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Keywords	Scenario Story Board, Scenarios.
Abstract (for dissemination)	This document presents the list of use cases, scenarios and their corresponding story boards. All the work has been conducted in the T&Tnet project. Scenarios contain the characteristics that the project consortium wishes to reflect.



**T&Tnet: Travel & Transport solutions through emotional-social
NETWORKing**

AAL-4-032

Deliverable

D1.2

Scenario Story Board

Public Document

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1 Introduction

T&Tnet, Travel & Transport solution through emotional and social networking, is a project concerned with the development of a mobile application that aims to assist senior citizens in their daily and leisure navigation tasks considering emotional aspects. The goal of this document is to contribute to the process of the development of T&Tnet applications by elaborating a set of stories told by seniors and moving to the creation of storyboards in the partner's languages.

A detailed development of storyboard with dialogues, graphics and cartoons including the experiences gained in previous tasks will be realized. By doing so, the work in the project profits from the earlier experience of focus group recruitment. In this way, the project aligned with mock-up models will come up with an enhanced prototype that better addresses expectations of the target groups, before going into a high resource-consuming implementation process and avoiding having to waste huge amount of effort.

1.1 Goal and Scope

The outcomes resulting from the Scenario Story Boards and Mock-Up Models will be the base for turning the prototype into the first iteration as well as for the development of further version of T&Tnet application.

In the process of storyboarding, which is the main aim of this document, all partners contribute to the creation of storyboards, arrangement of individual stories and identification of crucial mobility play elements as well as possible user interactions. This is particularly important for the implementation of content into the applications. In the present document the developed methodology for the creation of the storyboards with participation of all partner countries is described.

1.2 Structure of the Document

The first chapter describes the use of Scenario Story Boards as methodology for taking participants' attention by listing their main elements and the way these motivate users during the software development specification phase. The next chapter presents the list of use cases with the functionalities covered together with the set of scenarios that have

been elaborated with the profile of end users and taking real characteristics on the environment. The final chapter contains the story boards that reflect the described scenarios.

2 Scenario story boards

2.1 What is a storyboardⁱ

In an environment where you cannot take the participant's attention for granted, telling an intuitive story may be a crucial success factor for the intended learning events. Storyboards try to fill this gap by the development of a set of graphic organizers in the form of illustrations or images displayed in sequence for the purpose of pre-visualizing a motion picture, animation, motion graphic or interactive media sequence. When creating a storyboard, experts can discuss what they need and want their story to say by structuring it with images. Storyboards encourage top-down approach because of their design and brevity. By focusing on the end goal, it keeps discussions with too much detail.

A typical storyboard makes sense when in its edition the experts use drawings and cartoons with a minimum of text. Users can easily follow the stories and experts strongly think most others will do. More recently the term storyboard has been used in the fields of web development, software development and instructional design to present and describe, in written, interactive events as well as audio and motion, particularly on user interfaces and electronic pages. Storyboarding is used as part of identifying the specifications for particular software.

During the specification phase, screenshots the software will display are drawn, either on paper or using other specialized software, to illustrate the important steps of the user experience. The storyboard is then adapted by the engineers and the client while they decide on their specific needs. The reason why storyboarding is helpful during software engineering is that it helps the user understand exactly how the software will work, much better than an abstract description. It is less expensive to make changes to a storyboard than an implemented piece of software.

2.2 Elements for the story board

The story boards contain specific elements that catch the attention and awake interest among users:

- Address pedagogical aims.

- Raise latest concepts of the project in the course of execution.
- Include personalization and customization elements.
- Extremely focused in the topic.
- Evaluation and feedback.
- Characters and their descriptions.
- User interface –design.
- Avoid stereotypes.
- Show the timing of events.
- Learning purposes: Hard- and soft skills, specific to each scene.
- Help system (learning companion, external help, and tutorial).
- Interactivity and feedback.
- Changing graphical elements.
- Media.
- Text, dialogues, pictures and photos.

2.3 Scenarios

The definition of a model for a storyboard without knowing what contents are available is a tough work. What must be done at this stage is to show how pieces of stories could be connected to start creating something more articulated. To do so, a set of scenarios involving the main characteristics and functionalities from focus group sessions is compiled.

In order to gain a maximum of findings, experience and helpful output for our audience, the following methodology is applied:

- The process starts with the creation of scenarios that are designed in line with the findings in the user needs analysis as described in Deliverable D1.1.
- The system must be capable to adapt its answers/options to the participant's needs and requirements.
- The outcomes and assumptions in each country are transformed into the learning scenarios and technology that project partners will use.

2.4 Collecting the stories

A story can be defined as a narrative about a series of events. Typical elements of a story are messages, conflicts, characters and a plot. Storytelling can be defined as linking a set of events. Storytelling differs from abstract information transmission by the stimulation of processes of projection, identification, empathy, imitation and imagination on the receptor side. On the storyteller's side it enables expressing subjective points of view, feelings and personal relevancies about events. In the last years several theoretical frameworks and approaches for storytelling have been developed and storytelling is nowadays applied as an innovative technique in informal and formal educational settings, in organizational development and corporate knowledge management. Stories and experiences have been shared in every culture and in every country as a mean of distraction, teaching, safeguarding of culture and in order to introduce values.

The crucial elements of stories are their message, characters and sequencing, plot as well as point of view of the storyteller. Storytelling is distinct from conversational speech: the teller enters a performing mode through body language, delivery, and attitude. Storytelling involves both audience and teller in a constant interplay of tension between the teller and the audience. Storytelling has several implications for learning and application in educational settings. Stories are usually faster comprehended, better kept in mind and easier transferred than abstract explanations. Related learning processes promote not only knowledge, but also social and emotional intelligence. Storytelling techniques can additionally raise motivation for discussion between participants and engineers.

The consortium decided upon a range of topics which constitute the focal points of the narratives that will be played through by the target group. These major topics are:

- Mobility.
- Alarms.
- Trip planning.
- Collaborative platform.

3 Scenarios

This chapter collects the set of scenarios that have been identified as part of user requirements analysis. Next table lists the name of scenarios considered as well as the functionalities addressed as a whole.

Scenario name	Functionalities addressed
Getting started	<ul style="list-style-type: none"> • The usage of T&Tnet web site. • The possibility of selecting the preferred public transport modes when calculating the optimal routes. • To limit the maximum walking time. • To check accessibility and comfort parameters if available. • To trigger alarms to remember events. • Emotional feedback.
Real time conditions	<ul style="list-style-type: none"> • Introduce the desired arriving time. • Real time public transport information as delays, arrival times and disruptions. • Fire alarms when users need help • Emotional feedback.
Collaborative platform	<ul style="list-style-type: none"> • Find nearby friends. • Add/change accessibility information • Upload pictures. • Share information.
Path sharing	<ul style="list-style-type: none"> • Introduce a shared starting point and two ending points • To limit the exceeded travel time. • To limit the maximum walking distance. • To respect accessibility and comfort concerns. • Lost GPS signal
Synchronization	<ul style="list-style-type: none"> • Checks the last paths of routes that may be shared. • Evaluate of arrival and departures times from starting points and intermediate nodes.

Table 1. Summary of scenario names and functionalities addressed

Each scenario contains the characteristics that the project consortium wishes to reflect. For each of them, a tailored *instance* to a particular city is created. This permits to create as many instances as desired.

