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IMPLEMENTATION OF SIX SIGMA DMAIC METHODOLOGY IN THE TEAM FOUNDATION SERVER RELEASE NOTES ON-TIME DELIVERING FOR BOX TEST TEAM

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ABSTRACT

The study investigates the application of the Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) methodology to improve the on-time delivery of Team Foundation Server (TFS) release notes for the Box Test Team at PT. XYZ Indonesia. The company, engaged in software development for automatic transmission systems, faced substantial delays, with only 31% of projects meeting delivery deadline between 2012 to 2018. Using DMAIC, the team identified key causes of delays, such as communication issues, unclear requirements, and limited resources. The improvements made to approval times and code reviews led to a significant reduction in delays and enhanced customer satisfaction. This case study demonstrates the successful application of Six Sigma in optimizing software development processes, ensuring timely project delivery, and improving operational efficiency.

Keywords: *Six Sigma, DMAIC, Software Development, On-time Delivery, Process Optimization.*

ABSTRAK

Studi ini menyelidiki penerapan metodologi Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) untuk meningkatkan ketepatan waktu pengiriman catatan rilis Team Foundation Server (TFS) untuk Tim Box Test di PT. XYZ Indonesia. Perusahaan yang bergerak di bidang pengembangan perangkat lunak untuk sistem transmisi otomatis ini menghadapi penundaan yang cukup lama, dengan hanya 31% proyek yang memenuhi tenggat waktu pengiriman antara tahun 2012 hingga 2018. Dengan menggunakan DMAIC, tim mengidentifikasi penyebab utama penundaan, seperti masalah komunikasi, persyaratan yang tidak jelas, dan sumber daya yang terbatas. Perbaikan yang dilakukan pada waktu persetujuan dan tinjauan kode menghasilkan pengurangan penundaan yang signifikan dan peningkatan kepuasan pelanggan. Studi kasus ini menunjukkan keberhasilan penerapan Six Sigma dalam mengoptimalkan proses pengembangan perangkat lunak, memastikan pengiriman proyek yang tepat waktu, dan meningkatkan efisiensi operasional.

Kata Kunci: *Six Sigma, DMAIC, Pengembangan Perangkat Lunak, Pengiriman Tepat Waktu, Optimalisasi Proses.*

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1. Introduction

The paper has chosen to concentrate upon Six Sigma (DMAIC) methodology, which are define phase, measure phase, analyze phase, improve phase and control phase. Our main focus is on the Team Foundation Server release notes on-time delivering for box test team in the company which is the object in the software development in the past seven years on 2012 to 2018.

PT. XYZ Indonesia is a multinational company which provides integrated IT solutions. Established in Indonesia in April 2012 with a 100% investment from XYZ Holdings Co., Ltd. PT. XYZ Indonesia is a Group Company of XYZ Holdings Co., Ltd based in Japan. The main project of PT. XYZ is to develop software for automatic transmission (AT) for cars.

PT. XYZ Indonesia is working to fulfill demand from the main company in Japan. To improve the cost-efficiency during the processes of software development and maintenance for the Electronic Control Unit (ECU) of automatic transmissions (AT), a software architecture as well as its supporting environments for the ECU of AT was put forward based on the requirements analysis of AT system.

The software architecture has a structure with five layers and two bases, which consists of a data collection and processing layer, a communication layer, a decision-making and scheduling layer, a harmonization layer, a driving and control layer, an integrated information base, and a knowledge base.

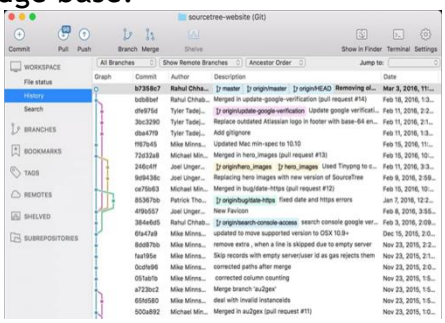

Figure 1.1 Example of the Final Product

The supporting environments include an interface between driver and AT ECU (transmission control unit, TCU), a display interface, other in-vehicle ECUs, a portable vehicle information online monitoring system, a shift schedule making platform, experts experience, etc. The proposed software architecture has been applied to an AT test vehicle successfully.

