

# **Software Engineering Assignment -1**

**UE19CS302**

## **Team Details**

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## Summary of the Assignment

Indian software services company **Service Inc Ltd.** is a **go to vendor for sectors** such as **web-based IT applications, manufacturing, e-commerce, banking, information security** etc. But the IT services sector has been a gold mine for the company and since there is a **stiff competition in these sectors margins are continuously falling while the costs are increasing.** But through profitable labour arbitrage it is able to maintain both growth as well as profit.

The company wanted to diversify into high margin sectors and got into product engineering space and a role of Senior Vice President (SVP) was created to be accountable for its performance. The new SVP in charge was set a goal by the CEO of Service Inc to **increase services revenue by 25% and margin by 40% in the next 3 years.**

**Product Inc Ltd.** a key client of Service Inc is **culturally different** from Service with open offices and senior managers having offices in corners whereas **Service Inc was hierarchical and bureaucratic** with senior managers assigned separate cubicles with larger desks. Product Inc has four engineering centres dedicated to four product lines manned and managed by Service Inc. The principle followed by these centres was to **“Build, Operate and Transfer”.**

**Service Inc SVP** realised that his ability to meet his target depended on **making Product Inc handing over execution of a part of the product line roadmap for growing products on a revenue sharing basis.** Service Inc did not follow agile scrum methodologies and operated on air tight requirements and froze the requirements before committing their resources and built **extensive documentation** with super elaborate processes and **not focussing on customer interaction.** But for Product Engineering operations being agile is imperative.

**Service Inc** came up with a resolution to **train all the members in agile and scrum,** hoping to **please Product Inc.** There were posters on the walls to remind the employees about the processes. **Service Inc** was very **pleased with the progress** made in the first **6 months.**

**Product Inc SVP** was sought to help **assess Service Inc** readiness for an expanded role. Product Inc sent a senior program director Stan to assess the four engineering centres in Bangalore. **Stan** got introduced to all the stakeholders and conducted **anonymous surveys, attended all the Sprint pre-planning, planning, daily scrum meeting, sprint review meeting.**

At the **end of 8th week** of his stay he listed his **findings across the four engineering centres** in a presentation. Each presentation specifically had to provide a **“go/no go”** recommendation at the conclusion. **Service Inc’s fate** of whether Service Inc **would partner Product Inc** in executing their current product roadmaps **depended on this assessment.**

**Stan's findings were as follows :**

1. **Daily Meetings** took **60-90 mins**.
2. **Quality engineers** joined after **2 weeks** and **test engineers** tested in **4th week in a 4 week sprint**.
3. The **Project Manager** trained as **Scrum master** was deciding and assigning tasks to the team and making commitment on behalf of the team.
4. **Team members** also responsible for **emergency product issues** would tend to upset the sprint deliverables.
5. After the sprint planning meeting, the **task list** was only a **draft**, which was finalised by the end of 1st week.
6. The **Teams** were encouraged to take **ambitious targets**.
7. **Product Owners** have worked with the products but have **never met a customer**.

The recommendation on the final slide was **“No GO”** and Service Inc SVP and his team of managers were stunned. **Product Inc SVP decided to keep Service Inc limited to low value IT services and maintenance services and shift to “Owned and operated” engineering centres from scratch through subsidiary companies.**

**Q1. Answer the following questions based on your understanding in not more than 10 sentences.**

**Q1a. Identify from the observations, where all would you think Service Inc did not meet the intent of the Agile Manifesto (any 10)**

1. **Extensive or Large Volumes of Documentation:** Service Inc. builds extensive documentations with super elaborate processes and these are helpful in billing clarity and to prevent revenue leakage for Service Inc but relying on volumes of documentation is just a waste of time that a fast-growing product cannot afford. *As an agile product has uncertainty and keeps changing, lots of things documented will have to be discarded. Hence, the efforts put into documenting goes waste.* It is against the Agile Manifesto of **Responding to change** over **Following a plan**.
2. **Bottom-Up Agile Transformation:** Management is **hierarchical and bureaucratic** which would work for sustenance, but not for a **pure product engineering operation**, where being agile is a crucial thing. *Seniority of a manager in the organization by the size of his desk and room, so they were **not easily approachable**.*

