Assessing User Requirements for New Digital Video Mobile Services – The INCCOM Project

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Abstract

As mobile technological capabilities advance, so does the search for new mobile business models and services. One new possibility is the broadcasting of 'television' to a mobile handset. This is known as DMB (Digital Multimedia Broadcasting). We have explored this new technology and possible associated services under the auspices of INCCOMs (Integrated Cross-Media Customer Orientated Models) research – This is a European Commission 6th Framework project that gathers experience from organizations and research projects that deal with cross-media technology environments with the aim of proposing successful business models in the domain.

In this paper we report preliminary results of a study that explored European (German) user's requirements and perceptions for new Digital Multimedia Broadcasting services. We compare this with the results of a similar study that was conduced in a different geographical region (Korea), with different users.

Our preliminary results show that, in general, users perceive a need for such new mobile services and are prepared to pay a premium for them. There also appear to be little differences in the perceived requirements of the different user groups (German and Korean).

1. Introduction

The global interest in the FIFA World Cup provided an excellent opportunity for the exploitation of technological possibilities within the digital cross-media content segment for commercial organisations and researchers. One such research initiative is [28] whose aim is to seek and gather experiences from particular organizations and research projects within a cross-media technology environment. The INCCOM project [28] has gathered this experience in order to propose new, customer oriented business models. The aim is to stimulate the commercial exploitation of innovations such as DMB as well as to focus future research activities. This research has run for almost three years. It is structured in three major phases Fig. 1, which incorporate (1) the defining of cross-media business models, (2) the investigation of these models and (3) the methodology for their introduction into the proposed multimedia environment

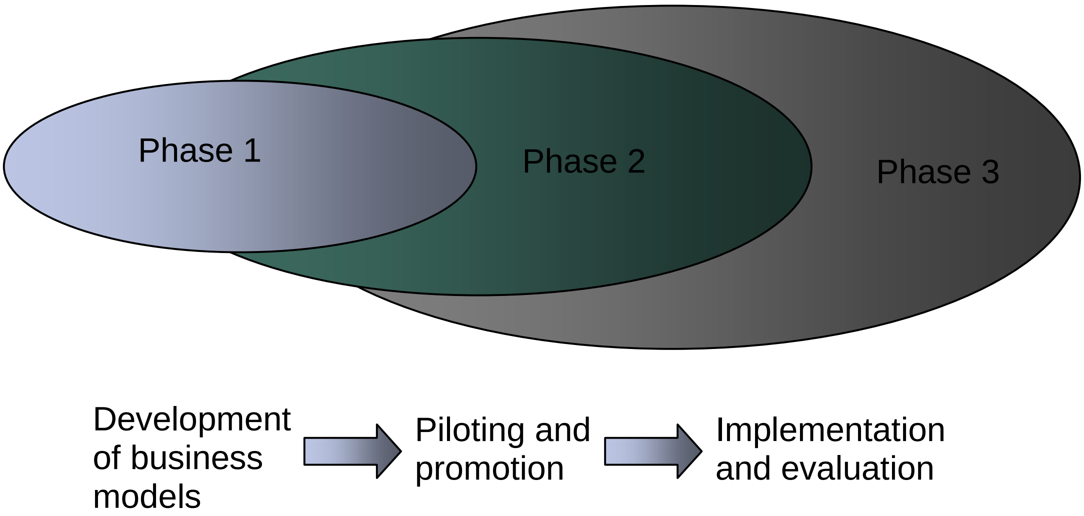

Figure 1 INCCOM project phases

In the first phase of the project, current know-how, research and commercial activities which could be classified under the ‘cross-media’ umbrella were aggregated and explored. The aim was to compare business ideas and models in cross-media related projects and initiatives with a special focus on the end user perspective.

The project consortium wanted to provide insight into the most appropriate and viable cross-media business models within such a dynamic technological and business environment. This required the identification and implementation of a comprehensive benchmarking and best practice methodology. The results of which were highlighted by [1]

In the second and third phases of the project these business models were evaluated in cooperation with other cross media research and commercial projects. In this paper we report preliminary findings from [28] analysis of user acceptance studies in the Digital Multimedia Broadcasting (DMB) domain. There are two notable such studies [2] and [3], the results of which are compared. The MI-FRIENDS project [2] surveyed 140 German ‘users’ and asked them a range of questions concerning current and intended use of mobile services. The Shim et.al. study [3] resulted in 264 usable results where users were asked a range of questions that focused exclusively on DMB services.

