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Abstract

Communities (especially virtual communities) of Interest have recently been the focus of substantial consideration within academic literature. This paper addresses Communities of Interest within the Leisure Industry and provides an innovative value added service concept for mobile coordination support for individuals. Thus it extends the discussion to mobile communities, which in fact leads to a hybrid-solution. After briefly presenting the state of the art of IT in the leisure industry and describing the empirical aspect of the project objectives we introduce the MCOR (Mobile Community Online Reservation) system. Finally we discuss design considerations and the blueprint of our future research.

1   Introduction

By the end of 2002 over a billion people around the world own mobile phones [Cronin 2003, for a constantly updated statistics of the Mobile Telephony Market and GSM in particular see GSM World 2004]. Daily life and work in metropolitan areas already reflect the ubiquitous availability of mobile communication. Everywhere, millions of mobile users are chatting, messaging, accessing data, and entertaining themselves. Since people do not like to carry multiple devices and personal conversation is still the most important way of communication, it is very likely that the use of mobile phones will be the most accepted mobile device for future city dwellers. Our research tries to tap this potential by proposing a mobile service for distributed physical communities which try to coordinate their leisure time activities while moving around.

As network speed increases and mobile devices become capable of more sophisticated services (such as the here described J2ME technology), there is general agreement that the missing ingredient in mobile commerce mass adoption are applications that create a unique mobility value proposition for the customer. Exactly this point was seen in the early studies on Mobile Commerce [cf. TIMElabs Research Center 2000, Durlacher Research Ltd 1999] but very few value added services (VAS) have been successfully launched since then. Our applied research aims to contribute by trying to tie the concept of physical communities to mobile applications. We are aiming to leverage the value of both the "network of friends" and the "use of mobile devices". In the categorization scheme proposed by Cronin [2003] our service would fall into the category of "Interactive Services".

In order to motivate our approach and underpin the general considerations with an example, we assume the following scenario. In most societies we observe a paradox: a constantly growing group of employees is increasingly interested in leisure time activity, but a significant proportion of them is regularly working overtime. In many cases they are young, sportive and wellness-oriented and belong to a high income class. Most often these people are severely time constrained and are usually unable to plan their leisure activities long-term in advance. An example of such a situation is as follows: To discover by 5:30 p.m. that they will be able to leave the office at 6:30 p.m. that day. Subsequently to organise at a short notice an evening out they need to know the availability of fellow sports friends and book any necessary resource (racket-court, trainer etc.) for 7:00 p.m. Thereafter they might want to meet friends for a drink or snack at a reserved table. Today, these appointments can only be realised by calling each party involved personally. This is where a mobile community online reservation (MCOR) system comes in: by supporting the reservation processes as well as the management of appointments by a mobile support system, this group of people would succeed in arranging their leisure time activities at short notice. All reservations and the notification of each person about the requested event or invitation will be immediately sent out by the support system and any incoming response is issued automatically choosing the appropriate channel based on a preference profile. The underlying mobile community approach deserves some reflection on the existing literature on communities.

2   Literature Review On Virtual And Mobile Communities

The research presented in this paper addresses the combination of two important research fields: Virtual Communities and Mobile Commerce. Where "Virtual Communities" have been discussed in a vast amount of literature over many years, publications on "Mobile Commerce" indicate that one is still tackling an area full of forecasts, assumptions and sometimes speculations [TIMElabs Research Center 2000, Kalakota 2001, Keen 2001, MeT 2001]. Figures of the market of mobile devices are very promising [GSM World 2004]. The mobile phone is generally accepted as a personal device which most users would not like to miss having. Telecommunication companies are looking for new, innovative business models for paid content and services for mobile devices.