Usually, top management is at some point aware of Agile activities in the company, Scrum adoption, they leave it to the teams. Hence, *the actual **Agile ideologies** are only implemented at **bottom level and not at Management level**. Because, Top management believes Agile, Scrum and other things have got to do only with delivery and teams' productivity and do not understand that Agility is beneficial for business, product, and the most important – customers/users.*

3. **Airtight requirement:** Service Inc. tends to **freeze user requirements** before committing their resources and work under a bunch of criteria and limits. Which again goes against manifest, **responding to change** over **Following a plan**.
4. **Shielding:** Service Inc shields **resource issues, customer complaints and the sustenance headaches** from the **core engineering team**. It limits **Customer collaboration** and **Individual interaction**.
5. **Limited collaboration with customers and users:** **Product owners** (i.e., those who understand user requirements and convey the same to the development team during meetings) have been working with the products but have **never interacted with a customer**. *Customer interaction is very minimal, so the Product Owner had a **lesser understanding of the user's needs**.* But Agile favours **individuals & interactions** over **processes & tools**, which is not the case here.

6. **Task List Approval:** Task List/Backlog must be **discussed with Manager** and then in the **event of approval**, based on Manager's suggestions, few **discussions are held with team members**. *Basically, a lot of time (minimum of 2 weeks) required to be finalised by the higher authority.* It clearly doesn't favour, **focus on Simplicity in Both the product and the process.**
7. **Communication and collaboration are the major hurdles in larger teams:** *Product Inc. had a team of minimum 8 members and hence the usual **daily meetups would take a significantly larger amount of time updating the progress.*** Spending too much time on discussing work progress and suggestions is not ideal.
8. **Detailed plan for the Agile Transformation:** Service Inc. made a detailed plan to implement Agile method, so that it would work out well and Product Inc. would be satisfied. *But, having long term plans is not realistic as Agile is all about getting Adapted frequently.*
9. **Employees had no freedom:** *Employees did not have the independence and **decision-making power.** The Agile model will be successful only when employees are trusted and are empowered to make their decisions.*

For instance **Netflix Agile Transformation Model**, which focused on employee values:

- By assigning **trust in responsible behaviour and judgment of employees.**
  - By gathering **annual reviews and performance improvement plans** with frequent and open conversations from team members.
10. **Project-oriented organization (instead of a product)** – Service Inc. seems to have a habit of legacy/conventional project development methods. Since projects have **fixed time, scope, and budget**, *there is little opportunity to adapt and deliver the most desired value to customers.* Hence, they might have stuck to traditional models like Waterfall.
  11. **Political:** When a product must go through many departments/ teams, there might be **defined workflow/ procedures** *that it must go through, which just increases overhead. Also, there might be **disagreements between 2 departments.*** Instead, it should **Focus on Simplicity in Both the product and the process.**

**Q1b. Identify from the observations, where all would you think Service Inc deviated from what is expected from a SCRUM implementation. (any 10)**

1 . **The Daily scrum or stand up meeting need to be quick and simple** meeting to make sure everyone is on the same page, aligned with the sprint goal, and to get a plan out for the next 24 hours, *but in Service Inc. each of the team members took 10 minutes to update and the daily stand-up meeting would even extend to 60-90 minutes including all the discussions.*

2 . **The Scrum team responsible for delivering shippable increments should have differing skill sets and cross train each other so no one person becomes a bottleneck in the delivery of work**, and strong scrum teams should be self-organising and approach their projects with a clear “we” attitude *but in Service Inc. in the 4-week sprints, quality engineers joined after 2 weeks as there was nothing ready for testing till the end of 3<sup>rd</sup> week. The test engineers wrote test cases in the 3<sup>rd</sup> week and tested in the 4<sup>th</sup> week. So if something goes wrong either the development or the testing team can become a bottleneck and affect in delivering the sprint goal, instead they could work together and make sure everything is aligned with the sprint goal and deliver in time.*

