Real-Time Systems for Energy
Production Planning

Project assignment for User Centered System
Design (Spring 2009)

The Institutionalization of Usability: A Step By Step Guide


Group 13:

- Hongyi Zhao
- Damian Hartley
- Moyen Mustaquim
- Stanislaw Zabramski
Table of Contents

1. Introduction ......................................................................................................................................... 2
2. Goals .................................................................................................................................................. 3
3. Process ................................................................................................................................................ 5
   3.1 Inputs ............................................................................................................................................... 5
   3.2 Roles ............................................................................................................................................... 6
   3.3 Activities ....................................................................................................................................... 9
4. Results .................................................................................................................................................. 11
5. Estimations .......................................................................................................................................... 13
6. Evaluation .......................................................................................................................................... 15
7. References .......................................................................................................................................... 16
1. Introduction

This project will discuss the process for the development of a real-time energy production planning system. The process is based on an approach to user-centered system design (UCSD). The approach to UCSD described in this report is based on the process illustrated in the book <<Institutionalization of Usability – A step-by-step guide>>. In this section, a brief introduction to the process used in this book will be given. Details to the process and the system will be discussed in the later sections.

The process to institutionalize usability described in the book is divided into four phases: the start-up phase, the setup phase, the organization phase, and the long-term operation phase. Each phase contains a series of actions to accomplish its goal.

The start-up phase takes one month in minimum. The start of the process usually happens when the company’s management is aware of the fact that the value of a product is usefulness and the satisfactions to customers, rather than technologies used in the application or whether it’s delivered on time. After the wake-up call, the organization should choose an executive champion. This person will lead and coordinate the whole team throughout the whole process. The last step is to choose a usability consultant that has the resources for training and experts on usability fields.

The setup phase builds the infrastructure used by the later part of the usability work. It may take 6-9 months. In setup phase, the following products will be created: a strategy plan, a methodology for system development, a whole toolkit of tools, templates and testing facilities, interface design standards and at least one showcase projects. Sequence, timing and funding should be involved in a strategy plan. The methodology should be a user-centered design approach, which is accepted by management and integrated with current approach. The toolkit is an efficiency tool to support the methodology the team chose. It helps the staff performing the professional usability work efficiently and practically. And the interface design standard specifies the way the interfaces will look and feel, reusable interface components and guidelines. It will make the development faster and make the maintenance easier. In the end of the setup phase, a showcase project is performed. It’s a “pilot” of the new usability methodology and toolkit. Its value is to demonstrating that the strategy and methodology deployed in this phase has a good effect on the usability engineering process.

In the organization phase, a solid infrastructure for usability process has been built. This phase may take 6-9 months. The organization should begin staffing people to form a usability team with all types of stuffs needed. This is a very important step because the success of the usability process depends on how appropriately the stuffs are doing with the usability tasks. And It’s also the time to perform the usability approaches to the projects held in the organization. The team will take advantage of the appropriate user-centered design approach to finish the projects.

The last phase is an ongoing step when the whole infrastructure and usability process start to functional. The usability tasks will become a common part of each project. The previous selected executive usability champion becomes the Chief User Experience Officer. The team must keep doing a process of review, evaluation to the current usability process. Enhancements to the process will be patched if needed.
2. Goals

After the institutionalization of usability, the organization now has the ability to perform professional engineering with a user-centered methodology. The user-centered methodology described in the book is called The Schaffer Method. The method can be divided into five phases: Plan Evaluation & Structure phase, Plan Standards phase, Plan Design & Implementation phase, Plan Evaluation phase and Plan Localization phase. In this section, we will outline what we are intent to do base on the methodology described in the book according to each phase in the methodology.

In the first phase - Plan Evaluation & Structure phase, we should evaluate the existing application (if has) and design the structure of user interface. For the power production planning system we are going to build, we can look at any current using system in the power plant. Reviewing the existing system helps us locating the areas that need focus during our design. And we can also spare some time to look at other kinds of real-time planning system design, such as real-time traffic system, to find some common issues betweens these similar systems.

