Project plan for Degree project
Department of Computer Science

Basic information

Title:	Application data synchronization (iOS)
External company:	

Persons involved

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Supervisor:	

Background

The world of mobile applications has exploded in the last couple of years.
Companies increasingly adopt the functionality of mobile devices to streamline the daily workflow, what used to be done by pen and paper or only by sitting down at a computer is now possible with a mobile application.

Most applications demand an external database to store data across users, this intern demands a mobile connection or WIFI by the device itself.
This can become a problem if you work in places where your cellular reception is limited.
You should be able to work seamlessly even if you are in, say a basement or on a train.
To be able to pull this off you need to be able to add and see your data even when you don't have any reception.

Problem formulation

Before mobile applications the problem to be able to work in sync with a database wasn't as big of a problem, because sitting at a computer especially for work you almost always had an internet connection. Now when devices are getting smaller and easier to move around and almost always gives you access to internet within your pocket this has changed drastically.

The problem that should be solved here is to make sure that an application is usable even when the connection to the database is not able to be established.

There are some previous solutions for syncing data that I already know about, for example Firebase. But to be able to use the Firebase framework you need to use the whole Firebase solution, including their database. This creates problems if you want to host the database yourself or if you want to create solutions that aren't possible within Firebase.

The goal of this degree project is to create a solution for seamless interaction with the external database from the application. A way to let you query and save the data that you need, and that's it.

This means that the framework needs to be able to interpret the data structure to a certain degree.
It need so handle the local storage and keep it up to date, the hard part here might be to keep a table updated if there are multiple queries to the same table with different constraints.
It needs to be able to update, save and delete data offline and then synchronize that to the database when a connection is available.
What might be the biggest and most challenging solution to solve is the problem of handling versions of data. If a user has been offline and updated an object that during the offline time also has been updated by someone else the framework shouldn't just override that. This needs to be handled carefully.

Motivation

To have a useful product, it always must work. Especially in work related tasks.
Having a work specific application that doesn't work when you need it to, is both frustrating, time consuming and expensive.
Todays mobile phones can easily handle the task of keeping data synchronized.

Having a ready to go framework that isn't locked down to a specific project would be both time and money saving.

Goals

O1	Research best database structure/language
O2	Create database and establish connection from an iOS application
O3	Create methods for querying data given specific arguments
O4	Research, experiment and determine the best type of local storage for speed and reliability
O5	

Method

By researching the functionality within **iOS** determine the frameworks that needs to be used and the limits within how things must be done.
Research and the determine what OS and database type to be used, depending on speed, overall performance and reliability. This will be done by

When basic structure is obtained conduct a series of test with both different data sets and functions to gain insight in performance and validity of the result to make informed decisions of how to move forward.

To determine data version merge rules to use research about previous solutions for example Firebase should be conducted.