Project

Choose project 1, 2, 3, or define your own project. If you are defining your own project, please consult with me.

Requirements

1. (Weight: 10%) Rank the usability factors based on their importance and relevance to the system. Write usability requirements for the system.

2. (Weight: 20%) Design a domain model that shows the concepts in the exercise and the relationships between them. Show sample data for each table, and write a data dictionary that describes two classes and their attributes.

3. (Weight: 25%) Write a task list with the different work areas. Also, write the detailed task descriptions.

4. (Weight: 35%) Design a UI prototype using the technique of virtual windows. Your answer will contain the following items:
- The planned virtual windows.
- The graphical virtual windows with functions.

The UI platform can be a desktop or a mobile phone. You decide.

5. (Weight: 10%) Usability test your prototype with two users. Report the usability problems.

Note

Feel free to make relevant assumptions for information you feel is lacking. Please write down your assumptions in the final report.

Project 1: Hotline support system

Many companies have a hotline that help users with IT issues. Several applications on the market promise to support the hotline, but they rarely do it well.

Users

Users encounter problems of many kinds. For instance they may have forgotten their password, so they cannot start their work, or the printer lacks toner, or they cannot remember how to make Word write in two columns. The problem may also be to repair something, for instance a printer, or to order a program the user needs.

The easiest solution is to call hotline. In many cases this solves the problem right away. However, hotline prefers to receive the problem request by email to *hotline@...* Sometimes this is impossible, for instance if the problem is that the user has forgotten his password.

If you cannot have your problem solved right away, it is annoying not knowing when it will be solved. How often will you for instance have to go to the printer to check whether it has got toner now? In many cases the problem has been solved, but the user doesn't know.

Some support systems allow the user to look up his problem request in the support system to see what has happened, but it is inconvenient and how often should he look? On the other hand, there are cases where the user wants to deliver further information, or has solved the problem in some other way. Here the user might open the problem request and record what is necessary.

Assume that there are at most 1000 users in the company. There is an employee database with the user's name, phone number, email address, user name and password. The support system can retrieve data from it.

Hotline

Hotline is staffed by *supporters*. Some supporters are *first line,* others are *second line*. First-line supporters receive the requests by phone or email, or in person when the user turns up at the hotline desk.

In busy periods, a first-line supporter may receive around 50 requests a day. Around 80% of the requests can be dealt with right away, and for these problems it is particularly hard to ensure that supporters record them for statistical use.

The remaining 20% of the requests are passed on to the second line. Based on the problem description and talks with the user, first line can often give the request a priority and maybe an estimated time for the solution. (Experience shows that users shouldn't be allowed to define the priority themselves, because they tend to give everything a high priority.)

Half of the second-line requests are in principle easy, but cannot be dealt with immediately. The supporter may have to move out of the office, for instance to change toner in the printer or help the user at his own PC. Usually this ends the request, but it may also turn into a long request.

Around 10% of all problems are long requests because the problem has to be transferred to a hotline person with special expertise, or because spare parts and expertise have to be ordered from external sources. Transferring the problem often fails. In some hotlines they place yellow stickers on the expert's desk, but the stickers often disappear. Or the expert misunderstands the problem. For this reason it is important that the expert in person or by phone can talk with the supporter who initially received the request, or with the user himself.

There are at most 10-15 employees that occasionally or all the time serve as supporters. They know each other and know who is expert in what. The supporters frequently change between first and second line, for instance to get variation.

The request is sometimes lost because a supporter has started working on it, but becomes ill or goes on vacation before it is finished.

Most hotlines dream of making statistics of frequent and time-consuming requests in order to find ways to prevent the problems. However, it is hard to record the correct data. Gathering data also makes it possible to measure how long hotline takes to handle each request. This also encourages hotline to be careful to tell the system when requests have been completed.

In busy periods, around 100 requests may be open (unresolved). Then it is hard for the individual supporter to survey the problems he is working on and see which problems are most urgent.

The supporter keeps the list on the screen so he can follow what is going on. He can open an incoming request (much the same way as you open an email), maybe take on the request (for instance by sending a reply mail), classify the case according to the cause of the problem

(printer, login, etc.), give it a priority, transfer it to someone else, etc. When the request has been completed, the supporter closes it, and the request will no longer be on the usual list of open requests.

Users requests have the following statuses:

First line ..... A first-line supporter must take on the request, for instance because it just arrived.
Second line .... A second-line supporter must take on the request.
Taken ..... The request is handled by a supporter (the owner). The owner may change from one line to another while he is handling the request.
Parked ..... The request awaits something, for instance an external delivery, and hotline need not do anything meanwhile.
Reminder ..... The request hasn't been closed in due time, or the external delivery wasn't received in due time.
Closed ..... The request has been handled. However, it may be opened again, for instance because the user doesn't think the problem has been solved.
Open requests are those that are neither parked, nor closed.

