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Case Study: SAP Development and Integration into General Motors Uzbekistan

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Case study: SAP development and integration
into General Motors Uzbekistan

Kamil Urunov

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Abstract

This case study describes the challenges and successes General Motors (GM) Uzbekistan experienced when implementing SAP using the Waterfall methodology. The company found success in using Waterfall methodology by emphasizing documentation and clear timing. However, limited user involvement, lack of flexibility, and limited feedback loops resulted in a disappointing end product that did not meet customer requirements.

As a solution, the case study recommends applying Agile methodology and launching the SAP base model without customization, gradually building up the system's functionality as the project progresses. This approach can help address the issues encountered during the Waterfall methodology implementation.

Overall, the case study highlights the importance of effective communication, collaboration, and flexibility in software development projects. It also shows the potential benefits of Agile methodology and the risks associated with excessive customization.

Acknowledgement

It is always important to express gratitude and appreciation to those who have supported and guided us throughout our academic journey. In this case, I would like to mention Professor Mary Piecewicz, who played a pivotal role in assisting me through the entire process. It is a testament to her dedication and passion for teaching that she was able to provide me with the necessary guidance and support.

Furthermore, I would like to express my appreciation towards all of the professors who delivered courses at a high level. It is clear that their commitment to excellence has helped me develop the skills and knowledge required to produce the case study. By acknowledging their contributions, I not only show my gratitude, but also encourage them to continue striving for excellence in their teaching.

Methods

As a primary research method for my case study, I chose to go with secondary research. Secondary research allowed me to gain a broader perspective on the topic of SAP implementation using Waterfall and Agile methodologies. By drawing on a variety of sources, I was able to examine multiple viewpoints, theories, and case studies, which enriched my understanding of the research problem. For example, I reviewed existing research on the challenges and benefits of Waterfall and Agile methodologies in software development projects. This helped me to identify potential areas of overlap and opportunities for further investigation in my case study.

Additionally, secondary research allowed me to access a larger pool of data, which could have been difficult to gather through primary research alone. Through online databases, I was able to access a wide range of industry reports, surveys, and statistics, which provided important insights into the current state of Waterfall vs Agile methodology.

Overall, by choosing secondary research as the primary research method for my case study, I was able to efficiently gather and analyze existing data, literature, and research findings. This approach allowed me to gain a broader perspective on the topic, identify gaps in existing knowledge.

Literature Review

Enterprise Resource Planning (ERP) is software system that enables organizations to manage their resources and operations (Ma, 2023). ERP development and integration is a multi stage process from planning to implementation. The decision to choose certain development methodology is one of the main factors of success of ERP project. The

following literature review is aimed at analyzing pros and cons of Agile and Waterfall methodologies in terms of ERP development and integration.

Pros of Agile Methodology:

- Flexibility: Agile methodology is perfect in terms of adapting to changes during the development process. It welcomes changes and creates create environment for change management (Clearbridge Mobile, 2019).

- Incremental delivery: Agile methodology is tuned at delivering project in incremental stages. This ensures that end product meets user requirements and any feedback is taken into account as project deliveries progress (Atlassian, n.d.).

- User involvement: Agile methodology keeps users engaged throughout the process. This leads to higher user satisfaction and acceptance. Moreover, this ultimately leads to less financial burden since developer will have less reworks (Lucidspark, 2021).

- Continuous improvement: Agile methodology advocates necessity for continuous improvement by means of regular feedback loops and retrospectives (Lucidspark, 2021).

- Early detection of issues: Projects under Agile methodology ensure issue identification as early in the process as possible during the development process, which ultimately leads to prompt reaction (Clearbridge Mobile, 2019).

Cons of Agile Methodology in ERP Development:

- Complexity: Successful Agile methodology might require very experienced team members that are used at working independently and are able to make fast decisions when needed (Kellen & Caio, 2017).

- Communication challenges: under Agile methodology it is assumed that there will be frequent communication between team members. This leads to challenges in managing remote teams or teams that are located in different time zones (Kaur, 2023).

- Lack of documentation: Agile methodology advocates on working software over documentation. With organizations that have government ties or publicly traded, there is always some requirement for documentation, with Agile this can be an issue (Olic, 2017).

- Scope creep: Agile methodology may result in scope creep in cases where requirements are not well-defined or managed (Kellen & Caio, 2017).