2. Literature Review

Time delivery in the service sector is closely connected to both customer satisfaction and the efficiency of operations. Six sigma focuses on minimizing process variation and defects to maintain high quality and efficiency. At the heart of Six Sigma is the DMAIC methodology, which consists of five key stages: Define, Measure, Analyze, Improve, and Control. Each stage is essential for identifying and addressing the underlying causes of inefficiencies, leading to improvements in time delivery. Time delivery in the service sector is closely connected to both customer satisfaction and the efficiency of operations. According to Choi and Choi (2012) applied the DMAIC approach to enhance the timeliness of service delivery, the result in shorter delivery times and higher customer satisfaction.

3. Research Methodology

3.1 Define Phase

This phase determines the objectives and the scope of the project, collect information on the process and the customer, and specify the deliverables to internal customers (head office).

3.1.1 Customer CTQ Requirements

The customer data (VOC) revealed that internal customer is mainly affected by Box Test release delay. Table 1.1 presents the requirement statements for the project. CTQ is prepared on the basis of the VOC and project objective.

Table 1.1 Requirement Statements

Customer Comment	Image or Issue	Requirement
"You went in wrong direction with understanding of the requirement. By the time it was understood that this had transpired, already lot of time got consumed."	Unclear Requirement	Put assumptions around team estimates based on experience and make sure it is visible to the developer and documented in the project plan, record a risk stating estimates are based on unconfirmed assumption and assign to the risk.
"We often complaint that you fail to follow up with us as promises."	Request pending	Try to under promise and over deliver. Measure and compare the required back and forth, for time to completion for requested tasks.
"There are many errors on the Box Test"	Lack of HR specialists	A new resource will need to be found, or the work split between the remaining resources. Company may have partners they work with in their network who can step in if necessary.
"You fail to fulfill the due date of the project, it always late around 18 weeks from the scheduled"	Project Delay	Make better planning and improve team organization to reduce the Box Test delay at least 6 weeks

3.1.2 Creation of a Problem Statement

During 2012, the TFS (Team Foundation Server) Release Notes on-time delivering for box test team in headquarters was 31% (only 9 from 29 projects on schedule). These represent a gap of 65% from the delay standard of 95% that amounts to ¥ 18,550 million.

Table 1.2. The cost loss of delay

Module	Contract Duration	Project Completion	Delay Duration	Cost of delay
SMR-FI0012012	92	112	20	¥ 1,000,000.00
SMR-FR0012013	92	113	21	¥ 1,050,000.00
SMR-CV0012013	89	99	10	¥ 500,000.00
SMR-R0012013	92	115	23	¥ 1,150,000.00
SMR-M0022014	92	103	11	¥ 550,000.00
SMR-FI0022014	89	114	25	¥ 1,250,000.00
SMR-B0022014	92	117	25	¥ 1,250,000.00
SMR-FR0022014	92	120	28	¥ 1,400,000.00
SMR-MC0012014	92	121	29	¥ 1,450,000.00
SMR-CV0022015	89	127	38	¥ 1,900,000.00
Not taken project on a month			31	¥ 1,550,000.00
SMR-R0022015	92	97	5	¥ 250,000.00
SMR-H0022015	91	99	8	¥ 400,000.00
SMR-CV0032017	92	104	12	¥ 600,000.00
SMR-R0042017	91	101	10	¥ 500,000.00
SMR-MC0022017	90	105	15	¥ 750,000.00
SMR-R0052018	92	101	9	¥ 450,000.00
SMR-M0042018	92	107	15	¥ 750,000.00
SMR-B0042018	91	106	15	¥ 750,000.00
SMR-FI0042019	90	111	21	¥ 1,050,000.00
				¥ 18,550,000.00

Source: Internal company, 2019

The problem statement on this project is the TFS (Team Foundation Server) release notes delay on delivering for box test team in headquarters that amounts to ¥ 18,550 million (This presents on Table 1.2).

3.1.3 Development of a Project Charter

The objective statement is to reduce the Box Test delay against UI development at least 95%. Project scope in this project will involve review of main reasons for UI development delay raised during Box Test. It will not examine phase after the box test like system tests and also it will not examine the delays raised in the stack and middle ware development. Table 1.3 presents the project plan and the team charter for the project.

