Creating an Usability-Focused Power Production Planning System

Using an approach based on
The Usability Engineering Lifecycle
by Deborah Mayhew

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1 A SUMMARY OF THE BOOK

*The Usability Engineering Lifecycle* book, by Deborah Mayhew, is a process-oriented book focused on creating Usable User interfaces.

The first step of the process is requirements analysis, in which the User interface designer and his team create User profiles, model the work process through task analysis, and put well established design principles in context while accounting for the platform's capabilities. The product of all these steps is a document called the Style guide, which summarizes the findings of requirements analysis.

The results from the first step are then used in the second phase of design, to fuel tasks such as work re-engineering, where the team incorporates the new system and the old work processes into a new, improved process that will be familiar to the users. After this is completed, Conceptual models (CM), that map the relationships between entities in the work environment are created, and tested in iterations until the quality of one of them is of an acceptable level. In a similar manner the Screen Design Standards (SDS) are created and iteratively tested and improved.

The combined results of SDS and CM produce another style guide document that guides the User interface design team in creating the detailed user interface. Once this is accomplished, it is evaluated and tuned in order to meet the usability goals that were set. Then, the User interface is implemented, at which point user feedback might lead to further improvements.

It is important to note that this whole process accounts only for the user interface and not for the backend of the application that can be developed for the most part in parallel.

A simplified version of the process is visualised on the next page.
2 ABOUT THE CURRENT ENVIRONMENT

2.1.1 THE NORDIC POWER MARKET

To be able to understand the complexities of the environment where the software is going to be used, it is also important to understand how the Nordic energy market works.

The Nordic market probably unique in the world in that way that Sweden, Norway, Finland and Denmark are interconnected to a high degree (in fact, these countries can be seen as one system). For example, the availability (and thus price) in Sweden depends on how much it rains in Norway and how windy it is in Denmark.

All produced energy is sold at a Nordic market called Nord Pool. Even when you buy electricity from Vattenfall, it has in turn bought that electricity on the market. It does not matter that another business unit within the same company actually produced it.

Finally, the market is unregulated (more or less). Although Vattenfall is owned by the Swedish government, it is a commercial company operating on the same rules as Eon, Fortum, and a large number of smaller energy companies.

This leads to the fact that there are companies that sell electricity even though they have no production themselves (like buying and selling any type of commodities). Also, the price depends on demand. Whatever company that has the cheapest price is likely to sell (to the companies acting on the market; private customers are not that much affected by this game).

2.1.2 POWER PRODUCTION IN VATTENFALL

As one of the largest energy companies in Europe (as well as the Nordic region), Vattenfall own and operate several power plants of various types. Some examples:

- Nuclear power plants
- Water power plants
- Wind, coal, gas, and oil plants.

About half of all electricity produced in Sweden comes from water, the other half from nuclear reactors; a very little part comes from other sources. It is very important to note that the different production types produce electricity at different costs. If it costs more to produce energy than it can be sold for, it will not be produced. This leads to higher demand, until the price goes up enough so you can profit and then you produce. But, if you wait to long, some of the other producing companies may sell instead of you, and again you lose money.

The problem therefore, is to sell (and to sell, you must produce) at the right time. Water plants is ideal for this - you have a lot of water in a large reservoir, and when the price is right, you tap some of it through the turbines. If the price falls, just stop the water flow.

However, consider a nuclear reactor: those cannot be turned on or off on a daily basis - it takes days (and a lot of administration) to start one up. That is why they are taken off-line for service during the summer months when electricity is cheap.

Then consider wind plants: they are fine as long as there is sufficient wind speed, but otherwise not. But the wind speed is not constant over the Nordic region. If it is windy in Denmark, Dong (a Danish company) may produce cheap power there. This means you do not want to produce anything that is too expensive at the same time.
A final example: there may be reserve plants that use (e.g) expensive oil. These will most likely only be used during a very cold winter, when the demand is so high that the costs for starting and operating it are covered. But the decision to turn it on (it may take a day or so before it is actually producing heat or electricity) must come at the right time, otherwise either the cost will not be covered, or someone else might beat you to it (which again leads to selling at a lower price than optimal).

