

TDT4900

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## Abstract

# Chapter 1

## Introduction

### 1.1 Research Questions

Suggestions

1. Hva gjør det vanskelig for en bruker å benytte seg av IKT som verktøy?
2. Hva er grunnen til at en bruker, i ett land med begrensede ressurser, ikke får utnyttet IKT verktøy maksimalt?
3. Hvilke hinder er det som står imellom bruker og IKT som verktøy i et land med begrensede ressurser og i en helse-setting?
4. Hva karakteriserer utfordringen, ”å ta ibruk IKT-verktøy” i helse-sektoren i et land med begrensede ressurser?
5. I denne oppgaven, hvordan skal jeg vinkle målet med IT (Tar gjerne imot forslag)?
  - (a) Få slutt på fattigdom?
  - (b) Øke livskvaliteten til folket?
  - (c) Mer kontroll til staten?
  - (d) Øke kunnskapsbasen om informasjons systemer?



- (e) Ved bruk av IT, kan en bruke begrensede ressurser mer effektivt?

# Part I

## Literature

## Chapter 2

# Electronic Health

2.1 In General

2.2 Updated Information

2.3 Time and space barriers

2.4 Mapping of user needs

2.5 The technology is there, why is it not used?

2.6 How can ICT's help us in the health sector?

2.7 Health personell interviews

2.8 Mobile

## Chapter 3

# Information and Communication Technologies for Developing Countries

### 3.1 In General

No correlation with productivity [4]

#### 3.1.1 Objective

**Productivity**

**Allocation of resources**

**Decision making**

Lack of literature in general: Until very recently, the entire literature on IS and developing countries would struggle to fill a single bookshelf. The attention of writers—from researchers to consultants to journalists—has been focused elsewhere.[4]

Lack of evaluation: Those who have the will to evaluate—such as academics—often lack the resources and capacity. Those who have the resources—such as aid donor agencies—often lack the will to evaluate.[4]

Focus on case studies: The literature on IS in DCs has grown, but it is a literature dominated by case studies of individual IS projects. Taken alone, these provide no basis for estimation of overall failure/success rates.[4]

## **3.2 Discourses**

Chrisanthi [2] points out three main branches that characterizes implementation of information systems in developing countries.

### **3.2.1 Diffusion**

Just move the technology and understanding to a new place. Usually from I-countries to D-countries. Usually a mismatch between actuality and design.

### **3.2.2 Transformative**

Transforming the organization to operate in a new way with the technology. (My understanding should be confirmed.) Working towards a design while facilitating the design-actuality gap. The whole is seen as a process with a starting point and an end point.

### **3.2.3 Socially Embedded**

Building the competence and technology from the ground up by including locals. User participation. Making the design and actuality gap smaller.

Diffusion and transformative development does not facilitate the already existing structures of the context the technology will be placed within. The implementation of information systems from this perspective requires the environment and the people in it to adapt to the new technology. This will in turn increase

the risk of the information system being rejected by the users. On the other hand, the socially embedded path will to some extent safeguard the underlying social structures by building upon what is already there. This might lead to unexpected results and be time consuming. Although, probably avoiding the sustainability pitfall.

### **3.3 Pitfalls in introducing IS in Developing Countries**

#### **3.3.1 Scalability**

The problem of moving expertise and system to new locations with the lessons learned. By conceptualize the use of ICT's one can make it easier to transfer ICT's to other locations, making it scalable.[5].

#### **3.3.2 Sustainability**

What happens when the AID funded projects stops being funded? The donors are interested in sustainable solutions that keep existing after the investment. How does one maintain a project that is built on temporary donors. Unfortunately many IS projects are drained from resources [2]. Here should it be mentioned something about political commitment [5].

#### **3.3.3 Assimilation In Dysfunctional Organizational Processes**

One has to take into account that an already broken system can't be fixed by speeding it up. Automating a process that already does not produce the right result would only give us more of the result we are trying to change [3].

