

PARTool Final Project Report

Version 1.0

Profile analysis and reconciliation tool	Version: 1.0
Final Project Report	Date: 2012-01-13

Revision History

Date	Version	Description	Author
2011-12-26	0.01	Initial Draft	Inderjeet Singh
2011-12-29	0.02	Corrected scope description, added references, modified "Background and Description" chapter and section 3.1, 5.1, 6.1	Igor Rutkowski
2012-01-13	1.0	Section 4 and 8 modified	Igor Rutkowski

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1. Introduction

1.1 Purpose of this document

This sole purpose of this document is to summarize the project profile analysis and reconciliation tool, by including projects goals, results, statistics and cost etc.

1.2 Intended Audience

Intended audience for final report is:

- PARTool team members
- Supervisor (Marin Orlić)
- Partool customer (Kapsch d.o.o)

1.3 Scope

This document describes the development process of the PARTool project, including: organization, milestones achieved, project results, project experiences, financial cost and metrics for showing contribution from each team members.

1.4 Definitions and acronyms

1.4.1 Definitions

Keyword	Definitions

1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
Partool	Profile analysis and reconciliation tool
MDH	Mälardalen University
FER	University of Zagreb (Faculty of El. Engineering and Computing)
CDR	Call details records
CTM	Customer
DEV	Developer
SYS	System
NFR	Non functional requirement

1.5 References

- [1] PARTool Project Plan
- [2] PARTool Requirement Definitions
- [3] PARTool Design Description
- [4] PARTool Acceptance Test Plan

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2. Background and Objectives

Fraud is one of the biggest problems for telecom service providers today. One of the techniques used to combat this is called “profile analysis”. Profiles are subscriber patterns of behavior created using information gathered as CDRs.

The goal of this project was to develop a module of a fraud management system responsible for visualization of selected subscriber profiles. The visualization is made by extracting information collected in CDRs and is helpful in detecting a sudden change in a subscribers’ usage pattern. It was designed with the possibility of integration into an existing fraud management system in mind [3].

The tool is flexible enough to be extended easily later. It is user-friendly to agents and requires no training. Because of the private nature of the information, agents are required to authenticate before using the tool.

3. Organization

3.1 Project Manager

As the project was distributed between two different location, it was important to have one person on both side to take care management and responsible for the work at both the ends. Following leading roles have been assigned [1]:

- Project Leader at FER: Igor Rutkowski
- Team Leader at MDH: Inderjeet Singh

3.2 Project Group

Initials	Name	Responsibility
IR	Igor Rutkowski	Project management, client side developer and document reviewer
IS	Inderjeet Singh	Project management, client side developer, documentation, client side tester
AVL	Arno van Lumig	Quality assurance manager, client and server developer, Server administration
MH	Matija Hanžić	SVN manager, server side developer, Server side tester
DP	Davor Perić	Server side developer, Documentation, Server side tester
EA	Ejaz Ali	Client side developer, Documentation
RB	Robert Borošak	Main client side developer, Client side tester

3.3 Steering Group

Supervisor: Marin Orlić (FER)

3.4 Customer

Branko Beslać, Drazen.Lakic from Kapach d.o.o (Croatia)

3.5 Others

DSD Teacher (MDH): Ivica Crnković

DSD Teacher (FER): Mario Žagar,

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4. Milestones

Id	Milestone Description	Responsible Dept./Initials	Finished week			Metr	Rem	
			Plan	Forecast				Actual
				Week	+/-			
M-001	Project vision	IR,IS,DP	41	41		41		
M-002	Project Plan	MH,RB,EL	42	42		42		
M-003	Requirement Definition	IS,DP	42	42		42		
M-004	Project policies	MH,IS,AVL	42	42		42		
M-005	Design description	IR,IS	43	43		45		
M-006	Alpha version	MH,RB,DP,IS,EA,IR	47	47	1	47		
M-007	Quality Testing	AVL	48	48	1	48		
M-008	Acceptance test plan	IS, RB	50	50		50		
M-009	Beta version	RB,IS,EA	52	52		52		
M-010	Test report	DP,MH	02	02		02		
M-011	Project final report	IS,IR	02	02		02		
M-012	Product manuals	AVL, EA	02	02		02		
M-013	Final Product	MH,RB,DP,IS,EA,IR,AVL	02	02		02		

4.1 Remarks

Remark Id	Description
M-004	Database failure project policy has been uploaded in week 48.
M-005	The only milestone that has not been delivered on time, due to not enough time given to project supervisor for review.

5. Project Results

5.1 Requirements

PARTool team has defined the requirement in the beginning, they have been based on the customer needs and some according to system needs [2]. Team members have added few requirements in order to improve PARTool project. As per the matrix shown below, we dropped only one requirement and almost all others are achieved on time.