3.1 Getting started with T&Tnet

This scenario is intended to show a conventional approach of the application in which users make use of the most demanding functionalities of T&Tnet. The scenario will address the following functionalities:

- The usage of T&Tnet web site.
- The possibility of selecting the **preferred public transport** modes when calculating the optimal routes.
- To limit the maximum **walking time**.
- To check **accessibility** and **comfort** parameters if available.
- To **trigger alarms** to remember events.
- **Emotional feedback**.

3.1.1 Visit to hospital (Paris).



Isabelle is an old woman (75 years old) who lives in 185 rue Vaugirard, in the 15th quarter of Paris. Her street is located in the south-west of Paris 3.5 km from the hospital. Since she has high blood pressure and several family members suffering from vascular diseases, she goes every six months to the Broca geriatrics hospital, in the 13th quarter of Paris, for a medical examination by a specialist. She wants to be sure to arrive on time and she is always afraid of facing unexpected event regarding public

transports, such as technical problem on the line, suppressed train, etc.

As many old persons, she has mild arthritis problems, so she needs to sit in the public transport and climbing stairs might be painful. That is why she avoids the metro (there are lots of stairs at the stations). Except when it's raining, she also likes to walk a bit, for her pleasure and because it prevents her from arthritis pains. Additionally, if possible, she would like to avoid bus or metro lines when technical problems occurs, because the delay might makes her miss her appointment, but also train/bus get crowded.

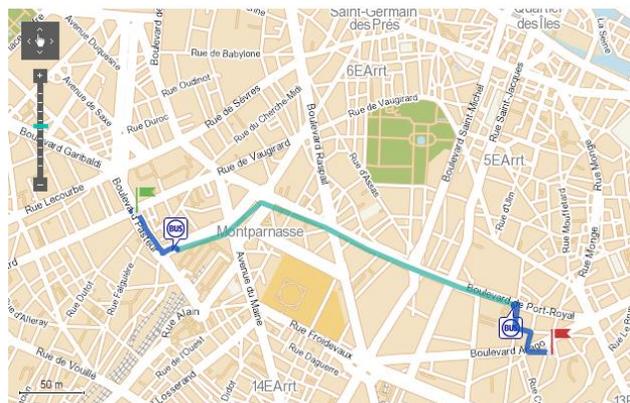


Her doctor's consultation schedule is planned every six months, usually at 10:00 am, so she wants to arrive at the hospital at 9:50 am. The first time Isabelle opens the T&TNet web site and she configures it according to these requirements. She enters the following preferences:

- She selects **to use public transport except metro**.
- In order not to fatigue she configures **walking time up to 15 minutes** and selects to **avoid stairs preferring stations** with facilities (e.g. escalators and lifts).
- She selects **not crowded transport** option in order that she could sit.
- She sets the **arriving time** at 9:50 am.

Isabelle saves her preferences so that she will not need to enter them again (but, of course, she can change any of them at any moment).

The T&Tnet platform suggests Isabelle to take the bus 91 from Armorique - Musée Postal, direction Bastille, up to the bus stop Port Royal -



Berthollet. Isabelle would have to walk from her home to Armorique bus stop and then another 5 minutes to reach the hospital from Port Royal stop.

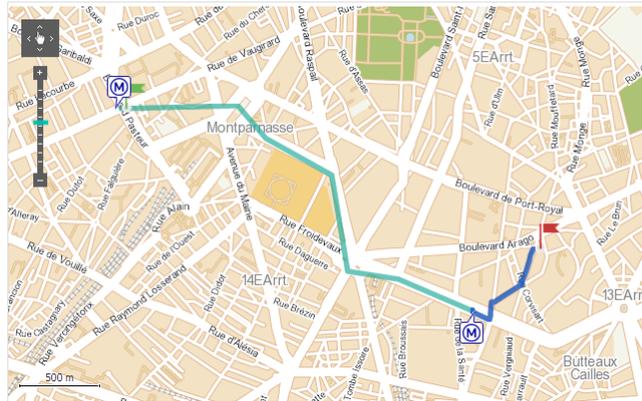
OPTION 1:

A car crash occurs in boulevard Port Royal. The traffic is disrupted and all buses 91 are delayed.

Another T&Tnet user reports the accident in the application.

T&Tnet proposes to Isabelle an alternative way, in order to avoid bus line 91.

Isabelle has to take the metro line 6 direction Nation, from Pasteur to Glacière station. Then she will have to walk 3 minutes to Pasteur and 11 minutes from Glacière to Broca Hospital.



When Isabelle arrives to hospital the T&Tnet application asks **her to enter some feedback** about her satisfaction degree using it. She is very pleased because thanks to T&Tnet she has avoided the traffic problems caused by the car accident and has arrived on time to her appointment, so **she enters** in the application **that she is very satisfied with it**.

OPTION 2:

It's very rainy today. Isabelle would like to avoid walking.

She changes her preferences (selecting “less walk”).

T&Tnet proposes to change her route and to take an additional bus (line 83, direction Porte d'Ivry, from Port Royal – Berthollet) up to Pascal bus stop, located a few meters from the hospital.

3.2 Real time conditions

Real time conditions in the public transport and environment are addressed during the user travel. These updates may affect the behavior and users are given the opportunity to consider them in their displacements.

- Introduce the **desired arriving time**.
- **Real time public transport information** as delays, arrival times and disruptions.
- Fire alarms when users **need help**
- **Emotional Feedback**

3.2.1 Going for shopping (Vienna)



Maria

María has been given for her 73th birthday a new dress but it doesn't fit her because it's too small and, because of that, she wants to change it for a bigger one. The dress was bought in a shop located in a new shopping center recently inaugurated in the south of Wien. She can't drive and she doesn't want her daughter to take her by car to the shopping center, so María decides to use public transport. She has never been there before and she doesn't know exactly how to reach it. Additionally, she needs to buy a medicine so she would like to go to a pharmacy if it does not suppose a big deviation. That's why she uses the T&Tnet web site to calculate the best route.



The shop is open until 13.00h and today is Saturday, so it will not open again until next Monday. Then she wants to arrive at least one hour before the closing time to have time enough to evaluate other products in case she would decide to change the dress not for

a bigger one but for another product (shoes, bag, skirt...). She introduces **12.00h as the desired arriving time**.

The application gives her several routes with different combinations of public transports and walking stretches. Today the weather is warm and María selects a route with a long walking stretch to enjoy the sunny day. As well as, there is a pharmacy not so far, so this route is perfect for her.

She follows the indications as usual. She gets off one bus at 11:00 and walks to the pharmacy. The bus she has to take at the station will arrive in 30 minutes (11:30) so she has



time enough to buy the medicine. When she is about to arrive to the pharmacy the application **detects that the bus is delayed by 30 minutes** and **fires a sound alarm** to advise María. The application **offers her an alternative route** which supposes taking a different bus

line and arriving to the shopping center at 12.10h. She accepts the new route and since then she follows the new route's indications. Her new bus departs in 20 minutes, so she has time enough to buy the medicine. After buying the medicine, she goes to the bus station, gets into the bus and arrives to the shopping center at 12.10h instead of 12.00h.

Once María has changed the dress, she wants to go back home but she is very tired. She feels sick and unable to return home by her own. **She needs her daughter's help** so **she fires an alarm** in T&Tnet, her daughter receives it with the address where María is and then María's daughter takes her car, drives up to the shopping center and carries her back home. Upon the arrival, T&Tnet asks Maria for **feedback**.