- Integration challenges: In some cases Agile methodology can result in integration challenges caused by frequent changes and updates during the development process (Kaur, 2023).

Pros of Waterfall Methodology in ERP Development:

- Clear requirements: Under waterfall methodology there is a requirement for well-definition and clear documentation. This can support avoidance of any misunderstandings and miscommunications (Calvello, 2021).

- Predictable timeline: Waterfall methodology is guided by fixed sequence of phases, which can lead to generation of predicted timelines and ensure timely delivery of the project (Merwe, 2017).

- Well-suited for complex projects: Waterfall methodology can be a good choice for for complex projects where there are well-defined requirements and fixed timelines (Merwe, 2017).

Cons of Waterfall Methodology in ERP Development:

- Lack of flexibility: Under waterfall methodology change implementation is very challenging and are not easy to make during the development process (Casteren, 2017).

- Limited user involvement: User involvement in not very close in Waterfall methodology. This in fact may lead to lower user satisfaction and acceptance at the end of the project (Merwe, 2017).

- Limited feedback loops: Waterfall methodology does not consider regular feedback loops, this in turn may lead to limited chances for improvement (Merwe, 2017).

- High risk: when requirements are not well-defined or there is a need for constant changes, there might be high risk project failure as waterfall does not adjust to these changes easily (Casteren, 2017).

- Limited scope for change: Waterfall methodology usually assumes that the project requirements must be frozen in order to avoid any negative impact to project deliverables, leaving no room for possible changes in scope, ultimately there is a risk that end product might not meet updated market needs (Casteren, 2017).

After analyzing the pros and cons of Agile and Waterfall methodologies, it can be concluded that both approaches have their own unique features. The selection of a particular methodology depends on the specific requirements and characteristics of the

project. The decision on which methodology to use for a project should be based on a careful consideration of the project's objectives, scope, and constraints. It is important to weigh the pros and cons of each methodology and choose the one that best aligns with the project's needs. Ultimately, the success of a project depends on effective project management and the ability to adapt to changing circumstances, regardless of the methodology used.

Background information
Target audience

The target audience for an Agile vs Waterfall during SAP integration case study could include:

- Project Managers: individuals responsible for planning, executing, and closing projects, and who need to choose an appropriate methodology for the SAP integration project.

- IT professionals: including software developers, architects, functional consultants, and business analysts who are involved in SAP integration projects.

- Business executives and stakeholders: C-level executives, business leaders, and other stakeholders who need to understand the benefits and tradeoffs of using Agile or Waterfall methodologies for SAP integration.

- SAP users: employees and end-users who interact with SAP systems on a regular basis, such as sales representatives, customer service representatives, accountants, and supply chain professionals.

- Consultants and advisors: independent consultants and advisors who provide guidance and support to organizations that are planning to integrate SAP systems and who can offer insights into which methodology is best suited for their needs.

- Academics and researchers: students, professors, and researchers who are interested in SAP integration methodologies, Agile vs. Waterfall methodologies, and project management practices.

Case study focus

The case study will focus on issues faced during SAP integration using waterfall methodology. The case study will assess benefits of implementing SAP integration using Agile methodology.

The case study on SAP integration using waterfall methodology will examine the challenges faced by an organization during the implementation process. The study will delve into the issues faced, such as delays, communication gaps, increased costs, and missed deadlines, which are common in waterfall methodology. It will also explore the reasons why waterfall methodology was chosen, including a lack of familiarity with other methodologies and the perception that it provides better control and predictability.

The second part of the case study will focus on the advantages of implementing SAP integration using Agile methodology. The study will highlight the key benefits of Agile methodology, including increased collaboration, faster delivery, flexibility to changing

requirements, and improved quality. It will provide a comparative analysis of both methodologies, highlighting the strengths and weaknesses of each.

In conclusion, the case study will provide insights into the challenges and benefits of using different methodologies for SAP integration. It will help organizations evaluate their approach to SAP integration and make informed decisions about which methodology is best suited for their needs.

Case study reflection about organization

The case study will examine the challenges and issues that manufacturing companies face when implementing software projects, specifically focusing on SAP integration. Manufacturing companies often have limited knowledge about software implementation, which can lead to a range of issues, including delays, cost overruns, and poor outcomes.

The case study will explore the root causes of these issues and provide examples of how they manifest in real-world scenarios. For example, manufacturing companies may struggle with defining requirements, communicating effectively with software vendors, and managing change throughout the project. Additionally, the case study will examine the impact of limited knowledge on project team dynamics and how it can lead to misalignment, misunderstandings, and ultimately project failure.

