

SolutionsWorkshop

BUSINESS CHANGE & INFORMATION SYSTEMS DELIVERY

Title: Requirements for Software
Development Quotation

Project: SM – Engineering Workflow

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About Solutions Workshop

Solutions Workshop Limited specialises in the delivery of technical solutions with an emphasis placed on the business implementation and change support required for a successful delivery. We take care to ensure the solution is correctly scaled for the business needs and that the business is enabled by the technology.

Solutions Workshop is not tied to any particular technology or supplier. We take pride in seeking out the solution that best meets the needs of our clients.

We manage our work using Confluence and Jira as it helps share and maintain documentation, traceability between requirements/designs/tests, whilst also supporting distributed working practices.

Instructions for the Quotation

Looking for **brief** proposals & effort/cost quotation:

- Feel free to submit more than one proposal, be as creative as you desire!
- Ideally your proposal will reference each requirement as to whether or not the requirement is covered in the proposal and an indication of how.
- Please highlight the relevant strengths/constraints of each proposal.
- Please include an hourly rate you would charge for ongoing support and future changes.

From a cost perspective, we ideally need to see quotes broken down to:

- All Must requirements only
- All Must + some Should requirements
- All Must + all Should requirements
- All Must + all Should + some Could requirements

The solution must be deliverable within a 3 month period. The period is to be split into 3 week sprints.

I need the proposals in by the end of Wednesday 12 July 2017.

About Our Client

Our client is a medium sized engineering company that is a subsidiary of a large global manufacturing and services company. One of the services our client provides is to test, service and repair units sent in by professional motorsport customers. It is this part of our client's business that this project focuses on.

Customers contact our client and send in units to be processed and then returned (if serviceable). During sustained busy periods, our client can have up to 90 individual units at their workshop needing to be looked at and processed, with the average turn-around of a unit being 2-3 days. Each unit normally follows a process dependent on the unit type. Each process consists of a number of steps where the unit might be connected to a rig or manually cleaned and inspected in a work area using specialist equipment.

Problem Statement

Our client currently monitors the progress of units using a whiteboard. This whiteboard lists the main steps and is manually updated by engineers as and when a unit is moved from one step to the next.

This process worked fairly well when our client resided in a single large workshop area, where there was clear visibility of the whiteboard from each rig and work area. However, the firm has increased the workload and also moved into a larger premises where the facility is separated into 6 main rooms. Tracking units on the whiteboard is no longer convenient, as there is no visibility of the whiteboard from the rooms and the volume of work is greater. This has also introduced an inconvenience to engineers, where they need to step away from the rooms and walk to a common area to view or update the whiteboard.

This is the primary problem. The client needs a solution for updating and viewing the progress of each unit on some form of tracking system, which is easily updated and viewable from each room.

In addition to the primary problem, there is an opportunity to deliver additional value:

At present there is no recording of start/estimated finish times for each unit at each step. Introducing this using the whiteboard (or similar) process would cause an additional overhead for engineers. The whiteboard space is also limited.

At shift handover, engineers have to update the whiteboard and create a document detailing any unit specific notes that they need to make the next team aware of. Any details missed or misinterpreted during shift handovers result in delays in completing jobs, unnecessary repeating of work and ultimately effects throughput.

Summary

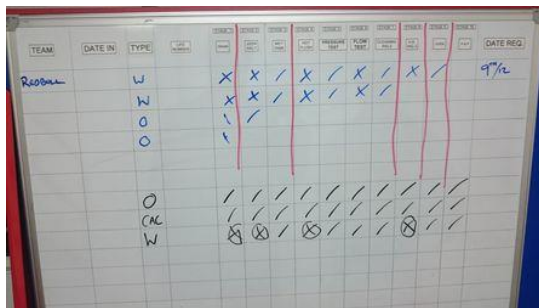
A solution is required that:

- **At a minimum** - enables the team to identify where in the process each unit is.
- **At a minimum** - enables the Engineers to easily update the progress of each unit from within each room.
- Is reliable: Minimise the impact of a system failure and quickly and easily recovered.

It will *ideally*

- Highlight units that are almost/are ready to be moved to the next stage
- Professionally presents information to the team and any customers visiting the site

Photo of the current whiteboard.



