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Title in English

Effect of Cloud-Based Project Management Software on Industrial Operations
_ Empirical Study Done on Saudi Diesel Equipment Company

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أثر برامج إدارة المشاريع السحابية على إدارة العمليات الصناعية _ دراسة تطبيقية على الشركة
السعودية لمعدات الديزل

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Abstract

This document is intended to showcase the effectiveness of implementing cloud-based project management services on the industrial operations of Saudi Diesel Equipment Company. The first sections give a background of the project management issues and effects that the cloud services may have after implementations. It will also include some study questions and hypotheses to be studied. The following section has literature reviews which goes over the uses of project management in the manufacturing industry and a background on Monday.com and Jira as cloud-based project management services. Research methodology section explains how the data is captured and processed. The results and results summary sections showcase the insights obtained from the data captured. Finally, the recommendation section gives some points to consider for future researches that have a similar approach.

المستخلص

الغرض من هذه الوثيقة هو إبراز فعالية تنفيذ خدمات إدارة المشاريع القائمة على السحب في العمليات الصناعية للشركة السعودية لمعدات الديزل. وتقدم الفروع الأولى معلومات أساسية عن المسائل المتعلقة بإدارة المشاريع والآثار التي قد تترتب بعد تنفيذ الخدمات السحابية على المنظمة. كما ستتضمن بعض الأسئلة الدراسية والفرضيات الواجب دراستها. ويتضمن الفرع التالي استعراضات لأدبيات تتناول استخدامات إدارة المشاريع في المجال الصناعي ومعلومات أساسية عن Monday.com و Jira بوصفهما خدمات لإدارة المشاريع القائمة على السحب. ويوضح قسم منهجية البحوث كيفية جمع البيانات ومعالجتها. وتعرض فروع النتائج وملخص النتائج الآراء المأخوذة من البيانات التي تم جمعها. وأخيراً، يقدم فرع التوصيات بعض النقاط للنظر فيها فيما يتعلق بالبحوث المقبلة التي تتبع نهجاً مماثلاً.

Introduction

Traditional project management methods that rely on planning are not effective in today's project environment; which is very dynamic, uncertain and fast-changing. (Ciric et al. - 2018) In a fast-paced and competitive business world, project managers need to plan ahead and be ready for change. However, the traditional approach to project management has some limitations that make it hard to adapt to dynamic projects. Therefore, the project management discipline needs to embrace change and find ways to manage projects successfully in this changing environment. (Ciric et al. - 2019) This paper focuses mainly on the effects of using cloud-based project management solutions compared to the traditional project management methods, and the applicability of agile methodologies in the manufacturing sector.

Study Problem

- **Theoretical Gap:**

While previous research has established a positive relationship between project management methodologies and project optimization and outcomes, there is a lack of understanding regarding the specific use of cloud-based project management tools in the manufacturing sector.

- **Empirical Gap:**

Limited empirical studies have explored the effects of cloud-based project management tools on industrial operations in the context of the manufacturing sector, leaving a gap in the literature.

Study Questions

- **Main Research Question:**

What are the effects of using cloud-based project management tools on the Industrial Operations?

- **Research Sub-Questions:**

- How can using cloud-based project management tools and services, like Monday and Jira, improve the project management process?
- How can using Monday and Jira improve the effectiveness of communication between stakeholders?
- What is the effect of using Monday and Jira on project scheduling?
- What is the effect of using Monday and Jira on document control?

Research Importance

Theoretical Importance:

To increase the level of understanding that cloud-based project management tools can contribute to the manufacturing sector, and specifically in managing the industrial operations.

Empirical Importance:

To highlight the effectiveness of cloud-based project management tools in managing industrial operations and to add those findings to the knowledge literature.

This study will mainly examine how project management is implemented in the industrial operations of Saudi Diesel Equipment Company, with the use of cloud-based project management tools like Monday and Jira. It will also contribute to the existing literature by proposing new theories that will help researchers to explore the topic from the manufacturing perspective. Most of the previous studies focused on construction and mainly on software development.