Finally, the case study will provide insights and recommendations for manufacturing companies looking to improve their approach to software projects, including SAP integration.

About GM Uzbekistan

Mission

To be the best automotive company in Uzbekistan by providing world-class quality products and services to our customers, while continuously improving our business processes and developing our people.

Customers

The main customers of General Motors Uzbekistan (GM Uzbekistan) are individuals and businesses in Uzbekistan, as well as customers in other countries where their vehicles are exported. GM Uzbekistan produces a range of passenger cars and commercial vehicles that are designed to meet the needs and preferences of local and international customers. The company's vehicles are sold through a network of dealerships and distributors in Uzbekistan and in other countries where they are exported.

In addition to selling vehicles to individual customers and businesses, GM Uzbekistan also provides vehicles to government agencies and organizations in Uzbekistan, such as law enforcement agencies, healthcare providers, and public transportation companies. The company has established partnerships with various institutions to offer financing and leasing options to customers who want to purchase or lease its vehicles.

Export markets

GM Uzbekistan has established a strong presence in its neighboring countries, which are the main export markets for the company. Russia and Kazakhstan are among the largest

countries in the region, with significant demand for passenger cars and commercial vehicles. As such, these countries represent a key target market for GM Uzbekistan's export strategy.

Russia is the largest export market for GM Uzbekistan, with the company exporting significant numbers of vehicles to the country each year. The demand for GM Uzbekistan's vehicles in Russia is driven by their affordability, reliability, and adaptability to different road and weather conditions. GM Uzbekistan has established partnerships with several distributors and dealerships in Russia to market and sell its vehicles.

Kazakhstan is another important export market for GM Uzbekistan, with the company exporting vehicles to the country since 2006. Kazakhstan is a key transit country for trade between Europe and Asia, and its growing economy has led to an increase in demand for passenger cars and commercial vehicles. GM Uzbekistan has established partnerships with several distributors and dealerships in Kazakhstan to market and sell its vehicles.

Overall, GM Uzbekistan's export strategy has been successful in targeting its neighboring countries, with the company continuing to expand its presence in these markets and exploring new opportunities for growth and expansion.

Industry

GM Uzbekistan operates in the automotive industry, specifically in the design, manufacture, and distribution of passenger cars and commercial vehicles. The company

is a joint venture between General Motors (GM) and Uzbekistan's national carmaker, UzAvtosanoat, and was established in 2008.

Important details about GM Uzbekistan

GM Uzbekistan's rapid expansion and growth have made it necessary for the company to automate its business processes and improve its operational efficiency. To achieve this goal, the company has decided to integrate SAP (Systems, Applications, and Products) software into its business operations.

SAP is a leading provider of enterprise software solutions that help businesses automate their processes, manage their resources, and optimize their performance. By integrating SAP software into its operations, GM Uzbekistan aims to improve its business processes, enhance its decision-making capabilities, and achieve greater operational efficiency and cost-effectiveness.

The integration of SAP software into GM Uzbekistan's operations is expected to provide several benefits to the company. It will enable the company to streamline its operations, reduce manual processes, and improve data accuracy and consistency. This, in turn, will help GM Uzbekistan to make more informed decisions, respond more quickly to changing market conditions, and improve its overall competitiveness.

Additionally, the integration of SAP software will enable GM Uzbekistan to better manage its resources, including inventory, production, and supply chain management. This will help the company to optimize its operations, reduce costs, and improve customer satisfaction by providing faster and more reliable delivery of products and services.

Overall, the integration of SAP software into GM Uzbekistan's operations is a strategic move that demonstrates the company's commitment to continuous improvement and innovation. It is expected to help the company to achieve greater efficiency and competitiveness in the automotive industry and position itself for further growth and expansion.

Production locations

GM Uzbekistan operates several plants in Uzbekistan, including an assembly plant in Asaka, Pitnak and a manufacturing plant in Tashkent. The Asaka and Pitnak plants produce passenger cars, while the Tashkent plant conducts Semi Knock Down Assembly only.

In terms of employment, GM Uzbekistan is one of the largest employers in Uzbekistan's automotive industry, with thousands of employees working in its production facilities and distribution network.

