

Semantic Portable Profiles Prototyping (SP3)

2.2.2.1 Update to use cases and requirements

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Executive Summary

This document is an update to the use cases and requirements of a mobile service, called Mediatutka, which aims at giving users recommendations when they access the service. These recommendations are based on both explicit and implicit profiles about the user, and it also takes the user location into consideration. The system is also capable of providing proactive information services by matching new incoming content with users' interest profiles.

The Mediatutka user tests were carried out in March 2013 utilising the first functioning prototype of the application. The user test results have been reported in deliverable D2.3.2.3 "Results of the prototyping – Mediatutka application". This document updates the earlier published deliverables D2.3.2.1 (2012) "Use cases, concept definition and evaluation", and D2.3.2.2. (2012) "Requirements for a mobile proactive recommendation information service" by taking into consideration the feedback and experiences of the user test.

Johdon yhteenveto

Tässä dokumentissa päivitetään Mediatutka-mobiilisovelluksen käyttötapaukset ja vaatimukset. Sovellus tarjoaa käyttäjille mediasisältösuosituksia käyttäjäprofiilin ja sijainnin perusteella. Käyttäjän semanttinen profiili muodostuu eksplisiittisen ja implisiittiseen tiedon perusteella. Palvelu pystyy myös tuottamaan proaktiivisia informaatiopalveluja täsmäyttämällä uusia sisältöjä käyttäjien profiilitietoja vasten ja lähettämällä tiedon käyttäjälle ilman että käyttäjän tarvitsee aktiivisesti itse käyttää palvelua.

Mediatutkan käyttäjäkokeet tehtiin maaliskuussa 2013 käyttäen sovelluksen ensimmäistä toimivaa prototyyppiä. Käyttäjäkokeen tulokset löytyvät raportista D2.3.2.3 "Results of the prototyping – Mediatutka application". Tässä käsillä oleva raportti päivittää aiempien raporttien D2.3.2.1 (2012) "Use cases, concept definition and evaluation", ja D2.3.2.2. (2012) "Requirements for a mobile proactive recommendation information service" sisällöt ottaen huomioon saadut kokemukset ja käyttäjäpalautteen.

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1 Overall description

This document consists of the vision and use cases, which have been updated and complemented based on the experiences and feedback of the user tests. The use tests were carried out in March 2013 after the first development year. The updated use case will focus the development work during the second part of the project.

2 Updated vision and use cases

2.1 Vision

The long term vision of the project and applications are:

to provide relevant personalised notifications and recommendations based on a user's *interests, needs and context*. User information is stored as a semantic portable profile, which can be used in different services according to the user's explicit wishes. Information about interests, needs and contexts are combined from various sources and of explicit and inferred information.

User profiles includes and takes into account

- Interests that are known and updated based on
 - explicit information of interests (e.g. own health, hobbies, stock ownerships) given by the user in Mediatutka
 - inferred interests based on information created in connected service like Facebook and Twitter
 - implicit information inferred from user interaction with Mediatutka
- places, their roles to the user (e.g. home, summer cottage, workplace, location of hobbies) and routes between them
- plans and intentions
- social networks (e.g. friends, family, work)
- managing several profiles (e.g. common interests of a family) for group recommendations

The recommendations that use the profile will additionally take into account

- time (e.g. working time, weekend, holiday, time of the year) and
- context.

The profile is usable in different services.

The business model in sight relies on the idea of a service that is both entertaining and value-adding, even problem-solving and proactive. It is targeted at consumers. The service is a helper for the user, supporting the user in managing her time better and giving her meaningful and valuable hints. The application will also entertain the busy consumer who wants to use media in short spare moments.

2.2 Concept

There are two ways of using the app:

1. actively checking the most relevant recommendations and
2. letting the app work in the background and notify the user when a relevant piece of information becomes available.

Recommendations are generated based on the known interests of the user included in the user controllable semantic profile, the location of the user, and the context in which the user is assumed to be and what she is assumed to be doing next. The user is expected to see value in that relevant information is brought to her automatically instead of her needing to be an active "information seeker". The application supports proactive information delivery.

