Department of Industrial and Systems Engineering

Re-engineering Processes to Enhance Work Efficiency

System Design Project

Introduction

Background

SP PowerGrid (SPPG) manages Singapore's electricity and gas transmission and distribution networks. Under SPPG's Network Development Division, the Customer Projects Branch fulfills customer orders for electricity distribution projects.

Project Scope

Business Process Review and Redesign of Service Connection (SVC) Projects under the Customer Projects Branch, SPPG

Objectives

- Identify areas of improvement in current SVC process
- Propose recommendations to enhance work efficiency and achieve better performance

Approach

Select Process and Define Boundaries → **Observe, Document and Map Process Steps and Flow** → **Collect Process Related Data**

Project Boundaries

Project focus is on SVC process from customer payment to project closing

SVC Project Process

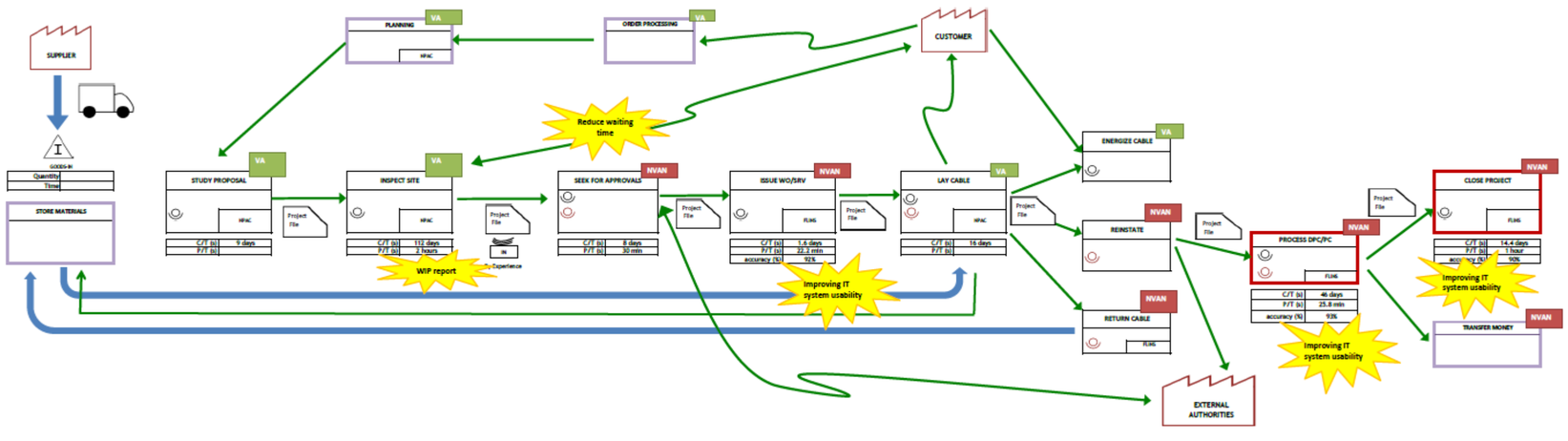
Preliminary Procedures → Execution of Actual Cable Work → Project Closing

Map Process Flow Charts

To understand how the process works and the steps involved in each part of the process

Value Stream Mapping

To map the information and materials flow in the SVC process value chain at the macro-level



Time Study

To identify steps with long process or cycle time and thus may be areas where improvement can happen

Interviews and Surveys

Conducted with Project Officers and Management to understand what are the steps that may potentially need more attention

Findings

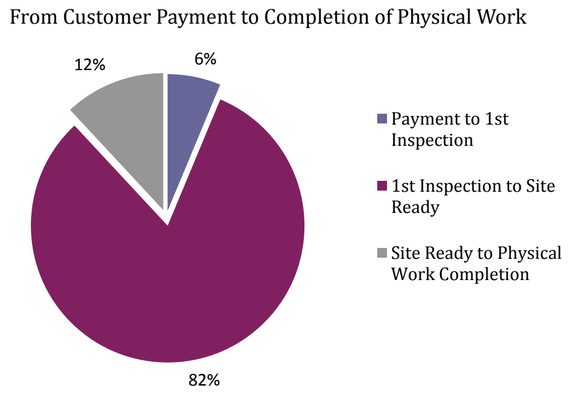
From Value Stream Mapping

Value-Added (VA) Processes	Non-Value-Added but Necessary (NVAN) Processes
Study Proposal Inspect Site Lay Cable Energize Cable	Seek for Approvals Issue WO/IO/SRVI/SRVR/CC Reinstate Return Cable Process Payment Claims Close Project Transfer Money to Contractors

Need for shortened cycle time of the NVAN processes

From Time Study

Description	Duration	Remark
Average time from customer payment to physical work completion	**134 days**	*From Monthly Report Data (Computed using Little's Law)*
Average time from receipt of customer payment to project officer's 1st on site inspection	**9 days**	*Controllable by SPPG*
Average time of waiting for customer to prepare the site	**112 days**	*Uncontrollable by SPPG*
Average time from site ready to completion of physical work	**13 days**	*Controllable by SPPG*