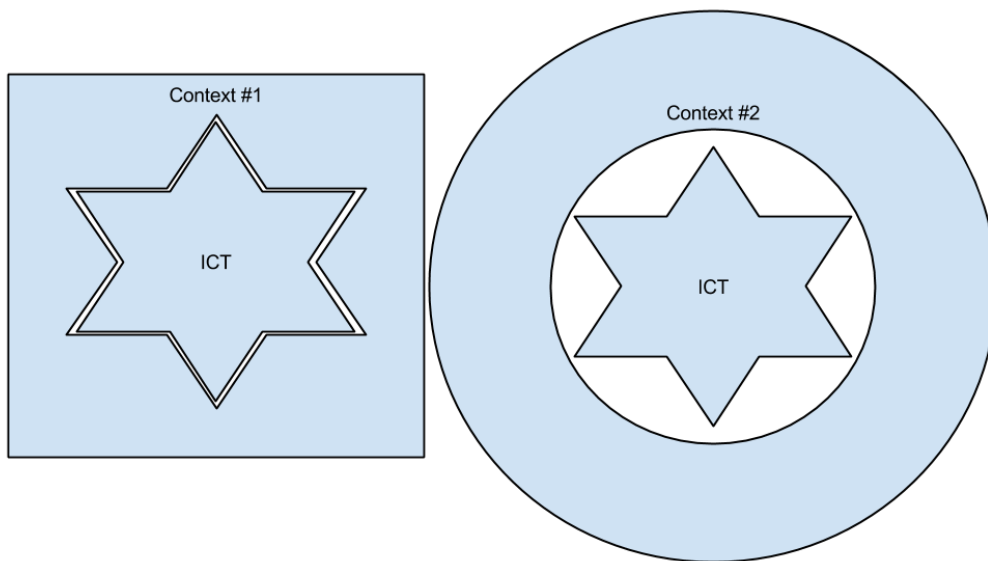


Figure 3.1: If it works for us it will work for you!

#### **3.3.4 Lack of persistence on key areas**

### **3.4 Updated Information**

### **3.5 The design and actuality gap**

### **3.6 Success or Failure**

### **3.7 Success stories**

#### **3.7.1 short examples**

### **3.8 Failure stories**

#### **3.8.1 short examples**

### **3.9 Evidence base**

Health information systems in South Africa: Braa and Hedberg (2002) reported widespread partial fail-

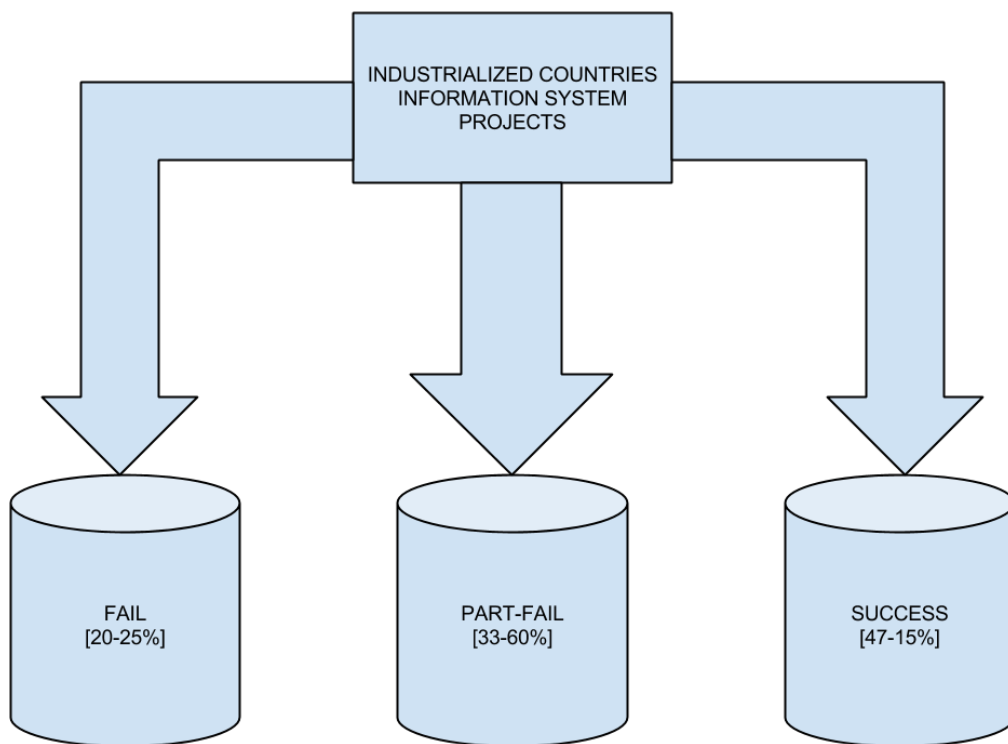


Figure 3.2: IS projects in Industrialized Countries. Year: 1995-2000 [4]



ure of high cost systems with little use of data.[4]

