

Approach to in-car social networking



Abstract

In the modern world people feel that there is a lack of communication. This is even more noticeable in a car, where we are isolated from each other and have very limited capabilities for interaction. But... the main problem with communication is not lack of capability. We're equipped better than ever before. We have mobile phones, PDAs, Twitter and Facebook, Skype and Asterisk. It is not difficult to find almost anybody, not difficult to search for information, not difficult to talk. The dilemma is finding a reason to communicate. This is the biggest problem of our era.

From this perspective, the car is a unique communication tool. The road itself gives us a lot of reasons to communicate. We discuss vehicles, jams, cities, roads, police inspectors and possible detours. We make pictures. We record sounds. We sing and we listen to music. This communication context is much more fruitful than, let's say, an office where we're restricted with a number of social limitations.

Luxoft is working to bring socialization to the car. Our approach is to create a dedicated social network environment for in-car users: drivers and passengers. While integrated with the global Internet world, this environment remains unique, with its own ergonomics, events and communication methods. We are working to make it easy and convenient while driving, safe, location-oriented and scalable.

We started. The in-car social network is still exotic, even as an idea. We try. We see. We prove. But we consider our approach to be one of the most effective extensions of car multimedia for the next several decades.

Introduction

Currently, everyday car driving is becoming a more and more routine task. Except in some exotic places, the roads are smooth enough, most vehicles are well-automated and becoming more and more sophisticated, which simplifies typical operations. Finally, driving in big cities is now like a very slow and boring game where you stand longer than move.



So, people have more and more free time and, more importantly, free mind, when driving cars. And, they are looking for ways to spend this time and use their free mind capacity. Traditional types of content like radio and music are becoming not enough for that, and it produces the need for complex and advanced entertainment and infotainment solutions.

Additionally, people in the modern world feel a lack of communication. They spend so much time in limited office spaces, in the car and public transportation with only restricted abilities for mass and personal communication. This makes online internet-based socialization more and more popular. Forums, social networks, chats/IMs, Twitter,

blogs... They all are a product of this special situation. But, most of these tools are not available in the car.

The lack of car-adopted tools for personal communication is one of the fundamental market problems for the moment, however it is not difficult to resolve, and will be covered by the world automotive infotainment community in the next several years. However, the automotive environment is not the same as other internet-connected environments we are acting in. The road itself is the place of communication, and the mass of car drivers moving in the same area, or having similar interests, are a kind of very specific, but obvious community, which might be treated as a target for social networking. The only barrier is the members of this community are separated and cannot communicate with each other.

In-car Social Networking Basics

There are many approaches to the in-car social networking, tried by various automotive market stakeholders. Luxoft's approach is based on the assumption that the set of vehicle users can be considered as a kind of virtual society, and the role of the connectivity service provider is to establish the connection between the members of this community. However, in contrast to regular PC-based social networking, automotive social networking is very special.

1. The main challenge to be accepted and answered is not the technical one. It is to provide vehicle users with enough reasons or motivators to communicate with each other. The need to communicate is not enough to overcome the psychological barrier, so there must be a specific reason to start communicating. By the way, one of the most specific factors for in-car communication is that the car is viewed as a private space, and unsolicited entry another person, even virtual entry, is sometimes treated as an invasion. So, all communication features must be designed with a lot of care in order to become popular.
2. The second problem is providing technical support for communication. Peer to peer, or meshing network, seems the most reasonable technological solution, however it is not supported by existing in-car equipment. Global communication technologies seem more flexible and widely institutionalized, but these have additional problems that must be solved. Server-based communication provides a lot of opportunities to share information, filtering it and integrating with other services. However, it makes exchange slower and more complicated, especially when we talk about audio and video data traffic.
3. The third problem is grouping and sorting the people who participate in the communication. It is clear that not every person in the world can, and must, participate in a particular dialogue, so reasonable and soft restrictions must be applied to make a set of practical communities from the entire mass of users.
4. Integration with out-of-the-car social tools. This might be implemented on the server or client level, but needs to consider in-vehicle ergonomic limitations. Luxoft's approach assumes

server-based integration to minimize over-the-air data traffic and unload limited clients' resources.

All these tasks cannot be solved separately, but are dependent on each other. So, Luxoft's approach for in-car social networking is a complex solution for this set of technical and organizational problems.



Reasons for Communication

Providing reasons for communication is the primary task directly impacting the popularity of the solution. For the on-the-road world, this task is a bit simplified as the road always produces events which could be discussed. So, the goal of the service provider is to comment on such events and

provide a convenient way to use the information.