The aim is to make the user interface simple to use. The first vision was an extremely simple user interface with only one click. Clicking the red button would bring the list of recommendations to the user. Based on the user feedback, it is good to have more features in the user interface.

Following issues need to be addressed when designing the next version of the user interface:

- The user needs to be able to understand why certain content is presented to her. Instead of giving an explanation to each recommendation, this need can be met by grouping recommendations based on the way they were generated (profile, location, etc.)
- Indicating clearly items that match closely to the user's interests in the list of personalised recommendations. This helps the user and creates trust in the system. (If there is no genuinely matching content for a user profile, partly related content needs to be separated from well matching content.)
- Opportunity to browse recommendations relating to only one interest at a time.
- Creating links from individual content items to similar content items and hence make it easy to explore related items and provide more detailed feedback on the content of interest to the user.
- Giving other ways to access and browse content, like the latest or the most popular item (if such approach makes sense with the content).
- Making the interface visually pleasing and informative, e.g. utilizing different view types such as grid/tile views and map views and leveraging the images better.
- Grouping recommended content based the on content type (e.g. videos, news or e.g. Entertainment and Utility in separate tabs)
- Giving the opportunity to store recommended items for viewing later

- Exploring other, more fun, user paradigms for liking an item than just clicking thumb up/down, e.g. swiping an item to a smiley in the corner of the screen; overall important to think how the fun and/or game-like aspect in the use of the application could be improved
- Showing quick, visible reaction to actions that users take with the application (like thumb up or indicating hating an interest)
 - Giving emphasis to items that match recently added interests
- Offering enough information of the recommended content

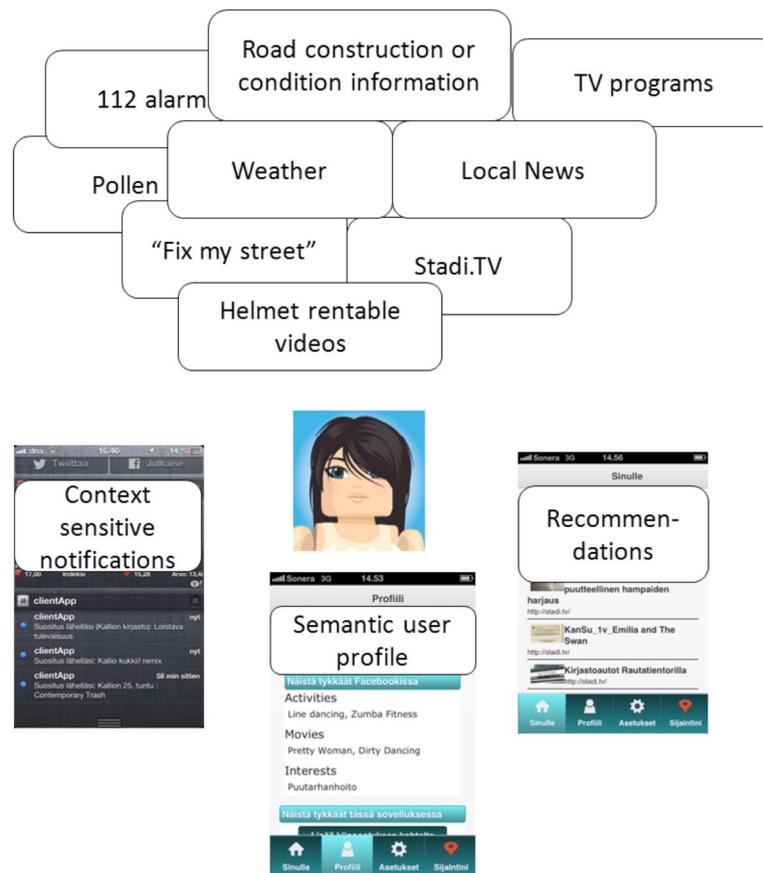


Figure 1 The concept of the mobile prototype

The content in the user test was TV programme recommendations from Skimm-tv, StadiTV videos and information of rentable HELMET movies. This is clearly a too narrow pool of content and it did not include such elements that could help users in managing their daily lives.

