

XMC Observation Report

Goals and Context

This study aimed to observe the current format, layout, and functionality of ROY-G-BIV's XMC Online Application. Specifically, I chose to do a comprehensive look at what components the application consists of, what indicators are used to convey meaning to the user, and other forms of user interface and user experience design. The motivation for this process is to eventually develop a mobile version of the application using the best possible methodology, and to create an intuitive and meaningful product that easily conveys the required information in the compact space provided by mobile systems. As the mobile system is designed to allow for an entirely new interface from the original interface, knowing which pieces of information are key, and knowing how they are currently conveyed, is an important step to designing a better and more efficient system.

Approach

In order to make my required observations, I was granted access to a live view of Precise Machining's XMC overview for their company. This view allowed me to make observations as to the display and function of various pieces of data. Additionally, I received a guided tour of the systems, with explanations provided for various indicators, such as color codes, description of the values being displayed in certain areas, and examples of how people may use the systems, such as management using different sections of the application from on the floor workers. As the application is computer based, it was simple to simply observe the system, and record its features into an adjacent Word Document.

In my observations, I simply recorded components I saw on each page of the application. I attempted to list all the components I saw in relative order, and provide explanations for the components' existence. In essence, I have broken down the page into more or less a list of components and their functions, stripping the page of visual organization. I recorded this data at a few times of the day, in order to capture changing data values. For example, different functions running on each machines changed the colors of their information displays, in accordance with the task being performed. I was able to see these variations, and record if errors, or downtime, or maintenance changed the given displays.

Results

In my observations of the XMC System, Three application Tabs appeared to have a general purpose, each speaking to a different level of corporate structure.

Live Status displays quick, on the floor information

The Live Status section has an apparent purpose of allowing for employees on the floor to have a quick overview of how their machines are functioning. The basic layout of the Live Status section is fairly simple. Firstly, the Name and Location of the company using the service are displayed. Below the display are boxes representing the status of the various machines used by the company. For example, the 'Makino MAG3" machine may currently be in operation. In this case, the machine's box will be displayed in green, indicating no issues, and full operation.

Besides the color, the structure of the boxes consists of a large, bold Title of the machine being indicated. Secondly is a pale sub-box of a lighter shade of the larger box color. This box displays two lines. One is an alphanumeric code, indicating the job being performed. Following is a more legible official name of the job, such as 'DailyJobs'. Below this section, the box returns to its standard color. A title indicated the status of the machine, and a line below the title indicates additional information. In the case of a green indicator, the title reads 'Production', and the following line reads '100% federate override'. These indicators change with the color of the machine's box, indicating they are connected to the current status of the machine, and are redundant pieces of information used to provide reinforcement of the current status. Additionally, a counter in the bottom right of the box indicates the length of time the machine has been in its current state.

Multiple machines are arranged in a horizontal fashion. As different machines may have different statuses, they each have their own box, and own status color. Other observed colors have been purple for Planned Downtime, orange for Idle, and yellow for active Setup.

Pacer allows for managerial level overview

The pacer section is designed for a day-long overview of machine status. Each machine is again represented, but in this section, as a smaller indicator box, again color coded and with a Job indicator, with a corresponding progress bar to the right. The bar has several segments. In the overview given to me, there are three, two sections for shifts one and two, and one Unscheduled stage during the early morning. The current stage is indicated with a yellow bar, the other shift is represented with a dark grey bar, and the unscheduled stage is a light grey bar. For the X axis of the bar, there is a percentage scale. Above the bar to the left is a numerical indicator of how many hours, out of the possible hours in a shift, the machine has been running. To the right is an overall 'Elapsed Time' counter.

The bar also have a visual tracking variant of the above numerical counters. A smaller green bar extends into the large r bar, indicating how long a machine has been in operation, an analogue to the top left counter. Farther along the bar is a black rectangle, indicating the point the green bar would be at if the machine was constantly operating in a day. This rectangle is an analogue for the 'Elapsed Time' counter. Mousing over locations on the bar give a popup with The Machine Name, Job Name, and Current Stage. There appears to be an option to switch to a 'Parts' representation, but it appears unutilized.