5.1.1 Requirement Compliance Matrix

Identity	Status	Priority	Description	Source	Status
			User Interface		
UI-1	I	1	Show subscriber profile and information.	CTM	Yes
UI-2	I	1	Show data visualization for two subscribers.	CTM	Yes
UI-3	I	3	Dialog box for changing properties of respective created tab	DEV	Yes
UI-4	I	3	Multiple selection usage type option	CTM	Dropped
UI-5	I	1	Enable defining of following parameters for subscriber data visualization in the parameter selection frame: <ul style="list-style-type: none"> • Call type • Usage type • Data display color • Measure type • Aggregation (SUM or AVG) 	CTM	Yes

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			<ul style="list-style-type: none"> Start and end date Visualization generate buttons Adding and removing parameters 		
			Data Visualization		
DVIS-1	I	1	Show subscriber data defined by the user	CTM	Yes
DVIS-2	I	1	Visualization dimensions: <ul style="list-style-type: none"> Time of day (hours) Day of week Measure (number or duration of calls, rated amount, discounted amount) Period (start and end dates) 	CTM	Yes
DVIS-3	I	2	User interaction ability (i.e. when user moves a cursor over part of a graph a popup description window appears saying how many calls, sms, mms... are shown)	DEV	Yes
			Non-functional requirements		
NFR-1	I	2	Safety and security of all user information.	SYS	Yes
NFR-2	I	1	Usability and an intuitive User interface.	DEV	
NFR-3	I	3	System should be able to provide service at all time.	DEV	
NFR-4	I	2	System should be responsive.	DEV	
NFR-5	I	1	Web application should be compatible with all new browser versions.	CTM	Yes
NFR-6	I	1	Web application won't have internet access.	CTM	

Completed: Yes (completely implemented)

No (not implemented at all)

Partially (partially implemented, more description under Remarks subsection)

Unknown (completion status not known)

Dropped (requirement was dropped during the course of the project)

5.1.2 Requirements Compliance Summary

Total number of requirements	14
Number of requirements implemented	13
Requirements partially fulfilled	0
Requirements not fulfilled	0
Requirements dropped	1

5.1.3 Remarks

Remark Id	Description
UI-4	This was not very highly demanded from the customer and implementation of this could affect the query, so by keeping time constraints in mind, we decided to drop it.

5.2 Work Products and Deliverables

To	Output	Planned	Promised	Late	Delivered	Rem
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		week	week	+/-	week	
All Stakeholders	Project plan document	42	42		42	
All Stakeholders	Requirements Definition document	42	42		42	
All Stakeholders	Design Description document	43	43	+2	45	
All Stakeholders	Project Policies	42	42		42	
All Stakeholders	Acceptance test plan	50	50		50	
Steering group, project and team leader	Minutes of meeting and weekly reports	42-02	42-02		42-02	
Steering group	Summary weekly report	42-02	42-02		42-02	
All Stakeholders	Test report	02	02		02	
All Stakeholders	Final Project Report	02	02		02	
All Stakeholders	Final versions of all documents	02	02		02	
All Stakeholders	User Manual	02	02		02	
All Stakeholders	Installation Manual	02	02		02	
All Stakeholders	Final Product	02	02		02	

6. Project Experiences

6.1 Positive Experiences

There are many good experiences within the PARTool team during whole project:

- Real life working experiences in distributed environment;
- Working in teams that are full of diverse cultures;
- Learnt new technologies including: Play! framework, Raphaël js library;
- Improved technical writing;
- Project management aspects;
- Improvement in English language skills;
- Improvement in presentation skills;
- Learnt the importance of communication in distributed environment.

6.2 Improvement Possibilities

Improvement possibilities in terms of technical, there are some points that could be improved:

- Implementation of multiple usage type features
- Algorithms for comparing two graphical profiles.

General improvement possibilities that are helpful in a project are as:

- Design document should start as early as possible which can help other members to start the implementation.

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7. Financials

7.1 Project Cost Summary

Planned Cost	13 350 Euro
Actual Cost	9 410 Euro

7.2 Work per Member

Member	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W01	Total
Inderjeet Singh	14	17.5	20	19.5	10	13	18	11	15	15	9	3	8.5	1.5	175
Davor Perić	15	19	16	18	20	15	6	18	13	11	8	2	4	10	175
Arno van Lumig	2.5	3	17.5	13.5	3	5.5	14	4	6,5	6	5	5	1.5	5	85.5
Robert Borošak	8	8.5	12	10	13	11	8	12	13	8.5	5	3.5	7	7	126.5
Ejaz Ali	7	3	7	8	2	3	2	17	15	21.5	10.5	3	8	8	115
Matija Hanžić	9	7.5	13	11	12	11	7.5	10	15	14	6	3	6	8	133
Igor Rutkowski	4	10	10	24	18	8	3	18	14	7	4	1	3	7	131
Total	58.5	68.5	95.5	104	78	66.5	58.5	90	85	83	47.5	20.5	38	46.5	941

8. Metrics

8.1 Milestone Metrics

Completed as planned or earlier	Total	Timeliness
12	13	92.2

8.2 Effort Metrics

Activity	Actual Effort	Planned Effort	Deviation (%)
Requirements definition and analysis	15 h	210 h	-93%
Design architecture	55 h	45 h	+22%
Developing alpha version	160 h	225 h	-29%
Developing beta version	120 h	225 h	-47%
Acceptance testing and final product	85 h	420 h	-79%
Documentation	90 h	120 h	-25%
Other (meetings etc)	416 h		
TOTAL	941 h	1335 h	-30%

Effort estimation accuracy (%) (100*(1 - abs(Actual - Planned)/Actual))	58.1%
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We have not been able to make good initial estimation of time required to finish the project. Requirements have been well defined from the beginning so we did not need much time to analyze them. More time has been spent on designing architecture than planned, but this time was well spent and allowed us to finish faster and with less effort. Alpha version had less bugs than expected, which reduced time needed for beta and final version.