

INFO5990: Computing 1A Professionalism

2021 Semester 2

Team Project

Project Title	Project failure analysis of the Sainsbury Warehouse Automation
Team Name	RE05-2
Team Members	Zihao Fu(500178674)
	Ruochen Pi (500055496)
	Xuhe Zhang (500608155)

Table of Contents

Executive Summary	3
1 Introduction	4
1.1 Team profile.....	4
1.2 Topic overview.....	6
2 Project Context	7
2.1 Client.....	7
2.2 Project overview and objectives	8
3 Project Failure.....	9
3.1 Description of the failure.....	9
3.2 Analysis of the failure	10
3.3 Impact analysis	12
3.3.1 Porter's Value Chain Analysis	12
3.3.2 Consequences of the Failure.....	13
4 Failure Avoidance	15
4.1 Project-specific strategies.....	15
4.2 Future recommendations.....	16
4.2.1 Communication.....	16
4.2.2 Test	16
4.2.3 Audit	17
5 Additional Considerations	18
5.1 Ethical considerations.....	18
5.2 Article analysis	19
5.2.1 Ruochen Pi	19
5.2.2 Xuhe Zhang	19
5.2.3 Zihao Fu	20
6 Group Contributions.....	22
7 References	23

Executive Summary

The aim of the project is to analyse the cause and impact of the "Sainsbury warehouse automation" project's failure.

The document provides detailed research of the causes, issues, and recommendations regarding the failure of the Sainsbury warehouse automation project.

The three leading causes of this project's failure: Contract dispute with the outsourced company; the outsourced project does not have enough communication and test; inability to realise the project's status.

Along with the causes, there are three recommendations and solutions that Sainsbury could hypothetically use for the project's success.

According to the research, Sainsbury should have enhanced communication with the outsourced team to resolve failures for any upcoming future projects. Secondly, Sainsbury requires an IT team to implement testing phases to the project to avoid scope creep. Lastly, Sainsbury should restructure and devise an audit team to supervise the management team and alert the higher management regarding an urgent issue.

Undertaking the above-recommended solution can result in a better outcome for the Sainsbury project.

1 Introduction

1.1 Team profile

The team consists of four members with high communication skills and professional competence. Team leader Zihao Fu, team members Ruochen Pi, XuHe Zhang. They have unique skills and irreplaceable personalities.

Zihao Fu	Zihao has been involved in multiple group work as a team leader and participated in a real-life client project during his bachelor's degree. This experience raises the level of leadership skills to help the project. The projects' experience makes him confident in communication and management skills, and it also taught him how to be a team player in an IT project, which make me a better leader for this project and help with the other two teammates. The experience also aids zihao with better analysis skill with project management issues. Zihao is also familiar with several programming languages, which would help understand clients' requirements, these skills would increase the accuracy in project error analysis and knowing the clients' requirements will help the client to have a project that meets their needs and offers engineers an executable project.
Ruocheng Pi	Ruochen Pi has a Dual Bachelor of Science Degree from Shanghai Normal University and the University of Dayton, which respectively are electronic information engineering and Computer Science technology. Ruochen's background would increase the team's knowledge base and easier to identify engineering related issues. Ruochen has one year of software testing and embedded

	<p>software development working experience in the field of Manned aerospace at the Chinese Academy of Science. As for her programming skills, that would aid the failure analysis from an engineer sight. She is very familiar with the constantly upgrading hardware structure and the ever-changing software programming and deeply studies computer professional knowledge and advanced applications. She is upon software development life cycle and management. These experiences are great help with the analysis of failed project and offered a different angle perspective.</p>
Xuhe Zhang	<p>An undergraduate major in computer science and technology, Xuhe Zhang understands professional knowledge in IT and has studied programming languages such as C language and C++. As Xuhe's experienced programming background, it would raise the level of the whole team's IT understanding. In addition, Xuhe Zhang is good at communicating and can create a good atmosphere with classmates or colleagues, which is a good skill to work with the team and would increase the efficiency in the communication and work. Worked in an IT company and bank successively, especially in artificial intelligence education projects. He has rich practical experience and his own understanding of the market application of artificial intelligence in education. Xuhe's working experience would assist the analysis of company failure and provide a company view of the issue. All these experiences provided xuhe a professional engineering view to analysis the failures.</p>

1.2 Topic overview

Sainsbury's is a supermarket brand with over 150 years of history, and it provides services in the United Kingdom area. As one of the largest supermarket chains in the UK which has sixteen percentages of market share. Sainsbury's now has more than 600 supermarkets and more than 800 convenience stores, and more than 189,000 employees. Sainsbury's also operates other five brands to help their supermarket business, such as Sainsbury's Bank (Sainsbury's, 2021).

In 2000, Sainsbury's tried to improve the company's supply chain efficiency. Accordingly, Sainsbury's put on a warehouse automation project the agenda. At this time, Sainsbury's outsourced the "Warehouse management systems" to the Manhattan Associates and many other IT systems to companies like Eqs and Microsoft .net (Clark, 2004). The warehouse automation project was intended to establish an automated system that installed a barcode-based fulfilment system at its largest depot and distribution centre around London (Double Loop, NA). After three years of starting the business transformation plan, Sainsbury's realised a technical problem with the automation system due to issues with reading the barcode. This issue eventually led to the failure of the entire project. The essence of this problem was the lack of clear and continuous communication between Sainsbury and Manhattan Associates (Rodrigo, 2017), the inaccuracy of project requirements, the inaccuracy of estimated risks, and the lack of adequate resources and good project management.