2.1.3 Work tasks of the end users

Thus, what the Power Production Planning personnel has to do is to constantly monitor trends in price, weather, demand and other factors, to decide which plants should start or stop. Very complicated indeed, since they must have data of the start up and operation costs for every power plant operated by the company. Add to this water reservoir levels, estimates on how much they will be refilled the next week/month/year, and probably a lot of other aspects not covered in the above examples.

2.1.4 The current application

Today, the personnel have a home-grown Excel application (that they have made themselves). Thus, these people are at the same time both the users, domain experts and developers of the application we want to replace or improve.
3 PROJECT PLAN

3.1 INTRODUCTION

This is the project plan for a software project that aims to replace the existing Excel-based software with a new one, where focus on usability goals drive the entire development process. However, the focus of this project is solely to produce a new user interface; the applicable bridges to the back-end processes will have to be added outside of this project. However, much of the back-end work might be done in parallel by a different development team.

The new software will primarily aim towards ease of use, since it will be used daily by a small set of users who are likely to both be offered training and remain for a long time. It is also important that the software is efficient and that business goals are met.

Some of the task are iterative, and as such it is impossible to foretell how long they will take. In our time plan, we have assumed that three iterations will be performed, but the customer should be aware that project might get delayed if more iterations are required.

Finally, it should be mentioned that while the book this process is based on contain some short-cuts for projects where resources are limited, we have chosen to do the full set of activities, since the Power Production Planning System is mission critical and serious problems are likely to cost a lot later on.

Please note that as since this project plan is heavily based on the book, some isolated sentences have been weaved into the text without explicit citation (for example, some small parts of the book such as step guides have been used as-is, since they apply directly to our specific project) . We have tried to mark any larger quoted sections, but properly marking everything with foot-notes etc. would probably make the text hard to read. For the complete process in original format, please refer to the book itself.

3.2 PROJECT TEAM ROLES

The following roles will play and important part in the project. One person may have multiple roles, and each role may have utilise additional staff with the same competence. For the User Interface Designer, Usability Engineer and Developer roles, there will be one individual who is designated as the (e.g.) Lead UI Designer. Whenever those roles are mentioned having a responsibility, it is the Lead person that is intended for the responsibility in question.

END USERS

The end users will be actively involved in evaluation tasks and feedback throughout the project. Since there is a small number of end users, it is possible to get feedback from all of them at some point.

USER INTERFACE DESIGNER

The UI Designer will be responsible for design, conceptual modes, mock-ups and prototypes. He/she will also be responsible for the Style guides in cooperation with the Usability Engineer.
**USABILITY ENGINEER**

The Usability Engineer will create user profiles, usability goals and evaluations. He/she will also be responsible for the Style guides in cooperation with the UI Designer.

**DEVELOPER**

The Developer will be responsible for much (if not all) of the coding activities.

**DOMAIN EXPERTS**

Domain experts provide valuable insight into the work process. These are likely to be found among the user population of the current application.

### 3.3 INITIAL REQUIREMENTS ANALYSIS

#### 3.3.1 Establish user profile

**Responsible role**

- User Interface Designer

**Deliverables**

- User Profiles Document

**Detailed description**

The requirements analysis starts with User Profile. The purpose of the User Profile is to describe the specific user characteristic that is relevant to the user interface design.

The user profile is obtained for the intended user population and to help the designer make important design decisions and identify major user categories to simplify the use of the system.

As we know it is impossible to design a perfect user interface that works for all types of users. To make a good user interface it is important that the interface designers know the specific characteristics of populations that will use the interface. For our project we know that the users of the system are familiar with the program since they have built it themselves and have used it for a while.

After collecting the user profile we need to obtain a description of the whole user population in terms of characteristics relevant to user interface design. The book has identified four important characteristics

- Psychological characteristics (e.g., attitude, motivation)
- Knowledge and experience (e.g., typing skill, task experience )
- Job and task characteristics (e.g., frequency of use, task structure)
- Physical characteristics(e.g., colour blindness)

There are many ways of getting these user characteristics. The most common way is to gather the data through interviews and/or a user profile questionnaire. From the book:
**Questionnaires**

The best way of getting accurate and reliable result as much as possible in short time is to gather data directly from intended users through a questionnaire. However this can be time consuming and requires a skill set that includes questionnaire design and data analysis. But once a user profile is obtained through this method, it can be reused across applications for the user population profiled, and thus the actual cost per development in a project could be reduced. For example if your building a system that will be used by many users it is more suitable to conduct a questionnaire rather then asking the users one by one.