Table 1.3 Project Plan

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DMAIC Project Plan Worksheet			
Project Title: To decrease Box Test delay by 20% before August 2019			
Project Leader: Aditya Rizky Pratama & Talitha Gustiyana			
Action/Milestone	**Responsible Team Member**	**Target Completion Date**	**Actual Completion Date**
Define: The problem statement and goal statement	Project sponsor (Six Sigma Belt) & Process owner (Champion)	6 March 2019	8 March 2019
Define: The high-level process map and scope	Project sponsor (Six Sigma Belt), Project Leader, & Team Members	12 March 2019	12 March 2019
Define: Voice of customer and Voice of business	Project sponsor (Six Sigma Belt) & Process owner (Champion)	22 March 2019	26 March 2019
Define: Critical-to-quality (CTQ) characteristics which is considered by the customer to have the most influence with delivery	Project sponsor (Six Sigma Belt) & Team Members	5 April 2019	5 April 2019
Define: Process improvement goals that are consistent with customer demands and the enterprise strategy	Project sponsor (Six Sigma Belt), Project Leader, Process owner (Champion) & Project coach	9 April 2019	11 April 2019

3.1.4 SIPOC Diagram

Figure 1.1 describes the transformation process of inputs from suppliers to output for customers and gives a high level understanding of the process, the process steps (sub processes) and their correlation to each other. Figure 1.2 represents the sub activities as company is used in organization process.

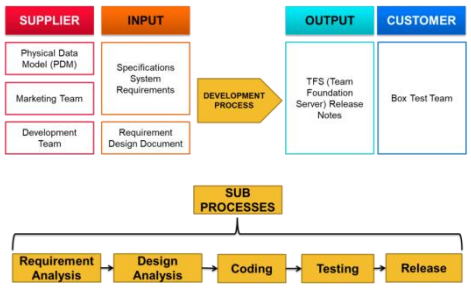

Figure 1.1 SIPOC Diagram

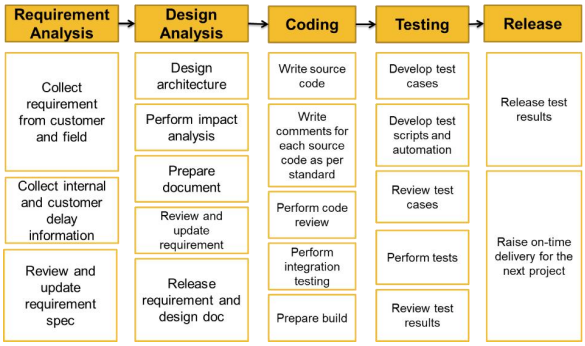

Figure 1.2. Top-Down Chart

3.2 Measure Phase

This phase presents the detailed process mapping, operational definition, data collection chat, evaluation of the existing system, assessment of the current level of process performance, etc (Desai and Shrivastava, 2008).

3.2.1 Process Mapping Levels

The process map of the Box Test process (Figure 2.1) is prepared by visually studying the process and then mapping various sub-activities in it. This mapping helped to visualize and separate value-added activities from the hidden waste streams.

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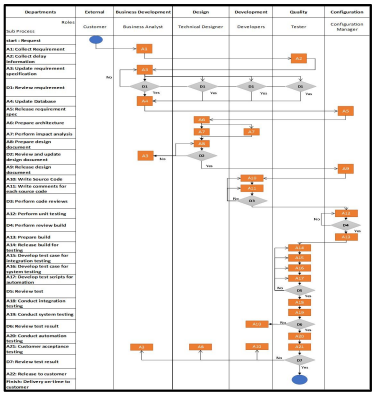

Figure 2.1 Process Mapping Levels

3.2.2 Type of Data

The type of data is continuous (variable). The Box Test (BT) UI delays Reduction in Team Foundation Server (TFS) from the input process output indicators (Table 2.1). Prioritize the output indicators in the cause and effect matrix (Table 2.2), the categories: 0 = no correlation, 1 = low, 3 = moderate and 9 = strong. Table 2.3 describes the measurement plan about the BT delay reduction in TFS project.

Table 2.1 Input Process Output Indicators

Input Indicators	Process Indicators	Output Indicators
Number of change requirement	Number of comments on document reviews	BT delay reduction
Number of customer requirement	Availability of resources	Customer satisfaction
Lines of Code	Types of internal delays	Reduce the rework efforts
Planned Effort	Number of BT service request's raised in TFS in each module	
TFS Project schedule	Actual Efforts	
	Number of code review comments	
	Number of design review comments	
	Actual size of each module	
	Number of internal delays	

Table 2.1 describes input indicators, process indicators, and output indicators. The indicators for input are number of change requirement, number of customer requirement, lines of code, planned effort, and TFS project schedule. The indicators for process are number of comments on document reviews, availability of resources, type of internal delays, number of BT service requirement's raised in TFS in each module, actual efforts, number of code review comments, number of design review comments, actual size of each module, actual size of each module, and number of internal delays. The indicators for output are BT delay reduction, customer satisfaction, and reduce the rework efforts.