Current column headings are:

Heading	Description
Team	Customer/team name
Date In	Date unit arrived
Type	Unit type (Wet/Oil/Charge Air)
Unit Number	Exclusive asset number assigned to the individual unit
Stage 1: Drain	Draining liquids
Stage 2: Jizer Rig 1	Degrease internals
Stage 3: Wet Tank	Wash over
Stage 4: Hot Flush	Wash through
Stage 5: Pressure Test	Pressure testing the unit
Stage 6: Flow Test	Testing air flow through the unit
Stage 7: Cleaning Rig 2	Flush through again – fine filter
Stage 8: HD Rig	High Definition particle analysis (if required)
Stage 9: Oven	Dry out and preparation (blow through, clean, polish, pack)
Stage 10: Shipping	Packaging for shipping & dispatch
Date Required	Latest date unit is needed by the customer

When using the whiteboard, the units are listed down the left hand side, with the progress tracked by ticking off the relevant 'stage'.

Business Objectives

These objectives are a level lower/in more detail than traditional objectives, but they give a good view on what the business needs and how they need the target solution to function in order to best support the engineering process. However do not feel that any proposals should be limited to the indicated target state. Please feel free to suggest alternative solutions.

#	Priority	Objectives	Current State	Target State
Obj1	Must	Be able to view/track the progress of units	Whiteboard used to track units manually, having to walk to and fro to update info.	Front desk and management are able to access all the information easily from any system terminal. Update information using a user interface in each room beside the rigs. Updated Information automatically available to others.
Obj2	Should	Make it easier to get updates on the status of orders.	Whiteboard used to track units manually while customer details and information on orders are paper based.	Front desk and management are able to access all the information easily from any system terminal. Link maintained between orders and units
Obj3	Could	Minimise the effort required at shift handovers	Manual handover, assessment of whiteboard and chasing up where units are. Document produced that aims to give updates to the next shift/team.	Staff are able to access update/real time information easily from any system terminal.
Obj4	Could	Improve performance of the process through efficiency.	Basic status of each unit is logged on the whiteboard, with any details known to the engineer.	Time stamp/count down timer information to be captured using a user interface in each room beside the rigs. Updated Information automatically available to others.
Obj5	Could	Enable presentation of reports and statistics to customers	Currently a manual task to obtain basic information on orders processed.	Be able to query the solution for information such as number of units, average time, late orders etc... A professional and smart looking interface for use to present the statistics
Obj6	Could	Provide a single point for all information relating to units and orders	Central whiteboard with information on the location of each unit, whilst order details are maintained at the front desk.	A single source of up to date information that is accessible in all rooms, the meeting room and front desk. So that users can always get first-hand information and not duplicate effort.
Obj7	Could	Maintain a historical view of information.	Whiteboard only displays information on current work, whilst only order information is available to the front desk for a longer period.	A solution that stores all order information, unit information and process related data for a set time, to enable historical reporting and analysis.

Requirements

About the Requirements

The core requirement is to address the need to track units through the process, as described in the problem statement and objectives. The below requirements provide additional information that aim to deliver benefits and achieve the various objectives.

Order and unit creation and tracking

#	Title	User Story	Obj	Priority	Notes
OU1	Unit Details	As a front desk user, I want to list all the individual units, so I can track the progress of the units.	Obj1	Must	Unit details entry/record creation Display all unit details Allow the user to edit unit details (which update the individual unit record)
OU2	Order Details	As a front desk user, I want to capture all order details, so I can track every orders and the associated units	Obj2	Should	Display customer name, department, address, contact details, due date (see User Details notes below) Display customer reference (client generated) Ability to search for orders based on customer Show all units associated with the order
OU3	Order Priority	As a front desk user, I want to be able to see which units should be worked on first, so that I can ensure orders are completed on time.	Obj4	Could	Based on "due by" date and the number of units within the order and estimated duration of the steps required.

OU4	Order Status	As a front desk user, I want to track the status of an order, so I can see whether we are on target for the due date.	Obj2	Could	Overall status of the order based on the combined status of the units. Individual status of each unit and stage unit is at in the process. A flag to show whether the order is a 'priority' order.
OU5	Alerting	As a front desk user, I want to be alerted to orders that have fallen behind, so that I can re-prioritise work to ensure the order is completed on time.	Obj4	Could	Alerting calculations based on the estimated time required on each rig for each unit, compared to the "due by" date.
OU6	Customer Interface	As a front desk user, I want customers to be able to enter/submit their order details directly to the system, so it saves me having to enter information manually.		Wont	Email template form import, or web form. Not currently in scope.