According to Accenture's statement, the direct reason that led to the failure of the project was that the system was never within the scope of their contract (Double Loop, NA), unmet project objectives, etc.

2 Project Context

2.1 Client

Sainsbury is a supermarket band with over 150 years of history, and it provides services in the United Kingdom area which own by J Sainsbury plc. In 2000, Sainsbury had over 138,000 people and 432 stores. Sainsbury also sells their products over 40% covering all kinds of products from food to pharmacies (AnnualReports, 2000). Twenty years later, Sainsbury has more than 600 supermarkets and more than 800 convenience stores worldwide. It is the third-largest supermarket and retailing sector in the UK, with more than 189,000 employees. The supermarkets have sites in England, Northern Ireland, and Scotland.

Sainsbury's stakeholders are suppliers, managers, staff, customers, and shareholders. The suppliers come from the UK and internationally who offer 30,000 products for Sainsbury. The managers execute the objectives for the owners, and the manager also related to the growth of Sainsbury. The staff is the fundamental part of Sainsbury, in 2000, Sainsbury had 138,000 staff, 30% of them are full-time staff whose living depended on Sainsbury. Customers are a significant part of Sainsbury since Sainsbury majored in retailing (AnnualReports, 2000).

One of Sainsbury's primary functions of the organisation is retailing. As Sainsbury is a huge supermarket in the UK, Sainsbury's supermarket owned many shops, which created equal job opportunities as staff or managers for the UK citizens and eased people's lives with access to daily necessities. Sainsbury's kept increasing their size and provided more chances for the supplier to join in (AnnualReports, 2000).

Sainsbury operates retail industries such as supermarkets and is also involved in people's livelihood industries such as banking. Sainsbury's and Bank of Scotland joined a bank called Sainsbury's Bank, which provided a service of 24 hours telephone banking service. Sainsbury's Bank had 1.25 million customers in 2000, and they keep improving their services by promoting more products. The joint revenue for Sainsbury's supermarket and Sainsbury's Bank was 13,267 million pounds (AnnualReports, 2000).

The technology level and adoption were relatively low before the automation warehouse. According to Sainsbury's procedure after the failure, Sainsbury hired 3,000 staff to pick and organise the warehouse. Thus, we can see that Sainsbury did not have advanced technology in 2000 for their warehouse (AnnualReports, 2000).

2.2 Project overview and objectives

Before the warehouse automation system project was proposed, Sainsbury used manual picking methods to select goods (Double Loop, NA). To meet the ever-expanding customer demand, Sainsbury needs to improve the efficiency of cargo transportation. The supermarket department decided to promote the warehouse automation project to improve the efficiency of the supermarket's supply chain.

To improve the efficiency of the supply chain, Sainsbury decided to establish a barcode-based warehouse automation system in its warehouse in Essex (Rodrigo, 2017). The proposal of the warehouse automation system project can effectively liberate Sainsbury. Productivity, improving the work efficiency of employees, can also quickly meet customer demand for goods.

The benefits of barcode-based warehouse automation systems can be divided into the following points:

1. Reduce the error rate: the staff can scan the goods by scanning the barcode to reduce the probability of choosing the wrong goods.
2. Improve efficiency: save staff time to select goods, liberate productivity, and significantly improve the efficiency of the supply chain.
3. Convenient for statistics: Through systematic management, the source of the goods and the transportation route of the goods can be found intuitively.

For a supermarket chain, high-quality batch picking is essential. First, using a warehouse automation system reduces the risk of human error and improves the accuracy of orders. Although an error does not seem like a disaster, customers who receive the wrong order will waste time returning the goods. Your business will also waste time providing additional customer service to make up for mistakes. Processing each order correctly for the first time will help your company cultivate customer loyalty (FinalInventory, n.d.).

3 Project Failure

3.1 Description of the failure

In 2000, J Sainsbury, a prominent British food retailer, started the "warehouse automation" project to overhaul and improve the company's supply chain management. The project is part of 'The Business Transformation Programme', started by Sir Peter Davies, the new chief executive. It includes Electronic Point of Sale (EPOS), supply chain management, outsourcing IT parts projects to Accenture, and signing a ten-year contract (Rodrigo, 2017).

The company planned to install a barcode-based fulfilment system at Waltham Point in Essex. It is the company's most giant warehouse in London and the southeast of England and distributes stock (Rodrigo, 2017). After the project began, Davis reported that 'The Business Transformation Programme' was going well, and then Sainsbury's extended Accenture's contract by three years.

In March 2004, four years into the project, Davis was promoted to chairman, only to leave three months later. Subsequently, the warehouse automation project was exposed to the news of losses. Meanwhile, Sainsbury's and Accenture were beginning to grow over the scope of their contracts. Accenture issued a statement saying that 'The IT automation systems at Sainsbury's four new automated warehouses are not and have never been part of existing contracts' (Double Loop, NA).

