

Human Computer Interaction

What good is the technology if it too complex to use?

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Preface

It is always hard to understand some ones else's position but human computer interaction is all about just that, understating how the user sees your user interface. But it is very important to learn how and why HCI is so important and it gets more and more important too because the computers gets more into our every days work and are not just a tool for professors any more. So from the way just a few years ago with only a few computers will we see computer and computer interfaces everywhere. From the kitchen to cars. But not everyone knows HCI as good as you can expect, just brows the internet for a few minutes and you fill see a lot of examples of horrible interfaces, not just personal sites but also big companies.

Project Summary

Fraud on the internet costs companies 15 billion Swedish crowns a year but will rise to over 150 billion in the next five years. Telia Research is developing a detection system for ip-based ip-fraud. Our project is focused on viewing and handling alarms created by their system.

Customer

Our customer is Håkan Kvarnström at Telia Research AB Farsta. He is a developer himself and working with the detection part of the fraud alarm project. Because he is a developer is it very easy for us to talk in technical terms and we all understand.

What is HCI?

Human Computer Interaction is about designing computer systems so the user can carry out their activities productively and safely. It is not how easy something is to use it is about how usable it is. Or a more broader definition of HCI is; “Human Computer Interaction is a discipline concerned with the design, evaluation and implementation of interactive computer systems for human use and with the study of major phenomena surrounding them” (Jenny Preece, p. 6).

“It is a wide variety of different kind of people and not just technical specialists as in the past, so it is important to design HCI that supports the needs, knowledge and skills of the intended users” (Jenny Preece, p. 26).

When thing go wrong

It can be hard to explain exactly what good HCI means; it is in some case easier to see when the HCI is bad and needs to improve. If a customer order a special software and then never uses it, it can be because of bad HCI. If the developer doesn't investigate what the user needs, uses most and so on, is it great chance that it is “too easy” or to hard to use the software. If the customer is an scientist then maybe he don't want the software to be as easy as possibly, he wants to easily access the most used functions.

“-I have borrowed a mobile phone with internet access. The phone is small but the manual is three times bigger.”

- Brittmarie Iderfors from the Magazine Lön & Jobb

Visibility and users goal

Some devices have good visibility, for example in cars or kitchen equipment things are generally visible, the user can easy see what the interface does and the user can easy reach his/her goal. When the devices gets more complex the interface is often not so understandable

any more. There is very poor feedback, so a user is often unsure whether the desired result has been obtained or not.

The same thing is it often with the software on computers, when the software gets more complex the interface gets more and more buttons and menus that can be hard to understand for the users.

But it is some things that can be done to get a more straightforward user interface. First of all the designers have to think beyond the technical requirements of the system, they must also consider the interaction that goes between the user and the computer. It is a lot of things that they must think of when they do the design. To start with is it the psychological processes when interacting with computers but that's not all for example training issues, working practise, management and organization issues are all important factors to consider when designing the system. Poorly designed and implemented computer systems can be very annoying to the users.

The goals of HCI

The goals with HCI are to develop usable, safe and functional computer systems. Usability is concerned with making systems easy to learn and easy to use. There is some things that the designers must try to reach with the design.

- Understanding the psychological, technical knowledge and organizational factors that determine how the user operate the computer systems.
- Use design techniques and tools that ensure that the goals are reached, for example well used techniques that have been proven to work before.

Productivity

To get even the manager of the company to listen to the ideas with HCI is it important to show him/her how much more money the company will earn on it. This will be done be increase the productivity. But it is not always as easy as you want it to be, most time it is hard to show the financial benefits of HCI because invariably many factors is involved. First of all

to improve a system that is already up and running must you first talk to the users. If it is something special they complain about like gross under use of the system or health problem when using the system is it easy to point out what's wrong and how to fix it and that way increase productivity.

HCI Design

HCI design is about designing the computer system for the people and not the people for the computers. Therefore the designer has to consider a lot of factors. The factors can't only be analysed individual because many factors invariably interacts with each other. Example of factors is:

- Physiology such as know the human behaviour and mental processes.
- Organizational such as the influence of one individual in a group with the other member's attitude and behaviour.
- Ergonomics such as how people interact with different artefacts.

References

Human Computer Interaction (1994) by Jenny Preece

Human factors is just a matter of taste.

- If it already is good productivity may you accept it as it is even if the taste is not the best.
- Availability are often more important and by laziness do you accept it as it is.
- Ergonomic and health is more important human factors than taste.
- Compatibility and communication in a team may result that everyone can't have exactly what they want.