3.3 Collaborative platform

This scenario shows how to enter information that users may share for consideration as useful and remarkable to other users. T&Tnet application let users to

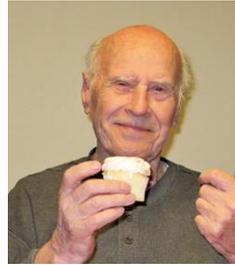
- **Find nearby friends.**
- **Change conditions** on streets

- **Upload pictures.**
- **Share information.**

3.3.1 An unexpected demonstration (Zaragoza)



Jose



Antonio

José is a recently retired man who every morning takes a walk. One day he is walking in the city center and suddenly discovers that a street is blocked. He asks a policeman what is happening and the policeman says to him that there is a demonstration and the **street will be blocked** for one hour. José thinks that this information could be interesting for other users and **decides to share it**. He inserts a notification in the T&Tnet system. In order to do that, he takes and uploads a picture, **marks street as blocked** in a map and **enters 1 hour as the expected duration** of this incident. This way, when another user uses T&Tnet, the application will take this information into account to calculate the route avoiding passing through this street.



Jose continues on his way and **wonders if there is some friend near him**. The T&Tnet application shows him all his friends in an area of radius 300 meters centered on him. José observes that Antonio is 200 meters behind. **Application orders him (by sound or vibration, according to his preferences) not to move on to other areas**. Jose **receives the way to get** Antonio and meets him in 3 minutes. Then they decide to wait together for the end of the demonstration.

When the demonstration finishes, José goes back home. It's later than his usual returning time and he doesn't want his wife to worry, so he uses T&Tnet to find the fastest way to home. The first street he has to cross is the previously blocked one, but this is not a problem because the demonstration has finished and the street is open again. One hour has passed and the **blocked street mark has automatically been removed** so the application can use it again in the route calculation.

3.4 Path sharing

In this scenario, users may share paths on their walks when calculating optimal trips. This responds to the demanding requirement of walking together to chat and share experiences. To do so, they are allowed to:

- Introduce a **shared starting point** and **two ending points**
- To limit the **exceeded travel time**.
- To limit the **maximum walking distance**.
- To **respect accessibility** and **comfort concerns**.
- **Lost GPS signal**.

3.4.1 Back home together (Oslo)¹



Erik



John

Erik and John are friends since they were young. Nowadays they both are in retirement and once a week they meet in the day centre for the elderly to spend the whole morning in the hobby they share: Playing cards. They can lunch at the day centre's dining room but neither Erik nor John does. Both of them prefer return home and lunch with their families. They

¹ The routes provided in this scenario are not real and are only shown for description purposes.

usually stay at the day centre until about 13.00 h. The day centre is located at the city centre but Erik and John live far away (Erik at the north-west of the city and John at the north-east) and they use public transport to return home. Both of them have more than one possible transport combination but they'd like to **make part of the way together** if this not implies great deviations of their personal optimized routes.

By using the T&Tnet system, they try to find out if they **can share part of their back home ways**. In order to do this, Erik enters the address of the day centre (**green mark** below) **as the starting point** and **two ending points** (the addresses of their houses). They are old men and, if possible, they try to avoid stairs, so they select this option in the app configuration section (it's supposed that somebody has entered the accessibility information previously. If not, the app will not take into account this requirement). They don't want the deviations from their optimized routes (**blue routes**) **to be greater than 5 minutes**, so Erik enters this parameter and launches the routes calculation application. Best route for Erik consists on taking the subway ring line in clockwise direction and get off at the 9th stop, the route's duration is 20 minutes. Best route for John consists on taking first the bus line 10 and then the line 23, with total duration of 19 minutes. These two routes have no common part.

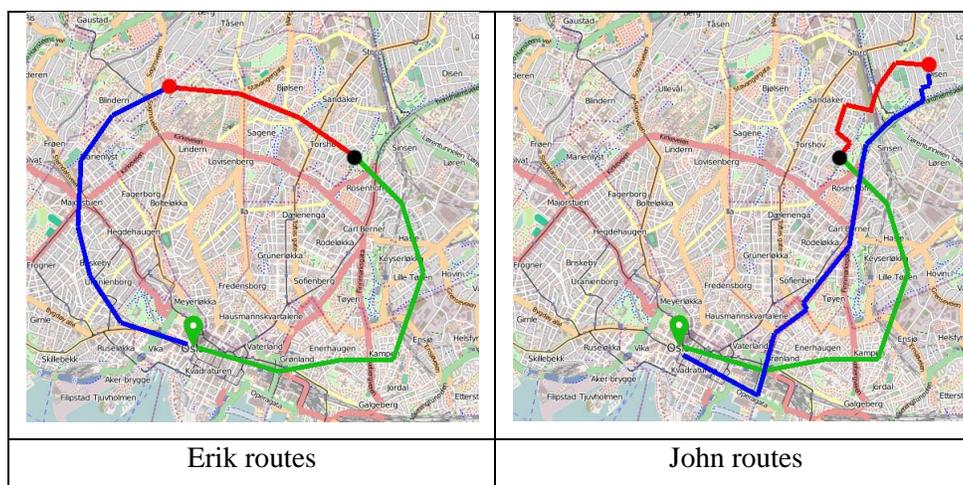
The T&Tnet app gives them two routes (one for Erik and one for John) with more than half of the journey in common (**green route**). The common part consists on taking the subway ring line in anti-clockwise direction. John must get off at the 7th stop (15 minutes), walk until to the bus station (2 minutes) and take the line 15 (6 minutes). By the other hand, Erik must continue his journey in the subway until the 12th stop (it's the same stop he'd arrive to taking the subway in clockwise direction). John's route duration is 23 minutes and Erik's route duration is 25 minutes, so both are inside the limit of 5 minutes.



To make sure that they will not have to climb stairs (the application can't guarantee that because it depends on the urban conditions and it also depends on the fact that somebody

has to have entered this information previously in the T&Tnet system), they search the T&Tnet app for information on mobility and it shows them that all the subway stations they will use are equipped with escalators and lifts for people with mobility problems.

Now, they only have to follow the indications together until the 7th stop of the subway. When they enter into the subway station both mobile phones suffer a loss of GPS signal and fires an alarm to advise Erik and John about it. At the 7th stop John gets off the subway. He and Erik say goodbye and they do the rest of their ways (red routes) to home alone. When John leaves the station and reaches the street his phone recovers the GPS signal, fires an alarm indicating this, and updates his current state and position to continue giving John indications to arrive home. In the same way, when Erik gets off the subway and leaves the station his phone also recovers the GPS signal and fires the corresponding alarm.



3.5 Synchronization²

This scenario describes how T&Tet application can synchronize routes so that users can share public transport paths when heading for a point of interest. In this scenario, T&Tnet:

- Checks the last paths of routes that may be shared.

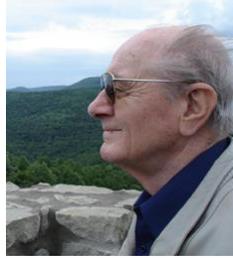
² This scenario is intended to allow synchronization by rescheduling the optimized routes. Users do not have to change the sequence of transport modes and transfers. They only have to change the departing and arriving times to the stops.

- Evaluate arrival and departures times from starting points and intermediate nodes.
- It only works for two people.

