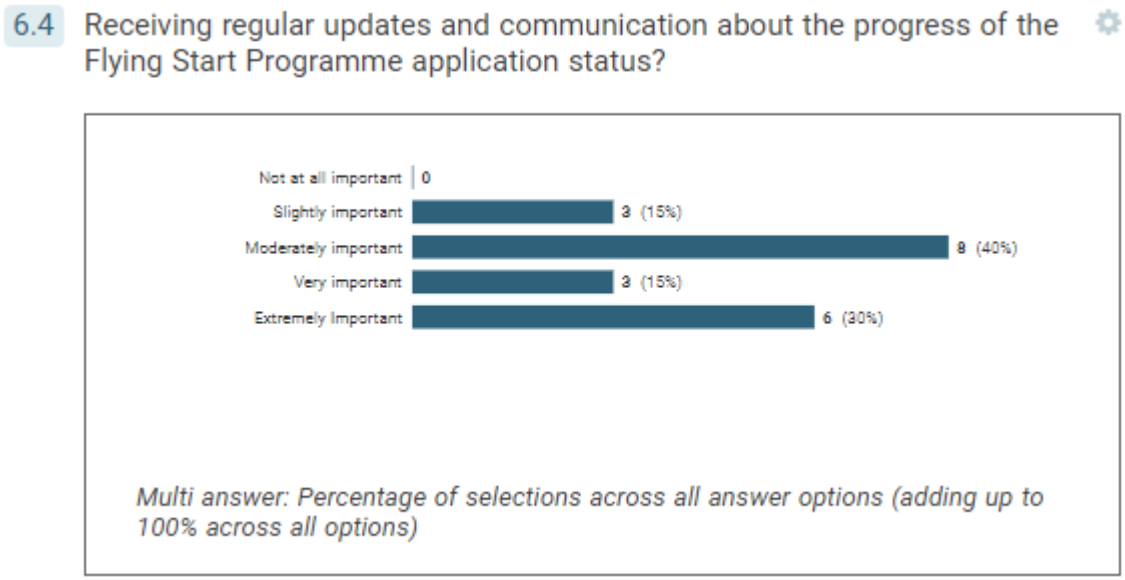


Figure 19 Impact of receiving regular updates/ communication about the status of FSP application

As seen in **Figure 19** above, Participants rated the importance of receiving regular updates and communication about the progress of the Flying Start Programme application status as moderately important (40%) and 45% of the respondents rating it very important or higher. There was a wide range of responses for this question, with 15% of participants rating it as slightly important and 15% rating it as very important. There were no respondents who thought that the impact of receiving regular updates/ communication about the status of FSP application wasn't important.

Receiving opportunities to give feedback on improving the FSP and Laptop Provision Process

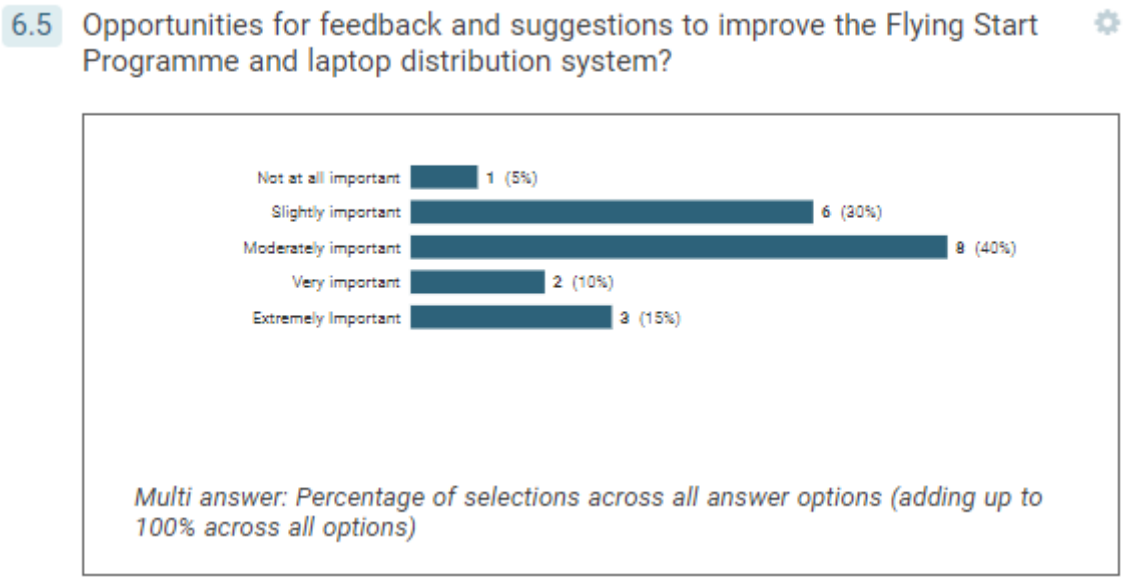


Figure 20: Impact of receiving opportunities to give feedback on improving the FSP and Laptop Provision Process

Participants rated the importance of opportunities for feedback and suggestions to improve the Flying Start Programme and laptop distribution system. Out of the 20 respondents, (40%) indicated that it was moderately important, while (15%) indicated that it was extremely important. This suggests that respondents value opportunities to provide feedback and suggestions for improving the Flying Start Programme and laptop distribution system, but it may not be as high of a priority compared to other factors previously mentioned above.

The results of Question 6 indicated that ITB students perceived the Flying Start Programme and laptop distribution to be important for their academic success, by the majority of respondents. Access to online resources and learning platforms is also considered extremely important. Respondents consider efficiency and accessibility in receiving laptops to be very important. Regular updates and communication about the progress of the application status and opportunities for feedback and suggestions are perceived to be slightly or moderately important.

These findings indicate that the Flying Start Programme should prioritise providing laptops and ensuring access to online resources for students, while also improving the efficiency and accessibility of the programme. Regular communication and feedback opportunities may also enhance student satisfaction and engagement with the programme. These findings helped inform the development and improvement of the Flying Start Programme and laptop distribution system at ITB.

4.3.3.2 Q7: Opinions on FSP and ALDS

Prior Knowledge of FSP

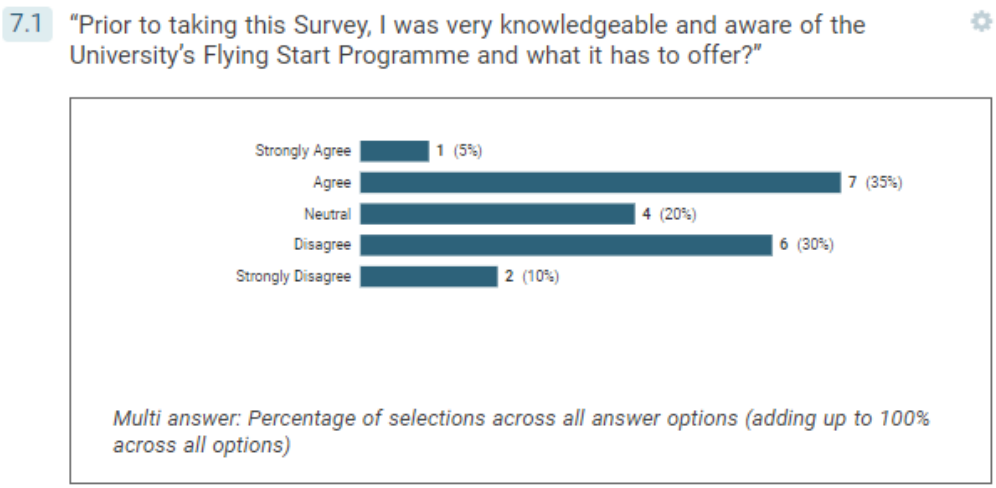


Figure 21: Prior Knowledge of FSP

Out of the total respondents, 35% agreed that they were very knowledgeable and aware of the university's Flying Start Programme and what it has to offer, while 30% disagreed with the statement. 20% of the respondents were neutral, and 10% strongly disagreed. These results suggest that there is a lack of awareness among students about the Flying Start Programme, and more efforts need to be made to inform students about the program.

Access to FSP Support

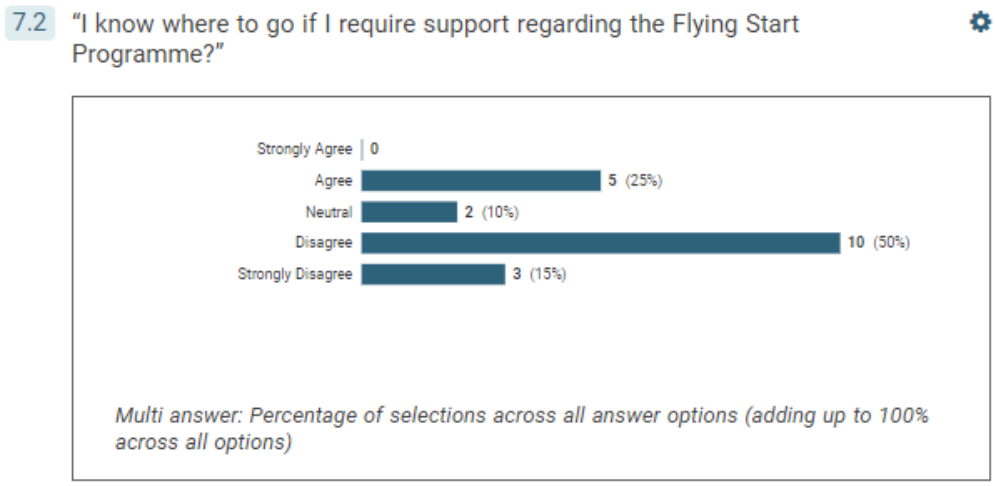


Figure 22: Access to FSP Support

About 50% of the respondents disagreed with the statement that they knew where to go if they required support regarding the Flying Start Programme. On the other hand, 25% agreed that they knew where to go, and 10% were neutral. These results indicate that the students need more information about where to go if they require support regarding the Flying Start Programme.

Access and Communication with FSP Staff

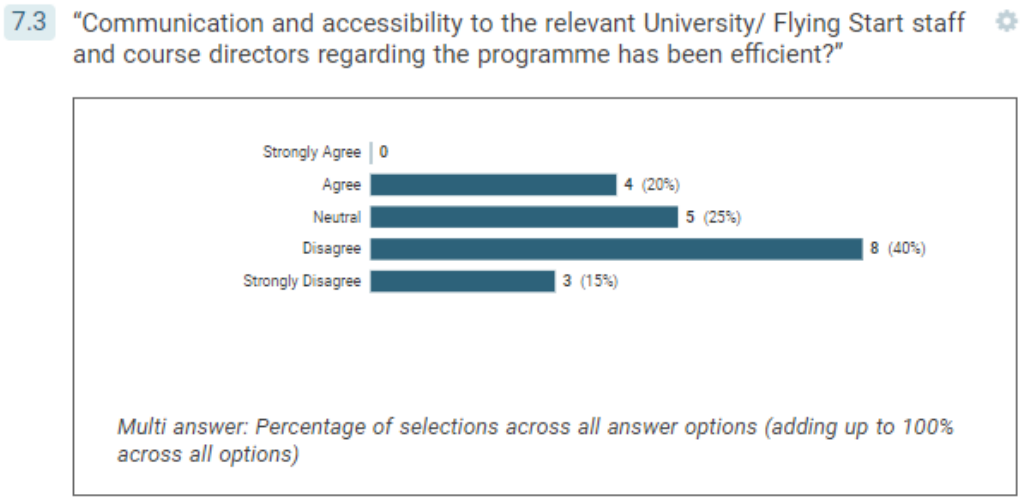


Figure 23: FSP Staff Communication and Access

In response to this question, 40% of the respondents disagreed that communication and accessibility to the relevant university/Flying Start staff and course directors regarding the program have been efficient. 25% agreed that the communication and accessibility were efficient, and 20% were neutral. These results suggest that the university needs to improve its communication and accessibility channels to enhance the Flying Start Programme's overall effectiveness.

Improvement to FSP using ALDS

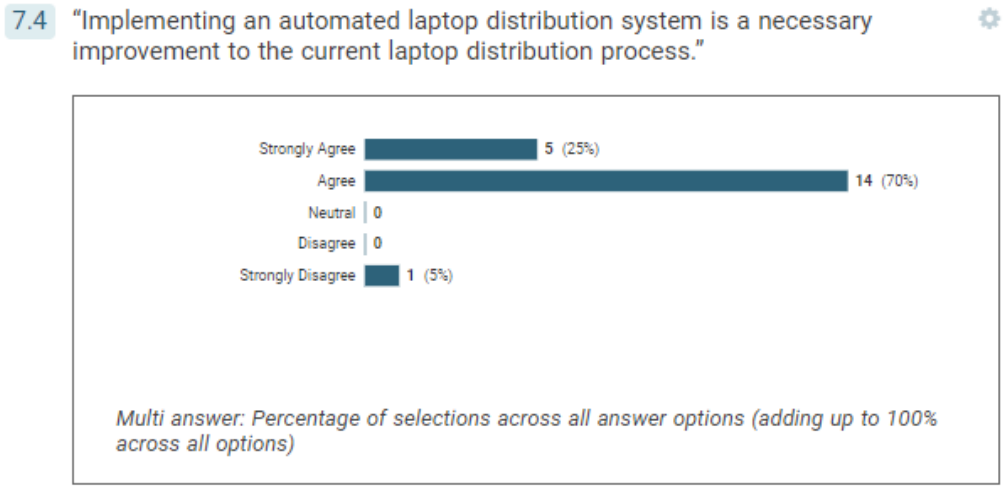


Figure 24: Impact of Implementing an ALDS on improving current Laptop Provision Process

Figure 24 above shoes 70% of the respondents agreed that implementing an automated laptop distribution system is a necessary improvement to the current laptop distribution process. 25% selected the option "Strongly Agree", while only 5% selected "Strongly Disagree". These results suggest that there is a consensus among students that an automated laptop distribution system would be a significant improvement to the current system.

Impact of ALDS on University Experience

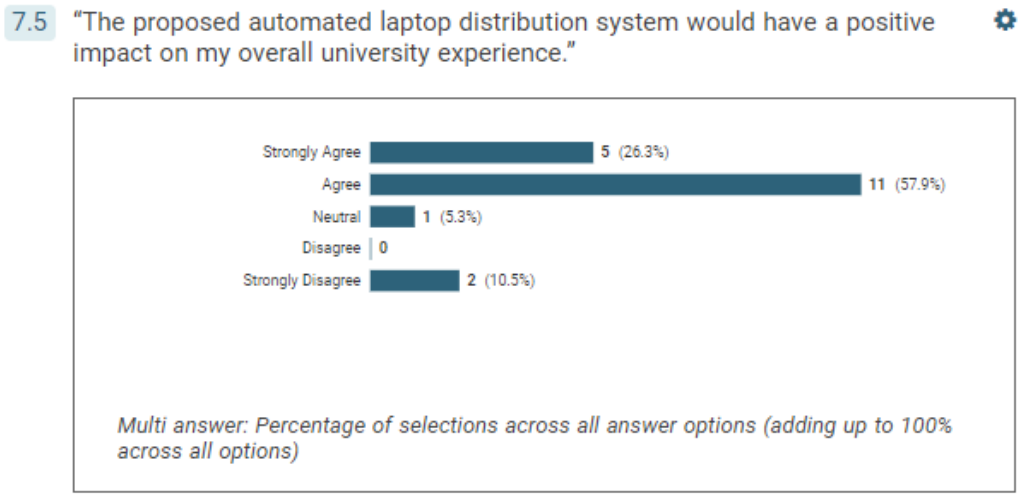


Figure 25: Impact of ALDS on Student University Experience

In response to this question, 58% of the respondents agreed that the proposed automated laptop distribution system would have a positive impact on their overall university experience. 26% selected the option "Strongly Agree", while only 10.5% selected "Strongly Disagree". These results suggest that the implementation of an automated laptop distribution system is likely to have a positive impact on students' overall university experience.

FSP Student Retention through ALDS

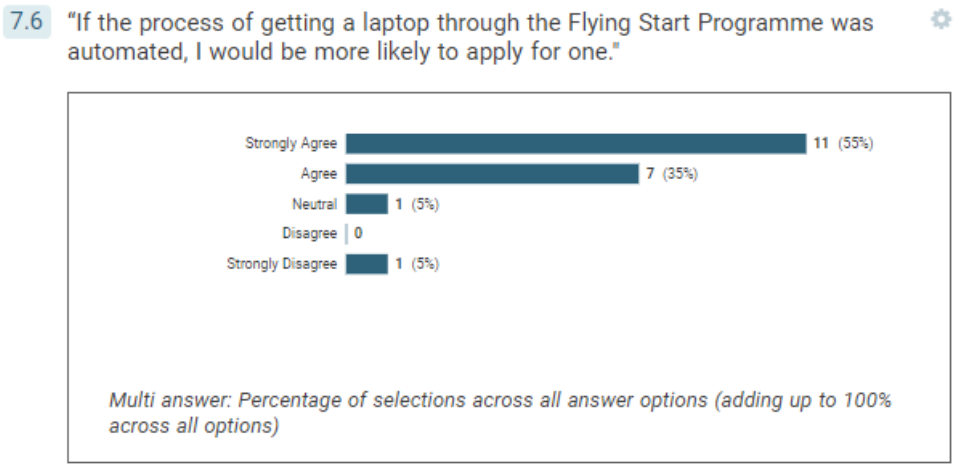


Figure 26: Impact of automating the process of getting a laptop through the FSP

Figure 26 shows that 55% of the respondents strongly agreed that if the process of getting a laptop through the Flying Start Programme was automated, they would be more likely to apply for one. 35% agreed, while only 5% strongly disagreed with the statement. These results suggest that an automated laptop distribution system could encourage more students to apply for laptops through the Flying Start Programme.

The results in Question 7 results reveal several important insights into students' perceptions of the Flying Start Programme and the proposed Automated Laptop Distribution System. With regards to the students' knowledge of the programme, a total of 40% (Agree and Strongly Agree combined) indicated that they were knowledgeable and aware of the programme, while 60% (Neutral, Disagree, and Strongly Disagree combined) indicated otherwise. This suggests that there is an opportunity for the university to better communicate and promote the programme to students who may not be aware of its benefits.

Overall, these findings suggest that the development of an automated laptop distribution system could be a worthwhile investment for the university, potentially leading to improved efficiency, accessibility, and student satisfaction. However, it is important for the university to also address the issues of communication and awareness of the Flying Start Programme in order to ensure that all students are able to benefit from the programme's offerings.

4.3.3.3 Q8: Factors for Evaluating Success of Flying Start Programme and Laptop Distribution System: Users' Perspectives

8 In your opinion, what are the most important factors to consider when evaluating the success of the Flying Start Programme and laptop distribution system?

Showing all 20 responses Show less

How detrimental it is to completing a module	1031425-1031407-108402837
I'm not too sure	1031425-1031407-108402861
The laptop must be strong enough	1031425-1031407-108402848
Communication from the university about the scheme should be more obvious. In addition to this, having more times available to collect would help students with lots of classes.	1031425-1031407-108406332
1. it will help specially students that don t have laptops (even though library and portable laptops are available sometimes can be inefficient for external factors) 2. it will motivate students in studying 3. it will decrease stress and anxiety for those students who work to save money to get new laptop 4. it will save time for students receiving this automated message	1031425-1031407-108407038
The amount of student who applied	1031425-1031407-108433553
The amount of students that use this function compared to the student that don't use it	1031425-1031407-108463624
How easily easily accessible and efficient the fsp and lds are	1031425-1031407-108465195
the laptop needs to be suitable for the course. EG. enough processing power etc.	1031425-1031407-108480034
Compare and contrast with students on how the flying start program benefitted ITB/computing students	1031425-1031407-108584135
I didnt know that this programme existed	1031425-1031407-108607960
Seeing how it could be used by multiple people, as there are a lot students to go through	1031425-1031407-108611649
How quick and efficient the process is	1031425-1031407-109192050
Fast distribution and communication	1031425-1031407-109192287
The accessibility and transparency of the system	1031425-1031407-109192251
Clear communication about the status of the applications or eligibility	1031425-1031407-109194407
Transparency throughout the whole process	1031425-1031407-109195952
The provision of necessary resources in time for the semester	1031425-1031407-109198777
Efficiency	1031425-1031407-109201923
Quickly receiving laptops to start off modules that need them correctly and not fall behind	1031425-1031407-109205685

Figure 27: Users' perspectives on factors for evaluating success of flying start programme and laptop distribution system

Based on the responses gathered, several factors emerged as critical to determining the success of the FSP and laptop distribution system. One of the most common themes was the importance of accessibility and efficiency in the distribution process. As seen in **Figure 27** above, many respondents highlighted the need for clear communication, transparency, and quick distribution of laptops to ensure that students receive the necessary resources in time for the semester. Respondents also suggested that providing transparent information would help to build trust and increase participation in the programme. This suggests that the success of the programme is closely linked to the speed and efficiency of the distribution process.

These finding imply that the communication and transparency of the programme was low and that the university should make the scheme more apparent and accessible to students and have more flexible collection times for students with busy schedules. This is to ensure that all students who are eligible for the program can take advantage of it. One such response outlined that equivalent of loaning or renting a laptop through the universities library is inefficient and implementing such a system will motivate students and decrease anxiety justifying the system will improve student satisfaction. Thus, these responses imply that the development of an ALDS will be highly influential in improving student satisfaction through increasing accessibility and efficiency.

4.3.4 Section 4: Laptop Distribution & Usage

4.3.4.1 Q9: Device Usage

Device Preference for Study Purposes

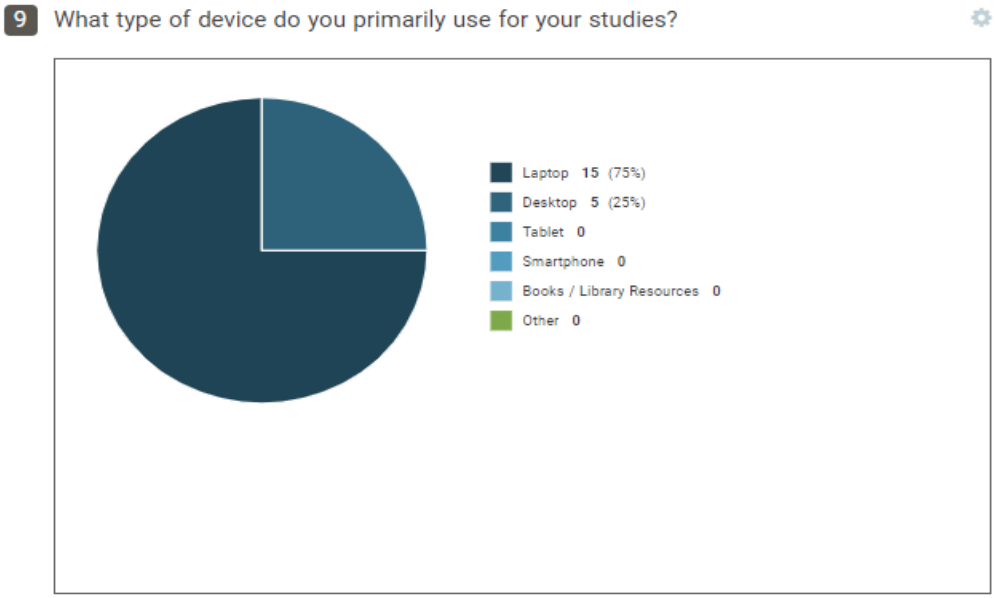


Figure 28 Respondents device preferences for Studying

The data collected from the question showed that 75% of the respondents primarily use a laptop for their studies, while 25% use other devices such as desktops, tablets, smartphones, books/library resources, or a combination of these devices. This finding suggests that laptops are the most popular device among students for academic purposes.

Further analysis of the data revealed that the use of laptops was more prevalent among undergraduate students, while graduate students were more likely to use other devices such as desktops and tablets.

These findings can have implications for the development of the ALDS as it is important to consider the devices that students are using in order to ensure that the platforms are accessible and optimized for the most popular devices. Additionally, these findings may inform decisions about the allocation of resources for technology in academic settings.

Device Screen time

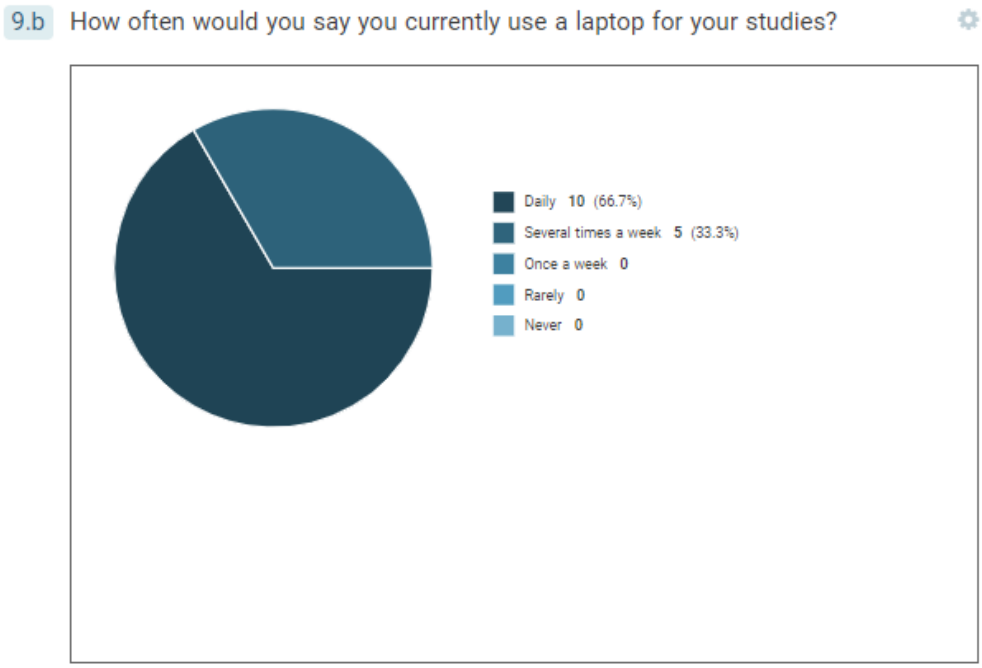


Figure 29: Respondent's average device screen time

The data collected from the question in Figure 29 reveals that most of the respondents, 66.7%, use a laptop for their studies daily, while 33.3% use it several times a week. None of the respondents stated that they rarely or never use a laptop for their studies. This suggests that a laptop is an essential tool for students studying in the ITB programme at Coventry University.

