GREEN BELT CAPSTONE PROJECT

Coursera

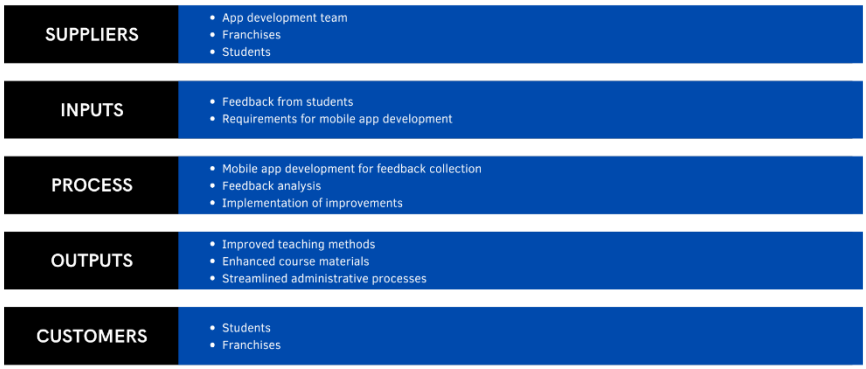
Six Sigma Advanced Improve and Control Phases

NEW MOBILE APP

PROJECT CHARTER

Project Name	New mobile app
Today's Date	April 16th, 2024
Project Start Date	April 20th, 2024
Target Completion Date	November 30, 2024

Project Element	**Response**
Problem Statement • Includes time, measurable item, gap and business impact	The project aims to enhance customer satisfaction at the language school by developing a mobile app to collect student feedback. This will provide valuable insights to improve the quality of services offered.
Business Case • Why is this project important to do now? • What is the project's financial impact? • What is the impact on DPMO/ Sigma level? • What is the impact on customer service	The project is important now to increase customer satisfaction by 15% within the first year of app implementation. The mobile app will provide a way to collect actionable feedback to identify areas of improvement in teaching methods, course materials, and administrative processes. The company aims to enhance its process quality from a 2-sigma level to a 6-sigma level. This improvement will significantly increase the reliability and efficiency of their operations. This will have a positive impact on customer service.
Goal Statement • Specific • Measurable • Achievable • Realistic • Time-bound	The goal is to increase customer satisfaction by 15% within the first year of app implementation. The project aims to deliver a fully functional mobile app for iOS and Android platforms and a data analytics dashboard for real-time monitoring and analysis of customer feedback.
List of Improvement Goals 1. 2. 3. 4. 5.	**Measure (units)** / **Baseline** / **Goal** Customer satisfaction / 50% of customer satisfaction / 15% increase Feedback collection / No direct feedback from the customer / Actionable insights Mobile app delivery / N/A / Fully functional Data analytics dashboard / N/A / Real-time monitoring
Process • Describe the process in which the problem exists	There is no direct feedback from the customer. The feedback received is from the franchise when it is too late to fix it so that the customer can find a solution within the online teaching experience. Usually, these customers change to one-to-one lessons in the franchise.

Project Scope • What part of the process will be addressed? • What are the boundaries of the project or process? • What areas are inside or outside the team's focus or authority? • Attach a SIPOC diagram if necessary	**1.** The part of the process that will be addressed is the feedback collection and analysis process within the language school. This involves collecting feedback directly from students through the new mobile app, analyzing it to identify areas of improvement in teaching methods, course materials, and administrative processes, and using this information to enhance customer satisfaction. **2.** The boundaries of the project include: • The development and implementation of the new mobile app for collecting student feedback. • Analyze feedback data to identify areas for improvement. The project does not extend to other aspects of the language school's operations unrelated to feedback collection and improvement. **3.** The focus areas of the team's or authority are: **3.1 Inside the team's focus or authority:** • Developing the mobile app. • Implementing the app for feedback collection. • Analyzing feedback data. • Implementing improvements based on the feedback. **3.2 Outside the team's focus or authority:** • Other aspects of the language school's operations are unrelated to feedback collection and improvement. • Larger strategic decisions that may impact the company's overall direction but are not directly related to this specific project. **Diagrama SIPOC** 

