Mobile application to support nurses’ workflow

**Bachelor project**

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**Major :** logiciels et systèmes complexe

**Foreword**

Document’s structure

This thesis was developed with the help of the **Universitary Hospital of Geneva** (**HUG**).

This thesis will start by a context description, what was the initial issue, how it was solved up until now and why a better solution was needed. It will also explain how the current informatics architecture of the **HUG** works.

It will then explain what technologies will be used to reach the overall goal and describe the new nurses workflow. This first part will end by the description of all the restrictions and issues working in a distant place with sensitive data imply and what were the main challenges coming along with it.

The second part will be an in depth description of all the technologies and protocols I’ve used. How they work alone and together to produce a “native app” on both **Android** and **IOS.**

The third part of this thesis will describe the application in itself; it will contain a lot of illustrations and schemas to help understanding exactly what everything does. It will also describe in detail how the **HUG** data are structured and how I accessed, manipulated and displayed them to ensure the best user experience (**UI**).

It will then end with the possible enhancing mostly in terms of user experience (**UX**).  
It will talk about the issues and problems encountered during the creation process and finish with the conclusions drawn out of the entire project.

Text formatting/Manual of style

To allow an easier understanding and readability of the document some text formatting rules will be applied:

* Names, acronyms and company names will be in **bold**.
* Important words will be in *italic*.
* References to code and/or file/folder will be between [**brackets in bold**]

Special thanks

I would like to start by thanking **Mr. Glück Florent** for his guidance and help during the entire thesis.

I would also like to thank **Mr. Ehrler Frédéric** for his availability, help and advices, as he was my main source of information for the entire **HUG** related questions. He also provided me with a desk within the **HUG** mainframe.

# Introduction

## Initial problem

Currently, the nurses dispose of a desktop application that helps them with their everyday work.

Nurses have complicated changing schedules, when they get to the hospital; For the sake of example, the nurse will be called **Francis** and the person responsible for rewriting all the medical information into the system will be **Sam**.

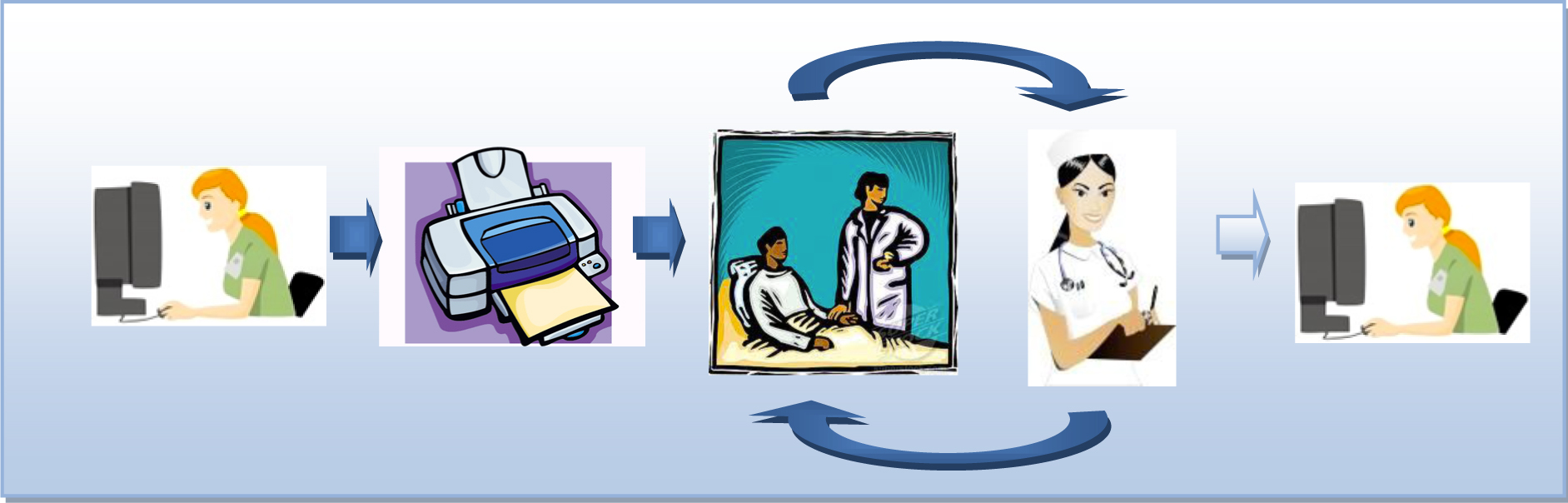


FIGURE 1.1 – NURSES’ CURRENT WORKFLOW

1. **Francis** logs into the desktop application and prints a paper sheet for every patient he has to visit today.
2. **Francis** has now a lot of paper with him, he chooses the one he will use shortly and go visit the patients in different rooms.
3. He notes on those sheets everything he does, when he does it and how the patient reacted if necessary.
4. Once he’s done he goes back asnd take the next sheets for the next group of patients he will visit.
5. When **Francis** is done visiting everyone he gives all the paper to **Sam.**
6. **Sam** has a lot of paper from **Francis** and his co-workers that have been working for a while.
7. **Sam** takes every paper one by one and rewrites it’s content in the system**.**

Taking apart the fact that this is an old fashion way of working, this workflow presents some very important issues that should be fixed.

**Francis** and his co-workers each have different way of writing, sometimes they’re tired and just don’t write as well as when they start working. They don’t watch the exact time for every intervention they perform, which means data, can be not accurate and in the medical field, accuracy is primordial.

Adding to that, **Sam** can mistype or misread something and enter false data into the system!

There’s a double risk for errors and that puts a lot of pressure onto **Francis** and **Sam**’s back.

The hospital wants something that will increase the accuracy of both measures and typing/reading, allow almost real-time data sync for all the working employees and less volatile than paper.

## Hospital architecture

The hospital has several servers delivering data chunk relative to the employee asking for it, in the case of **Francis**, he receives a list of all the patients he has to visit during his current shift.

To read data from the Hospital’s servers, **Francis** needs to use a trusted machine that will ask the servers.

“TOCONTINUE”

## Solution proposed

### Existing app

### Requirements

### Technologies

### New nurses workflow

## Restrictions

## Challenges

# Framework

## AngularJS

## Ionic

## Plugins / Modules

## IBeacon

## OAuth

# Application

## Navigation and architecture

## Wireframes and functionalities

## Hospital data structure

## Sensitive patient data handling

## Data transmission

# Conclusion

## Possible enhancing

## Problems and challenges

## Conclusions

# References

# Annex