Transport4You1
Final Project Report

Version 1.0

Doc. No.:

Revision History

Date	Version	Description	Author
2011-01-15	0.01	Initial Draft	GK
2011-01-16	1.0	Minor Fixes	GK

Table of Contents

1. Introduction

1.1 Purpose of this document

This document describes the development process followed, milestones achieved, delivered deliverables and results of the Transport4you1 project. It summarizes the effort and cost matrices for the project.

1.2 Intended Audience

Intended Audience for this document is

- Team Members
- Customer
- Steering group

1.3 Scope

The scope of this document is to provide the final analysis report of the Transport4you1 project. It covers the results of the project and procedure how these results are achieved.

1.4 Definitions and acronyms

1.4.1 Definitions

Keyword	Definitions
Customer	Elisabetta Di Nitto and Matteo Rossi

1.4.2 Acronyms and abbreviations

Acronym or abbreviation	Definitions
MOM	Minutes of Meeting
MDH	Mälardalen University, Vasteras, Sweden
VOIP	Voice over IP
TMA	Transport Main Application
TUA	Transport Unit Application
FER	Faculty of Electrical Engineering and Computing, University of Zagreb, Croatia

1.5 References

- Score competition: http://score-contest.org/2011/
- Project details: http://score-contest.org/2011/projects/DiNittoRossi.Transport4You.pdf
- Course details: http://www.fer.hr/rasip/dsd
- Project Documents : http://www.fer.hr/rasip/dsd/projects/transport4you1

2. Background and Objectives

Public transportation is a form of travel that most people experience during their lives. This experience can be both enjoyable, but also unpleasant for a variety of reasons. The sole action of purchasing a ticket can be problematic: working with difficult automatic ticket dispensing machines that require the exact amount of change, or waiting in line in a specialized shop. This is even more difficult when one is in a hurry, as most people are these days.

Even when one manages to start the trip more inconveniences can occur. Public transport is often unreliable and cannot guaranty that one will make the trip on time. This is because a wide variety of variables affect the flow of vehicles and units around a public transport network of a metropolitan city. Daily issues, such as rush hour traffic or unexpected accidents, can cripple the transport network for hours causing interruptions or modifications to the standard transport lines. The quality of the entire system can also be judged by how it can cope with such abnormal situations, keeping the network flowing despite the problems, and ultimately getting the passengers to their intended destinations.

The Transport4U project is designed to help organize the public transportation system of metropolitan cities. Such complex transportation systems most often consist of many network layers, such as buses, trams or subways. The main goal of the project is to make public transportation more reliable and easier to use for people who heavily depends on it. The project also attempts to automate many of the everyday actions that are currently manually executed.

The Transport4U project was proposed by external SCORE customers, Elisabetta Di Nitto and Matteo Rossi. Like in a real life development scenario, all modifications to requirements and all major decisions had to be approved by the product customers. In addition to this the team had to meet the local requirements set upon them by their local DSD courses. Extensive communication with both external customers and internal course supervisors was crucial to the success of the project. The development team is confident with the developed product, considers it in full effect an intelligent public transportation manager, and is confident that it shows a glimpse of the future where public transportation is heading.

3. Organization

3.1 Project Manager

Gaurav Kushwaha acted as Project leader and Dajan Zvekić as team leader. Both were responsible for the project management

3.2 Project Group

Name	Responsibility
Dajan Zvekić	Development Manager, Testing
Dino Bartošak	Test manager, development
Gaurav Kushwaha	Design, Development, Testing
Mahdi Sarabi	Integration Manager
Muhammad Anwar Islam	Design, Development
Toni Pivčević	Design, SVN Manager
Vengal Rao Pachava	Document Manager, Design

3.3 Supervisor

Aneta Vulgarakis (MDH),

3.4 Customer

Elisabetta Di Nitto and Matteo Rossi

3.5 Others

Prof. Ivica Crnković (MDH), Prof.dr.sc. Mario Žagar (FER)