2.1   Virtual Communities

Despite of the fact that there is a vast amount of literature on virtual communities (VC), there is still no consensus among researchers regarding the appropriate definition for the term "Virtual Community" [Hillery 1955, Preece 2000] although there have been propositions for classification schemes [Armstong/Hagel 1996, Schubert 1999, Markus

2002, Mathwick 2002]. Neither has one of the many classification schemes really been accepted and adopted by the scientific community. In the context of this paper, it is important to notice that there are two fundamentally different kinds of communities which have been discussed controversially in VC literature: socially oriented communities and business communities. Hagel and Armstrong were the most prominent authors to discuss the value of business communities. There is a vast amount of literature on potential benefits of virtual communities for business purposes [Armstrong/Hagel 1996, Barnatt 1998, Brown et al. 2002, Bughin/Hagel 2000, Hagel/Armstrong 1997, Horrigan 2001, Jones/Rafaeli 1998, Rothaermel/Sugiyama 2001, Schubert/Ginsburg 2000, Williams/Cothrel 2000]. As we will discuss later, mobile commerce resembles electronic commerce in some aspects.

In this paper, a mobile community is defined as an aggregation of individuals who interact around a shared interest (in our case spending their leisure time together), and where the setting up of the interaction is supported by mobile technology.

This definition is in analogy with the one proposed by other authors [e.g. Preece 2000, Leimeister et al. 2003]. Rheingold [1993] first conceptualized virtual communities as purely social entities. Several years later, Hagel and Armstrong [1997] came up with the innovative idea to propose virtual communities as business models. This claim was often rejected by other authors in the aftermath of the publication of their book "Net Gain". In a study on Virtual Communities, Horrigan [2001] showed that more people use the Internet to participate in virtual communities than to make purchase transactions. The growth in membership and usage of virtual communities is still expected to continue [Bressler/Grantham 2000].

People in virtual communities engaging in consumption-related activities can be an important source of marketing data [Kozinets 2002]. There is a growing body of literature that addresses a consumer's willingness to exchange personal information with a marketer [Schoenbachler/Gordon 2002, Milne 1997, Phelps et al. 2000, Sheehan/Hoy 2000]. Moon and Sproull [2001] even offer anecdotal evidence of how companies have used virtual communities to support new product development efforts [see also Nambisan 2002, Piller et al. 2003]. Some researchers have suggested that virtual communities offer firms an opportunity to build deeper and more loyal relationships with consumers [Brown et al. 2002, Hagel/Armstrong 1997].

We believe that the combination between social and economic goals might work well in a setting were the social ties between the members are strong and the economic goals are supplementary to the social relationships. This is the case for the support tool which we are presenting in this paper.

The typology proposed by Markus [2002] is the one that best serves the purpose of this paper. Markus suggests three main types of virtual communities based on their orientation: Social, Professional and Commercial. The community that we are dealing with in this paper is a hybrid one that combines social and commercial aspects. Comparable to eBay, it falls into the class of C2C communities, but clearly with the option for the platform provider to interact or even to intervene.

The characterising attributes of a VC which are most often mentioned in literature are (1) place, (2) purpose, (3) platform, (4) population, and (5) profit model. Community platform operators will be well advised to find the right mix of attributes if they want to generate profits for their members.

As Virnoche and Marx [1997] put it, virtual communities can be categorized based on the degree of virtuality which they constitute. According to Virnoche and Marx, the mobile community described in this paper would qualify as a virtual community. The wellness centre and its members represent a physical community. The sub-communities which are

formed by segmenting the members' base into sub-communities (buddy lists) are virtual communities supported by mobile devices. This community structure is only formed in virtual space but constitutes itself in the physical realm. The borders of the sub-communities are permeable since at any given event, new members can be added or members who have been passive for a long period of time are likely to be removed. The WELL, one of the first and most well-known examples of a virtual community also had its roots in the physical world: the people of the neighbourhood in Silicon Valley [Rheingold 1993]. In analogy to the WELL, our mobile communities could be called "virtual extensions" of their "real-world" counterparts.

In terms of the platform (technical dimension) the mobile aspect of our community is asynchronous. Members broadcast their messages to the buddy list and people react whenever it is convenient for them. The consequences from the mobile interaction, the meeting at the club on the other hand, is purely synchronous.

An advantage for mobile communities described in this paper is the fact that they do not need any external moderation or a superimposed incentive structure. The motivation to become a member of the community comes with the desire to be part of a group of people engaged in leisure activities. The mobile community is highly "self-motivated" and moderated by each member autonomously.