Delay in process is due to factors out of SPPG's control

From Surveys with Project Officers

- Error rate of issuing WO/IO/SRVI = **8%**
- Error rate of processing DPC/PC = **7%**
- Error rate of closing project = **10%**
- Most of the errors could have been checked by the IT system

From Interview and Study of IT Systems

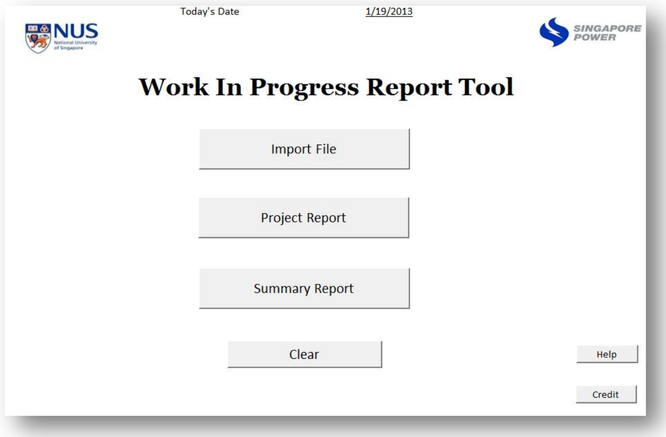
- IT systems are independent and disintegrated → cross-referencing is made difficult
- Information displayed in the summary reports are fragmented and voluminous → visibility of project progress is low
- System interface is not well customized to user needs for generating different documents → leading to input errors
- G/L code is not automatically associated with material numbers in system → leading to FCS rework

Recommendations

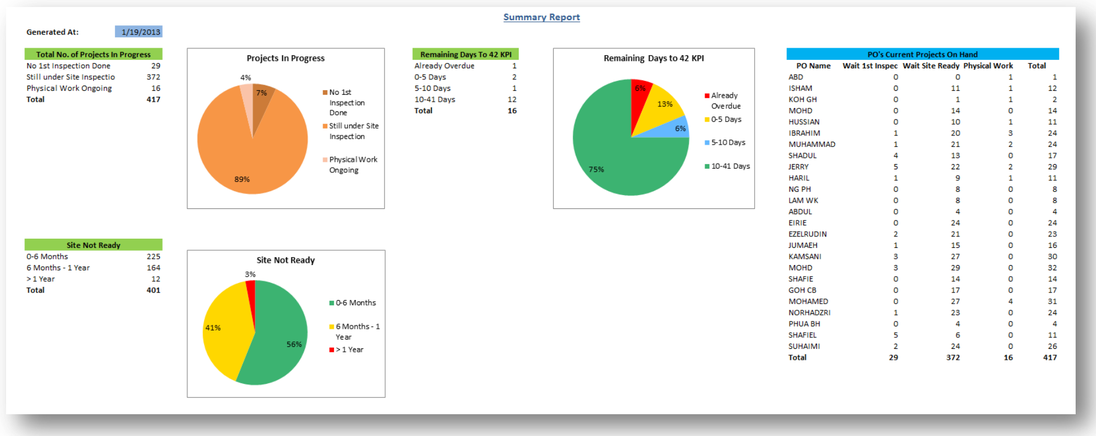
Work In Progress (WIP) Report

- Ad-hoc automatic report generation
- Project emergency level flag notification
- Summary statistics about ongoing projects

1.Main User Interface



2.Summary Report



3.Project Report

Project No.	Site Address	Project Officer	Flag	Current Stage	Site Ready?	Payment Date
1110055371	TK AYER ST	TAN S K	7 Days No 1ST Inspect	Wait For 1st Inspec	No	21/12/2012
1210007481	BOAT QUAY	TAN S K	One Year Site Not Ready!	Wait For Site Ready	No	10/3/2011
1210007900	BOAT QUAY	TAN S K	One Year Site Not Ready!	Wait For Site Ready	No	10/3/2011
1210008597	SHIPYARD CRES	TAN S K	One Year Site Not Ready!	Wait For Site Ready	No	16/11/2011
1210010951	TEMP SUPPLY SCIENCE PK DR	MUHAMMAD	2 Month From Latest Inspect	Wait For Site Ready	No	1/3/2012
1210010952	TEMP SUPPLY SCIENCE PK DR	MUHAMMAD	2 Month From Latest Inspect	Wait For Site Ready	No	1/3/2012
1210011896	SENTOSA COVE (PLOT 3)	MUHAMMAD	42 KPI Approaching!	Physical Work	Yes	23/5/2012

Improvement Suggestions on IT System

- Bundle G/L code with corresponding material specification and activity type for automatic generation of G/L code in WO/IO/SRV
- Customize the layout of user interface according to user needs
- Enhance the automatic error checking features of the systems
- Involve users in the development of systems
- Conduct periodic reviews of systems and consult users' opinions

Team

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