Design Considerations: Data Required

Order details captured at present:

- Team/Customer
- Customer Contact Name & Details
- Order number
- Date in
- Required by (Date)
- Date out

Unit details captured at present:

- Type (Water Cooler, Charge Air Cooler, Engine Oil Cooler, Gearbox Oil Cooler, ERS, Hydraulics Cooler)
- Side (Left, Right)
- Life Number (asset #)
- Unit Code
- Combi Unit Number (asset # of a collection of assets - only if the unit is a sub-component of an assemble/collection of units)
- Job Type (Standard Process, Ad-Hoc, Priority)
- Notes

Process and functionality

#	Title	User Story	Obj	Priority	Notes
PF1	Set process per unit type	As a user, I want each unit type to follow a 'unit type' specific process, so that the work carried out follows a default set of predefined steps	Obj4	Must	See "Unit Type & Process Steps" table
PF2	Task functionality	<p>As an engineer, I want to be able to;</p> <ul style="list-style-type: none"> • start • finish (successful) • stop (stop due to issue) • restart (restart after a 'stop') <p>The task, so that the status of the task is noted per unit.</p>	Obj1 Obj2	Should	
PF3	Timer	As an engineer, I want to be able to set a countdown timer on each task per unit, so that my colleagues and I know when the specific unit will be ready for the next task	Obj3	Could	
PF4	Skip	As an engineer, I want to be able to skip steps in the process, so a unit can move back or forwards in the process if there is an issue/need	Obj4	Should	

PF5	Engineer Interaction	As an engineer, I want to physically interact with the solution as little as possible, with simple one touch action. So that I don't need to spend much effort on updating the system	Obj1 Obj4	Must	Minimal button press to perform an update. Touch screen interface only – no additional peripherals to handle No text entry.
PF6	Front desk/Management Interaction	As a front desk user, I want the ability to type details into the system, so I can enter order and unit details	Obj1 Obj4	Must	Keyboard and mouse peripherals for typing. Touch screen if sensible.

Design Considerations: Unit Type & Process Information

According to the photo of the Whiteboard and information from the client. The process flows from left to right.

		Email	Front desk	Room1	Room 2		Room 3				Room 4	Room 5				Room 6		
		Stage -1	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9					Stage 10	
Unit Type	Process Type	Early visibility	Check In	Drain	Jizer Rig 1	Wet Tank	Hot Flush	Pressure Test	Flow Test	Cleaning Rig 2	HD Rig 3	Oven	Blow Through	Endoscope	Preparation	Packaging	P&P	Shipped
Engine Oil Cooler	Oil	optional	required	required	required	required	required	required	required	required	optional	required	required	optional	required	required	required	required
Gearbox Oil Cooler	Oil	optional	required	required	required	required	required	required	required	required	optional	required	required	optional	required	required	required	required
Hydraulic Oil Cooler	Oil	optional	required	required	required	required	required	required	required	required	optional	required	required	optional	required	required	required	required
Water Cooler	Water	optional	required	skip (optional)	skip (optional)	required	skip (optional)	required	required	required	skip (optional)	required	required	optional	required	required	required	required
ERS Cooler - Energy recovery system?	Water?	optional	required	skip (optional)	skip (optional)	required	skip (optional)	required	required	required	skip (optional)	required	required	optional	required	required	required	required
Charge Air Cooler	Air	optional	required	required	required	required	required	required	required	required	optional	required	required	optional	required	required	required	required
Any	AdHoc	optional	required	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	optional	required	required	required	required

Design Consideration: Capacity of Each Stage

Step	Capacity (units)	Approx Time (minutes)	Min time	Max time
Drain room	4	240		
Jizer	3	60		
Wet Tank	1	60		
Hot Flush	1	60		
Pressure Test	1	20		
Flow Test	1	20		
Wet Flush Rig 2	3	60		
HD Particle Analysis	1	20		
Oven	15-20	300	180	360
Blow Through	4	20	10	30
Endoscope	1	30	20	40
Preparation	2	30		
Package	2	15		
P&P	-	10		

Information and Reporting Requirements

#	Title	User Story	Obj	Importance	Notes
IR1	In room information	As an engineer in a room, I want to see information on the units that are currently on each rig in that room, so I know what work is on-going and what needs attention.	Obj1 Obj3 Obj4 Obj6	Must	Basic information on units Information on when the work was started/finished Information on what units are to be worked on next.
IR2	Overall information	As an engineer, I want to be able to see a list of all the units booked in and where in the process they are, so I can identify where a specific unit is, and if anything is falling behind.	Obj1 Obj3 Obj4 Obj6	Must	Basic information on units Information on what stage each unit is at Be able to see details on when work was started/finished for a particular unit.
IR3	Front desk information	As a front desk operator, I want to be able to look at an order and see whether the order is progressing to schedule, so that I can expedite work on certain units if the order looks like it might be late to finish.	Obj2 Obj6	Should	Overview of the orders in the system, with the ability to drill down into the order and see the status of each unit. Ideally a dashboard of whether an order is progressing to schedule or if it will miss the 'required by' date.

