

# **Platforms for Local Mobile Services: Case studies of Commercial Applications in Germany**

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**Abstract:** Local mobile services offer great commercial opportunities in consumer and business oriented applications. Platforms can encapsulate technical details and thus enable also non-technical companies to provide such services to their clients or employees. Ten existing applications are described with a focus on business models and cooperation, and their technical and organisational lessons learnt are elaborated. From these results, crucial requirements for such platforms have been derived, such as their independency from network providers and localisation technologies. Moreover, two future scenarios for local mobile services in the publishing and in the maintenance domain are detailed, stressing the tasks of the involved players.

## **1. Introduction**

Local Mobile Services are data services made available to mobile users via networks in a location or context-aware way. There is a market dilemma today: On the one hand, small and medium sized enterprises would be willing to offer context-specific services to their customers or employees, but network operators lack the appropriate service portfolio to support industry-specific demands. On the other hand, infrastructure services, such as the intended Galileo system, need their integration into business and consumer services to justify the investments in such localisation services.

A platform operator could be a mediator providing technical services to different kinds of organisations. Technical services would be integrated and more easily accessible for many companies and their applications.

This requires a controlled service environment in which business and consumer services can be offered by any, even small or medium sized enterprises (SME) at an acceptable operational cost. Next to connectivity via various access networks (2G/3G, WLAN, DSL, etc.), enabling services have to be available on the platform, such as identity or presence management and charging, which can serve as building blocks in creating company-specific mobile user services.

The implementation of this vision does not have to start from scratch, but can profit from existing commercial solutions of mobile platforms that already operate successfully for various application domains. To use and build upon these solutions and the experience thus gained the business situation for local mobile services was examined by case studies, market potential analysis and scenario descriptions, from which suggestions and requirements towards software architecture, user interfaces and relevant services were derived.

## 2. Objectives and Methodology

This paper describes the results of ten in-depth case studies of platforms and applications for local mobile services which were conducted during 2006 in Germany. Highlighted are the business ideas, the involved players and their cooperation, as well as the technical principles. Some general requirements derived from all the case studies are highlighted, and possible application scenarios presented.

There have been more than 20 Research and Development Projects in the 6<sup>th</sup> Framework Programme dealing with location based services, mainly IST-oriented, most of them with a focus on transport and tourism, covering many different location technologies, networks and devices [1]. Many of the solutions are streamlined for a specific scenario. The presented platform approach aims at an openness of application areas. Other existing concepts like Simple Mobile Services intend to simplify the mobile user interface to avoid complexity [2] but they do not offer the opportunity to design solutions for specific industries or companies. Also ModiFrame aims to develop a technical framework for SMEs to develop and operate mobile services [3], only it is limited to data communication and is mainly stressing the technical but less the organisational aspects.

In total, 17 case studies were gathered and analysed to reflect the status of platforms for local mobile services in practical applications [4]. Ten of these existing local mobile services were selected for deeper elaboration, presenting implementation status and commercial usage of the services, and the added value gained by localisation and mobile use. A structured description was generated based on the analysis of a guideline-supported personal interview with the platform suppliers and operators [5].

## 3. Case Studies for Local Mobile Service Platforms

In the analysis we distinguished between four segments of local mobile platforms: "Community Publishing" and "Tourism", which represent the business-to-consumer (B2C) market, as well as "Maintenance Servicing" and "Hospitals" as part of a business-to-business (B2B) market.

All the case studies were evaluated regarding the business ideas, the involved players and their cooperation, as well as the technical principles in a detailed German publication [5]. In this paper the idea and services along with lessons learnt are highlighted.

### 3.1 *Mobile Services by Newspaper Publishers*

The "MINDS-platform" (provided by dpa-infocom, Hamburg) deals with daily regional newspapers that offer interaction with mobile newspaper readers to increase customer loyalty. The platform offers local news and community services by regional media to newspaper readers using mobile devices. dpa-infocom provides the platform for mobile functionalities and services, such as AdAlert, MobileMMS, MobileSMS, MobileAudio and NewsAlert, but also games or photography competitions.