After we evaluated the current using system, we need to understand what the organization really wants. We need to indentify the business strategy and the true value to the organization. We can talk to the stakeholder and internal staff of the power production plant to get the organization information. They are usually the high management of the organization who have a clear vision of the system and the business. Also, we need to understand what the end user want and care about. We need to indentify all sorts of users and their requirements before we design the user interface structure. Once we understand what users want and need, we can start build the interface structure. It includes concept design, navigation mechanism, and information architecture.

The second phase will focus on the creation of a template-based interface standard to make design efficient and consistent. The templates are some screen with design examples that integrate all the standard’s decisions. The later user interface design will be guided by this standard. As from the screenshot of the working environment in the following figure, there are probably many screens to display different real-time data on a few monitor. If all of these screens are not designed by a standard, The user’s learning curve may suffer a lot more. So we should design a set of standards of interface to guide the user interface design later on for the power production planning system.
The third phase contains screen design and implementation. As long as the interface standard and system navigation flow are finished, we should start design screens iteratively. Each screen is a navigation entry in the navigation flow. We should design the screen according to the interface standards. After the screens are designed, the usability member should create a functional requirement to illustrate each screen, describe the interaction details and available actions.

The documented specification will be handed over to the developer team and the testing team. The developer team will design the system upon the functional requirement, create design document and then implement the system. The testing team will create test plan according to the features described in the design document and perform testing to the latest build of the system.

The forth phase performs evaluation to the built-up system. After developer team implement the system and before the system is delivered to user, usability testing will be done through the pre-release version of the system, the test is to make sure that the system is useful and easy to use. The evaluation is a user-centre process rather than a technical one.

The final phase is localization related. This process won’t make sense if the system is designed for one region/language. But for our power production planning system, it makes sense to make it internationalized because many countries/regions need real-time power planning. But the challenge is to make the system fit in the local environment and power-related aspects. For example, for some areas, the temperature is a very important aspect related to power consumption but some others aren’t. Thus, except that we can do a translation process to make the interface translated to multiple languages, we can divide the system into several modules according to the effecting aspects to the power consumption. Then user can choose which aspects to take into account by its local.

The above are the goals that we should address while developing the system using the methodology described in the book. In the next section, we will give a full detailed view of the process.
3. Process

3.1 Inputs

In this section, a series of inputs will be identified. The inputs are carried out according to each activity in each phase. The input is required by the activity to make it happen.

In the Plan Evaluation & Structure phase, the existing power planning system is the input for usability test and evaluation. The tools and templates used for usability test are also the inputs for evaluation. The questions or questionnaires and the interviewees are the inputs of the activity. Different users and their needs are also the inputs while interviewing users. At the end of the phase, the requirement of the organization and the needs of users are the inputs to user interface structure.

In the Plan Standards Phase, if the interface standard doesn’t exist, we need to create it. We take some inputs from usability experts. We also take advantage of some usability theories/patterns, which are proven to be useful and positive in screen designing. The standard will also inherit from the structure derived in the last phase.

During the Plan Design and Implementation Phase, the standard templates and navigation are needed for screen designing. Screen design is a process to extend the navigational structure to a full-detailed level with a screen for each navigation entity. While implementing the system, the functional requirements conducted from screen design will be used as input by the developer team and testing team. Developers will be informed about usability design concerns and backgrounds, which help them to avoid misdirection when developing the system. In the mean time, content developers will take the whole system design as an input or start. They will feed content into the design. The contents include actual text, illustrations, and other content in the product. They will also take standards and templates into consideration.

The Plan Evaluation Phase is a process to review the pre-release system in a user-cantered point of view. The usability test tool and principles are the inputs. The system itself is also the input to be tested. After the system was delivered, user’s feedback and the system run-time data are the inputs to enhance the system.

The Plan Localization Phase needs a localization plan, which includes the regions/languages to be supported. The different formats and environments aspects, which are key factors to the power production, should be included in the localization plan. Also, for user interface translation engineering, an interface translation specification should be created as the input of the process.
3.2 Roles

The Executive Champion

A wake up call is noted as when a company realises it needs some form of usability standards put into place. Such wake up calls can be a train wreck (a critical error noted at the final production stage), Executive Insight, new staff that comes on board, education and training, or through an expert review. In a power production plant, wake up calls such as the train wreck could be extremely costly, even dangerous. One critical aspect in deciding a plan of action is developing key roles within the power plant.