3.5.1 Attending a football match (Zaragoza)



Lorenzo



Jesús

Lorenzo and Jesús are friends and supporters of the Real Zaragoza football club. They attend all matches played in La Romareda stadium.

Lorenzo lives in the center of Zaragoza and goes to the stadium by tram (**green route**). Jesús lives in the district of Las Fuentes, in the east of Zaragoza, and has to take two public transports: the bus and the tram (**dark blue route**). Although they live far from each other, they know the last part of their ways is the same (from the tram station where Jesús gets into) so **they wonder how to meet up in the tram** and arrive together to La Romareda.

They have been attending to the stadium for years so they know that most people usually arrive during the 15 minutes before the match. At that time, the doors of the stadium are crowded. They want to avoid this situation so they decide to arrive 30 minutes earlier.

They want to use the T&Tnet application to synchronize the arrival of Jesús at the tram stop in order to arrive to the stadium together. For this, Lorenzo starts his computer and accesses to the T&Tnet website. The web has a routing section in which Lorenzo configures the



routes. The match time is 17.00 h. so Lorenzo sets the arriving time at 16.30 h. and La Romareda stadium as the destination. He also enters his home address (**green mark**) and Jesús address (**blue mark**) as the origins. The application includes the functionality of adding intermediate points to a route, so Lorenzo marks the tram stop where they will meet as intermediate point.

The system returns Lorenzo best route (**green route**) and Jesús best route (**dark blue route**), both routes synchronized to join at the tram stop. Both routes are synchronized. Thus, to assist to the football match and arrive to La Romareda together, they only have to follow the instructions as they always do.

When the tram arrives at the tram stop (**black point**), Lorenzo sees his friend getting on the tram. Jesús gets happy to see Lorenzo on board. The optimized routes of Jesús **keep unchanged**: he only had to leave home 4 minutes earlier than usual in order to take the previous bus to the one he usually takes. Finally they arrive together to La Romareda at 16.30h.

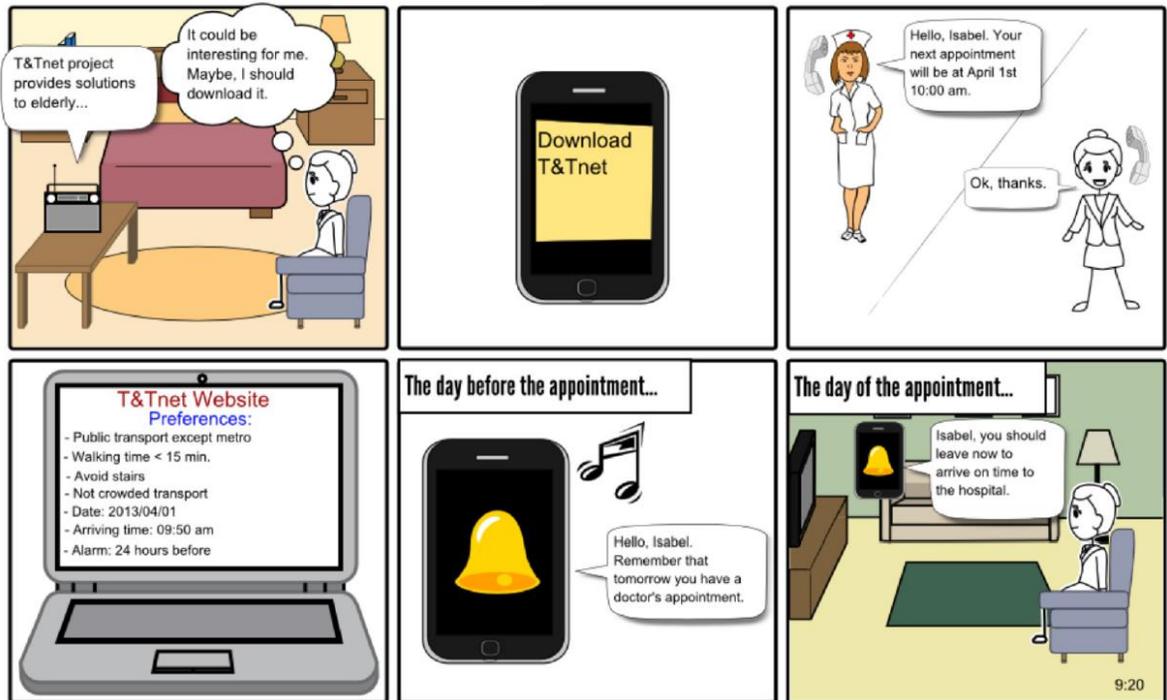


4 StoryBoards³

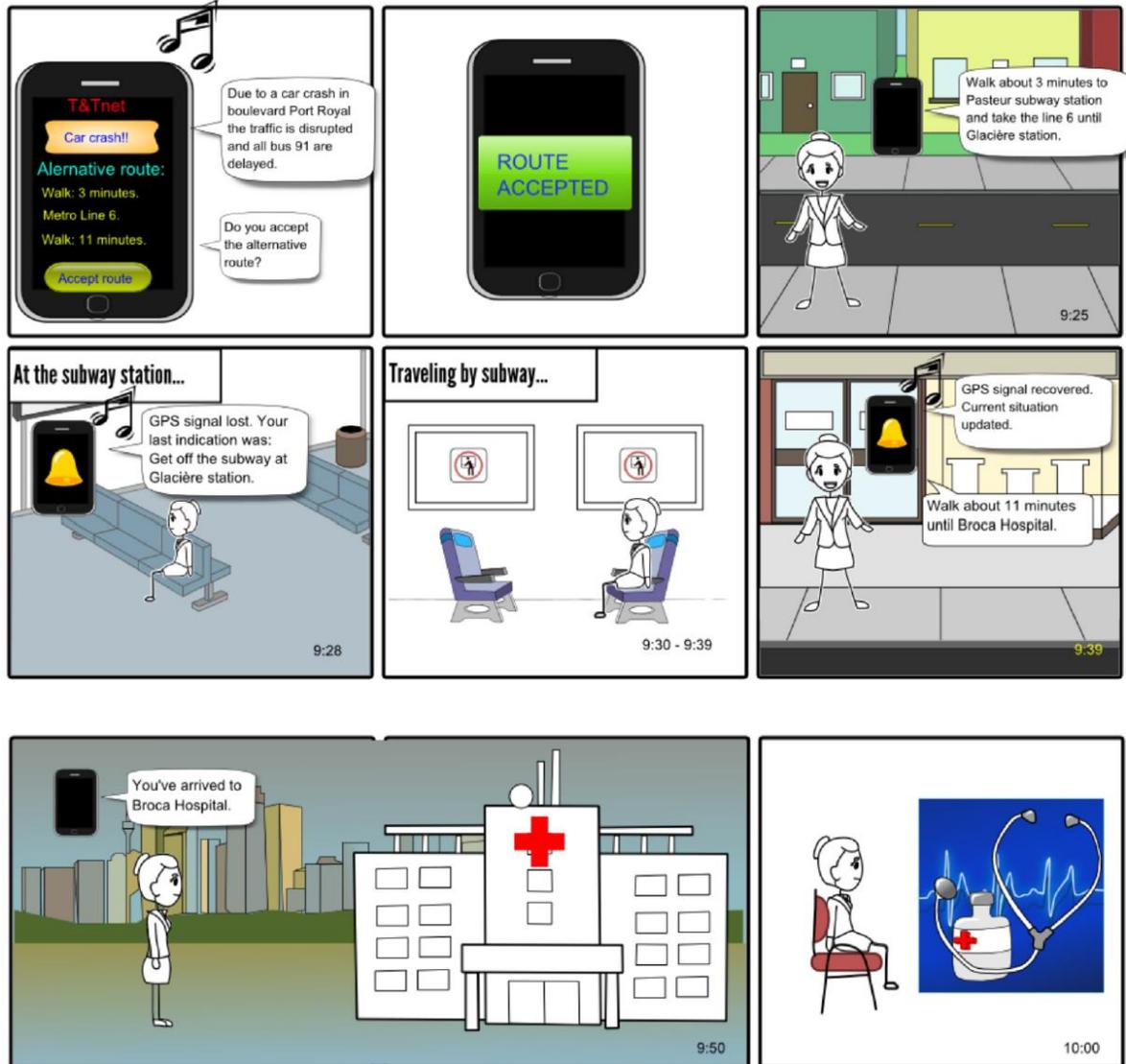
The story boards reflecting the scenarios described above are presented in this section.