Table 2.2 Cause and Effect Matrix

Project Name: BT UI delay Reduction in TFS				
	BT delay Reduction	Customer Satisfaction	Rework Efforts	Output Indicators
Prioritize the X's	10	9	7	Importance
Input or Output Indicators	Expected Correlation of Input to Output			Total
Number of change requirements	9	3	9	180
Number of customer requirements	1	9	1	98
Lines of Code	3	1	9	102
Planned Effort	9	1	3	120
TFS Project schedule	3	1	1	46
Number of comments on document reviews	9	1	3	120
Availability of resources	3	1	9	102
Types of internal delays	**9**	**9**	**9**	**234**
Number of delay's raised in TFS	**9**	**9**	**9**	**234**
Actual Efforts	1	1	3	40
Number of code review comments	9	1	3	120
Number of design review comments	9	1	3	120
Actual size of each module	3	3	1	64
Number of internal delays	**9**	**9**	**9**	**234**

Table 2.2 describes the output indicators such as BT delay reduction, customer satisfaction. The important numbers from the champion for BT delay reduction (10), customer satisfaction (9), and rework efforts (7). The expected correlation of input to output categories are 0 (not important) to 9 (very important). Total prioritizes that very importance for the champion are type of internal delays, number of delay's raised in TFS, and number of

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internal delays with highest value. Table 2.3 describes the measurement plan for the highest value in prioritize.

Table 2.3 Measurement Plan

Project: BT delay reduction in TFS									
Performance Measure	Operational definition	Data source and location			Display Analysis tool	Sample size	Who will collect the data?	When will data be collected ?	How will data be collected?	Other data that should be collected at the same time
	Describe delay or metric	Continuous	Discrete			Sample size Cost? Practical ?				
			Ordinal	Nominal						
Number of delay	Total number of delays identified by the Box Test Team in Release 1.0 in each module		Data source: CCMPD (tool) Data location: CCCM		Histogram – Pareto Chart	delays raised in all modules of TFS	BT	When each modules are getting tested	CCMPD tool	
Number of internal delay	Total number of delays identified by the development team in various modules of release 1.0		Data source: local clear quest tool Data location: local intranet		Histogram – Pareto Chart	delays raised in all modules of TFS	Development Team	When each modules are getting unit tested	Local clear quest tool	
Types of internal delay	delay are categorized based on the impact levels on the product process.			Data source : Local CQ Data Location: Intranet	Histogram – Pareto Chart	delays raised in all modules of TFS	BT	When each modules are getting tested	CCMPD tool	
How will data be used? To find the largest contributor of delays caught and delays escaping Is Data Normally Distributed? Yes Sigma Level and Variation					How will data be displayed? Pareto chart-histogram Control charts Scatter plots					

The operational definition for number of delay is total number of delays identified by the Box Test Team in release 1.0 in each module (can be shown in Table 2.4), number of internal delay is total number of delays identified by the development team in various modules of release 1.0 (can be shown in Table 2.5), and type of internal delay that delay are categorized based on the product process (can be shown in Table 2.6).

Table 2.4 Data Delay in Team Foundation Server (TFS) Release

Table 2.5 Internal Delays in Team Foundation Server (TFS) Release

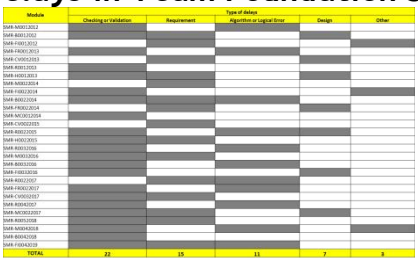
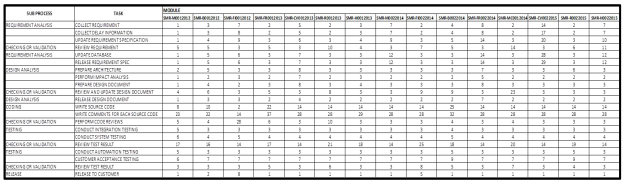