New DMB technology combines multimedia, and interactivity with a network interface to produce a new mobile service. Satellite and terrestrial signals can be received by a DMB mobile handset. Users have the option of selecting on demand television and audio mobile stations whilst simultaneously making phone calls. In this paper we draw out the major trends from the two studies and compare the findings.

2. The Market for DMB

The mobile phone industry has grown rapidly in the last decade. To use the UK as an example, in 2003/4 the mobile phone industry was worth £13.97bn, which is more than double its value 5 years earlier [4]. Mobile devices now account for over 40% of revenue of the telecommunications market and this level is increasing [iBid]. As we move from a fixed line market to a mobile market there is huge potential to target mobile phone users with other applications and services to aid and enhance increasingly flexible lifestyles. With new technologies such as 3G offering greater bandwidth of mobile devices, the services offered are moving to be demand led rather than supply/technology constrained. The UKs first 3G operator Hutingson3G (3) first offered TV clips for download in 2002. The 2006 FIFA World Cup triggered a massive surge in the uptake of mobile TV in the UK. With 3 achieving over 3.6 million viewings of its World Cup based mobile programming, pushing mobile TV usage to an all time high in the UK. On the 7th of August 2006, 3 announced that it will broadcast the UK TV channel ITV1 live on mobile phones from the autumn of 2006. ITV1 is Britain's most popular commercial TV channel, playing all 300 of the top commercial programmes on TV this year. ITV has granted an exclusive 3G mobile licence to 3 for six months.

The Key Note Market report 2005 for mobile phones states “many analysts believe the battle for the 3G market share will be won and lost according to the quality of content made available to users” [iBid]. In the UK, Vodafone has made agreements with major media distributors Sony and Disney to facilitate exclusive content provision in the future. However in order for the content market to grow, 3G must fully penetrate the UK market and service providers must provide services that are of value to users. In 2003 only around 4% of the UK mobile phone market revenue was derived from value added services [iBid].

In order to realise greater content revenues, mobile operators must address the issue of defining a suitable and attractive charging model for such services. Ghys [5] explores the extended business model for mobile content provision. Ghys [iBid] adds two additional roles to the Business model of mobile operators. *Media Providers* such as TV producers who create the content and *Content Providers* who transform the content into a suitable format for use. Content and media providers then act with existing mobile network service providers to distribute and gain revenue from their ‘products’. Ghys [iBid] explores numerous charging models in great detail, for mobile operators to consider when providing content. This is an important issue that is addressed in both [2] and [3].

In the search for ‘revenue’, mobile phone handset manufactures must continue offer users services that meet all of their requirements not just content provision. A survey by the target group index in 2004 found that, in the UK, the three most important factors when choosing a mobile network were tariffs, network coverage and reception [4]. This analysis indicates that whilst value added services, such as content provision, are anticipated to be profitable future revenue streams for operators, they must also continue to fulfil customers’ basic requirements (by offering attractive call packages and good network coverage). The detrimental effects of failing to fulfil these basic requirements was highlighted by Which Magazine [6] (A popular consumer advice magazine published in the UK) in 2004 when they advised consumers not to buy 3G phones until they achieved better network coverage. At the time 3 was the only operating 3G network in the UK and had only 80% coverage of the population compared to the network coverage of other UK operators of 97%.

In addition to offering availability of core functionality (allowing users to make and receive calls and SMS messages), to ensure successful market penetration mobile operators looking to deliver additional content should consider the *usability* of the mobile devices that they offer to connect to their network. Lee et.al. [7], is an example of one of many papers (cf. also, [8]; [9]; [10]; [11]; [12]; [13]; [14]; [15]; [16]; [17]; [18]) that offers advice on how to evaluate user interfaces to ensure their design is intuitive and easy to use and hence attractive to consumers. Lee et.al. [7] find that an easy to use user interface is considered a core competency in the mobile phone market. They suggest that user interface evaluation is essential in the development process of mobile devices.

