Design and Implementation of a Mobile Application for the Collaborative Structuring of Knowledge-Intensive Processes

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wwwmatthes.in.tum.de
1. Motivation

2. Review of Existing Applications

3. Implementation

4. Live Demo

5. User Evaluation
Support for Collaborative Knowledge Work

- Wiki pages as work plans with timeline
- Creation and generalization into work templates
- Simple structuring concepts as metaphors

Darwin
Empowering Users to Collaboratively Structure KIPS

Mobile Client
Task-Centered Mobile Applications I

**Pros**

- Intuitive UI
- Calendar feature
- Easy Creation of boards and cards for projects
- Collaboration within a team

**Cons**

- No charts for project progress and tracking
- No wikis for boards, only simple descriptions

**Pros**

- Simple
- Intuitive UI
- „Any.do Moment“

**Cons**

- No sorting of tasks by dates
- No web app, only chrome extension
- No wiki, only notes for tasks
Task-Centered Mobile Applications II

**Pros**

- Simple and easy to use
- Add notes via email and Google Now
- Collaboration with comments

**Cons**

- Subtasks hidden within task window
- Limited customization and organization options

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**Pros**

- Minimalistic UI
- Extended search and filtering functionality
- Multiple ways to organize tasks in projects

**Cons**

- Free version very limited (no labels, reminders)
- Assigning of tasks cumbersome
Process-Aware Task Management for KIPs with Checklists

- Research project of the university of Ulm
- Process-aware task management support for KIPs
- Checklists for active, organizational and dynamic coordination of tasks
Seperation of Concerns with a Client-Server Architecture

Mobile Client
- Mobile Browser

Model
- View
- Controller

Desktop Client

Server
- MongoDB

REST API
- Scala
- Models
- Controllers

ANGULAR JS
ANGULAR MATERIAL

Model
View
Controller

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Material Design

- Set of design guidelines introduced by Google
- Provide intuitive and natural interfaces by transferring attributes of the real work to the virtual world
- Comprehensive design language unified experience across platforms and device sizes
User Interface Design

Colors

<table>
<thead>
<tr>
<th>Color</th>
<th>Hex Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary - Light Blue</td>
<td>#3498DB</td>
</tr>
<tr>
<td>500</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>#81D4FA</td>
</tr>
<tr>
<td>500</td>
<td>#3498DB</td>
</tr>
<tr>
<td>800</td>
<td>#0277BD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color</th>
<th>Hex Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accent - Cyan</td>
<td>#00BCD4</td>
</tr>
<tr>
<td>500</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Color</th>
<th>Hex Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warn - Pink</td>
<td>#F50057</td>
</tr>
<tr>
<td>A400</td>
<td></td>
</tr>
</tbody>
</table>

Typography

- ABCDEFGHIJKLMNOPQRSTUVWXYZ
- abcdefghijklmnopqrstuvwxyz
- 1234567890

Quantum Mechanics
- $6.26069 \times 10^{-34}$

One hundred percent cotton bond

Quasiparticles
- It became the non-relativistic limit of quantum field theory

PAPERCRAFT
- Probabilistic wave - particle wavefunction orbital path

ENTANGLED
- Cardstock 80lb ultra-bright orange

STATIONERY
- POSITION, MOMENTUM & SPIN

Components

Toolbar & Tabs

Navigation Drawer
Live Demo
Empirical User Evaluation to Determine the Usability of the Developed Website

Participants

- 69 students of the Seba Master SS 2015 course
- Used desktop Darwin to hand in deliverables

Time & Place

- Conducted over two days
- Students distributed to slots, each about 20 minutes

Procedure

- Participants were asked to perform five tasks
- Think-Aloud Protocol and observation of user behavior
- Following a SUS questionnaire with

Tasks

1. Commenting on feed entry
2. Navigating to a wiki page
3. Creating a new task
4. Navigating to the task overview
5. Finishing a task
Results of the Questionnaire I

Frequency of use

I think that I would have used the mobile www.sebamaster.de frequently, e.g. additionally to the desktop version if it would have been available from the beginning.

- 28% Strongly Agree
- 17% Agree
- 16% Neutral
- 10% Disagree
- 10% Strongly Disagree

Ease of use

I felt very confident using the system.