The business model is an important aspect for the sustainability of a community platform. The operation of the platform is only feasible if the costs are fully covered on a long term basis [Leimeister et al. 2003]. Krishnamurthy [2003] identified three different kinds of business models for the operation of a virtual community: community enablers, trading/sharing communities and communities as a Web site feature of corporations. In our case we are talking about the classical type of a community enabler. As will be discussed in more detail in the following chapters, members do not pay for the service. The platform will be sponsored by the recipients of the revenues that arise once the members have engaged in leisure time activities (sports, restaurant services). Since we felt that a valid business model would be a major success factor for our mobile community service, we also included a short literature review on mobile commerce in the following paragraph.

2.2 Mobile Commerce

In our paper, we follow the definition synthesised by Cronin from various sources about the nature of mobile commerce.

"Mobile commerce refers to all data-driven business transactions and exchanges of value by users of mobile devices via wireless telecommunication networks." [Cronin 2003]

In her paper, Cronin points out that some authors use an oversimplification of the term "mobile commerce" by stating that it is just "a wireless form of electronic commerce". There are some major differences which we became especially aware of when designing our prototype. Mobile commerce applications can be easily personalized to match individual situations. In contrast to electronic commerce where customers need a personal computer, a mobile device can easily be carried around and gives its user the potential of being always available to transmit urgent information or support transactions. This means that one can do business everywhere and at any time. There are also limitations compared to e-commerce which had been discussed broadly [Durlacher Research Ltd 1999], e.g. display size or the limited amount of data which can be sent using a mobile device. This is not a problem in our case as we only need to transmit small pieces of information.

The intriguing question in today's mobile commerce is the question of "who is making the profit in the emerging value chain?" Classically, there are at least three major interest groups involved:

1. Providers of mobile devices (e.g. mobile telephones)

2. Network operators (telecom companies)

3. Value-added service providers (content providers)

These interest groups correspond with the owners of the three steps of the mobile value chain as described by Turowski and Pousttchi [2004] or in an extended, generalised form with many more players involved by Zerdick et al. [1999].

Figure 1: *The Mobile Commerce Value Chain*

Our research is positioned at the end of the value chain in the area of "service & content" – called "secondary services" by Turowski and Pousttchi [2004]. In our business case, we assume that community members are equipped with a Java-capable mobile telephone (e.g. Siemens S55, Sony-Ericsson P900 etc.) and have a contract with one of the main network operators (providers of so-called "primary services") offering GPRS. Our analysis does not include the business models of the primary service providers. In our discussion they should be "already in place".

Previous research in the area of "secondary activities" has shown that end consumers are usually not willing to pay a premium on services and content – unless they reap a direct benefit from it. In our "business model" the consumer receives the service for free. The other involved parties – the operator of the wellness centre and the tenant of the restaurant – are the ones who pay for the service, since it increases their potential revenues.

Following Ginsburg and Weisband [2003], a healthy business model for a community depends on the "just" distribution of perceived value and cost. As long as the players have the feeling that what they receive is worth its money, they are likely to accept the service and contribute to its cost by paying either member fees or certain amounts in per use (pay-per-use).

3   Research Methodology: Concept And Prototype Application

Together with a business partner, we investigated a business case for a mobile service – an online reservation system with a mobile community extension. Robinson, a company specializing in club holidays for German vacationers, started a new business sub-unit in 2002 bringing their highly successful concept of "club vacation" into the cities. The new business concept is called "Robinson Well-fit in Town" [Robinson 2004]. When approached by the authors of this paper, Robinson Managers showed an interest in an innovative mobile application for their Well-fit centres. So far, they have been offering an online reservation system for the advanced booking of squash courts and some wellness

services for their members. We suggested extending this service using a mobile community support platform.

As outlined before, we started the research project by analysing the literature on virtual communities with a focus on their reasons for success or failure. As described in the following paragraph, we especially started to look at business models and the motivational factors which provoked the members to use the service. After a couple of structured interviews with responsible people at Robinson, we had a fair idea of how such a system could look like. Endowed with the assessment of the potentials by the future operators we came up with the concept for a prototype which was built on top of their existing online reservation system. The new system was named MCOR (Mobile Community-enabled Online Reservation System). The prototype has been developed and tested and is ready to be implemented by the time this paper may appear. The first pilot implementation is planned to become part of the project "Maschsee Hannover" which is likely to start in the last quarter of 2004.

