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## EU-wide interoperable mobility payment services

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### Abstract

The European Wide Service Platform MOBiNET has set the goal of creating an “Internet of Mobility” linking the main actors – travelers, road or transport operators, vehicle manufacturers, and service providers – through a dynamic platform for online services available to everyone in Europe.

This paper describes how MOBiNET enables interoperability among EU mobility services in terms of payment, billing and clearing through a dedicated component capable of managing financial transactions for membership and business fees.. Service/app provider can use the Billing platform component facilities in order to enable End-Users (B2C) and Businesses (B2B) to pay for the use of applications, services and data. As a concrete use case, a parking payment interoperable service is developed by Pluservice, the Hungarian National Mobile Payment Plc. (NMP) and North Denmark Region. This integration allows, for instance, PluService customers to buy parking service in Hungary using their usual application.

**Keywords:** MOBiNET, Billing, Parking

### Introduction

MOBiNET project ([www.mobinet.eu](http://www.mobinet.eu)), co-funded by the European Commission under the 7th RTD Framework Programme, has set the goal of creating an “Internet of Mobility” linking the main actors – travelers, road or transport operators, vehicle manufacturers, service providers – through a dynamic platform for online services available to everyone in Europe, anywhere and anytime. MOBiNET will offer: a one-stop-shop for end users whatever their mobility service requirements may be; a travel data aggregator and source, facilities and services marketplace for data suppliers and service providers; an open service channel to users’ (in-vehicle & nomadic) terminals; an open “app store” offering a wide range of safe, secure and reliable mobility services.

The MOBiNET platform meant to be an enabler for the implementation of end-user Applications for a Pan-European seamless travel experience, in terms of booking, payment, service usage (like parking) and information received. Access to data – real time local public transport, traffic information, parking information, Point of Interests, events, disruptions - is the priority for end-users applications as well as the access to B2B services.

## EU-wide interoperable mobility payment services

This paper describes how MOBiNET enables interoperability among EU mobility services in terms of payment, billing and clearing through a dedicated component capable of managing financial transactions for membership and business fees. Service/app provider can use the Billing platform component facilities in order to enable End-Users (B2C) and Businesses (B2B) to pay for the use of applications, services and data. As a concrete use case, a parking payment interoperable service is developed by Pluservice, the Hungarian National Mobile Payment Plc. (NMP) and North Denmark Region. This integration allows, for instance, PluService customers to buy parking service in Hungary using their usual application. A standardized common interface to Parking service providers as well as to resellers published to the MOBiNET market place, will create a truly interoperable EU-wide parking solution.

## MOBiNET

The aim of MOBiNET is the simplification of the overall process of bringing together mobility service offerings and demand. Thus, the idea of MOBiNET is to provide the required “glue” functionality to let service providers sell their services and enable them to easily compose new services to quickly react on changing market demands.

MOBiNET provides a portal dedicated to service providers to manage all aspects of their services and a corresponding end user market for MOBiNET applications. Together both core functionalities aim to create a



**Figure – MOBiNET ecosystem**

new marketplace of mobility-related services to connect end users and service providers. To support a proper migration of existing services, the functionalities of MOBiNET are accessible via dedicated APIs for mobile application and service developers.

EU-wide interoperable mobility payment services

MOBiNET is decomposed into six top-level subsystems: Service Directory, Identity Manager, Billing, MOBiAgent (basically targets mobile devices of end users), Dashboard, Telematics Service Providers (TSP) Manager.

**Table – Overview of MOBiNET components**

<b>Component</b>	<b>Description</b>
Service Directory	Provides basic capabilities to manage and search service description including all metadata.
Identity Manager	Provides capabilities to manage common identities and to handle all security and privacy related concerns.
Billing	Handles all financial transactions and provides a neutral instance which monitors those transactions between different parties.
MOBiAgent	Provides an end-user market for MOBiNET Applications and APIs for mobile App developers.
Dashboard	Provides the basic portal framework in which other subsystems can plug in their user interfaces to form a corresponding MOBiNET market for service providers. In addition, it provides means for service monitoring and service composition.
Telematics Service Provider Manager	The TSP Manager is a broker component which provides a platform for telematics service providers to consumers. It is an example of a core mobility service.