Research Objectives

To answer this research's main question, the following objectives have been identified:

1. Examining the current project management practices in the Industrial Operations.
2. Identifying the key challenges faced in project management in the Industrial Operations.
3. Evaluating the contribution of using Monday and Jira tools on project success.

Research Hypotheses

- Using cloud-based project management tools will positively affect Industrial Operations.
- Using cloud-based project management tools will significantly increase communication effectiveness.
- Using cloud-based project management tools will improve manufacturing scheduling.

Literature Review

Project management is a complex task that requires coordinating different aspects and resources of a project within a fixed time frame. The following critical factors are essential for managers to ensure the success of their projects:

- The backing of senior management. (Fortune, J.& White, D., 2006)
- Clear and effective communication among stakeholders. (Fortune, J.& White, D., 2006)
- The appropriate allocation of funds for the project. (Fortune, J.& White, D., 2006)
- Qualified and competent project managers (Chan, et. all, 2001)
- The team's enthusiasm and engagement in the project. (Chan, et. all, 2001)
- The collaboration and contribution of all team members. (Chan, et. all, 2001)
- The commitment to achieve the project objectives. (Chan, et. all, 2001)
- Sufficient project oversight (frequent tracking, prompt feedback, and adjustments in the project as per the changing circumstances. (Chan, et. all, 2001)
- Resolution of project issues. (Belout, A. & Gauvreau, 2004)

To optimize this process, many enterprises are adopting online project management software solutions that can automate and streamline their project workflows. The software enables real-time collaboration, feedback, and monitoring of projects across different locations and devices. Some of the key players in this market are ProjectManager.com, Nulab, Asana, Smartsheet, Zoho Corporation, Basecamp, Zapier, Wrike, and OpenProject GmbH. (Fortune Business Insight, 2021)

Managing inventory and resources is essential for manufacturing, as it depends on the market demand and supply. Manufacturing project management software helps with resource management, which covers the people, materials, equipment, knowledge, and time needed for the project. Resources are often scarce and need to be allocated carefully. A resource allocation plan can help with this, as well as a project schedule that shows the task dependencies. This way, you can identify any gaps or risks in your resources. You can also use a similar plan for inventory management. You can't avoid uncertainties in project management and manufacturing, but you can plan ahead and mitigate them with comprehensive plans. (Louie, 2022)

The Role of Monday and Jira in Project Management

- **Monday, a project Management Tool and Software**

Monday.com is a project management tool that is created where ease of use, versatility, and customizability was inspired by the iPhone. It allows a company to automate functions which improves work accuracy and time. It can also improve communication with the chat and comment functionalities that can also be automated when certain events or triggers happen. (Pierce, 2020)

Furthermore, Monday has the capability of integrating many 3rd party softwares and services like Jira, Gmail, Microsoft Teams, Slack, and many more. It also offers a

variety of dashboards to get a high-level overview of the organization to help in decision-making. (Monday, 2023)

- **Jira, a project Management Tool and Software**

Jira is a project management tool that offers agile issue tracking and other essential features. It can help the project manager to monitor the work and progress of the team members. It also allows notifications, bug reports, feature requests, and other reporting. (Özkan & Mishra, 2019)

Jira is a fully functional software that is widely used by engineers and product development software companies. However, Jira cannot work with all the applications of the companies, but it can work with some apps like “Miro or GitHub” for product development. For connecting with any app or integrating apps of any size, another agile software tool called Asana or Monday is suggested. (White & Watts, 2022)

Research Gap

The literature review shows that agile project management tools help project managers to achieve better results in resource allocation and team communication when needed. These tools are more suitable than traditional tools, like Gantt Chart and WBS, to manage budgets, schedules, competitive environments, and daily challenges. Studies have shown that Jira and Monday, in particular, have enabled more centralized management, lower project costs, and higher privacy and security; as well as improved coordination and communication among the team members. However, there is a lack of studies that specifically focus on the importance of these agile project management tools in running a project process. It is because researchers have discussed all the agile tools together, which creates confusion about which tool is best for which type of industry. (Özkan & Mishra, 2019)

Research Methodology

This research will use a quantitative approach that is focused on the industrial operations division in Saudi Diesel Equipment Company. This division consists of the following departments:

- Contracts and Projects
- Engineering
- Manufacturing
- Testing and Commissioning

The study will use questionnaires and personnel experience as the primary data collection method. The sample for the questionnaire will be divided based on the used project management tool assigned to each department within the division. Where Monday was used mainly for the manufacturing and testing & commissioning departments; while Jira was used for Projects and Engineering departments. There will be some overlap between

the two services because they can be integrated to share some information across to the other departments.