In October 2004, J Sainsbury wrote off a million dollars investment in an automated supply chain management system. Finally, Sainsbury's ended its 2.16 billion pounds ten-year contract with Accenture in 2005 (Double Loop, NA). The goods in the company's warehouses were so heavily stocked that they could not reach other stores. Sainsbury's has had to hire about 3,000 extra staff to get goods back on the shelves correctly.

3.2 Analysis of the failure

Analyse the cause of the failure of Sainsbury's Warehouse Automation project. Sainsbury's investment in Warehouse Automation in 2000 collapsed in 2004 when it was forced to pull the plug (Rodrigo, 2017).

The immediate trigger of Sainsbury's termination were contract disputes, outsourcing, and unachievable project targets. There are multiple indirect reasons: including unclear contracts, lack of monitoring and evaluation of projects; no timely communication between the company's senior management and the project team; not enough high-level involvement, outsource the IT part to Accenture; weak Sainsbury's IT department; realizing unattainable goals too late; the management deliberately covered up the mistake; management positions change; senior executives leave. The root cause of project failure is inaccurate requirements, uninvolved project sponsors, inaccurate estimates, unexpected risks, dependency delays, not enough resources, poor project management.

The fault tree analysis shows in Figure 3.2-1 below.

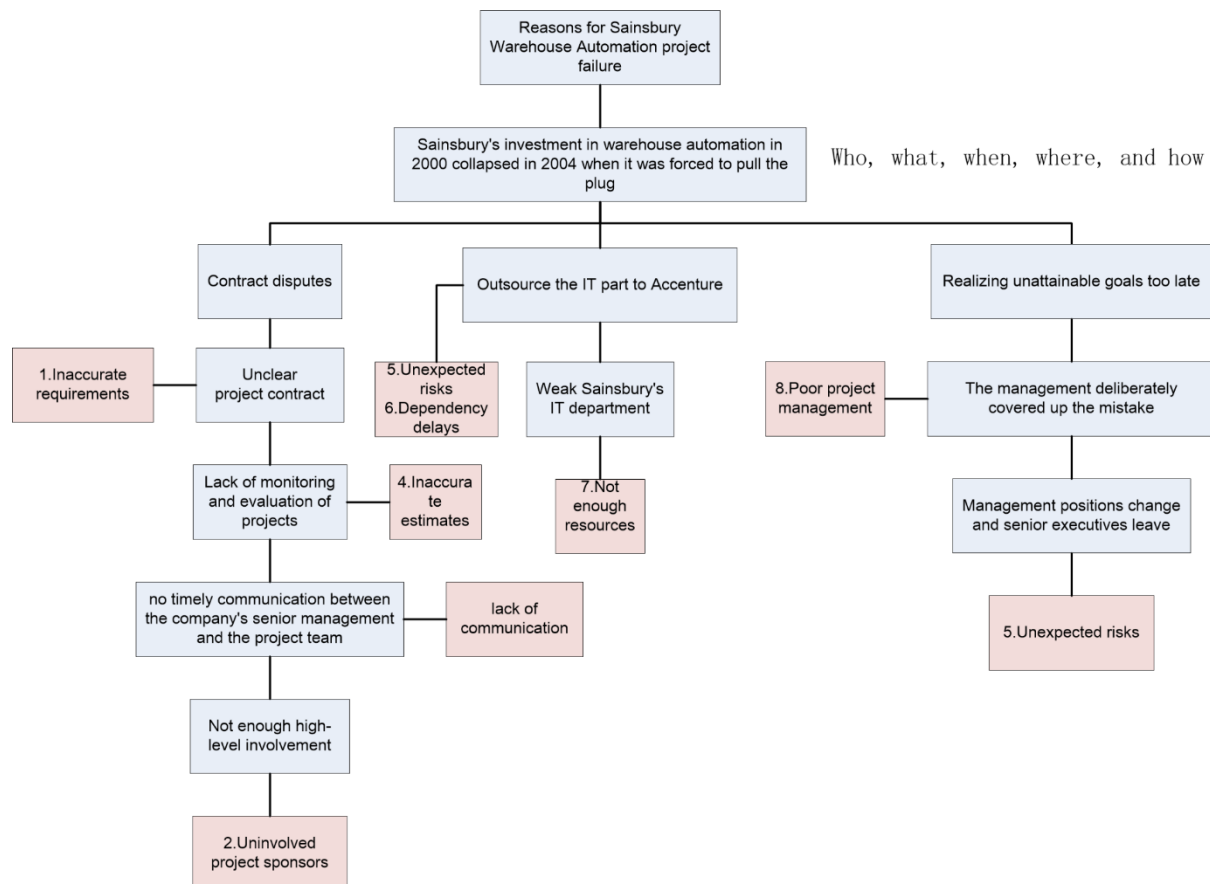


Figure 3.2-1 Fault Tree analysis of Sainsbury Warehouse Automation

First, the indirect cause of the Sainsbury Warehouse Automation project failure is a contract dispute because the project contract is not clear. There are many reasons why the contract is not clear, among which the main reason is lacking monitoring and evaluation of projects. The company's senior management did not timely communicate with the outsourcing project team members, which led to insufficient high-level involvement in the project. One of the top 9 reasons for IT project failure is Uninvolved project sponsors (Greene, n.d.). At the same time, uninvolved project sponsors result in unclear requirements. Inaccurate requirements are also among the top 9 reasons for IT project failure (Greene, n.d.).