Challenges

What went well:

Good documentation:

Waterfall methodology is a linear and sequential approach to software development, where each phase is completed before moving onto the next. One of the key advantages

of waterfall methodology during General Motors Uzbekistan SAP implementation was its emphasis on great documentation.

With respect to SAP's complexity as a large scale project, its implementation requires careful planning and execution. By using waterfall methodology GM Uzbekistan was able to achieve structured and controlled approach that enabled teams to document each phase of the project in detail. This documentation was beneficial in multiple ways, such as improving project transparency, clear communication among team members and stakeholders, and supporting project maintenance and evolution.

During implementation of SAP using waterfall methodology, the project team took great amount of time to define and document all project requirements in detail during the initial planning phase. This documentation was the basis for framing further project deliverables. It as a reference point and provided a clear understanding of the project objectives, scope, and constraints.

Overall, the level of attention waterfall methodology grants to documentation is fascinating and provides a robust framework for achieving project goals. By putting requirement to document each phase of the project, waterfall methodology can help the team to deliver good quality product that meets initial business requirements.

Clear timing:

Another key benefits of using the Waterfall methodology during SAP implementation was clear project timing.

This methodology has clear phases by breaking down the project into clear and distinct phases, such as planning, design, development, testing, and deployment. As a customer

GM Uzbekistan was more involved in planning and initial requirement gathering. Each phase had its own set of deliverables and objectives. Moreover, there was clear deliverable for moving from one phase to the next. For example, developers took time to interview each department to have clear understanding of user requirements, once this was done according to project timing they moved on to framing user stories based on initial interviews. This means that the the team was able to create a detailed project plan with specific timelines for each phase, making it easier to track progress and stay on schedule.

Additionally, Waterfall provides clear project timing by means of using milestones. As mentioned above each phase of the project had clear set of milestones that must be achieved before moving on to the next phase. Not only that, the payments to developers was tied to successful and on time delivery of these milestones. This helped to ensure that the project stays on track and that everyone is working towards the same goals. Considering such a great level of attention to timing, the project was successfully delivered as per original plan.

What didn't go well:

Limited user involvement: since GM Uzbekistan is a manufacturing company it had zero experience in launch of complex software projects. The company assumed that after initial interviews and clear documentation, developers would be able to deliver the right product that would meet the highest expectations. However, due to lack of involvement, the end product was disappointing and didn't satisfy the company needs and required large scale second phase implementation with introduction of required changes.

Lack of flexibility: once the team finalized initial requirement gathering and documentation was complete, GM Uzbekistan started to realize that some of the key requirements were not included. This was partially due to lack of experience of manufacturing team to clearly state their requirement as well as changes advocated by ideas of business optimization and changes in legislation. However, Waterfall methodology limited the ability of this particular project to introduce all required changes during phase 1 implementation. In order to keep original timing the team decided to implement all those changes as phase 2, which would start only after phase one implementation.

Limited feedback loops: with manufacturing experience GM Uzbekistan was used to having a touch at the product during multiple test runs in development process. However, with software project under waterfall, there was no opportunity to see the end product until it was introduced at the end of the project. This limitation led to serious consequences as user expectation and developer actions were highly misaligned. With some intermediate loops in the process this could have been avoided.

In general, the whole project turned out to be a big failure due to lack of communication between customer and developer. If constant communication channels and feedback would have been established most of the issues would have been identified early in the project and necessary actions would have been taken.

What was done:

Upon delivery of a product that doesn't meet customer requirement, GM Uzbekistan decided to terminate contract with their current developer (this was a company from

Belarus that won the tender by offering the lowest cost) and hired new local company to work on phase 2 of the project that would take into account all required changes and improvements. The initial project cost was $5 million dollars, additional contract cost company extra $2 million.

Solution:

Apply Agile Methodology

The integration of SAP into General Motors Uzbekistan has faced several issues under the Waterfall methodology, which has been the traditional approach for project management. However, the first and most obvious solution to address these issues is to apply the Agile methodology. Agile is a flexible and iterative approach that emphasizes collaboration, continuous feedback, and adaptability.

By applying Agile methodology, the integration project can be broken down into smaller, manageable increments or sprints. Each sprint will have its own set of deliverables, timelines, and goals, which will be reviewed and adapted as necessary based on continuous feedback and assessment. This approach will allow the project team to be more responsive to changes in requirements, address issues as they arise, and ensure that the project is delivering value to the organization.

