Department of Industrial and Systems Engineering

System Design Project

Optimization of blasting hall utilization and manpower (continuation from the previous project)

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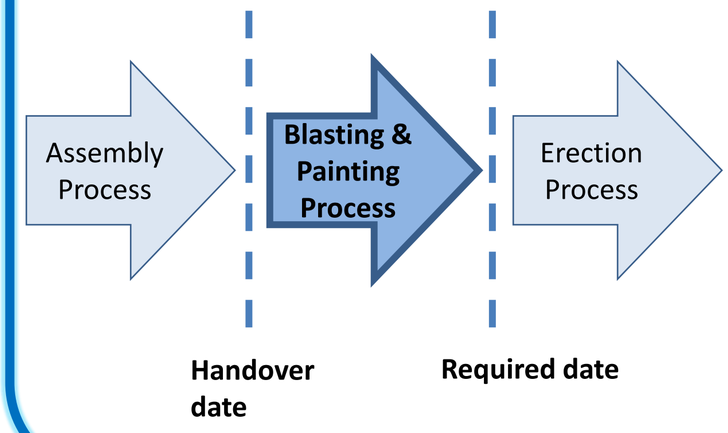
Phase I: Problem & Objective

Scope



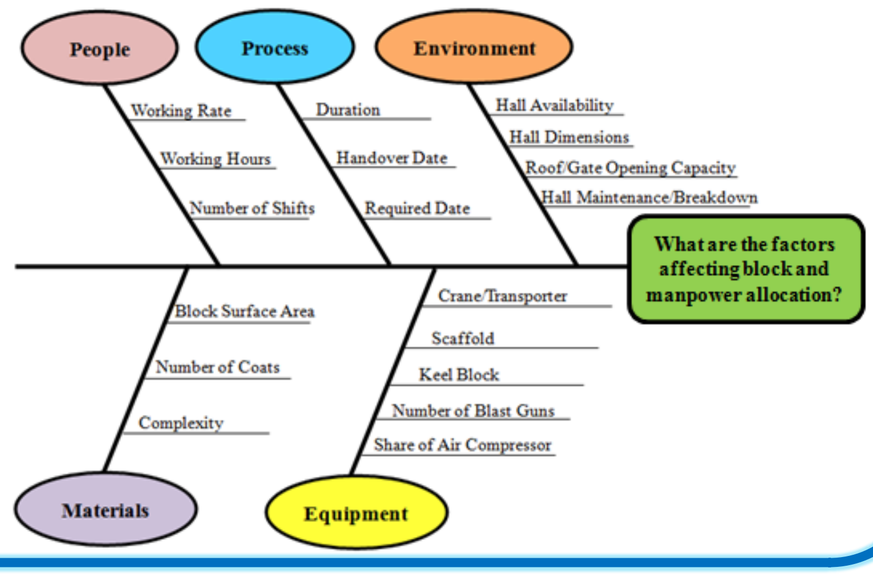
Problem

- Manual planning process is tedious
- Lack of visibility of work progress against manpower allocation