Secondly, one of the other indirect causes of the Sainsbury Warehouse Automation project failure is that scope of outsourcing is not clearly defined. In this project, Sainsbury's used multiple IT systems to manage its supply chain, mainly in the Accenture outsourcing deal. Because of Accenture's non-delivery, the entire project was delayed, and there was no backup plan. It is a Known knowns risk that is known and can be planned to mitigate. The project relies on another outsourcing team, which has not yet committed to completing the work. We should know the risks and plan for the worst. Unexpected risks and Dependency delays cause project failure (Greene, n.d.). The reason Sainsbury's outsourced IT part to Accenture was that Sainsbury's IT department was weak. A weak IT department means not enough resources, which is also a fundamental reason for IT project failure (Greene, n.d.).

Finally, and most bizarrely, realising too late that the goal of a project is unattainable is also a direct cause of project failure. The fundamental reason is that the management deliberately covered up the mistake and pretended everything was fine when they realised the problem and the project was likely to fail. Therefore, other personnel cannot find the problem in time and make compensation measures. This is artificial poor project management. This also explains why it took three or four years and a change in leadership to realise that the project was unlikely to achieve its stated goals (Greene, n.d.). The reason may have something to do with power struggles within the company. Because after Sainsbury's warehouse automation project problems came to light, the company's senior staff left, and management positions changed. It could also be that the company's top management saw big problems with the project and quit. In any case, it belongs to poor project management, one reason for project failure (Greene, n.d.). According to statistics, poor project management is responsible for project failures (Greene, n.d.).

The above are the causes of the failure, including the immediate trigger cause and the root cause behind it.

3.3 Impact analysis

3.3.1 Porter's Value Chain Analysis

To analyse the impact, we can identify the main activities and support activities that led to the failure of Sainsbury's warehouse automation project based on Porter's value chain model. Then analyse the consequences of the accident, whether it is the short-term impact or long-term impact.

Porter's Value Chain Analysis is a method of Value Analysis. Help enterprises better understand which sources of value and which sources of losses are their losses. It includes primary activities and supports activities. Primary activities refer to those directly affecting production, maintenance, sales, and after-sales service. Support activities are a complement to the main activities and form the foundation of any organisation.

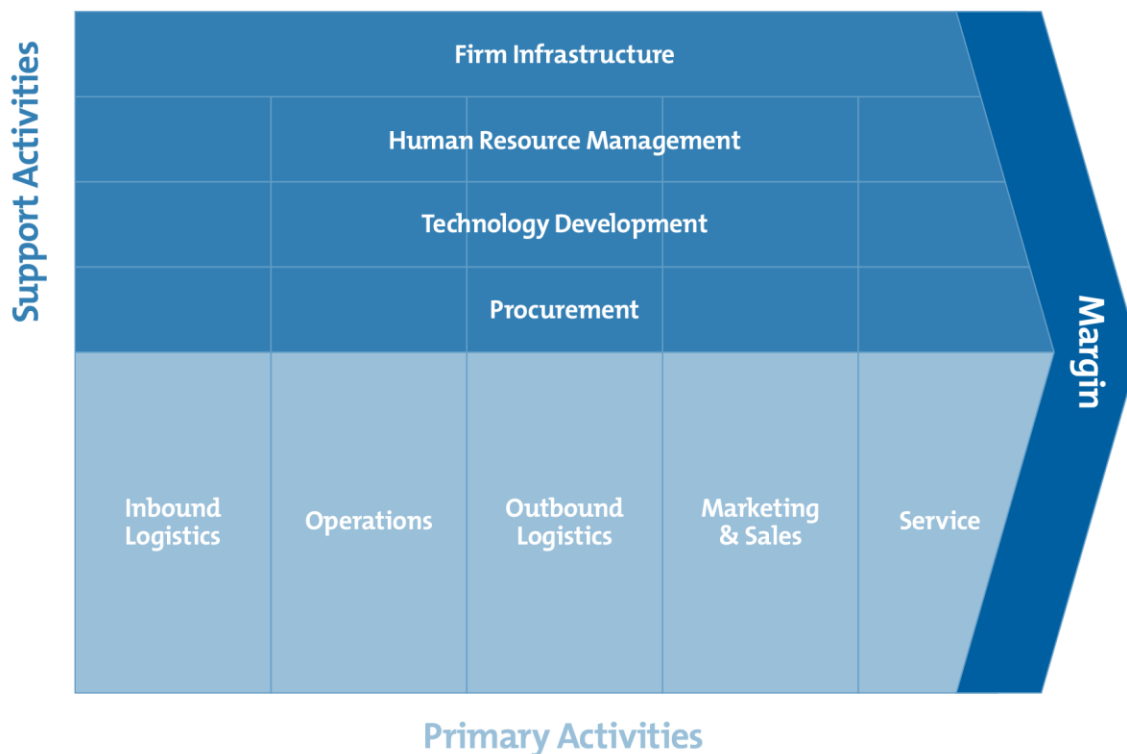


Figure 3.3-1 Porter's value chain (TheMindTools, n.d.)