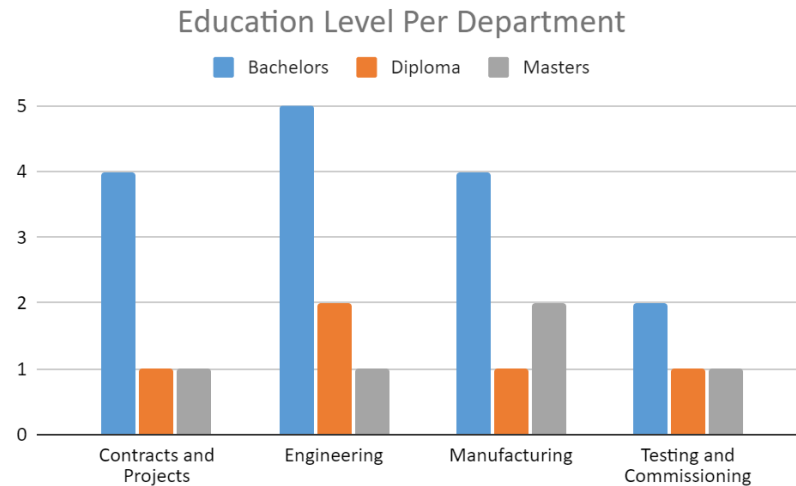
The survey was done in Saudi Diesel Equipment Company during October-December of 2023 with a sample of 30 employees across the concerned departments. It was done digitally through microsoft forms as it is a familiar service to the employees. The survey included the following questions:

1. Your highest degree level
 - a. Bachelors
 - b. Masters
 - c. PHD
2. Which department are you assigned
 - a. Contracts and Projects
 - b. Engineering
 - c. Manufacturing
 - d. Testing and Commissioning
3. Your Position level
 - a. Technician
 - b. Engineer
 - c. Supervisor
 - d. Manager
4. Year of experience at that position
 - a. 0-2 years
 - b. 3-5 years
 - c. 5-9 years
 - d. 10+ years
5. Rate the use of your department for project management methods
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
6. Do you believe there are problems with the way it was implemented?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
7. (If you agree with the previous question), What are the areas of weakness [select all that applies]?
 - a. Planning
 - b. Scheduling
 - c. Communication
 - d. Document Control
8. Which project management cloud service are you using?
 - a. Monday

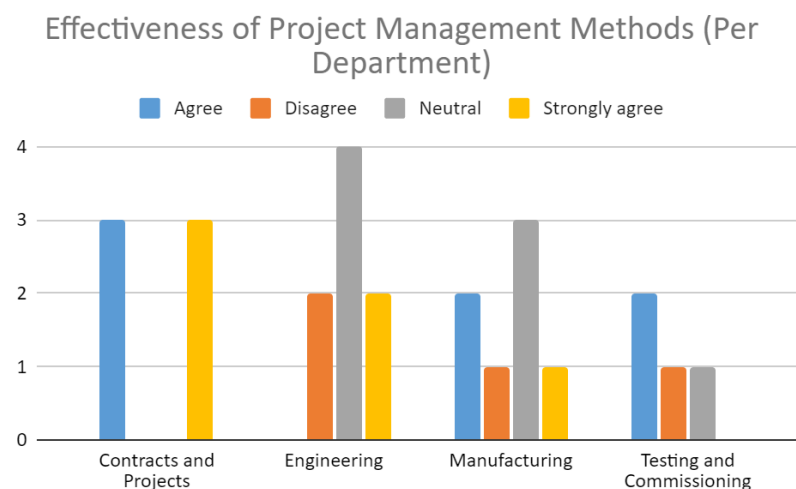
- b. Jira
- 9. Is the service easy to use?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 10. Have you received prior training for that service?
 - a. Yes
 - b. No
- 11. Do you believe that training is required to use this service?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 12. Do you see improvement in the communication aspect after using this service?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 13. Do you see improvement in the productivity aspect after using this service?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 14. Do you see improvement in the scheduling aspect after using this service?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree
- 15. Do you see improvement in the document control aspect after using this service?
 - a. Strongly disagree
 - b. Disagree
 - c. Neutral
 - d. Agree
 - e. Strongly agree

Research Results

After conducting the surveys and gathering the results. The following charts show the breakdown of the votes with insights underneath.