An investigation of the Internet showed that there are already a couple of similar but less complex services in operation. One example is golf.ch, a WAP-portal where users can find the nearest golf course in their present region [Golf CH 2004].

All parties within the value chain, the users themselves, the service providers, the wellness centre operator and finally any restaurant leaseholder will face a win situation with such a system. This does not imply that each player will be willing to assume the same amount of investment and transaction cost. We will need to consider business models that are much more subtle.

For the user the mobile service provides convenience in arranging their leisure activity and it guarantees availability of the necessary resources. Provided the service will include an automatic (mobile) payment mechanism as well as a reminder service in addition to the standard notification procedure, the perceived convenience might even be extended. We will have to deal with the "price of convenience" issue as generally discussed by Ng-Kruelle et al. [2002].

The operator of the wellness centre is getting a variety of advantages following the successful launch of MCOR. First, the predictability of resource planning will be improved and the financial liquidity could be enhanced if the effective charging takes place at the time of booking. Secondly, MCOR will help to increase customer loyalty, or more precisely it will create customer retention by locking the customers to the system as they get used to the increase in convenience. Changing wellness centres would then become awkward (resulting in increased switching cost) as all buddy lists would have to be set up from scratch, not to mention the possible loss of community adherence. This stream of arguments follows the well-known theoretical considerations as formulated by Shapiro and Varian [1999; Chapter 5 and 6]. As a third argument, we expect that an increase in automatic booking lowers the operational cost (labour cost) since booking processes today are done mostly by employees via phone.

The restaurant leaseholder might primarily be interested in issuing special offers to groups who get together using the MCOR service. Since they are characterised by advance booking and are members of a high income class they are prone to lavish consumption. They are also a target for cross- or up-selling activities (bring your friends, happy hour dining, special of the week etc.). As a consequence this should lead to an increase in revenues.

Finally, one might expect that the mobile carrier (the telecom company) has an interest in launching such a service, as it will generate additional air-time (including message or packet volume). This argument, on the other hand, may be controversial since the flip

side of using MCOR are extensive telephone conversations for getting all the details arranged, which could prove to be even more profitable.

4 Developing A Community Support For Well-Fit Centres

The following paragraphs describe the IT background in the Well-fit centres, the general requirements for the mobile application and the current MCOR prototype.

4.1 Background: Leisure Industry

The leisure industry has seen an enormous growth over the last few years in most industrialized nations. For a literature overview we refer to [Academy of Leisure Sciences 2004]. Not only have the number of working hours decreased (in Germany typical working hours per week have been reduced from 40 to between 38 and 35.5) but also overall wellness and health awareness has impacted on and dispersed within all population groups [Brokmann 1997]. Wellness activities have become a regular part of people's lives and are valued higher than conventional sporting exercise. Companies increasingly offer their staff free access to well-equipped in-house facilities or to third-party wellness centres (using a corporate contract). Such corporate incentives are generally welcomed (and now sometimes even expected) by employees. In general, most wellness activities are undertaken outside working hours and rarely alone. They are in fact now often perceived as community events organized around a nucleus of the wellness action.

After coming up with the idea of designing a prototype for a mobile application for reservations, we first had to analyse the current use of IT in our target sector. Most leisure centres use IT systems that are cash register-based enhanced by a customer data system. In some cases they allow for reservation of resources (e.g. courts or coaches) and occasionally even for personal customer training plans. The users have access via dedicated systems either within the centre (kiosk-systems) or via the Web. Simple pricing models (e.g. flat rate subscription) can be enhanced by more sophisticated strategies such as last-minute discounts, pay-per-use and so on.

Existing IT-systems focus solely on planning and reservation of resources and do not support the sociological aspects of interaction between the customers. Many activities (e.g. tennis, concerts, and sports events) require the presence of others. Thus people often seem to direct their intrinsic motivation to social recreational activities. Empirical evidence in favour of social interaction as a motive for leisure time activity is strong [Ahola 1980].