In Sainsbury's Warehouse Automation Project failure, the main activities affected included outbound logistics, service, and operations. Affected support activities include corporate infrastructure, senior management roles, internal communications, outsourcing and technology development.

Here is a detailed analysis of the impact of project failure:

First, logistics functions will be affected. The most crucial function of warehouse automation is to transfer goods to customers. The project's failure leads to the failure of automation, so the logistics function is suspended because of the ineffective transfer of goods.

At the same time, services will also be affected. The automated warehouse project is to transfer the goods in the warehouse to customers through automation. The project optimised the customer experience and improved the quality of service, which was affected by the project's failure.

Third, operations are affected. Any processes associated with the products and services generated in the warehouse automation project are affected when they are brought to market, including managing and developing customer relationships.

Forth, corporate infrastructure. The warehouse is one of the infrastructures of the company. Sainsbury's infrastructure suffered because of the failure of its warehouse automation project. The Sainsbury's supermarkets, which are supposed to automate their warehouses, don't have a complete store chain.

Last, technology development. Technological development includes activities related to information processing and management (TheMindTools, n.d.). The failure of the project affected the development of technology. This project is a service to improve the supply mode through technological innovation. The failure of the project leads to the delay or failure of technological development.

3.3.2 Consequences of the Failure

Sainsbury's has written off 260 million pounds of IT expenditures, including the use of today's useless IT assets to spend 140 million pounds, the cost of cancelling its distribution centre automation equipment will add another 120 million pounds, and the failed system will also make Sainsbury's new system Lost or damaged inventory lost 30 million (Oates, 2004)

The complex supply chain system did not work as expected. The new system could not track inventory correctly due to barcode reading issues, resulting in Sainsbury's hiring 3,000 employees to put it on the shelves. The IT system failed to achieve the expected productivity growth. Compared with four years ago, costs now account for a more significant proportion of sales (Clark, 2004).

The implementation of the project resulted in a pre-tax loss of 39 million pounds in the first half of 2004, which was the worst record in the company's history since its 139 years of operation (Rodrigo, 2017).

Due to the technical problems of the system, errors in the selection of goods have been caused, and Sainsbury cannot meet the needs of customers in time, the customer's purchase experience is poor, and the complaint rate is high. This failure affected the company's operations and caused contract disputes between Sainsbury and Accenture, economic losses, and excessive media attention (Rodrigo, 2017).

The company lost to competitors including Asda and Tesco in the market (Double Loop, NA).

In the early stage of system operation, replacing labour with the system greatly reduces productivity and improves efficiency. After the system has problems in the later stage, the manual method is reactivated to complete the work, which reduces productivity and weakens the morale of the employees.

Due to the failure of the automation system this time, some people will have resistance to the automation system and barcode technology, which will lead to difficulties in technology updates in the future.

After the project failed, Sainsbury created the worst loss record in the company's history in 139 years of operation in the first half of 2004, which had a huge negative impact on the company (Rodrigo, 2017). Sainsbury's CEO Peter Davis resigned in June 2004. In October of the same year, the new CEO Justin King broke the bad news. The announcement led to an untimely quarrel between Sainsbury and Accenture (Double Loop, NA).

4 Failure Avoidance

4.1 Project-specific strategies

According to the analysis above about the failure, the reasons are contract dispute, outsourcing, and inability to realise the project's statutes. Some project-specific strategies are given below regarding the three reasons.

The first reason is a contract dispute. After signing the contract, Sainsbury did not pay enough attention to the project, leading to a lack of supervision. They should have a team of employees to follow up on the project and keep communicating with the project leader consistently, for example, every month or every milestone of the project, to understand which stage and result.

The second reason is that Sainsbury outsourced multiple IT projects, they did not have any backup plan to prevent failure, and the scope of the projects outsourced are not defined clearly. To solve this problem, Sainsbury should hire an IT department to test the outsourced projects and to support their business, making the project much more controllable and reliable. This will help with the first failure reason since the IT department belongs to Sainsbury. They will test the project with more strict rules to secure the project work. The IT department could give detailed and professional advice to the outsource team.

The third reason is that realising project failure is too late. After the start of the project, Sainsbury did not communicate with the outsourcer on the project in time and did not consider the specific details carefully. As a result, it was slowly discovered that the IT system had many unresolved errors after deploying the Barcode system. Sainsbury should set up a dedicated team to audit the project and supervise the leadership's behaviour. The department should issue related policies to restrain the management and follow up on the project on time to keep abreast of the latest progress. This will make the project more in line with needs and reduce the risk of concealment by the leadership.

4.2 Future recommendations

According to the failure reasons we have listed above in section 3.2, the project failure exposed three issues in Sainsbury. These three issues can be solved with the suggestion we offered in section 4.1. For a long-term consideration, Sainsbury should take the following recommendations to prevent another project failure.