Compatibility in a team

In a team it is often more than one taste so all can't get what they want. The problem is that if they share documents and tools can it be a problem with compatibility. They may not be able to open each other's documents or it may not look correct.

So someone will not get what they want but the team can work together and that it is more important in most cases.

Developing for the big mass

When developing for the big mass and trying to sell the software to the public can you only ask a very small part of the people that will use it in the future. One way to make it fit more tastes is to make it more dynamic. But that will probably lead to a more complex and a user interface that is harder to use. This makes that the developer must find the point between all users' taste and the complexity of the system.

Hard for the engineer to know the users' taste

It is always hard for the computer engineer to know about the users' taste. First of all the user not always know what the computers can do for him/her. So it is often up to the developer to explain for the user what it can do. But then it is not the users' taste that's come up, it is the engineers.

So if the user know more about what he/she wants is it a much bigger change that he/she also gets it. One way or another the user must get the information about what's possible and not. The problem is he/she will get the source of the information's version. One way is to read about it and talking to more then one engineer.

From the engineer's perspective is this a problem when the software is finished but the customer is not happy with it and will probably not use it as much as it was planed. So the developer must tell the user the "whole story" what is possible with today's technology and what is not so the software is what the user wants it to be.

Knowledge about the users

Identifying the users

Our customer is not the same person that later will use the system. He has much more technical training than the final users will have. The final users are the operators that will investigate the alarms and they have at least normal computer experience.

Usability

The main problem with errors in a web system such as the one we build is to have a good input validating system. The user must be able to write everything and the system must correct it or at least answer with an error message that explains it for him/her.

The second problem is that everything is depending on the server and that it is online. The user will not be able to do anything if something on the server crashes. Our system is built on a Unix platform and our system can't do anything about a system crash.

All other errors shall result in an error message. Examples of errors that could arise are that it can't connect to the database, can't find a file or the hard disk is full etc. All of these errors are hard to recover from without an administrator that makes some service on the server (or restarts it).

“HAL 9000: - Let me put it this way, Mr. Amer. The 9000 series is the most reliable computer ever made. No 9000 computer has ever made a mistake or distorted information. We are all, by any practical definition of the words, foolproof and incapable of error.”

- From the motion picture 2001: A Space Odyssey (1968)

Speed is almost every time a problem when you develop a web project because you develop it with a local server and when the user will start to use it, it is much slower than it was for

you. This is something that you can easy test in a early stage of the developing by using a modem and phone in to the server. A solution for it is to have multiple pages for search results etc.

Learning and skills

We use a web interface for our system. That's make it easy to learn and easy to use because everyone with at least some computer experience know how a web page with menus, forms etc. works. The users that will use our system will use it in there everyday works so after a short learning period should it not be any problem to use it.

Form and Solution

We use a web interface to handle all interaction with the users. We use well known software as the platform to build our system on, it is Unix as the operating system and apache web server. This make it possible for us to use well known standards that other developer has tested before us so we don't get any weird errors that is out of our control.

Problems

Our major problem is that we can't have direct contact with our customer, this because he is in Farsta near Stockholm. All communication is handled by mail, phone or videophone. This makes it harder to discus the project. We use videophone to better discus it but that is very limited to only one time per week.

That the customer not exactly know what they want because they develop other part of the same project makes it even worse. Our way to handle this is to make small examples and that he can see the progress at all time and then we gets comments back what's good and what we need to change.

Ask them vs. watch them vs. ask the manager

For us is the customer not the same person that then will use it. The problem is that we can't ask them or watch them, everything comes from our customer. This will probably result that the user will not do exactly how we design it. A solution that we will implement for this is that the user can do the same things in more then one way. The problem with this is that the system will be more complex.

Why we use cooperative design

What cooperative vs. traditional analyse and design focus on.

There is some different ways that you can attack the design problem. If you use the traditional way you ask your customer what his problem is and then you come up with a solution for the problem. If you use the cooperative design you more study how the user use the system and how you can improve it not by changing the behaviour too much and not losing the users knowledge.

With traditional design are you focusing on how the information flows thru the system but with cooperative design are you focusing on how the users interact with each other and the social relationship in the group.

One other big difference is that you focus more on the individuals but with cooperative design do you focus on the group and how they work together.