3 . **The fundamental sprint goal** - what the team wants to achieve from the current sprint **cannot be compromised** *but in Service inc. team members were also responsible for emergency product issues that would tend to majorly upset the sprint deliverables or the sprint backlog.*

4 . Any changes to the requirements are done and reprioritized in the product backlog by the product owner and **during the sprint planning meeting held before the start of the sprint the user stories are selected which determines the sprint goal** *but in Service Inc. the sprint backlog underwent changes till 3<sup>rd</sup> week in a 4 week sprint.*

5 . **The product owner** is the voice or representative of the team, and **makes commitments to the customers and stakeholders on behalf of the team** *but in Service Inc. the project manager who has been trained into the new role of Scrum Master is making commitments on behalf of the team.*

6 . **The development team forecast how much work they believe they can complete** over the iteration using their historical velocity as a guide *but in Service Inc. the backlog at the beginning of the scrum is more ambitious than the average velocity of the scrum teams recorded so far and the scrum team were encouraged to take more ambitious targets.*

7 . **The scrum team** drives the plan for each sprint and **selects tasks from the product backlog as much as it can commit to deliver** at the end of the sprint *but in Service Inc. the project manager who has been trained into the new role of Scrum Master is deciding and assigning tasks among team members, instead of allowing the development team to choose the tasks to complete during the sprint.*

8 . The fundamental goal of scrum **Customer collaboration over Contract negotiation** is **having customers to experience the sprint outcomes** and participate in sprint reviews to ensure they can visualise and ensure that product meets their needs *but in Service Inc product owners in the scrum teams have worked with the products ever since the centres have been set up but have never met a customer.*

9 . In a Sprint Pre-Planning meeting, Product Owner needs to talk and align requirements of **multiple stakeholders** which enables the business and stakeholders to focus on prioritisation and preparation of requirements far in advance before the sprint planning session, *but in Service Inc. the product owner discuss the draft task list with the centre manager and based on his feedback, there were few online discussions with the scrum master and team members following which the backlog was finalised instead of finalising before the start of the sprint in sprint pre-planning meeting.*

10 .The work to be performed during the current sprint is planned during the sprint planning by the entire development team led by scrum master where the team decides on the sprint goal *but in Service Inc. after the Sprint planning meeting, the task list was only a draft which was finalised by the end of 1st week which could misalign the user stories with the sprint goal.*

11 . At the end of the sprint, the team gets together for an informal session to view a demo of or inspect the increment or the achieved sprint goal, **the development team showcases the backlog items that are now “Done“ to the stakeholders and teammates for feedback**, *but in Service Inc. in sprint review meetings, there was just a detailed presentation and the feedback was only collected from the members instead of the stakeholders and other customers.*

12 . *There was no Sprint Retrospective meeting done at the end of the meeting* where the team comes together to document and discuss what worked and what didn't work in a sprint, a project or relationships, tools, *so there was no time to discuss what went well and what needs to be improved for the next time.*

**Q1C. Discuss each of the findings in the table and indicate whether the finding contributed positively or negatively in go/no go recommendation and indicate with ~5 sentences why it is so.**

The findings in the table have been indicated as contributed positively or negatively which in turn reflects on the final go/no go recommendation by the Product Inc. senior product manager Stan.

**Finding 1: Contributed Positively**

The finding states that there was a daily scrum meeting held which took about 60-90 mins for a team of 8. There was also a sprint review meeting with every scrum member speaking for no greater than 10 mins. The team was well distributed with test engineers, developers and there was a product owner and a scrum master associated with each scrum team. These are in accordance with the Agile-Scrum Approach hence contributing positively.