4.2.1 Communication

Communication plays a vital role for a project to complete with its original project scope. In project management, communication needs five Ws and one H: who to communicate with, what information to communicate, when to communicate the information, where to communicate, why to communicate this information and how to communicate this information (Rajkumar, 2010). These key points would require Sainsbury to have a professional team to take care of. An experienced team that corresponds with the outsourced teams to protect Sainsbury's business interests.

The communication between the outsource team and Sainsbury determines that the project outcome will align with the scope, and the scope will align with Sainsbury's business goals. If the project's scope was not defined clearly or was not the original intention, then the project went sideways in the beginning. Thus, Sainsbury will need a communication team to keep the outsourced project on the right track.

The Communication team equally needs to track the project after the scopes are settled. The communication team should be aware of any project milestones, deliverables, and cost changes to ensure progress. They should also monitor any side-track signs, which should be reported to the manager and the audit teams for the alert.

To conclude this, the communication team will cover the project management needs between Sainsbury and the outsource team, reduce the misunderstanding, secure the project scope to align with its intention, keep the project in line and notify any situations to Sainsbury in advance.

4.2.2 Test

Test in an IT project to ensure the system is working correctly and designed according to the system's scope and requirements. The testing will provide detailed results about the IT project outcome, which will help the developer understand its project and its performance, which is to the Sainsbury managers (Rothman, 2007). The IT test team would help Sainsbury obtain a fully functional IT system and make sure the system fits the requirements.

As Sainsbury has many IT systems outsourced, it would be good to have an IT department test the outsourced systems before Sainsbury signs off. This would prevent Sainsbury from losing money for taking over unfinished projects, which would cause more money to cover the results of system failure. The testing could also improve the quality of the IT system as a final adjustment.

Thus, Sainsbury's IT department would be the last defence to reject any uncompleted or unpolished system.

4.2.3 Audit

Sainsbury's management concealed the facts of the project, and the warehouse automation project only discovered the problem after three years of operation. This is an important reason for failure, so Sainsbury should set up a full-time audit team to supervise future projects. The audit team is responsible for conducting project management audits and supervising the various performances of the management on the project. After the audit team is established, the team should immediately formulate a policy to regulate the content of their work.

Project management audit can be divided into six stages: plan the audit, conduct the audit, summarize the audit, present the results, determine the action plan, and schedule follow-up.

In the planning audit phase, let everyone involved and the project know about the audit. During the audit phase, all data and evidence are obtained by personally interviewing the project sponsor, manager and team, or through group meetings or detailed questionnaire surveys, etc. At the summarising of the audit phase, the audit team will provide an executive summary that includes the improvements and errors with a clear and broad overview. In the present results stage, the summary of the results is presented to all parties who need to understand the review. In determining the action plan, use all the data to develop an action plan that helps improve efficiency. The audit team will arrange a dedicated person to ensure that the follow-up work is carried out as planned in the scheduled follow-up phase (Bridges, 2019). The audit team can effectively guarantee the quality of products and services, and business risks can be identified through project management audits (Twproject, 2019).

Another function of the audit team is to supervise the management tier at all stages of the project, which can regulate the behaviour of the management and promote the development of the project. After the problem occurs, the audit team can solve it in time to avoid more significant issues.

5 Additional Considerations

5.1 Ethical considerations

The project starter leaves at a critical time in the project. In 2000, the project was launched by a new CEO, Sir Peter Davies. Peter Davis signed an outsourcing contract with Accenture in August 2000 (Double Loop, NA) Payroll and IT infrastructure management for the 530 stores in the warehouse automation project were outsourced to Accenture (CBR, 2004). In March 2004, Mr Davies was promoted to chairman of Sainsbury, a position he was supposed to hold until July 2005, but left in June 2004 (Double Loop, NA). During his tenure, Peter Davies started and oversaw projects that were not completed and deviated significantly from what had been envisaged, and it was unprofessional for him to resign. Subsequently, the contractor refused to undertake the expected work after Peter Davies resigned because the contract was unclear.

As the first point discussed, Sir Peter Davies, left Sainsbury in June 2004, the changed higher management team discovered the issues with the project that could not be completed within the time. (Double Loop, NA) This fear of consequence by leaving the company before any mistake will be found is unethical. As a CEO, who signed the contract is responsible for the project. Still, Sir Peter Davies did not report any predicaments in this automation project and instead chose to cover it and let the manager who took over to dig. From professional ethics, Sir Peter Davies did not fulfil the telling truth to Sainsbury.

The warehouse automation project started in 2000. The purpose is to overhaul and improve the company's supply chain management. The project was entrusted to Accenture for development. After the project started, Sainsbury's manager lacked supervision and evaluation of the project. As Sainsbury's management had little involvement in this project, Sainsbury found that the project was unlikely to achieve its set goals in three years. On the other hand, there was an insufficient engagement between the company's CEO and its IT suppliers in projecting the possible key business and IT risks. For this reason, no delivery strategy that could tackle these challenges was promptly designed. Sainsbury's management not only failed to take responsibility but also violated professional ethics.