Project lessons learnt are:

- Close relation to the mobile user (via daily newspaper) is crucial for acceptance.
- Simplicity of technology and offered services leads to success.
- ASPs are able to run platform and services without contact with network operators.

### 3.2 *Touristic City Information for Mobile Devices*

"QuickScout" is a product by Yellowmap (Karlsruhe) and belocal (Bamberg) that aims at tourism, business travelling and citizen information. The business idea is based on time, profile and location related editorially proven information and visit suggestions. QuickScout provides local information about anything in the person's vicinity: city maps,

routing, company addresses, shopping guide, events, emergency services, etc. The platform aspect is that many content providers can integrate their regional content. Furthermore, event-specific extensions are easily possible.

Project lessons learnt are:

- Close technical integration in Internet service (content, hardware, software) allows attractive mobile business model.
- Complicated cooperation with network operators result in unclear service strategies, short-term marketing activities, permanently changing contact persons.
- Trust between content and service partners is necessary for timely implementation.

### *3.3 Knowledge and News in and about a City*

"Stuttgart mobil" offers tourists a multilingual online service, accessible by mobile sources which can be used by anyone using an Internet-enabled mobile phone. The service provides tailor-made information for mobile users based on the Internet Content Management System of the City of Stuttgart.

Project lessons learnt are:

- External event (WM 2006) created political support.
- Reduce online content for mobile usage scenarios.
- Concentrate on editorially controlled content.

### *3.4 Public Transport Tickets for Mobile Phones*

"Mobile Ticketing" is a service that allows the user to acquire tickets for a bus and/or train by using the mobile phone. Tickets for special zones, day tickets or tickets with start and end point can be bought. The user receives the ticket via SMS. The service can be used by anyone travelling with a mobile phone which has a mobile ticketing application (J2ME), or alternatively use it can be used at home via a web browser. The platform was developed by Siemens Business Service (Paderborn) and the service is provided by different public transportation services in Germany.

One lesson learnt is that the integration of positioning data is very important.

### *3.5 Intelligent Fleet Management*

The company Fleetboard (Stuttgart) offers fleet management for trucks in order to reduce consumption and wear of vehicles, manage order schedules quickly and easily, view vehicle location and trip tracking at a glance, and allow safe and comfortable navigation throughout Europe. Users of the platform are truck owners, both with small and large fleets.

Project lessons learnt are:

- A close connection to Mercedes-Benz simplified contact to clients in the marketing phase, but specific sales support is still necessary.
- The connection to the technical truck development improved the solution development.
- After a tested prototype was developed, a completely new organisational set up was necessary to introduce the product.

### *3.6 Business Process Integrated Dispatching*

The company easyfleet (by Euro Telematik, Ulm) allows fleet management with industry-specific adaptations. This enables efficient order processing with a high degree of customer satisfaction due to business-process-integrated fleet management. For example, company-specific locations and context-dependent mobile services can be defined. A platform is used by companies with small or large fleets, e.g. furniture industry, security service, shipping company, silo transport. General functions are vehicle localisation and tracking, evaluation

of vehicle and related devices data, and also bidirectional integration with ERP and other IT-Systems.

Project lessons learnt are:

- Clients need to see the added value of a technology for their business processes.
- Client-driven project-specific development of new services is a key success factor.

### 3.7 *Mobile Data Communication and Telematics*

Besides fleet management, Sycada (Munich) offers customers measurable benefits from wireless technology in its m!-Series. This is applied to many industries with field staff, machines, vehicles, etc. such as car rental, street cleaning, and airports. The platform provides a middleware to handle mobile network challenges and on that base is able to manage field staff, remotely controlled machinery, and track vehicles.

Project lessons learnt are:

- Test new mobile devices intensively before passing it to clients.
- Develop new solutions together with clients and specialised partners, not alone.

### 3.8 *Quality Improved Track Measurement*

The company Plasser+Theurer (Linz, Austria) developed the machine EM-SAT+GPS, which is a high-output railroad construction measurement system which uses GPS reference points and GPS localisation for better measurement quality. The users are railroad construction companies, and specialised track measurement service providers for track geometry survey when preparing for tamping of the track, or track relaying and rehabilitation sites, acceptance of newly built tracks. Additionally it makes it possible to establish a track geometry database where this data is unknown.

