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Table of Contents

[1 Introduction 1](#_Toc271807831)

[2 Vision 1](#_Toc271807832)

[3 Scope 1](#_Toc271807833)

[4 Stakeholder needs 1](#_Toc271807834)

[4.1 Identify legitimate stakeholders 1](#_Toc271807835)

[4.2 Elicit requirements 1](#_Toc271807836)

[4.3 Use cases / Build scenarios 1](#_Toc271807837)

[5 Project constraints 1](#_Toc271807838)

[5.1 Define constraints 1](#_Toc271807839)

[6 Stakeholder requirement list 1](#_Toc271807840)

[(Main output from: Stakeholder Requirements Definition Process) 1](#_Toc271807841)

[7 Concept documents ? 1](#_Toc271807842)

[8 Requirements specification 2](#_Toc271807843)

[8.1 Functional requirements 2](#_Toc271807844)

[8.2 Non-functional requirements 2](#_Toc271807845)

[8.3 Performance requirements 2](#_Toc271807846)

[9 Architectural constraints 2](#_Toc271807847)

[10 Verification strategy 2](#_Toc271807848)

# Introduction (Michael)

This case will investigate the initial processes from the INCOSE Systems Engineering Handbook(1). It has the purpose to educate the attendees in applying the technical processes be using them in a real life case with unreal companies involved. The case work will furthermore train the attendees in the art of systems engineering in general. The case work will also end with a description of the case unique requirements in order to develop the suggested Common Operation Picture (COP).

# Vision&Scope(Peter)

1. Problem Statement
   1. Project background

In crisis situations coordination between authorities is crucial. A train accident may require involvement from authorities such as traffic police, Medicare, firefighters and train related authorities.

It is crucial that the commander in charge has the optimum situational awareness, which is also known as the Common Operations Picture (COP).

Systematic provides with its SitaWare solution a complete COP management system for military purposes.

Systematic wishes to extend its solution to the domestic area. The intention is to provide a COP collecting infrastructural, personnel and other important data to the commander in charge.

* 1. Stakeholders
     1. Police
     2. Armed forces
     3. Hospitals
     4. Emergency Mgmt.
  2. Users
     1. Commander
  3. Risks
  4. Assumptions
     1. Can we assume that all persons/groups are equipped with a GPS? GPS connection is always available?
     2. Access to data such as weather information is always available?
     3. Power is always available (evt. via generators)
     4. Backup system exists (radio)

1. Vision of the Solution
   1. Vision statement
   2. List of features
   3. Scope of phased release (optional)
   4. Features that will not be developed

# Stakeholder needs

## Identify legitimate stakeholders(Anders)

## Elicit requirements(Michael)

In order to elicit the requirements it is important to understand the needs from each of the identified stakeholders. Table 1 shows the stakeholders in the case together with their level in the project and identifies if they have any decision power.

|  |  |  |
| --- | --- | --- |
|  | **Has decision power** | **Has no decision power** |
| **Directly involved stakeholder** | Systematic (Costumer)  The development team | Police, armed forces, hospitals etc. |
| **Not directly involved stakeholder** | The government  Legal parties | Commanders |

Table - Stakeholder matrix

*Many tools and techniques can be used to elicit user requirements, such as marketing and technical questionnaires or surveys, focus groups, prototypes, and beta release of a product. Trade off analysis and simulation tools can also be used to evaluate mission operational alternatives and select the desired mission alternative.*(1)

It is therefore important to gather stakeholder inputs on “needs” and “wants” in order to define the system constraints. The customer might have limitation to the total budget, limitation in technology, and legal requirements. This process is initiated by studying both how it is done without any high tech solution and evaluate the amount off added technology compared with the added benefits of doing so.

### Existing systems

Each and every department has its own chain of command, where information will be managed from the top and down. The information is delivered trough radio and details like location is plotted on an old fashion map. This system is well known and has proven its worth throughout the history, but of cause some major disadvantages can be highlighted.

* Misinterpretation of information since it is verbally translated
* Lack of cross compatibility between existing systems and involved parties
* Information overload in some parts in the chain of command

The development team has recognized that these three issues is to be improved be using new technology to handle emergency situations and establishing the COP.

### Mission analysis

The success of the mission might depend of using just the right amount of added technology. The mission might be corrupted by adding to much technology, which could make it almost impossible to operate. The development team has considered the mission performance versus the amount of added technology.

In order to handle an emergency situation without automatic and intelligent systems to filter information and share important knowledge it can be quite a challenge to make an emergency operation run smoothly. The commanders face this exact challenge today.

It is of highest importance that the commanders feel that they are in charge, when they use the system and that they control the important stream of information. The system might suggest and point out critical elements, but it is the development team believes that an emergency situation is dynamic and cannot be controlled by a computer. The COP should provide the right amount of information, and ensure that everything is updated. The COP might be able to filter out some of the less critical information, by correlating some emergency facts with information available. This will help the commander focus on what is important, without being under informed.

The system might be even a bigger help for the people in the field, because they might experience “a hectic life” and they do not need to feel in command, but need to be commanded. The system will therefore help them filter the information based on their location. The sum of this analysis is three subsystems within the system of interest, which must be implemented be means of added technology.

* Redundant communication interface to ensure information exchange between involved parties
* Location tracking system
* Critical information back-up system

### User requirements

The development team has collected user requirements by means of questionnaires, interviews and by discussing the customer produced document in which they present their view on the problem. These investigations have lead to the build scenarios, which will help define the project requirements.

## Use cases / Build scenarios(David)

Build scenarios to define the concept documents; the range of anticipated uses of system products; the intended operationalenvironment; and interfacing systems, platforms, or products.

# System solution constraints(Christian)

The solution must conform to the SitaWare infrastructure and any associated standards. The development of the product is budgeted at XXXXXXX DKR.

There must be a proposition for a solution at the 15th of October. In the development period a System Requirement Review must be conducted the 28th of September and a Critical Design Review at the 11th of October.

The solution shall include the following documents:

* System Requirements Specification
* Project Plan
* Detalied Design Description
* Interface Control Document
* Verification Matrix

Budget

Schedule

Laws/regulations

Industry standards

Agreements - terms and conditions

Organization infrastructure

Directives

# Concept documents (David)

## Concept of production

## Concept of deployment

## Concept of operation

## Concept of support

# Requirements specification

## Functional requirements

## Non-functional requirements

## Performance requirements

# Architectural constraints

# Verification strategy

# Bibliography

(1)**International Council on Systems Engineering**. *INCOSE Systems Engineering Handbook v. 3.2a*. INCOSE, 2010.

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