Table 2.6 Type of Internal Delay



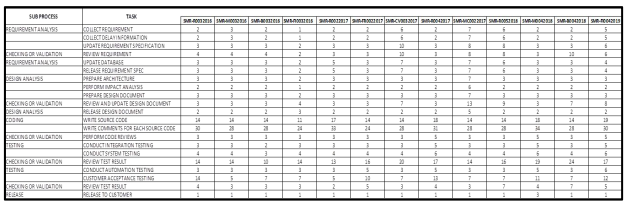


Table 2.7 The Delay Standard

TASK	MAXIMUM TIME LIMIT			TIME LIMIT
COLLECT REQUIREMENT	2		2	
COLLECT DELAY INFORMATION	2	Start from the same day	2	
UPDATE REQUIREMENT SPECIFICATION	3		3	
REVIEW REQUIREMENT	3		3	3
UPDATE DATABASE	3	Start from the same day	3	
RELEASE REQUIREMENT SPEC	3		3	
PREPARE ARCHITECTURE	3		3	3
PERFORM IMPACT ANALYSIS	2	Start from the same day	2	
PREPARE DESIGN DOCUMENT	3		3	3
REVIEW AND UPDATE DESIGN DOCUMENT	3		3	3
RELEASE DESIGN DOCUMENT	2		2	2
WRITE SOURCE CODE	14		14	14
WRITE COMMENTS FOR EACH SOURCE CODE	28		28	28
PERFORM CODE REVIEWS	3		3	3
CONDUCT INTEGRATION TESTING	3	Different 1 day	2	2
CONDUCT SYSTEM TESTING	4	every task	3	3
REVIEW TEST RESULT	14	Different 3 day	11	11
CONDUCT AUTOMATION TESTING	3		3	3
CUSTOMER ACCEPTANCE TESTING	7		7	7
REVIEW TEST RESULT	3		3	3
RELEASE TO CUSTOMER	1		1	1
				89

Table 2.5 describes type of delays in Team Foundation Server (TFS) release such as checking or validation, requirement, algorithm or logical error, design, and other (release, etc). Table 2.6 represents the type of internal delay based on sub process per module, there have a gap from the company delay standard (can be shown in Table 2.7).

From the Table 2.5 describes the most frequently type of delays in TFS release is checking or validation process. Figure 2.2 describes the result for checking or validation from Table 2.6 processed in Minitab 17 for running the process capability report, and Table 2.7 describes the maximum time.

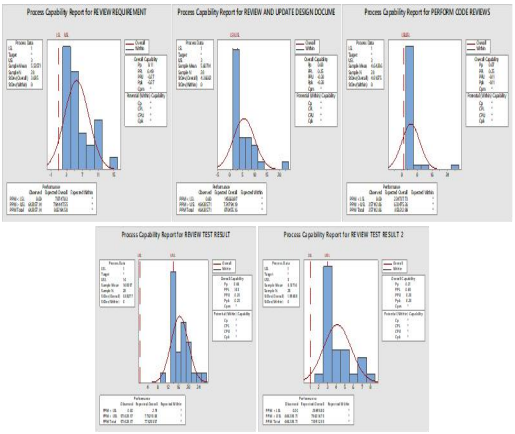


Figure 2.2 The Process Capability Report

3.3 Analyze Phase

This phase describes the potential causes identified which have the maximum impact on the low process yield, Pareto analysis of the causes, and 5 why analysis to identify the root causes of the delay problem and helped to examine the processes that affect the CTQs.

From Table 2.5, the Pareto chart analyzes the problems or causes in process. A graphically summarize and display the relative importance of the differences between groups of data. Figure 4.1 represents a Pareto chart illustrating the reasons for the BT delay release. The graph is read from left to right and it starts with 1) checking or validation, 2) requirement, 3) algorithm or logical error, 4) design, and 5) other. The cumulates from the Pareto Chart are checking or validation (37,9%), requirement (25,9%), algorithm or logical error (19%), design (12,1%) and other (5,2%).

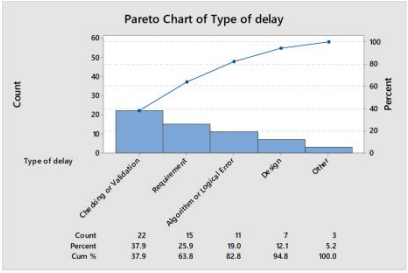


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Figure 4.1 Pareto Chart of Type of Delay

3.3.1 *Cause and Effect Diagram*

A cause and effect diagram for Box Test Team process yield presents a chain of cause and effects, sorts out causes and organizes relationship between variables. The cause and effect diagram prepared for the 16 initial probable causes identified can be viewed in Figure 4.3.