Problem with traditional design

The main problem with the traditional design is that you interview the user. With this method will you miss things, maybe you miss things that he say, he talks to fast or he take something for granted. The other problem is that it is hard not to influence with your own ideas.

Understanding Practice

The cooperative design is all about understanding the human behaviour, not only how an individual use the system but also how they work as a group. It is also about how to use the users knowledge and tacit skills.

The four principle with Human behaviour

When you make a cooperative analyse it is imported that you follow some rules. From this rules can we come up to this four principles. If you follow this principles can you be sure to make a good cooperative analyse.

- **Natural Setting**

First of all must it be in a natural setting. If the user use the software at work, then that is the place for the test. Or if it is at a bus station, then that is the natural setting. This is because you must make sure that everything around that can distract the user, for example a loud noise that can be louder than the warning beep from your system.

- **Holism**

The second thing is that the test must be in its natural context, if the user normally is under big stress, then the user must also be so when the analyse are made. For example can he miss a message box if it is not big enough.

- **Descriptive**

Everything that the user does must be recorded. This is best to do with a video recorder because if you just take notes will you miss things. It is also imported that it is what the user do that is recorded and analysed, not only what they are supposed to do.

- **Members point of view**

The last things to remember is that it is the users version you are interested in, not the manager that ordered the system. This because the user usually finds and use shortcuts in the system and not using it as it was design to in the first place.

Video Ethnography

This is mostly used in software design. It is a very nice tool to analyse how the user use the system, you can record everything and watch it over and over again. You don't miss anything

that you will do if you only take notes. If it happens a lot of things at the same time can you pause and you can watch it again.

Field Methods

The observation is often a improvisation. When you find something you ask about it and so on. You must continue the observation until you don't find anything more to investigate.

- **Observation**

It is different levels of observation, from the “big brother” way when you install cameras that they don't know about. This will record exactly how they use it in the normal daily work, but it is a big moral quandary with that method.

You can also take the job yourself and investigate how it is to work. The problem with this method is that you can't investigate the skills of the normal users.

The third way is to follow a user around for a day or two and ask him everything. How things work, how he do it and how he want but can't do it.

- **Focus on observation**

It is four things you can focus on, each with its positive and negative sides. Things that you see with one way may you miss if you follow something else.

1. **Events**

Example when a new alarms comes in to the system, or a led that's flash.

2. **Person**

Example the cashier or one of the operators.

3. **Place**

Example one specific machine, or a specific room.

4. **Object**

Example a document.

The developers Responsibility

It is very much the developer's responsibility that he investigates and analyse the system so much so the user can use the skills and knowledge that they already have. The user will still use the system, but they must learn it all over again, and that cost a lot of time and money.

How we can use this in our project

This is very hypothetical, if the system we develop was already developed and we came in to improve it instead.

First of all must we identify our user with is the operator that's going to investigate the alarms.

Then can we start the investigation, first can we set up a camera that record how the user use the interface, if he use more software or maybe paper and pencil to administrate the incoming alarms. Because the operators probably not only sit with the computer can it be a good idea to follow one operator in there daily work from the time the alarm shows up on the screen to it is fully investigated and the case is closed.

To get a clear view about how they work and how an alarm go thru the system and are handled by the operators must we start to analyse the video and the notes. There can we see if the system is used as the original idea was (probably not...) and see what can be improved. If the communication between different operators can be better, faster and/or maybe safer.

Future Workshop

Why use Future Workshop?

Nearly all design and developing of computer systems are focusing on how the system can be improved. No work is made about how the users want it to be in the future, how he can change his way he does his work. It is some problem with this, some of them is:

- “Development activities pay only slim attention to the changes of job content, autonomy, work load and so forth introduced by the new system.
- System goals are ambiguous and often poorly defined, and if defined too narrow, because they concern mostly technical and economic issues.
- System goals motivate mainly system analyses and management and not end user. The result of this is that the development process seldom solves the “right” user problems, because these are insufficient incentives for the user to participate and contribute his know how.
- Process is a specialist driven activity and it tends to focus on the average user instead of a unique individual and his needs.
- Methods and tools employed are orientated toward improving the work of the systems analyst and programmers; they do not help much users to take part in the process and build systems they really need.
- In general conceptual problems result in solving the wrong problems instead of the right ones.

