BSc Thesis

Reactive User Interface for Px-Statbanks

- A Prototype

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Abstract

testabout 1/2 page:
(1) Motivation (Why do we care?)
(2) Problem statement (What problem are we trying to solve?)
(3) Approach (How did we go about it)
(4) Results (What's the answer?)
(5) Conclusion (What are the implications of the answer?)

Foreword

1.The first sentences of the preface tell what the book, the thesis or the report is about.
2.This is followed by the reason for writing the book, the thesis or the report.
3.Then you tell your experiences as a writer of the written text.

Acknowledgement

4.You thank all the people who were involved and / or you worked with. You can think of the translator, supervisor or proofreader.
5.Then you thank friends and family for the support they have given you during writing.
6.Then sign the forword with your name; after all, it is a personal piece.
7.You conclude with the date and place.

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CHAPTER 1

Introduction

National statistical offices disseminate official statistics in statbanks where it is available to citizens and institutions via web interfaces.

All the statistical offices in the Nordic region and in several other countries around the world use an installation of the statbank application, PxWeb, to disseminate official statistics.

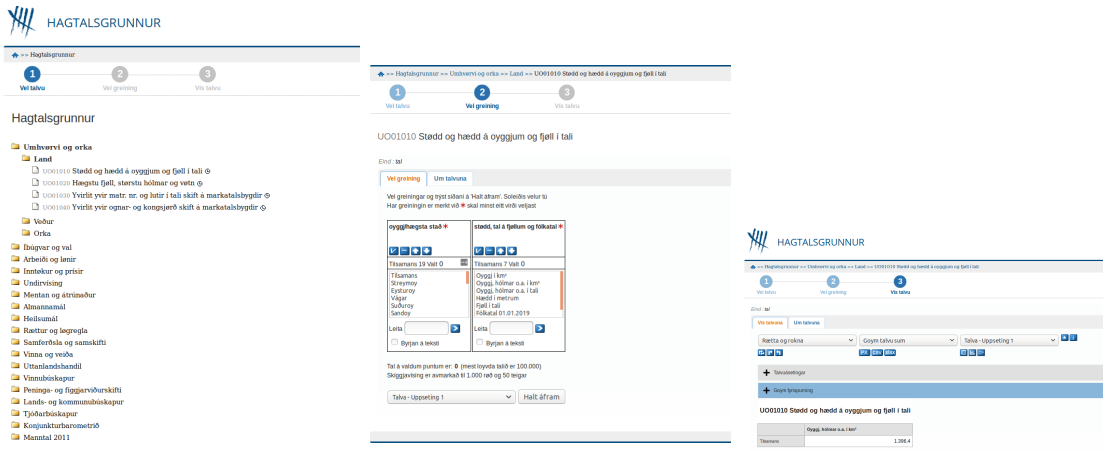
PxWeb is lead by Statistics Sweden and developed in cooperation with other national statistical offices, among them Statistics Norway and Statistics Finland.

1.1 Statement of the problem

User research performed in the Faroe Islands shows that many of the mediocre and novice users have a difficult time using the PxWeb interface. Similar findings have been found by other statistical offices, which are using the PxWeb statbank application. This is therefore a cross-national problem since users in several countries using PxWeb are facing the same usability issues.

One of the main challenges for the users across different sectors is to find the right data in the statbank. The user interaction tends to involve many clicks to get data and when the data finally is returned from the application it often is not what user is expecting. This often results in users giving up in finding the right data.

The user journey in the statbank starts by navigating the folder structure and then finding the right table1.1a. When the user has found a relevant table the user has to choose multiple categories from several statistical variables1.1b and then click the submit button to display the data1.1b. If the data is not what the user is expecting the user has to go over this procedure once again.



(a) List (b) Selectors (c) Result

Figure 1.1: User Interface (Faroese Statbank)

In ISO 9241[1] usability is defined as the effectiveness, efficiency and satisfaction with which specified users achieve specified goals in particular environments. In this case this means users finding the right data in the statbank.

Effectiveness is the accuracy and completeness with which the users can achieve specified data in PxWeb. Efficiency is the resources expended such as time or number of clicks in relation to the accuracy and completeness of getting the right data. Satisfaction is the comfort and acceptability of the work system to its users and other people affected by its use.

From a usability perspective it seems that there is a lack of effectiveness and efficiency in the PxWeb application. This requires a new approach to get and display the data from the statbank application.

1.2 Significance of the Study

In this thesis I am aiming to improve the effectiveness and efficiency of the application by developing a prototype of a new web interface that exploits and utilizes the API in the PxWeb statbank. I aim to establish a direct communication between interface and the API in order to get data, manipulate data and displaying data instantly.

In this approach the user will instantly be shown data when the user has chosen a category from a statistical variable. This differs significantly from current approach where the user has to choose multiple categories in several statistical variables and then click the submit button to get the data.

This new approach reduces the number of clicks and the time used to get data significantly.

It will make user interface more intuitive and easier to use.