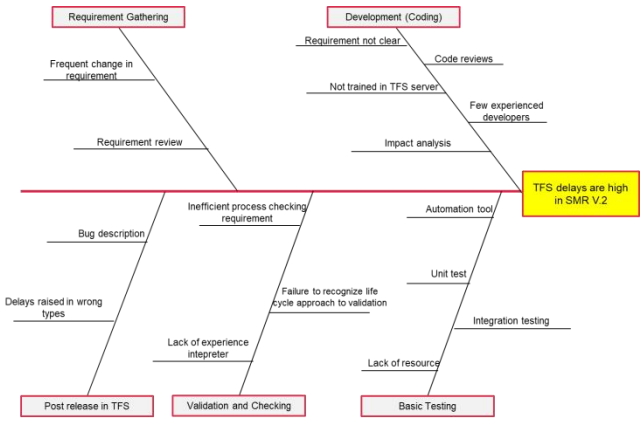

Figure 4.3 Cause and Effect diagram for Box Test delay release

3.3.2 *Five Why Analysis*

Five why diagram helped in identifying root cause of the problem (can be shown in Figure 4.4). The focus group discussion (FGD) is data collection method and technique to identify the problem and potential development opportunities into the company capital in development.

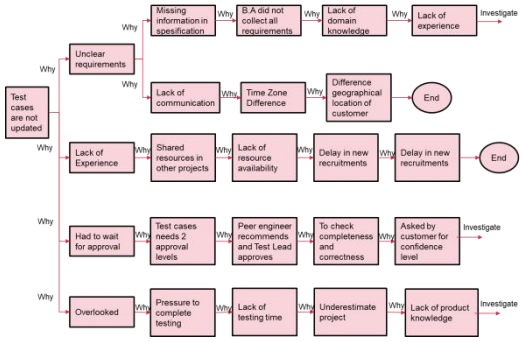

Figure 4.4 Five Why Diagram

The major causes on the test cases are not updated, prioritized on hard to wait to approval; which is responsible for delay of the Box Test release.

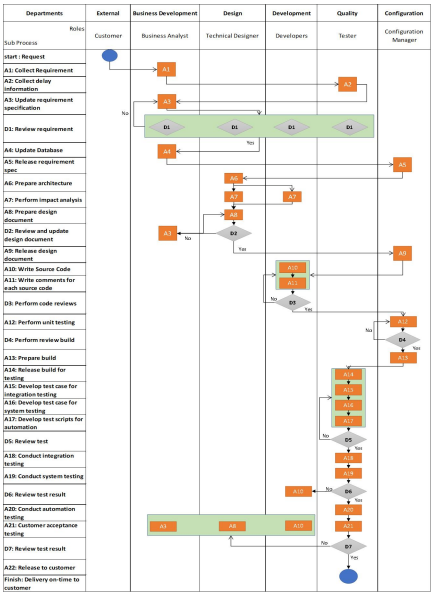

Figure 4.2 Repair the Process Mapping

Figure 4.2 analyses the lack of coordination and communication among various departments and ambiguous wording in agreement in review requirement (D1), perform code reviews (D3), review test (D5) and review test result 2 (D7).

3.4 Improve Phase

The project team identified variables from various tools and took actions to optimize these input resources and thus develop process requirement that minimize the likelihood of those delay. The team members generated ideas for improving the process, analyzed and evaluated those ideas and selected the best potential solutions, planned and implemented these solutions.

3.4.1 *Repair the Process Mapping*

Improved process map incorporates modification such as: repair the long approval time in review requirement (D1) by gathering the required decisions from decision makers, perform code reviews (D3) by combining the process of write source code (A10) and write comments for each source code (A11) if the result of perform code is not going well, review test (D5) by combining the process of release build for testing (A14), develop test case for integrating testing (A15), develop test case for system testing (A16), and develop test scripts for automation (A17) if the review test is not acceptable, and review test result 2 (D7) by integrating the process (can be shown in Figure 4.2).