- Negative attitudes or reactions toward the built system which find their expression in a multitude of ways from Luddism and sabotage to lack of motivation to use the information system as appropriately as possible.”(F. Kensing and K. Madsen, p. 156)

It is here future workshop comes in, it focus on the future and what is possible. It use a more brain storming way to come up with new ideas, with this way will all ideas at least be disused and not because one person think it is a bad idea means that everyone think so. This also does that the user can be a part of the design and development of the system because future workshop doesn't require any specific skills.

It is always better to solve the problems as soon as possible and if you can “see” how the future will be and what you need in the future is it good that it comes into the system now, and not when you acute needs it. A good example of this is if the designers had seen the upcoming year 2000 problem much sooner or the problem with euro that all computer systems will have all over Europe.

When to use Future Workshop

When you start designing a system it is a question that you must ask yourself; what are you designing for? And there are three answers to that question:

- Fixing something with a system: There are a problem with a system that must be corrected. Here is the design focused on that problem and the system and a cooperative approach can be a good design solution.
- Making a part on an existing system: A new part in a system must be design. Here can future workshop work well, new ideas can come up to solve the problems and how the new part shall be implemented.
- A complete new concept: It is here future workshop works best, new ideas can easy be inserted into the design long before the implementation of the system, there are no old design that you have to build the system on.

The problem with Future Workshop

There are some problems and some things that can be hard to do with future workshop that you have to handle when doing it.

First of all many of the ideas that comes up with the future work shop is to futuristic and not possible to implement today. This problem occupier because the users don't know what is possible and not. This can also be something positive when the users come up with new fresh ideas that the engineer haven't thought of because they are so looked up in the way they think.

The second problem is that it is hard not to influence the user with your own ideas. You want the user to start come up with new ideas and to brain storm but without that you control it too much. Specially in the fantasy phase do you want them to come up with everything that they can think of.

The three phases

A future workshop is divided into three phases: the critique, the fantasy and the implementation phase.

All ideas must come up so all ideas shall be written down and no one must explain why the idea is good, this also mean that no one shall complain on a idea. And no one can speak for more then 30 seconds. This make the future workshop to a brain storm there the users ideas are all equal, the managements ideas are not higher on "the ranking list" than one that comes from a worker.

Critique phase

The first phase is the critique phase, the focus here is to draw out specific issues about the current work practice. There can be things that are bad and can be improved.

Fantasy phase

The second phase is the fantasy phase, here is the focus on what if everything was possible. Here can all crazy ideas come up, but that's the point with this phase. It is thru this crazy ideas all the good ones came.

Implementation phase

I this phase will you go thru all ideas that the group have came up with under the two first phases and see what can be implemented today and what is just science fiction.

References

Interactive System Design 1995, Finn Kensing and Kim Halskrov Madsman

Justify Design Decisions

The Problem

With all new technology all around us is a good design very important, or as Donald A. Norman writes(p. 1); “You would need an engineering degree from MIT to work this, someone once told me, shaking his head in puzzlement over his brand new digital watch. Well, I have an engineering degree from MIT. (Kenneth Olsen has two of them, and he can’t figure out a microwave oven.)”

There is not only the users and designers opinion that counts to get a product to success. First of all the manufacturer want it to be economically, then will the store sell as much of the product as possible so the price must be right and it must attract the customers. Then when the customer comes home must it be functionally and useful. If it broke must it be easy to take apart and repair it. Then latest when the product is not in use any more must it be easy to recycle and good for the environment.

The problem with new technology is that is normally start as a hard to use machine to then becomes more and more user-friendly to then later again becomes more complex. Take a stereo for instance, first it was a machine that was sensitive and only a few person operated them. Then the cassette radio came and everybody had one, they had a play button and a control for the sound level. Now a days the stereo has a lot of controls, buttons and switches to control everything. The problem is that no one use them all, so what good is the technology if it is too complex to use?

Visibility

One of the most important principles of design is visibility. There is different levels of visibility, from natural visibility that is the best there the user don’t need any extra explanation to there you need signs and labels to explain the controls.

Visibility problems come in many forms, for example some problems concern the mapping between what you want to do and what appears to be possible, and when you try it what the feedback is. Visibility problems is specially noticed when a first time user tries to use the system. Is the bars supposed to be pulled backward or pushed forward, with a good visibility will the user do the right from the beginning. Other problems that occupier when you go from a system to another made by a different company is that some functions switch names so the new functions failure to relate to the functions that people already know about.