4.1 Visit to hospital (París)

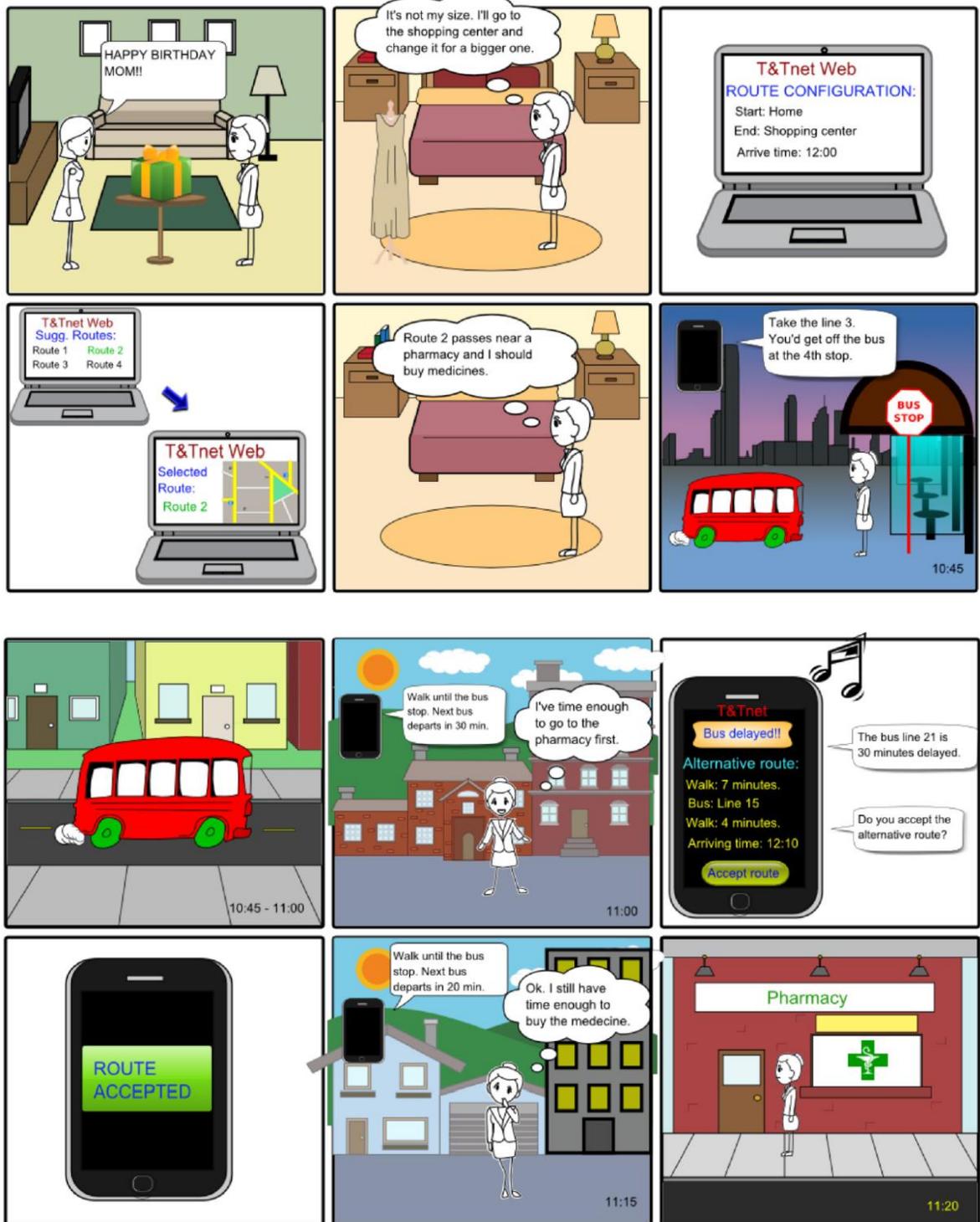
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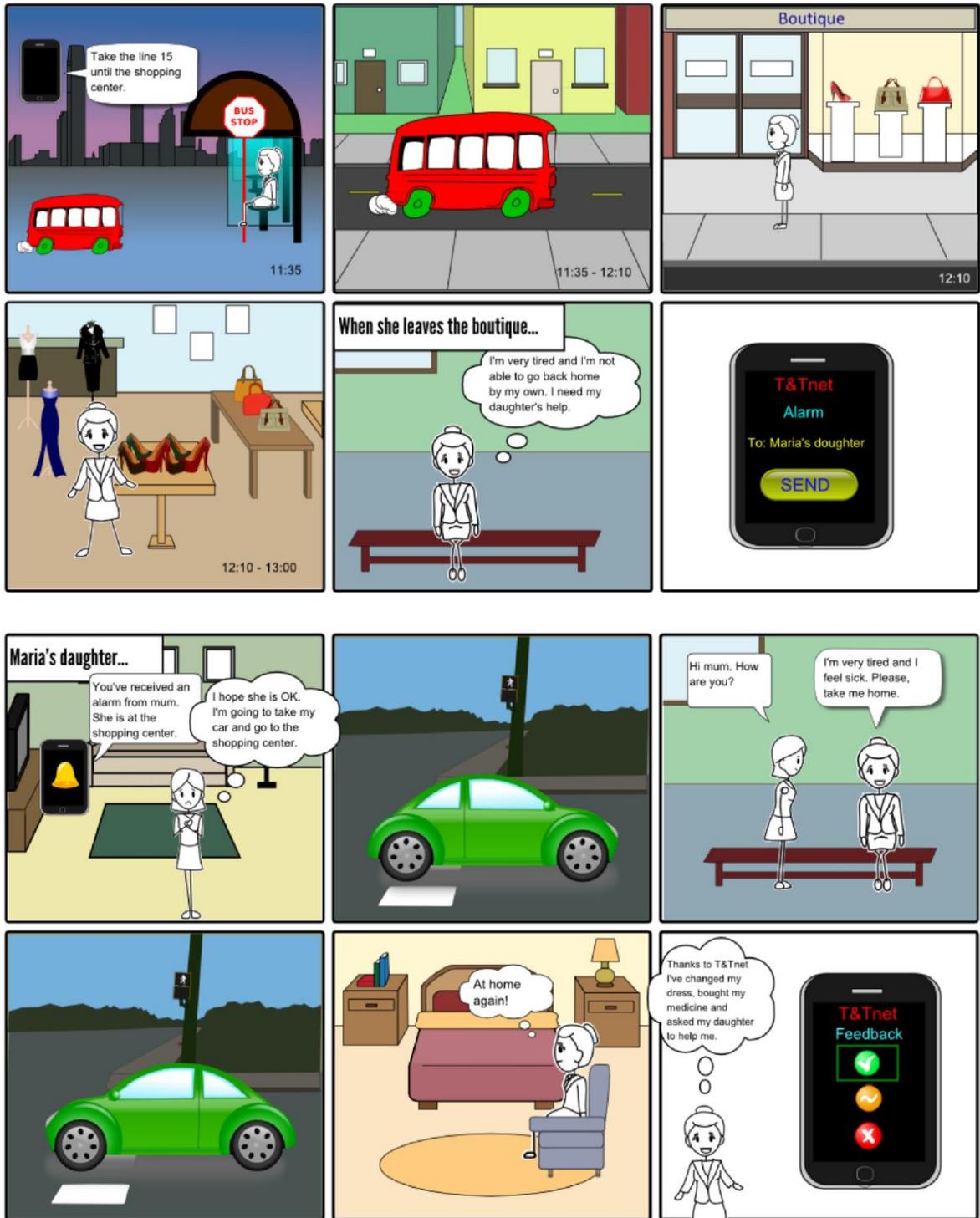