Most systems include front-office and back-office components. These are often complemented by a database system that stores client data (accounting information, training plans, health-status parameters etc.). Back-office systems focus on daily routine procedures and data collection.

4.2 The Prototype: Java-Based Application For Mobile Telephones

A system for the coordination of leisure time activity needs to meet several requirements, including:

- Convenient communication through user-friendly interfaces for the customers on all media channels. The systems requirement is to offer a community platform through synchronous and asynchronous communication media. Mobile devices must be strongly integrated in order to ensure that the system can be used ubiquitously.

- An instantaneous multidirectional information flow supporting awareness and confidence in the completion of the process of user matching and reservation

- Reliability, privacy, and trust as with most other services (further discussion of this aspect is beyond the scope of this paper).

The service elements used in the present context can be classified into three categories:

Push Services can only be effectively offered within areas of common interest (which are difficult to specify) or in cases of emergency. In any other case (e.g. advertisements or unwanted information) this approach to service-delivery tends to create a disturbance for the user.

Push Services "on demand" are less intrusive and more flexible. Via the Web the user may, for example, specify categories of interest. The service challenge is to offer adequate categories and to allow them to be combined flexibly into a "personal profile" while anticipating and offering appropriately targeted information. Problems arise whenever individual user requirements (the personal profile) cannot be defined within the categorisation scheme offered. To ease this problem the categories need to be very detailed, but there is an inevitable trade-off between providing a large variety of categories and keeping the system simple.

Pull Services do not face this problem because the user chooses the desired services on an ad-hoc basis.

The scenario described in the introduction of this paper can be depicted as follows. The initiator (the community member) is already enrolled as a registered user of MCOR and has set up a buddy-list. Through a Web interface he makes a reservation for a squash court and a table in the club restaurant afterwards. He indicates that he wishes to contact a friend who is comparably good at squash as he is (such details are stored in the system's database). The reservation is then pre-processed. An invitation is issued to an appropriate friend, who must either accept or reject the invitation within a limited timeframe. In case of a rejection, the inviting party is being informed and may either manually restart the process or a second partner could be contacted automatically (depending on the setup in the preference profile of the user). Once the invitation has been accepted by a friend, both parties receive a feedback combined with additional information (time and location of the court, special prices for an extra period, or advertisement for the "special of the week"). They may even receive a voucher for food or drink as common in some cinemas in combination with the use of a customer value card [Kitag 2004, Kino Basel 2004]. In the case that our user has set up one or more buddy-list(s), he may choose to inform all people from his list (the option of rearranging the order should be given). He has afterwards to decide whether he accepts either the first positive answer or follows any other selection strategy, leading perhaps to further (pair-wise) appointments or conflicts due to rejections.

In addition, the system could allow for additional cross- and up-selling campaigns. For example, based on the information in the customer interest profile (e.g. hiking or biking), information about upcoming outdoor events could be transferred to the user. This way, the time necessary for spreading activity-oriented information is minimised and a group can spontaneously plan such activities at short notice.

4.3 *The MCOR Prototype*

It would be beyond the scope of this paper to present the full details of design and implementation of the prototype here. We consider the description of the general architecture of MCOR (sketched in

Figure 2) as most beneficial to our earlier discussion of mobile commerce and virtual communities.

At the bottom layer we connect to the leisure provider's operational system, accessing the DBMSs containing customer and transaction data. Thus MCOR will be an attached system, lowering the risk of missing compatibility in case of existing legacy IT-infrastructure.