**Finding 2: Contributed Positively**

Quality engineers joined at the halfway of the sprint and were rotated among projects, making it efficient. Test engineers tested the product under development in the 4<sup>th</sup> week as the product was not ready for testing until 3<sup>rd</sup> week. So, this is very much in line with the standard operating procedures one would follow when developing a product using Agile-Scrum.

**Finding 3: Contributed Positively**

The project managers were committed to their role of scrum masters by deciding, assigning, logging, making commitments and encouraging the scrum team members.

**Finding 4: Contributed Negatively**

The sprint backlog undergoing changes till the penultimate week indicates that the requirements for the 4-week sprint were not conclusive during the sprint planning meeting. Hence, the user stories are not prioritised and the team doesn't have a complete idea of the product feature needed to be developed, resulting in development of inefficient product feature or incomplete product feature.



#### **Finding 5: Contributed Negatively**

Though there was a presentation on what went well and didn't go well during the 4-week sprint in the sprint review meeting, it was never observed that the customers review on the current feature developed was discussed, as agile-scrum focuses on interaction with customers on a regular basis contrary to legacy model. Also, the product owner is not observed to be doing his duty of gathering customers' reviews and presenting it during the sprint review.

#### **Feature 6: Contributed Negatively**

The task list or the product backlog must be prioritised and sorted during the sprint planning meet which here was not the case. Moreover, the draft of the task list was discussed with the centre manager rather than the customer whose inputs and reviews are more important for product outcome. The product owner has clearly not done his duty here resulting in the failure of the agile-scrum approach trying to be implemented to the product line.

#### **Finding 7: Contributed Positively**

The scrum team was aggressive and ambitious in deciding the product backlog. Hence, they estimated the work and value associated with each story and worked out a profile about the same. This helped in designing an efficient and optimistic roadmap.

#### **Finding 8: Contributed Negatively**

Agile-scrum approach focuses on interactions with customers frequently during the development of the product so changes can be implemented at any point of time and cost of this change is not very costly. The product owner is responsible for the product backlog. Hence, the requirements are already frozen as the product owner never meets the customer which is contrary to 'change' from agile-scrum approach. There is *no response to change* here.

- *From the above findings, the finding 8 can be seen to have largely compromised the agile-scrum approach trying to be implemented by Service Inc.*

## **Q2. How can Service Inc achieve 40% growth in margin while achieving only a 25% growth in revenue?**

Service Inc wants to achieve 40% growth in margin and 25% growth in revenue in 3 years, which is a high expectation for them as their current growth in margin is only 10%(Y-O-Y) and growth in revenue is 12%(Y-O-Y). Service Inc is in the IT sector which is a highly competitive market with continuous drop in profit margins.

If we consider the expectation Service Inc wants to reach **Mathematically**, we realize it is pretty hard. For example, if they have total revenue of \$100, expenditure \$60 and profit \$40 in a year. Considering 25% growth in revenue and wanting to have a growth in margin of 40% in 3 years, their revenue would be \$125, expenditure \$55 and profits of \$70. As Service Inc is a well-established company, this simple calculation(without consideration of drop in profit margins) tells that they have to have a lot of **cost cuttings to achieve their goal with implementation of Agile and Scrum model**.

Service Inc can achieve 40% growth in margin while only having 25% growth in revenue with a lot of **Cost Cuttings** and having **business in the engineering sector with high demand** like Growth products.