³ The creation of story boards has been performed in <http://www.storyboardthat.com/>



4.2 Going for shopping (Vienna)

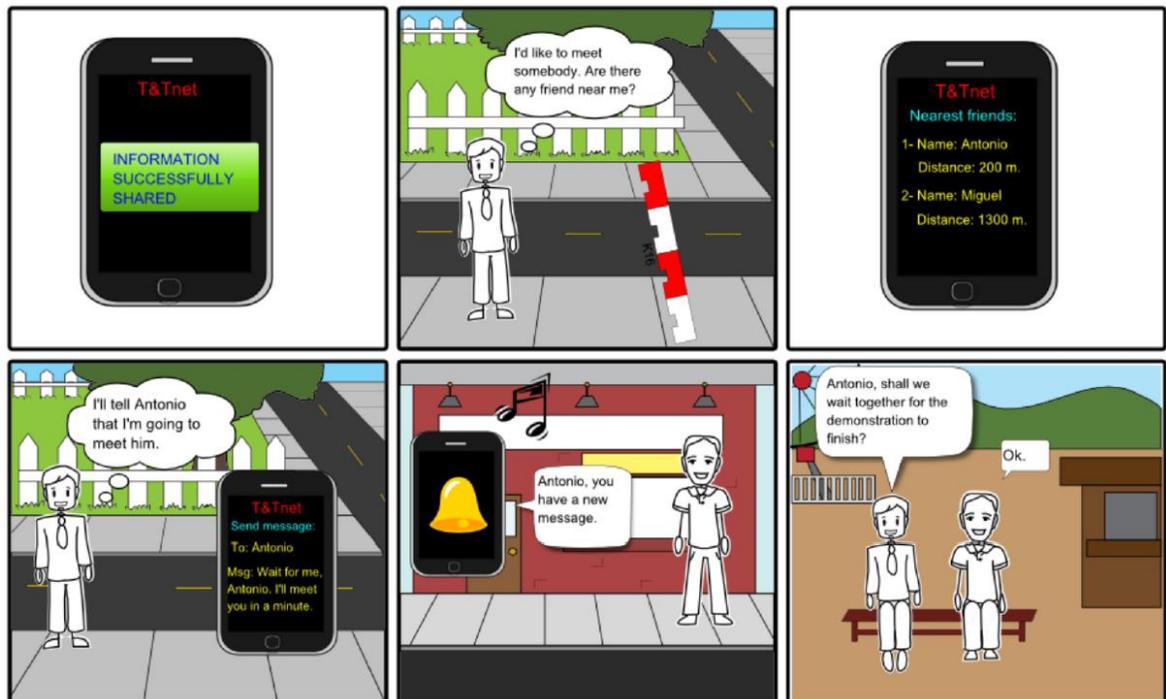
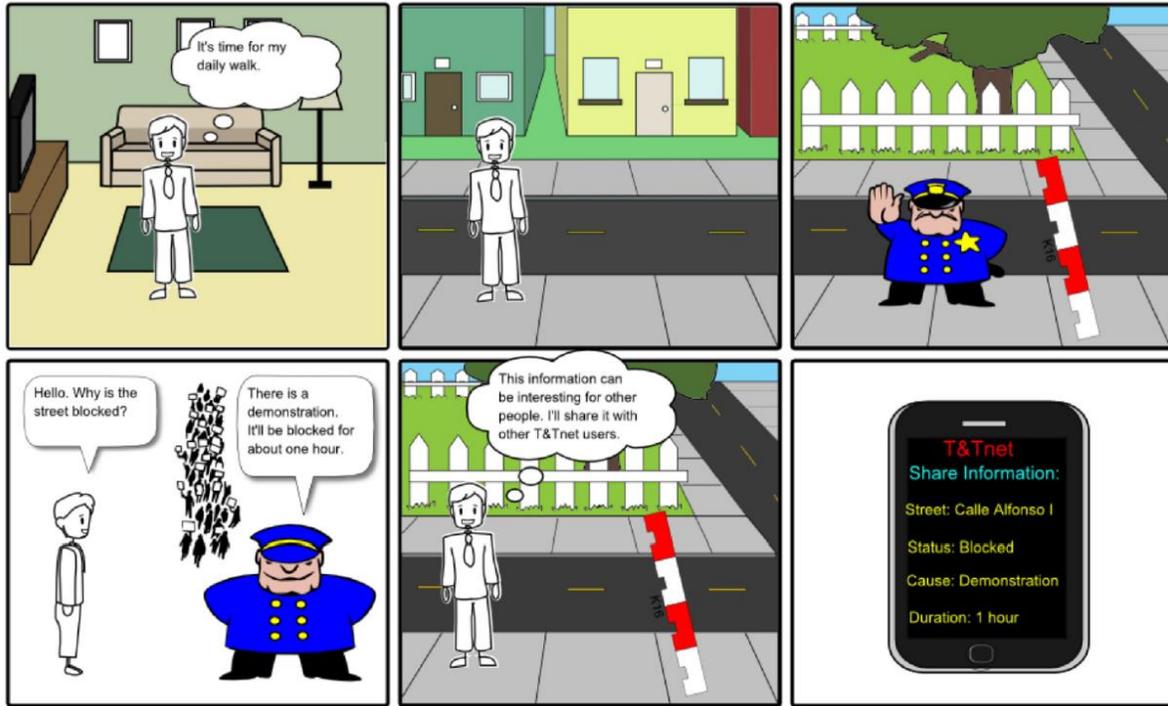