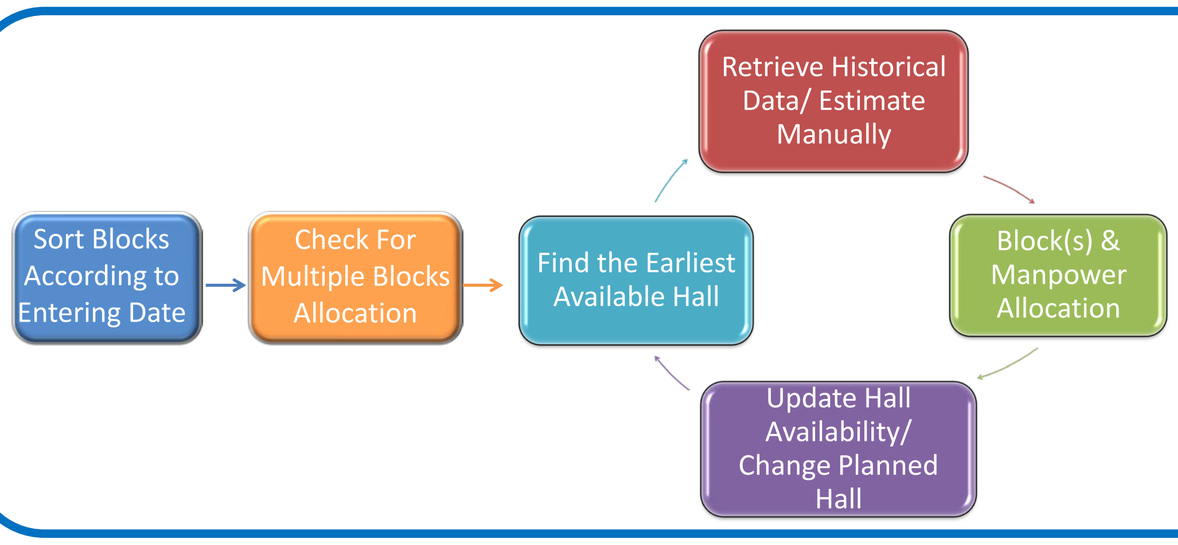
Objectives

1) Handle multiple blocks allocation
2) Incorporate manpower allocation
3) Improve the user-friendliness of existing operation platform
4) Improve visibility of job productivity for work-in-progress /completed blocks

Problem Analysis



Phase II: Methodology



Heuristic Approach

- ✓ Experience-based technique
- ✓ Feasible solution obtained in minimal time
- ✓ Consistency in data recording
- ✓ Re-plan based on daily updates

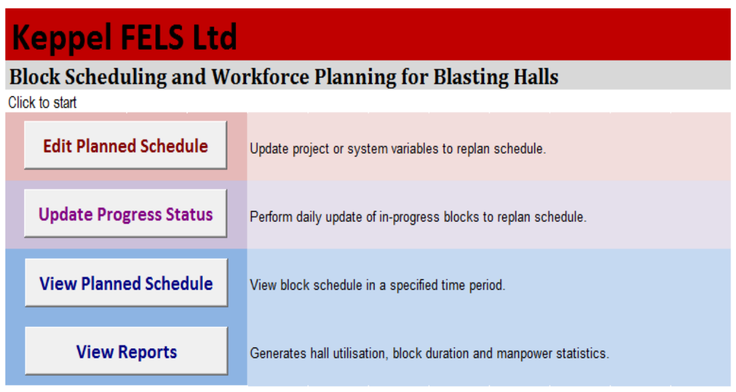
Operation Platform

Excel Visual Basic for Applications (VBA) platform

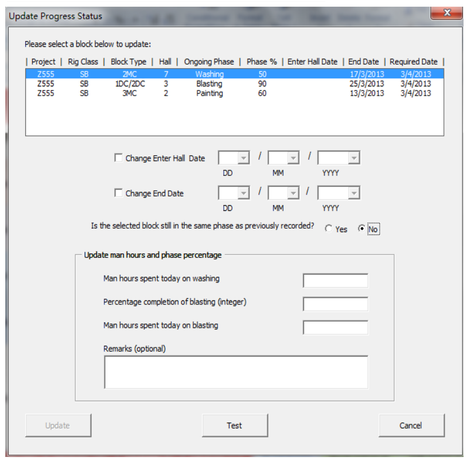
- ✓User-friendly
- ✓Compatible with existing planning process
- ➢ Semi-automated planning process

