

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

# **Link Analysis Tool Requirements Definition**

**Final Version**

Project Name: Link Analysis Tool	Version: 1.2
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## Revision History

<b>Date</b>	<b>Version</b>	<b>Description</b>	<b>Author</b>
2010-10-01	1.0	Initial Requirements Definition	Hassan Aziz Khan
2010-11-06	1.1	Refinement in Requirements	Hassan Aziz Khan
2011-01-14	1.2	Final Version	Hassan Aziz Khan

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

## Table of Contents

1.	Introduction	4
1.1	Purpose of this document	4
1.2	Intended Audience	4
1.3	Scope	4
1.4	Definitions and acronyms	4
1.4.1	Definitions	4
1.4.2	Acronyms and abbreviations	4
1.5	References	4
2.	Requirements Description	4
2.1	Introduction	4
2.2	General requirements	5
2.3	Specific requirements: Interface	5
3.	Use Case Models	6
3.1	Use case model 1	6
3.1.1	Use case "Setting Parameters"	<b>Error! Bookmark not defined.</b>
3.1.2	Use case "Visualize Transaction"	7
3.1.3	Use case "Selecting Transaction from Matrix"	7
3.1.4	Use case "Graph Zoom-in Zoom-out"	7
3.1.5	Use case "Getting Subscriber details"	8
4.	Requirements Definition	8
4.1	Requirement Group Definitions	8
4.2	Requirement Sources	8
4.3	Requirements definitions	9
4.3.1	Change Log	9
5.	Future Development	9
5.1	General Overview	9
5.2	Specific group 1	9
5.3	Specific group 2	9

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

## 1. Introduction

### 1.1 Purpose of this document

This document is intended to give a description of requirements of Link Analysis Tool. This tool is a part of Fraud Management system which is used to detect the fraudulent activities within a telecom network. The link analysis tool will visualize the transactions made by a specific subscriber with a specific search depth.

### 1.2 Intended Audience

Intended audience is the Link Analysis Tool development team, DSD students from Germany, MDH Sweden and FER Croatia, Instructors of the DSD course and the team from Kapsch TIS d.o.o., Zagreb.

### 1.3 Scope

This document will give the initial requirements of the link analysis tool. It will cover functional and non functional requirements of the project.

### 1.4 Definitions and acronyms

#### 1.4.1 Definitions

Keyword	Definitions
Visualize Transactions	Graphically represent the calls or data transfer between different users.
Java Script	A scripting language used in dynamic web pages
Search Depth	No of hops from a certain user or subscriber
Activity Matrix	A table representing certain transactions over a period of time

#### 1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
UML	Unified Modeling Language
PHP	Hypertext Preprocessor
SQL	Structured Query Language
DSD	Distributed Software Development
MDH	Mälardalen University
FER	Fakultet elektrotehnike i računarstva

### 1.5 References

[1] Link Analysis Tool user requirements document

## 2. Requirements Description

### 2.1 Introduction

Fraud management systems are the most powerful and irreplaceable tools that large companies use to combat fraud. One of the techniques that are used in these systems is the so-called "link analysis". It helps fraud agents to visualize the behavioral patterns of subscribers, using collected information in CDR-s (Call Detail Records). This gives fraud agents the opportunity to detect unknown members of a fraudster organization, trace mobile devices or SIM cards used in fraudulent activities, create subscriber profiles, etc.

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

## 2.2 General requirements

The main functionality of the tool is to - for a given subscriber - visualize transactions (call detail records data

read from a database table) in a defined period of time and with a defined search depth (who called whom). Below is a list of some initial requirements.

1. Graphically represent the transactions between subscribers.
2. Search depth can be controlled.
3. Time period will be user defined.
4. Different types of transactions should be in different colors.
5. A zoomed out graph should represent the whole network.
6. Activity matrix should summarize the transactions.
7. Main graph should be clickable and zoom able.
8. Cells of activity matrix should be selectable.
9. Transactions from a selected cell in activity matrix should be highlighted in the main graph.

## 2.3 Specific requirements: Interface

Interface should have the following parts.

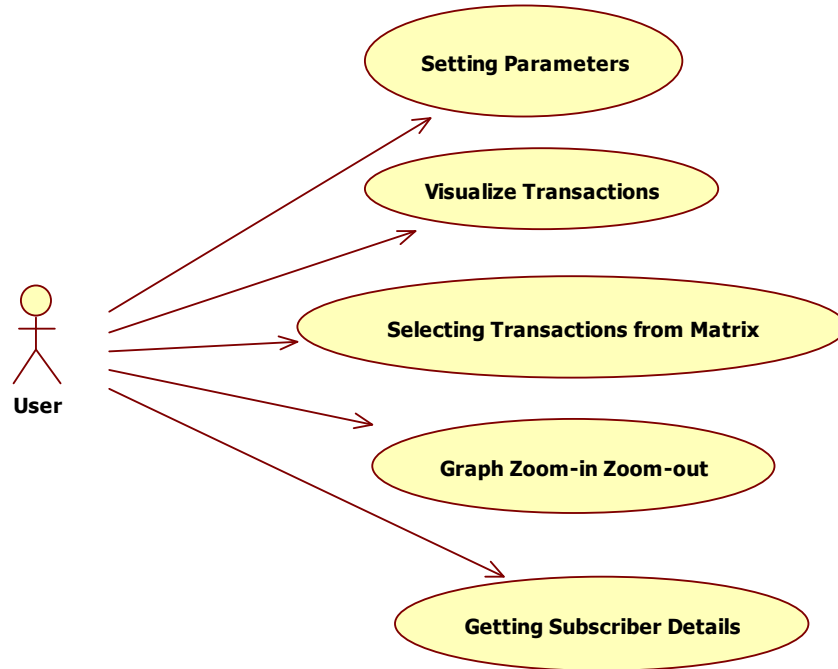
1. Main content are which will have the main graph.
2. Control panel on right side.
3. A small zoomed out graph on lower right corner.
4. Activity matrix at the bottom of the screen.