Based on the user feedback and availability of content we will include following content sources in the next version:

Content	Role	Context when to emphasise
Skimm.TV recommendations	Entertainment that can be consumed in other channel (TV) and later	Late afternoon, evening
StadiTV videos	Entertainment that can be viewed when recommended (at the moment)	On the move (can be viewed online)
Helmet rentable videos	Supporting finding content when content is available close by	On the move or before starting a route that takes the user close to the item (can be fetched on the way).
Exception info from public transport	Help to avoid problems in commuting and transportation	When the user plans to use the route where exceptions occur. Users who often commute in affected area/route.
Info about road construction or conditions	Help to avoid problems in commuting and transportation	When the user is inferred to plan to use the route where exceptions occur. Users who often commute in affected area/route. Specific information can be targeted for example to bikers.
Local news	Inform and entertain the user.	When commuting in public transport (based on location) When something relating to the users' interests and frequently visited places is in the news.
112 alarms	Inform, and to help take action if possible	Those going now, soon or usually in the affected area.
Weather	Inform, help to avoid problems.	Warnings to everybody when extreme conditions.

		Based on personal info, more notifications. Basic information could be always available.
Radiation	Warn when some exceptional radiation is identified	To anyone using the system if reason for concern
Water levels (current & forecast)	Help to take action to reduce potential damage	Owning property or living in an affected area.
Pollen (current & forecast)	Medical condition, for example allergic person	Being near or likely to go to an area of high pollen level
Twitter – originated data	Supporting finding content, inform and entertain. Alerting user on personally relevant emerging "events/topics" or on location-specific "events/topics"	Being near or likely to go soon to an area where unusual Twitter activity has been identified.
User generated "Fix my Street" type of content about the neighbourhood	Inform, help to avoid problems.	When something relating to the users' frequently visited places

The accuracy of recommendations can be improved in the following ways:

- Updating the explicit profile with the implicit profile more quickly and clearly.
- Trying to find ways to get the user input on the explicit profile quicker e.g. using stereotype profiles as a fun way to find a profile matching closest to yours
- Giving the user the opportunity to like (thumb up/down) not only individual content items but also what aspect they liked about the item (e.g. liking a specific metadata field)
- Allowing user to link places to context, at least work and leisure
- Getting and utilising information of user defined locations and frequent routes with context (home, work, sport) as well as utilising other available location context data (e.g. from Foursquare) .
- Varying the recommendation and notification selection and prioritisation criteria based on the time of the day and the inferred context (when present in home-office location, no tourist information presented).

- Adding metadata to the user based on the location where he or she is (work, home, but also possibly suggesting keywords based on the location, e.g. being in Otaniemi may indicate interest in technology, architecture, nature, etc.)
- Giving more emphasis in the recommendations to interests that have been added lately into the profile.
- Looking for opportunities to connect additional data sources to get information of user intentions and plans (calendar, to-do-lists, goals).
- Trying to capture also user intentions. Adding more information to the user profile from additional sources such as Twitter and improving the utilisation of information coming from Facebook
- If possible in the UI, allow the user to show the strength of the liking more easily and more expressively

Issues to consider: how to give recommendations before the user starts a journey because it is hard to notice and change plans once on the move.

2.2.1 Features and use cases

The list of key features of the prototype is presented below updated based on the experiences and feedback of the user tests.

Features:

- The user can create and update a profile using a mobile device by defining topics (or interests) and indicating one's relation to them (love, like, hate).
- The profile will be automatically updated based on the user's activities like commenting and reviewing (thumbs up or down), and storing in favourites.
- Information can be imported to the profile utilising the information that can be imported and analysed from the user's social media accounts (Facebook analysis; Twitter, etc.).
- The user is able to share only part of his or her profile to a service using the portable profile. The profile will be modular in a way that is easy for users to understand, use and manage such as: Demographics, interests, intentions and real identity.
- The user is able to connect his/her profile with those of his/her friends and to get recommendations based on this combined information.
- A user is able to
 - indicate meaningful places of his/ her life together with their roles :
 - on a map or using GPS functionalities of her phone.
 - Roles: home, work place, summer cottage, hobbies, parents, friend, daily groceries, favourite café etc.