Schaffer describes a role known as the executive champion. We take the CEO of the power plant or one of the top executives and focus their attention on usability. No background knowledge of usability is needed for this executive to assume this role; however he or she must understand the importance of usability. It is up to the executive champion to begin the process of institutionalising usability into the power production process.

To begin with, the executive champion must see the importance of “moving the usability effort forward”. This is achieved through training of the executive in the basics of usability, a short course or some generally reading is usually enough to lay a foundation for the executive. Next we ensure that the executive has proper communications with not only the usability staff but also with key people in the hierarchy of the power plant. The executive champion acts as a medium between these two groups within the company. Without an executive champion, the usability group does not have access to important figures within the organization and without an executive champion the other executives would be oblivious to the importance of usability.

He or she must also be prepared to handle backlash. No doubt there is much emotion involved when designing a real time system for the power plant and when the design is criticized from a user’s point of view the executive champion must be able to ‘keep the peace’ so to speak. The executive champion must also emphasize the importance of usability to the company whilst keeping the usability staff motivated on the business goal, which is to have the most functional, safe and cost effective system available in the power plant.

The Chief User Experience Executive

Once usability has been institutionalized the chief user experience executive will need to take over from the executive champion. We will choose another executive high up in the company for this role who is also committed to the user experience and the importance of usability. In times of cutbacks the usability team is often the first to go, but with a chief user experience executive we expect that he or she will keep this from happening and keep the importance of usability constantly in the mind of the company.
The Central Usability Organizational Manager

The company will need a manager who is in the usability team who carries out day to day managerial tasks. This person does need a good background in usability. We need someone who is fully dedicated to controlling the usability engineering aspect within the company. The executive provides overall direction within the usability group but the manager has to plan, staff and provide the funding for the project. The central organizational manager is also the person directly responsible for the hiring and firing of usability staff.

To select a good central usability organizational manager we need to address the following issues. We need someone who has a background in usability, a full grasp of organizational dynamics, and a passion for management. If such a manager cannot be found Schaffer suggests a ‘street’ smart manager over a usability expert. In the hands of a technically sound, but not managerially skilled person, the institutionalization of usability into the company may be lost.

Other Usability staff, graphic designers and technical writers

The power plant will need a certain amount of people dedicated to the primary function of usability. These people will consult with the central organizational manager, but will also get feedback and direction from the higher powers within the plant. Their focus should be 100% on the usability of the systems within the plant and not on any other design or functional aspects of the system. It is up to the other usability staff such as the executives to assimilate the usability with design and functionality. The single most important aspect here according to Schaffer is that usability should not be an idea kept solely within this group, but should be ingrained within the whole organization.

Consultant Company

The best way to start the institutionalization process is to go to an outside consultant company. These companies are professional and have all the necessary tools in place for creating a successful usability team. Once a successful assimilation of a usability team has been integrated into the company then we can begin an internal usability department using the staff as described above.

The benefits of using a consultant company are as follows:
Table 1.1 Benefits of a consultant company

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffing</td>
<td>Has trained and professional usability personnel</td>
</tr>
<tr>
<td>Completeness of solution</td>
<td>Can provide a complete integrated solution, rather than hiring multiple vendors who specialize in niche areas</td>
</tr>
<tr>
<td>Domain expertise</td>
<td>Saves time and offers some special insights for your specific domain</td>
</tr>
<tr>
<td>Methodology</td>
<td>Follows a methodology that has clear activities and deliverables and is appropriate and comprehensive</td>
</tr>
<tr>
<td>Tools and templates</td>
<td>Already has an infrastructure of tools and templates in place</td>
</tr>
<tr>
<td>Size and stability</td>
<td>Is large enough to absorb your project requirements</td>
</tr>
<tr>
<td>Corporate cultural match</td>
<td>Matches or complements your own corporate culture</td>
</tr>
<tr>
<td>Specializations</td>
<td>Has a wide range of specializations in the field</td>
</tr>
<tr>
<td>Organizational structure</td>
<td>Has a clear and easy-to-work-with organizational structure</td>
</tr>
<tr>
<td>Change management ability</td>
<td>Helps you build usability into your organization rather than just providing usability consultancy</td>
</tr>
<tr>
<td>Quality control and feedback</td>
<td>Has a good quality assurance and process improvement program in place</td>
</tr>
<tr>
<td>Ongoing training for consultant's staff</td>
<td>Makes a continuous effort to keep staff up-to-date in usability knowledge and practice</td>
</tr>
</tbody>
</table>

The first benefit is quite important. It would cost time and money for us to train insider staff to become usability experts and even then there is no guarantee that they would be good at what they do. There are very little companies that invest in an internal usability group, but most companies start with a usability consultancy. The consultant company brings an integrated and experienced team of people and a complete set of resources.