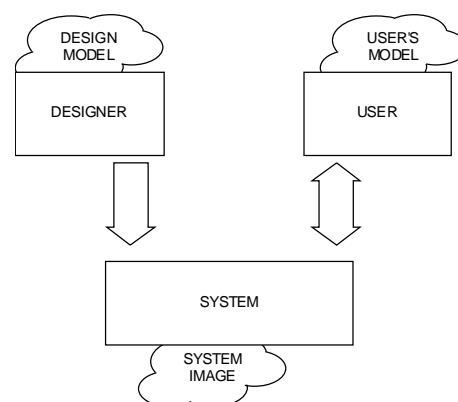
To solve this problem do you need to do a good design. A good start is to only have one function per button or control because if the possible actions exceeds the number of controls is there a apt to be difficulties. Another good tips is to have the most important functions more visibly then less important. And all functions must not be visibly at all time, a good tips is to hide functions to make it less complex.

Conceptual Models

How do you know if your design model works as you wish? You could make a prototype and test it, but that is expensive and takes time. The easiest way to be sure is to make a conceptual model and simulate it's functions.

A good conceptual model allows us to predict the effects of our actions. The focus of the conceptual model is not the physics or chemistry of the device each device, we only have to know the relationship between the controls and the outcomes.

“The design model is the designer’s conceptual model. The user’s model is the mental model developed through interaction with the system. The system image results from the physical structure that has been built (including documentation, instructions and labels). The designer expects the user’s model to be identical to the design model. But the designer doesn’t talk directly with the user, all communication takes place through the system image. If the system image does not make the design model



clear and consistent, then the user will end up with the wrong mental model.” (Donald A. Norman, p. 16)

As Donald A. Norman writes is the Mental model a very important concept. The problem is to find what the mental model is. One way is to use a cooperative approach and study the users in there interaction with the system and also interview them.

”If people keep buying poorly designed products, manufactures and designers will think they are doing the right things and continue as usual.”
- *Donald A. Norman, p. 8*

Justify Design Decisions in our project

We used the interaction design in our project.

1. Understanding

At the beginning had we no ideas what they meant with “fraud alarm management platform” but after our first meeting with our customer over video phone had we a clearer view of the problem. The problem that they had was to sort and manage a large number of incoming alarms from different sources. They also wanted a function to group alarms and to make cases that the operator can follow up and investigate.

2. Abstracting

Early in the design we found that there was three main elements in this project, the alarms, groups and the cases. We decided to show all information elements as tables because tables are easy to overview and all search results can be represented the same way.

3. Structuring

We first design the relationship among the elements and come up with a first version of the database design and the ER-model. We saw that the alarms can be part of multiple groups and the groups can be part of multiple cases.

Searching and sorting was a very important function so that was investigated extra careful with discussions with our customer. All fields and tables that was searchable was closely documented how the user can search on them.

4. Representing

The easiest way for this was to make a easy prototype of the GUI that show how the interface is linked together. We showed this for our customer to see that we had the same image of how the system should look like. They had some minor changes but I don't think we had find them if we hadn't made the prototype.

5. Detailing

In the beginning of the implementation phase did we write some documents that tells everything about the layout, underlying structure etc. We also made a common library with functions that everyone in the group used. All this because everything should looked the same.

References

The Design of everyday things 1988 by Donald A. Norman

Icons

Why are icons so important?

We see them everywhere. We see many of them every day without noticing them. We just take them for granted, it is not that they show what they represent it is just that we always see them. A good example is traffic signs, we see them everyday and we know what they mean without really have to think, but if we travel to another country can we have some really problems with the signs. When they designed the signs they thought more that the signs would be easy to see in a long distance and not that they should representing what they mean.

So instead of a large portion of text can you use a small icon that when someone sees it think of the text.

Icons in computer systems

A computer screen is very limited in size, so to have all function available for the user at all time must you have something else then buttons with text on them, icons can be a good way to represent functions and commands in the system. And every since the first graphical user interface has the icons been used everywhere in the interface. We have learned that the disk represent the function “Save” and that the empty sheet represent “New” even if we don’t save to the disk drive any more and the empty sheet is used in more then word programs.

New icons pops up every day, many of them because the companies don’t want to use each others icons, they want to have there own style. I think this is not so good, the best must be that they all used the same interface. The second reason that we have to learn new icons is that new technologies comes. Internet has made a lot of them, it wasn’t too long ago that the “Mail letter” icon came up and now everyone that use computers know what it means.