When a user calls by phone or in person, the supporter creates a new request. It will appear in the normal list of requests. For statistical and other purposes, it is useful to keep track of when requests change state.

While a long request is handled, it may receive additional information from the original user as well as from supporters. The user and the supporters should at any time be able to see the request history, including state changes.

A supporter can set the system to send an ordinary email to himself when he has to look at some request. This is particularly useful for second-line supporters who concentrate on other tasks until they are needed for support.

In most support systems it is cumbersome to classify requests according to the problem cause. One reason is that the true cause may not be known at the beginning. Some hotlines work with causes in several levels, for instance:

printer -> color printer -> toner

Managers

Managers look at statistics and insights to see if things need to improve. For instance, they look at performance of employees to see who’s doing great and who’s behind. They also look at busiest days of the week, times, etc. Furthermore, they look at most common requests so that they can allocate resources better.

Project 2: Planning articles in a newspaper editorial office

The software house BIT develops IT products for companies that publish newspapers and other periodicals. BIT is now developing an IT product that can help the newspaper editors plan the contents of the daily newspaper and manage the work of the journalists.

The daily work process

An editor collects ideas for articles all the time. The ideas come from the newspaper's journalists and from the editor himself. Each morning the editorial board (the editor and some of the journalists) gathers to plan the contents of tomorrow's newspaper, e.g. the 7th April edition. They look at the list of ideas, read telexes from abroad, present their own ideas, etc. The result is a list of articles to go into tomorrow's newspaper. There may also be suggestions for articles to appear the day after tomorrow, or a bit later, for instance because it will take more time to write the article. There may of course also be ideas that nobody knows whether to publish and when.

Next they allocate the work. Each article gets a responsible journalist, maybe an assistant, and often a photographer too. Each of them has to perform a job (also called a task) that is part of the article production, and they coordinate with each other as a team. During the planning, the board looks at who is good at making this article. If one of the journalists suggested the article earlier, it may be natural to let him write it, but there is no rule that it be so. All the time the board pays attention to what other jobs the employees have. Maybe they have to work on a paper for the day after tomorrow, which has been decided earlier, or the journalist may work for several editorial offices in the company, or he may be on vacation or ill.

The editorial board has a good sense of who is good at writing what, how long the article will be, and how many articles are needed for tomorrow's newspaper. They don't need support for this.

However, it is hard to get an overview of who writes what, and whether it is too much for the individual journalist. The IT system must help them here. The board knows roughly how long the job will be for this specific journalist, although they don't make it up in work hours. Some editorial offices talk about small jobs (around 1/4 working day), medium size (around 1/2 working day), and large (a full day or more). The photographer's jobs are measured in the same way, but are usually just 1/4 day. The board doesn't care when exactly the jobs are done. The team arranges this on their own.

When the plan is ready, journalists and photographers are told what to do. Today it is done in many ways, for instance personally, by phone or by email. The idea with the new system is that they are told automatically by email or SMS when their plan has been made or changed. They can then see their own plan - including comments - on NewsPlan's screens. Through the same screens, they can report back to the editorial office. Initially they have to reply whether they accept the job. Later they have to report that it is finished. During the work, it may turn out that it cannot be finished today, but has to wait for tomorrow. It may also happen that the article has to be abandoned entirely, for instance because there wasn't a good story to tell after all. Such changes are of course very important to report to the editorial office.

What is an editorial office?

Larger newspapers have several editorial offices, each with its own special area, for instance foreign affairs, financial, sports, motor. Each editorial office has an approximate number of pages to fill a specific date. Typically, they produce 10 to 40 articles per day. Journalists and photographers are assigned to a specific editorial office, but they may also work for other editorial offices in the company. A typical office has 10-20 journalists and 1-5 photographers. It has one chief editor. Staff members are denoted by their initials, e.g. MiH for Michael Hansson. Everybody in the editorial office knows each other's initials. Journalists quite often move to other newspapers or take other kinds of jobs.

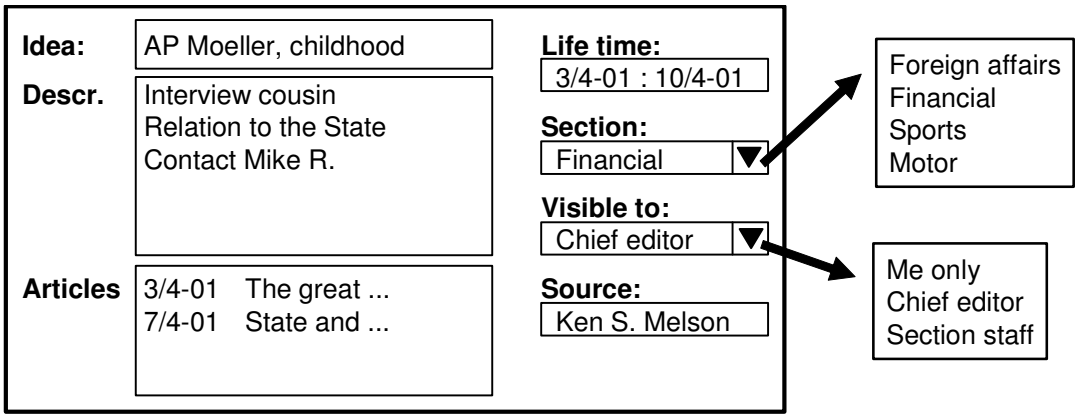
The part of the newspaper produced by a specific editorial office is called a section. Often the editorial office is also called a section.