Another benefit is, as they are outsiders, their advice is often more easily accepted compared to an insiders view. This means for our energy production planning we will gain valuable criticism related to the use of our real time system.

Many consultant companies only provide a part of the solution. It is best to find a consultancy company that presents us with a complete solution. Solutions can be pieced

---

1 Table taken from Schaffer (2004)
together from the individual usability research provided from the parts of the solution, but they will not match.

Elements of a complete solution, described by Schaffer, that we should expect to be provided by the consultant are as follows:

- Strategic consulting
- Expert reviews
- Detailed training
- Methodological standards
- Design standards
- Tools to support the standards
- Graphic design
- Interface design
- Usability testing
- Ongoing support

If we search for a consultant company that can provide us with these elements then we will be well on our way to making usability a major part of our development process within the power plant.

3.3 Activities and Tools

To effectively establish a workable and efficient real time system in an energy production plant we need certain activities and tools to help us achieve our goal. The value we get from the right tools and activities is time and cost saving. Every time a test is needed a usability expert can fabricate a new form from an existing one and can tailor it to our needs. This can cut weeks off the time by not having to design a new test for each situation or redevelopment of the systems within the power plant. The tools required depend a lot on the methodology and the processes within the plant. If the process is updated, the tools will need to be updated also. It may also work the other way around where the acquisition of better tools forces us to update our processes.

In order to be able to properly institutionalize usability within the organisation we need activities and tools which give us feed back and also help with research. One such tool is a template. Templates can be used to form questionnaires that can be used for interviews and screening for usability testing. Templates are also useful for documenting results, expert reviews and usability testing reports. They are crucial if we want to make usability an integral part of the organisation, not only for this project but for future ones. They allow for the reuse of materials without the consultant having to reinvent everything again. In regards to the power plant we can use templates for interviews and feedback regarding prototype systems.

Research and testing facilities could be invaluable in the production of energy. Whether it is a small office or a full testability lab they provide hands on gathering of data. There may be other benefits to having a testing facility, such as the mere presence of one tells the organisation the commitment to usability and its importance. The testing facility for the power plant should be on site.
Recording of testing sessions is also a very popular tool. This allows for video of the users actually using the system and highlights any problems associated with it. There are two types of tape usage. One involves a continuous recording of sessions, while the other highlights important user reactions and feedback.

Most importantly, in this day and age, modelling software can be a very handy tool. To model a physical prototype of a real time system for a power production plant could be a very difficult thing to do, not to mention costly and time consuming. Modelling software can possess a variety of tools in the one package. It may contain graphical packages to help with the interface design, some kind of modelling tool that imitates real life situations. Many software tools also possess flow chart packages and word processes from which the results can be documented.

While all of these tools can be extremely useful it is important to note that a team of trained usability experts sitting in a room with a piece of paper can outperform inexperience usability staff with the best tools available. This goes to show that training is probably the most useful to the organisation can have.
4 Results

The goal is to achieve a typical user centred design to create a power production plant, to do a planning for creating a power production plant. A proper documentation is mandatory which will include the in depth discussion of what the design proposal is aimed for and how the overall system is going to function. A documenter within the usability engineering staff is far less productive than the role of a consultant or specialist. As he or she spends much less time interacting with the constituent project teams, it is advisable that the documenter in the power plant design can carefully craft the tools and templates which is needed to complete the usability work and then creates and updates the infrastructure of the design of the plan. However, a lot of documentation of this type needs to be done in the proposed power plant design. The methodology of the design can be updated by using documentation while it will also reflect the new practice, lessons learned and standard documentation with new screen types and enhanced rules. The person doing documentation in this design also must maintain the reusable templates for test questionnaires and deliverable documents. The documents off course need to be a detail-oriented individual skilled in technical writing who will do an excellent job of keeping track of the document. Hence it is important to do the proper documentation for getting the most out of the design.