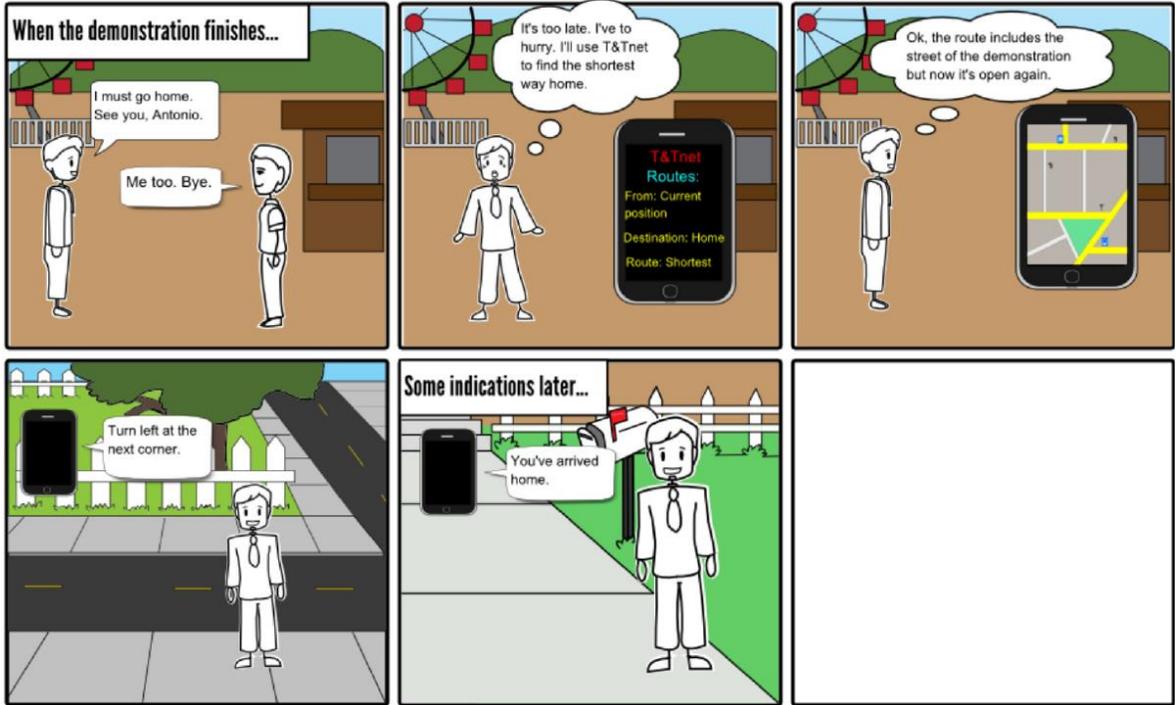


[FBM3]

4.3 An unexpected demonstration (Zaragoza)

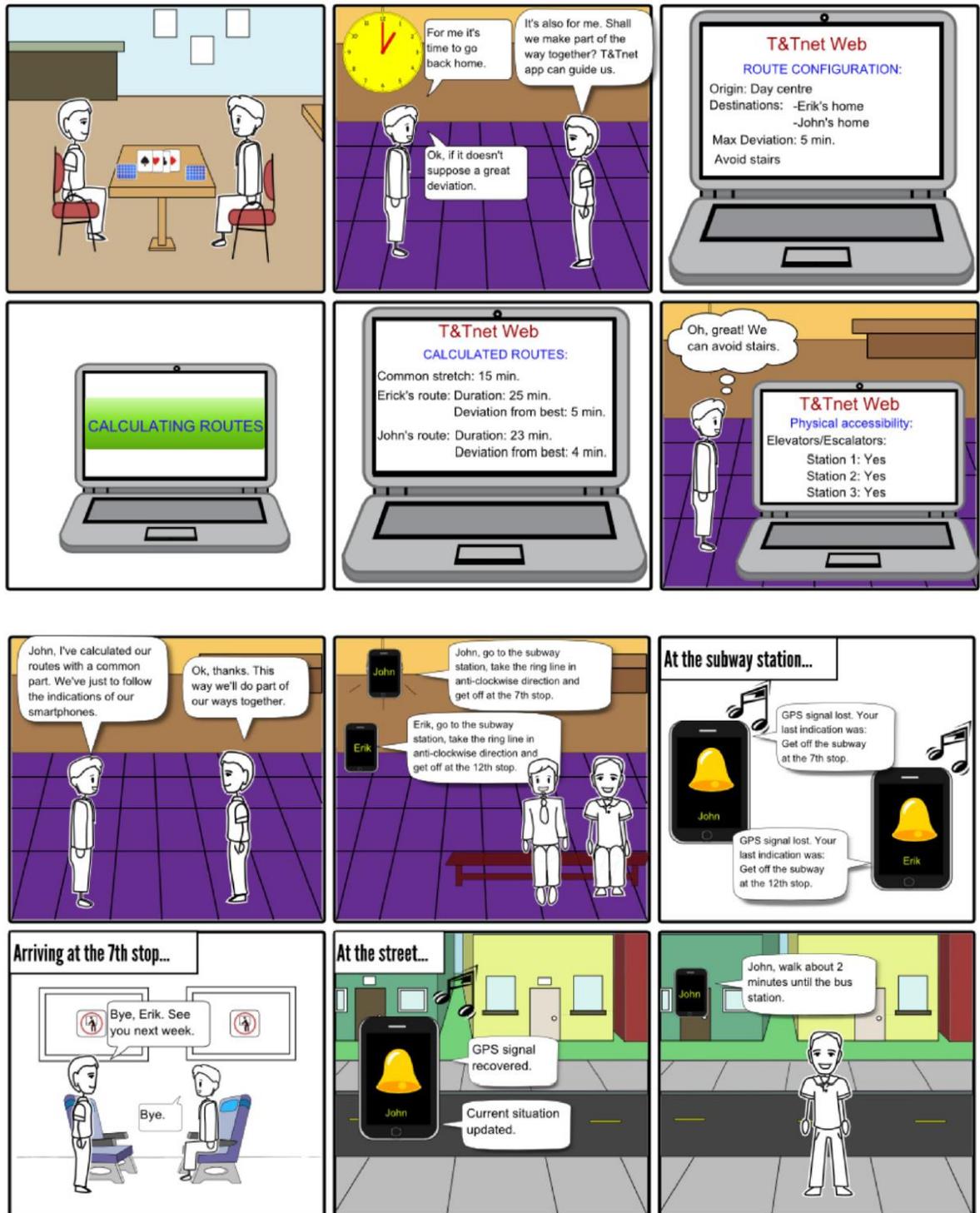
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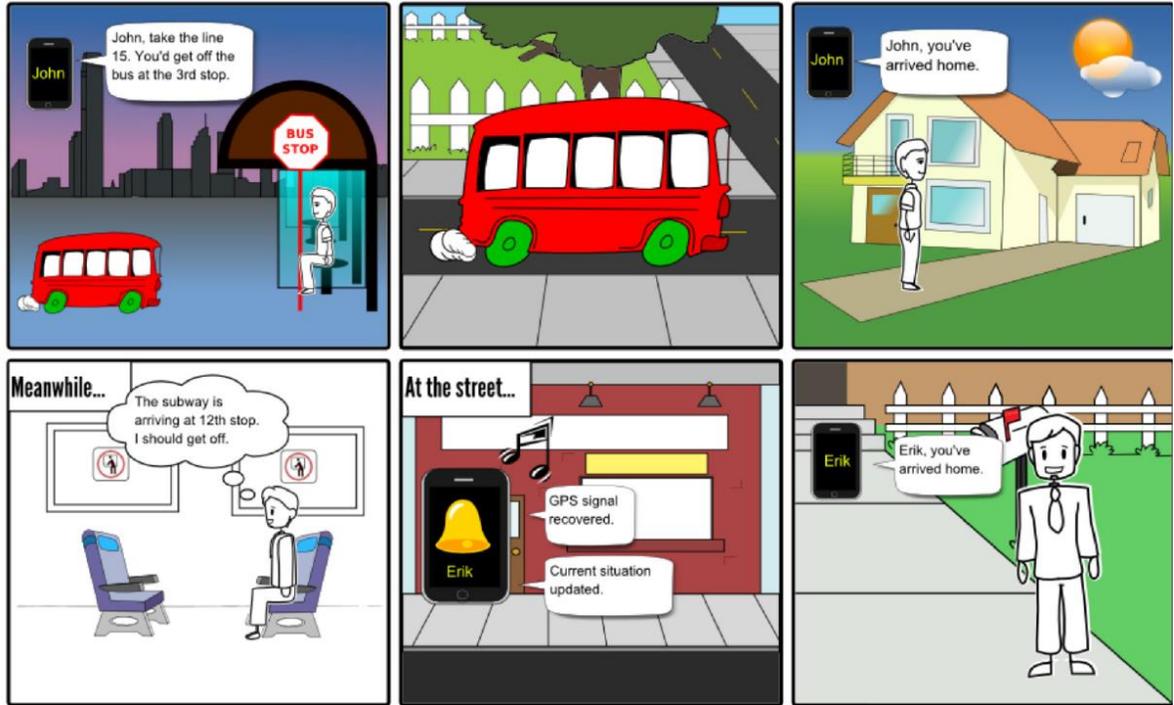