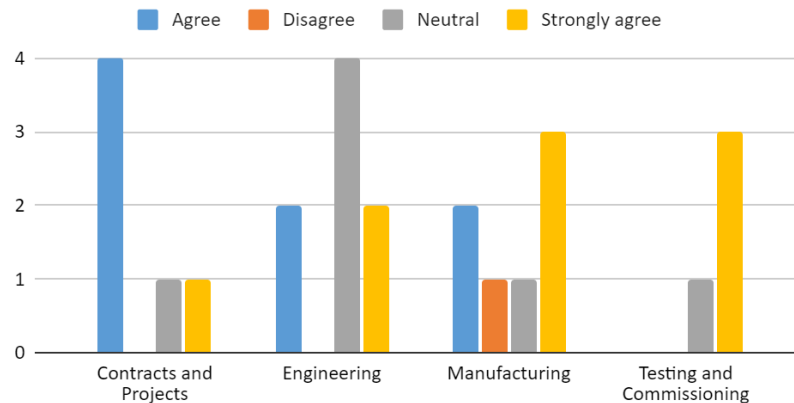


The majority of employees have an education level Bachelors degrees in different disciplines but mainly in Electrical or Mechanical Engineering.



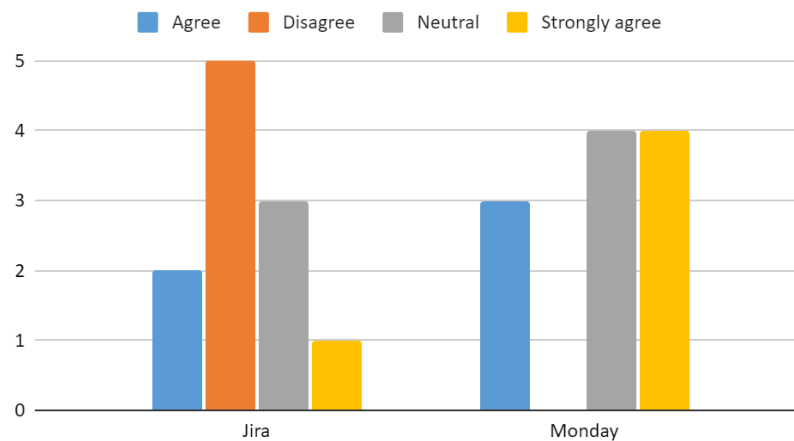
Contracts and Projects had an expected overwhelmingly positive use of project management methods since that is the core of their department. Engineering had a mostly neutral response where the managers and supervisors implement those methods, but the rest of the employees only focus on their assigned work. Manufacturing and testing & commissioning had a mixed response because of the variety of their tasks requiring different levels of project management methods.

Problems of implementing the Project Management Methods (Per Department)