The problem with icons

Too much icons can really be a big problem in a system. The howl idea with icons is that they should be easy to find and easy to remember what the function that is hidden behind they is. The problem can be to hold them apart, if they have similar functionality can it be hard to know with one that does what. Icons are often very limited if size and colours so it can be hard to draw the icons as you would like too.

Using to much colours on the screen will only does that the user don't see what's important and what's not. Colour is good if its limited. Colour can be a very effective way to hold icons apart. Some colours have we learned what they stands for, example a red signs always stands for "Warning" or "Stop" and if we see a green signs will we direct think that it is ok.

Four types of icons

Icons can be categories into four groups depending on how they show what they represent.

Resemblance icons

The resemblance icons looks like what it says, that can be an arrow for direction or a empty sheet in a text editor.

Example icons

One of the best icons for first time user is the example icons, you can look at it and direct understands what it stands for. A good example is the knife and fork for restaurants.

Symbolic icons

Most of the icons in today's computer system is symbolic icons, symbols that are taken from the real words. One example is the scissors in a text editor for the "Cut out" function. An example in the real world is the icons on video recorders, the arrows for play and fast rewind and so on. You can see by the direction of it what it does, even if it has nothing to do with how the recorder works.

Arbitrary icons

In computer systems can you find arbitrary icons in the file list, most software company has made a small icon that represent there own file types, but it really not saying anything about the file and its contents. A good example in the real world is the traffic signs that also really don't say anything, it just that you have learned what they stands for.

Justify Interface Design Decisions

Overall structure

The overall structure of the layout is to have a easy to use and easy to navigate and to see a overview of the contents. Because that we use a web interface can we take use of the knowledge that the user already have about how to use a web interface with buttons, links etc.

We have decided that all pages is maximum one screen high so the user don't have to scroll the page. This makes it easier for the user to find what he was looking for on the page.

Graphics

We have decided to use no heavy graphics because the site will be used everyday and will be reloaded very much so speed is more important than a cool interface. Instead of graphics are we using more advanced html code with tables and using colours. With this decisions made we the interface better and easier to use too.

The Menus

We show the same menu on every page, this make it easier to remember where to find different functions. We have also categorised them under different "blocks" of function. For example all functions that has something to do with the alarms is under the "Alarm" category.

Showing the contains

All contains is showed as tables, so it is easy to have a overview of all the items of the page. Because the system must be able to handle a lot of items on the same time have we decided to have page breaks after every 20 items. The second decision we made was to include the sort function so the user can sort the items the way he wants it to be. All sorting is handled the

same way as most software have it, you press once on a column header to sort it after that column, and once more to sort it descent.

To show more than one group and the alarms within them on the same time using we a tree like view. The user press on the “plus” icon to see all alarms in just that group. We use the same technology when we show cases.

Input forms

We have three types of input forms. First is the search forms. Because that the user must be able to search on more than one parameter have we developed a small function that draw one more line with input fields every time the user clicks on a button. The second type is the add new item. The item can be a new group, a case, etc. Here will the user see a few input fields and some pull down menus to fill in. Nothing is too complex for a user with at least some computer experience. The third type is the modify forms, it looks the same as the second type but all old values is already inserted, this makes it very easy to find and change a value and then pressing the “Save” button.

Error handling

Our error handling is in two parts, one on the clients computer and one on the server. The one on the clients computer is used for input validating so the user will get a fast answer if he input a field wrong or forget to input a value. The second is the one on the server, it is used for validating there a check against the database is required. For example the login there if you enter the password wrong comes to another page that shows you the error message.

The multi platform problem

One of the biggest problem we have with our project is to get the page to look the same on all platforms and browsers. The w3 organisation has made several standard for the html and how it should look like in a browser but either Microsoft or Netscape(AOL) follows it correctly, this make it very hard for us developers to get it as we wants it to be everywhere. The problems grows when the system must work in Windows and Unix because Unix and Windows handle fonts different. We have solved this problem by make one style sheet for

every platform that the system is suppose to work with and on the server see witch client the user use and returning the right layout. The problem will probably come back when new versions of Netscape and Microsoft Internet Explorer comes.

Analysing a Site

The site that I analyse here is www.spray.se.

The Elements

There is a lot of elements on this page, and the problem is that you really don't know where to start looking when you enter the site for the first time. So the problem start with that Spray is made as a portal that has everything. To start with must they start hiding some things and delete some other things to start with. They could delete elements like the weather, "Dagens fråga" etc. to start with, this just take away the focus from the more important elements.