#	Title	User Story	Obj	Importance	Notes
IR4	Management information	As a manager, I want to see information on the throughput of the process, so that I can understand if there is any more capacity or if the team are over stretched.	Obj4	Could	<p>Statistics on the amount of time units are in the 'waiting' state?</p> <p>Statistics on pinch points?</p> <p>View on capacity?</p> <p>Information on how long each rig has been running (number of units and time - for service schedule purposes)</p>
IR5	Presentation of Statistics	As a manager, I want to be able to present statistics on the throughput of the process or on orders for a specific customer, so that I can present information to customers without giving away any sensitive information	Obj5	Could	<p>Number of units (of each type)</p> <p>Average time on each rig</p> <p>Number of orders (filter by on time, late)</p> <p>Time spent on individual units</p> <p>Average time spent on units</p> <p>Sum of time spent per customer</p> <p>Ability to download reports for inclusion on reports.</p>

#	Title	User Story	Obj	Importance	Notes
IR6	Remote access to information	As a manager, I want to be able to access all information whilst away from the site, so that I can keep an eye on work as well as use the information for sales and relationship management when with customers.		Wont	Remote web portal Mobile/Tablet App

Design Consideration: User Interaction Suggestions

Possible solutions:

- Dashboard type display
- Replica of the whiteboard
- Critical path/process with overlay of number of units/status

Infrastructure & Non Functional Requirements

#	Title	User Story	Obj	Importance	Notes
IN1	In room device	As an engineer, I want a device in each room so that I can update/check the status of each unit easily and on time	Obj6	Must	min 10 terminals required – one per room + front desk and loading bay, meeting room etc.
IN2	Front desk device	As a front desk user, I want a device on the front desk that allows me to input and update order/unit details, so that orders and units can be entered into the system and updated accordingly.	Obj6	Must	

IN3	Network	As a user, I want the information entered into the system to be accessible from any terminal in the building	Obj6	Should	
IN4	Independent of the Internet	As a management user, I want the solution to be independent of the internet as far as possible, as the internet connection is not reliable and we cannot afford to lose connection if all our process details are on the system	<i>Technical constraint</i>	Should	Internet capability to be reviewed – may be possible to get a better line put in.
IN5	NFR: Data storage	As a management user, I need x years of orders, unit and process related data to be retained for reporting and analysis reasons	Obj7	Should	
IN6	NFR: Backup	As a management user, I need the solution to perform a backup every x hours so in the event of a failure, we can recover the data with minimal loss.	Obj6	Could	
IN7	NFR: Recovery capability	As a management user, I want to be able to recover the solution within x hours, so we do not need to revert back to the whiteboard for too long in the event of a system outage.	Obj6	Could	This also applies in a disaster recovery scenario.
IN8	NFR: Performance	As a user, I want the system to respond within 3 seconds, so I am not waiting around for the system to save details when entered.	Obj1 Obj2	Should	

IN9	NFR: Throughput /Capacity	As a management user, I want the solution to be able to cope with over 90 individual units needing work at any one time, so that we can be assured that the system can cope with out peak work load.	Obj4	Must	90 units in the state of awaiting to be/being/finished being worked on
IN10	NFR: Scalable	As a management user, I want to ensure the solution is scalable, so that it can be upgraded in line with the growth of the company	Obj4	Should	Number of units in the process at any one time. Number or sequence of the process steps could change Services offered may change
IN11	NFR: Availability	As a management user, I want the solution to be available 24 hours a day, 7 days a week, so that the solution supports around the clock working during busy periods (e.g. Formula 1 season)	Obj6	Should	During busy periods, it is important that the solution is available 24/7. Outside of the busy periods, the solution is only required during normal office hours.
IN12	Presentatio n in the Meeting Room	As a management user, I want to be able to present information/reports from the solution on a large flat screen TV in the meeting room, so that live data/reports/stats can be shown off to customers.	Obj5	Should	Display connectivity & user interface/control mechanism required.

Basic - backup (recovery) solution could be a screenshot/data dump of orders and current status of units into a file on an hourly basis - which could be printed off and used to populate the whiteboard in the event of a system loss.

Assumptions

- Set process exists for each unit type
- There will be a user interface of some sort in each room
- Internet connectivity to the site is very poor and unreliable
- There is no current need for an interface with other systems.
- Information only needs to be presented within the building, and not accessible remotely.
- The engineering firm's customers will not have direct access to the information or reports. Information will only be accessed by the staff of the engineering firm.

Not doing (as part of version 1)

- Remote access for customer to submit orders
- Remote access for customers to monitor progress
- Remote web access for Management to monitor progress
- Any links to billing tools