**Interviews**

The alternative to questionnaire, is to collect data by interviewing user representative. The user representative might be managers or user category leaders or even marketing staff in a vendor situation. It can be anyone expected to be familiar with a broad range of users from the intended population. You ask them to describe the overall user population according to characteristics you are interested in.

This technique is of course much quicker and thus cheaper than questionnaire technique, however the reliability of the data depend on how accurately the people interviewed know the user population. Nevertheless the best guess of people most likely to know the users well is an acceptable alternative when you can’t gain data from real users for different reasons. Bear in mind that once a User Profile is conducted for a given user population, this profile can be reused on any project developing a product for the same user population is simply to reuse the User Profile from the previous project.

We use questionnaires to gather accurate and reliable user profile data for our project, this is mainly because the system will be used by several users and we need to get as much user feedback as possible.

### 3.3.2 Perform analysis of current work tasks

**Responsible role**

- Usability Engineer

**Deliverables**

- Work Process Model

**Detailed description**

Contextual task analysis requires projects in which a product has been clearly defined. This assumes that a set of features and functions has been determined. This method allows the modelling of the work process users follow, and with this knowledge there are important goals that can be achieved. The new system can follow a similar process to the pre-existing one therefore minimizing the learning curve since users are already trained in the existing process. Another important advantage is the chance to reengineer the existing work process to better support identified business goals, and with this increase productivity.

A set of specific steps has to be followed, in order to perform contextual task analysis. These steps are:
1. Gather background information about the work that will be automated.
2. Collect and analyse data from observations and interviews with the users, in their work environment.
3. Construct and validate a model of the user’s current task organization.

This model can be used as a guideline in the later stages of the design and development process. It is crucial to mention that observing how users function in their natural environment, acting as a protégé and learning about their routine is the best way to acquire the most accurate information in order to create a representative model of the tasks in focus. This type of research is known as a case study research, where there is little interaction with the participants (users), in our case by asking questions about their processes in order to get an accurate description.

### 3.3.3 Research Platform Capabilities

#### Responsible role

- User Interface Designer

#### Deliverables

- Customer approved documentation regarding acceptable (for Vattenfall) hardware and software options.

#### Detailed Description

In this step, research of what kind of hardware and software requirements that applies within Vattenfall will be done. At a minimum, the following questions must be answered:

- What, if any, is the standard desktop computer?
- What is the normal type of monitor (size, resolution, update frequency)
- What operating system is standard?
- Is it possible (politically or economically) to use non-standard hardware or software for this project?
- Are there any requirements regarding brands of databases and other related systems?
- Are any of the above requirements likely to change in the near future?
- Are there any requirements whether the application should be web based or run on the client?
- What is the maximum cost that software and hardware changes may incur?

After the research is completed, the result will be summarised in a document describing the available options. This document will then be discussed with – and approved by – the customer (Vattenfall).
3.3.4 Establish General Design Principles

**Responsible role**

- User Interface Designer

**Deliverables**

- Design principles document

**Detailed description**

The purpose of the General Design Principles task is to identify all general principles and guidelines from the Usability Engineering literature that may be relevant to the product under development. It works together with requirements analyses to provide guidance for the first pass at design at levels 1, 2, and 3. Requirements and general design principles can significantly shorten the iterative cycle of design and evaluation by helping to generate a better first pass at design. For our project, the general design principle is help Power Production Planning department make right decision at the right time by constantly monitor trends in price, weather, demand and other factors, to decide which plants should start or stop. So we need to combine the requirements analysis tasks and the general design principle to achieve optimal design. As we know, in general, user interface design can be greatly improved and facilitated by four general strategies that summarize the overall usability engineering lifecycle:

- Conducting a thorough requirements analysis
- Applying known general design principles and guidelines
- Approaching user interface design through a structured process
- Employing interactive usability testing.

From that we can see gathering and using available and applicable general user interface design principles is a key part of the overall usability engineering lifecycle.

In this task we pull together potential sources of general design principles to our product, there are several mainly techniques we usually used list as below:

- Review any relevant platform, corporate, and product family Style Guides
- Perform a literature review
- Consult with usability experts
- Consider automated development tools with guidelines built in.

The general design principles can be performed any time during requirements analysis. Integrated with all requirements analysis data to drive all design tasks in later phases.