[1] ISO 9241

1.3 Addressing the Problem

The problem will be address by using the right technology and the software engineering approach such as the software methodology[2] Agile and the five framework activities:

- Communication
- Planning
- Modeling
- Construction
- Deployment

1.4 Overview of the Thesis

This thesis is in 3 parts... part 1 is the fundamentals,Architecture

1.5 Definition of Terms

UI user interface...

[2]A software methodology is a set of related activities that leads to the production of software

CHAPTER 2

Review of Related Literature and Work

study others statbanks, greenland,denmark,sweden,finland

2.1 Related Literature

The Finish Documentation

2.1.1 PxWeb

what is PxWeb? the theoretical approach

2.1.2 PxWeb API

what is PxWeb API theoretical approach

2.2 Related Work

Take a look at others statbank

2.2.1 Faorese Statbank

2.2.2 Finish Statbank

2.2.3 Danish Statbank

2.2.4 Greenland Statbank

2.2.5 Sweden Statbank

CHAPTER 3

Methodology of the Study

3.1 Technology

One of the main goals is to establish a communication link between the back-end REST API served by statbank application and the new front-end prototype user interface.

This means that the technology used in this project has to be a solid front-end technology that communicates well with REST API's. Other than that the technology chosen has to be accessible for a variety of users since the statbank is intended to the public.

Code maintainment is an important factor in picking the right technology since this prototype is intended to all statistical offices.

Many technologies have been considered relevant to the project's web interface prototype.

In the end, JavaScript[1] has with related advanced JavaScript frameworks has been chosen as the main programming language. JavaScript is one of the worlds most used front-end programming language[2] supported and implemented in all modern browsers with the support of new versions of the language. Addition to this, the React[3] library will be used for building the user interface. React main maintainer is Facebook.

3.1.1 JavaScript

JavaScript is one of the worlds most used front-end programming language supported and implemented in all modern browsers with the support of new versions of the language which is relevant since the user interface has to be accessible to a variety of users.

One of the advantages of using JavaScript in this project is that JavaScript is not compiled and therefore can be run immediately within the client-side browser. Not only is it an advantage for the users but makes it easy for other statistical offices to implement and try out the prototype user interface.

[1] JavaScript
[2] Top 10 programming languages used in web development
[3] Reactjs

The data from the PX WEB API is served in JSON[4]. JavaScript is highly compatible with JSON since the syntax of JavaScript Object Notation is based on JavaScript object syntax. It consists of a metadata part and a data part. Metadata is structured in a hierarchical node tree, where each node contains information about subnodes that are below it in the tree or, if the nodes are at the bottom of the tree structure, the data referenced by the node as well as what dimensions are available for the data at that subnode.

Other programming languages were considered, among them TypeScript[5] and ASP.NET[6].

3.1.2 TypeScript

TypeScript is a strongly typed, object oriented, compiled language. TypeScript is both a language and a set of tools. TypeScript is a typed superset of JavaScript compiled to JavaScript. In other words, TypeScript is JavaScript plus some additional features. This means that TypeScript has a steeper learning curve than JavaScript with new syntax of TypeScript and strict typing.

3.1.3 ASP.NET

ASP.net is a framework for running web applications on the server. Applications that run on the server are used for processing data that you don't want to user to have access to. This project is a client-side project.

3.2 Methods and techniques

3.2.1 Software engineering

3.2.2 Agile

3.2.3 Communication

use case

3.2.4 Planning

risk analysis - object Diagram

3.2.5 Modeling

sequence diagram

3.2.6 Construction

Architecture diagram - Component diagram - tests

[4] JSON
[5] TypeScript
[6] ASP.NET

3.2.7 Deployment

Deployment diagram - figma

CHAPTER 4

Architecture

Developed architecture / system design / implementation: 1/3

- start with a theoretical approach ???
- describe the developed system/algorithm/method from a high-level point of view describing how the system works with code and figure examples
- go ahead in presenting your developments in more detail presentation of the web application and its functionality

4.1 System Design

Design of the application and its components (code examples)

4.2 User Interface Design

How the user sees it

4.3 Prototype Presentation

functionality presentation

CHAPTER 5

Presentation, Analysis and Interpretation of the Prototype

5.1 Presentation of Prototype

Presenting the prototype in the order of the specitif problem stated in the statment of the problem

5.2 Analysis of Prototype

speed user experience etc.

5.3 Interpretation of Prototype

Link the present findings with the previous literature or related work

5.4 Benefits of the new Application

usually, adequate graphs help to show the benefits of your approach

5.5 Results

show speed user experience etc.. some kind of visualization of the results.

CHAPTER 6

Summary of Findings, Conclusions and Recommendations

- summarize again what your paper did, but now emphasize more the results, and comparisons
- write conclusions that can be drawn from the results found and the discussion presented in the paper
- future work (be very brief, explain what, but not much how)

6.1 Summary of Findings

describes the problem, research design and findings (answer to the questions raised), paragraph forms

Tests1

Tests1

6.2 Conclusions

6.3 Recommendations

They should be based on the findings and conclusion of the study.

Recommendations may be specific or general or both. They may include suggestions for further studies. They should be in non-technical language.

They should be feasible, workable, flexible, doable, adaptable.