- actively pull personalised recommendations out of different kinds of content sources within one service,
- get notifications based on his or her interests and context (push) out of things that are particularly valuable at the place and time where the user is located,
- control different aspects relating to receiving push notifications (allow or not, how often, which topics or conditions),
- browse recommended content (pull),
- store recommended content as favourites for returning to them later,
- search content (this provides the user an alternative way of finding material and information),
- get recommendations based on the whole profile or by selecting only one interest at the time,
- give feedback on the content (thumbs up or down),
- see which recommendations and content his or her friends have liked, and
- share recommendations and notifications to his or her social network. (support alternative way of finding content).

The use cases below illustrate the features mentioned above. The project group will prioritize features for implementation.

Use cases

Use Case 1: Creating and updating a profile

Liisa's friend Leena has praised the Mediatutka app, so Liisa decides to try it out herself. She logs into the service with her Facebook account and gives the service permission to use her Facebook information for creating her profile. While her personal profile and first set of recommendations are being generated her attention is drawn to the location based recommendations. After looking at them for a moment, she notices that there are personalised recommendations for her. She is pleased to notice that there are gardening related items on top of the recommendations for you section

After having used the app for some days, Liisa starts to wonder what information her personalised recommendations are based on and notices a link to her profile. She sees the interests that have been inferred based on her Facebook account. She notices that her profile includes her interest to allergies, because she reviewed (thumb up) an article relating to this topic earlier in the service. She adds 'asthma' as a medical condition to the service as she has got this condition since she was a child.

Liisa adds the location of her home, work place, her children's day care centre, and summer cottage on a map, as well as the sport arena, where she has the dance lessons. The service will make recommendations and give notifications relating to

these places and taking into consideration the type of the location. In addition to these points of interest (POI), Liisa records her work route in the service by clicking on 'Follow me' when leaving home for work and clicking on 'Stop following' once she arrives at the office. Liisa also records her hobby travel route by clicking on 'Follow me' when leaving office for a tennis lesson and again 'Stop following' once she arrives at the tennis court.

Use Case 2: Controlling notifications

Liisa notices that she is able to give the service permission to send notifications based on her context and interests. She can see that she can cancel the permission later on, if she decided to do so.

Liisa has indicated in her profile that she suffers from asthma. The application shows a warning about high pollen level estimate for tomorrow on her usual travel route. Liisa also gets a notification about high water level forecast that is going to affect one of her POIs (point of interest): her summer cottage on the West coast of Finland.

Use Case 3: Getting notifications

Liisa is soon leaving for home from work, and she receives a notification about traffic jam on the "Kehä 1" road. She had been thinking about whether to go to an extra dance lesson after work, but as the road is blocked, she decides to skip it and keep on working a little bit longer.

Use Case 4: Viewing recommendations in bus

Liisa is going home from work by bus and logs into the Mediatutka service and looks at the recommended content for today. There are several new items there, and Liisa notices a video that interests her, but it is too noisy in the bus and she saves it into Favourites to be viewed later when she is in a more quiet location.

Liisa has noticed that checking the local news via Mediatutka in the bus works very well: the app shows all the news that relate to her regular locations without her needing to make any adjustments. Sometimes, when she is tired, she only waits for location-based notifications, which is kind of fun as long as there are not really bad accidents that she is notified of.

She likes the way that the user interface shows, which items can be viewed directly, and of the rest there is enough information to help her decide whether to view or read the content when she has the opportunity to do so.

Use Case 5: Giving feedback

Liisa looks at the content that is shown in the user interface. A couple of articles raise her interest, and she gives positive feedback by pressing 'thumb up' on these articles. Articles are stored into her favourites so she can find them easily later on. These articles deal with a topic that is not included in her profile, so the app adds this interest to her profile. If she'd checked her profile, she could see this topic included with information that it was because of her 'thumbing up' in the app.