Base SAP without customization

To ensure a smoother and more effective integration of SAP into General Motors Uzbekistan, it is recommended to launch the SAP base model with minimal customization

and gradually build up the system's functionality as the project progresses. This approach can help to avoid unnecessary complexities and confusion that often arise from excessive customization.

Launching the SAP base model with minimal customization means that the project team will focus on implementing the standard SAP functionalities without making any significant changes to the system's design. This approach allows the team to take advantage of SAP's best practices and preconfigured processes, which are based on industry standards and years of experience. By following the standard SAP model, the project team can avoid common mistakes and ensure that the system works as intended.

As the project progresses, the team can evaluate the system's functionality and determine where customizations are necessary. This approach allows the team to identify the specific areas where customizations are required, rather than customizing the entire system upfront. By doing so, the project team can minimize the risk of unnecessary or redundant customizations, which can lead to further complexity and confusion in the project.

Additionally, it has been observed that many customizations can actually be counterproductive and cause more issues than solutions. By launching the SAP base model and testing its functionalities, the team can identify areas where customizations can improve the system's efficiency and performance. This approach ensures that the customizations are aligned with the organization's specific requirements and goals and that they do not cause more issues than solutions.

Welcome changes

In order to ensure that the final product meets the needs of both the market and any legal requirements, it is essential that changes are welcomed as an ongoing process. By doing so, the team can continuously assess the needs of the market and adapt the solution accordingly. This will help to ensure that the final product is up to date with the latest market trends and demands, and that it complies with all relevant legal requirements. By embracing change as a part of the development process, the team can avoid any potential issues that may arise if changes are not considered until later in the project. Furthermore, by being open to ongoing changes, the team can ensure that the final solution is both relevant and effective for its intended audience.

Client engagement

In order to avoid any misunderstandings or miscommunications between the client and developer, it is crucial to engage the client in discussions throughout the project. This means that the client should be kept informed of the progress being made, and that any decisions that need to be made are done so with the client's input and agreement. By doing so, the client will feel more involved in the project and will have a greater understanding of the development process. This will also help to ensure that the final product meets the client's needs and expectations, as the client will have had the opportunity to provide feedback and make suggestions throughout the development process. Ultimately, by involving the client in discussions and decision-making, the project team can ensure that the client is satisfied with the final product and that any issues or concerns are addressed in a timely and effective manner.

User training

To avoid the situation where users are not properly trained on a new software system, it is recommended to organize user training sessions well in advance of the project launch. By doing so, users will have a better understanding of how to use the software and will be better prepared to work with it once it is implemented. This can prevent major issues from arising, such as the one experienced by the company in this case study, where only 5% of users were trained and major functionality was impacted as a result. In such situations, urgent training sessions may have to be established, causing stress for both the project team and the end users.

By conducting user training sessions well in advance, users will have ample time to learn and become familiar with the software. This can help to minimize the amount of stress and confusion that users may experience during the transition period. Furthermore, by providing ongoing training and support, users can continue to develop their skills and confidence in using the software, leading to improved productivity and efficiency. Ultimately, by investing in user training, organizations can improve the success rate of their projects and ensure that they achieve the desired outcomes.

Local vendor

In order to minimize communication issues and ensure smooth project delivery, it is recommended to use a local supplier. In this particular case, having a vendor located 2000 miles away led to communication challenges, which caused delays and

misunderstandings. Additionally, with the ongoing COVID-19 pandemic, the final stage of the project launch was at high risk of failure, since travel restrictions and lockdowns were in place. By using a local supplier, the project team can benefit from a closer working relationship, more frequent face-to-face interactions, and easier coordination, especially during uncertain times like these. Furthermore, a local supplier is likely to have a better understanding of the local market, regulations, and culture, which can be beneficial when implementing a complex system like SAP. Overall, engaging a local supplier can help mitigate risks, streamline communication, and increase the chances of a successful project outcome.

Conclusion

The above statement highlights the pros and cons of General Motors Uzbekistan's implementation of the SAP system using the Waterfall methodology. While the implementation was successful in terms of documentation and timing, it lacked user involvement, flexibility, and feedback loops, resulting in an unsatisfactory end product. As a result, a second phase implementation was required.