There is a lot of links that can be under the same instead as now separated and in some cases under different headers. For example the middle green part contains links to different part of the spray.se site, but you find almost the same links in the yellow right column.

There have also some ads together with the rest of the page. The big banner at the top is good, you see it but you also know it is a ad for a company so you will come to a new site if you click on it. But they have some small banner at the bottom right part that you don't know if it will send you to a new site or if you will still be on spray.se.

Images and Icons

I like that you don't have so much images, it make the site faster to load. The problem they have is that they use images of the same size as images for an article in one place and images as icons somewhere else. They also haven't make the icons as a link, this make them anointing because you first try to click on them and when you notice that does not work must you find the text link that is with the icon and click on that to go on to that page. Some other icons are used in the header, but not all header have icons, not even headers whit in the same section have it. Some have it and some other don't.

Text and links

The font that they using is good, but it can be hard to find what you are looking for because the size of the text is very small. They also use the same size of the normal text on some places that they are using in the header somewhere else.

The header have a problem, some headers are links and some are not. And almost everything on the site is a link to something, so when they use bold text on some word will you direct try to click it, even if you then find that the text wasn't a link.

Colours

They use colours in a good way when they use different colours on different headers to split the elements of the site apart. But because they have too much extra things everywhere dose this not work. For example on the big green part that the use first seen when they arrive to the page have the search and categories for the link library together with extra things like the dating and the "Send postcard" etc there too.

The second problem with colours they have is that they use three different colours on the text links. I really don't understand when they use red, black or the standard blue colour.

Negative Space

To improve the site must they insert some negative space on different places on the site. They have a lot of information to show the use but they must learn from other pages like Microsoft.com that much information is not the same as much information on the first page. They need to focus on the most important thinks to show and have white space on the rest of the page.

Symmetry and Alignment


The symmetry is good, they have three columns that make you focus on the middle on first. The alignment is good too, the different parts are in the same height and length and the marginal to the sides are good too.

Spray - Här börjar internet! - Microsoft Internet Explorer

Arkiv Redigera Visa Favoriter Verktyg Hjälp

Bakåt Framåt Stopp Uppdatera Startside Sök Favoriter Tidigare E-post Skriv ut Redigera Diskutera

Adress http://www.spray.se/ Länkar >>



Rea på bolån!

Lördagen den 17 mars 2001 Gör Spray till din [startside](#).

MITT SPRAY LOGGA IN

Bli Spravmedlem nu!

Du får:
Spray Mail - egen e-mailadress
Spray Bygg - egen hemsida
Spray Svar - hjälper dig kl 8-22
Spray Internet - ett enkelt och bra internetabonnemang
Medlemsbrevet - det bästa och senaste om Spray och internet
Medlemserbjudanden - förmåner och rabatter för medlemmar

Nordea - en nordisk idé

DAGENS VÄDER

Göteborg	3°	Molnigt
Luleå	-6°	Molnigt
Stockholm	1°	Molnigt
Malmö	4°	Molnigt

[Lokal femdagsprognos](#)
[Europavädret](#) | [Satellitbild](#)

SPRAY SMART

Spray Smart erbjuder våra medlemmar marknadens lägsta bolåneränta.
[» Läs mer](#)

SPRAYKLUBBEN

[Se Traffic på bio](#)
Tävla om biljetter till den nya filmen Traffic med Michael Douglas och Catherine Zeta-Jones i huvudrollerna.

[Varför har vi en Sprayklubb?](#)
[Föli med till fjällen i april](#)
[Sprayklubben fixar Väffelkalaset](#)
[Gå och se Rocky på backstage](#)
[Läs Mats](#) månadstips

SPRAY AGENT

Ha full koll på webben! Med hjälp av Spray Agent kan du enkelt bevaka aktiekurser, nyheter eller hela webbsidor.
[» Ta kontrollen!](#)

SPRAY TREFF

[Chat](#) - träffa nya kompisar
[Forum](#) - sjung ut
[Vykort](#) - skicka ett kul vykort
[Länkare](#) - bli länkare
[Spravspelet](#) - nå high score

SPRAY PARTNERS

Bra länk: [Allamedia](#)

- Välj site -

WEBBAID

Hjälp människor i nöd med [ett livgivande klick](#) varje dag. Helt gratis för dig, tack vare sponsorerna bakom Webaid.nu.