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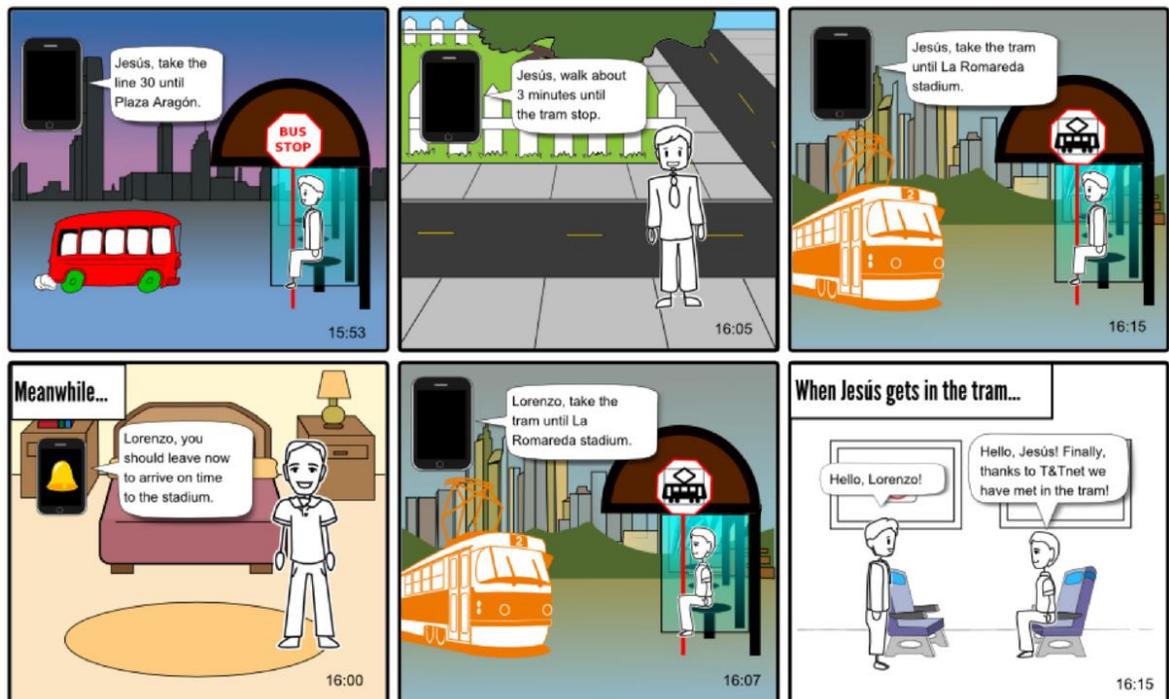
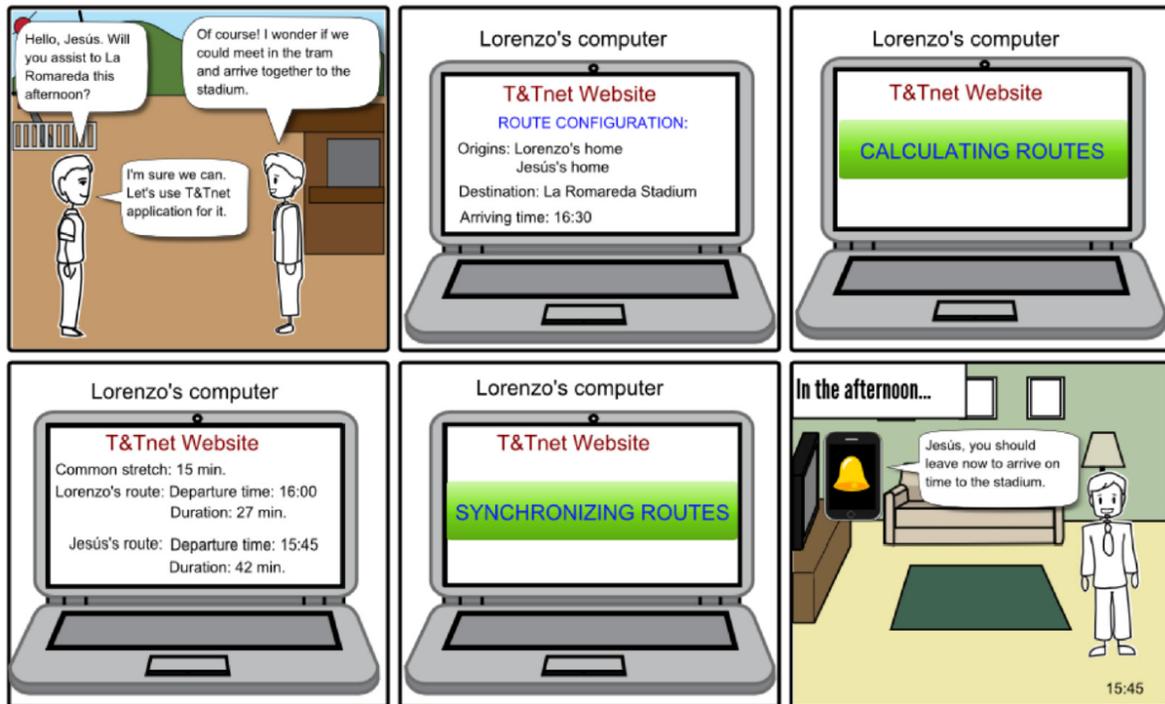
4.4 Back home together (Oslo)





4.5 Attending a football match (Zaragoza)

[FBM6]





5 Conclusions

This deliverable has shown the scenario story board methodology that T&Tnet consortium will conduct to incorporate the final users' feedback into the application development process. Essential characteristics coming from users' analysis have been translated into the scenarios and story boards reflect properly the sequence of events that users may face when using T&Tnet application.

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