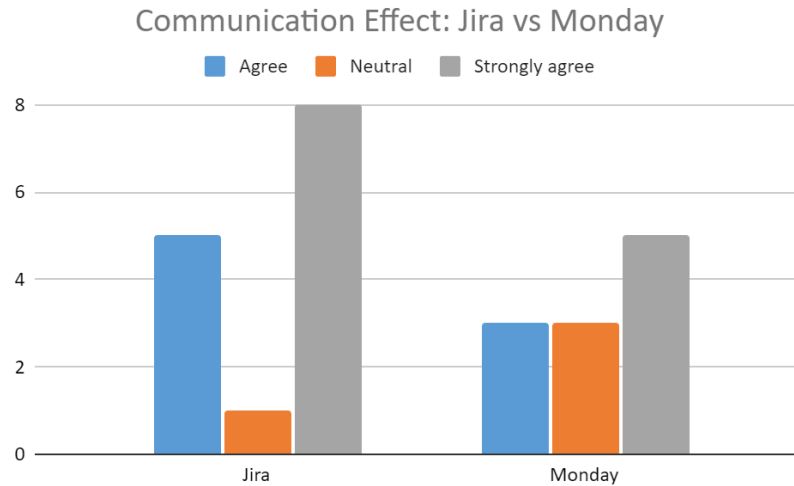


There is an agreement across all departments that there are some problems caused by the way they used to implement the project management methods before using the cloud services. This was mainly because everyone was handling every detail, communication and documents manually which needed greater attention and time requirements. This also affected the productivity of the employees because they used to spend their time creating records of every step taken and sending and receiving emails instead of effectively doing the work assigned.

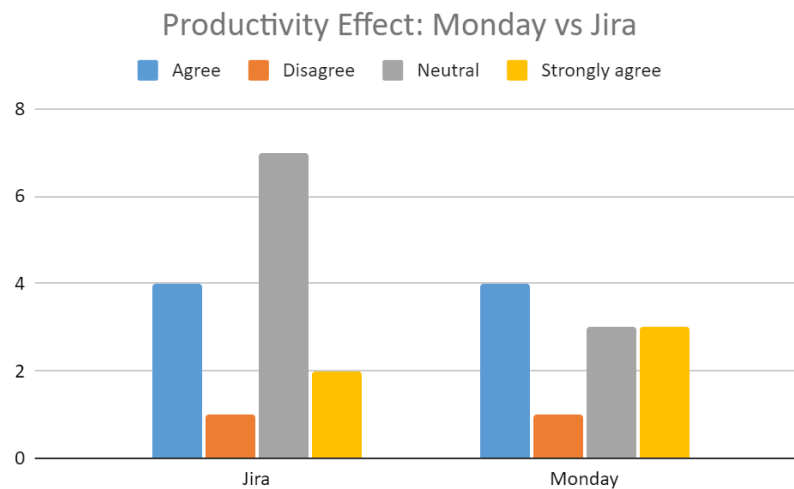
Ease of Use: Monday vs Jira



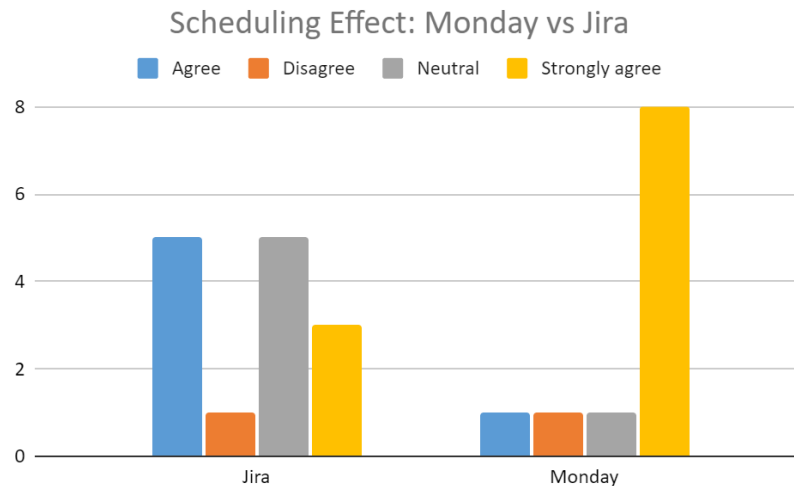
Monday was more intuitive to use for the majority of employees without the requirement of prior training. This was an important factor since it will be used by manufacturing technicians who had a big percentage of non-technical users. On the other hand, Jira's elaborate functions have the downside of requiring the core users to have some level of training to make full use of Jira's offerings.