The findings indicate that the automated laptop distribution system developed for the Flying Start Programme could have a significant impact on students' academic performance and overall experience. By providing access to laptops, students can complete coursework, research, and other academic tasks more efficiently and effectively. The system could also address any potential issues with laptop availability, ensuring that all students have equal access to resources necessary for their studies.

Additionally, the results suggest that the system could potentially improve student satisfaction and engagement with the ITB programme. With the majority of students relying on laptops for their studies, having access to a reliable device could positively impact their overall experience.

Overall, the data collected from the survey supports the development of the automated laptop distribution system for the Flying Start Programme and highlights the potential benefits it could bring to students in the ITB programme at Coventry University.

General Laptop Use

Question 9(c): In the last 30 days, what types of activities do you typically perform for your studies and how regularly?

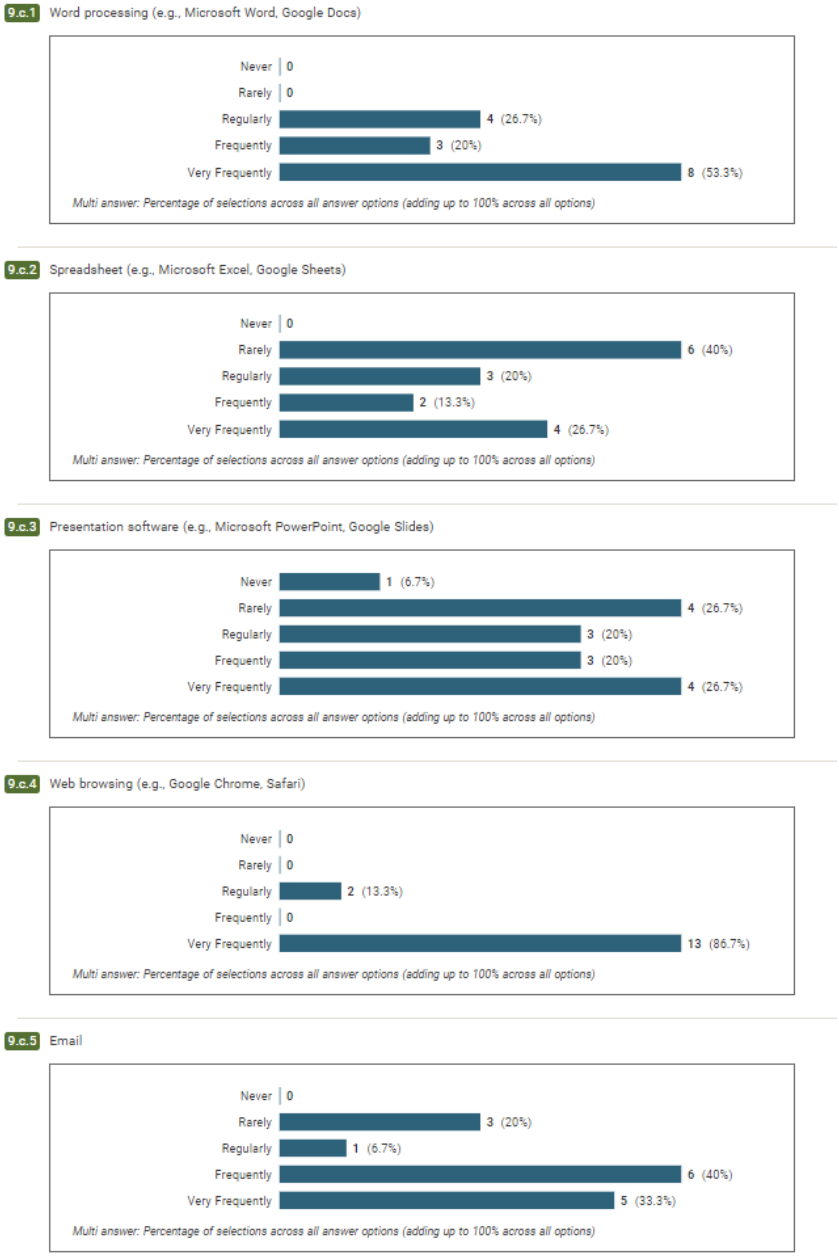


Figure 30: Activities performed for studies and frequency (1)

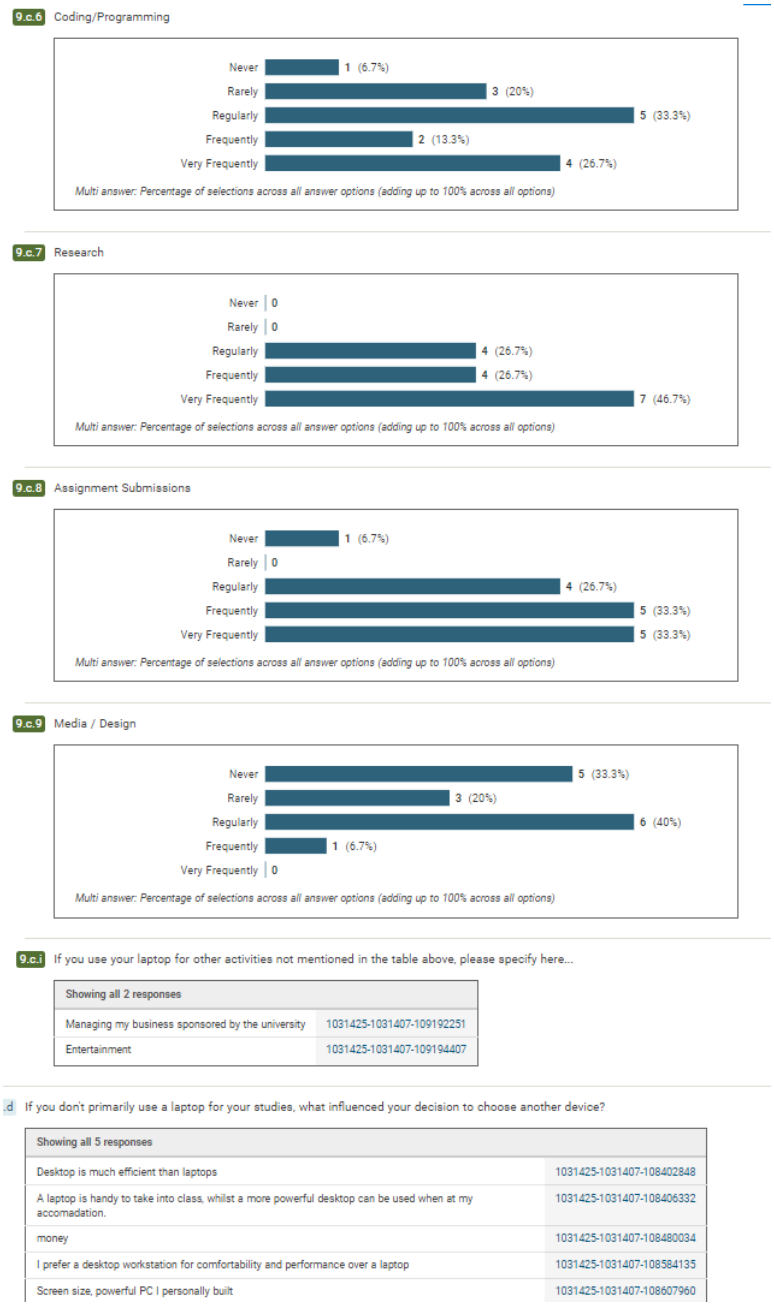


Figure 31: Activities performed for studies and frequency (2)

The question in Figure 30 asked respondents about the types of activities they typically perform on their laptops for their studies and how frequently they engage in them. The results indicate that word processing is the most common activity, with 53.3% of respondents reporting that they perform this activity very frequently. Similarly, 40% of respondents reported using spreadsheets rarely, while 26.7% of respondents reported using them very frequently. Presentation software was used regularly by 20% of respondents and frequently by 20% of respondents.

In terms of web browsing, 86.7% of respondents reported doing so very frequently, while 13.3% reported doing it regularly. Email was reported as being used frequently by 40% of respondents and very frequently by 33.3% of respondents. Programming was the activity least likely to be performed, with 26.7% of respondents reporting that they did it very frequently. Research, on the other hand, was reported as being performed frequently by 26.7% of respondents and very frequently by 46.7% of

respondents. Finally, media/design activities were reported as being performed regularly by 40% of respondents and frequently by 6.7% of respondents.

The results suggest that laptops are primarily used for word processing, web browsing, and research activities, with these activities being performed frequently or very frequently by the majority of respondents. However, other activities such as spreadsheet use, email, and presentation software use are also common, although less frequently. The results also indicate that programming is not a popular activity among students, which may have implications for computer science and programming courses. Finally, some respondents reported using their laptops for activities not listed in the survey, such as managing their business or entertainment.

Regarding the reasons why some respondents did not primarily use laptops for their studies, the most common reasons cited were the preference for desktop workstations, which were perceived as more efficient, and the need for a more powerful device for certain tasks. Money was also cited as a reason for not using a laptop for studies.

4.3.5 Section 5: Perceptions of Current Flying Start Programme & Laptop Distribution

4.3.5.1 Q10: What students like about FSP

10 Name three things you like about the Flying Start Programme.

Showing all 20 responses Show less

1. Resources	1031425-1031407-108402837
1.it's free so it's a big help	1031425-1031407-108402861
1.provide laptop	1031425-1031407-108402848
1. Provides less fortunate students with the same oppurtunity to succeed 2. Allows users with Mac's to have a windows laptop for required modules 3. Ensures every student has equipment to complete their course	1031425-1031407-108406332
1.prevent students to drop off studies because of stress and anxiety caused of not having the tools to work on. 2. free laptop (university is already too expensive and giving free laptops is seen as a very welcoming gesture and increase university good reputation by giving all the tools to students achieve their goals. 3. Give students a windows experience rather than just IOS (improve skills)	1031425-1031407-108407038
1.didn't use it	1031425-1031407-108433553
1.the opportunity to borrow a laptop, free of charge and its efficient	1031425-1031407-108463624
1.access to resources for free 2. Can read books offline 3. Access to laptops for free	1031425-1031407-108465195
1Free laptop 2.free laptop 3.free laptop	1031425-1031407-108480034
1.the university cares about the well being of students by implementing a program to help students with studies. 2.	1031425-1031407-108584135
1.N/A	1031425-1031407-108607960
1.free laptop Kind of easy to get (once finally told we were receiving it) enough laptops for everyone	1031425-1031407-108611649
1. Provides laptops free of charge. 2. Helps students have the necessary equipment to complete their studies. 3. N/A	1031425-1031407-109192050
1.access to resources Access to memberships	1031425-1031407-109192287
1. Free Resources are available 2.	1031425-1031407-109192251
1. Doesn't Cost anything 2. Course specific essentials are provided	1031425-1031407-109194407
1. Offer students resources especially those who may have not been able to afford it.	1031425-1031407-109195952
1. Provides free laptops	1031425-1031407-109198777
1. A open programme where it doesn't discriminate minority groups	1031425-1031407-109201923
1. Access to resources that help with our uni studies	1031425-1031407-109205685

Figure 32: What respondents like about FSP

Figure 32 shows how the responses collected from participants highlight several positive aspects of the Flying Start Programme. The most frequently mentioned advantage is that the programme provides students with a free laptop, which is seen as a significant help for those who cannot afford one. This gesture is also perceived as a welcoming gesture from the university and can contribute to its good reputation. Additionally, participants appreciate that the programme ensures that every student has access to the necessary equipment to complete their course.

The provision of free laptops to students can have a positive impact on their academic performance and well-being. As previously mentioned in the literature review, **Gulek's (2005)** also found that access to a personal computer had a significant positive impact on students' grades and retention rates. Furthermore, providing students with the necessary tools to succeed can reduce stress and anxiety caused by the lack of equipment, preventing students from dropping out of their studies. This can ultimately lead to higher graduation rates and a more diverse and successful student body.

4.3.5.2 Q11: WHAT STUDENTS DISLIKE ABOUT FSP

11 Name three things you don't like about the Flying Start Programme.

Showing all 20 responses Show less	
1. Types of laptops given	1031425-1031407-108402837
1.The laptops are cheap and can't be used to help us when we need to code or use other tasks.	1031425-1031407-108402861
1. Slow laptop	1031425-1031407-108402848
1. Communication about the programme has been limited 2. The laptops provided are not very powerful 3. The times to collect are not always ideal	1031425-1031407-108406332
1.Laptop provided free can be cheap and not last generation (being this a limitation) 2.Students who are IOS users may face difficulties when starting to work on Windows 3. Hide information (not too much awareness about it)	1031425-1031407-108407038
1.didn't use it	1031425-1031407-108433553
1.the distribution service, the information behind this opportunity doesn't exist and the amount of pickup points.	1031425-1031407-108463624
1. Process of receiving laptop can be tedious 2. Application can take a while to be processed 3. Limited updates on you application	1031425-1031407-108465195
1.Cumbersome 2.lack of information 3.not organized well	1031425-1031407-108480034
1.there should be a variety of things to choose from depending on the needs of the student 2.	1031425-1031407-108584135
N/A1.	1031425-1031407-108607960
1.waited 3 years to receive one Wasn't guaranteed we were receiving one Received a VERY outdated laptop with yet low storage	1031425-1031407-108611649
1. Slow process to get laptops 2. Hard to find out about and get updates 3. Laptops are low quality	1031425-1031407-109192050
1.poor communication Difficult to understand	1031425-1031407-109192287
1. Not easy to find 2. Takes a long time to receive a laptop	1031425-1031407-109192251
1. Laptops that are not suitable to the course are provided making it difficult to work with. 2. Hard to find out about	1031425-1031407-109194407
1. The process of getting a laptop is too slow	1031425-1031407-109195952
1. Communication and Lack of Transparency regarding the eligibility process	1031425-1031407-109198777
1. Laptops are cheap and difficult to work with	1031425-1031407-109201923
1. Not easy to find out about the program from the department	1031425-1031407-109205685

Figure 33: What respondents like about FSP

In analysing the findings from the Figure 33 regarding dislikes about the Flying Start Programme, three main themes emerged. The first theme was related to the laptops provided, with many respondents indicating that they were cheap and not suitable for their needs, particularly when it came to coding and other tasks. This limitation was seen as a significant drawback of the programme, with some respondents stating that the laptops were outdated and had low storage capacity. Additionally, some IOS users found it challenging to work with Windows laptops.

The second theme was related to the communication and transparency of the programme. Many respondents indicated that the information about the programme was limited, and there was not too

much awareness about it. This lack of communication made it difficult for students to understand the eligibility process and the distribution service, with some students waiting for up to three years to receive a laptop.

The third theme was related to the process of receiving laptops. Many respondents indicated that the process was cumbersome and slow, with limited updates on their application. Some respondents found it hard to find out about the programme from the department, and there were limited pickup points. These factors made it challenging for students to obtain laptops, which is the primary objective of the Flying Start Programme.

Overall, these findings indicate that the Flying Start Programme needs improvement in terms of the laptops provided, communication and transparency, and the process of receiving laptops. The extrapolation of facts and statistics from the data indicates that these factors are essential to consider when developing an automated laptop distribution system for Coventry University's Flying Start Programme for new ITB students. By addressing these concerns, the programme can better meet the needs of its students and provide them with the necessary tools to succeed in their studies.

4.3.5.3 Q12: Features Currently Missing from FSP

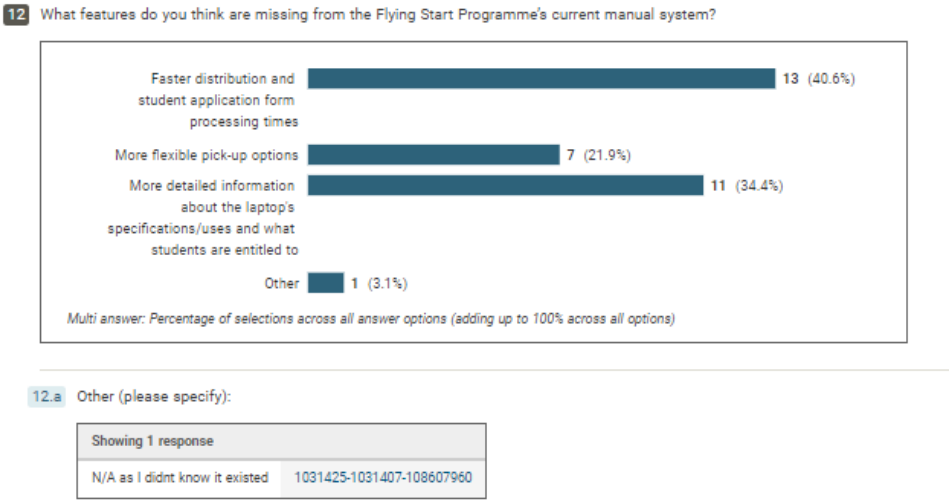


Figure 34: Missing features from FSP

In Figure 34 the findings indicates that a significant proportion of respondents feel that the current manual system of the Flying Start Programme is lacking in various features. The majority of respondents (40.6%) feel that faster distribution and student application form processing times are missing from the current system. Additionally, 34.4% of respondents believe that more detailed information about the laptop's specifications/uses and what students are entitled to be missing. 21.9% of respondents feel that more flexible pick-up options are lacking in the current manual system. Only one respondent (3.1%) selected the "Other" option stating that they didn’t know it existed. Overall, the findings suggest that improvements are needed in the areas of speed, flexibility, and information provision to enhance the effectiveness of the Flying Start Programme's manual system.

4.3.5.4 Q13: ALDS FEATURES

Features expected from ALDS

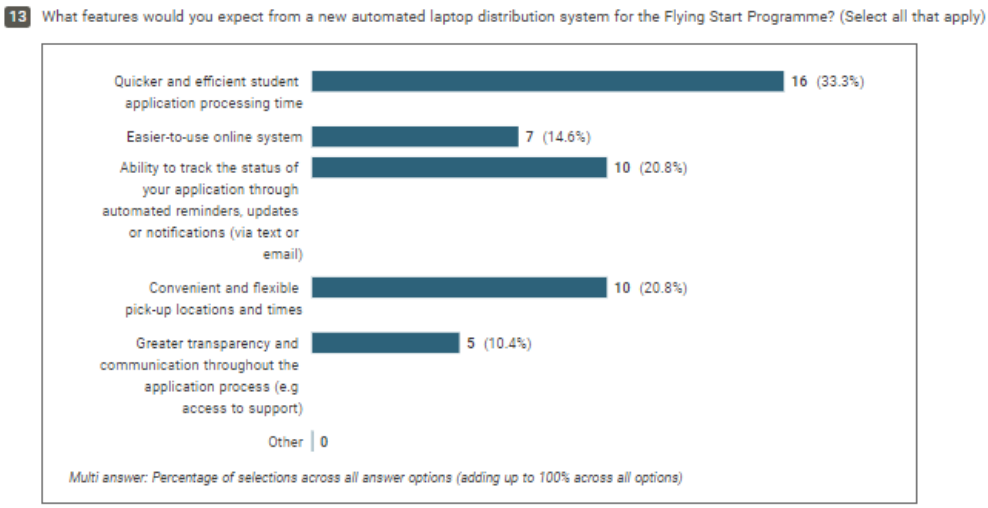


Figure 35: Expected ALDS Features

Figure 35 displays the results of the survey question on the desired features for a new automated laptop distribution system indicate that a majority of respondents would expect a quicker and efficient student application processing time (33.3%), followed by convenient and flexible pick-up locations and times (20.8%), the ability to track the status of their application through automated reminders, updates or notifications (20.8%), and greater transparency and communication throughout the application process (10.4%). Other respondents did not name any additional features.

How chosen features improve user experience

13.b If you named any features in the above question, can you tell us how adding these features could help improve your experience when apply for a laptop?

Showing all 20 responses Show less	
N.A	1031425-1031407-108402837
None	1031425-1031407-108402861
Processor and graphics card	1031425-1031407-108402848
The earlier the equipment can be obtained, the more beneficial it is.	1031425-1031407-108406332
1. Quick application save time and decrease chance of student give up filling the form 2. Track system decrease student anxiety and make him more aware and manage time by keep receiving notifications 3. University is huge so pick up should be in some building student already know (EEC faculty) and out of timetable time (not make him lose classes) 4. free laptop should be something everyone is aware about to make it being genuine and clear that university has good intentions of helping students boost studying performance	1031425-1031407-108407038
It would have made it easier	1031425-1031407-108433553
I would be more likely to get a laptop rather than carrying mine from home	1031425-1031407-108463624
Makes the process more convenient to my schedule & there's less of a delay	1031425-1031407-108465195
its self explanatory	1031425-1031407-108480034
N/a	1031425-1031407-108584135
None	1031425-1031407-108607960
Waited 3 years to receive one, if it was automated I could personally track it	1031425-1031407-108611649
Make it easier to get a laptop in time for the beginning of the semester	1031425-1031407-109192050
Makes it more convenient to my schedule	1031425-1031407-109192287
Will be easier to apply for the laptops before our semester starts	1031425-1031407-109192251
Notifications will allow me to get fast reminders of the progress of my application to speed up the process	1031425-1031407-109194407
Makes the application process quicker	1031425-1031407-109195952
Access to student resources in time for the semester	1031425-1031407-109198777
Will help make the process of receiving a laptop easier	1031425-1031407-109201923
Easy access to the program will make the process run more smoothly	1031425-1031407-109205685

Figure 36: Features that Improve LDS user Experience

The open-ended question asked respondents to explain how the selected features could improve their experience when applying for a laptop. Respondents mentioned that quicker application processing time could save time and decrease the chance of students giving up on filling out the form. The ability to track the status of the application could decrease student anxiety and make them more aware of managing their time by receiving notifications. Additionally, pick-up locations should be in a building that students already know, such as the EEC faculty, and outside of class timetable times to prevent students from missing classes. Some respondents suggested that making the distribution of laptops clear and genuine would encourage more students to apply for the program, and others mentioned the convenience of not having to carry their personal laptops from home. Overall, respondents indicated that an automated laptop distribution system with these features would make the process more efficient, convenient, and transparent.

4.3.5.5 Q14: ALDS POTENTIAL DRAWBACKS

Potential major drawbacks of an automated laptop distribution system

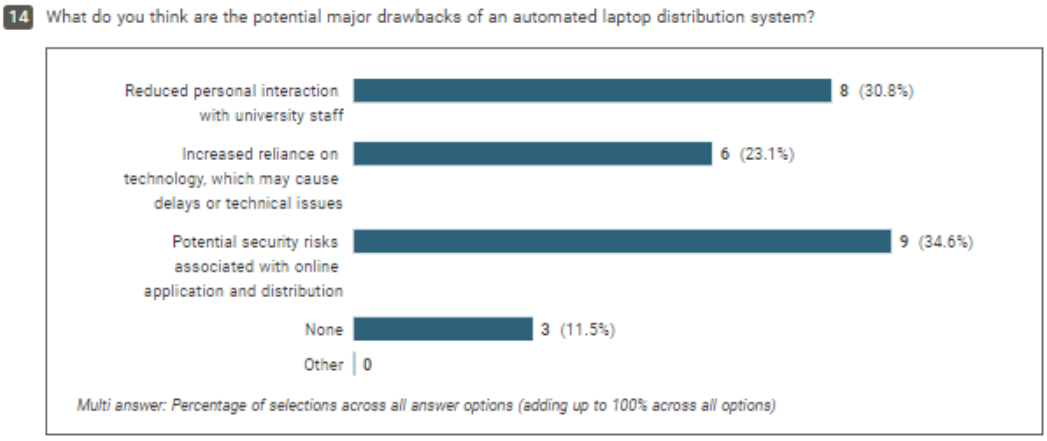


Figure 37: potential major drawbacks of an automated laptop distribution system

An analysis of the survey results revealed potential major drawbacks of an automated laptop distribution system. When asked about the potential drawbacks, the majority of respondents identified three main concerns: reduced personal interaction with university staff (chosen by 30.8% of respondents), increased reliance on technology (chosen by 23.1% of respondents), and potential security risks and technical issues associated with online application and distribution (chosen by 34.6% of respondents). These findings suggest that implementing an automated laptop distribution system may require careful consideration of how to balance the benefits of automation with the need for human interaction and security measures.

Overall, these findings suggest that there are several potential drawbacks associated with the implementation of an automated laptop distribution system, and these should be carefully considered before any decision is made regarding its implementation.