Team	**Member Name**	
Project Sponsor	Sam Zam	
Key Stakeholders	Language School, Students, Customer Service department, IT department, Data analysis team	
Team Lead	Sam Zam	
Team Members	Dan Jill, Carla Gonzalez, Kevin Iturbide	
Process Owner	Sam Zam	
Other	N/A	
Timeline by Project Stage	**Milestone**	**Target Completion Date**
Define	Inception Phase	April 2024 - May 2024
Measure	Planning Phase	May 2024 - June 2024
Analysis	Development Phase	July 2024 - September 2024
Improve	Testing and Deployment Phase	October 2024 - November 2024
Control	Monitoring and Evaluation Phase	December 2024 - Ongoing

TEAM CHARTER

Project Title	New mobile app

Expectation	Team Rule
Attendance	All team members are expected to attend all scheduled meetings. Any changes to meeting times must be communicated to the team at least 24 hours in advance.
Participation	Each team member is responsible for actively participating in discussions and contributing to project tasks. Substitutions are only permitted with prior approval from the team leader.
Focus	Team members must remain focused during meetings, adhering to the agenda and referencing the Project Charter for guidance. Meeting agendas will be circulated at least one day before the scheduled meeting.
Interruptions	Interruptions during meetings should be minimized, with priority given to emergencies. All team members must keep their phones silent during meetings to avoid disruptions.
Preparation	Team members must complete assigned tasks and deliverables within the specified deadlines. Meeting agendas will be prepared and shared in advance to facilitate effective discussions.
Timeliness	Meetings will start on time as per the scheduled agenda. Punctuality is expected from all team members.
Decisions	The team will employ appropriate decision-making methods for different situations, ensuring consensus whenever possible. Once a decision is made, all team members are expected to support it.
Data	Decisions will be based on factual data and evidence, whenever possible, rather than personal opinions or assumptions.
Conflict	Open and respectful communication is encouraged, even in the case of disagreements. If conflicts arise and cannot be resolved independently, a designated facilitator will assist in finding a resolution.
Other	N/A

Project Title	New mobile app

Expectation		Team Rule
Team Member	**Role**	**Signature**
Sam Zam	**Project manager**	
Dan Jill	**Team member**	
Carla Gonzalez	**Team member**	
Kevin Iturbide	**Team member**	