3.3.5 Usability Goals

**Responsible role**

- User Interface Designer
**Deliverables**

- Style guide document

**Detailed Description**

In engineering projects it is important that the project team must establish and agree upon clear goals and then work towards accomplishing them. The purpose of having Usability Goals is of two primary reasons. First, specific and clear usability goals help to focus user interface design efforts during the design process by giving the designers something concrete to aim for and something concrete to assess their design ideas against as they generate and consider them. Hence usability goals should drive design, because they can organize the design process and shorten the design cycle.

Agreeing on design alternative usually takes very little time and energy if all designers share a common and accurate picture of the total user population (which comes from the User Profile), a common and accurate model of the work and work environment(which comes from the Contextual Task Analysis), and they agree upon clear goals that best serve this total population doing these tasks in this environment. Therefore usability goals can save time in overall project life cycle as well as ensure better design for the intended user population.

The second purpose of usability goals is to serve as acceptance criteria during evaluation, especially towards the end of the design process. Because the design efforts are iterated with evaluation until the usability goals are satisfactorily met, the usability goals establish criteria for when an iterative design and evaluation cycle should end, and the team can move on either to the next level of design and evaluation or to development. Related to this, usability problems occurring during evaluation can be prioritized according to whether that relate to usability goals or not.

Usability goals are based on the User Profile and the Contextual Task Analysis, as well as on general business goals. However certain usability goals will be appropriate for some types of users and tasks, but not others. For example easy-of learning goals will not be a high priority for complex products where highly educated users will get extensive training and will use the product frequently. Example of such systems can be space shuttler software, traffic control systems or even Power Production Planning system. For these products, easy of use goals will take priority.

Usability goals fall into several categories, the biggest one are qualitative usability goals and quantitative usability goals. Quantitative goals can be broken down into easy-of-use goals and easy-of-learning goals they are objective, measurable and therefor can serve as acceptance criteria during usability evaluation. Qualitative usability goals are on the other hand general unquantified goals that guide design.
3.4 **First Design Level**

3.4.1 **Reengineer Work Tasks**

**Responsibility Role**
- User Interface Designer

**Deliverables**
- Reengineered work process document

**Detailed Description**

The purpose of this task is to reconfigure work practices inside the energy production planning workspace that were identified through contextual task analysis, in order to meet specific goals. These are: increasing efficiency of work by using the power of automation, better supporting important business goals, such as producing power only when it is profitable, and lastly minimizing retraining by utilizing the users existing knowledge while accommodating the capabilities of the workers. The usability goals that have been developed, will now guide work reengineering. It is important to create a work plan that supports the users and allows them to be more productive while letting them be in control.

The reengineered work model is designed to be the foundation on which the user interface design will be built on. Finally it is important to only make changes in the work process that utilize the power of automation and help achieve business goals, otherwise there is a risk of jeopardizing ease of use and increasing the learning curve.

3.4.2 **Perform Conceptual Model Design**

**Responsibility Role**
- User Interface Designer

**Deliverables**
- Conceptual model document

**Detailed Description**

This is the first step in the actual design process. A conceptual model can be process oriented or product oriented. In our case a process oriented model is appropriate, since the purpose of our application is to assist energy production planning. That said, the development team must

1. Clearly identify the processes involved
2. Design presentation rules for these processes (such as how each part of the process hierarchy will be visually presented)
3. Design rules for the window behaviour, such as menu bars etc.
4. Identify major displays, in our case more than one monitor will be used, as critical information must always be visible, and in order to support decision making, all relevant information must be visible at the same time.

5. Define and design major navigational pathways

6. Document alternative designs. It is advisable to have more than one conceptual model design made, without going into much detail in each design.

3.4.3 CREATE CONCEPTUAL MODEL MOCK-UPS

RESPONSIBLE ROLE
- User Interface Designer

DELIVERABLES
- One or several user interface mock-ups

DETAILED DESCRIPTION
The purpose of this task is to create model mock-ups in order to support formal evaluation of the conceptual model. This evaluation will help the development team identify potential problems early in the process when it is easier and more cost efficient to resolve them. Ideally there will be a few competing conceptual model designs by now, and this phase will help in making the right decision in questions such as which model uses a better metaphor in terms of navigational pathways. The mock-ups can be low fidelity since studies indicate that design flaws can be revealed even with the use of low level prototypes.