5.2 Article analysis

5.2.1 Ruochen Pi

5.2.1.1 *Week 2 People and teams*

Project success and project management success are two different concepts, they have similarities and differences. Project success is judged from the output results, while project management success is judged from the three elements of project time, scope and cost. (Radujković & Sjekavica, 2017)

According to different project types, such as public and private projects, the authors review the different models of project management success and how these different models of projects can be used for continuous improvement in a rapidly changing IT project. (Radujković & Sjekavica, 2017)

The author analyzes the successful factors of project management, which includes management ability, organization and management tools and techniques, and obtains a structure method which conforms to the actual trend and status of the project. (Radujković & Sjekavica, 2017)

Finally, Studies have shown that investment should be made in project management, of which personnel training and organizational capacity are more important. (Radujković & Sjekavica, 2017)

5.2.1.2 *Week 7 QA/ risk*

This article focuses on how distributed agile development builds a risk management framework. Because there are risks and conflicts between the two elements of distributed and agile development, and their key principles are different, it is critical to locate risks and discover why they exist. At the same time, this paper also studies how to manage risk in the industrial field. (Shrivastava & Rathod, 2017)

Through analysis, the author finds that outsourcing cooperation, team consciousness and software development life cycle are the high risk factors of distributed software development. The author establishes a management framework for effectively reducing DAD risk in practice through risk attributes and possibilities, as well as hazard ranking. (Shrivastava & Rathod, 2017)

5.2.2 Xuhe Zhang

5.2.2.1 *Week 8 Testing management*

By comparing the data of 2009 and 2017, the researchers found that software testing practices have undergone some changes in the industry. First, test automation continues to grow. In the testing trend, automation is becoming more and more common in all levels of testing. Second, the application of formal software process models and capability maturity models has generally declined. Then, testing tools became more and more common and complex, while at the same time, configuration issues and lack of platform support became more and more common. (Hynninen, et al., 2018)

The research results show that the reduced use of formal processes and the need to introduce new features into products means that products need to better support acceptance testing, regression testing, and overall quality assurance of features added after the initial release. This shows that the importance of acceptance testing has further increased. (Hynninen, et al., 2018)

Sainsbury can enhance the universality of testing in future software projects, strengthen acceptance testing, and avoid project failures.

5.2.2.2 Week 10 Communication

Effective project communication ensures that the right information is delivered to the right people in a cost-effective manner at the right time. Communication is the key to let team members, managers, and stakeholders understand the situation and achieve project goals as planned, as well as identify problems, risks, misunderstandings, and all other project completion challenges. However, most of the communication process in the project is usually completed without proper planning and is mainly driven by personality and preferences rather than needs, agreements, and procedures. (Muszynska, 2016)

This article proposes 11 project communication management modes:

1. In the information category, three modes of communication management are defined: Communication schedule, Project knowledge center and Diversity of communication means.
2. The strategy category defines three other communication management modes: Clear rules at the start, Cultural and language competencies and Client's power scope.
3. The emotional category includes three modes: Fostering direct communication, Visits and team rotations and appreciating the team.
4. In the practical category, two communication management modes are identified: Basic communication principles and Synchronous working environments.

These models support project managers and teams to implement best practices in communication management more effectively. (Muszynska, 2016) Sainsbury can adopt the most suitable model to help project managers and teams implement communication management more effectively and avoid project failures.

5.2.3 Zihao Fu

5.2.3.1 Week 6 Project scoping

The project scope outlines the key factors in the project such as stakeholders, goal, milestones, etc,. Therefore, the project scope determines the success or failure of the project and one of major causes of project failure is scope creep. The article talks about a framework which is developed to aid the project managers to encounter scope creep.

The article's result shows that communication is the vital cause of scope creep. One of the diagrams in the article indicates there are four factors of scope creep: project management office, project team, clients and consultants. The commonality of these factors is shown in the figure 3 which is communication. (Ajmal, et al., 2019)

In Sainsbury's case, there was a scope issue that the outsource company Accenture did not consider the IT automation system as a part of the Sainsbury IT projects (double loop). This indicates a huge communication error with the project team and client which is too late to cover the scope creep of the IT project. Thus, to avoid the above situation, Sainsbury will need to improve the communication frequency and efficiency, to prevent any scope changing causing project failure.

5.2.3.2 Week 12 Decision making

According to the article, the most important factor for a project to be successful is the top management support. The article used fuzzy set analysis to be able to draw four linear diagrams that different factors against the relative success, within that four graph, the top management support has a steeper gradient and closer allocated point around the line. (Young & Poon, 2013)

As in our case, the top management support is questionable, as the CEO, Sir Peter Davies appears to be covering the company loss of the IT project and the IT automation has not even been noticed by the outsourced company (double loop). To prevent such failure, Sainsbury should through more top management support to the IT project even outsourced projects should be under monitor and supported.

6 Group Contributions

Our team have two meetings every week. One is on Monday afternoon, which is after tutorial class. The main point we discuss is distributing the work. Also, the team will communicate with each other about what we have learned in lectures and tutorials and integrate them into our project research. The meeting lasts about 1 hour.

The other is on Sunday evening. It was the fifth day after the assignment, and we agreed to finish the tasks each week. They communicate and summarize their tasks and help each other with grammar and logic problems. The meeting should last between 40 minutes and 1 hour.