Project lessons learnt are:

- Changing contact persons at the clients hinder implementation.
- Outsourcing of technical services lead to know-how drain by client contact persons.
- Cooperation with universities and research organisations is useful for technical improvement.

### 3.9 *Mobile Facility Management*

"mobile Facility Management" (mFM) is a PDA-based solution for a comprehensive treatment of tasks in the area of the facility management, provided by f+s software (Berlin). The system allows decentralised, barcode, RFID-based management of different activities. By interfacing to the central systems ERP and CAFM (computer aided facility management) a row of treatment functions can be automated. Functions are, for example, track position and work time, transmission of order information and work state, integration of information from other applications, planning of work assignment, and work tour planning. The applications are used in the security and facility management business.

Project lessons learnt are:

- GPRS bandwidth is too low for some functions.
- It is necessary to support all mobile networks and devices.
- It is necessary to read sensor data and barcodes.
- It is necessary to have a better indoor localisation and navigation.

### 3.10 *Patient and Device Information in Hospitals*

The "medical dashboard" (by Dimension Data, Oberursel) visualises the positions of medical devices in hospitals as well as status information for patients and rooms. For example, the patient status, including waiting time, can be displayed on a central

anonymous dashboard. Additionally, an event-based alert system sends alerts while considering staff roles and positions. Moreover, workflow support for operation planning is possible, and inventory and overview of device positions for better usage are in place. The common platform of functionalities can be adapted to specific demands of several hospital wards, ambulance and operation areas, etc.

Project lessons learnt are that the central visualisation offers a common understanding of a complex and changing situation that requires individual decentralised decisions.

#### 4. Generic role model

Analysing all the existing and also the project-intended platforms for local mobile services, we discovered some generic roles that help to understand the tasks and interests in such a complex environment (see also Figure 1):

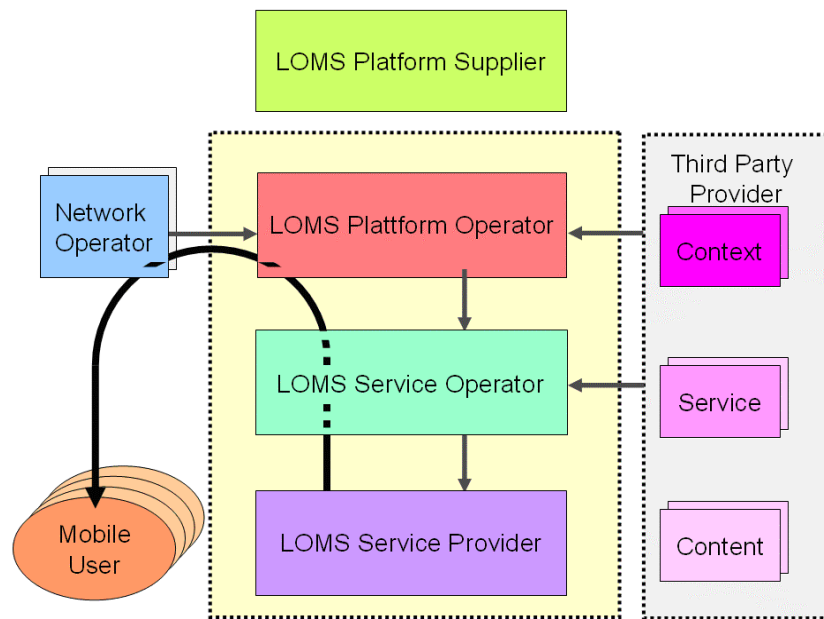


Figure 1: Role model for Local Mobile Services ([1], [2])

- A mobile user is a human person who uses basic services offered by a network operator and additionally consumes the end-user services offered by a service provider via the platform.
- A platform supplier develops the platform and sells it to the platform operator who operates it during runtime. The platform manages the integration of context information, contents, or services from internal systems and third party providers.
- A platform operator provides a service-creation environment allowing the development and deployment of mobile user services by service providers.
- A service operator takes the services that the platform operator provides and specifies them to the demand of a specific target group of service providers, e.g. in a specific industry.
- A service provider provides local mobile services for the mobile user. The service provider is usually a SME or public institution that is not very experienced in IT development.
- A third party provider offers additional services to the service providers, through the platform. Such third party providers may offer, for example, content (news, weather information, and videos), translation and positioning services.