To overcome these limitations, it is recommended that General Motors Uzbekistan adopt the Agile methodology for its integration project. The Agile methodology emphasizes continuous feedback, collaboration, and flexibility. It involves breaking down the project into smaller increments, each with its own specific objectives, which allows for continuous feedback and assessment. This approach allows for a more iterative process and can help the company address any issues that arise more quickly and efficiently.

Another recommendation is to launch the SAP base model with minimal customization to avoid unnecessary complexities and confusion. This approach will help the company focus on getting the system up and running quickly while minimizing the risks associated with customization.

Overall, by adopting the Agile methodology and launching the SAP base model with minimal customization, General Motors Uzbekistan can ensure a smoother and more effective integration of SAP into its operations.

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Lessons learnt:

Developed by Kamil Urunov on 5/3/2023

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What did I do well?

- Good research on the topic

- Ability to apply newly acquired knowledge

What can I do better?

- Better time planning, I felt that at some point I lost track of my timing and left out with multiple assignment at the end of the semester

What still puzzles me?

- I am still a little confused with the whole case study template, I tried to follow the given format but at times I was confused if it really made sense

What would I do again?

- Deep research on the topic

- Pros and cons analysis

What would I not do again?

- Bad time planning

What would I do differently?

- I would remake the case study with more of actual data to which unfortunately I didn't have access at this moment

What have I learned?

I have learnt to apply all my knowledge acquired during my master's degree into case study analysis. Moreover, I have learnt drafting issues into case study format which was previously unknown to me.

School of Professional Studies

Kamil Urunov

SAP INTEGRATION

Project Overview

Introduction

The following Charter will cover the project on SAP development and integration into General Motors Uzbekistan operations during 2018-2020. The work consisted of the following items:

- All accounting operations to be integrated into new system.
- Production parts ordering to be done through SAP.
- All employees to be trained for new software.
- Support team to be established on site to fix issues when needed

The project was carried out using waterfall methodology. The main aim of the project was to establish transparency in daily operations and achieve efficiency through automation of processes as all previous tools proved to be inefficient, had lack of accuracy and crucial month end reports took at least few weeks to be generated.

This following case study will study possible hypothetical benefits from applying agile project development methodology to the same project that was completed using waterfall.

Major Stakeholders

- Capstone Advisor   Mary Piecewicz
- Project Manager   Kamil Urunov
- Examiners of final presentation   Mary Piecewicz
                            Brain LeBlanc
                            Richard Aroian

Project Goal and Scope

Project Goal

The project goal is to analyze hypothetical benefits from execution of SAP development and integration project under agile methodology rather than waterfall. Based on the results of the study respective recommendations to be generated.

Project Scope

In Scope:

- What were the issues of the project with waterfall methodology
- Comparison analysis of waterfall vs agile methodology

- o Pros and Cons analysis of waterfall methodology with respect to current project
- o Pros and Cons analysis of executing the project under Agile methodology
- o Critical analysis of results of both methodologies and delivery of recommendations

Out of Scope:

- o Since the project is already executed, agile methodology is only hypothetical
- o End product testing under Agile methodology is out of scope and cannot be conducted due to lack of data

Assumptions

- It is being assumed that the project should be carried out as software development project, rather than improvement in manufacturing processes. Hence under agile there is much better communication since developers and customers have constant communication.
- Under agile methodology, changes are welcomed and handled much efficiently.
- It is being assumed that if time was to be reversed same project could be executed under agile.
- There is an assumption that employees have enough skills to communicate with developers to provide required feedback in timely manner.
- Cutting project timing is expected to lead in reduction in project spending
- Developer has enough skills to execute the project under Agile
- Customer has knowledge and understanding to accept work portion by portion under Agile.

Constraints.

- One semester might not be enough to conduct in depth analysis of this project objectives, timing might not be enough to complete the project on time.

Risks

- Main risk is failure to complete the project on time.
- Unexpected change in study conditions, such as new wave of Covid
- Health related issues with me or any member of my team
- The end study result might not show clear recommendation

Measures of Success

Project Outcomes	Measure of Success
Understanding of main aspects of waterfall methodology	By end of project, I must have clear understanding of all aspects of projects under waterfall, its pros and cons, as well as what projects are best for waterfall.
Understanding of main aspects of agile methodology	By end of project, I must have clear understanding of all aspects of projects under agile, its pros and cons, as well as what projects are best for agile.
Conduct project audits	Based on waterfall vs agile analysis, by end of the course I must have good experience of analyzing every aspect of the project to propose best solution
Time management	Ability to work independently on a project without much supervision and guidance, achieving development of full report by deadline