- 38% Strongly Agree
- 28% Agree
- 15% Neutral
- 12% Disagree
- 2% Strongly Disagree

I thought the system was easy to use, e.g. regarding the creation and the editing of tasks.

- 51% Strongly Agree
- 22% Agree
- 13% Neutral
- 12% Disagree
- 2% Strongly Disagree
Results of the Questionnaire II

Learnability

I think that I would need the support of a technical person to be able to use this system.

- Strongly Disagree: 30%
- Disagree: 6%
- Neutral: 2%
- Agree: 13%
- Strongly Agree: 18%

I would imagine that most people would learn to use the system quickly.

- Strongly Disagree: 21%
- Disagree: 13%
- Neutral: 48%
- Agree: 18%

Consistency

I found the various functions of www.seba-master.de were well integrated into the mobile version, e.g. the feed, pages and tasks.

- Strongly Disagree: 2%
- Disagree: 2%
- Neutral: 15%
- Agree: 59%
- Strongly Agree: 24%

I thought there was too much inconsistency in this system, e.g. the colors in the feed.

- Strongly Disagree: 5%
- Disagree: 36%
- Neutral: 5%
- Agree: 36%
- Strongly Agree: 0%
The System Usability Score

- System Usability Score (SUS) gives indications about a product’s usability.
- It is calculated with the responses of the 10 item questionnaire.
- Score ranges from 0 to 100.
- Different interpretations of SUS score in terms of product usability.

Calculated SUS Score

67.57
Counts as highly marginal
Equivalent letter grade C

Average system wide SUS score*
68

Aaron Bangor, Philip Kortum, and James Miller. Determining what individual sus scores mean: Adding an adjective rating scale, 2009

*Jeff Sauro. Measuring usability with the system usability scale (sus). 2011
Adaptions to the UI according to participants‘ responses

before

1. Improve visibility by highlighting tabs with colors

2. Apply „typical“ button design

3. Make use of familiar designs

4. Provide available actions at first glance

after
Mobile-Friendly Test

http://vmmatthes19.informatik.tu-muenchen.de/

Awesome! This page is mobile-friendly.

How Googlebot sees this page

Any questions?
Navigation

Side Drawer Navigation

Drop Down Menu
Feed

New Discussion Post

I will start with the documentation today. If you have any ideas just let me know!

83/508

POST

New Comment

@breckn
I will implement the progress today.
11.09.2015 at 23:31

@freelichen
Can you commit your changes?
11.09.2015 at 23:32

Sure, I will commit everything today
Task Overview

Sprint 12

08 Jul
Implement autocomplete

06 Aug
Write requirements analysis

- Implement alert feature similar to the profile
- Limit the number of expertises in the pie to ten
- Replace ranking with percent

6 COMPLETED TASKS

Wiki Text

Sprint 11

Visualization for the profile page
I prefer the following solution for the expertise visualization. The ranking still needs some improvements.

Task progress
Turns out that both the task progress and the chart for the expertises had the same scope name in the controller. So I just renamed one of them.

Example Wiki
I created a new wiki in the init folder called 'Training Wiki'. In order to create it, the initialize() function needs to be called on for every page.

Attribute Overview

Sprint 4

Attributes of this Sprint
- Color scheme: color_scheme.png
- Instal plugin: ✓
- Link to presentation: Final Presentation
- Project Manager: abreckn
- Screenshot: sidenav_v31514.png
- Date: 20.04.2015

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Visualization for the profile page

I prefer the following solution for the expertise visualization. The ranking still needs some improvements.

Task progress

Turns out that both the task progress and the chart for the expertises had the same scope name in the controller. So I just renamed one of them.

Example Wiki

I created a new wiki in the init folder called 'Training Wiki'. In order to create it, the initialize() function needs to be run. Later on, for every new user a new page with predefined attributes and tasks will be created.

Create Task

Name

Implement autocomplete

Start date

July 1, 2015

End date

July 8, 2015

Task Progress in %

Drag to update progress and finish task.

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Expertises

Javascript

AngularJS

Enter a new expertise

Delegate to:

abreckn

Search for a user or group