Training is the second issue to be discussed in the result part. As a company has a budget limit and have their own training methods a sample plan for the training for the staff is proposed below. This plan is meant to be during the starting year. This plan may change if the power plant that we have proposed to design increases in volume and turns out to be a large industry. Initially the people can be sent for training for few courses to other public places. When the industry gets larger then we may try to adopt in house training to the people that we recruit.

A sample training plan for the power production plant:

<table>
<thead>
<tr>
<th>Class</th>
<th>Time Commitment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Four hours</td>
<td>In this training class the executives gets the overview of the user centered design and also they see a lot of examples. They try to learn the industrialization effort related to the power plant system.</td>
</tr>
<tr>
<td>Basic infrastructure guides</td>
<td>Four hours</td>
<td>This class will give knowledge training for the general development community and class sizes should be large to get training for everyone who needs it.</td>
</tr>
<tr>
<td>Web training</td>
<td>Three full days</td>
<td>This skill design will focus on giving the people from the company a through idea of creating web interface and if needed to update it according to the need of the power plan design. The web based dynamic functionality can be updated frequently or on demand way hence they need this training to achieve their goal.</td>
</tr>
<tr>
<td>Conceptual design</td>
<td>Two full days</td>
<td>Starting from the initial concept to the user interface design in one of the hardest challenges hence this course will cover how to move from the concept design.</td>
</tr>
<tr>
<td>User centered analysis</td>
<td>Two full days</td>
<td>People associated with the analysis of the project or the company will participate this.</td>
</tr>
</tbody>
</table>
training to get the idea of how to do proper analysis from users point of view and from there they can achieve the knowledge of taking further decision to improve the power plant system.

<table>
<thead>
<tr>
<th>Training Type</th>
<th>Duration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Usability testing</td>
<td>Two full days</td>
<td>The staffs working in the company or we can say the practitioners will take this class which will present a synthesis of the usability testing. This course will teach them the right test the user need to perform on any stage of the design, from the very early level to the advanced prototypes and while working on the site.</td>
</tr>
<tr>
<td>Certification of some field</td>
<td>Ten days training with test</td>
<td>This is considered to be the advance training and is meant to for the people working in the power plant and would like to practice them as the core of the usability effort.</td>
</tr>
</tbody>
</table>

Table 1.2 Training plan of a consultant company

There are two different types of training discussed in the text—skilled and knowledge based training. We believe for the power plant system that is being proposed by us, for the user to get training both of these training is needed. Skill training is meant to be for participants who need basis for doing any actual tasks and knowledge based training is needed for the participants who needs to gain appreciation of the need for usability engineering. The authority that is going to imply the system can choose the staff and their training method that is meant for the particular staff.

While training can make the institutionalization effort not only helps the stuffs but also provides an invaluable level of ongoing support. In addition to the fundamental knowledge it is also advisable to add conference in the plan. While the persons working in the power plan get themselves attended in a conference they will get insight which is really valuable in the project. At least each person should attend one conference a year. For the power plant design we would like to propose the staffs should attend the usability professional association’s conference which suits the purpose.

From the result that is obtained from the proposed design it is noticeable that the design cannot always be peak perfect hence there can be error at some extent in many phases of the design. However it is advisable that an option to handle the error should be available. While the power plant system is being designed and persons associated with handling the program are trained they may feel something is not suiting them or they may feel something is not user friendly to them which was user friendly to the developer may be. So strategies to handle the error should be implemented in the system if not done already. Example of such error handling includes pop-ups, inline error messages, and embedded messages and of course graphic treatments and formats for message wording. Contemporary applications face many design challenges when considering exception handling strategies. Particularly in modern enterprise level applications, exceptions must often cross process boundaries and machine boundaries. Part of designing a solid exception handling strategy is recognizing when a process has failed to the point where it cannot be economically handled by the software portion of the process. At such times, it is very important to present exception information to the appropriate stakeholders.
## 5 Estimations