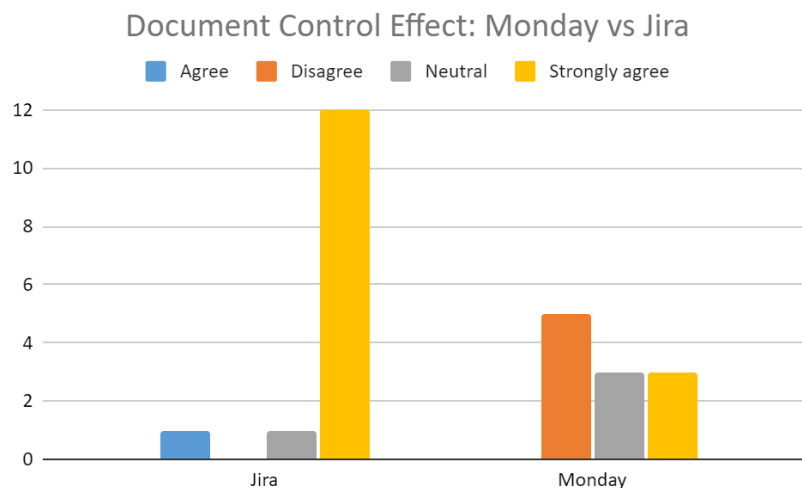
There is an overall positive feedback for both cloud services for improving communication between stakeholders. Jira had an overwhelmingly positive effect compared to Monday. I believe this is heavily linked to how Monday wasn't set up to support communication as a main function. Also, Jira has more robust features regarding the communications and a whole ticket system that informs the users when they receive one and every step all the way to completion. The submitter can also add other stakeholders in the chain of notifications to keep them informed without using emails.



Productivity effect had mixed results with the average being neutral for Jira and positive for Monday. Since those cloud services were only recently implemented in the industrial operations, I believe that it is difficult to gauge the effect on productivity; Because of the nature of the projects having long-term execution, the effects on productivity will not be clearly evident.



Scheduling had an overwhelmingly positive reception on Monday; while Jira's effect was less positive with a big portion of the employees being neutral about it. This is evident because Monday was mainly implemented for scheduling for manufacturing and testing. While Jira has the same functionality, scheduling was a minor part of the implementation.



Document control had a massively positive effect with Jira compared to Monday which had a mixed response. Again this is essentially because one of the core implementations of Jira was for document control of engineering and projects departments. Monday has the capability of document control, but it wasn't set up for it since the manufacturing didn't require that functionality fully added and only kept the base level of it.

Results Summary

The above results indicate that using Monday and Jira as cloud-based project management services had a positive impact on the industrial operations. After consulting the department managers on which was affected most by using those services, their feedback was as follows:

- **Planning and Scheduling:** Monday had a huge impact in those to plan and schedule the work for manufacturing and testing departments. The user-friendly visuals were great because the field workers can recognize their duties without consulting their supervisors. This was achieved by having a big monitor in the workshop that displays their assignments and that week's schedule.
- **Communication:** Monday and Jira had a big role in increasing effective communication by reducing the amount of emails necessary to push information forward and replacing that by easy to digest dashboards and push notifications that are automated when a certain criteria is met. Applying the automations also reduced the amount of steps required to complete a job for every employee because the system will do the notification instead of the employee themselves.
- **Document Control:** Jira had the biggest impact on document control as it was the area where Saudi Diesel Equipment company suffered the most across all departments. They used to manually save and control every document which resulted in redundancies and different departments having different versions of the same document. Also, revisions of these documents were handled poorly because of the manual nature of sending it to every stakeholder by email.

Research Limitations

This research is limited to the industrial operations division in Saudi Diesel Equipment Company. At the time of conducting the study, the project management tools focused on in this research are recently implemented, with no extensive use of them at the moment. This can limit the research outcomes due to the lack of experience of the employees using these tools, and the lack of previous proper project management documentation within the division. This limitation can be overcome by consulting employees who have been handling the company's projects for many years, on how the project management process was being conducted previously; to have an idea on how to measure and analyze the results of the research.

Recommendations

Some recommendations to improve the results of implementing the cloud-based project management services:

1. Make sure that all the requirements are properly captured and recorded before the implementation phase.
2. Consult experts in implementing these services with the full requirements. This can help to make sure that all of them may be resolved with one service instead of using two for the case of this research.
3. Make use of agile methods while implementing. Sprints of implementing several features then displaying it to the concerned department will have better feedback and will reveal some requirements that were not known previously.

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