### **Payment and Billing MOBiNET component**

The MOBiNET payment and billing component handles all financial transactions and provides a neutral instance which monitors those transactions between different parties.

Main functions are:

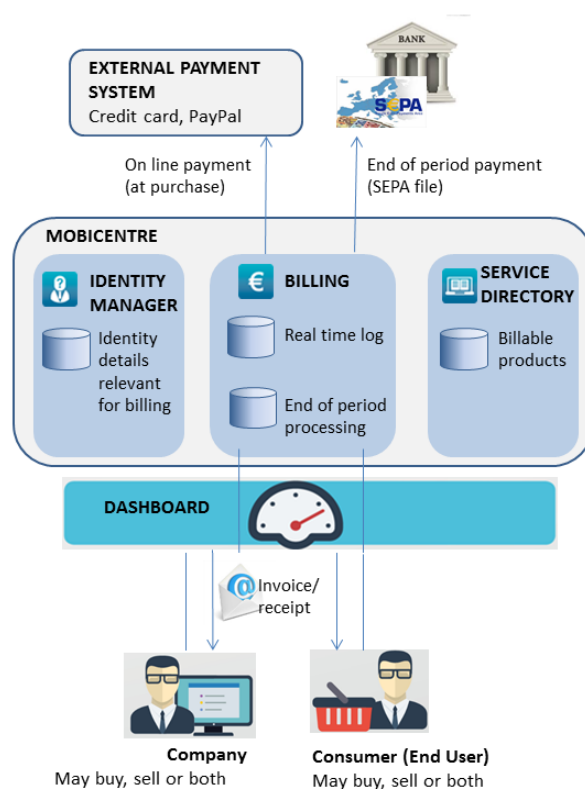
- configuration of parameters relevant for billing/clearing purposes
- real time log of all events relevant for billing/clearing purposes - tracking takes place with web services invoked by MOBiNET components and external Apps and services
- end of period (e.g. monthly) processing. Includes: data verification of real time log , calculation of the amounts due, generation of invoices for MOBiNET services, generation of all data necessary for the creation of invoices, payment.

Objectives of billing and clearing are combinations of:

## EU-wide interoperable mobility payment services

- fees due to MOBiNET for its services: e.g. MOBiNET subscription fee, monthly fee for publication of a billable product on catalogue, one-off charge for each product sold through MOBiNET service directory, monthly fee paid by a Service Provider for each subscription/renewal of one of its products, etc.
- in a one-off product sale with postpaid: payment takes place with a direct debit at the end of the period; MOBiNET billing component generates SEPA<sup>1</sup> file
- in a one-off product sale with payment to MOBiNET virtual store: amount buyer pays to MOBiNET - MOBiNET collects at sale from buyer with its virtual store
- in a subscription scheme with monthly fee: buyer shall pay to Service Provider the amount due for each subscription renewal. Payment takes place with a direct debit; MOBiNET billing component generates SEPA file
- amount due among Service providers in B2B and B2B2C scenarios.

All fees due to MOBiNET are determined and configured by MOBiNET administrator (for subscription, for clearing services in B2B2C, etc.). Each Service Provider determines the price and the fare rules for its services; the amount is distributed to the MOBiNET billing component at each event relevant for billing purposes.



**Figure – Logical architecture**

<sup>1</sup> <http://www.europeanpaymentscouncil.eu/index.cfm/about-sepa/sepa-vision-and-goals/>

EU-wide interoperable mobility payment services

Billing component is designed for a general purposes e-market place:

- B2B: Buyer pays at sale (e.g. with credit card or paypal), periodic payment with SEPA
- B2C, Payment may take place: on line at product sale, with credit card or PayPal; at the end of the month with direct debit (SEPA).
- B2B2C: each consumer continues using the app of his/her Service Provider (on a broader area), paying as usual and receiving the invoices from the same Service Provider. MOBiNET billing component: analyses cross-provider logs and calculate the amount due among Service Providers (clearing) and the fee for MOBiNET itself; generates reporting for Service Providers, invoices and SEPA files for direct debit.