**Business in the engineering sector with demand is a key to achieve 25% growth in revenue, while cost cutting is required to grow their margins by 40% as per their expectations.**

**Cost cutting involves many planned approaches for a 3-year term.**

- **Investments** in the Growth Product engineering sector as they have higher margin business. Ex: Having owned centres for development, in the long run reduces costs on rent for the place, which is a huge incentive to the company.
- **Layoffs**: Considering growth products, Agile and Scrum models are necessary. To implement this, they have to have a proper bottom-up efficient approach. During the transition, managers are converted to Scrum masters. Fewer scrum masters are required as the model promotes self-managed teams. So, firing a higher ranked, less approachable and less flexible manager is necessary.  
Removing these higher ranked managers can lead to saving a lot of money, with the saved money hiring economical and efficient developers who can bring fresh ideas and thought processes into the system.
- **Hiring** flexible and efficient developers to create better scrum teams.
- **Cultural change**: Flat hierarchical organization like Product Inc. Culture followed by Product Inc to be implemented. Having open offices can accommodate more people, improve communication between people and remove hierarchical differences.

- **Labour Arbitrage:** As there is a lot of supply of Engineers from colleges and Universities, hiring them can be cost effective as their payroll is less for the same work done by highly paid existing Engineers.
- **Training higher authorities** to have an open, acceptable and approachable mindset to the opinions of teams for flexible progress leading to faster approval, changes and deployment.
- **Faster paced scrum sprints**, so as to reduce development time using a larger number of developers as there is no dearth of budget.
- **Having a centralised engineering centre** can reduce the cost of maintenance and management.
- **Performance Review:** Frequent performance analysis of all employees in the company to have better analytics of the work being executed. Accepting feedback to improve the system.
- **Automation:** Repetitive tasks to be automated to reduce cost paid for Engineers and developers.

### **Q3. What are the cultural differences between Service Inc and Product Inc that you think is a challenge for successful scrum implementation that would satisfy Product Inc?**

For scrum to be successfully implemented in any organisation, there is a need for a cultural mindset that is very different from the traditional pre-existing cultures in organisations. From a cultural standpoint, the **structure of the organisation** is one of the most important features for scrum implementation. A well-defined organisational structure is proven to help employees work more efficiently, thereby laying the groundwork for all internal operations, establishing a chain of command, and thus increasing transparency in the workplace.

Product Inc has a **flat organisational structure** whereas Service Inc has a **hierarchical organisational structure**. In flat structures, there are only a few levels of middle management between leadership and employees while hierarchical structures resemble a pyramid with a vertical chain of command, with the CEO at the top and various management layers beneath. Product Inc has **open offices**, where all engineers and managers including VPs and SVPs share open cubicles of the **same size**, with senior managers having offices in corners of the building where engineers don't need to go often, thereby reducing the possibility of **external interference** during work hours. In contrast, in Service Inc, the seniority of a manager in the organisation can be determined by merely looking at the **size of the room and desk** allocated to them.

Due to the **limited bureaucracy** in Product Inc, there is **transparency** across all layers of the organisation. Since there are fewer levels of management, **internal communication is simplified and thus decision-making is faster**. The presence of dedicated conference rooms in Product Inc makes it easier to have discussions in the daily scrum meetings, sprint planning meetings etc. Additionally, since the layers of middle management are removed, **power and responsibility are divided evenly throughout the organisation**. In a scrum implementation, there is **minimal documentation** generated at each increment whereas Service Inc follow a **big bang approach** and thereby rely on large volumes of documentation, causing **excessive delays** which a fast-growing product cannot afford.

In Product Inc, it is normal for managers and program directors to be **relatively young** and part of the work culture includes **direct one to one conversations** between senior employees and engineers/junior managers. On the contrary, the general managers running Service Inc's engineering centres have an **experience in excess of 22 years** individually and have teams of 200+ reporting to them directly and indirectly. Any communication between the general managers and junior employees only occurs during meetings in one of the elaborate cabins in Service Inc's office.

Thus **bureaucracy and hierarchy** are prevalent issues in organisations like Service Inc, leading to communication silos and a lack of collaboration across departments. For a fast-growing product, there will be frequent changes occurring within a sprint and as a result **interaction** between the managers and engineers is vital for scrum implementation. Since **communication and collaboration** are essential for ensuring that the requirements are correctly understood and delivered, it would be a huge challenge for Service Inc to successfully implement scrum.