IS in the Thai public sector: Kitiyadisai (2000) reported “failure cases seem to be the norm in Thailand at all governmental levels.”[4]

Donor-funded IT projects in China: Baark and Heeks (1999) reported that all were found to be partial failures.[4]

World Bank-funded IT projects in Africa: Moussa and Schware (1992) reported almost all as partial—often sustainability—failures.[4]

### **3.10 Digital Divide**

### **3.11 Implicit and explicit components of Design**

The explicit components of a computer application is the physical components the user would need in order to use the application. Examples include cost, computer hardware, operating system, monitor and such. The implicit ones are a little harder to quantify. These include knowledge, expectations and skill. When addressing the implicit, how would one go about evaluating if the user is qualified to use the application as intended and ensure that it is used for the proper intentions?

### **3.12 Outsourcing**

IS has the potential of being more than just a tool for making processes better, more efficient etc. With enough knowledge a country may provide a service in the form of providing ICT solutions and support. Rwanda being a good example. Knowledge

is key, it requires little more than effort and some hardware, making it possible for countries with little natural resources to have the opportunity to contribute to the global market. India is currently being a great example of this.

### **3.13 Education and IS development**

### **3.14 Untapped Market**

From a certain perspective one can see the developing countries as an untapped market. By building up the countries infrastructure one has the opportunity to offer services that previously was not possible. Take Telenor and their agenda to offer insurance and banking services in the east. By building up the infrastructure they can now offer their services as "mobile providers" and even expand their services to banking with a fresh market and less competition.

### **3.15 IT and Economic Growth**

With IT comes the assumption that it will in some way enable economic growth [1]. Although it can be said that highly successful businesses are using IT it would be wrong to say that more IT equals more money. For an example. The simple view of IT being able to enable economic growth is not enough. It can however increase productivity in several ways by automating existing processes, but the potential of IT lies in new ways of structuring organizations. Time and space can be compromised significantly.

In the 1980's there was invested 750 billion \$ in IT [1], but this only led to 0.7% increase in productivity. This was a decrease from the previous decade. There are findings that suggest that

ICT has a positive correlation with productivity. Data from 1983 to 1990 shows this for eleven Asia pacific countries [1]. May be a necessity in order to take part in the global economy and making it possible to trade. IT can also directly affect how organizations structure themselves by introducing new ways of working and increasing productivity. ICT should be used is withing the organization to enable better work processes, not automatize existing processes [3].

### **3.16 Sustainability[5]**

Building networks running on the same concept will make the ICT initiative more sustainable.

User participation is another tool one can use in order to make ICT initiative more sustainable. When the concept is accepted and made by the users they understand how and why it works and are more likely to accept it.

# Chapter 4

## Implementation

### 4.1 In General

### 4.2 Updated Information

### 4.3 Changing Processes

With information technology comes the great advantage of cutting processes to more effective ones. In Michael Hammers article [3] he discusses how information technology can change how people execute their work. The idea is that computers should not automate existing processes, but rather make room for new and more effective ones to rise. Hammer's ideas are of some age, but it still highly relevant. **Some examples here.** Information passed by paper has the disadvantage of being bound by geography making an organization or system slower due to delivery. Information technology can bring an organization together and simulate being on the same place, but still being spread out. This allows for old work processes to be replaced by new ones making the turn-around for each task possibly much faster.

In big organizations the process of swap out old processes can be of very high risk. Change in work processes takes the personnel out of their comfort zones and they have to readjust

to the new environment. The new way of doing things may in a short term perspective seem unproductive.

This calls for leadership with strong vision and determination in order to implement the new processes and reap of the benefits.

#### **4.4 Facilitate the transition**

#### **4.5 Over complicating**

# Chapter 5

## Testing

### 5.1 In General

### 5.2 Updated Information

### 5.3 Defining success and failure

#### 5.3.1 Categories

As mentioned by Richard Heeks [4], there are some ways of categorizing success and failure of information systems that I will use.

**Total Failure** These system is either not implemented at all or implemented and abandoned shortly after.

**Partial Failure** • Significant undesirable outcomes.

- Major objectives unattained.
- Sustainability failure.
- Subjective goals unattained.