The solution provider's part of the MCOR system can be hosted anywhere, allowing outsourcing (to an ISP) or any centrally managed service model. In principal, these two sites could be merged into a set of dedicated servers. Depending on the media channels offered for customer interaction, the Web servers have to support different communication interfaces. At present only SMS, J2ME and email communication has been realised.
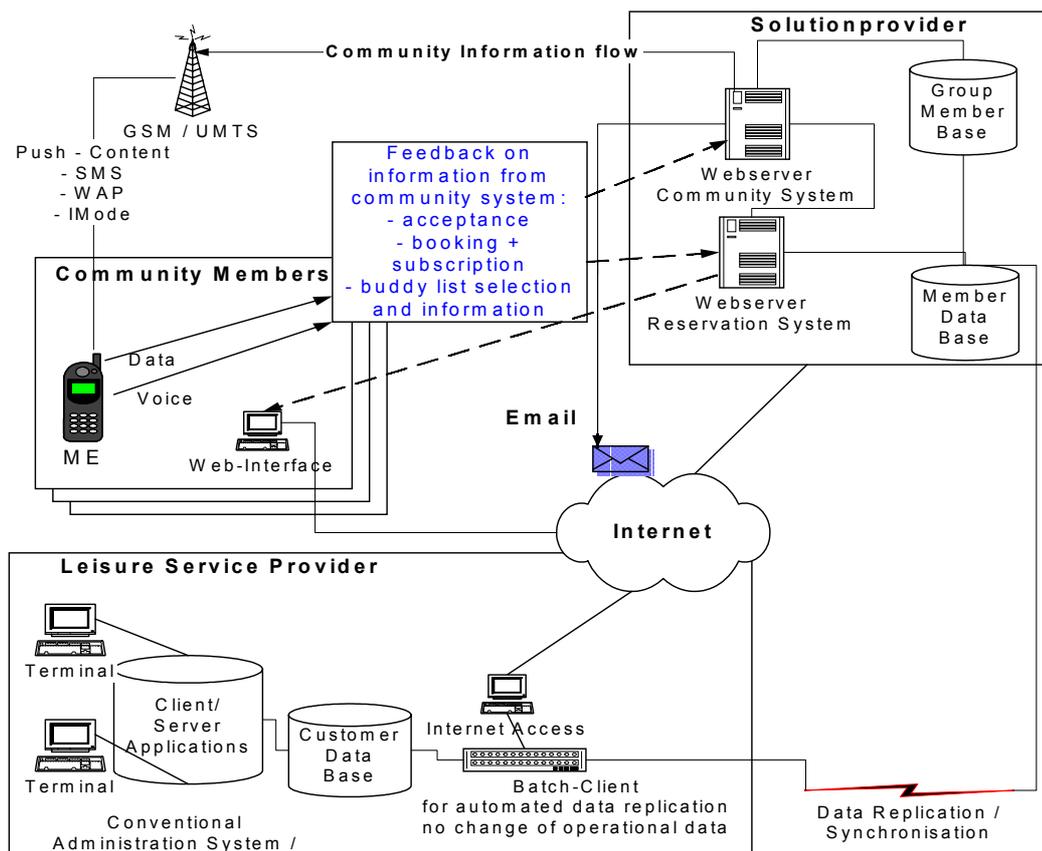

Figure 2: *MCOR-Architecture Overview*

4.3.1 The Web Interface

As mentioned above, we built the mobile enhancement of MCOR as an add-on to the existing CR-Online Reservation System. The latter is a Web-based solution for resource reservation which had been launched as a separate product in 2002. A screenshot showing one of the resource reservation pages (labelled in German) is shown in Figure 3. It is possible to manage all services via this Web site, e.g. user preferences and security settings, or buddy-list membership. Using an Internet access, the MCOR-notification process could be started directly via any Web browser.
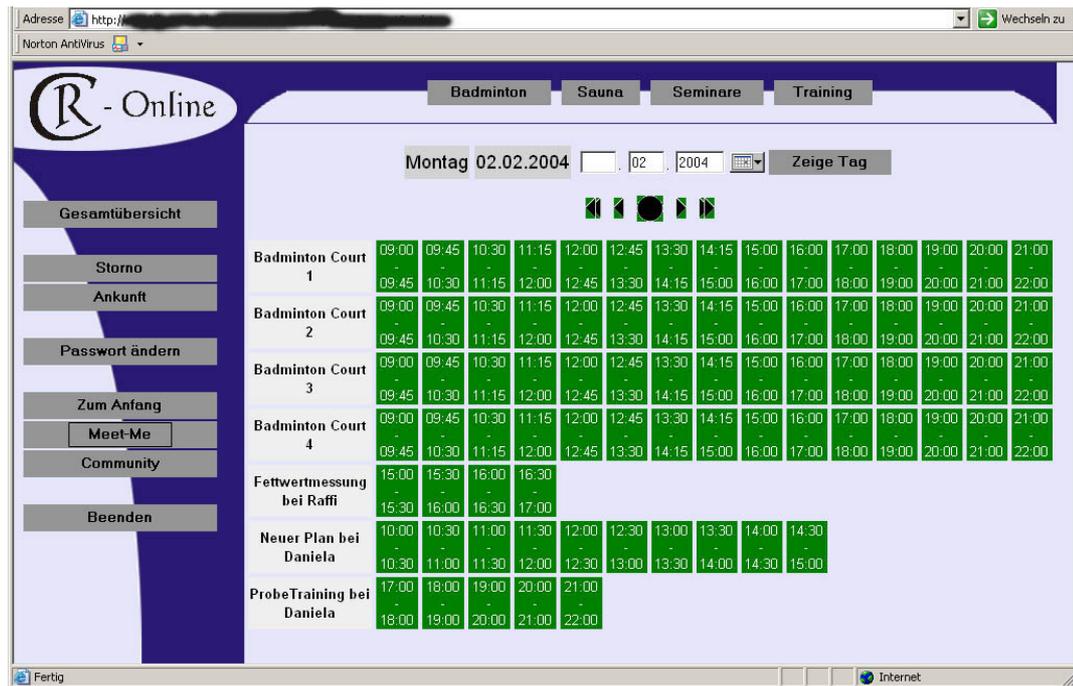