### **Interoperable parking payment service**

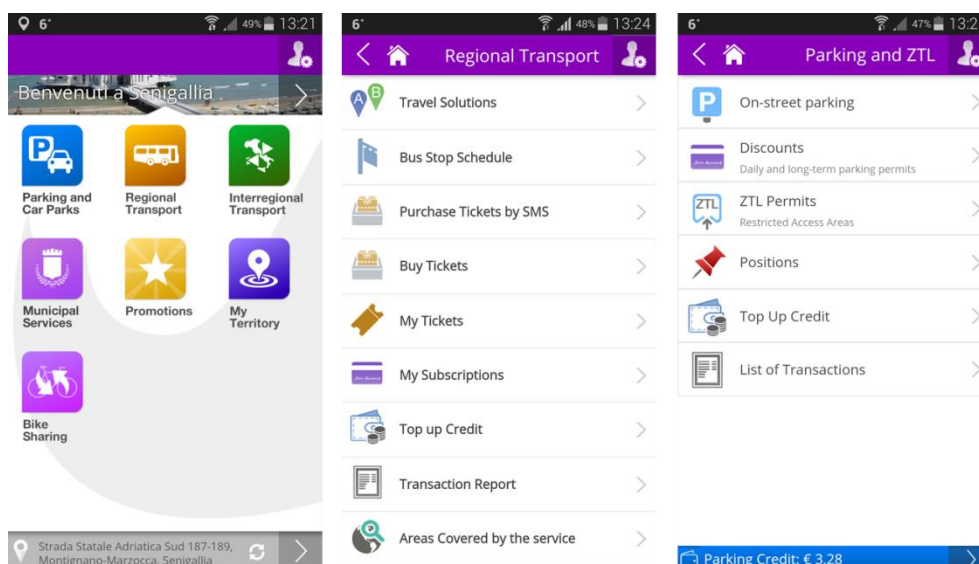
Among the innovative services, with a clear emphasis on "green" mobility including CO<sub>2</sub> reduction suitable for pan-European deployment and with the potential for high user take-up, the multi-service Application myCicero ([www.mycicero.it](http://www.mycicero.it)) developed by PluService represents one of that can benefit most from MOBiNET and in particular from its payment and billing features.

It is based on a technological platform that merges several services and sets off participation and fidelity policies on the territory, as well as on social, economic and institutional stakeholders. Among the services provided the booking and ticketing services like Local Public Transport, Coaches, Parking, Bike-sharing are already used by end-users and mobility operators. Within the PluService platform, the traveler can benefit of a virtual personal assistant, including a multimodal journey planner with booking and payment facilities. Currently the Application enables a number of features:

- A traveler information system including prices, possibility to book travel (with selection of the seat on board) and purchase, using different forms of payment;
- Management of pricing policy: for example management of low-cost policies on routes with a low appeal for a set of available seats, managing different prices for high and low season, etc.;
- Parking payment
- Bike-sharing
- Municipality services
- Point of Interests (POIs) and Events, promotion of the territory
- Multi-channel payment methods

This application will be connected to a range of other services, which as of today very difficult to interface to without MOBiNET.

## EU-wide interoperable mobility payment services



**Figure – Multi-service App enabled by MOBiNET**

As a concrete demonstration of the potential of MOBiNET, an EU-Interoperable parking payment service is developed and made available in the MOBiNET service directory. The service provides a common interface to Parking Service Providers as well as to Resellers to create truly interoperable parking solutions. The target is to propose a EU-wide standard parking service interface to be used within MOBiNET and beyond.

Although it is a demo service, the plan is to have a fully functional integration behind. This integration will allow myCicero users to buy parking service in Hungary (via National Mobile Payments) or North Denmark Region parking service using their usual application. In this case the payment will be done via myCicero, and the MOBiNET Billing component will do the clearing among the parties. As MOBiNET providing the platform, any registered MOBiNET user will be able to discover such interoperable service, which is a very important change in mindset.