3.4.2 *Brainstorming: Long Approval Time*

A Group creativity technique by which efforts are made to find conclusion for a specific problem by gathering a list of ideas for long approval time such as: 1) Use informal meeting procedure than formal for service meeting, 2) Define review frequency and time for final approval, 3) Communicate review time to customer and hence include in project plan, 4) Communicate product critical review results to customer, 5) Peer review should be encourage, 6) Use review tool to monitor and track review comments status, 7) Automatic assignment of test cases on completion using review tool, 8) Independent reviews by Test Lead, 9) Not all test cases should be given for review to Test Lead, 10) Provide training in using review tool and to perform reviews, 11) Improve review checklists and guidelines, 12) Improve review tool interface for user friendly, 13) Approve test cases in batch and not all at once, and 14) Review tool should email review results on review completion.

3.4.3 *Affinity Diagram*

A business tool used to organize ideas and data. An affinity diagram organized output from a brainstorming session. The purpose of an affinity diagram is to generate, organize, and consolidate information concerning a product, process, complex issue, or problem. To improve review procedure and implementation method:

1)Review procedure to be improve

Use informal meeting procedure than formal for review meeting, Test cases for low and medium priority requirements should be reviewed and approved by peer test engineers, Test cases for major and critical requirements shall be reviewed and approved by Test Lead, Review tool should have feature to send notification email when: Test cases submitted for review and 1 day left to complete review cycle, and Independent reviews by Test Lead i.e. they should not wait for test engineer to sit with them and assist in reviewing the test cases.

2)Standardized review method

Improve checklist to ensure all important aspects (completeness, consistency, etc) can be checked, Include review efforts and time in project plan share with customer, Only these review comment which impact on Cost/Quality/Time of the product, shall be shared with customer, and approve test cases one by one i.e. in batch and not all test cases at once

3)Improve review tool

Improve UI interface so that author and reviewer can see the current status in single screen, Implement notification feature for authors and reviewers, Web training material and Q&A should become part of help menu so that immediate support on review tool can be received, Improve feature to maintain review history, and Automatic assignment of test cases to reviewers when complete by Test engineers and to Test engineers when approves/rejects by Test Lead.

4)Improve review skills

Explicitly define roles and responsibilities for review procedure and Develop role based training.

3.4.4 *Solution Mapping*

A solution mapping shown in Figure 4.5 allows visualizing the long time approval problem clearly for reducing approval time to standard limit or less.

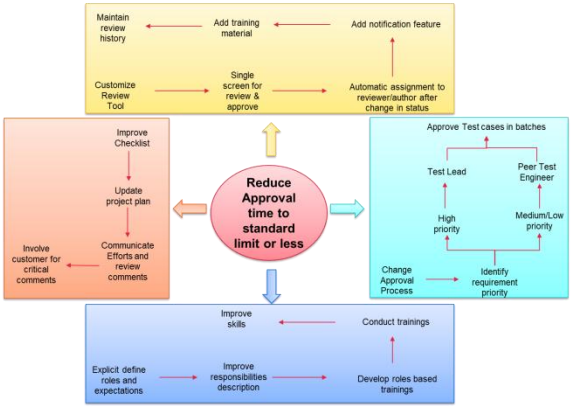

Figure 4.5 Solution Mapping

3.4.5 *Solution Selection Matrix*

The solution selection matrix provides a method of assessing the positive impact of each proposed solution on reaching the goal as well as the relative effort, time to implement and cost. Improvement teams rate each solution resulting in individual scores and then indicate whether they choose to implement the solution or not. A solution selection matrix

shown in Table 4.1 is developed from the causes, which provided a picture of how well sets of objects or issues are related and helped to set priorities on plans and actions.

Table 4.1 Solution Selection Matrix

	Cost impact	Time Impact	Benefit impact	Evaluation Criteria
	10	5	1	Importance
Solutions	Correlation of Solution to Criteria			
Customer Review Tool	9	1	3	98
Categorize Test Case for	9	3	3	108
Approve Test cases in batches	9	5	3	118
Involve customer for critical	3	1	1	36
Develop and conduct role	9	9	9	144

The evaluation criteria from the 0 (not importance) to 10 (very importance) that cost impact (10), time impact (5), and benefit impact (1). The results from the highest solutions such as develop and conduct role (144 points), approve test cases in batches (118 points), and categorize test case for (108 points).

3.5 Control Phase

This is about holding the gains which have been achieved by the project team. Implementing all improvement measures during the improve phase, periodic reviews of various solutions. Table 6.1 represents after the improvement of the long time approval, the delay are not raise. The solution makes every task on validation faster than the maximum time.