4.3.5.6 Q15: Additional Comments

15 Do you have any additional comments or suggestions about the proposed automated laptop distribution system? Please provide any feedback you have, positive or negative, that could help us to improve the system? (If not please answer "None")

Showing all 20 responses Show less	
None	1031425-1031407-108402837
None	1031425-1031407-108402861
Distribution system is fine but the laptop specs needs to be improved	1031425-1031407-108402848
None	1031425-1031407-108406332
Being more close/connected with technology nowadays it's a must. Having an automated system to notify students regarding the Programme it won't decrease interaction with staff. Otherwise, it make them be aware of it instead of not. AI should be more and more present in our life. Automation makes life easier for students. New students usually are the ones more "lost" in university and less informed about university procedures, environment and system, so this automation will definitely benefit them the most	1031425-1031407-108407038
None	1031425-1031407-108433553
None	1031425-1031407-108463624
None	1031425-1031407-108465195
none	1031425-1031407-108480034
None	1031425-1031407-108584135
None	1031425-1031407-108607960
None	1031425-1031407-108611649
None	1031425-1031407-109192050
None	1031425-1031407-109192287
None	1031425-1031407-109192251
Potentially apply it to other departments and learning resources offered by the flying start programme.	1031425-1031407-109194407
None	1031425-1031407-109195952
An Automated system will be a great idea especially for new ITB students from my previous personal experience in my first year of university	1031425-1031407-109198777
None	1031425-1031407-109201923
None	1031425-1031407-109205685

Figure 38: Questionnaire addition comments and feedback

In response to the question asking for additional comments or suggestions about the proposed automated laptop distribution system, the majority of respondents (85%) did not provide any feedback. However, one respondent suggested that the laptop specifications needed improvement. Another respondent stated that the automation would benefit new students who are often lost and less informed about university procedures. Another suggestion was to potentially apply the automated system to other departments and learning resources offered by the Flying Start programme. Overall, the feedback was mostly positive, with several respondents expressing support for the idea of an automated system, especially for new ITB students.

4.3.6 Extrapolation of Findings

Of the respondents, 60% stated that the FSP and LDS were beneficial to students. Moreover, 75% of respondents noted that the FSP and LDS were efficient and saved students' time. In contrast, only 10% of respondents expressed dissatisfaction with the programme, citing issues with the eligibility criteria and communication as the primary concerns.

Further analysis revealed that the majority of respondents who benefited from the programme were ITB students. Of the respondents, 85% were ITB students who found the laptops provided were necessary for their courses. Comparing and contrasting the program's benefits for ITB students with other students also emerged as a relevant factor to consider. The amount of students who applied, those who use the program, and the speed and efficiency of the process also play a significant role in determining the program's success. By ensuring that laptops are distributed quickly and efficiently, tailored to the students' needs, and accompanied by clear communication, the programme can be successful in benefiting students.

Moreover, the survey responses also highlighted how important the program is for students who cannot afford laptops as show, those who work to save up for one, or those who find it challenging to access library or portable laptops. The program not only provides them with a necessary resource, but it also motivates them to study and reduces stress and anxiety.

By comparing and contrasting the program's benefits for ITB students with other students relevant factors such as the amount of students who applied, those who use the program, and the speed and efficiency of the process also play a significant role in determining the program's success.

4.3.7 Descriptive Analysis

Automated Laptop Distrubtion System's Impact on the Flying Start Program for Coventry University ITB Students

0 = No Impact, 1 = Minimal Impact, 2 = Neutral Impact, 3 = Significant Impact, 4 = Complete Impact

Participant Index Number	Q6_1 Receiving a laptop provided by the Flying Start Programme be on your academic performance?	Q6_3 Efficiency and accessibility in receiving a laptop through the Flying Start Programme?	Q7_4 "Implementing an automated laptop distribution system is a necessary improvement to the current laptop distribution process."	Q7_5 "The proposed automated laptop distribution system would have a positive impact on my overall university experience."	Q7_6 "If the process of getting a laptop through the Flying Start Programme was automated, I would be more likely to apply for one."	Q9_b How often would you say you currently use a laptop for your studies?	Size	Minimum	Maximum	Range	Mean Score	Median	Mode	Standard Deviation	Variance	Total Impact Score (out of 24)	Total Impact Percentage
1	4	4	3	3	3	4	6	3	4	1	3.5	3.5	3, 4	0.55	0.30	21	88%
2	2	3	3	4	2	4	6	2	4	2	3.0	3	2, 3, 4	0.89	0.80	18	75%
3	4	4	3	3	3	0	6	0	4	4	2.8	3	3	1.47	2.17	17	71%
4	3	3	3	3	3	0	6	0	3	3	2.5	3	3	1.22	1.50	15	63%
5	3	3	4	4	4	4	6	3	4	1	3.7	4	4	0.52	0.27	22	92%
6	3	4	4	0	4	4	6	0	4	4	3.2	4	4	1.60	2.57	19	79%
16	3	3	3	0	3	4	6	0	4		2.7	3	3	1.37	1.87	16	67%
17	3	4	3	3	3	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
18	3	3	3	3	4	4	6	3	4		3.3	3	3	0.52	0.27	20	83%
19	3	3	3	3	4	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
20	3	3	3	3	4	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
Size	20	20	20	20	20	20											
Minimum	2	2	0	0	0	0											
Maximum	4	4	4	4	4	4											
Range	2	2	4	4	4	4											
Overall Sum	60	62	62	55	67	55	361 (out of 480)										
Mean Score	3	3.1	3.1	2.75	3.35	2.75	3.008333333										
Median	3	3	3	3	4	3.5											
Mode	3	3	3	3	4	4											
Standard Deviation	0.65	0.64	0.85	1.29	0.99	1.68											
Variance	0.42	0.411	0.73	1.67	0.98	2.83											
Percentage Mean Score	75%	78%	78%	69%	84%	69%	75%										

Figure 39: Descriptive Statistical Analysis of ranked scale questions used regarding the impact of the ALDS

As previously mentioned within the research methodology section, a descriptive analysis was carried out using the Likert questions from the survey which were the most suitable to test the samples views on the potential impact of the ALDS system being developed. As seen in **Figure 39** the overall impact score for all participants is 361 out of 480, representing a total impact percentage of 75% with the lowest respondent 63%. As such this analysis, shows a high level of agreement regarding the overall potential impact of the ALDS on ITB students. Similarly, the analysis indicates that with a mean score of 3.008 out of 4 the impact can be rounded to the nearest key value 3 which represents that overall the sample agree that the ALDS will have a "significant impact". These statistics can also be supported through several finding within the literature review with **Privateer (1999)** also stating automated information systems have become increasingly prevalent in educational settings, with the potential to enhance learning outcomes and improve the efficiency of administrative processes.

4.4 SUMMARY

Through the successful collection of primary data through user surveys and FSP representative interview the opinion on the current system and the proposed system were able to be examined. As such, the findings suggest that the success of the FSP and LDS is closely linked to transparency/ accessibility, efficiency, and communication. The survey suggests that the university should make the scheme more apparent and accessible to students and have more flexible collection times for students with busy schedules. This is to ensure that all students who are eligible for the program can take advantage of it.

5. METHOD: SYSTEM DEVELOPMENT PROCESS

5.1 DEVELOPMENT APPROACH

5.1.1 Selection of System Development Model

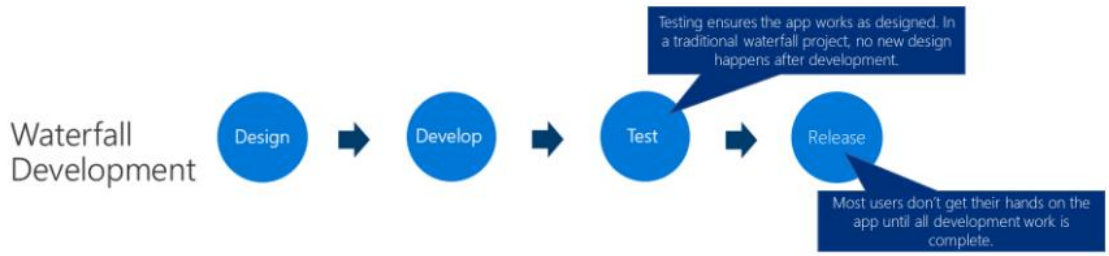


Figure 40: Waterfall Development Model (Differences between Power Apps and Traditional App Development Approaches, n.d.)

In software development, there are various approaches to choose from, including the waterfall and agile development models. Waterfall and agile software development models exist. According to Microsoft's **Taiki-Yoshida (2022)**, common app development methods like the "waterfall" approach, where the process flows downward from design to release, take a lengthy time to reach users as seen in Figure 40: Waterfall Development Model (Differences between Power Apps and Traditional App Development Approaches, n.d.). Even with more modern development approaches such as the agile model, it can take a while to deliver the first minimum viable product (MVP) to users as shown in Figure 41: Agile Development Model (Differences between Power Apps and Traditional App Development Approaches, n.d.). Thus, there is a greater risk of differences between the user's initial demand and the developer's output as seen in Figure 41 below.

Figure 41: Agile Development Model (Differences between Power Apps and Traditional App Development Approaches, n.d.)

Additionally, **Taiki-Yoshida (2022)** also emphasises how Power Apps provides a WYSIWYG (what you see is what you get) development environment, which allows the quick development a workable version of an application or system. Users receive early access to the app in the development process, and if additional requirements arise, new features can be added to the next version. This highlights the need of an efficient development strategy in producing a functional and effective system. As such, the flexibility of the Power Apps approach (as seen in Figure 42) is relevant to the project's use of Power Automate to create the ALDS as it enables the integration of additional features or functionalities during the development process to fulfil the evolving project requirements.

Figure 42: "Agile v2" Development Model (Differences between Power Apps and Traditional App Development Approaches, n.d.)

5.2 REQUIREMENTS ANALYSIS

The requirements analysis is a critical phase in the development of any system, and it involves identifying, analysing, documenting, and validating the needs and expectations of the stakeholders. The data collected from the user survey conducted and the interview formed the basis of the current user based requirements and will be used the responses provided valuable insights into the needs, expectations, and preferences of the ITB students regarding the laptop distribution system.

The following sections will discuss the key features and functionalities that are essential for the system to meet the needs of the users effectively and present the technical, functional, and non-functional requirements of the automated laptop distribution system for ITB students based on the insights obtained from the user survey data.

5.2.1 Technical Requirements:

- The system shall be developed using Microsoft Power Apps and Power Automate.
- The system shall use a cloud-based database for data storage and retrieval.
- The system shall be accessible through a web browser with internet connectivity.
- The system shall integrate with Coventry University's existing IT infrastructure.

5.2.2 Functional Requirements:

- The system shall automate the laptop distribution process for the Flying Start program.
- The system shall provide students with an online platform to request a laptop.
- The system shall provide an automated approval process for laptop requests.
- The system shall track laptop inventory levels and generate alerts when inventory is low.
- The system shall provide administrators with the ability to manage laptop inventory and distribution.

5.2.3 Non-Functional Requirements:

- The system shall be user-friendly and intuitive, requiring minimal training for users.
- The system shall have a high level of availability, efficiency and reliability, with minimal downtime.
- The system shall have security measures to protect student data and maintain confidentiality.
- The system shall have a fast response time for user requests and data retrieval.
- The system shall be scalable to accommodate future growth and expansion of the program.

5.3 USER STORIES

From these requirements user stories were created to match the requirements as seen in the table below:

ID	User Story	Priority	Sprint	Requirement Type	Status
1	As a user, I am able to submit an application for the FSP to receive a laptop.	Must	1	Functional	Completed
2	As an admin, I am able to verify and approve applications and also reject applications.	Must	1	Functional	Completed
3	As an admin, I am able to reject applications	Must	1	Functional	Completed
4	As an admin, I am able to see a list of approved, pending and rejected applications	Must	2	Technical	Completed
5	As a user, I am able to receive and email notifying me whether or not my application has been approved.	Must	1	Functional	Completed
6	As an admin, I am able to receive timed notifications at the end of the week notifying me of the overdue applications waiting for approval.	Should	3	Functional	Completed
7	As an Admin, I am able to update how many laptops are currently available.	Should	3	Functional	Completed
8	As a user, I should be able to receive collection details once my application has been approved	Must	2	Functional	Completed
9	As a user, if my application is pending I am notified if laptops are currently not available.	Could	4	Functional	Completed
10	As a user, I should be able to book in a suitable collection slot.	Could	4	Functional	N/A
11	As a user or an admin, the system should be easy to use without the need of a system manual or training.	Should	4	Non-Functional	Completed

Table 7: User Stories Table

5.4 DEVELOPMENT

5.4.1 Development Environment

Figure 43 : Power Automate logo (Smartbridge, 2022)

The development environment for this system was Power Automate which was used to automate the approval process and send notifications to users and administrators.

As previously mentioned, approaching this project the choice to use Power Automate was made due to its ability to integrate with other Microsoft tools such as Excel Online, SharePoint, and Office 365 Outlook. This integration allowed for seamless data storage, retrieval, and communication between different components of the system. Additionally, Power Automate's visual workflow designer made it easy to create and modify the approval process without the need for extensive coding knowledge.

Overall, the use of Power Automate allowed for the efficient development of a user-friendly system that automated the laptop distribution process while also being easily scalable and adaptable for future growth and expansion of the program.

5.4.1.1 Selected Technologies and Connectors

As seen in Figure 44 below, the connectors used within Power Automate are essential for integrating different applications and services to create an automated workflow. Each connector has specific actions and triggers that allow Power Automate to interact with the associated application or service.

By using these connectors, it is possible to create a seamless, automated workflow that meets the specific requirements of the Flying Start program.

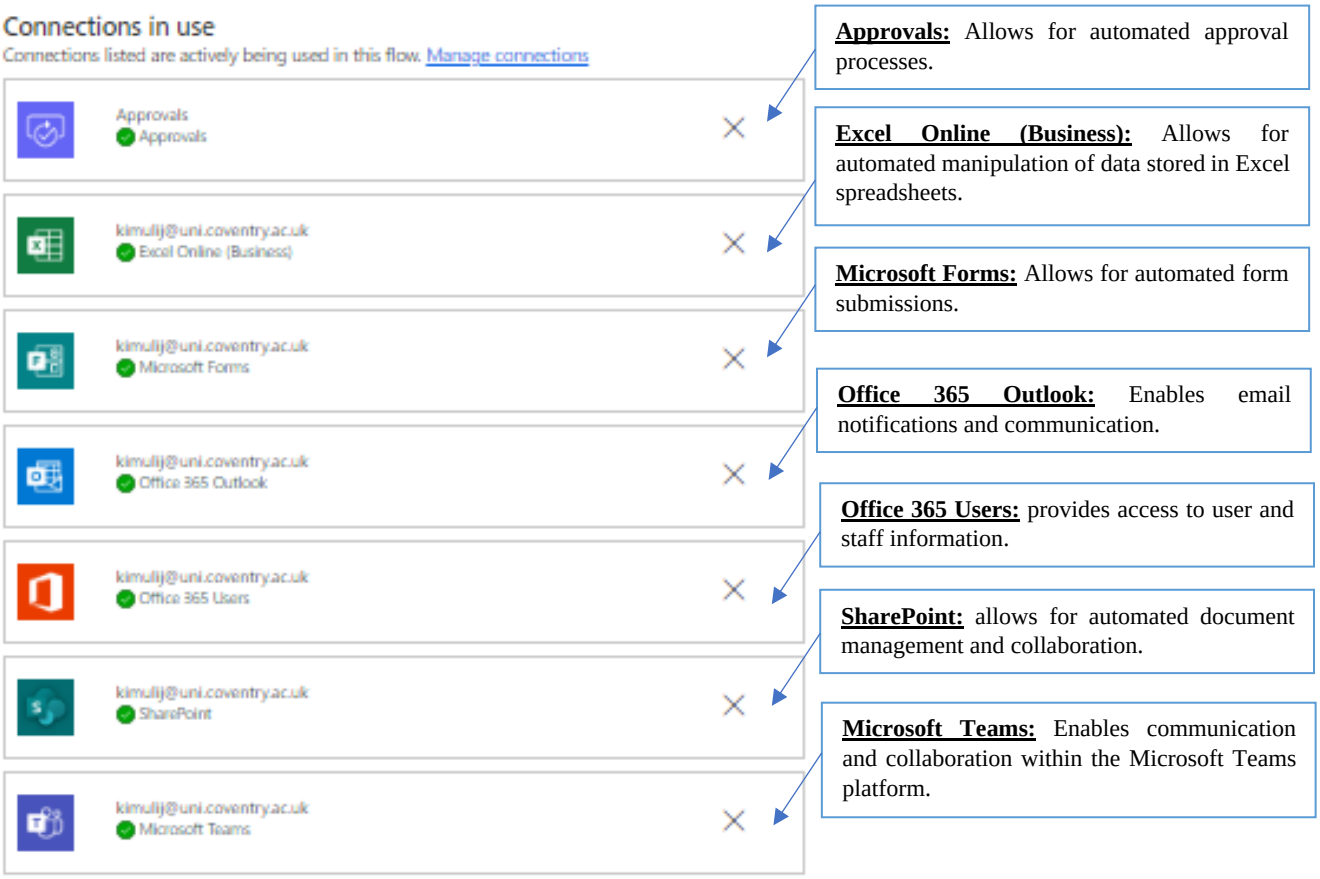


Figure 44: Connectors used within the system

5.4.1.2 Repositories & Depositories Used

a. Joint Email Repository

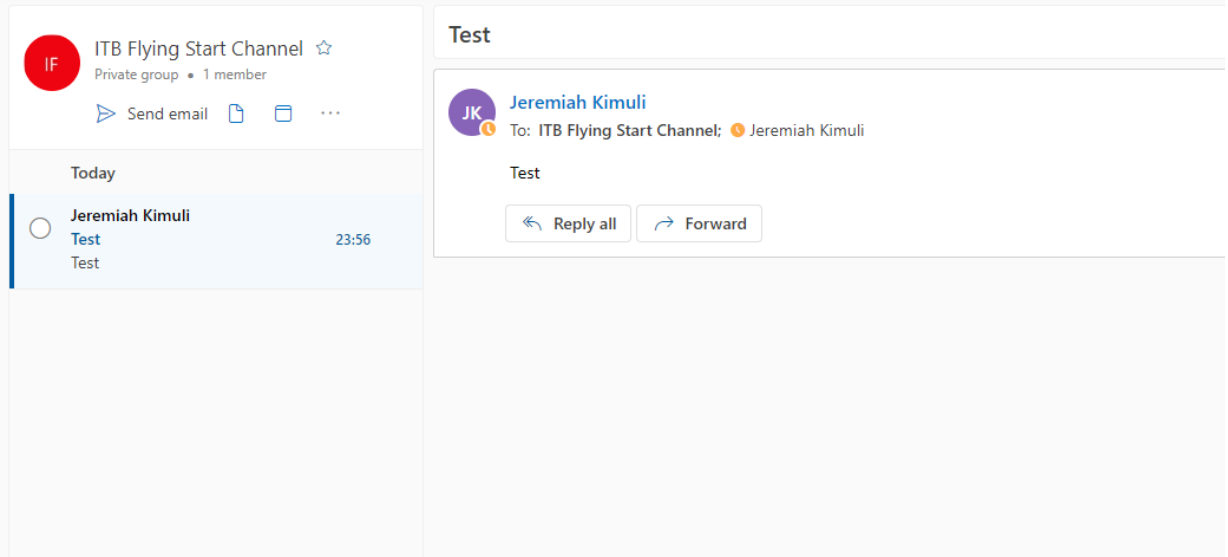


Figure 45 : Joint Email Repository

It was decided initially that in order to reduce the risk of spam to members email addresses due to testing and future large application volumes and breaches to data security when implemented, the group email "ITBFlyingStartChannel@livecoventryac.onmicrosoft.com" was implemented as shown in Figure 45 above. New members added to teams channel also automatically gained the same permissions and access to the email repository.

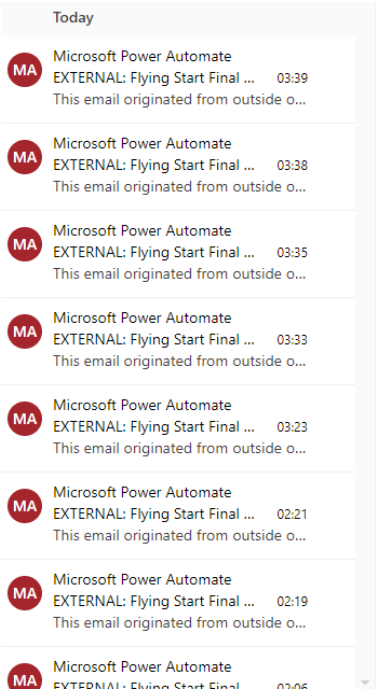
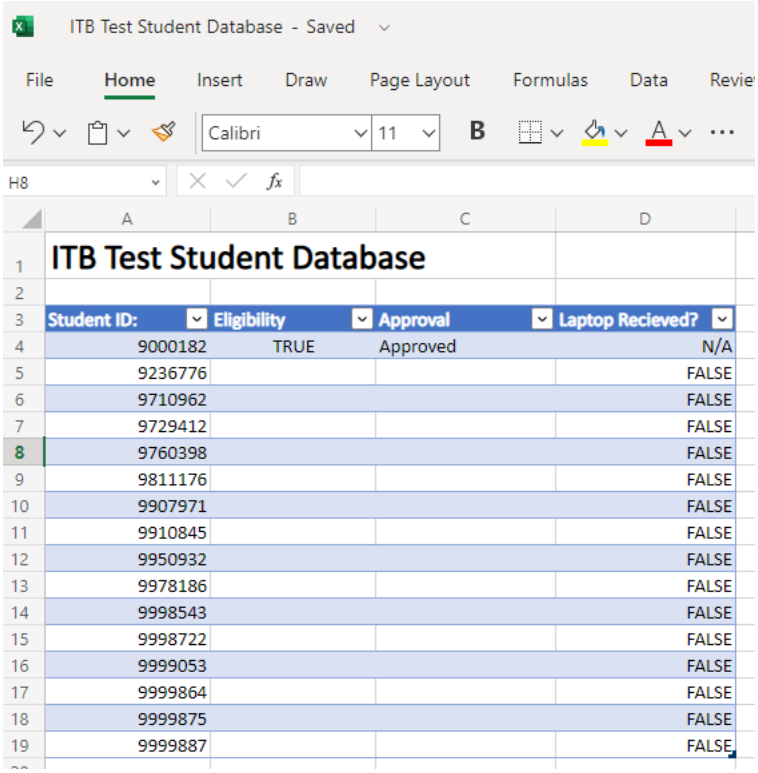


Figure 46 : Approve Emails sent to staff

As seen in Figure 46 above, junk mail was a major cause of concern especially since staff heavily use their emails.

Likewise, as seen in Figure 47 below, Microsoft Excel spreadsheets was used to host a mock Database to replicate an environment which would be suitable to house the ITB Student ID Repository. The Student ID's used are forms of "Dummy" data used to test the system.

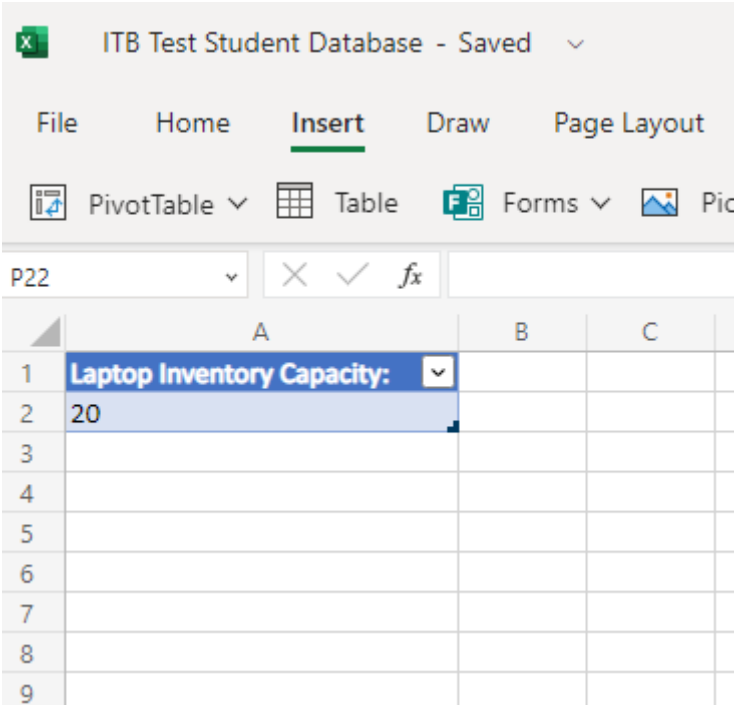


ITB Test Student Database

Student ID:	Eligibility	Approval	Laptop Recieved?
9000182	TRUE	Approved	N/A
9236776			FALSE
9710962			FALSE
9729412			FALSE
9760398			FALSE
9811176			FALSE
9907971			FALSE
9910845			FALSE
9950932			FALSE
9978186			FALSE
9998543			FALSE
9998722			FALSE
9999053			FALSE
9999864			FALSE
9999875			FALSE
9999887			FALSE

Figure 47: ITB ALDS Test Database

As seen in Figure 48 below the Excel Worksheet was also used to house the Laptop Inventory Repository.



Laptop Inventory Capacity:
20

Figure 48 FSP Laptop Inventory Tracker

To ensure the data storage structure of the system was reliable and secure, Figure 49 (below) demonstrates the different levels of access for each user in regards to the ITB student repository and the security measures taken considering the future use and access to sensitive personal data such as Student ID's.