The group assigned tasks with voluntary priority and passive allocation as auxiliary. The team leader Zihao Fu divided the task reasonably, and the two team members Ruochen Pi and Xuhe Zhang, participated in the task to a high degree. The tasks also including check grammar and references, and make sure the contents are within the requirements.

The following table shows the detailed assignment of each person in each chapter:

Content/Contributor (%)	Zihao Fu	Ruochen Pi	Xuhe Zhang
Executive Summary	50	50	0
1.1	33	33	33
1.2	60	40	0
2.1	50	0	50
2.2	10	0	90
3.1	45	10	45
3.2	5	90	5
3.3	5	90	5
4.1	45	10	45
4.2	45	10	45
5.1	33	33	33
5.2	33	33	33
Total percentage (~)	41%	40%	39%

7 References

Ajmal, M., Khan, M. & Al-Yafei, H., 2019. Exploring factors behind project scope creep – stakeholders' perspective. In: *International journal of managing projects in business Vol.13(3)*. s.l.:s.n., pp. 483-504.

AnnualReports, 2000. *AnnualReports*. [Online]

Available at:

https://www.annualreports.com/HostedData/AnnualReportArchive/i/LSE_GB0767628_2000.pdf

[Accessed 05 Sept 2020].

Bridges, J., 2019. *How to Do a Project Management Audit*. [Online]

Available at: <https://www.projectmanager.com/training/project-management-audit>

[Accessed 18 Oct 2021].

CBR, 2004. *Sainsbury's overhauls \$3 billion Accenture deal*. [Online]

Available at:

https://techmonitor.ai/techonology/sainsburys_overhauls_3_billion_accenture_deal.

[Accessed 10 11 2021].

Clark, L., 2004. *Sainsbury's writes off £260m as supply chain IT trouble hits profit*. [Online]

Available at: <https://www.computerweekly.com/news/2240058411/Sainsburys-writes-off-260m-as-supply-chain-IT-trouble-hits-profit>

[Accessed 28 August 2021].

Double Loop, NA. *Double Loop*. [Online]

Available at: <http://www.doubleloopconsulting.com/sainsbury-warehouse-automation>

[Accessed 29 August 2021].

FinalEinventory, n.d. *Final Einventory*. [Online]

Available at: <https://www.finaleinventory.com/barcode-order-picking>

[Accessed 10 Sept 2021].

Greene, J., n.d. *The top 9 reasons for IT project failure: Is your project at risk?*. [Online]

Available at: <https://www.atspoke.com/blog/it/reasons-for-it-project-failure/>

[Accessed 13 Sept 2021].

Hynninen, T., Kasurinen, J., Knutas, A. & Taipale, O., 2018. Software testing: Survey of the industry practices. In: *41st International Convention on Information and Communication Technology, Electronics and Microelectronics*. s.l.:s.n., pp. 1449-1454.

Muszynska, K., 2016. Project communication management patterns. In: *Federated Conference on Computer Science and Information Systems*. s.l.:s.n., pp. 1179-1188.

Oates, J., 2004. *Sainsbury's, Accenture and the £3bn IT flop*. [Online]
Available at: https://www.theregister.com/2004/10/19/sainsburys_v_accenture/
[Accessed 27 Sept 2021].

Radujković, M. & Sjekavica, M., 2017. Project Management Success Factors. In: *Procedia Engineering Vol.196*. s.l.:s.n., pp. 607-615.

Rajkumar, S., 2010. *Art of communication in project management*. [Online]
Available at: <https://www.pmi.org/learning/library/effective-communication-better-project-management-6480>
[Accessed 18 Oct 2021].

Rodrigo, N., 2017. *Analysis of the Warehouse Automation Failure at Sainsbury's*. [Online]
Available at: <https://writepass.com/journal/2017/02/analysis-of-the-warehouse-automation-failure-at-sainsburys/>
[Accessed 26 August 2021].

Rothman, J., 2007. *What Project Managers Need to Know About Testing*. [Online]
Available at: <https://www.stickyminds.com/article/what-project-managers-need-know-about-testing>
[Accessed 18 Oct 2021].

Sainsbury's, 2021. *About Sainsbury's*. [Online]
Available at: <https://www.about.sainsburys.co.uk/about-us>
[Accessed 27 August 2021].

Shrivastava, S. V. & Rathod, U., 2017. A risk management framework for distributed agile projects. In: *Information and software technology Vol.85*. s.l.:s.n., pp. 1-15.

TheMindTools, n.d. *Porter's Value Chain*. [Online]
Available at: https://www.mindtools.com/pages/article/newSTR_66.htm
[Accessed 15 Sept 2021].

Twproject, 2019. *Project Audit: what it is and how to perform it*. [Online]
Available at: <https://twproject.com/blog/project-audit-perform/>
[Accessed 18 Oct 2021].

Young, R. & Poon, S., 2013. Top management support—almost always necessary and sometimes sufficient for success: Findings from a fuzzy set analysis. In: *International Journal of Project Management* Vol.31(7). s.l.:s.n., pp. 943-957.