3.4.4 ITERATIVELY EVALUATE AND IMPROVE THE CONCEPTUAL MODEL

RESPONSIBLE ROLE
- Usability Engineering

DELIVERABLES
- Conceptual model evaluation document

DETAILED DESCRIPTION
After designing mock-ups for the conceptual model, it is advisable to do an evaluation of this model. In this stage no major investment of time and money has taken place, so changes can be easily made. Iterative evaluation makes use of formal techniques and uses the usability goals as guidelines. For each iteration a set number of representative users should perform realistic tasks while using the “think aloud” method. This method can provide insight to what the user experience is. On a final note, time measurements should not happen in this early stage if testing.
3.5 Second design level

3.5.1 Establish screen design standards

Responsible role

- User Interface Designer

Deliverables

- Screen design standard document

Detailed description

In this step of the creative process our goal is to ensure consistency and simplicity in the detailed design across all displays in a product interface. Some of the screen design standards are predetermined by the platform that is used, in our case MS Windows. For the remainder of the UI elements that are developed, this is the step in which they are standardized. Examples of elements:

1. Use of Controls (buttons, check boxes, scroll buttons etc.)
2. Location and format of the display components. This is especially important in the case of the power management application, as users are expected to frequently use this interface. Keeping the location of elements constant throughout the different screens facilitates both learning and consistency.
3. Colour
4. Terminology
5. Fonts
6. Characteristics of messages that appear throughout the screens

The standards evolve and mature with every iteration until they become validated, and are documented in the product style guide. These standards will be applied during the Detailed UI design.

3.5.2 Create screen design prototypes

Responsible role

- User Interface Designer

Deliverables

- Screen design prototypes

Detailed description

This process is about creating detailed prototypes of the user interface. It is more cost effective to produce low fidelity prototypes, with complete functional details, so that these can be used...
in the iterative screen design standards evaluation that comes next. On the other hand, high fidelity prototypes might become part of the code of the final product if they make it through the evaluation.

For this project, we are aiming for low fidelity in order to be able to do as many iterations as possible.

3.5.3 Iteratively evaluate and improve screen design prototypes

**Responsible role**

- Usability Engineer

**Deliverables**

- Screen design evaluation document

**Detailed description**

The aim of this evaluation is to obtain early feedback regarding the usability of the Screen Design prototypes that have been produced. It is key to spend some resources in performing an evaluation now, in order to avoid costly modifications to the code in the long run. This step of the process is similar to the iterative conceptual model evaluation, with the difference that the screen design standards prototypes are much more detailed and also interactive. This allows for tasks in this evaluation to be much more specific, and also collecting time measurements for every task.

The iterations of the evaluation should stop when all major problems have been solved and the usability goals set have been reached. Since our target population is frequent users of the product, ease of use is first priority in this stage of the process.

3.5.4 Develop product style guide

**Responsible role**

- User Interface Designer
- Usability Engineer

**Deliverables**

- Product style guide

**Detailed description**

The style guide aims to summarize all the data that has been created in previous tasks, in a single document, so that no information is lost. This document includes intended user interface standards for designers to follow during the UI development process.
3.6 Third Design Level

3.6.1 Create Detailed User Interface Design

**Responsible Role**
- User Interface Designer
- Developers

**Deliverables**
- User interface

**Detailed Description**
This is the stage where we design the user interface of our product in detail. It is recommended that the user interface designer creates a complete specification of the detailed user interface design for developers who do not have experience in using the style guide as a reference. Tasks that have to be performed in this stage include complete and detail design of the menu bar, windows and dialog boxes, interactions with input devices, as well as completed identification of all pathways between the elements of the UI.

3.6.2 Iteratively Evaluate and Improve the User Interface

**Responsible Role**
- Usability Engineer

**Deliverables**
- User interface evaluation report

**Detailed Description**
The Iterative detailed user interface design evaluation aims to evaluate the final interface against the set usability goals. This evaluation is performed in a similar manner to the conceptual model evaluation and the screen design standards evaluation. However in this stage, actual application code is tested instead of prototypes.

The tasks developed for this evaluation must be detailed and specific, as well as representative of real tasks. Measuring timing data is recommended in this stage. It is also important to test for ease of use, as our clients are frequent users of the application. Iterations continue until the usability goals have been reached.