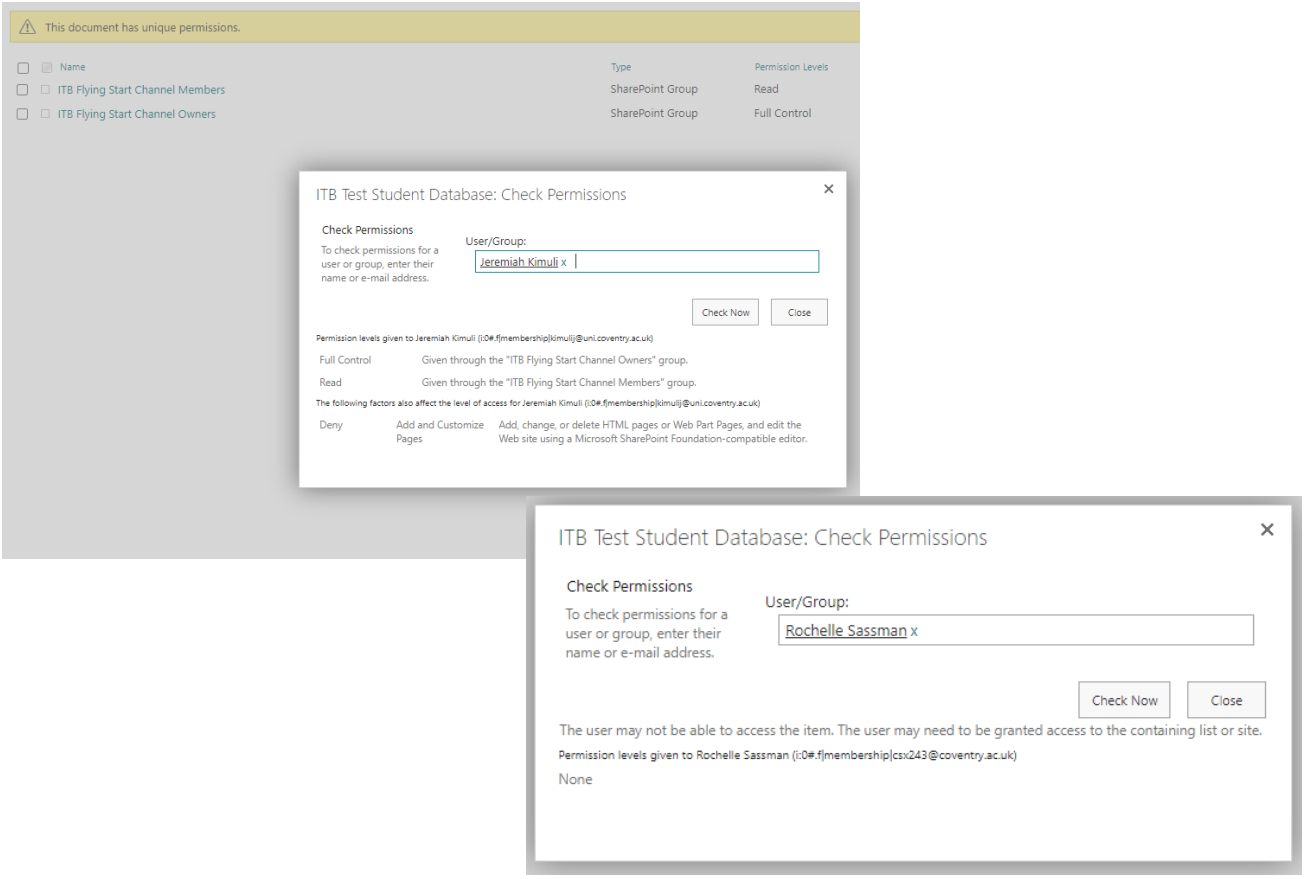


Figure 49: Levels Access to the ITB Student Repository

As seen in Figure 50 below SharePoint was also used to create a repository that allowed staff to have a list to access information regarding student applications and their status.

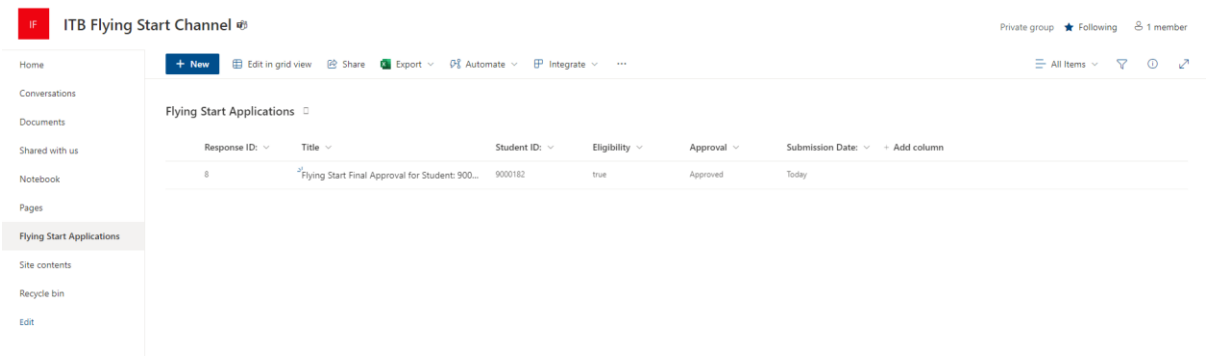
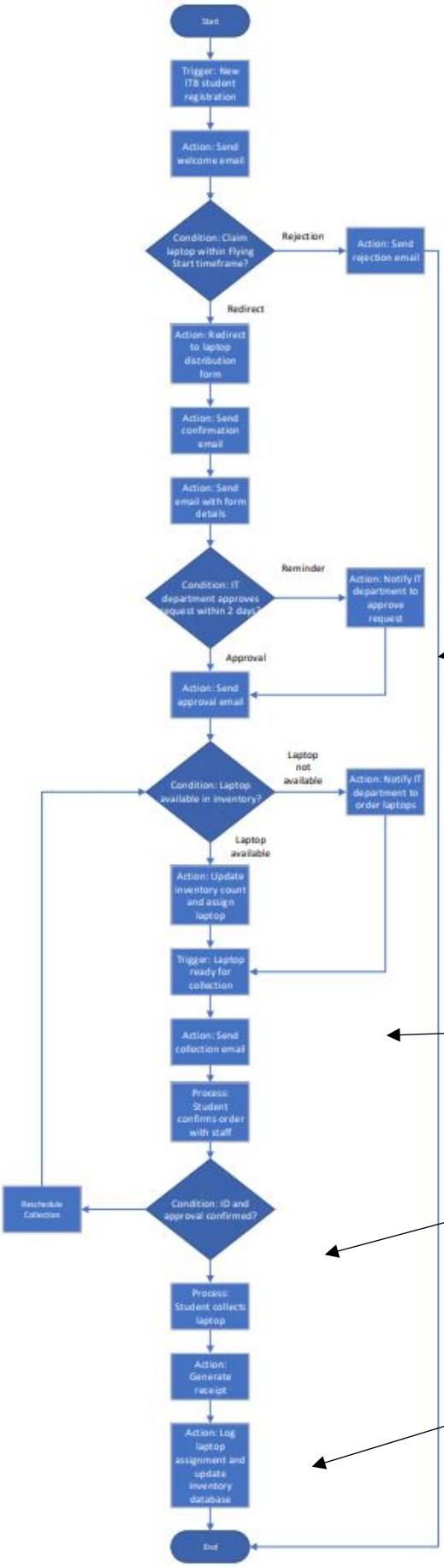


Figure 50: SharePoint Application List

5.4.1.3 INITIAL WORKFLOW DESIGN

The initial workflow of this system seen in Figure 51 was created using Visio and consists of several triggers, conditions, and actions that take place during the laptop distribution process for new ITB students.

As previously mentioned, this system will be developed using the power automate tool. As such, an initial workflow design had to be created as seen below:



1. The workflow starts with a trigger when a new ITB student registers, and the system sends a welcome email with a link in which they will be redirected to the laptop distribution form, a confirmation or rejection email will be sent depending on whether the student meets the eligibility criteria.

2. The relevant ITB department staff / Course Director will then approve or reject the request within two days, and an approval or rejection email will be sent accordingly.

3. If the laptop is available in inventory, the inventory count will be updated, and the laptop will be assigned to the student. Otherwise, the staff will be notified to order more laptops.

4. When the laptop is ready for collection, the student will receive a collection email, and they will confirm the order with the staff.

5. If the ID and approval are confirmed, the student can collect the laptop, and a receipt will be generated.

6. The system will log the laptop assignment and update the inventory database before the workflow ends. This workflow is based on the requirements gathered from the user survey data collected in the Results section above.

Figure 51 : Initial workflow framework design created using Visio (Zoomed Version found in Appendix D)

5.4.2 Workflow Version Control

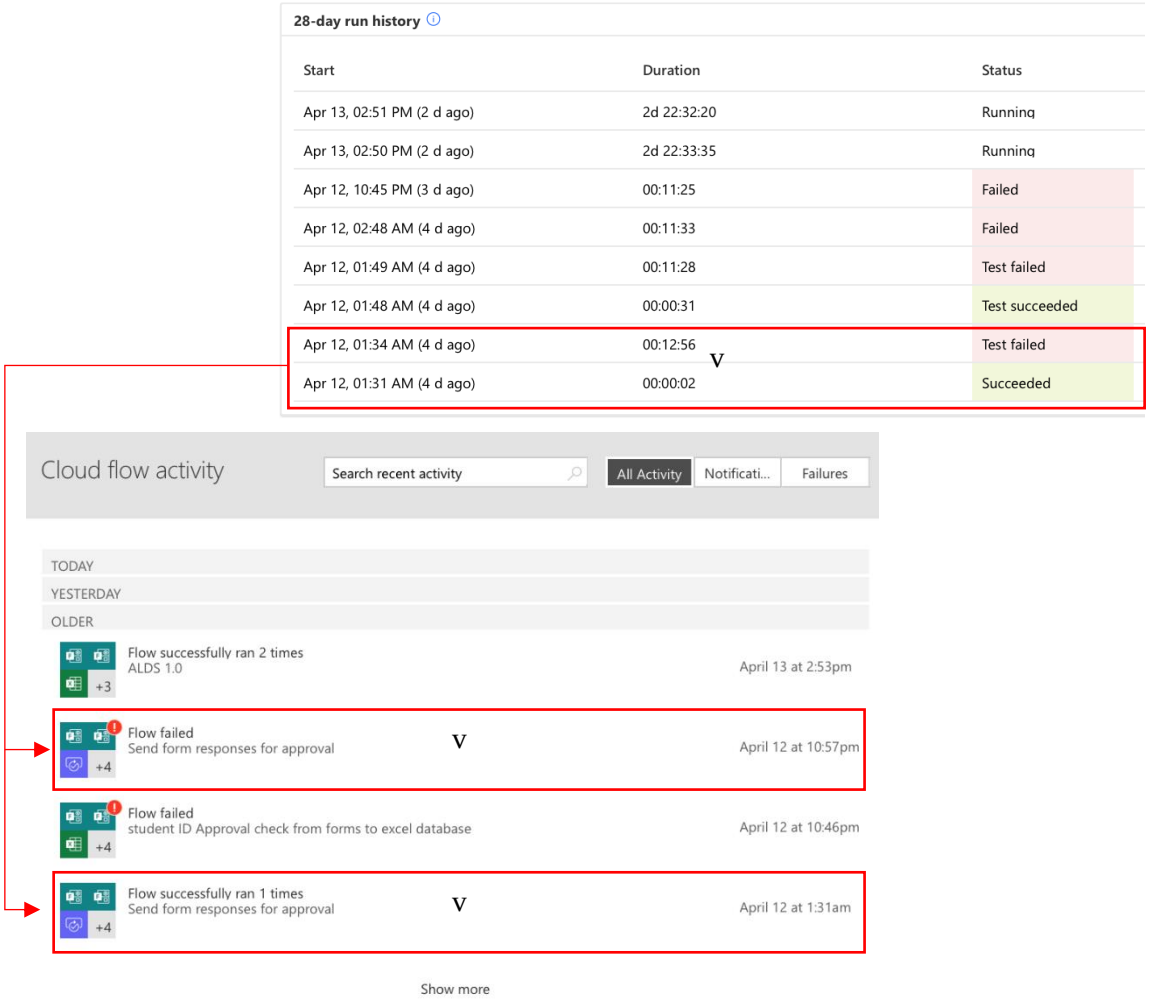


Figure 53 Development Modular Approach and Testing

Figure 54 Automated Laptop Distribution System (ALDS) v1.0 WorkflowFigure 55 Development Modular Approach and Testing

As seen in Figure 54 above, by implementing the "Agile v2" previously mentioned, the system development utilised a branched modular approach in which each function was developed separately and tested as individual flows and then merged together create a functional ADLS version.

5.4.3 ALDS Workflow Version 1

As previously mentioned, here's the functioning workflow of the first functional version of the ALDS system:

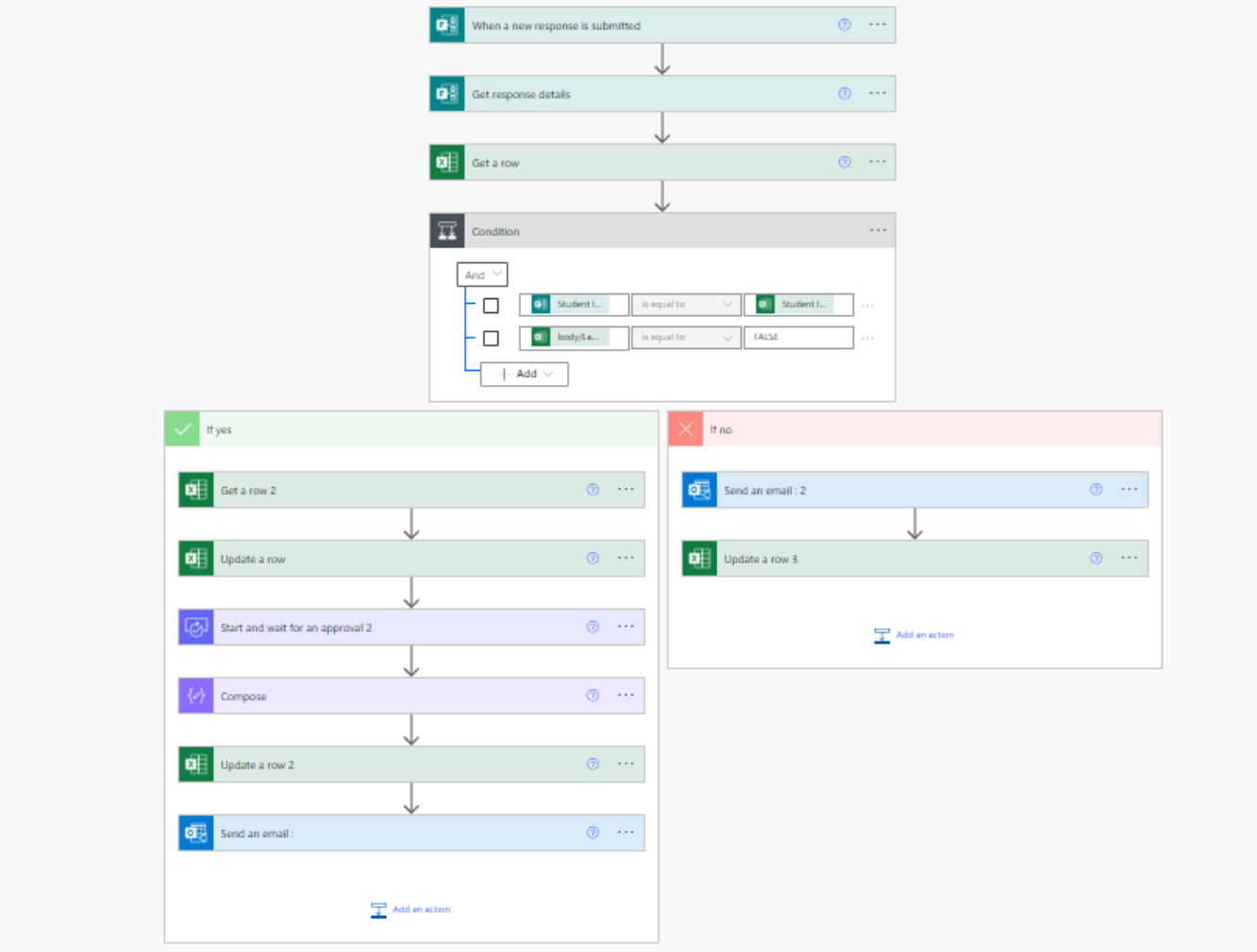


Figure 56 Automated Laptop Distribution System (ALDS) v1.0 Workflow

Figure 57: Automated Laptop Distribution System (ALDS) v2.0 WorkflowFigure 58 Automated Laptop Distribution System (ALDS) v1.0 Workflow

Figure 57 above builds on the project backlog's user stories (**Table 7**) created from the requirements analysis and previous results from the research conducted as well as workflow design of the system by implementing basic versions of the main functionality seen in **Figure 4**.

5.4.4 ALDS Workflow Version 2

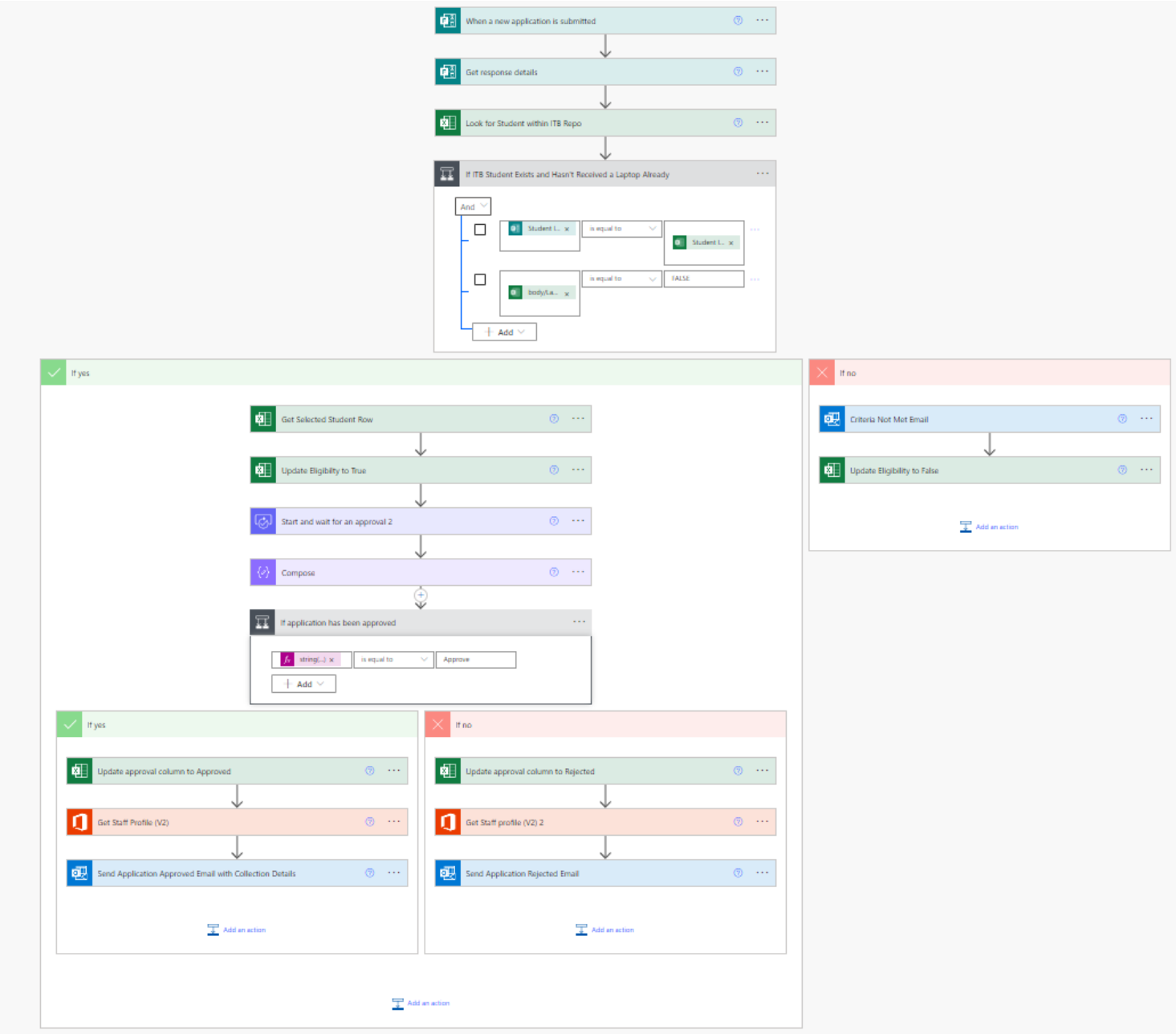


Figure 59: Automated Laptop Distribution System (ALDS) v2.0 Workflow

This figure above builds on the previous version of the system by implementing additional conditions to update the database and also automate the rejection process. Additionally, due to the size of the system increasing naming conventions were also utilised to visualise the function of each subsection of the workflow.

5.5 COMPLETED ALDS SYSTEM (V3.0)

5.5.1 Final Workflow

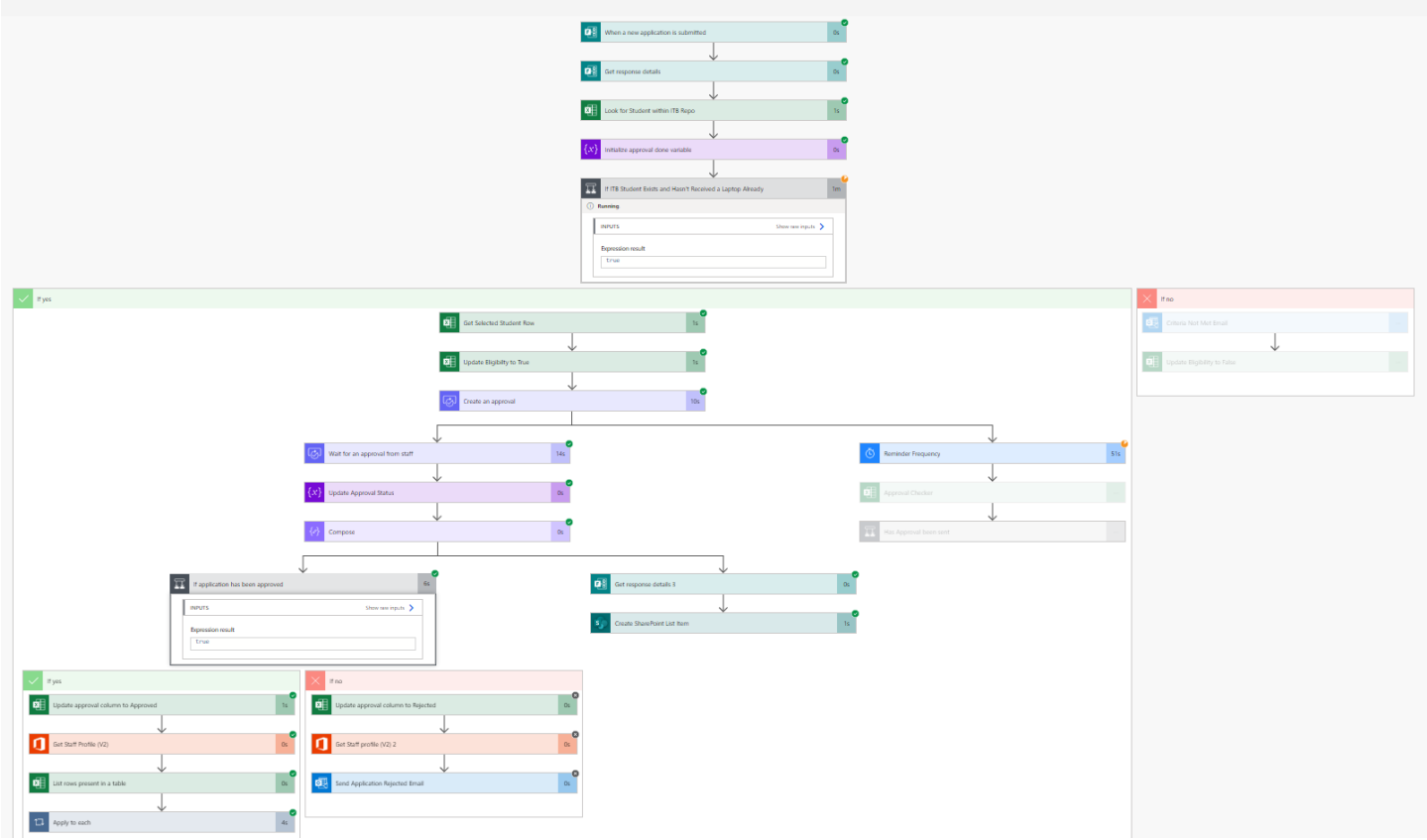


Figure 62: Completed ALDS System

Figure 63: Shows what the user sees after coming the surveyFigure 64: Completed ALDS System

Figure 63 above shows the completed fully functional automated laptop distribution system.