Activity list of the proposed design

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description of Activity</th>
<th>Immediate Predecessor</th>
<th>Mean Time (week)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Planning and Requirement Analysis</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>B</td>
<td>Preliminary System Design</td>
<td>A</td>
<td>2</td>
</tr>
<tr>
<td>C</td>
<td>Detail Database Design</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>D</td>
<td>Network Design</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>E</td>
<td>Web Page Design</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>F</td>
<td>Database Implementation</td>
<td>E</td>
<td>3</td>
</tr>
<tr>
<td>G</td>
<td>Module Assembly and Testing</td>
<td>F, J</td>
<td>3</td>
</tr>
<tr>
<td>H</td>
<td>Acquire Furniture</td>
<td>B</td>
<td>2</td>
</tr>
<tr>
<td>I</td>
<td>Acquire Hardware</td>
<td>C, D</td>
<td>3</td>
</tr>
<tr>
<td>J</td>
<td>Network Setup</td>
<td>I</td>
<td>3</td>
</tr>
<tr>
<td>K</td>
<td>Security system Setup</td>
<td>I</td>
<td>6</td>
</tr>
<tr>
<td>L</td>
<td>Web Development and Internet System Setup</td>
<td>J</td>
<td>2</td>
</tr>
<tr>
<td>M</td>
<td>Office Arrangements</td>
<td>H, I</td>
<td>2</td>
</tr>
<tr>
<td>N</td>
<td>System Integration and Testing</td>
<td>K, L, M, G</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 1.3 Activity list of the design
Pert/CPM network of the design

To find the estimated time the part diagram is drawn from where the approximate project estimation time has been calculated

- The activities that lies on the critical path are A, B, D, E, G, I, J, K, N
- Total project time = 21 weeks (approximate)
**Cost Analysis**

The cost of the project involves the cost of hardware, software and the expenditure to do the total installation. The hardware costs consider the cost of workstation, server, printer, scanner, copiers, setup of network, and also the backup cost. Software cost includes the cost of operating system and office package along with the development tools like SQL server and visual studio. An overall total implementation cost has been planned by summing up the hardware cost, software cost along with project team cost, rent of office location, cost of furniture, and cost of interior decorations and also miscellaneous costs. From the cost analysis the intangible benefits we see in the designed system are better customer care, production and management simultaneous movement, quick processing and a strong security system. The cost analysis includes the resources required to implement the project.

6. **Evaluation**

The approach presented in the book highly focuses on the issues related to the organization and describes how to deal particularly with the executives in the organization. It presents the view that these people need a deeper understanding of the field and methods of implementing usability in the design process what should lead to changes in the way the organization is operating.

Having usability related development tasks integrated in the design process ensures that software is practical and useful and user experience and performance is taken into consideration. The positive outcome of that approach can be measured and evaluated in terms of improvements in the user's accuracy, speed, self-efficiency, satisfaction and safety.

Introducing the usability to the design process requires funding to provide staff, training, standards, tools, and a user-centered process and it takes time to establish the infrastructure. But these resources are worth spending even if a user-centered design process can be expected to consume about 10% of the overall project budget.

Implemented usability practices greatly reduce the chances of redesign and substantial costs of that process. So, the best way is to design the interface right the first time.

Certain functions of the software can be unnecessary. Discovering that before well in advance means that they need not be designed, coded, tested, and maintained. It also means a huge savings in development and maintenance costs.

The development team need not spend hours second-guessing how best to design the system. Being familiar with these and other usability research principles and current research saves development and testing time and helps contribute to a more usable product.

Using reusable templates helps to avoid reinventing conventions for the design of menus, forms, wizards etc. Having reusable code around these templates saves design, development and testing time.

The author highlights number of risks that can be encountered in the organization leading to marginalization of usability issues in the design process or even lack of the user-centered design training and knowledge in the organization. He suggests that a deep philosophical change must take place in the shift to user-centered development since most companies build applications with intention of meeting a given time frame or budget and providing a specific extent of functionality. And that is usually is a combination of executive inspiration and customer comments that tend to focus on features, rather than the overall design, error handling, page layout, or other usability issues. The
design that results from that approach may not represent the majority of end users and may not address the application as a whole.

References