Main frame	Menu, Actions, Parameters, Options, ...
Activity bar graph and matrix	Zoomed out graph

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

### 3. Use Case Models

#### 3.1 Use case model



##### 3.1.1 Use case "Setting Parameters"

**Initiator:**

*User*

**Goal:**

*To Set the parameters.*

**Main Scenario:**

1. *User opens the home page .*
2. *User click on parameters menu on the right.*
3. *Parameters will be shown.*
4. *User sets the parameters (Period, Search depth, Find user by).*
5. *User clicks on BAKE bottom*
6. *Parameters will be set.*

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

### 3.1.2 Use case "Visualize Transaction"

**Initiator:**

*User*

**Goal:**

*To observe transactions visually.*

**Main Scenario:**

1. *User opens the home page .*
2. *User defines the parameters.*
3. *The transactions will be displayed.*
4. *Different colors show different types of transactions (voice call, video call, SMS).*

### 3.1.3 Use case "Selecting Transaction from Matrix"

**Initiator:**

*User*

**Goal:***To highlighting the result of selected transaction in the mainframe diagram (colored differently or other transactions grayed).*

**Main Scenario:**

1. *User opens the home page*
2. *User define the parameters*
3. *Result will be shown.*
4. *User selects a matrix cell*
5. *Result of selected cell will be highlighted in the main frame diagram*

### 3.1.4 Use case "Graph Zoom-in Zoom-out"

**Initiator:**

*User*

**Goal:** *To zoom out a particular part of graph that is showing with a rectangle that currently displayed in the main frame.*

**Main Scenario:**

1. *User opens the home page*
2. *User define the parameters*
3. *Result will be shown.*
4. *User selects a part of graph*
5. *Selected part will be zoomed out in zoomed-out graph part in right bottom of page*

### 3.1.5 Use case "Getting Subscriber details"

**Initiator:**

*User*

Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

**Goal:**

*To get the details information of subscriber*

**Main Scenario:**

1. *User opens the home page.*
2. *User define the parameters.*
3. *Result will be shown.*
4. *User select subscriber.*
5. *User select from menu to give the subscriber information.*
6. *Subscriber information will be shown.*

## 4. Requirements Definition

### 4.1 Requirement Group Definitions

Identification	Requirement Group	Rem.
Grp	Network Graph	
Atm	Activity Matrix	
Ctp	Control Panel	

### 4.2 Requirement Sources

Source	Description	Rem.
Ctm	Customer (Kapsch TIS d.o.o) defined requirement	
Sys	Required as a consequence of system design (contractor's requirement)	
De	Domain Experts	



Project Name: Link Analysis Tool	Version: 1.2
Requirements Definition	Date: 2011-01-14

### 4.3 Requirements definitions

Identity	Status	Priority	Description	Source
Network Graph				
GRP-1	I	1	Clickable graph	Ctm
GRP-2	I	1	Zoom able graph	Ctm
GRP-3	I	1	Subscriber details	Ctm
GRP-4	I	1	Colored links	Ctm
Activity Matrix				
ATM-1	I	1	Selectable	Ctm
ATM-2	I	1	Summary of Transactions	Ctm
Control Panel				
CTP-1	I	1	Search Depth Adjustment	Ctm
CTP-2	I	1	Time Period Adjustment	Ctm

Requirement status:

- I = initial* (this requirement has been identified at the beginning of the project),
- D = dropped* (this requirement has been deleted from the requirement definitions),
- H = on hold* (decision to be implemented or dropped will be made later),
- A = additional* (this requirement was introduced during the project course).

#### 4.3.1 Change Log

Identity	Action	Date	Comments
GRP-4	Dropped	2011-01-10	Dropped due to lack of time.

Requirement status:

- D = dropped* (this requirement has been deleted from the requirement definitions),
- H = on hold* (decision to be implemented or dropped will be made later),
- A = added* (this requirement was introduced during the project course).
- R = resurrected* (dropped or on hold requirement was reactivated)

## 5. Future Development

### 5.1 General Overview

So far there is no planned or expected future development for this tool.

### 5.2 Specific group 1

### 5.3 Specific group 2