Figure 3: *The existing Web based online reservation system*

4.3.2 The MCOR-System As Seen By The User

The screen shots shown in Figure 4 illustrate some of the steps which a user will typically perform: starting with a request for booking of a resource, the user invites his buddies to accept this invitation and awaits the acknowledgement. Depending on the preferred channel either all buddies receive this specific invitation instantly or iteratively and can then confirm, deny or ignore it. The MCOR-system distributes the incoming answers, thus acting as a message hub. All parties involved may inquire the status of all pending invitations at any time. Furthermore, they have the option to invoke additional events which would turn the evening into a real community event.
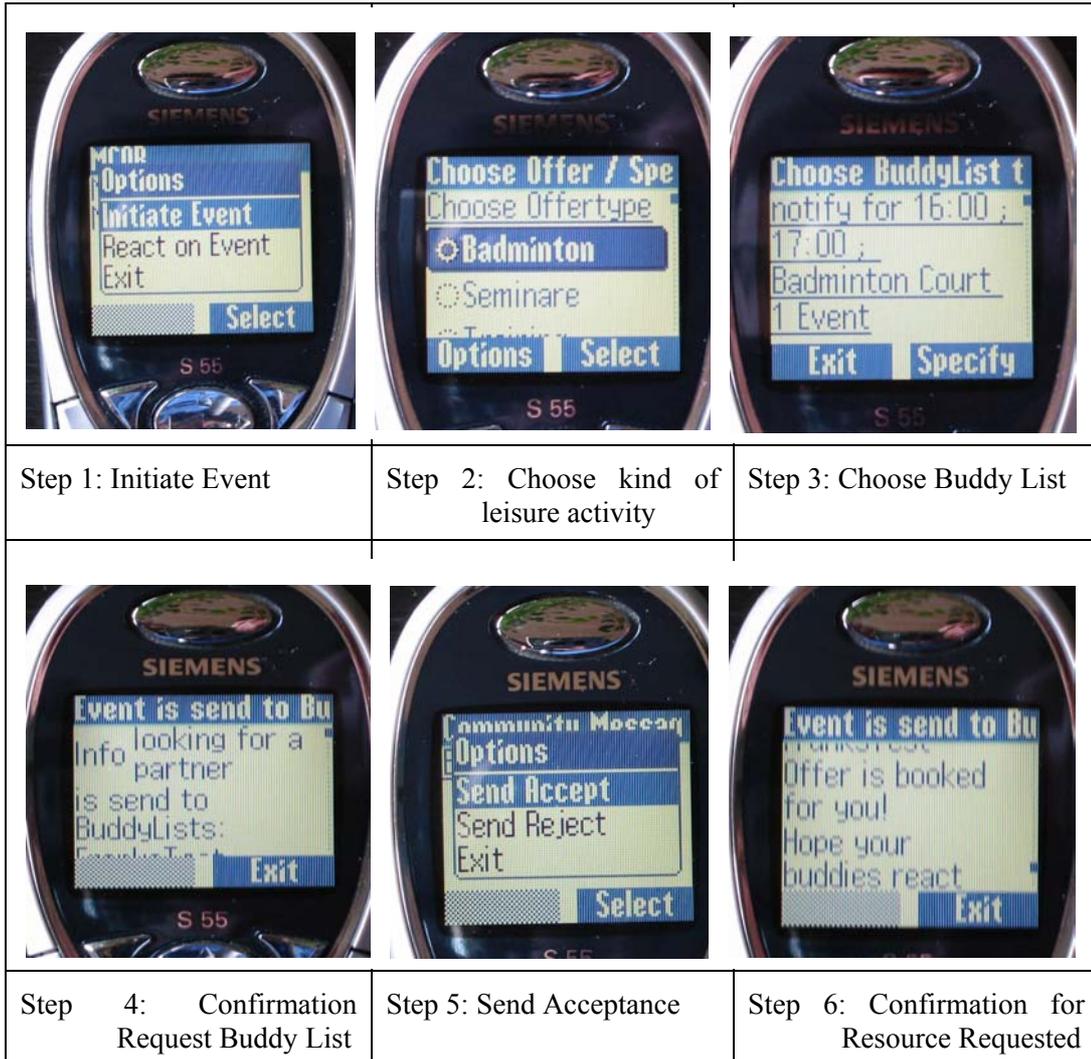
Step 1: Initiate Event	Step 2: Choose kind of leisure activity	Step 3: Choose Buddy List
Step 4: Confirmation Request Buddy List	Step 5: Send Acceptance	Step 6: Confirmation for Resource Requested