Reports allows for upper management whole picture decision making

The reports tab displays a large graph area allowing for large scale looks at productivity over the course of days, weeks, months, or even years. To the left of the graph area is a control panel designed for determining what data is provided to the graph. An 'Assets' box showcases the available Machines to generate reports for. A second box allows for selection of what type of data to extract. Below these option boxes are Buttons for generating a report, and exporting a report. There are also Radio buttons for display options, such as Trend, Time, and Record, and a calendar selected to change the time period of the graph.

The Time radio button displays a Pie Chart instead of a graph, and allows for greater detail. Clicking on sections of the Pie chart shows an additional Pie Chart with comprehensive breakdown of time spent in different statuses.

The Record radio button shows a table view, with start and end time entries, durations, and other data.

Discussion

The key to understanding the current layout is to keep in mind who will be using these systems. There are different part of the application used by different hierarchical levels in the organization, and each page needs to be useful to their specific level. Overall however, the focus appears to be on simplicity and redundant conveyance of information. There are multiple methods of conveying meaning, from color indicators to text outputs. This I must conclude that an important component of the design for the interface should be at-a-glance clarity, and ease of use to individuals who may not be avid computer users.

This particular study does have limitations. While I was able to look at the layout and functionality of the product, my ability to see the product in a working environment is limited. Thus, I can only draw my own conclusions as to how interaction with the product may occur.

Implications for Design

The data I have gathered is likely best applied towards cataloging the current design choices of the XMC application, and observing what design components are useful. Seeing what components are present also offers a view of components that are lacking, and may need augmentation. Especially as the current project is to create a new interface to a mobile platform, seeing the current techniques for conveying information provides useful data. As ideally a mobile application won't lose functionality, it is important to know the baseline standards of a mobile application.

Ideas for next Project

I hope I can better address some of the limitations of this observational study with the next interview stage, by designing questions about how I see the application performing, and asking my interviewee about those observations. Ideally, I should keep some questions more open-ended in order to get a better idea of what design choices are desired by the consumer.

Appendix 1

XMC Observations

5 sections:

- **Live Status**
- **Pacer**
- **Reports**
- Alerts
- About

Live Status

Upper left: Displays Product Name

Area displays colored boxes. –*One Purple(Downtime/Monitoring Error), one Green(Operating), saw Orange(Idle), yellow(Setup)*

One box per machine

Upper Left of main area displays Company Name, Location

Machine Areas

Name of Machine – *No Label*

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Some code – *Work function*

Name of code – DailyJobs

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Title of ‘Production’ or ‘Planned downtime’ or ‘Idle’, ‘Setup’ – *Type of action*

Explanation: ‘90% feed override’ and ‘Monitoring Error’ or ‘Machine idle” , ‘edit program’– *Presumed status message*

Time Running

Pacer

Horizontal display

Same machine names/color scheme as Live Status, ‘DailyJobs’ displayed

0%-100% Bar

Shift # Runtime Hrs: x of X

Elapsed time: X

Grey Area – Other Shift or Unscheduled

Yellow Area – Current Shift

Green Bar – Current Progress/Time Running

Black Marker – Ideal Progress/Time Running

Under is Date and Time- Says 4:00 AM?

On Mouseover

Name of Machine

Job: Dailyjob

State: Shift 1/2 Runtime Hrs/Unscheduled – *Dependent on mouseover position*

Reports

Large Graph Area

Tabs: KPI[Default], Parts, Jobs

X Axis Time

Crosshairs Show Y or X value, selectable

“Show Report” Button populates Graph

Y= machine utilization % and minutes

Can change Machines looked at in ‘Assets’ Menu

Trend->Graph, Time->Piechart, Record->Table

Settable start and end times

Hour/day axis changer