Use case 6: Utilising the user's social network

Liisa shares interesting event information privately to her friend Leena via Facebook integration: the message goes to Leena's Facebook inbox, because Leena is not using Mediatutka app yet. When Leena installs the app, she gets to see the content of the privately shared article.

Liisa is also able to see what kind of content her friends have liked. Mediatutka articles that Liisa has thumbed up can also be seen as her likes in her Facebook profile.

Hanna – Another friend of Liisa's – browses her Facebook feed and sees an article that Liisa has liked in Mediatutka. Hanna taps the article to know more, and she is taken to the Mediatutka app where the details of the article are shown.

Hanna thinks that the article is worth reading for many of her friends and chooses to share it openly with some words of recommendation. Hanna chooses to publish it on her own Facebook wall, which manifests as a share type of object in Facebook. The shared item also serves as a link to Mediatutka app, like private shares and likes.

Use case 7: Predicting user role

As Liisa has updated her profile with semantic concepts and Points Of Interest (POI) and route information, her recommendations can be ordered based on her context (work, leisure). Liisa can also explicitly ask the application to give work related recommendations. These take as a starting point her interests exported from LinkedIn. In addition, the service can monitor the user location and determine whether the track is towards a home address and activate the 'Home' profile without user's explicit interaction. This prediction of a role is based on monitoring of user position and mathematical proximity of user's track to a previously recorded track.

Use case 8: Utilizing social network data sources in user interest profiling, content discovery, and proactive services

Liisa is an active Twitter user and she often posts tweets that include links to web pages that interest her. She links her Twitter account to Mediatutka, which can utilise Liisa's tweets to add more information to her profile. Mediatutka gets her tweets daily and in making recommendations gives emphasis to those interests that have been identified most recently in her tweets.

Liisa is going home from work. Mediatutka has noticed that there is unusual level of tweeting activity close to Liisa's route. Liisa will get a notification that there is a big free concert in the park just few kilometres from her house. She decides to participate to the event and enjoy the lovely weather and good music. At the same time she follows tweets around the event and participates in Twitter discussions.

3 Research questions in 2013

A more complete user model is needed for the Mediatutka application and to reach the full potential of semantic portable profile. The user model should not only reflect past interests and actions but it should be future oriented and help answer the question of what information and content will be of interest and value to the user at each point of time.

From the research point of view, the *building, updating and utilising a predictive user model* is a key task: what information should a predictive user model contain and what are the sources that can provide this information with optimal balance between ease of use and reliability of information. The work will be focused on utilising information about users' common routes (e.g. between home and work), points of interest and interests based on role such as leisure or work.

Predictive user model together with contextual information will be taken into consideration when generating recommendations.

The second research question deals with analysing natural language: geocoding natural language content and semantic profile creation from natural language.

In geocoding two aspects need to be looked at: how reliably a geolocation can be generated for content items and how different levels of location information should be used in making recommendations. The latter issue deals with cases, where a fairly large geolocation has been identified for a new story, for example Espoo or pääkaupunkiseutu (capital area).

In semantic profile creation from natural language social networks such as Twitter provide constantly updating data sources that can be used in several ways. User profiles can be updated based on the semantic analysis of content they create ("tweets"), semantic analysis of content they refer to in their tweets, and by analysing users they are interested in ("following"). Topical "events" (in very abstract sense) can be identified when there is an unusual level of activity of users or unusual activity in a location. Semantic analysis of (large population of) users' tweets is another way to identify what the topical "event" is about.

Proactive services can be based on for example alerting user on personally relevant emerging "events" and alerting user on location-specific "events" (perhaps in combination with predictive model on where user is likely to be in the near future)

Project partners will evaluate to what degree the already developed semantic tools (VTT) would be suitable for these purposes. If promising, further pilots with media discovery and or location-based proactive notification services can be done with Twitter-originated data.