The events used for to launch communication must be:

- Commonly interesting,
- Being (happening) close to the community,
- Live and ongoing,

Able to be personalized or applied to the community members

The types of events which can be used to initiate the communication are:

- Location-based events, like traffic jams, road works, speed limits and speed measurements which can be reported to the community and discussed. This type of event requires the social networking subsystem to be integrated with interactive navigation services, like Luxoft's Dynamic POIs.
- Personal events, like the bad maneuver of a neighbor, meeting a car of the same make and colour, necessity to change the route etc. This type of event can be handled by proper user identification and on-time presenting of peer availability for the dialogue. Also, limited radio-styled broadcasting is helpful to join the neighbor society.
- Global events, like political and sport news, tax changes, etc. To process this type of event it is necessary to integrate the social network with broadcasting services like radio/video/podcasting.

All these types of events can be commented and discussed by in-vehicle users provoking the communication, linkage and networking. As it is stated above, the deep integration of social networking with other in-car multimedia and infotainment services is the best way to launch the communication and involve wider groups of people to the exchange process. It is not enough just to

present the list of people driving nearby who have the same area of interests, or to use the location-based principle to identify people for potential interaction.



Technological Support of In-car Social Networking

As is the case for every in-car feature, the main technical challenge for in-car social networking is ergonomics. The user must be able to minimize his attention spent for infotainment operations, and perform most of the activities in hands-free mode. Another extremely valuable thing is communication. Peer-to-peer or meshing based connectivity is the most native for cars since they are in close proximity. However, currently almost no vehicle entertainment is equipped with short and medium distance wireless communications. In contrast to this, cellular phone based data link (via NAD or consumer electronics) becomes more and more popular for various car devices. And, a global Internet connection provided over this cellular link provides additional opportunities to utilize common server functionalities. It also provides a method of using PC and PDAs to collaborate with in-vehicle users and manage functionalities which are hard to access via the car head unit. Therefore, Luxoft's approach to in-car social networking assumes TCP/IP over cellular (3G/LTE) connections as the main carrier of the data, voice and video streams.

Ergonomics of in-car social networking is rather different from usual PC-oriented social networks. All elementary and frequent operations must be performed with minimum usage of hand-operated controls. Voice-based messaging must replace text oriented messages in most cases, such as events commenting or direct messaging. However, text messages should remain for compatibility with PC technologies expected by the user, and to simply the crossing of the psychological communication barrier.

Using an in-car-mounted photo/video camera to share media content makes exchange more convenient, impressive and attractive. This technology might be treated as second generation technology of in-car social networking when LTE becomes the major communication media for fast data traffic.

Features

According to the list of communication provoking events, all the in-car social networking features can be grouped into the following categories:

- Voice commenting of events, including hierarchical commenting of the comments left by other users
 - Text and voice based forums / micro-blogs

- Text and voice based events commenting
- Direct messaging of the registered user
 - Messaging to a known user (text, voice, photo, video)
 - Messaging to an anonymous user (e.g. registered by license plate or other label)
- Contributing to a discussion group
 - Messaging to the group based on common interests
 - Messaging to the group based on geographical neighborhood
- Broadcasting the message for a group of subscribers

All these features must be supported by the in-car head unit and managed through the centralized server storage.

Grouping of the Service Users



The in-car social networking must not be obtrusive in any case. Therefore, all kinds of services shall be provided for the users based upon the subscription of their choice.

The grouping of the users might be done using either formal characteristics like proximity, same car make or dealer, or according to the interests list submitted by the user himself. Luxoft's approach assumes the combination of these two methods,

making user groups by using both criteria. The subscription can be managed from both the head unit and PC via Internet access to the common server storage.

Summary

Social networkings are on the peak of popularity. Everybody wants to make something exclusive there. To involve people, to get clients, to make money. For automotive it is easier than for many other areas, because people in their cars having a lack of communication. They are close to each other and they are alone. Their cars are full of electronics, mobile devices and communication tools... and they are alone.

It is not a problem to give them an access to the usual social network. They already have it with their iPhone's, iPad's, laptops and... even head units sometimes. But they are still unhappy. Luxoft considers the problem is not in tooling, but in ergonomics and reasons for communication. People in

the car don't need just to communicate. They need to do it safely and convenient. And they need a reason for communication. Car driving is so boring. People around are so unknown. We are to give them a chance to meet each other!

Luxoft's approach to car-oriented social networking is focused on these goals. We don't just provide a tool. We provide a set of the reasons to communicate, collaborate and cooperate. And we provide a fast and convenient method for this communication without diverting driver's attention from his way and his vehicle.

Social network is always an attempt. But this attempt is not because we want it, but because people need it. Therefore we believe it must be successful. Join us. Let's try together.

Luxoft. You steer. We accelerate.

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