Stakeholder Sign-off

Kamil Urunov	Project manager	2/13/2023
Mary Piecewic	Capstone advisor	2/13/2023

Capstone Planning Document

Name: **Kamil Urunov**   Program: **MSPM**

Contact Information: Email: **kurunov@clarku.edu**

Phone: **508 4105506**

Employer (if applicable):

Current Job Title (if applicable):

Prior Degree(s): **BSc in Economics**

Personal/Professional Goals

- **What are your plans after graduation?**

Upon graduation I am planning on exploring opportunities of employment in USA. I am planning on finding project management or similar roles within Supply Chain direction. However, the end goal is to establish a separate business that I will be able to manage and run myself.

- **What are your strengths within your discipline?**

Experience – I have over 10 years of work experience and I count it as my strength.

Analytical skills – over the course of my career I have been challenged with many tasks. The key to acing such tasks is through usage of analytical skills where you have to pick up necessary piece of data from big pile and present it to leadership in understandable way.

Communication skills- being a manager is not an easy task, especially when you have to work both with internal and external stakeholders, so I believe that my communication skills have helped me in solving this challenge.

Teamwork – be this in early stage of my career or at latest role, I have always had to work in different groups to achieve best results. This experience has given me an opportunity to tackle team work issues with required skills.

- **In what areas would you like to explore within your discipline?**

My goal is to move from supply chain daily operations to more of Project/Program management within Supply Chain. Moreover, I would like to explore opportunities to learn technical skills with data management – SQL/Tableau.

Individual/Group Preferences

- **Would you prefer to work on your Capstone individually or as part of a small team?**

    I prefer to work on the Capstone project individually.

1. **If you are interested in being part of a small team, do you have individuals in mind with whom you would like to work?**
   n/a

2. **Have you connected with them about being part of a team?**
   n/a/

Considering Capstone Topics and Options

- **Capstone Focus Area/Topic.**

I plan to do my capstone project on case study basis. This is about a project that I was part of during my employment. We were working on software development for our company needs. Activities on the project have been carried out on Waterfall methodology. With respect to the knowledge that I have obtained during my Master's degree I plan to study possible scenario of conducting same project under Agile methodology. As part of my study I plan to apply Lean methodologies to eliminate the wastes that waterfall methodology might have.

- **What interests you most about each of these ideas/topics?**

I have a feeling that most organizations are already in the process of shifting away from waterfall to agile. Therefore, conducting capstone project on this topic would be helpful in deepening my knowledge on the topic. Moreover, I have a plan of getting certified both on Scrum and Six sigma, so this project will be a good practice ground for my preparation.

- **How does each idea/topic relate to your personal and professional goals?**

I believe that the project has indirect impact on my professional goals. Of course I am not planning on working on software company, or even managing software related projects. However, I honestly believe that Agile methodology covers a topic of waste elimination, Lean, which is part of most of manufacturing companies. This project will give me good experience in terms of waterfall vs agile and when best to apply one of these methodologies.

- **What courses and/or experiences have prepared you to further explore these ideas/topics?**

I have taken Agile course during my first semester, as well as project management fundamentals during my second semester. These courses cover both agile and waterfall methodologies in detail.

- **What knowledge or skills—that you don't currently possess--do you think you will need to address these ideas/topics for your Capstone project?**

First of all I will have to research more on RACI table for software project management, as well as make additional independent study on Six Sigma methodologies.

- **There are three options for Capstone. Which option seems to best align with each idea/topic? Refer to the Capstone descriptions.**

Case study basis.

Please add the information requested for the Capstone Option you think best aligns with each idea/topic.

- **Case Study**
    1. **Focus of Case Study: What question does the case study intend to answer?**

How to transfer project implementation from waterfall to agile?

What are the pros and cons of Waterfall methodology?

What are the pros and cons of Agile methodology?

In terms of time and money, which method is more applicable to the project?

What challenges might be expected during transition to Agile?

Are there any issues/errors that have been made during Waterfall? How can they be avoided in Agile?

    2. **How will the development of this Case Study benefit and/or contribute to your field?**

As mentioned above, many companies are concentrated on waste elimination, hence this project would give me on the ground experience on the topic. Moreover, it will be a good preparation point for my certification exams.