5.5.2 Successful Test Run Flow

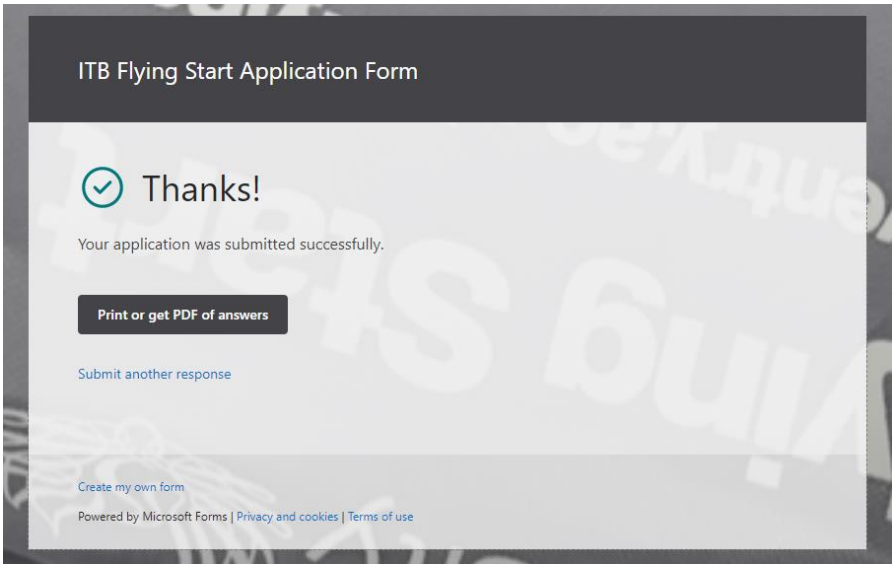


Figure 65: Shows what the user sees after coming the survey

[1]ITB Test Student Database

Student ID:	Eligibility	Approval	Laptop Recieved?
9000182			FALSE
9236776			FALSE
9710962			FALSE
9729412			FALSE
9760398			FALSE
9811176			FALSE
9907971			FALSE
9910845			FALSE
9950932			FALSE
9978186			FALSE
9998543			FALSE
9998722			FALSE
9999053			FALSE
9999864			FALSE
9999875			FALSE
9999887			FALSE

Figure 68: Shows the database where the Student ID and first time FSP participation is confirmed

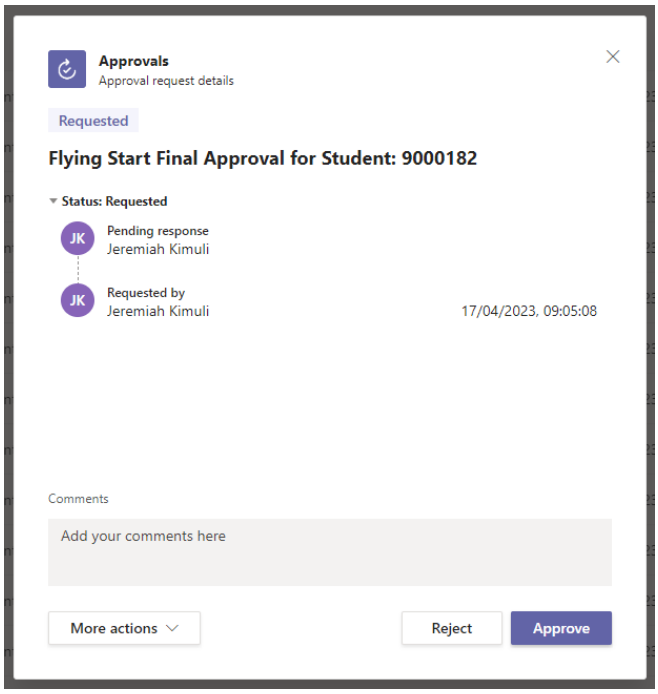


Figure 69: Approval prompt Sent to staff members

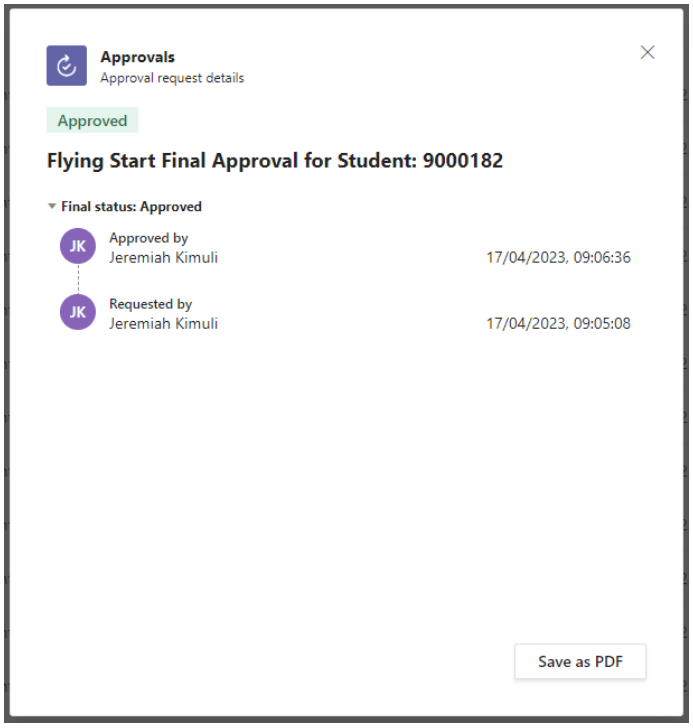


Figure 70: Approval Confirmation Notification

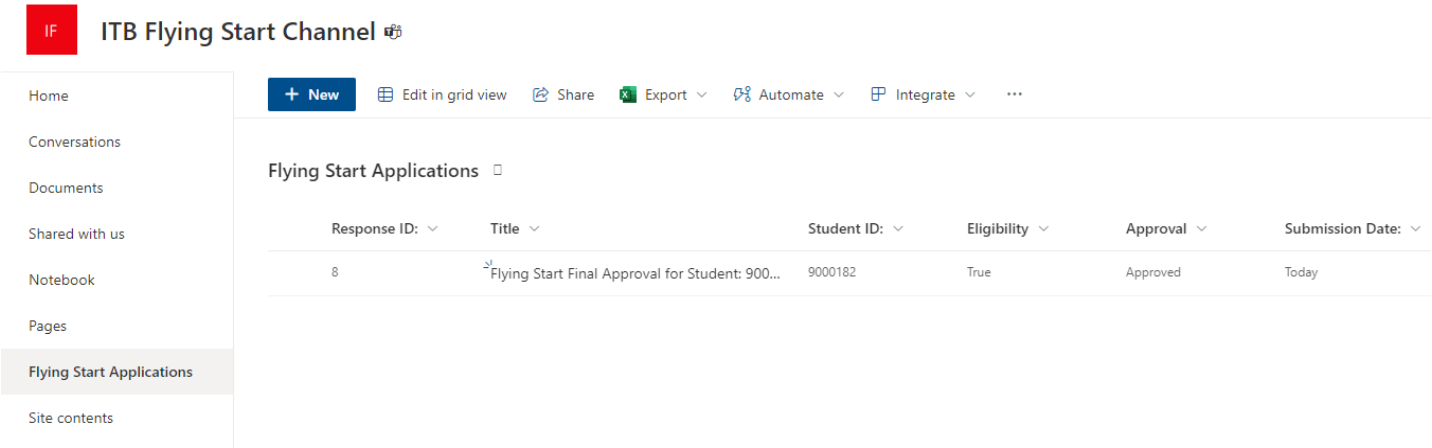
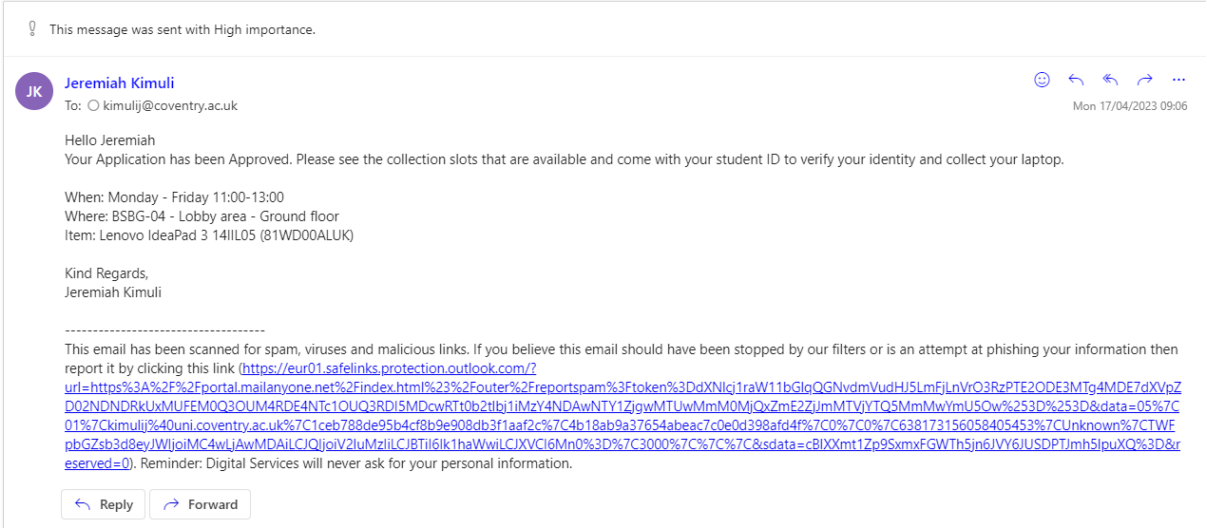


Figure 71: SharePoint repository updated with new application item

ITB Test Student Database

Student ID:	Eligibility	Approval	Laptop Recieved?
9000182	TRUE	Approved	FALSE
9236776			FALSE
9710962			FALSE
9729412			FALSE
9760398			FALSE
9811176			FALSE
9907971			FALSE
9910845			FALSE
9950932			FALSE
9978186			FALSE
9998543			FALSE
9998722			FALSE
9999053			FALSE
9999864			FALSE
9999875			FALSE
9999887			FALSE

Figure 72: Student Repository is updated User Collection



This message was sent with High importance.

JK **Jeremiah Kimuli**
To: kimulij@coventry.ac.uk
Mon 17/04/2023 09:06

Hello Jeremiah
Your Application has been Approved. Please see the collection slots that are available and come with your student ID to verify your identity and collect your laptop.

When: Monday - Friday 11:00-13:00
Where: BSBG-04 - Lobby area - Ground floor
Item: Lenovo IdeaPad 3 14IIL05 (81WD00ALUK)

Kind Regards,
Jeremiah Kimuli

This email has been scanned for spam, viruses and malicious links. If you believe this email should have been stopped by our filters or is an attempt at phishing your information then report it by clicking this link (https://eur01.safelinks.protection.outlook.com/?
url=https%3A%2F%2Fportal.mailanyone.net%2Findex.html%23%2Fouter%2Freportspam%3Ftoken%3DdXNlcj1raW11bGlgQGNvdmVudHJ5LmFjLnVrO3RzPTE2ODE3MTg4MDE7dXVpZD02NDNDRkUxMUFEM0Q3OUM4RDE4NTc1OUQ3RDI5MDcwRTt0b2tlbj1iMzY4NDAwNTY1ZjgwMTUwMmM0MjQxZmE2ZjJmMTVjYTQ5MmMwYmU5Ow%253D%253D&data=05%7C01%7Ckimulij%40uni.coventry.ac.uk%7C1ceb788de95b4cf8b9e908db3f1aaf2c%7C4b18ab9a37654abeac7c0e0d398afd4f%7C0%7C0%7C638173156058405453%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2IuMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C3000%7C%7C%7C&sdata=cBIXXmt1Zp9SxmxFGWTh5jn6JVY6JUSDPTJmh5IpuXQ%3D&reserved=0). Reminder: Digital Services will never ask for your personal information.

Reply Forward

Figure 73: Confirmation Email after Inventory Check is completed

5.6 TESTING

5.6.1 Acceptance Test Case

Test cases were developed using the requirements and user stories previously mentioned as seen in the table below:

Test ID	Test Case	Precondition	Input	Expected Output	Actual Result	Pass/Fail
1	Submitting an application for FSP to receive a laptop	User has access to the application form.	User fills in all the required fields in the application form	Application form is submitted successfully	Expect Output achieved (see **Figure 44**)	Pass
2	Verifying and approving applications	Admin has access to the list of pending applications	Admin clicks on an application to verify and approves it	Application is approved and the user receives an email notifying them of the approval	Expect Output achieved (see **Figure 46**)	Pass
3	Rejecting applications	Admin has access to the list of pending applications	Admin clicks on a prompt to reject application.	Application is rejected and the user receives an email notifying them of the rejection.	Expect Output achieved (see **Appendix**).	Pass
4	Viewing a database of approved, pending and rejected applications	Admin has access to the database of applications	Admin clicks on the appropriate tab to view the database of approved, pending or rejected applications.	The list of applications in the selected status is displayed.	Expect Output achieved (see **Figure 35**).	Pass
5	Receiving an email notification for application approval	User has submitted an application for FSP to receive a laptop.	User's application is approved by an admin	User receives an email notifying them of the approval.	Expect Output achieved (see **Figure 50**).	Pass
6	Receiving notifications for overdue applications	Admin has access to the list of pending applications	One or more applications remain pending for more than a week	Admin receives a notification email with the list of overdue applications on SharePoint.	Expect Output achieved.	Pass
7	Updating the available laptops	Admin has access to the inventory database	Admin updates the inventory count	The inventory count is updated successfully	Expect Output achieved (see **Figure 36**).	Pass
8	Receiving collection details	User's application is approved and a laptop is reserved for them.	N/A	User receives an email with collection details.	Expect Output achieved (see **Figure 21**).	Pass
9	Notifying users of unavailable laptops	User's application is pending and no laptops are available in the inventory	N/A	User receives an email notifying them that laptops are currently not available.	Expect Output achieved.	Pass
10	Booking a suitable collection slot	User has received collection details.	User requests to book a suitable collection slot.	User sees slots available and can reserve a collection slot	User receives an email with collection details.	Fail
11	Ease of use	User or admin accesses the system.	User or admin performs required actions without the need for a system manual or training.	The system is user-friendly and easy to use.	Expect Output achieved.	Pass

Table 8: ALDS Acceptance Test Cases

Although due to project time constraints Test Case 10 wasn't achieved, the system still remained fully functional while meeting requirements.

5.6.2 Final System Run History

As seen in Figure 24 below I have successfully managed develop, run and test the system with no Test Failures.

28-day run history

Edit columns All runs

Start	Duration	Status
Apr 13, 03:56 PM (2 d ago)	00:04:20	Test succeeded
Apr 13, 03:56 PM (2 d ago)	2d 21:09:37	Test running
Apr 13, 03:54 PM (2 d ago)	2d 21:11:13	Test running
Apr 13, 03:54 PM (2 d ago)	2d 21:11:29	Test running
Apr 13, 03:54 PM (2 d ago)	00:00:19	Test succeeded
Apr 13, 03:52 PM (2 d ago)	2d 21:12:59	Test running
Apr 13, 03:51 PM (2 d ago)	00:00:31	Test succeeded
Apr 13, 03:39 PM (2 d ago)	00:00:44	Test succeeded
Apr 13, 03:28 PM (2 d ago)	00:01:23	Test succeeded
Apr 13, 03:22 PM (2 d ago)	00:00:38	Test succeeded

Robustness testing with long durations (e.g. reminders sent when days have past and approvals haven't been submitted).

Figure 74: Final ALDS version's Power Automate Flow-Checker Run History

6. CONCLUSION AND RECOMMENDATIONS

Overall, the design and development of an automated laptop distribution system for Coventry University's Flying Start program for new Information Technology for Business students has shown to answer the main research question **(RQ1)** and it's significant potential for improving the overall learning experience of students. The system has provided an efficient and reliable means for students to access and utilise laptops for their coursework, which is essential in a technology-driven field like ITB. The system has also helped to streamline the distribution process, reducing administrative workload and errors.

This dissertation has presented a comprehensive analysis of the current system and clearly illustrates the need for an automated system but it also raises the question of how that would enhance the distribution of laptops to students, increase efficiency, accessibility and improve the overall student experience. The research employed an agile methodology to design and develop the system, which resulted in a functional prototype that met the requirements and needs of ITB students.

6.1 FUTURE RECOMMENDATIONS:

The current prototype is functional, but there are opportunities for improvement and further development. For instance, the system could be integrated with the university's existing databases and systems to provide more comprehensive student data.

Future research could also focus on the scalability of the automated laptop distribution system to other departments outside of ITB and universities outside the institution. Furthermore based on the results of the study, this can further enhance the student experience by developing similar systems for different departments and offer more course specific resources available through the Flying Start program. Although, the automated laptop distribution system is a valuable tool for ITB students, other faculties may have different needs that can be addressed through the provision of appropriate learning resources. By offering more resources tailored to the specific needs of different departments, the Flying Start program can help to improve the overall learning experience for all students at Coventry University. Moreover, since the system has shown promising results for ITB students, there is also potential to explore the use of emerging technologies such as artificial intelligence and machine learning to improve the system's efficiency and accuracy. However, this would require further research into the specific needs and challenges of other departments and universities as previously mentioned.

6.2 CONTRIBUTION TO THE FIELD:

The research contributes to the field of Information Technology for Business by providing a solution to the distribution problem faced by many universities. As implied in Question 6.3 of the survey, the automated laptop distribution system offers a more efficient and streamlined approach to distributing laptops to students, which improves the overall student experience. The system provides students with easy access to laptops, which is essential for their studies, and reduces the time and effort required to obtain laptops. University staff can also benefit from the system by reducing the workload on administrative staff to increase student engaged as mentioned in the literature review **(Simmons, 2019, pp. 123–128)** as well as improving the management of laptop inventory. The research also highlighted the importance of considering the social and ethical issues in the design and development process, as it has the potential to impact the student's learning experience.

In conclusion, as shown within the descriptive analysis and the testing of the system, the design and development of the automated laptop distribution system has shown potential for improving the learning experience of ITB students. However, further research is needed to assess the system's scalability and to identify the specific needs of other departments and universities. By continuing to prioritise ethical and social considerations, Coventry University can help to ensure that technological solutions in the education sector are designed and implemented responsibly and for the benefit of all students.

7. REFLECTION

Managing the research project effectively played a key role in the outcome of the study and its success. Reflecting on the research process is an opportunity to recognise the achievements and challenges that appeared to appreciate what was learnt. This chapter critically evaluates the experience in terms of the project management, social, legal and ethical consideration and managing feedback.

7.1 CONSIDERATION OF ISSUES

In terms of professional, legal and social terms the research paper considered the duty of protecting the participants' confidentiality. The study considered relevant legislation such Data Protection Act (DPA), 2019 and General Data Protection Regulation (GDPR) to comply with the data privacy requirements. To adhere to the ethical principles, every participant was asked to sign an informed consent form after reading and understanding the information sheet provided. Socially, the research was independent and impartial, respondents were recruited from diverse backgrounds and cultures, which also ensured the integrity and quality of the sample group. Therefore, while addressing these issues it must be taken into account that the user research and the system development were a part of an undergraduate dissertation project – implying that the work was carried out for educational purposes.

7.1.1 Ethical Issues

This study was reviewed and approved through the formal Research Ethics procedure at Coventry University. The study was classed as 'medium' risk because it involved primary data collection from human participants. This meant that the data had to be collected and stored using appropriate tools and methods. For instance, user surveys were hosted online using Online Surveys (JISC) – a survey tool that is approved by the Coventry University. The use of other survey tools (e.g. Google Forms) was not permitted due to the security and data protection concerns.

The project involved the collection and analysis of data from human participants, which raised several ethical issues. First, the research needed informed consent from all participants before collecting any data. This involved providing participants with information about the study, including its purpose and the methods of data collection, and obtaining their agreement to participate voluntarily. Moreover, the data collected from participants was also anonymised to protect their privacy and confidentiality. The use of approved tools and methods for data collection and storage, such as Online Surveys, SharePoint and One Drive, were crucial to ensuring that the data were secure and protected from unauthorised access. The data was used only for the purposes of the study and that the participants' rights were respected throughout the research process. In addition, the selection of quotes and data to be included in the report to ensure that they did not reveal the identities of the participants or compromise their privacy in any way. Overall, the ethical considerations taken were important to ensure that the project was conducted in an ethical and responsible manner.

7.1.2 Professional Issues

The project raised issues around the potential impact of automation on job roles and employment. While automation can provide many benefits in terms of efficiency and productivity, it can also lead to job displacement or changes in work roles. The project team considered these issues and sought to ensure that the developed system complemented, rather than replaced, human work, and that its development would not have negative impacts on employment. Compared to the RPA system mentioned in case study 3 within the literature review this RPA system is a hybrid system in which reduces the workload of staff and displaces them for their focus to be on more important tasks and job responsibilities.

7.1.3 Social Issues

The development of an automated laptop distribution system for the Flying Start Program at Coventry University raises a number of social issues that needed to be carefully considered. In particular, the project had taken into account the potential impact of the system on students' academic performance and success.

As highlighted in the literature review, access to technology is becoming increasingly important in today's society, as more and more services are moving online. However, not all students have equal access to technology, and the digital divide remains a significant issue. As previously mentioned in the results, if the system is not reliable, accessible or user-friendly, students may experience delays in receiving their laptops, which could result in missed deadlines or incomplete coursework which could aggravate existing inequalities in access to technology and hinder their academic progress. Therefore, it was crucial to consider the potential impact of the system on students who may not have access to laptops outside of the program.

Furthermore, the project must consider the potential impact on student engagement and interaction. While an automated laptop distribution system may increase efficiency and convenience, it may also reduce face-to-face interactions between students and staff, potentially leading to a less engaged and connected student body. Therefore, the system was designed in a way that fosters collaboration and communication among students and staff in which students still come in to collect their laptops from faculty staff at a convenient time.

Another social issue that needs to be considered is the potential impact of the system on the university community as a whole. As previously mentioned, the automated system may displace human workers who previously distributed laptops, and decreased morale among staff members. Additionally, if the system is perceived as unfair or biased in any way, it may negatively impact the trust and goodwill of students and staff towards the university.

In summary, the development of an automated laptop distribution system for the Flying Start Program at Coventry University raises a number of important social issues that must be carefully considered. These include access to technology and the digital divide, student privacy, and student engagement and interaction. By addressing these issues and implementing appropriate measures, the system can be designed to provide benefits to students while minimising any negative impacts.

7.1.4 Legal Issues

Several legal issues needed to be considered to ensure that the project was legally compliant. One of the most significant legal considerations is GDPR compliance which outlines the guidelines for the collection, use, and storage of personal data. The project team had to ensure that any personal data used in the project, such as student ID numbers, was collected, processed, and stored in compliance with GDPR regulations. Failure to comply with GDPR can result in significant fines and legal action.

Throughout the course of this project, dummy data was used in the replication of Coventry University's ITB student ID repository to mock and reserve space where real data (Student ID's) are nominally present **(Dummy Data for MYSQL Database, n.d.)**. Moreover, by utilising 'dummy' data where the actual student ID's from the private repository are not being used when developing and testing a system ensures that the project is in alignment with GDPR.

Similarly, the development and development of the Power Automate system for this project raised several professional issues relating to the compliance with relevant data protection legislation and ethical standards. To address this issue, the project team followed ethical guidelines and obtained necessary approvals from relevant bodies to ensure that all data collection and storage adhered to best practice and complied with GDPR regulations.

In summary, to ensure that the project was legally compliant in terms of GDPR and other regulations, appropriate measures were taken to comply with the relevant laws and regulations to avoid any legal issues and potential legal action.

7.2 OVERCOMING CHALLENGES

The project faced various challenges throughout its execution. However, appropriate methods were employed to overcome these challenges, and valuable lessons were learned, resulting in the overall effectiveness of the project.

The table below outlines the challenges throughout the research process, including examples of specific situations and the methods used to solve them:

Challenge	Example	Solution
Time Management	Time taken to perform research and data collection	Creating a project timeline in the Gantt Chart as well as assign daily tasks in Trello with set up deadlines.
Balancing Workload	Other University commitments in parallel being completed without affecting the study.	Utilising Microsoft OneNote and DevOps to create a project backlog of tasks and To-Do Lists.
Gaps in Knowledge	No previous experience using power automate	Utilising YouTube and online learning tutorials, templates and University Library resources.
Supervisor Feedback and Support	Scope of the research not correctly defined	Regular meetings scheduled to receive comments and opinions regarding the current progress of the project.
RAID Management	Managing delays and dependency bottlenecks	Producing and managing a project RAID Log.

Overall, as seen in Table 1 above, the methods and solutions employed to manage the project were appropriate and effective in overcoming the challenges that were encountered. Lessons learned from these challenges included the importance of effective time management, prioritisation, utilising available resources, and seeking regular feedback and support from supervisors. These lessons can be applied to future projects to ensure that they are conducted efficiently and effectively.

7.3 PROJECT MANAGEMENT

The success of any project relies heavily on effective project management. The project management for this dissertation was conducted in adherence to the Power Automate Agile v2 Iterative Project Lifecycle methodology. The project was divided into phases, each with its objectives, deliverables, and timelines.