4. Milestones

Id	Milestone Description	Responsible Dept./Initials	Finished week				Metr	Rem
			Plan	Forecast		Actual		
				Week	+/-			
M001	Project Plan	GK	39	39	0	39		
M002	Requirement Plan	TP,DZ	39	39	0	39		
M003	Design Plan	TP, GK	40	40	0	40		
M004	Project Policies	DB,DZ	40	39	-1	39		
M005	System Architecture	DZ, DB,TP,GK	42	42	0	42		
M006	TMA Component	DZ,DB,TP	46	50	0	50		
M007	TUA Component	DZ,DB,TP	46	46	-1	45		
M008	Web Component	GK,DB	46	50	2	52		TS001
M009	Acceptance Testing	DB,DZ,GK	49	51	0	51		
M010	Project Report	GK,DZ	52	52	0	52		
M011	Final Presentation	All	50	50	0	50		
M012	Product manuals	DZ,TP,DB	51	02	0	2		
M013	Final Product	All	50	02	0	2		

4.1 Remarks

Remark Id	Description
TS001	New version of web component development to support internationalization feature.

5. Project Results

5.1 Requirements

5.1.1 Requirement Compliance Matrix (Functional Requirements)

Id	Requirement Description	completed	Rem
Transport Main Application			
F-TMA1	Application enforces billing.	Yes	
F-TMA2	Application notifies users about payment: • On payment success.	Yes	

	• Reminder to pay ticket. • On payment failure. • On ticket expiration.		
F-TMA3	Application checks when ticket is expired and if user is still in vehicle application buys new ticket.	Yes	
F-TMA4	Application records routes of every user.	Yes	
F-TMA5	Application performs scheduled standard route identification. (Finding standard users routes based on existing data about users)	Yes	
F-TMA6	Application notifies users about routes and suggests alternative: • Interruption in standard route. • Modification to standard route. • Optimization to standard route.	Yes	
F-TMA7	If system crashes tickets are archived. (User will not lose its active tickets because of system crash)	Yes	
~~F-TMA8~~	~~If system crashes users are notified.~~	Dropped	
~~F-TMA9~~	~~If system crashes control is notified.~~	Dropped	
F-TMA10	System provides transport line data pushing when changes occur to transport unit application.	Yes	
F-TMA11	Application performs scheduled route optimization.	No	
F-TMA12	Application performs scheduled route optimization notification.	No	
F-TMA13	Application has structured schema for network input.	Yes	
Transport Unit Application			
F-TUA1	Application smartly detects users inside vehicle.	Yes	
F-TUA2	Application sends users current route section data to TMA: • GPS location where user enters vehicle. • GPS location where user exits vehicle. • Vehicles transport line. • Time when user enters vehicle. • Time when user exits vehicle.	Yes	
F-TUA3	In case of application crash restart user detection.	Yes	
~~TUA4~~	~~In case of application crash notify users inside transportation unit.~~	Dropped	
F-TUA5	Transport unit driver must select transport unit line at application start or when applies.	Yes	
Web Application			
F-TWA1	User registers profile.	Yes	
F-TWA2	User needs to input personal data: • Name • Address • Password	Yes	
F-TWA3	User needs to input cell phone data: • Phone number • Bluetooth address • Wi-Fi MAC address	Yes	

F-TWA4	User can choose billing mode: • On demand payment • SMS payment • Prepaid (User billing option. How application handles user billing.)	Yes	
F-TWA5	User can choose payment type: • Credit Card payment • SMS payment • Cash payment (Type of payment transaction. How user buys tickets.)	Yes	
F-TWA6	User can choose between various ticket types: • T_VAL ticket (ticket valid for T_VAL period) • Daily ticket • Weekly ticket • Monthly ticket	Yes	
F-TWA7	Web application has administrative section: • User choose to pay in cash and admin updates users ticket/credit count • Admin can insert route modification/interruption	Partially	
F-TWA8	User can define route and check its availability.	Yes	
F-TWA9	Administrator can add news which will be shown on home page.	Yes	
F-TWA10	Web application should support internationalization.	Yes	