**Success** Obtains objectives and no significant undesirable outcomes.

# Chapter 6

## Use

### 6.1 In General

### 6.2 Updated Information

# Part II

## Empirical



# Chapter 7

## Case

### 7.1 Stakeholders

# Chapter 8

## Method

### 8.1 Action Research

### 8.2 Data Generation

#### 8.2.1 Interview

1. User objective
2. User desired outcome

#### 8.2.2 Observation

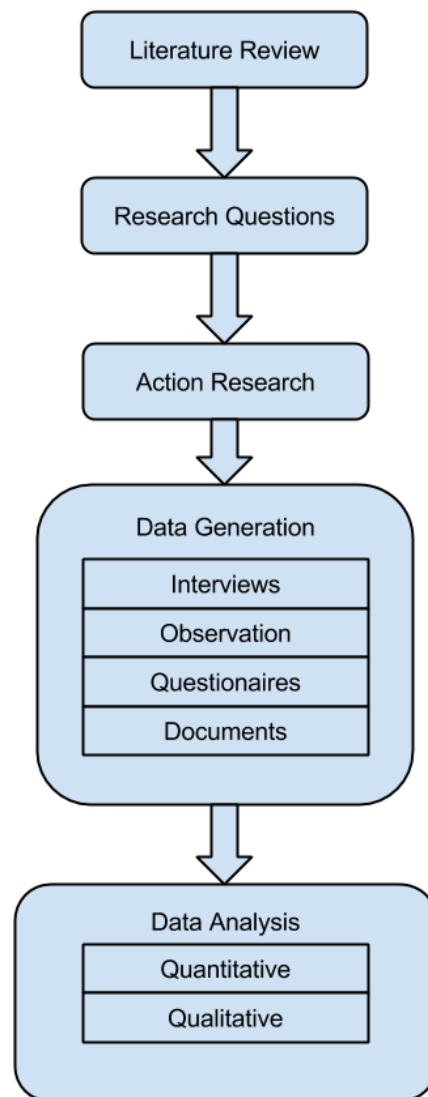


Figure 8.1: Overview of the research process

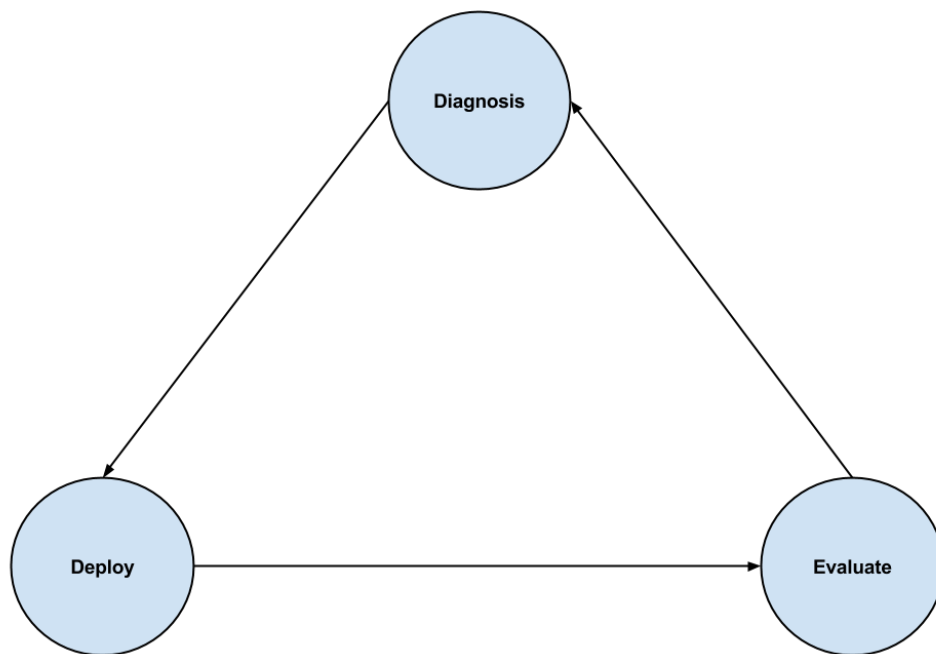


Figure 8.2: Overview of Method

# Part III

## Discussion

# Part IV

## Conclusion

# Appendix A

## Functional Specifications for LMIS

### A.1 Context

#### A.1.1 Operating Environment

#### A.1.2 Users

##### Server-side

- PHP
- Ruby
- Rails

##### Client-side

- Safari
- Chrome
- Internet Explorer
- Firefox

## **A.2 LMIS**

### **A.2.1 Hardware**

### **A.2.2 Input**

Semi-parent data

Emergency requisition forms

Monthly report and requisition forms

### **A.2.3 Output**

Dashboard

Individual requisition forms

Delivery note

Consolidated consumption report

List of cooperatives reporting

List of cooperatives missing reports

List of items likely to be overstocked

List of items likely to be out of stock

## **A.3 Database**

## **A.4 Purpose**

**#1:** Automate messages/notifications based on rules. Like an emergency need for medicine based on consumption trends (algorithms). See figure: A.4.1.