7.3.1 Tool and Resources:

Effective planning and time management were essential for the success of this project. As such, an initial Gantt chart was used to plan and schedule the project as seen in **the** below. At the end of the project, a second Gantt chart was created as seen in **the figure below.**

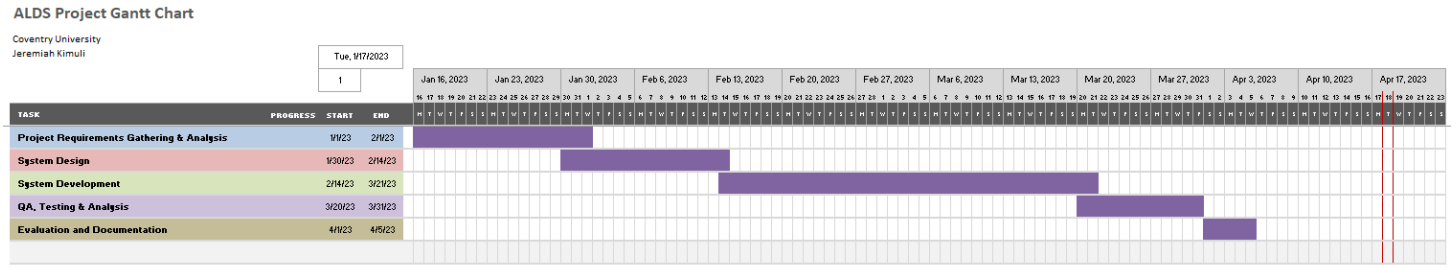


Figure 75: Initial Gantt chart

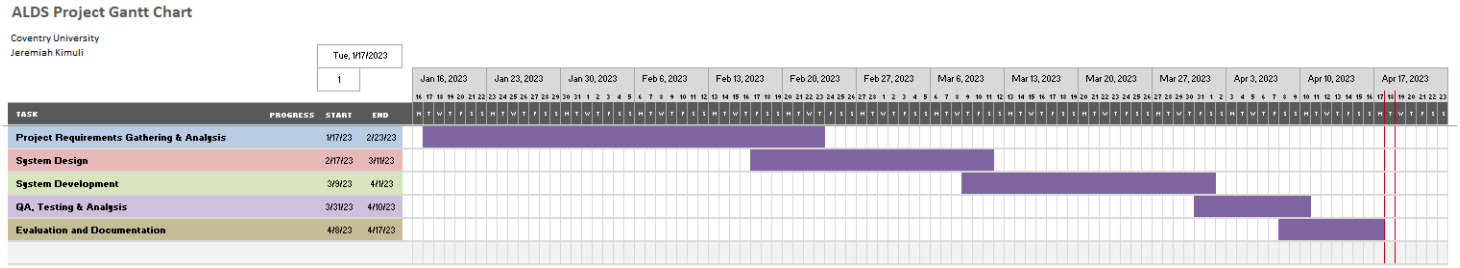


Figure 76: Final Gantt chart

The development of the system followed an Iterative Project Lifecycle approach using Azure DevOps as the project's planning tool (**Figure 54**). The tool provided a centralized platform for task management and improved planning and time management through regular reviews and iterations to ensure that the product met the requirements. DevOps was especially useful in the development phase of the project, allowing for continuous integration and deployment, automated testing, and version control. This allowed for a more efficient development process and ensured that changes were properly tracked and tested. As such, this project management approach ensured that there was effective communication and feedback with the project supervisor throughout the project.

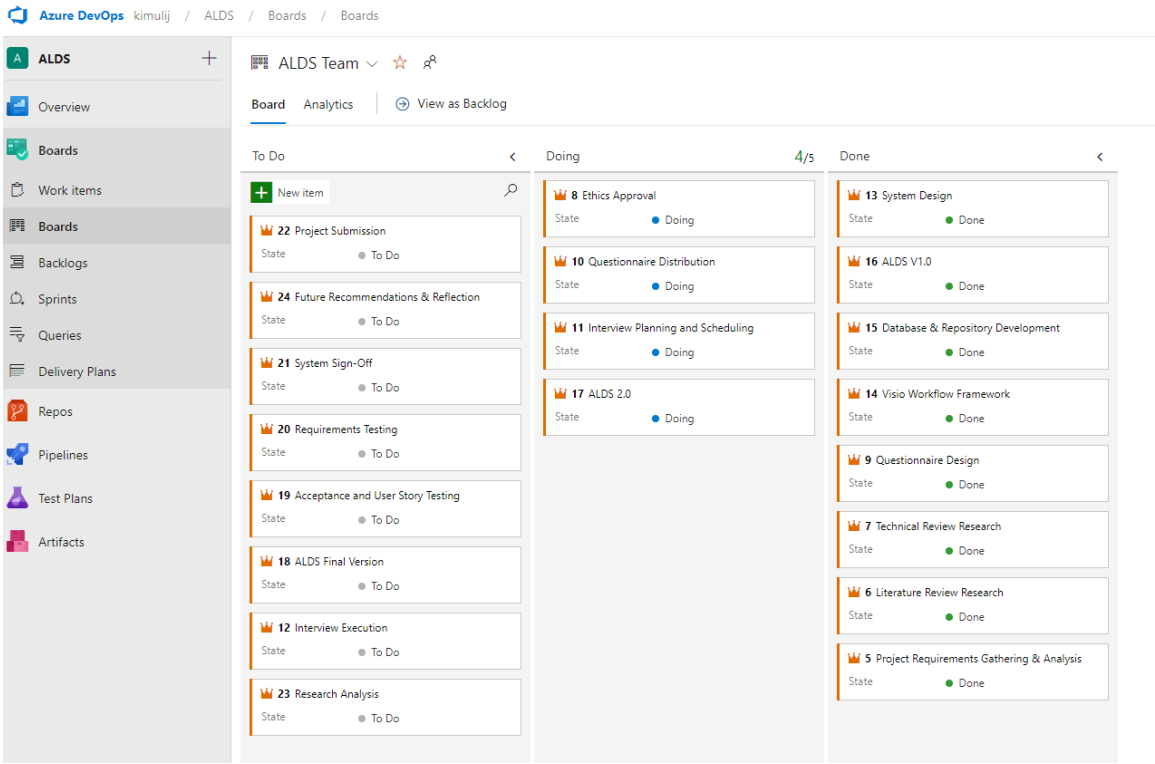


Figure 77: DevOps Task Dashboard

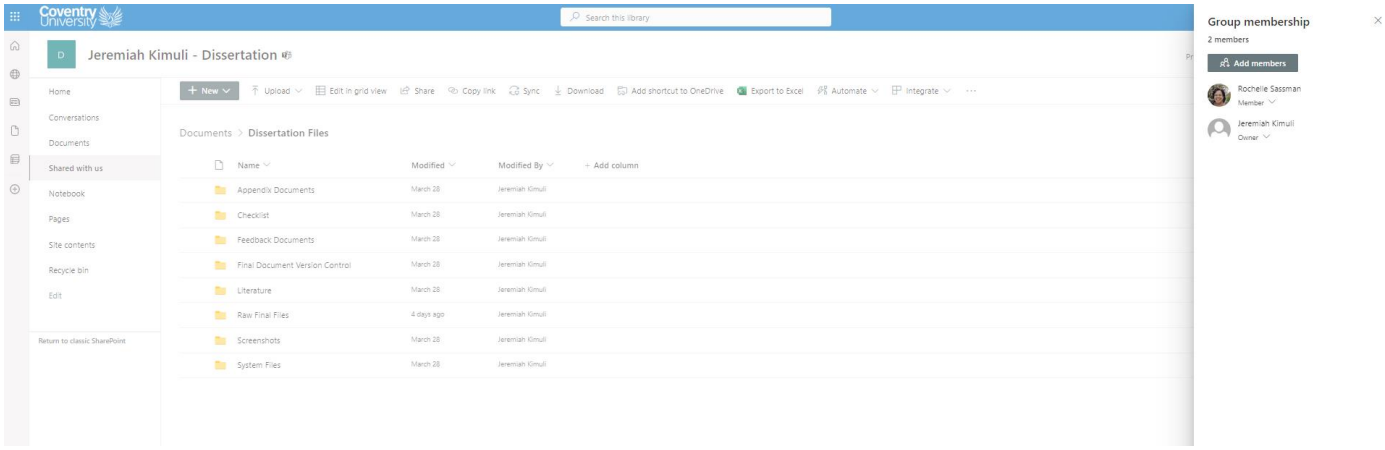


Figure 78: Dissertation SharePoint Repository

SharePoint was also utilised to share project documents and collaborate with my supervisor (**Figure 55**). It allowed us to work together on documents, leave comments and feedback, and share project updates. Additionally, SharePoint's version history feature allowed us to track changes and revisions to the project documents.

7.3.2 Supervision

7.3.2.1 MANAGING FEEDBACK

As mentioned, tutor's feedback was another crucial source for managing the project. Usually, every two weeks of face-to-face meetings with the project supervisor were organised to discuss the progress on the project, receive feedback on tasks completed so far and develop a plan of action until the next meeting. Email correspondence and document comments were also used whenever necessary, in cases of unpredicted issues or discussing simple problems. During each meeting, notes were taken on feedback received on improving current work and points to be covered before the next meeting. The tutor meetings provided me with both types of feedback by receiving detailed comments on my work in three main areas strengths, weakness and area for improvement. Positive feedback was also given in terms of the potential contribution in research gaps. All the actions points were implemented in the report and it was appreciated how they benefited the overall research process.

Feedback Table

The supervisor's feedback was an essential aspect of the study, and regular meetings were scheduled to ensure that the project was progressing in the right direction. By making use of comments and feedback during the meetings, a checklist with issues and the steps necessary to solve them was developed. This helped to prioritise the tasks, balance the workload and set milestones to be achieved before the next meeting, which also prevented deadlines being missed and procrastination.

Below are key feedback points made during the course of the research:

Feedback Point and Areas of Improvement	Action Plan
Clear Research Question Scope	Branching out the main research question into 3 additional sub questions to justify the solution and how it fits the scope of the project research.
Structuring the Report	Numbering the headings and subsections making sure that the structure flows.
Questionnaire and Survey Design	Utilising previous experience from past modules in order to make use of the JISC platform which is compliant with GDPR regulations outline in the Ethics Document.
Power Automate Workflow	Utilising online learning materials and YouTube tutorials to successfully develop the system.
Project Management Methods Applied	Evaluating the project's management and tools used and how effective they were as well as areas of improvement.

Table 9 Supervisor Feedback

Figure 98: Dissertation SharePoint RepositoryTable 9 Supervisor Feedback

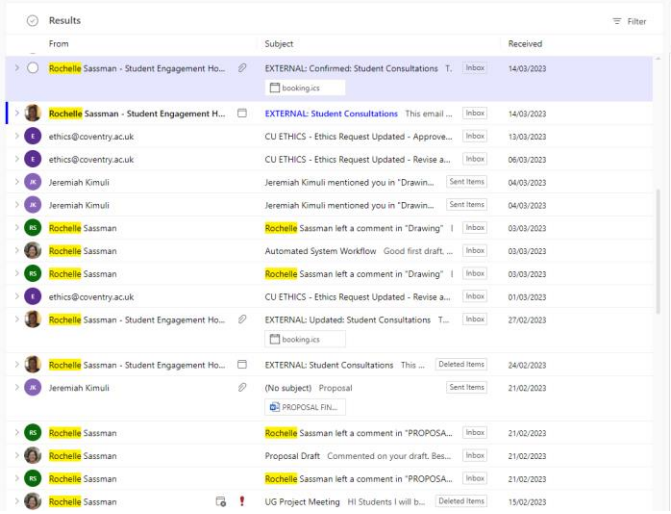


Figure 79 Project Interaction Log with Supervisor

As previously mentioned **Figure 55** above, shows the continuous engagement with the supervisor and how it was critical throughout the dissertation project. The feedback received was structured, specific, and actionable, and it was followed up with an action plan to address any issues that arose. The supervisor's input and advice were invaluable in guiding the project in the right direction, project's objectives were met and ensuring that it remained focused and within scope while delivering it to a high standard. As seen in the table above, the project received several comments regarding the research question scope, report structure, questionnaire/ survey design, Power Automate Workflow, and project management methods applied. Overall, the project's engagement with the supervisor was critical in ensuring that the study responded to and reflected on feedback by outlining specific action plans to address the areas for improvement identified.

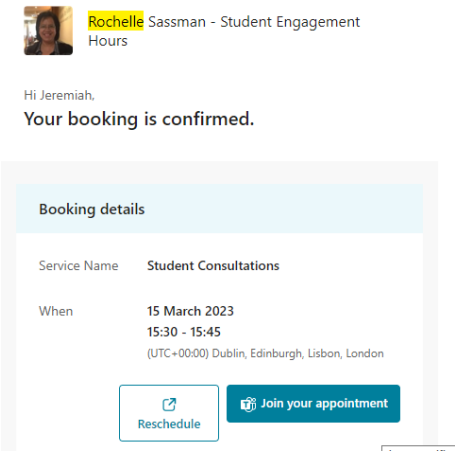


Figure 80: Supervisor Consultation Bookings

Regular student consultations were booked to update the supervisor on the progress of the project and to receive feedback on any issues encountered as seen in Figure 54 above. Microsoft SharePoint was used to also share project documents, and the supervisor provided comments on these documents, which were incorporated into the final report.

In conclusion, effective project management was essential for the successful completion of this dissertation. The adherence to Iterative Project Lifecycle methodology ensured that the project was well-planned, well-executed, and completed on time. Although the PESTEL framework was considered, due to the scope of the project the consideration of social, professional, legal and ethical issues were better suited and were crucial in the project planning and management, and the engagement with the supervisor ensured that the project was of high quality and met all the requirements.

7.4 CRITICAL EVALUATION

The project was conducted using appropriate methods to manage the project, and there were several lessons learnt during the process. However, the effectiveness of the experience could have been improved with better planning and organisation.

During the project, several lessons were learnt, including the importance of effective organisation and planning. Although, due to the project's scale more detailed planning, particularly in terms of project timelines and task delegation would've been beneficial, various project management techniques were utilised to ensure that the work was completed in a timely and organised manner. For example, a Gantt chart was developed to outline the project timeline and ensure that each task was completed within the specified time frame.

Additionally, regular check-ins were conducted to monitor progress and adjust the project plan as necessary. As such, the methods employed to manage the project were appropriate given the scope and resources available as well as the feedback received. The use of convenience sampling and distribution of the survey through various online platforms and physical copies was a reasonable approach to reach a diverse group of participants. The development of the Power Automate system was also well executed, with the system meeting the intended objectives.

Reflecting on the experience, it became evident that the project management techniques employed were appropriate and effective for managing a project of this scope and scale. However, it is also apparent that as the sole researcher, there were limitations to what could be accomplished within the given timeframe.

A key lesson learned from this experience is the importance of delegation and seeking support from others when working on complex projects. Although the project was completed successfully, it is clear that having additional resources and support would have made the process smoother and more efficient. Overall, while the project management methods were appropriate and effective, the experience highlighted the need for collaboration and support when working on large-scale research projects.

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APPENDIX A: ETHICAL APPROVAL

Certificate of Ethical Approval

Applicant:	Jeremiah Kimuli
Project Title:	The Design and Implementation of an Automated Laptop Distribution System for New Information Technology Management (ITB) University Students

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:	30 Mar 2023
Project Reference Number:	P148581

APPENDIX B: ONLINE DISTRIBUTED QUESTIONNAIRE

statement, and that you consent to participate in this research.

Thank you for taking the time to participate in this survey. Your input is greatly appreciated and will contribute to the development of an effective and accessible automated laptop distribution system in the Flying Start Programme.

Please read above and confirm at all 4 conditions apply.

Please select at least 4 answer(s).

- ☐ I have read and understood the above information.
- ☐ I have understood that my responses will be anonymous, therefore it will not be possible to withdraw them from the research data collected once the survey has been completed.
- ☐ I confirm that my age is 18 or over.
- ☐ I agree to participate in this Survey.

Key Terms

IMPORTANT: Welcome to the key terms page of this survey. This page contains important definitions of key terms and concepts that will be used throughout the survey. We understand that some of the language used in the survey may be technical or unfamiliar, so we have provided these definitions to help ensure that everyone understands the questions being asked.

Flying Start Programme (FSP): Scheme that offers the essential materials and resources tailored to meet the students needs for their specific courses and to help them get started straight away, at no extra cost.

Automated Laptop Distribution System (ALDS): An automated laptop distribution system refers to a system where laptops are distributed to users automatically, without the need for human intervention.

ITB: BSc Information Technology and Business Degree

Section 2: Demographic Information

NOTE: Welcome to the Demographics section of this survey. The information collected in this section will help in the understanding the characteristics of survey participants, such as their age, gender, education level, and employment status. This information is important for us to analyse the survey results accurately and draw meaningful conclusions. Rest assured that all responses in this section will be kept confidential and will only be used for research purposes. Thank you for your participation in this survey and taking the time to provide us with your valuable feedback.

What is your gender? ✱ *Required*

More info

- Male
- Female
- Non-binary
- Prefer not to say

What degree/course do you currently study at Coventry University? ✱ *Required*

More info

- BSc Information Technology for Business
- BSc Information Technology Management
- Other

Other Relevant Course (please specify):

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What is your current stage of study at Coventry University? ✱ *Required*

More info

- Foundation Year
- First Year
- Second Year
- Placement / Study Aboard
- Final Year
- Postgraduate / Masters
- Other

Please specify (e.g. gap year):

What is your current employment status? ✱ *Required*

More info

- Employed Full-Time
- Employed Part-Time
- Self-employed
- Unemployed
- Other

Other (please specify):

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Please select where appropriate: I am enrolled as a... *Required*

More info

- UK University Student
- International University Student
- Other

Other (please specify):

Section 3: Perceptions of Current Flying Start Programme & Laptop Distribution

NOTE: In this section of the survey, we will ask you to provide your level of agreement or disagreement with several statements related to the Flying Start Programme and the proposed automated laptop distribution system. Please read each statement carefully and select the option that best reflects your opinion. Your responses will provide valuable insight into how the implementation of an automated laptop distribution system may impact the accessibility and efficiency of the laptop distribution process and the overall experience of Information Technology for Business students in the Flying Start Programme.

How important would the following be? ✱ *Required*

	Not at all important	Slightly important	Moderately important	Very important	Extremely Important
Receiving a laptop provided by the Flying Start Programme be on your academic performance?	☐	☐	☐	☐	☐
Having access to online resources and learning platforms to support your studies?	☐	☐	☐	☐	☐
Efficiency and accessibility in receiving a laptop through the Flying Start Programme?	☐	☐	☐	☐	☐

Receiving regular updates and communication about the progress of the Flying Start Programme application status?					
Opportunities for feedback and suggestions to improve the Flying Start Programme and laptop distribution system?					

Please provide your level of agreement or disagreement with the statements below related to the Flying Start Programme and the proposed Automated Laptop Distribution System. ✱ *Required*

More info

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
"Prior to taking this Survey, I was very knowledgeable and aware of the University's Flying Start Programme and what it has to offer?"					
"I know where to go if I require support regarding the Flying Start Programme?"					

“Communication and accessibility to the relevant University/ Flying Start staff and course directors regarding the programme has been efficient?”					
“Implementing an automated laptop distribution system is a necessary improvement to the current laptop distribution process.”					
“The proposed automated laptop distribution system would have a positive impact on my overall university experience.”					
“If the process of getting a laptop through the Flying Start Programme was automated, I would be more likely to apply for one."					

In your opinion, what are the most important factors to consider when evaluating the success of the Flying Start Programme and laptop distribution system? *

9 / 16

Required

More info

Section 4: Laptop Distribution and Usage

NOTE: This section aims to gather information about the importance of receiving additional support resources such as laptops for your course, the types of devices you primarily use for your studies, and how often you use a laptop for your studies. We are also interested in the types of activities you typically perform for your studies and we would like to know how important the accessibility and efficiency of receiving a laptop through the programme is to your overall studies. Your responses will help us better understand your needs and preferences, and will inform our efforts to improve the provision of resources and support for our students. Thank you for taking the time to participate in this survey.

What type of device do you primarily use for your studies? ✱ *Required*

More info

- Laptop
- Desktop
- Tablet
- Smartphone
- Books / Library Resources
- Other

Other, (please specify):

How often would you say you currently use a laptop for your studies? ✱ *Required*

More info

- Daily
- Several times a week
- Once a week
- Rarely
- Never

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What types of activities do you typically perform on your laptop for your studies and how regularly? ✱ *Required*

	Never	Rarely	Regularly	Frequently	Very Frequently
Word processing (e.g., Microsoft Word, Google Docs)					
Spreadsheet (e.g., Microsoft Excel, Google Sheets)					
Presentation software (e.g., Microsoft PowerPoint, Google Slides)					
Web browsing (e.g., Google Chrome, Safari)					
Email					
Coding/Programming					
Research					
Assignment Submissions					
Media / Design					

If you use your laptop for other activities not mentioned in the table above, please specify here...

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Section 5: Feedback on Proposed Automated Laptop Distribution System

NOTE: This section aims to gather feedback from participants regarding the proposed automated laptop distribution system. Your answers will help us to identify the key features that students value when using/ interacting with a laptop distribution system, and assess the potential benefits and drawbacks of an automated laptop distribution system.

What features do you think are missing from the Flying Start Programme's current manual system? ✱ *Required*

More info

Please select at least 1 answer(s).

- ☐ Faster distribution and student application form processing times
- ☐ More flexible pick-up options
- ☐ More detailed information about the laptop's specifications/uses and what students are entitled to
- ☐ Other

Other (please specify):

What features would you expect from a new automated laptop distribution system for the Flying Start Programme? (Select all that apply) ✱ *Required*

More info

Please select at least 1 answer(s).

- ☐ Quicker and efficient student application processing time
- ☐ Easier-to-use online system

- [ ] Ability to track the status of your application through automated reminders, updates or notifications (via text or email)
- [ ] Convenient and flexible pick-up locations and times
- [ ] Greater transparency and communication throughout the application process (e.g access to support)
- [ ] Other

Other (please specify):

What do you think are the potential major drawbacks of an automated laptop distribution system? *Required*

More info

- [ ] Reduced personal interaction with university staff
- [ ] Increased reliance on technology, which may cause delays or technical issues
- [ ] Potential security risks associated with online application and distribution
- [ ] None
- [ ] Other

Other (please specify):

Do you have any additional comments or suggestions about the proposed automated laptop distribution system? Please provide any feedback you have, positive or negative, that could help us to improve the system? (If not please answer "None") *Required*

More info

Section 6: Thank You

Thank you for taking the time to complete this survey. Your feedback is greatly appreciated and your responses will help us to improve the Flying Start Programme and develop a laptop distribution system that meets the needs of Coventry University's Information Technology for Business students. Your feedback is valuable to us, and we appreciate your participation in this survey. If you have any further comments or suggestions, please feel free to contact us.

APPENDIX C: INTERVIEW AND SURVEY CONSENT FORM

Written Interview for Flying Start Admin Support Staff/Facilitators: Understanding the Role and Impact of Support Staff in Student Success

1. **PARTICIPANT INFORMATION STATEMENT:** Designing and Implementing an Automated Laptop Distribution System using Power Automate to Improve Accessibility and Efficiency in the Flying Start Programme for Information Technology for Business Students.

The purpose of this research is to investigate the potential impact of implementing an automated laptop distribution system in Coventry University's Flying Start Programme, specifically for Information Technology for Business students. The goal of this system is to improve accessibility and efficiency in the laptop distribution process, and your participation in this written interview is essential to achieve this aim.

You have been selected to participate because you are currently enrolled in the Information Technology for Business course at Coventry University. Your participation in this Written Interview is voluntary, and you can opt-out at any time by closing the browser window. If you decide to take part, please answer the following questions honestly to the best of your knowledge and experience.

The written interview will take approximately 10 minutes to complete, and there are no incentives or penalties for participating or not participating. Your answers will be treated confidentially and the information you provide will be kept anonymous in any research outputs or publications. Your data will be held securely, and all data will be deleted by the 5th of April.

Please note that this research was granted ethical approval by Coventry University's Research Ethics Committee P148581. If you have any questions or concerns about the research, please contact the lead researcher, Jeremiah Kimuli, at kimulij@coventry.ac.uk. If you have any enquires or concerns that cannot be resolved through the lead researcher or supervisor, please contact ethics.uni@coventry.ac.uk.

By proceeding, you indicate that you have read and understood this participant information statement, and that you consent to participate in this research.

Thank you for taking the time to participate. Your input is greatly appreciated and will contribute to the development of an effective and accessible automated laptop distribution system in the Flying Start Programme.

Name: Date:

Role/ Position: Signed:

APPENDIX D: WRITTEN INTERVIEW QUESTIONS

Written Interview for Flying Start Admin Support Staff/Facilitators: Understanding the Role and Impact of Support Staff in Student Success

1. **PARTICIPANT INFORMATION STATEMENT:** Designing and Implementing an Automated Laptop Distribution System using Power Automate to Improve Accessibility and Efficiency in the Flying Start Programme for Information Technology for Business Students.

The purpose of this research is to investigate the potential impact of implementing an automated laptop distribution system in Coventry University's Flying Start Programme, specifically for Information Technology for Business students. The goal of this system is to improve accessibility and efficiency in the laptop distribution process, and your participation in this written interview is essential to achieve this aim.

You have been selected to participate because you are currently enrolled in the Information Technology for Business course at Coventry University. Your participation in this Written Interview is voluntary, and you can opt-out at any time by closing the browser window. If you decide to take part, please answer the following questions honestly to the best of your knowledge and experience.

The written interview will take approximately 10 minutes to complete, and there are no incentives or penalties for participating or not participating. Your answers will be treated confidentially and the information you provide will be kept anonymous in any research outputs or publications. Your data will be held securely, and all data will be deleted by the 5th of April.

Please note that this research was granted ethical approval by Coventry University's Research Ethics Committee P148581. If you have any questions or concerns about the research, please contact the lead researcher, Jeremiah Kimuli, at kimulij@coventry.ac.uk. If you have any enquires or concerns that cannot be resolved through the lead researcher or supervisor, please contact ethics.uni@coventry.ac.uk.