    3. How do you envision the Case Study will be used and by whom?

I hope the case study results will be applicable to any company/individual seeking to transfer operations from waterfall to agile. It could also be lessons learnt activity on certain mistakes during project execution.

Faculty Review and Comment: **Date: _____**

Capstone Status Report No.1

Capstone Project Name: SAP Development and Integration Into General Motors Uzbekistan

Student Name: Kamil Urunov

Date: 2/20/2023

Accomplished to date:

- Planning for Capstone project created
- Project scope, objectives and goals listed out
- All stakeholders are identified
- Assumptions listed
- Risks to the project identified, mitigations taken into account

Issues/Concerns:

Plans for next 30 days:

Waterfall:

- Project performance analysis under waterfall methodology. What were the weak and strength points.
- Analysis of company structure and R&R of SAP integration team
- Budget analysis
- Risk and change management under waterfall
- Feedback on end project

Agile:

- Start research on Agile methodology strengths and weaknesses.
- Developing a plan and strategy on how above project could have been done under agile.

Capstone Status Report No.2

Capstone Project Name: SAP Development and Integration Into General Motors Uzbekistan

Student Name: Kamil Urunov

Date: 3/28/2023

Accomplished to date:

- Planning for Capstone project created
- Project scope, objectives and goals listed out
- All stakeholders are identified
- Assumptions listed
- Risks to the project identified, mitigations taken into account
- Basic data gathered
- Literature articles identified, draft started
- Pros and cons of agile and waterfall identified

Issues/Concerns:

n/a

Plans for next 30 days:

- Finalize literature review portion
- Draft background information portion
- Draft about the organization portion
- Draft challenge portion
- Identify possible solutions
- Draft presentation slides

Capstone Status Report No.3

Capstone Project Name: SAP Development and Integration Into General Motors Uzbekistan

Student Name: Kamil Urunov

Date: 4/17/2023

Accomplished to date:

- Planning for Capstone project created
- Project scope, objectives and goals listed out
- All stakeholders are identified
- Assumptions listed
- Risks to the project identified, mitigations taken into account
- Basic data gathered
- Literature articles identified, draft started
- Pros and cons of agile and waterfall identified
- Literature review complete
- Drafted background information
- Drafted about organization

Issues/Concerns:

n/a

Plans until deadline:

- Finalize methods
- Finalize challenge and solution
- Prepare presentation slides
- Finalize full case study

SAP DEVELOPMENT AND INTEGRATION INTO GENERAL MOTORS UZBEKISTAN

KAMIL URUNOV

CLARK
UNIVERSITY

Introduction

- General Motors Uzbekistan is a vehicle manufacturing company established in 1996. Annual production capacity is 350K vehicles, with a plan to reach 500K by 2025.
- Company operations were based in multiple systems that were not related to each other: accounting, ordering, warehouse, production etc.
- In 2018 company decided to integrate all processes into single ERP-SAP.
- Developer from Belarus (2000 miles away from Uzbekistan) won the tender. Project was completed by Feb.2020.

2

Introduction

Intent
- Analysis of Waterfall vs Agile when integrating SAP

Desired outcome
- By means of case study come up with recommendation covering pros and cons of both methodologies and which one is best fit for SAP integration

Benefit for:
- Business executives/Project managers
- SAP users and developers/IT Professional
- Consultants and advisors

3

Methods and Outputs

- Secondary research
  - Time saving
  - Multiple viewpoints & theories
  - Case studies

4

Methods and Outputs

For this case study the following documents have been developed:

- Project plan
- Project charted
- Literature review
- 3 status reports

Methods and Outputs

What went well:

- Leadership support
- Project team
- Good documentation
- Clear and detailed timing

What didn't go well:

- Limited user involvement
- Lack of flexibility
- Limited feedback loops

Recommendations/Conclusion

- Implement project in Agile methodology
- Launch SAP base model with little customization
- Welcome changes as ongoing process
- Engage client into discussions all the times
- Organize user training before project launch

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Professional Development

- Recap of all knowledge acquired during Master's study
- Improved analytical skills: analyzing pros and cons of both methodologies helped to improve my ability to think critically and analytically.
- Enhanced project management skills: managing and organizing data, timelines, and resources
- Increased knowledge of ERP implementation: gaining knowledge and insights into ERP implementation

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Discussion

Any questions

9

THANK YOU

Use for subhead or
additional information

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CHALLENGE CONVENTION. CHANGE OUR WORLD.