- A network operator provides a communication network for the purposes of transmitting, distributing and providing messages.

## 5. Technological Requirements

The case studies are quite different concerning organisation and technical aspects:

- There are usage scenarios showing from just a few up to several thousands of parallel mobile users, as well as from a few to many service providers.
- Some business scenarios need the support of robust and insensitive devices in case of vibrations, dust, water, etc.
- The exactness expectation of content or device positioning information differs from millimetres (e.g. in measurement) and to kilometres (e.g. news for city districts).

Nevertheless, some general conclusions can be drawn towards a generic platform for local mobile services. First of all, the service platform should hide all the complexity of building and executing the local mobile services from the service provider who created the service, as well as, obviously, from the mobile user. Moreover:

- Important factors for acceptance by service providers are technical maintenance costs and their own effort.
- A platform needs to be network operator independent to make in contact with all mobile users who are interesting for a service provider (especially in B2C scenarios that address uncontrolled mobile users).
- The platform must handle mobile network challenges (interruption, roaming, etc.), so that the service provider does not have to take care of this.
- The platform needs to offer standard interfaces to sensor and context networks (e.g. CAN-bus) in order to allow context depending services.
- Position input for mobile users or devices can be from satellite signals as well as from RFID or Bluetooth signals.
- Positioning of content items (news, addresses, etc.) is essential for location-based services.
- Predefined rules (“service templates”) must exist to simplify service creation.
- Individual rule definition must be possible for the service provider to define status dependent activities, e.g. messaging.
- The platform needs to support easy integration of new interfaces to IT systems (e.g. ERP), so that the service provider can effectively support his business processes.
- Duplicate management is crucial for integrated content sources because content items often exist in different granularities and accuracies.
- Integration of different kinds and formats of maps must be possible (e.g. by cities or companies with their own spatial information).
- Avoid additional content management effort for the mobile solution; ideally build upon existing online services, data sources and enterprise systems.

## 6. Demonstration Scenarios

Based on a market potential analysis [3], the sectors Publishing and Maintenance have been selected as application areas for scenarios that can serve as demonstration cases of the final platform and its tools and services. The first scenario describes a business-to-consumer relation (B2C), the second a business-to-business relation (B2B), which illustrates the broad scope of supported industries and functionalities.

The core idea of the scenarios is to exemplify the easy (uncomplicated for a non-IT related person) service creation by any small or medium-sized company. The scenarios also

deal with the integration of different access networks and third party providers for content, context information or IT services.

### 6.1 Publishing Scenario (B2C)

The local publisher of a newspaper decides to invest in additional local mobile services for his readers and the visitors of events in the region. Based on the LOMS platform, a Service Operator (see Figure 1) had already created service specification questionnaires specifically for local publishers.

So the local publisher (the Service Provider in Figure 1) will fill in service specification questionnaires for the services he intends to offer and will receive implemented services covering the desired end-user services as stated above. The structure of such questions is exemplified for a News Push Service in Figure 2:

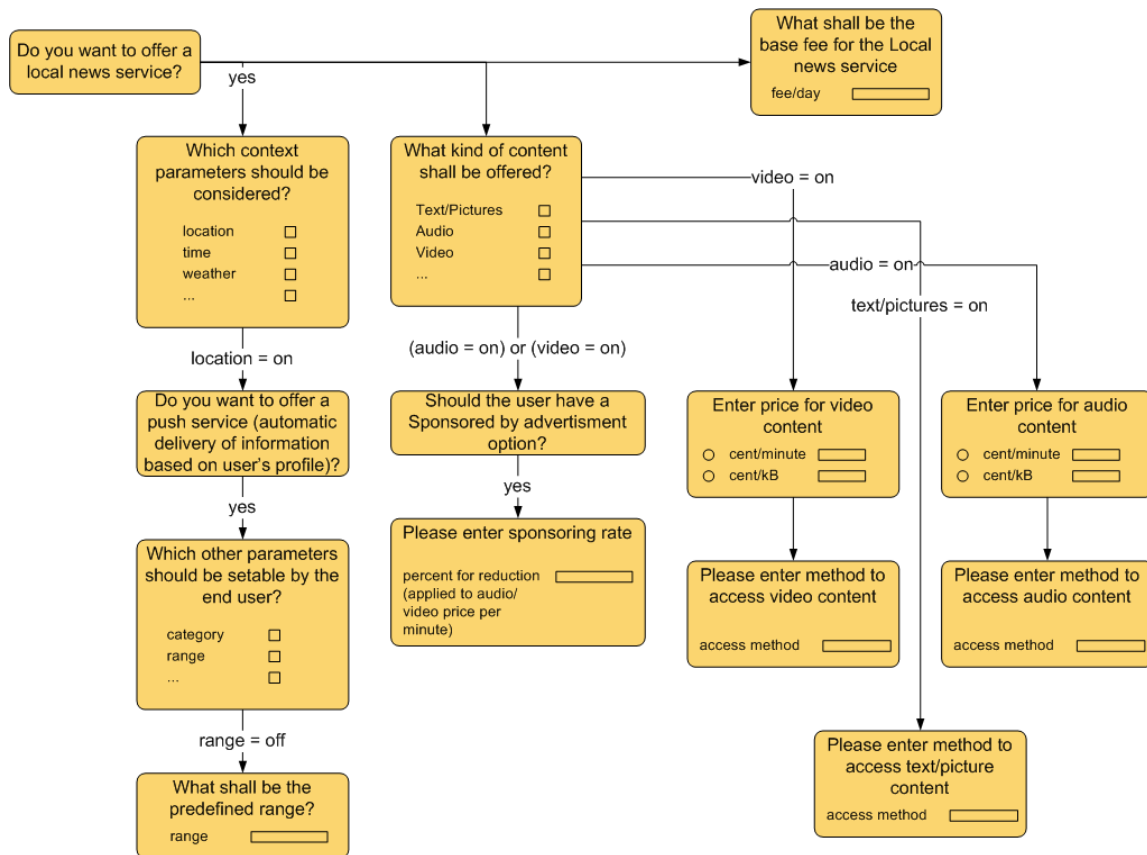


Figure 2: B2C Scenario –Definable Settings at the News Push Service

The main services offered to the mobile end user in the LOMS B2C demonstrator are:

- Search a point of interest nearby
- Receive electronic coupon for selected interests
- Show news map and browse latest news
- Show event map and browse current events
- Context-dependent charging for multimedia content
- Rich context-dependent community services

## 6.2 Maintenance Scenario (B2B)

A machine manufacturer plans a service application for the mobile support of service technicians at the machine operator's site and beyond with location- and context-adapted information, based on functional modules from his service management system.

The highlights for demonstration activities based on this scenario are:

- Machine-triggered mobile service order and matching
- Routing to the location of machine operator
- Routing within the machine operator's premises
- Location identification of the machine
- Point of service at the machine
- Context- and location-aware mobile information support for the service technician
- Semi-automated report generation

## 7. Conclusion and Summary Recommendations

The case studies summarised above offer a clear picture of existing solutions in organisational and technical respects. Such platforms have been proven to overcome the current gap between network providers and single SMEs, and thus platforms offer a breakthrough option for mobile applications. Some core ideas of local mobile services via platforms are already implemented in different industries, but they are all missing either a generic service creation environment or the localisation aspect of the content and services they offer.

The platform, for which tools and services are being prototypically developed within the LOMS project in 2007, takes the requirements identified in the case study analysis into account and covers IT components of the Service Creation Environment for the three main players during the run-time of the platform: platform operator, service operator, and service provider. It allows a broad access of many SMEs (the service provider) in different industries to up-to-date mobile services which will improve their business perspectives and will offer more opportunities to their clients or employees.

Based on the case study results, two scenarios are described which illustrate the intended usage of the platform both for consumer as well as for business-oriented applications. For such solutions, both business models and methodological implementation guidelines for the players involved are currently being developed. A platform operator with strong technology and marketing power is needed to bring the described services to the market.

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