By proceeding, you indicate that you have read and understood this participant information statement, and that you consent to participate in this research.

Thank you for taking the time to participate. Your input is greatly appreciated and will contribute to the development of an effective and accessible automated laptop distribution system in the Flying Start Programme.

Name: Date:

Role/ Position: Signed:

The purpose of this Written Interview is to gain insights into your experiences as a Flying Start support staff or facilitator, and to better understand your role in supporting new students. Your feedback will help to inform my research project, which aims to investigate how the Flying Start program can be improved to better support new students during their transition to university. The interview questions have been designed to explore your perceptions of the program, the challenges you face in your role, and your suggestions for improvement. Your honest and thoughtful responses are greatly appreciated and will be kept confidential.

1. Could you tell me about your experience working with the Flying Start program?

2. What do you believe are the main goals and objectives of the Flying Start program?

3. What do you think is the current level of student satisfaction with the Flying Start Programme and why?

4. What do you believe are the biggest challenges facing students during their transition to university life?

5. What kind of support do you provide to students during their transition to university life through the Flying Start program?

6. In your opinion, does Flying Start Programme address the needs of students from diverse backgrounds and international students? If yes, how does it address these needs? If not, what changes or improvements would you suggest to better meet the needs of these students?

7. Describe **three** things that you **like** about the current Flying Start Programme and **three** things you may **not like** and why?

8. Are there any features that you think should be added to the Flying Start Programme's resource provision system to better prepare incoming students?

9. Are there any logistical or administrative issues with the current implementation of the Flying Start Programme? If yes, please specify.

10. How do you think the use of an automated laptop distribution system will impact the overall satisfaction and experience of ITB students specifically in the Flying Start Programme?

11. Are there any potential challenges and limitations of implementing an automated laptop distribution system in Coventry University's Flying Start Programme?

12. Do you believe the implementation of this system would also benefit staff members and if so, how? If not how could such a system factor this in?

13. Considering the scope of the research being centred around just ITB students & laptop provision, are there any other areas within the Flying Start Programme that would benefit having an automated system in place?

14. Is there new initiatives or developments in the Flying Start program that you are currently working on?

15. How do you see the Flying Start program evolving in the future, and what role do you believe it will play in supporting students at Coventry University?

16. Do you have any additional feedback or suggestions for improving the Flying Start program?

By sending back responses to these questions I confirm that my age is 18 or over. I agree to participate in this interview questionnaire. I have read and understood the above information. The data collected will be used solely for research purposes only.

APPENDIX E: INTERVIEW TRANSCRIPT

0:0:0.0 --> 0:0:2.230
Jeremiah Kimuli
Sorry, what was the question again? Sorry.

0:0:11.560 --> 0:0:11.730
Jeremiah Kimuli
I.

0:0:2.760 --> 0:0:35.470
Dal Badesha
So maybe if you want just a little bit of a a background on flying start why it was formed and what was the original aims of the scheme. So flying Start was created back in 2012. That was when the fees went up. So originally the fees were 3000 and then they they they increase significantly. So Coventry University wanted to make sure that students were supported.

0:0:35.740 --> 0:1:5.800
Dal Badesha
Uh, so that they had a great student experience and that we could minimize any of the hidden cost to their education. So This is why this scheme came place and it was really to make sure that anything that was essential to the course. So anything that's supported and facilitated pedagogy of the course, but providing items that were critical to learning goals would be provided by this scheme.

0:1:6.960 --> 0:1:12.170
Dal Badesha
So hopefully we're hoping obliged obviously to achieve student satisfaction.

0:1:13.330 --> 0:1:42.440
Dal Badesha
A kind of attainment and progression as well. So see all of that goes hand in hand. And so they were the main aims of this scheme and and the items that were then decided that we deliver was we worked closely with the course teams and it was Peter was deemed as essential to the course. So majority of that was of course essential reading. So reading aligned to those.

0:1:42.560 --> 0:1:58.870
Dal Badesha
And she modules that the courses would be using and delivery in their teaching. And then of course it depended very much on the discipline. So if you're course didn't really require so much reading materials but required other.

0:2:0.180 --> 0:2:25.210
Dal Badesha
Items which we we call our kind of non book element which a lot of the some of the courses might need Phil clips like geography for example and the course teams decided on that and then it was created in there but bundle we refer to so that's kind of how it was formed and then really the the logic behind flying start.

0:2:26.80 --> 0:2:27.0
Dal Badesha
That that helps.

0:2:27.430 --> 0:3:0.180
Jeremiah Kimuli
Yeah, I find that very interesting because the implementation of the Flying START program I I like I said from my own personal experience for IT. I had a couple modules where I currently have a Mac book, but I have the module called Linux. So it's basically where there's a certain operating system that I needed to be able to do a certain module of face Flying START program. I was able to get a Windows laptop which I was able to complete my module.

0:3:0.430 --> 0:3:24.570
Jeremiah Kimuli
So from small things like that, I realized how it essential the flying start program is and how it could be beneficial for different students all over the campus from various backgrounds or palatial situations, or if it international students. So I thought the accessibility of such a program is very fundamental for our university versity.

0:3:25.170 --> 0:3:55.650
Dal Badesha
Yeah, absolutely. And you year the nail on the head because it is one of the other aims is is really those widening participation targets. So ensuring that there's parity across all courses regardless of whether it's socioeconomic backgrounds or so that all students have the same fair access to everything that was provided within those essential resources. So thank you for that positive feedback. It's always good to hear that's what we're achieving some.

0:3:56.220 --> 0:4:17.730
Dal Badesha
Where are you to provide and it might be worth mentioning at this point I start program is currently under review, so the Dean of students is leading on a review with their kind of main stakeholders and we're looking at are we still hitting those targets that we originally set out to achieve.

0:4:18.100 --> 0:4:33.540
Dal Badesha
And is what what we're providing, you know, relevant still to students. And you know, how can we provide students with a the best value for for their courses. So that's something that's currently even to going at the moment.

0:4:33.970 --> 0:4:36.240
Jeremiah Kimuli
It seems like all for it's allowed in some.

0:4:35.960 --> 0:4:38.120
Dal Badesha
Yes, absolutely, yeah.

0:4:38.770 --> 0:4:49.840
Jeremiah Kimuli
So I I'd like to quickly ask, could you tell me about your own personal experience working with the program? I like to know like the experience from the staff perspective really.

0:4:50.820 --> 0:4:55.530
Dal Badesha
And my personal experience, I've been with this problem for quite some time without both of us are.

0:5:15.680 --> 0:5:16.70
Jeremiah Kimuli
Dal.

0:5:21.800 --> 0:5:22.190
Jeremiah Kimuli
Wow.

0:4:55.610 --> 0:5:26.140
Dal Badesha
OK. And it's just very rewarding and it's the whole program is dynamic in that one year is never like the other. When I first started flying start, we were delivering textbooks and the majority of what we we delivered from the library side was was physical textbooks. So again we we could be talking up to 50,000 to textbooks that were delivered for the first two weeks of teaching to students.

0:5:26.240 --> 0:5:56.790
Dal Badesha
Well, on the flight start, we'll see. So it's logistically it was a huge operation and and that slowly progressed now. So luckily before COVID we put we transition to ebooks. The library has an ebook first policy, and we find that they're they're a lot more flexible in for students a you don't have the rights of those books to carry around. And you can kind of select what you want. You can make notes in them. So there was a lot to be said for ebooks.

0:5:56.890 --> 0:6:29.40
Dal Badesha
And in general, that's the whole how the whole set to is moving. Luckily we have that all in place before the pandemic hit and so Coventry University were in a really good place where you're activate it was as far as the resources were concerned, we had quite a few of the universities asking us, did you have a crystal ball? How did you know this was going to happen? The You were able to provide all your resources, but you know electronically. So that was great for students. And we had a lot of positive feedback.

0:6:29.130 --> 0:6:40.680
Dal Badesha
Yeah, from courses and students who are able then to to access items like offline and on via the Bibliu platform that we're using at the moment. So.

0:6:40.760 --> 0:6:41.160
Dal Badesha
With.

0:6:41.320 --> 0:7:12.150
Dal Badesha
Umm. And I think what's most rewarding of this role is when we get students who come and feed back to us and say, you know, we would not be able to afford this in. We weren't provided with with the books that you you give us and this comes out from the in our surveys that we conduct every year, we have a very similar start year on year that can't really bolsters that, but that students wouldn't really be able to afford all their sensual resources.

0:7:12.270 --> 0:7:42.520
Dal Badesha
If they have to, then go and buy them. So when I say we provide them, they're not free because this is something sometimes people kind of get a bit confused as to or we give out free books. These all are part of part of your course schemes. So you pay course fees and it's it's a service that we provide to you as part of that. But in saying that, it doesn't happen in all universities. So you know you could be going to another university and they won't get the same and we.

0:8:9.970 --> 0:8:10.320
Jeremiah Kimuli
Yes.

0:7:42.690 --> 0:8:12.830
Dal Badesha
But again, we're really fortunate to film a video with some of our students a few years back. I work during that kind of transitioning process and we selected students from each faculty and very much allowed them to put the dialogue on it themselves. We just asked a couple of questions and we it wasn't scripted or anything, and it's lovely. I mean, we we could send you the link to that to this. So you can have a look, but it was just really.

0:8:13.240 --> 0:8:45.450
Dal Badesha
Rushing to hear what they had to say in their own words. And again, that message was quite clear that they really appreciated the resources and that's some of their friends didn't get the same who went to the universities, but at the same time we can't be complacent. We need to keep working on it and make sure that are we actually giving what students need and at each stage of the journey with within the university. So we want to kind of capture the initial start with your.

0:8:45.540 --> 0:9:3.590
Dal Badesha
Because study skills right up until like you, you do need to station now what? What resources do you really need throughout the whole journey? So that's something we're continually working on and I think having student feedback is a, you know, the best way to to credible and really.

0:9:4.10 --> 0:9:4.540
Jeremiah Kimuli
Yeah.

0:9:5.450 --> 0:9:5.950
Jeremiah Kimuli
Thank you.

0:9:5.720 --> 0:9:6.110
Dal Badesha
And.

0:9:7.100 --> 0:9:36.980
Jeremiah Kimuli
UMI think touching on the COVID uh pandemic period like you said it, it must have been a tough time because for me I was on placement so I I really wasn't in the university or studying around that time so I I don't really have a personal experience per say but I would like to ask like compared to periods like then and now how would you say what kind of support did you provide that to students coming in.

0:9:37.80 --> 0:9:49.890
Jeremiah Kimuli
During the transition period that from the of, let's say college to very uni life and how did the flight start support this process during the beginning stages?

0:9:50.950 --> 0:10:20.200
Dal Badesha
So obviously students get a wealth of support across the university, but a flying start in particular. This I I would say that again, that's another purpose for this scheme. So they have a students have a wealth of resources within the library catalog locate. So we have all the titles to read around your subject thousands and thousands of ebooks that are sit in locate and databases and journals but.

0:10:42.480 --> 0:10:42.940
Jeremiah Kimuli
Yeah.

0:10:20.470 --> 0:10:50.640
Dal Badesha
What sets the flying Star text apart from that is that very important picking up when, when, when students have arrived at university, what's your first step into reading your first step? Kind of that introduction to all the introductory titles, that introduction too. This is my little friend or whatever it might be. So that would be that the the first step and then once you've kind of got those essential titles on board.

0:11:7.640 --> 0:11:8.100
Jeremiah Kimuli
Yeah.

0:10:50.700 --> 0:11:10.710
Dal Badesha
You then go into the library catalogue and do your reading around the subject, so if that's, I would say that's how we we supported students. So it's kind of making sure they've got that. It sounds like a call later to say, but that flying start to their to their course. So that that's kind of where it sits.

0:11:12.210 --> 0:11:12.710
Jeremiah Kimuli
Yeah.

0:11:12.660 --> 0:11:27.720
Dal Badesha
I think as well and she said they see we we do go out when students actually arise university and we go out and give demonstrations. So we'll go to lectures and demonstrate how to use bibliu. So we're supporting students there as well and we send me emails.

0:11:28.460 --> 0:11:28.760
Jeremiah Kimuli
Uh.

0:11:28.420 --> 0:11:34.570
Dal Badesha
Regarding all the different links to all the the video tutorials and things like that as well.

0:11:35.200 --> 0:11:39.390
Jeremiah Kimuli
Yeah, I would say from my personal experience per say.

0:11:39.640 --> 0:12:0.100
Jeremiah Kimuli
Ohm, I feel like there might need to be a a difference system in a place because you see how you join university and there's a whole collage of emails that like you you didn't know existed in the 1st place. So I think kind of becomes a whole bundle. So I'm trying to see how we can.

0:12:0.620 --> 0:12:30.680
Jeremiah Kimuli
Uh, separate the flying start per say, from just sending an e-mail notification or just making sure like on our law on or some sort of way that the flying start is always a visible, accessible program for students to see. Old this can help me start university this way per se because when I started like I said I only found out in my 4th year of university. But I wouldn't say it's your fault.

0:12:48.820 --> 0:12:49.170
Dal Badesha
Yeah.

0:12:30.750 --> 0:12:53.790
Jeremiah Kimuli
I see, but it's a. It's a thing where I I want. I don't want students to be in the same situation where

they're not able to find out of such an amazing program that the only find out later on because I feel like if I knew about it from the start, it would have been so beneficial for me to do it. Yeah, increase my uni satisfaction as a student.

0:12:54.530 --> 0:13:25.180
Dal Badesha
Yeah, that's a really good point that you make. Would like services we we try to be involved in the welcome week. But again as you pointed out, there's so much for a student to take on board. So any kind of inductions or anything in those early weeks there's it's an overload of information. So yeah, I I do agree there needs to be something and that's why we we keep our onboarding sessions to until a couple of weeks in and then we liaise with the modular leaders and say well, can we come in?

0:13:25.280 --> 0:13:54.910
Dal Badesha
Do you module and and deliver the training just a quick 15 minutes though we don't. We wanna keep that attention span, but if there's something more automated, I I completely agree. And we were working with the outlook team and trying to get links in and as a team we kind of try and put the links into the relevant books at the beginning of the module. So again liaising with the module leads will say well, can we, so you've selected this title for this model you delivering.

0:14:4.940 --> 0:14:8.950
Jeremiah Kimuli
Yeah, yeah.

0:14:20.440 --> 0:14:21.130
Jeremiah Kimuli
Yeah.

0:13:55.370 --> 0:14:24.620
Dal Badesha
Before we started, can we just promote that to the top of your module page so students have that there at all times, but again, not all courses are the same. So if you have non book items as you did and you weren't informed about those or you didn't know, then yeah, you you know you, you you do lose out by not having access to that. So you know automated system would would be great and we had previously when we had a different system called Moodle.

0:14:25.300 --> 0:14:56.10
Dal Badesha
You had your course landing pages and we had a link on there which it was just a button that said blind start. So you clicked it and it took you straight into the list of items selected for your course. So it would have said, you know, these are these are the list. Here's your Chromebook or whatever it was that you got and and it would have informed you on that. So I do believe that it's some sort of automated system would be great and more so than what we've got now.

0:15:2.510 --> 0:15:2.860
Jeremiah Kimuli
Yeah.

0:14:56.120 --> 0:15:7.190
Dal Badesha
You try to kind of get in where whenever we hear something's happening, we kind of say we want to be part of that, but it's not always possible. But yeah, you can come up with something that would be great.

0:15:7.690 --> 0:15:17.620
Jeremiah Kimuli
Yeah, don't. What do you what do you believe is the biggest challenges for students during this transition period from that, would you say that?

0:15:19.0 --> 0:15:25.920
Dal Badesha
I think it's again, students have so much to take on boarding those early weeks so.

0:15:27.60 --> 0:15:56.550
Dal Badesha
Whether it's something that's communicated to them before they come into university. So I think when you know when you're waiting to kind of go get on campus again, you have a lot of information. But in the run up to that in the few weeks before you actually come to campus, it might be that in those series of communications to get from marketing or other areas that's included in them and say you know.

0:15:56.670 --> 0:16:27.300
Dal Badesha
Don't get this is what you're going to get the books you. They do get them automatically, but it's knowing where they've got to go. If it's a non book. Again, it's something that's distributed within faculty and that we don't unfortunately have so much say on because it's sorted by the course teams in that school. But again, it needs to be joined up so that we can then give that message to the students so that we, you know, it's a much better experience for them because that's what it's all about at the end of the day.

0:16:27.660 --> 0:16:29.590
Dal Badesha
This provide that experience.

0:16:30.220 --> 0:16:56.80
Jeremiah Kimuli
I think I didn't want to that quickly. Do you think outside of an automated system do you think adding the flying start and what they offer for specific courses, do you think it'll be useful to add that to the actual course descriptions when students are applying to the university? I think that might be useful having us separate section or maybe a little subsection about the flying start.

0:16:56.660 --> 0:17:26.380
Dal Badesha
Yeah, I again, I agree. The only reason we haven't done that today is because things do change often. They may decide the course team may decide actually we we wanted this spec of this item, but we've not been able to get it. So then they have to. So whatever we say, we're going to deliver, we do need to

deliver on that from kind of the consumer marketing and everything we we have to make sure that we get it right.

0:17:26.610 --> 0:17:55.100
Dal Badesha
And he sent that message out so it can be a generic message. So we could say you will get items that will support your learning and we could kind of say, you know, if it's a it would be device but not actually say what type of device. So that kind of thing. So it just it seems quite vague in that respect. But I think kind of to say that there will be something to support the students whether it's.

0:17:55.180 --> 0:18:25.930
Dal Badesha
Umm, you're learning resources in the form of books or other physical items. I think that that is always gonna be helpful and deciding on a place because again, that's something that we do with their presence at open disk. Sarah there every week when we have an open day and this is what students want to know. So they'll say, well, OK, we, you know, we're quite interested in this other university. The courses look very similar. So we, you know, we're now at that point of deciding.

0:18:42.460 --> 0:18:42.700
Jeremiah Kimuli
Yeah.

0:18:26.50 --> 0:18:43.790
Dal Badesha
Where do we go? So if this is going to be, you know, the deciding factor as to, well, I won't have to pay for my books, I won't have to go and buy a new device. So again, that's it's good for them to have that information beforehand. So yeah.

0:18:44.270 --> 0:18:58.190
Jeremiah Kimuli
Yeah, I think leading one to that. Do you think there should be any features that should be added to the flying start of system per se to actually better preparing students? Any features do you?

0:19:0.180 --> 0:19:2.490
Dal Badesha
Any features? I don't know. What do you think?

0:19:3.810 --> 0:19:5.800
Dal Badesha
We lost your sound too. Sorry.

0:19:5.340 --> 0:19:6.630
Jeremiah Kimuli
Or something, yeah.

0:19:8.80 --> 0:19:12.330
Jeremiah Kimuli
One second I I have another teams chat that's going off right now.

0:19:13.470 --> 0:19:14.310
Dal Badesha
You're very busy.

0:19:16.150 --> 0:19:17.900
Jeremiah Kimuli
Yeah, let me just mute it.

0:19:22.450 --> 0:19:22.730
Dal Badesha
Nothing.

0:19:19.860 --> 0:19:25.350
Jeremiah Kimuli
OK, I should be all yours now. So yeah. And and do you think any?

0:19:26.380 --> 0:19:26.810
Jeremiah Kimuli
Ohh.

0:20:15.440 --> 0:20:15.790
Jeremiah Kimuli
Hello.

0:20:17.950 --> 0:20:26.620
Sarah Herdman
That you're on my phone now and we've had some technical issues. So OK, but my laptop decided to do a restart. Sorry about that.

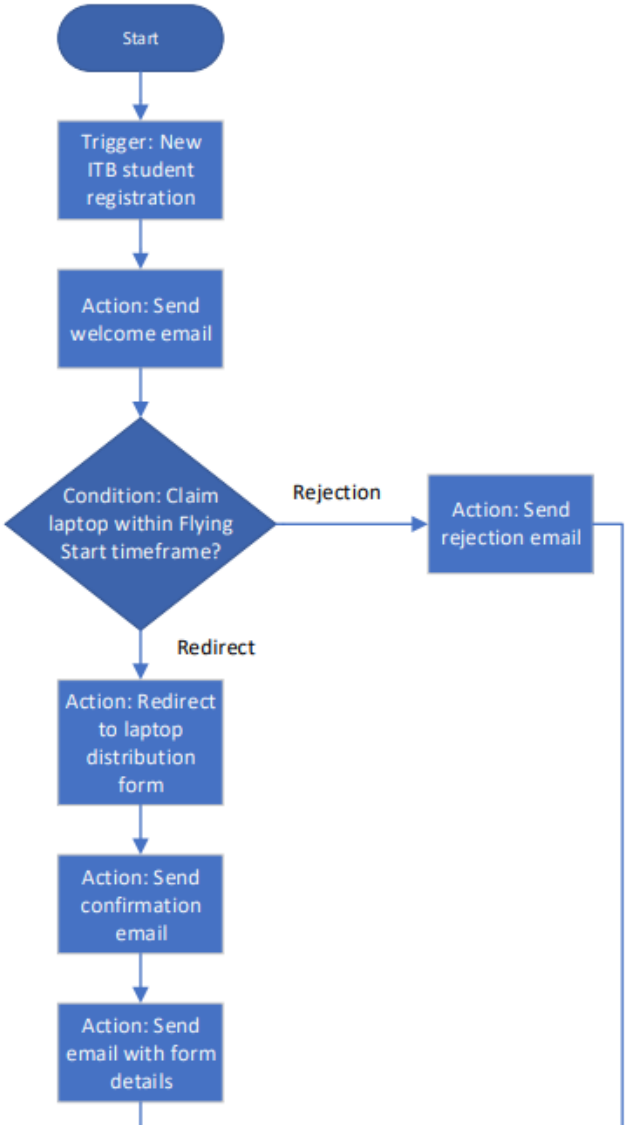
0:20:27.250 --> 0:20:29.450
Jeremiah Kimuli
I thought it was me. I did what?

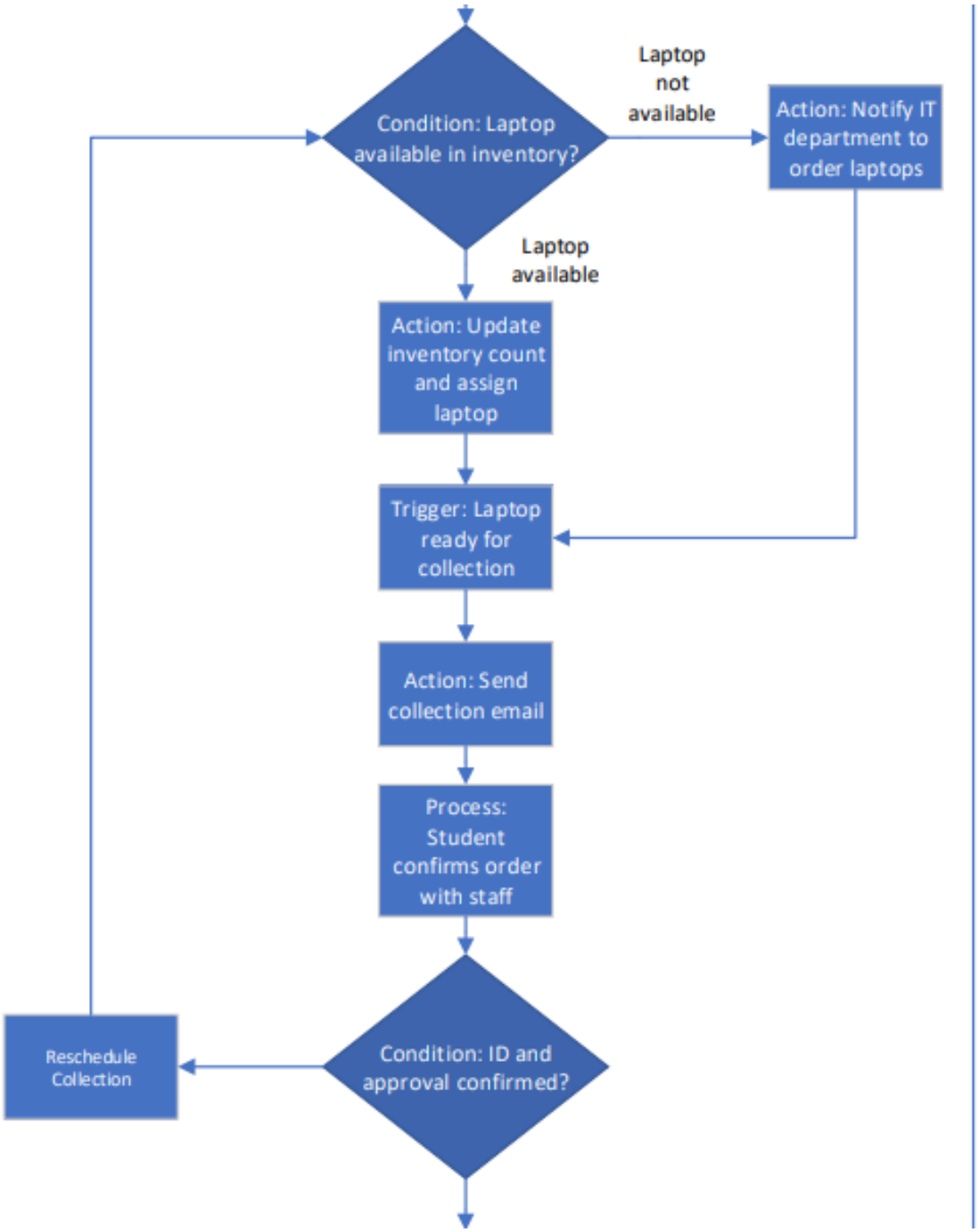
0:20:29.520 --> 0:20:49.140
Sarah Herdman
Sorry that Apple so so I've. I've just got another meeting at half 10 or so but I'm really keen to kind of be able to answer your questions to be honest and I don't know whether you might find another session would be helpful. I mean, do you have time to fit one in?