Idea and article

An idea may become one or more articles. As long as it is only an idea, the editor has decided not to spend time on it. Some ideas have a limited lifetime, for instance a concert review. Others are permanent themes that may be taken up again when readers have forgotten the old article. The section may have 500-2000 ideas on file. It is a problem to find your way in them, but don't care about this here. Just assume that there are some relevant search criteria.

The figure shows how some newspapers record ideas, and the plan is to use a similar screen in NewsPlan. Some journalists are very sensitive about their own ideas and don't want others to see them for the time being. For this reason, they can choose between different degrees of visibility, for instance: only for me, me and the chief editor, all staff in the section. The screen also shows who came up with the idea. You must specify the section to which the idea relates. Notice that the editors try to keep track of the articles that came out of the idea.

When an idea becomes an article, much of the data is copied to the description of the article. However, the editor may change the name of the article, which now becomes the heading in the newspaper, or the description of the contents. The article may also be assigned to a different section in the newspaper. During the writing process, the editor may send messages, e.g. why the article is urgent, and the journalist may send messages to the editor, e.g. why it is delayed.



Each job relating to an article has a status that is crucial for all parties. Typically, they use these codes:

P: Planned. The editor has asked the employee to do the job.
A: Accepted. The employee has accepted the job.
F: Finished. The employee has done his job.
D: Delayed. The employee cannot do it on schedule, but continues working on it. Or the editor has decided to postpone it to the next issue of the newspaper.
X: Cancelled, for instance because there wasn't a good story, or because the editor has assigned the job to someone else.

Managers

Managers look at statistics and insights to see if things need to improve. For instance, they look at performance of employees to see who's doing great and who's behind.

Project 3: Movie Rental System

Study the following text:

A shop rents out DVD movies to customers. The management decided to get a computerized system. The system should keep track of the movies the shop rents out. Each movie has a title, a list of main actors and actresses, duration, year of production, and language. To help a customer find an interesting movie, movies can be found using keywords (tags). Here are a few examples on keywords associated with movies:

Keyword	Movies
Suspenseful	Life of Pi, The Impossible
Breathtaking	The Impossible
Heartbreaking	Life of Pi

Movies can be classified by type. For instance, they can be horror, action, drama, etc. Movies can also be classified by rating. For instance, these are some possible ratings:

Rating	Meaning
G	General. People of different ages are allowed to watch the movie
PG	Parental Guidance Suggested. Some Material May Not Be Suitable For Children.
PG-13	Parents Strongly Cautioned. Some Material May Be Inappropriate For Children Under 13.
R	Restricted. Children Under 17 Require Accompanying Parent or Adult Guardian.

Customers

Customers can rent a movie for typically a week for a standard price ($2). However, they can extend the rental for another week as well provided no body requested the movie. One of the problems customers face is that they forget to return a DVD movie on time. If customers don't return a movie on time, they have to pay a 10-cent penalty for each late day.

If the movie is not available (either because all the DVDs are rented out or simply it is unavailable in the inventory), customers can request it. The employees will look at the request and make a decision about whether they want to order a new movie, let the customer wait, or simply inform him that that it won't be possible to provide it. The problem is the employees might forget to inform the customer on the request status.

The customer can rent multiple DVD movies online. The customer might ask to receive the rented movies by mail or go to the shop to pick them up. If he chooses to pick them up, the employees will have them ready for him to check out. The customer can pay online or at the counter. The customer can return the movies by dropping them at a drop box at the shop or by shipping them.

Only after the customer has returned the movie, can he rate it on a scale 0-10, and write a short review.

Employees

Employees help the customers find a movie to rent, for instance by telling him where to find the movie (on which shelf/section). Further, they help the customers with checking a movie out. Employees also look at the rental orders customers made online, and prepare them for shipment or for the customers so that they don't have to wait much when they arrive to check a movie out. Employees might also need to order a DVD that a customer has requested. However, it is hard for the employee to make a decision about which DVD to order. One solution is to prioritize the ones that are requested often.

Finally, Employees look at the returned movies (either in the drop box or by mail) and record that they are returned.