3.6.3 Packaging & Installation

**Responsible Role**
- Developers
Deliverables

- An installed product

Detailed description
At this point, the User Interface is completed, and should be packaged for installation in the target environment. We are proposing that installation is done in a separate education system, which does not actually affect the real world. In this environment, the operators may learn how the new system behaves, without causing problems in the sharp system.

3.6.4 Receive post-installation user feedback

Responsible role
- Usability Engineer

Deliverables
- Product evaluation document

Detailed description
This task will be conducted one month after the training/education system has been running successfully. The focus will be to measure ease of use and operator satisfaction, since these areas are of paramount importance for this project.

We will perform an usage study in order to find if any particular functions are hard to find (or too complicated to use). We will also make interviews with the operators to hear their opinions on the new system as well as asking them to compare it with the old system (it could be useful to know if there are any features that they are missing.

It should be noted that the small total number of end users makes it possible to get more in-depth discussions with some of these, and still get a good coverage of the end user population.

3.7 Project termination

After the feedback has been received and analysed, the project will make a recommendation to either to back to some of the development levels to fix found problems (if any), or to proceed with the actual integration of the back-end systems. Depending on which alternative the customer choose, a contract renegotiation might be required.

3.8 Time plan

A time plan is included at the end of the document.
### 3.9 Time Budget

<table>
<thead>
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<th>#Hours</th>
<th>(weeks)</th>
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<td>Establish user profile</td>
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<td>144</td>
<td>3,6</td>
</tr>
<tr>
<td>Develop product style guide</td>
<td>256</td>
<td>6,4</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>732</td>
<td>18,3</td>
</tr>
<tr>
<td><strong>Third design level</strong></td>
<td></td>
<td></td>
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<tr>
<td>Create detailed user interface design</td>
<td>240</td>
<td>6</td>
</tr>
<tr>
<td>Iteratively evaluate and improve the user interface</td>
<td>144</td>
<td>3,6</td>
</tr>
<tr>
<td>Packaging &amp; installation</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>Receive post-installation user feedback</td>
<td>194</td>
<td>4,85</td>
</tr>
<tr>
<td><strong>Sum</strong></td>
<td>658</td>
<td>16,45</td>
</tr>
<tr>
<td><strong>Total hours for project</strong></td>
<td>2574</td>
<td>64,35</td>
</tr>
</tbody>
</table>

### 3.10 Project Cost

We are making an assumption that all resources will cost 900 SEK for each hour spent on the project (we think this is justified for internal resources, since they will have other tasks they must forsake to participate; however they will likely cost a bit less than 900/h, but this is compensated by the fact that some consultants will be more expensive).

This gives an accumulated cost of $900 \times 2574 = 2316660$ SEK.

To this, we want to add an additional 100 000 SEK for changes in hardware, new software licenses, test systems, and so on (the entire sum of 100 000 might not be utilised, but we want to have it planned for, should the need arise). Finally, we add an additional 50 000 for travel expenses.

Added to the work hours, the overall project cost will be 2 466 600 SEK.
<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish user profile</td>
<td>26d</td>
<td>2010-02-05</td>
<td>2010-02-11</td>
</tr>
<tr>
<td>Perform analysis of current work tasks</td>
<td>41d</td>
<td>2010-02-12</td>
<td>2010-04-12</td>
</tr>
<tr>
<td>Research platform capabilities</td>
<td>14d</td>
<td>2010-02-18</td>
<td>2010-02-24</td>
</tr>
<tr>
<td>Establish general design principles</td>
<td>1d</td>
<td>2010-03-01</td>
<td>2010-03-01</td>
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<tr>
<td>Reengineer work tasks</td>
<td>13d</td>
<td>2010-04-13</td>
<td>2010-06-29</td>
</tr>
<tr>
<td>Perform conceptual model design</td>
<td>26d</td>
<td>2010-04-30</td>
<td>2010-06-04</td>
</tr>
<tr>
<td>Create conceptual model mock-ups</td>
<td>10d</td>
<td>2010-05-08</td>
<td>2010-05-21</td>
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<tr>
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<td>43d</td>
<td>2010-06-22</td>
<td>2010-08-10</td>
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<td>2010-08-20</td>
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<td>2010-09-21</td>
<td>2010-10-15</td>
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<td>2010-10-10</td>
<td>2010-12-15</td>
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<td>2011-03-31</td>
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