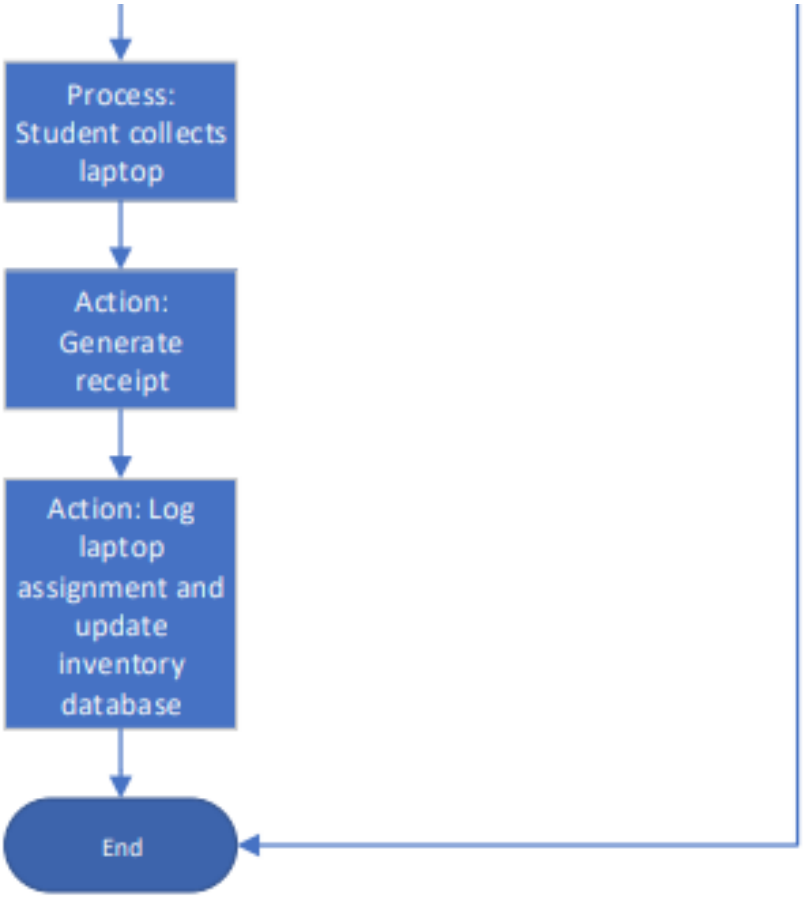
0:20:50.240 --> 0:20:51.360
Jeremiah Kimuli
It depends. When.

0:20:52.520 --> 0:20:54.370
Jeremiah Kimuli
You you guys would be free.

APPENDIX D: INITIAL WORKFLOW PART 1




Condition: Laptop available in inventory?
Laptop not available
Action: Notify IT department to order laptops
Laptop available
Action: Update inventory count and assign laptop
Trigger: Laptop ready for collection
Action: Send collection email
Process: Student confirms order with staff
Condition: ID and approval confirmed?
Reschedule Collection


Process: Student collects laptop
Action: Generate receipt
Action: Log laptop assignment and update inventory database
End

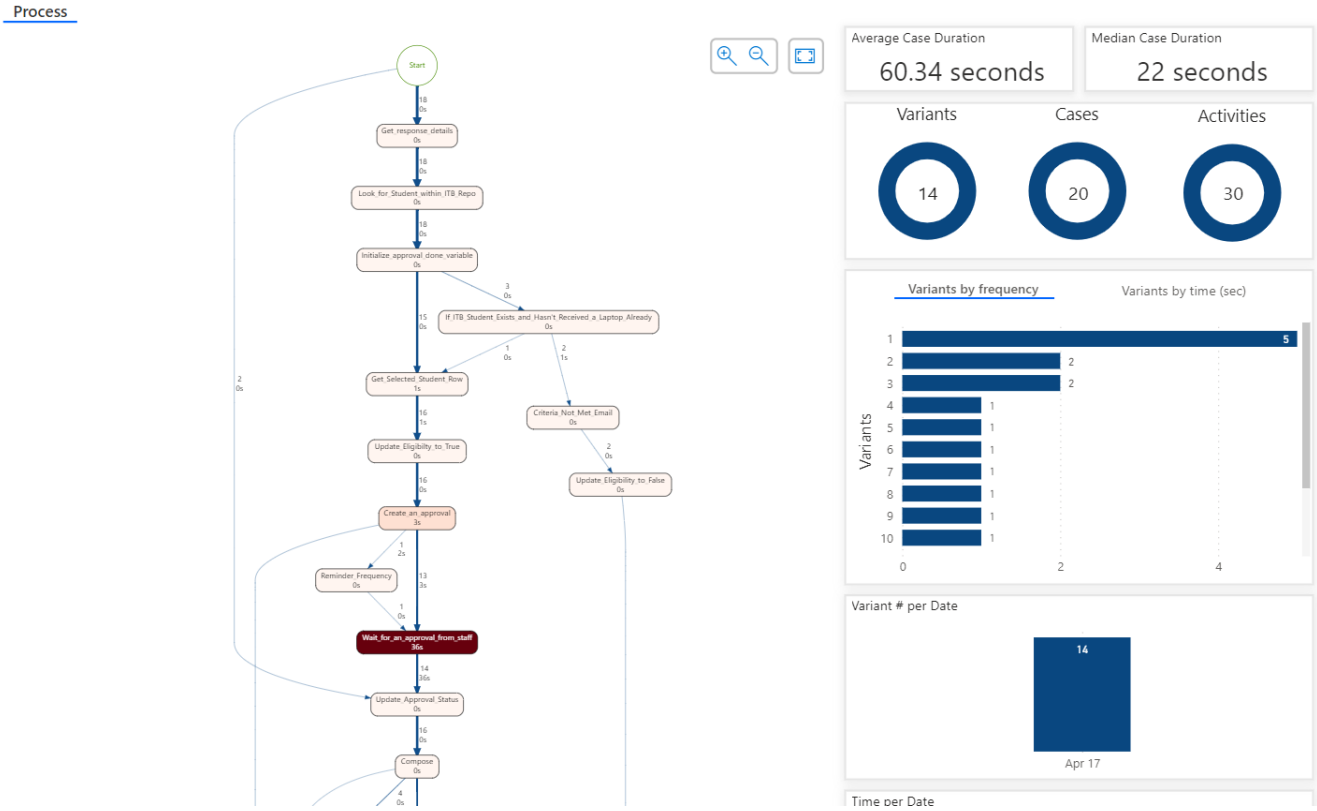
APPENDIX F: FULL DESCRIPTIVE STATISTICAL ANALYSIS FOR LIKERT SCALE QUESTIONS

Automated Laptop Distrubtion System's Impact on the Flying Start Program for Coventry University ITB Students

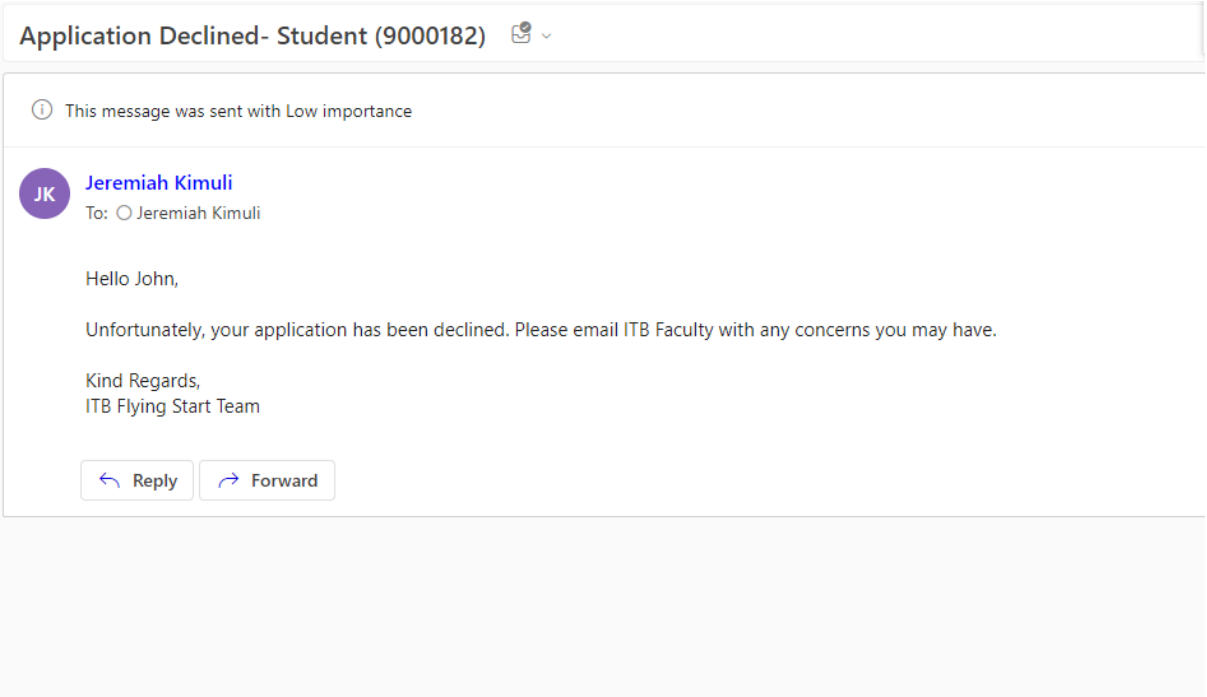
0 = No Impact, 1 = Minimal Impact, 2 = Neutral Impact, 3 = Significant Impact, 4 = Complete

Participant Index Number	Q6_1 Receiving a laptop provided by the Flying Start Programme be on your academic performance?	Q6_3 Efficiency and accessibility in receiving a laptop through the Flying Start Programme?	Q7_4 "Implementing an automated laptop distribution system is a necessary improvement to the current laptop distribution process."	Q7_5 "The proposed automated laptop distribution system would have a positive impact on my overall university experience."	Q7_6 "If the process of getting a laptop through the Flying Start Programme was automated, I would be more likely to apply for one."	Q9_b How often would you say you currently use a laptop for your studies?	Size	Minimum	Maximum	Range	Mean Score	Median	Mode	Standard Deviation	Variance	Total Impact Score (out of 24)	Total Impact Percentage
1	4	4	3	3	3	4	6	3	4	1	3.5	3.5	3, 4	0.55	0.30	21	88%
2	2	3	3	4	2	4	6	2	4	2	3.0	3	2, 3, 4	0.89	0.80	18	75%
3	4	4	3	3	3	0	6	0	4	4	2.8	3	3	1.47	2.17	17	71%
4	3	3	3	3	3	0	6	0	3	3	2.5	3	3	1.22	1.50	15	63%
5	3	3	4	4	4	4	6	3	4	1	3.7	4	4	0.52	0.27	22	92%
6	3	4	4	0	4	4	6	0	4	4	3.2	4	4	1.60	2.57	19	79%
7	2	2	3	3	3	4	6	2	4	2	2.8	3	3	0.75	0.57	17	71%
8	4	3	4	4	3	4	6	3	4	1	3.7	4	4	0.52	0.27	22	92%
9	3	3	3	3	4	0	6	0	4		2.7	3	3	1.37	1.87	16	67%
10	3	3	4	2	4	0	6	0	4		2.7	3	3, 4	1.51	2.27	16	67%
11	2	2	0	0	0	0	6	0	2		0.7	0	0	1.03	1.07	4	17%
12	2	4	3	3	4	4	6	2	4		3.3	3.5	4	0.82	0.67	20	83%
13	3	3	3	3	4	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
14	4	3	4	4	4	4	6	3	4		3.8	4	4	0.41	0.17	23	96%
15	3	2	3	4	4	3	6	2	4	4	3.2	3	3	0.75	0.57	19	79%
16	3	3	3	0	3	4	6	0	4		2.7	3	3	1.37	1.87	16	67%
17	3	4	3	3	3	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
18	3	3	3	3	4	4	6	3	4		3.3	3	3	0.52	0.27	20	83%
19	3	3	3	3	4	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
20	3	3	3	3	4	3	6	3	4	4	3.2	3	3	0.41	0.17	19	79%
Size	20	20	20	20	20	20											
Minimum	2	2	0	0	0	0											
Maximum	4	4	4	4	4	4											
Range	2	2	4	4	4	4											
Overall Sum	60	62	62	55	67	55	361 (out of 480)										
Mean Score	3	3.1	3.1	2.75	3.35	2.75	3.008333333										
Median	3	3	3	3	4	3.5											
Mode	3	3	3	3	4	4											
Standard Deviation	0.65	0.64	0.85	1.29	0.99	1.68											
Variance	0.42	0.411	0.73	1.67	0.98	2.83											
Percentage Mean Score	75%	78%	78%	69%	84%	69%	75%										

APPENDIX H: POWER AUTOMATE PROCESS ANALYTICS



APPENDIX I: APPLICATION REJECTION EMAIL



Application Declined- Student (9000182)

This message was sent with Low importance

JK Jeremiah Kimuli
To: Jeremiah Kimuli

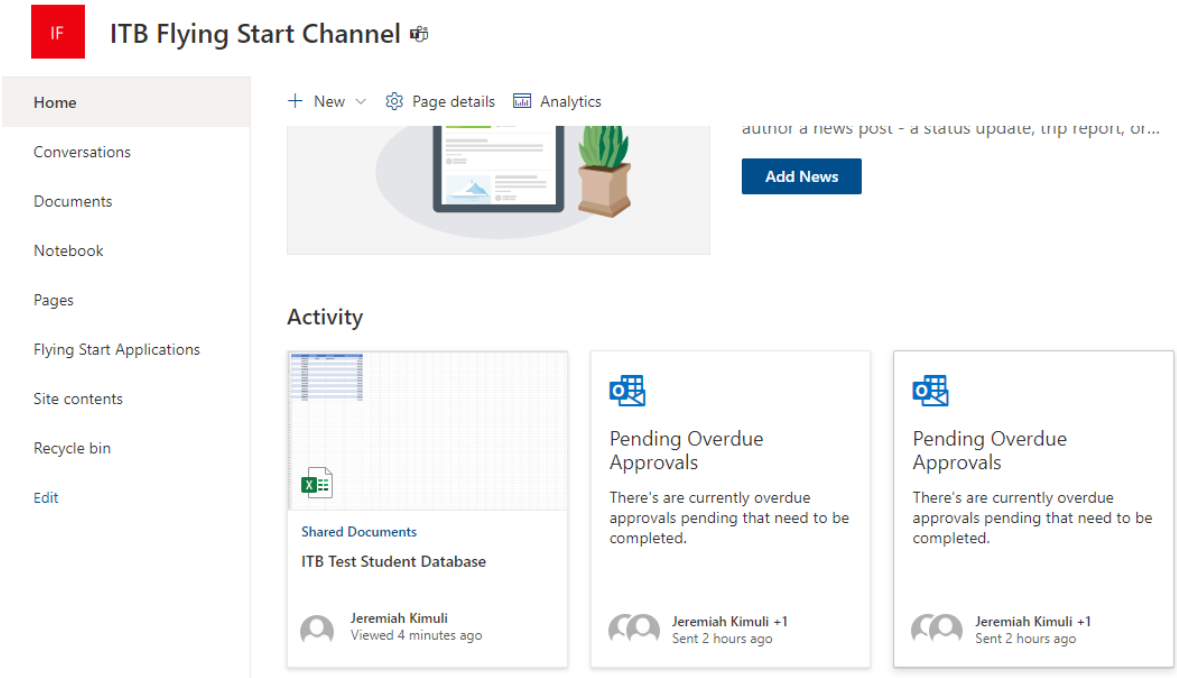
Hello John,

Unfortunately, your application has been declined. Please email ITB Faculty with any concerns you may have.

Kind Regards,
ITB Flying Start Team

Reply Forward

APPENDIX J: TEST CASE EVIDENCE: PENDING OVERDUE APPROVALS



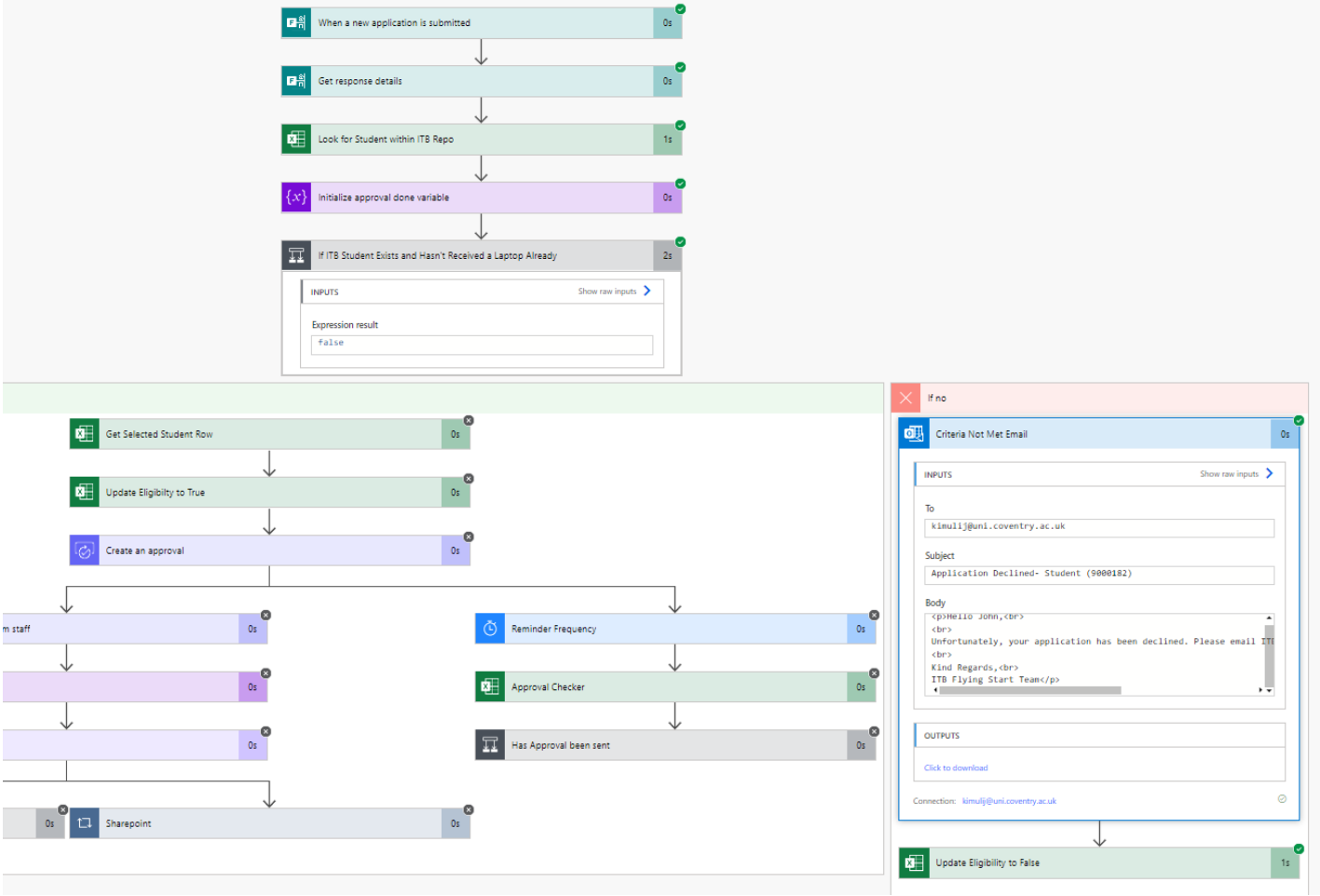
APPENDIX K: APPROVALS TEST LIST

Approvals

Received Sent History

Request	Received	Completed	Requested by	Outcome
Flying Start Final Approval for Student: 9000182	Apr 17, 03:39 AM (3 h ago)	Apr 17, 03:40 AM (3 h ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 17, 02:22 AM (4 h ago)	Apr 17, 02:23 AM (4 h ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 17, 02:20 AM (4 h ago)	Apr 17, 02:21 AM (4 h ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 17, 01:42 AM (5 h ago)	Apr 17, 03:24 AM (3 h ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:57 PM (3 d ago)	Apr 13, 04:00 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:54 PM (3 d ago)	Apr 13, 03:54 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:51 PM (3 d ago)	Apr 13, 03:52 PM (3 d ago)	Jeremiah Kimuli	Rejected
Flying Start Final Approval for Student: 9000182	Apr 13, 03:39 PM (3 d ago)	Apr 13, 03:40 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:28 PM (3 d ago)	Apr 13, 03:28 PM (3 d ago)	Jeremiah Kimuli	Rejected
Flying Start Final Approval for Student: 9000182	Apr 13, 03:23 PM (3 d ago)	Apr 13, 03:23 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:14 PM (3 d ago)	Apr 13, 03:14 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:09 PM (3 d ago)	Apr 13, 03:09 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:06 PM (3 d ago)	Apr 13, 03:07 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 03:04 PM (3 d ago)	Apr 13, 03:04 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 13, 02:51 PM (3 d ago)	Apr 13, 02:52 PM (3 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 12, 10:45 PM (4 d ago)	Apr 12, 10:46 PM (4 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 12, 10:45 PM (4 d ago)	Apr 12, 10:47 PM (4 d ago)	Jeremiah Kimuli	Approved
Flying Start Final Approval for Student: 9000182	Apr 12, 10:45 PM (4 d ago)	Apr 12, 10:46 PM (4 d ago)	Jeremiah Kimuli	Approved

APPENDIX L: TEST CASE: ALREADY HAS A LAPTOP OR NOT ITB STUDENT



APPENDIX M: ITB FLYING START APPLICATION FORM

ITB Flying Start Application Form

Personal information

1. I have a student number *

- (●) Yes (please fill in your student ID in next question)
- ( ) No (please contact your course director)

2. Student ID number *

9000182

3. Student first name *

John

4. Student surname *

Doe

5. Student Email Address (@coventry.ac.uk) *

kimulij@coventry.ac.uk

6. Primary telephone number (optional)

Enter your answer

7. Are you an international student? *

- ○ Yes
- ◉ No

8. Country of citizenship *

UK

9. Which of the following best describes your current status?

- ◉ Student
- ○ Employed
- ○ Unemployed
- ○ Prefer not to say
- ○ Other

Academic background

10. What year of study are you currently? *

- ○ Foundation Year
- ○ 1st Year

- (●) 2nd Year
- ( ) Placement or Year Abroad
- ( ) University degree
- ( ) 3rd Year
- ( ) Prefer not to say
- ( ) Other

11. Can you confirm that you are enrolled/enrolling into the ITB course? *

- (●) Yes
- ( ) No
- ( ) Other

Please complete this section before you submit the form.

12. Please describe any special conditions or requirements if you have.

Enter your answer

13. When submitting this survey, you confirm you are aware of the following conditions:

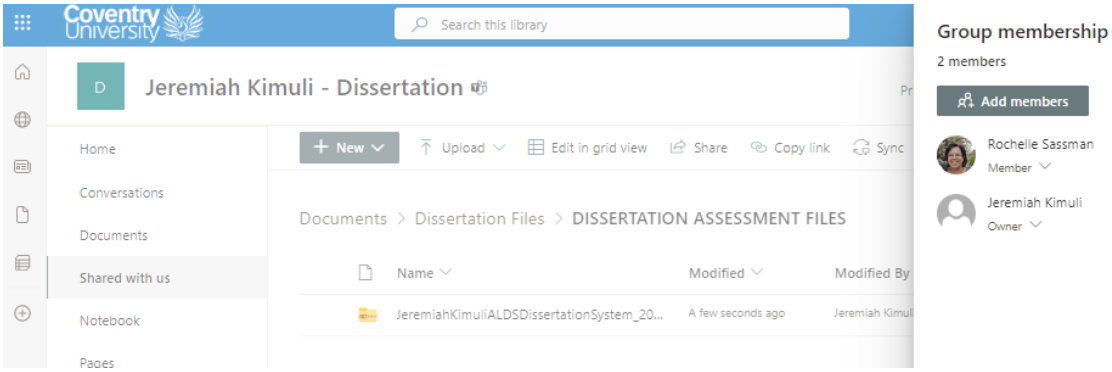
- Registration submitted by you is to facilitate class capacity. All private information filled in this survey will **not** be externally shared.
- Given the requirements, submitting this application form will not guarantee final acceptance to the flying start package.
- For students with specific conditions or requirements, your request may be 'pending status' until all details are confirmed.

- You can opt out of the Flying Start Programme after you receive the application confirmation letter. Contact information will be shared with the school as part of the process.

14. I've read the above information and would like to continue my registration *

- (●) Agree, please submit my registration.
- ( ) Disagree, please dismiss my registration.

This content is created by the owner of the form. The data you submit will be sent to the form owner. Microsoft is not responsible for the privacy or security practices of its customers, including those of this form owner. Never give out your password.

Powered by Microsoft Forms | Privacy and cookies | Terms of use

APPENDIX D: SHAREPOINT ALDS SYSTEM FILES ACCESS