SPRAY MAIL | **SPRAY SÖK** | **SPRAY BYGG** | **SPRAY SVAR**

Sök Sök

Världen Sverige MP3 Företag

Kanaler

Affärer	Mobil	Nöje	Resor
Börs	Nyheter	Bil	Smart

Guider

Bostad	Hälsa	Sex	TV-tablåer
Ekonomi	IT/Data	Shopping	Treff
PC-spel	ny! Jobb	Spel	Väder
Gay	Mat	Sport	

Favoriter

[Spray Date](#) | [Darling](#) | [SPRAYdio](#) | [Netbaby](#) | [Quiz](#)
[Spray Chat](#) | [Skunk](#) | [Sylvia](#) | [Sylvester](#) | [Replay](#)

[Läs mail](#) | [Hitta en date](#) | [Skicka vykort](#) | [Översätt TV-tablå](#) | [Ladda upp ringsignal](#) | [Tävla](#) | [Agent](#)

SPRAY NYHETER - Snabbast i Sverige

SVERIGE | 15:51

Höjning av bensenpriset att vänta

De oljeexporterande länderna i Opec beslutade på lördagen att minska produktionen av olja. För konsumenterna väntas det betyda höjda priser på bensen och eldningsolja./TT
[» Läs mer](#)

TILL DAGENS LÖPSEDEL

SVERIGE

14:06 ["Idrottande ungdomar åter för lite"](#)
12:06 [Oklart om Malmöexplosion](#)

VÄRLDEN

14:01 [Brott bakom explosionerna i Kina](#)
12:21 [Dansk qisslan släppt i Bangladesh](#)

EKONOMI

00:15 [Nytt kursfall i New York](#)
20:40 [Nedåt igen på Europabörserna](#)

SPORT

15:21 [Elofsson säkrade världscupsegen - men missade prispallen i Falun](#)
15:16 [Forsberg överlägsen i Holmenkollen](#)

SPRAY BÖRS - 4 019,16 -2,62

Kurser 01-03-16 kl. 21:35. Kurserna är fördröjda med 15 min.

Vinnare just nu

A-listan	O-listan
Electrolux A +10,00%	Senea +23,52%
Consilium B +2,86%	Novestra +15,00%
Scania A +2,37%	ScanMining +11,11%

IDAG PÅ SPRAY

Nytt Nirvana-material

Courtney Love säger att mängder av tidigare okända Nirvana-låtar ska ges ut

[» Spray Nöje](#)

[» Mat: Idag är det St Patrick's Day](#)

[» Shopping: Länkkunde för nätshoppare](#)

[» Resor: Reguliära flygresor till läppis](#)

[» Treff: Copacabana - när du känner rumban pumpa genom kroppen](#)

[» Mobil: Ta en gratisprenumeration på vårt nyhetsbrev!](#)

[» BilNytt: MB C-Sportcoupé - flirt med yngre köpare](#)

[» Dagens tv-tips: Kurosawa - porträtt av ett filmgeni](#)

Replay för spelgalna

Nu har vi stället för alla som gillar spel.

[» Replay](#)

Vinn en Nokia Dial n'Smile

VECKANS ERBJUDANDE

Förverkliga dina drömmar!
Alla har vi olika uppfattning om vad drömresan innebär, förverkliga den snabbare genom att spara varje månad.

[Gör en egen kalkyl](#)
Drömresa 30 000:-

JUST NU

Vem leder?
Spela [Spray Quiz](#) tillsammans med Svenska Spel.


SPRAY SHOPPING

[Boka Din semester på MrJet](#)

POPULÄRT PÅ SPRAYdio

Populärt på SPRAYdio just nu är **Lucy Pearl - Don't mess with my man**.
[Lysna](#) | [Önska](#)

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Internet

Human Computer Interaction – EAR102

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Summary

There is two ways you can learn about human computer interaction. The first one is the hard way, you learn the background of why it is so important and from that learning how to use it. This way will you be prepared for new situations and you can understand how to make a good interface. The second way is to learn all the rules professors and doctors in human computer interaction have came up with and just follow them. You will come up with a good interface with booth ways but with the second way will you not really understand why it is so good and it is easy to forget some important. Of course is the best way to learn booth ways and taking the best part from them booth. The first is more about understanding the user but that takes time and with the second will you just focus on the rules, this is faster but you can miss important details about the user.

The first thing you have to do, with booth ways is to identify the users and understand theirs requirements. Then must you find the way the information flows thru the system and how the users interact with it and each other. First after all this can you start with the new design. So all good design starts with a deep investigation of the system.