The benefit for the users is that they will not be forced to leave their familiar mobility application to access local services, subscribing only once to the parking service and continuing to use the usual payment method, even likely via their usual mobility provider as clearing can be done between providers within the MOBiNET machinery.

This service, in a possible future commercial operation, might also become one of the B2B enablers that the MOBiNET platform will offer to its business users, thus becoming a core service of the MOBiNET platform. This is by design a B2B solution, so any service provider can publish or consume parking services via this interface. This will open the market for many companies to provide a common parking application – integrated into their mobility application - to be used Europe wide for its customers. This would also not be possible without a Europe wide mobility platform such as MOBiNET.

## EU-wide interoperable mobility payment services

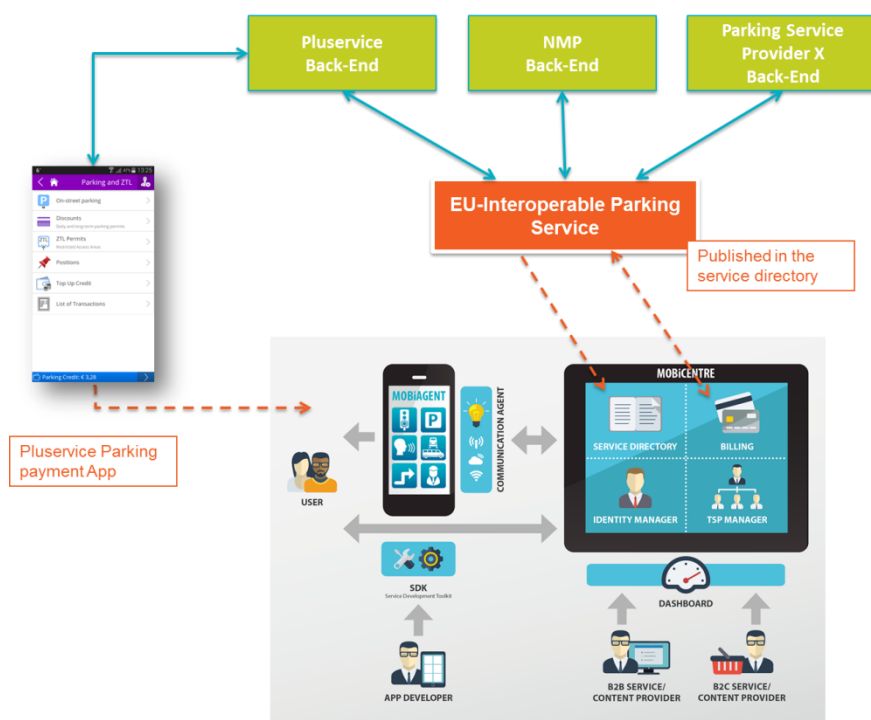


Figure – EU-interoperable parking payment service

## Conclusions

The impact of the MOBiNET platform to Pan-European interoperability of mobility and transport services can be very high if the transportation eco-system will adopt such a standardized approach, not only in data format, but also in concerning legal issues (e.g. B2B contract templates), methodology, best practices. Payment services will be provided via a single service, so service providers not having their own payment solutions benefit from a standard payment service thus lowering development and operational costs. B2B services may have complex financial relationship via the clearing services provided by MOBiNET. Users benefit from the background B2B billing and clearing, as they are able to use their usual mobility provider while paying for local services, without worrying to get “officially” connected to the local service provider moreover having concerns about the payment system of the “unknown” local provider.

## Aknowledgements

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## References

1. U. Noyer<sup>1</sup>, T. Schlauch, P. Cercato, L. Mikkelsen (2015). MOBiNET – architecture overview of an innovative platform for European mobility services. In *Proceedings 22nd World Congress on ITS*, Bordeaux.
2. MOBiNET Consortium (2014).  
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