Figure 4: *The MCOR Prototype: Selected Steps Of The Reservation Process Displayed On The Mobile Handset*

5 Outlook: A Roadmap For Further Research On Mobile Communities

The results presented so far open a wide range of future research perspectives. The following list is neither meant to be coercive nor exhaustive.

First we will concentrate on user acceptance of the service in general and the improvement of the user interface design by conducting usability surveys. The study will include the business dimension by means of carefully monitoring the activity handled via the system right from the start of the operation of the service. Once the service has been launched, any customers cancelling the service or holding a subscription but not using it should be interviewed (if possible). Different ideas of how to get customers to subscribe to the systems have been examined.

The next step in this research project will be the identification of the final business model for our prototype together with the implementation partner. We plan to perform a survey asking all players for their interest in the new service and their willingness to join a

shared cost model. This will give us a good idea of the possible acceptance of the service as well as the general cost model. The question that will ultimately define the success of our implementation is the following: "Who will be willing to pay for the fixed and variable cost of the service and host the platform?" After a thorough literature review and interviews with our business partners we figure that this will not necessarily be the party that gains most profit from it. Once the system is operational, we will conduct user surveys to learn about acceptance.

Another challenging research item will focus on deploying the MCOR-approach to other domains. This would stimulate the need to develop a generic software platform. Questions related to this are: Which branches are suitable for mobile community support and how do they differ with respect to the underlying business conventions and operational aspects?

Finally the MCOR-system could be technically enhanced by adding a voice portal interface, which would allow the users to interact with the system via natural speech. There are mature software platforms on the market, but the complicated part resides in the seamless media-integration and the semantic precision.

By aggregation of results from this and other studies on mobile communities [e.g. Hampe / Schwabe 2003] we should be able to draw a more precise picture of the specifics and interdependencies of different mobile community approaches with respect to the theoretical concepts of communities in general.

6   Summary

Conventional IT systems in the leisure industry are mainly focused on accounting and supporting the internal organisation of companies. The proposed mobile reservation system goes significantly further by adding support for the users' requirements. The main challenge on the social level is the combination of leisure activities with communication and simultaneous interaction with other people. On the technological level, the challenge is the integration of different communication and media channels.

Mobile (virtual) communities are a very promising approach to overcome difficulties in organising leisure activities. Especially the aspects of ubiquitous access to a community, its members and services, as well as to new services enabled through innovative mobile technologies seem to be most promising.

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