Phase III: Implementation

User Functions

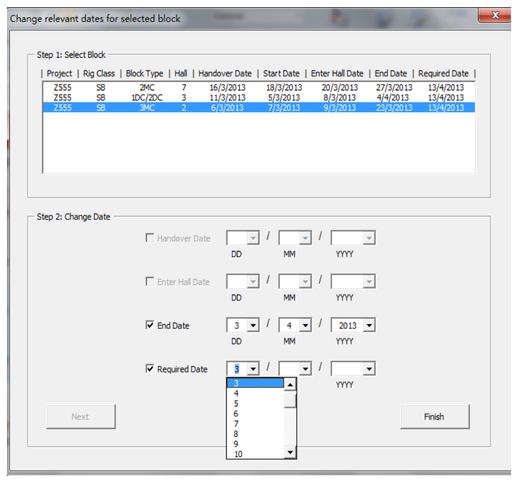


User Interface

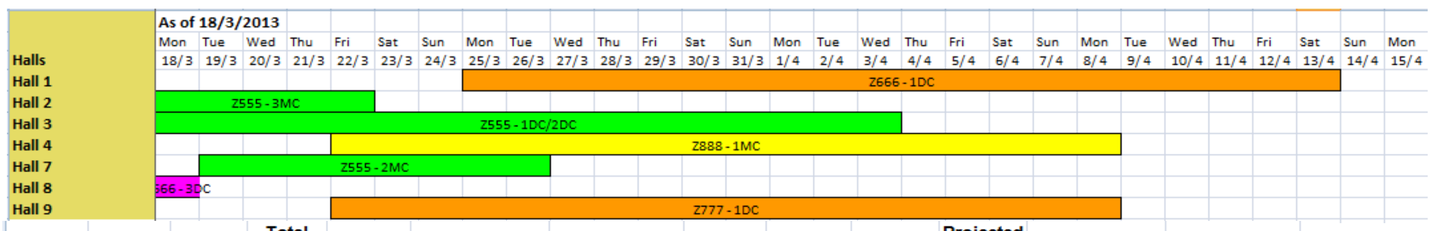


User-friendly Features

- ✓Mistake-proofing features in the interface
- ✓Short control-tips
- ✓Help and error messages
- ✓Subsequent controls are temporarily disabled and are enabled only after predecessor fields are entered accurately

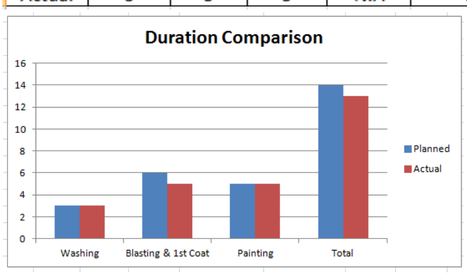


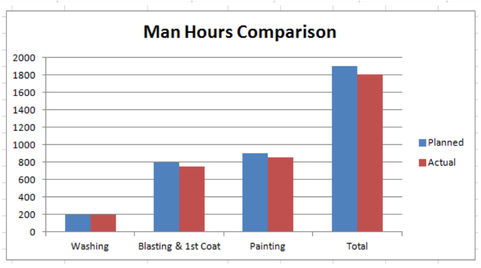
Output Schedule and Report

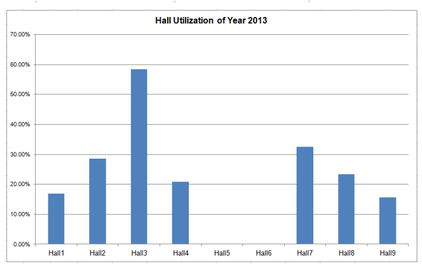


Project	Rig	Block	Total Surface Area	Handover Date	Required Date	Hall	Start Date	Entering Hall Date	End Date	Projected /Actual Final KPI	Target KPI
Z666	CJ	3DC	3000.00	5/3/2013	18/3/2013	8	6/3/2013	9/3/2013	18/3/2013	1.35	1.4

	Duration						Man Hours					
	Washing	Blasting	Painting	Misc	Total with Misc	Total w/o Misc	Washing	Blasting	Painting	Misc	Total with Misc	Total w/o Misc
Planned	3	6	5	N.A	N.A	14	200	800	900	N.A	N.A	1900
Actual	3	5	5	N.A	N.A	13	200	750	850	N.A	N.A	1800







Long Term Sustainability

- ✓All parameters can be updated
- ✓New halls and blocks can be added

Validation

Modes of Validation	Remarks
Test Cases	Inputted specific test cases to check for the accuracy of specific outputs
What-if Analysis	Carried out what-if analysis to test the robustness of the program
Comparison with Historical Data	Inputted historical data to compare the level of consistency
Feedback from Company	Continuous communication with industry supervisors for feedback

Phase IV: Future Direction

Future Direction

- ✓ Explore other approaches to achieve an improved solution
- ✓ Address the assumptions made for further improvement
- ✓ Develop from a semi-automated to a fully automated system