5.1.2 Requirement Compliance Matrix (Nonfunctional Requirements)

Id	Requirement Description	completed	Rem
Transport Main Application			
NF-TMA1	Application sends notification by SMS.	Yes	
NF-TMA2	Network schema is XML based.	Yes	
Transport Unit Application			
NF-TUA1	Application detects users inside but through unique wifi/bluetooth MAC address.	Yes	
NF-TUA2	Connection between TMA and TUA is GPRS-based.	Yes	
NF-TUA3	The actions the passenger should proactively perform should be limited, very simple, and suitable to all situations.	Yes	
NF-TUA4	Transport unit provides simple user interface for interaction with driver.	Yes	
Web Application			
NF-TWA1	Application is available on browsers: • IE 7+	Yes	

	• Mozilla Firefox 2+ • Google Chrome • Opera • Safari		
NF-TWA2	Application should be easy to use.	Yes	

5.1.3 Requirements Compliance Summary

Total number of requirements	36
Number of requirements implemented	30
Requirements partially fulfilled	1
Requirements not fulfilled	2
Requirements dropped	3

5.1.4 Remarks

Remark Id	Description

5.2 Work Products and Deliverables

To	Output	Planned week	Promised week	Late +/-	Delivered week	Rem
All Stakeholders	Project plan document	39	39	0	39	
All Stakeholders	Requirements Definition document	39	39	0	39	
All Stakeholders	Design Description document	40	40	0	40	
Team Members	Project Policies	40	40	-1	39	
All Stakeholders	Acceptance test plan	49	49	0	49	
All Stakeholders	Test report	2	2	0	2	
All Stakeholder	Final Project Report	2	2	0	2	

s						
All Stakeholders	Final versions of all documents	2	2	0	2	
All Stakeholders	Technical Documents	2	2	0	2	
All Stakeholders	User Manual	2	2	0	2	
All Stakeholders	Installation Manual	2	2	0	2	
All Stakeholders	Final Product	2	2	0	2	

5.2.1 Remarks

Remark Id	Description

6. Project Experiences

6.1 Positive Experiences

This project offered a real environment for distributed software development, where master students learned how to communicate with project customers, supervisors and with other team members in a distributed environment. It was a good experience as it provided us with a real world scenario and we learnt how to prevent and tackle real problems in a software development cycle. The team was expected to handle the pressure of upcoming deadlines in early stages of project so the team members need to get to know each other very fast and start producing visible artifacts. This was quite challenging, but a great overall experience.

We learned to work under pressure, as we had to develop some component from scratch at a late stage of project.. Overall, we are happy that we had the opportunity to work on this project within the DSD course. Distributed environment and challenging project forced us to give our best and to adapt to a new environment as the project progressed. On top of everything, we made some new friends which make this experience additionally special.

6.2 Improvement Possibilities

There are some areas of improvement like enrolment of students based on their technical competency, not solely on the credit points.

7. Financials

7.1 Project Cost Summary

Planned Cost	17580 Euros
Actual Cost	6332 Euros

7.2 Work per Member

Member	W37	W38	W39	W40	W41	W42	W43	W44	W45	W46	W47	W48	W49	W50	W51	W52	W1	Total
Dajan	18	17	19	13	20	22	13	19	23	24	20	18	22	14	14	25	11	312
Dino	13	14	14	8	18	21	17	18	21	26	25	28	31	2	20	8	21	305
Gaurav	-	15	19	16	12	20	15	18	22	23	13	21	19	7	18	0	13	251
Mahdi	10	17	9	6	9	8	16	14	12	14	9	11	14	0	10	0	14	149
Muhammed	4	15	11	9	10	10	19	11	16	16	19	14	14	09	0	0	0	179
Toni	15	14	17	12	18	22	9	22	22	24	16	19	17	4	11	7	12	261
Vengal	3	9	11	11	7.5	6	12	10	12	11	13	8	9	10	10	8	0	150.5
Total	63	101	100	75	95	109	101	112	128	138	115	119	126	46	73	48	57	1583

8. Metrics

8.1 Milestone Metrics

Completed as planned or earlier	Total	Timeliness
12	13	92.3%