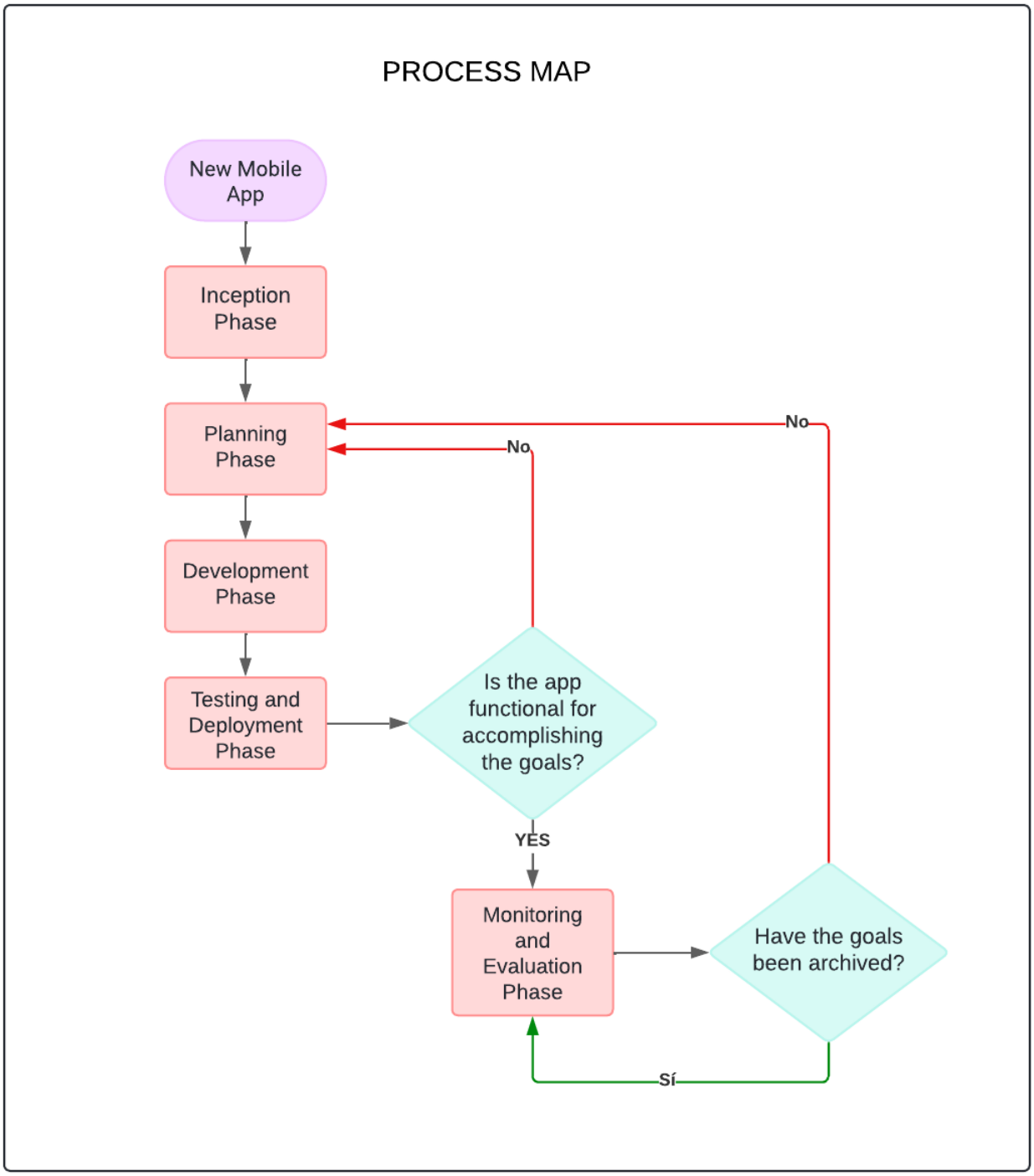
DATA COLLECTION PLAN

A concise data collection plan is crucial to gauge the impact of the new mobile app designed to enhance customer satisfaction in the language school.

- **What will be measured**:
    - Customer satisfaction before and after implementing the mobile app.
    - Number of feedback submissions through the mobile app.
    - Types of feedback received (teaching methods, course materials, administrative processes).
- **What is the data type**:
    - Customer satisfaction: Continuous numerical data (percentage).
    - Number of feedback submissions: Discrete numerical data (count).
    - Types of feedback: Categorical data.

Understanding these data will enable informed decision-making and continuous service improvement for the language school.

Process Map


PROCESS MAP
New Mobile App
Inception Phase
Planning Phase
Development Phase
Testing and Deployment Phase
Is the app functional for accomplishing the goals?
No
No
YES
Monitoring and Evaluation Phase
Have the goals been archived?
Sí

HYPOTHESES

1. **Customer Satisfaction**:
    - Null Hypothesis (H0): There is no significant difference in customer satisfaction levels after implementing the mobile app.
    - Alternative Hypothesis (H1): Customer satisfaction levels after implementing the mobile app have significantly increased compared to before.
2. **Number of Feedback Submissions**:
    - Null Hypothesis (H0): There is no significant difference in the number of feedback submissions after implementing the mobile app.
    - Alternative Hypothesis (H1): The number of feedback submissions after implementing the mobile app has significantly increased compared to before.

These hypotheses will help evaluate the effectiveness of the mobile app in improving customer satisfaction and feedback collection processes within the language school.

DATA ANALYSIS

1. Customer Satisfaction

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Before	30	54.100	2.564	0.468
After	30	64.100	2.564	0.468

Estimation for Paired Difference

Mean	StDev	SE Mean	95% CI for μ_difference
-10.00	0.00	0.00	(-10.00, -10.00)

μ_difference: population mean of (Before - After)

Two sets of data were collected, before and after the app implementation. The mean customer satisfaction score before implementing the mobile app is 54.100, and the score after implementing the mobile app is 64.100. This indicates an increase of 10 points in the mean customer satisfaction score after the implementation.

The standard deviation for both the "Before" and "After" data is 2.564. This indicates that the variability in customer satisfaction scores is the same before and after the implementation.