Table 6.1 Time Project after using the Solutions

SUB PROCESS	TASK	MODULE
		SMR-CV0042019
REQUIREMENT ANALYSIS	COLLECT REQUIREMENT	2
	COLLECT DELAY INFORMATION	2
	UPDATE REQUIREMENT SPECIFICATION	3
CHECKING OR VALIDATION	REVIEW REQUIREMENT	3
REQUIREMENT ANALYSIS	UPDATE DATABASE	3
	RELEASE REQUIREMENT SPEC	3
DESIGN ANALYSIS	PREPARE ARCHITECTURE	3
	PERFORM IMPACT ANALYSIS	2
	PREPARE DESIGN DOCUMENT	3
CHECKING OR VALIDATION	REVIEW AND UPDATE DESIGN DOCUMENT	2
DESIGN ANALYSIS	RELEASE DESIGN DOCUMENT	2
CODING	WRITE SOURCE CODE	14
	WRITE COMMENTS FOR EACH SOURCE CODE	28
CHECKING OR VALIDATION	PERFORM CODE REVIEWS	2
TESTING	CONDUCT INTEGRATION TESTING	3
	CONDUCT SYSTEM TESTING	4
CHECKING OR VALIDATION	REVIEW TEST RESULT	10
TESTING	CONDUCT AUTOMATION TESTING	3
	CUSTOMER ACCEPTANCE TESTING	7
CHECKING OR VALIDATION	REVIEW TEST RESULT	2
RELEASE	RELEASE TO CUSTOMER	1

The process capability report before using the solutions (can be shown in Figure 2.2), after using the solutions, the delay in checking or validation is reducing (can be shown in Figure 6.1).

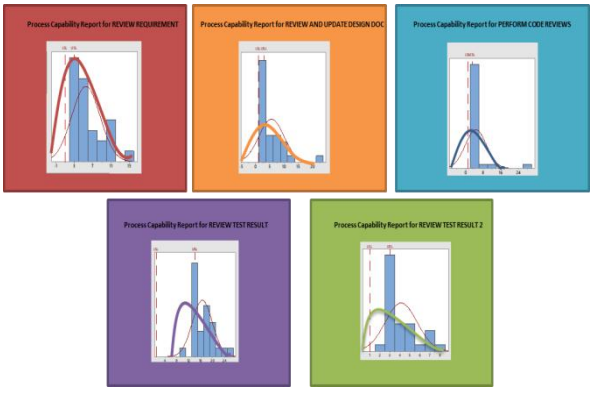

Figure 6.1 The Process Capability after the Solutions

4. Results

The council executed strategic controls by an ongoing process of reviewing the goals, progresses the target, and controllers the related problems that cause delays in checking or validation such as: The level of acceptance, Interpreter understanding, Process checking requirement, Recognize life cycle approach to validation, Acceptance test allows inspection and testing of an item, Condition in the facility , Time of testing qualification, The staff acceptance to understand an item of equipment in advance of delivery, and The factor acceptance test as per all test protocols.

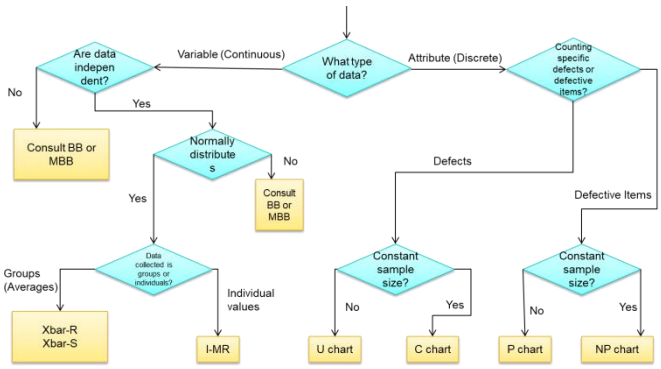

Figure 6.2 Control Chart Selection Guide

Figure 6.2 describes the control chart selection guide for the council executed strategic controls by an ongoing process of reviewing the goals and progress of the targets. To meet periodically and reviewed the progress of improvement measures and their impacts on the overall business goals.

5. Conclusion

This Six Sigma improvement methodology (DMAIC) project shows that the time process of the company is decreased the delay. Six Sigma provides business leaders and executives with the strategy, method, tools, and techniques to make it easier checking or validation process.

The council executed strategic controls by an ongoing process of reviewing the goals, progresses the target, and controllers the related problems that cause delays. To meet periodically and reviewed the progress of improvement measures and their impacts on the overall business goals.

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