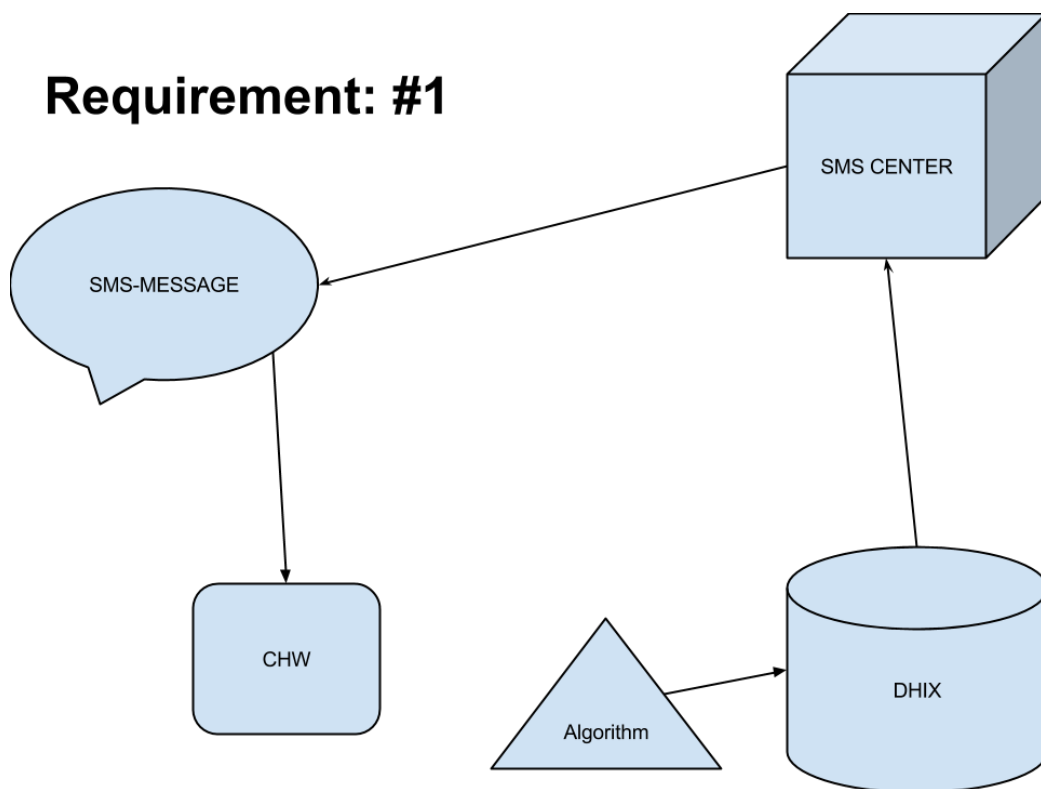


Figure A.1: Requirement 1

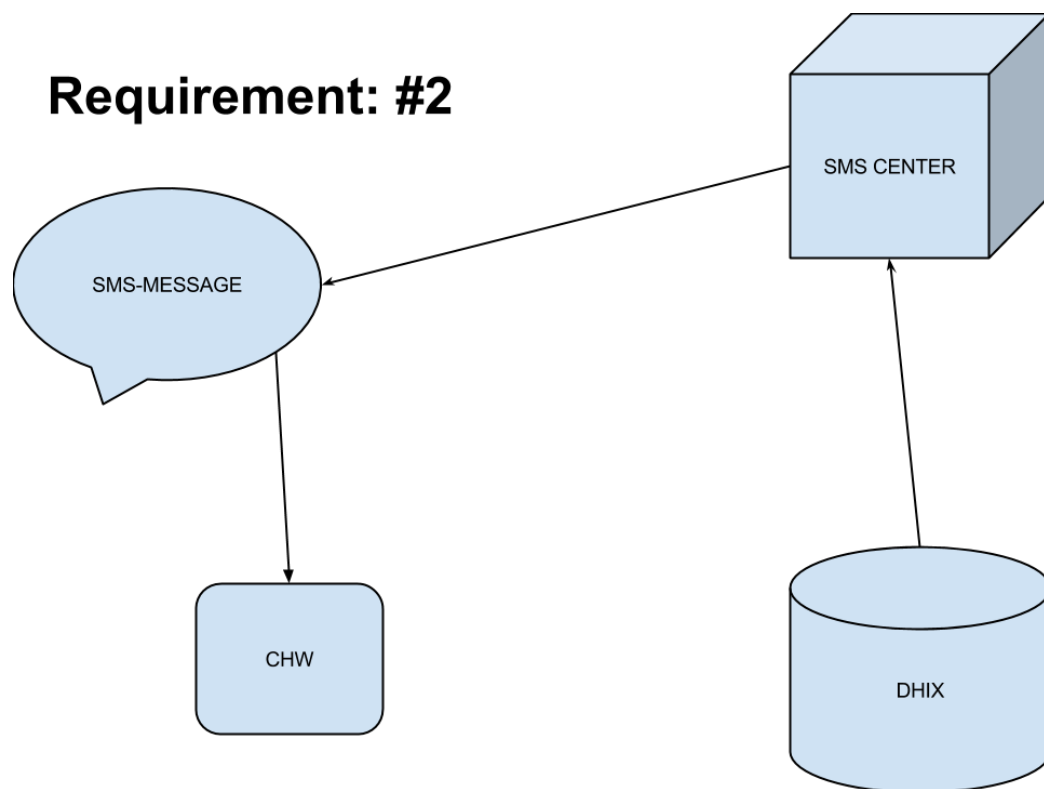


Figure A.2: Requirement 2

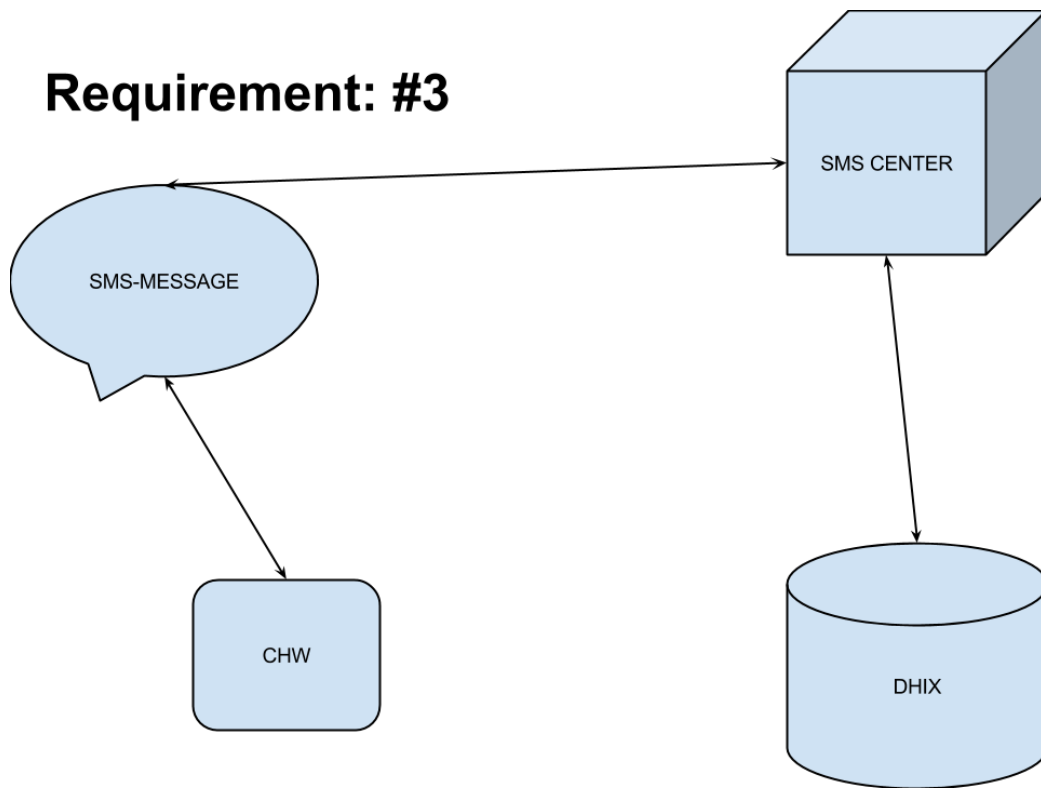


Figure A.3: Requirement 3

**#2:** Send out a reminder if a report is more than 4 days delayed.  
See figure: A.4.2.

**#3:** Notify if data does not map correctly. See figure: A.4.3.

**#4:** SMS codes for reporting over SMPP protocol. See figure:  
A.4.4.