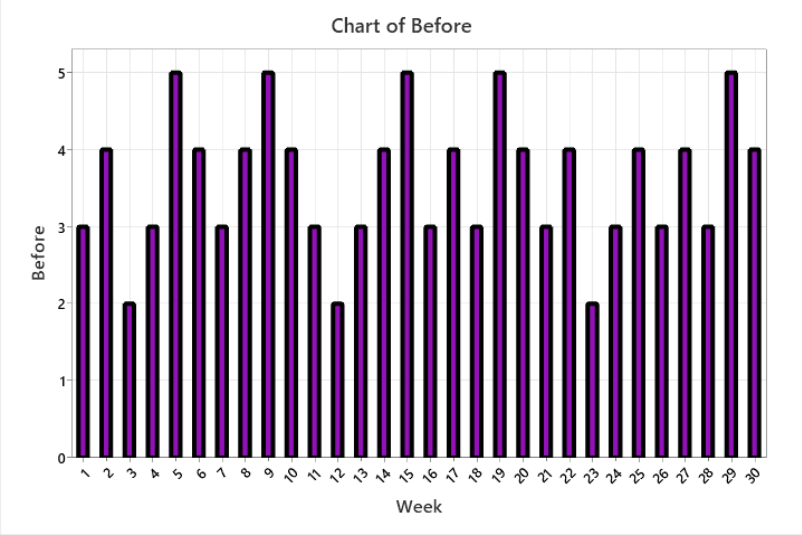
```
>> Green_Belt_Capstone_Project
t-Statistic: -Inf
p-Value: 0.000000
Confidence Interval: [-10.000000, -10.000000]
>>
```

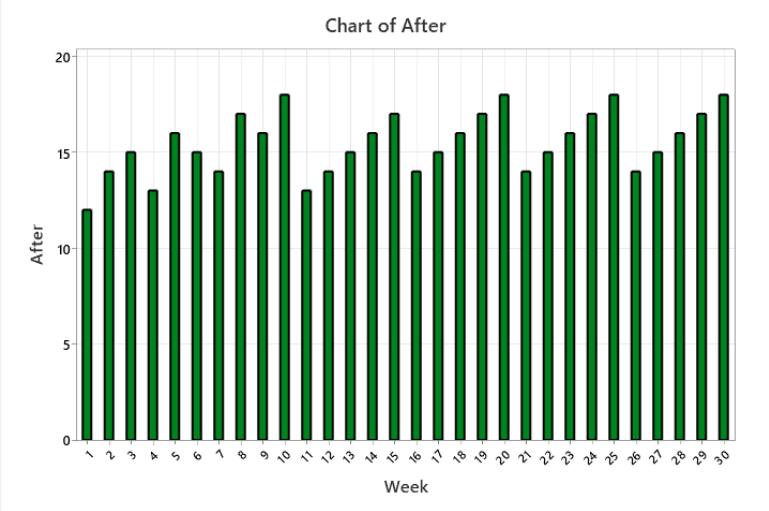
The paired t-test shows an extreme t-statistic of -Inf and a p-value of 0.000000, indicating that the increase in customer satisfaction is highly statistically significant. The confidence interval of [-10.000000, -10.000000] confirms a consistent improvement in customer satisfaction by exactly 10 points.
This means that we reject the null hypothesis as there is a statistically significant difference in the customer satisfaction before and after implementing the mobile app.

2. Number of Feedback Submissions

Before Implementation:

The average number of feedback submissions appears to be around 3.6 submissions per week.
The data shows relatively low feedback submissions, with some weeks having as few as 2 submissions and the highest around 5.





After Implementation:
The average number of feedback submissions significantly increases to around 15.5 submissions per week.
The data shows a much higher and consistent number of feedback submissions, ranging from 12 to 18 per week.

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Before	30	3.600	0.894	0.163
After	30	15.500	1.635	0.298

Estimation for Paired Difference

Mean	StDev	SE Mean	95% CI for μ_difference
-11.900	1.423	0.260	(-12.431, -11.369)

μ_difference: population mean of (Before - After)

Test

Null hypothesis H_0: μ_difference = 0
Alternative hypothesis H_1: μ_difference ≠ 0

T-Value	P-Value
-45.81	0.000

The mean difference of -11.900 indicates that, on average, there were 11.900 more feedback submissions after implementing the mobile app compared to before. The t-statistic is -45.81, indicates a very large difference between the "Before" and "After" number of feedback submissions. The negative sign indicates that the "After" submissions are significantly higher than the "Before" submissions. The p-value is effectively zero, which is much less than the typical significance level of 0.05.

The 95% confidence interval for the mean suggests that the true mean difference in feedback submissions lies between -12.431 and -11.369, indicating a consistent increase in feedback submissions after the implementation of the mobile app.
This means that we reject the null hypothesis as there is a statistically significant difference in the number of feedback submissions before and after implementing the mobile app.

Possible Improvements

Based on the analysis of customer satisfaction and the number of feedback submissions, the possible improvements identified are:

1. **Enhance User Interface of the Mobile App:** Improve the design and usability of the app to ensure a smooth and intuitive user experience. Incorporate user feedback to make continuous improvements to the app interface.
2. **Automated Feedback Analysis:** Implement automated tools to analyze feedback in real-time and provide actionable insights quickly. Use machine learning algorithms to identify patterns and trends in the feedback data.
3. **Incentivize Feedback Submission:** Introduce incentives such as discounts or rewards for students who regularly submit feedback. Create a point-based system where students can earn points for each feedback submission, which can be redeemed for various benefits.
4. **Regular Updates and Bug Fixes:** Schedule regular updates to address any bugs and improve app performance. Ensure that the app remains up-to-date with the latest technology standards.
5. **Enhanced Communication Channels:** Integrate additional communication channels within the app, such as live chat support or discussion forums. Provide quick and efficient responses to student queries and concerns.

6. **Training and Awareness Programs:** Conduct training sessions for students to educate them on the importance of providing feedback and how to use the app effectively. Raise awareness about the improvements made based on their feedback to encourage further participation.

CONTROL PLAN

The control plan will focus on monitoring the implementation of the mobile app and its impact on customer satisfaction and feedback submissions.

Control Plan Steps:

1. **Monitoring:**
    - Regularly track the number of feedback submissions and customer satisfaction scores.
    - Use dashboards and reports to monitor key performance indicators (KPIs) related to the app's performance.
2. **Evaluation:**
    - Conduct periodic evaluations to assess the effectiveness of the improvements.
    - Use statistical analysis to compare pre- and post-implementation data to ensure that the changes are having the desired impact.
3. **Continuous Improvement:**
    - Establish a feedback loop where students can continuously provide suggestions for further improvements.
    - Implement a continuous improvement process to regularly update the app based on user feedback and technological advancements.
4. **Documentation:**
    - Maintain thorough documentation of all changes made to the app and the feedback received.
    - Document the impact of each change on customer satisfaction and feedback submissions.
5. **Training:**
    - Provide ongoing training for staff and students on how to use the app effectively.
    - Update training materials to reflect any changes or new features added to the app.
6. **Communication:**
    - Keep all stakeholders informed about the progress and impact of the improvements.
    - Share success stories and positive feedback from students to encourage continued engagement.

REFLECTION

The journey through Coursera's Six Sigma Green Belt certification and the completion of this capstone project have profoundly enriched my experience. The DMAIC (Define, Measure, Analyze, Improve, Control) methodology provided a structured approach to problem-solving, emphasizing the importance of clearly defining the problem, accurately measuring relevant data, analyzing the data to identify root causes, implementing effective improvements, and controlling the process to sustain the gains. The project underscored the critical role of data-driven decision-making, using statistical tools and techniques to analyze data and draw meaningful conclusions rather than relying on intuition or assumptions. Engaging stakeholders through regular communication and updates was essential for ensuring alignment with project goals and progress.

Flexibility and adaptability were also crucial, as the ability to pivot and adjust based on new insights and feedback contributed significantly to the project's success. The concept of continuous improvement emerged as a central theme, highlighting that excellence is not achieved through one-time changes but through fostering an ongoing culture of improvement. The project provided a valuable opportunity to apply theoretical knowledge to a real-world scenario, solidifying the concepts and demonstrating their relevance in practice. Overall, the Six Sigma Green Belt certification has equipped me with essential skills and insights for driving process improvements and achieving operational excellence, with the capstone project particularly highlighting the transformative potential of structured problem-solving and data-driven decision-making in achieving significant business outcomes.

References

Munro, R. A., Ramu, G., & Zrymiak, D. J. (2015). The Certified Six Sigma Green Belt Handbook, Second Edition.

Coursera (2024) *Six Sigma Advanced Improve and Control Phases*. Coursera - University System of Georgia.