## Requirement: #4

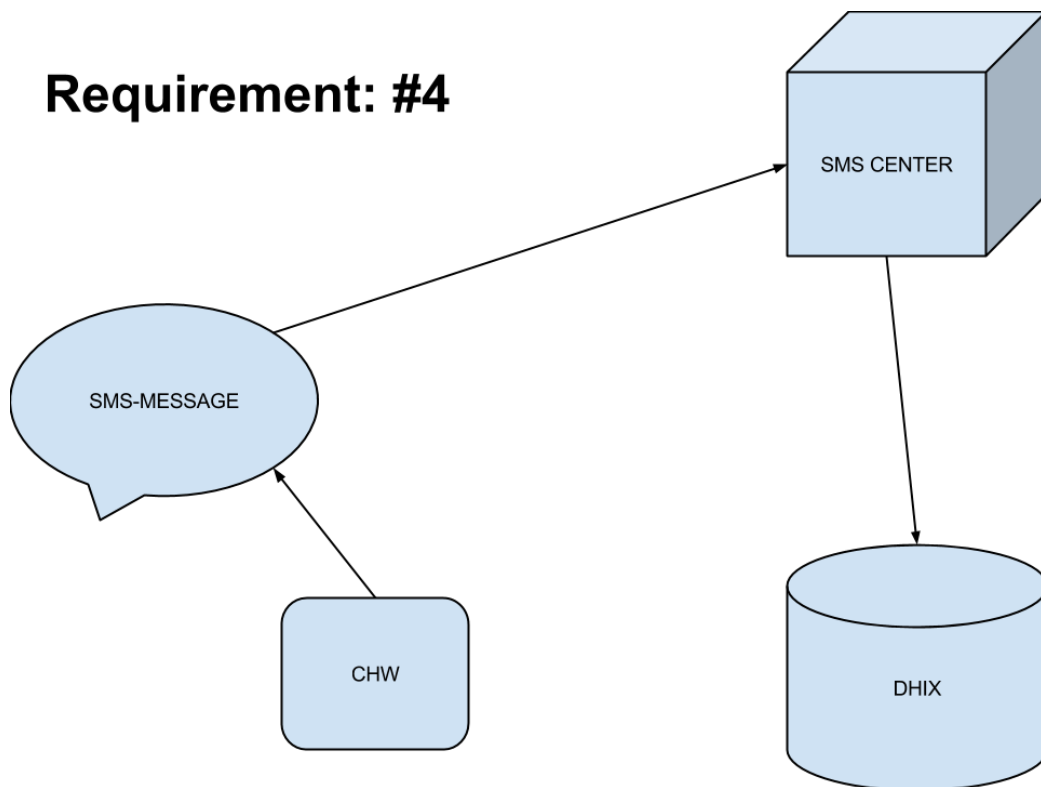


Figure A.4: Requirement 4

# Appendix B

## Journal

### B.1 Day 1

#### B.1.1 Breakfast

Missed on the time here today. Wrong time zone. I thought the devices configured themselves, so I just trusted the watch. Randy missed a part of his meeting because of that. Very embarrassing.

#### B.1.2 MSH Office

Got the first tasks. Should refine and define the requirements. I don't see any problems just yet. A little unclear just who are the ones involved. There are two guys, Patrick and Eric that i should meet with. Both working with logistics I think, at least in stock management. Haven't heard anything on the the SMPP protocol other than it should be there.

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