3. Methodology

This paper describes preliminary results of research that is in progress. Data collection techniques and research methodology are inextricably linked. The research in this paper was conducted using documentary evidence [19] as we have sought to compare the findings of two major studies in the Digital Multimedia Broadcasting domain. With little known about users of Digital Multimedia Broadcasting technologies in academic literature, the research that we reference has been necessarily ‘exploratory’. The methodological debate in IS concerning ‘rigour versus relevance’ is interesting when we consider new technologies and new phenomena which are ill-researched by academics (c.f. [20]; [21]; [22]; [23]; [24]; [25]; [26]).

It is clear *from the data* that the issue of DMB *usability* is extremely *relevant* to both users and potential vendors. Regarding the significance of ‘contextual setting’ in IS research, [27], one of the studies we have compared in this paper [2], clearly demonstrated that contextual factors need to be understood. Our research which is in progress focuses on ***understanding the drivers for successful business models in the cross-media technology domain; we focus here on DMB services and technology***. We have attempted to code our data using qualitative data analysis software so that dominant themes can be identified. This technique has not worked particularly well with the use of secondary data drawn primarily from documentary sources. The data has been collected in the context of a European Commission funded project [28].

4. User’s Perceived Use of DMB Services

In the following sections we present the main findings from the two main studies that have been conducted in this domain. We have attempted to align the results where possible in order to draw comparisons and to deduce the major trends concerning user’s perceived use of DMB services.

4.1 Shim et.al Study [3] of Korean Users

This study [3] of Korean user’s perceived use of DMB services focused on understanding the following questions:

(1) Do users perceive easy access to DMB applications as a satisfactory service offered by DMB service providers?

(2) Do users perceive high-quality DMB program contents as a satisfactory service offered by the DMB service providers?

(3) Are there differences between different age groups in terms of their perception of DMB phone prices, phone usage time, program contents, and services?

It appears that the main factors that Korean users felt were actually important when choosing DMB services were; *pricing of the handset, quality of the video picture, contents of the programme, quality of the handset itself, ease of use*, and 'others' such as brand image and customer service.

4.2 MI-FRIENDS Study [2] of German Users

This study [2] of 190 German DMB users took place from the 8th June to the 3rd August 2006. This was timed deliberately to coincide with the World Cup being hosted in Germany. The study organisers distributed mobile devices to users that allowed them to receive DMB broadcasts in Southern Germany. The users were interviewed at the start of the trial, completed online surveys during the trial and the world cup on the 29th of June, an additional survey just after the world cup had finished on the 12th of July and a final survey several weeks after the end of the world cup on July 26th. Nine Focus groups were held with 65 of the DMB trial participants during and after the world cup. There was an online forum in which all users could communicate and express their opinion both during and after the trial. Because of the timing of the trial, the focus was on football fans as example 'early adopters' of DMB technology. Users were from all age ranges, but with users from age 21-30 contributing 58% of the participants. The gender split was 40% female 60% male. The trial results also allow for comparisons during and after the world cup to understand the influence of major event participation and its potential impact on DMB usage.

4.3 Price

The Shim et.al. [3] findings show that teen-aged users said that they would be prepared to pay current market prices for DMB services. The authors therefore recommend that vendors should target this group. We question this assertion as the intention to purchase by this age group may not be matched by the availability of funds!

The MI-FRIENDS study [2] did not cross-correlate for user-age group but did ask users to express how much they would be prepared to pay as a monthly fee for access to DMB services. Twenty six percent of respondents said that they would pay up to 5 Euros and 23% up to 10 Euros. Despite not cross correlating with age group, 40% of respondents were aged up to 18 years and 30% were aged 18-25. The question is rather limited as it does not encompass the potential pricing complexity of a more 'metered' or 'pay-as-you-go' model.

In summary, pricing is clearly an important area for the vendors and future customers of such services. Both [2] and [3] have attempted to explore the price elasticity of demand for such services but the research approaches are rather simplistic and it is therefore difficult to draw firm conclusions. However, there are indications that the services appeal to the younger users who would be prepared to pay for them.

4.4 Usage Time

The Shim et.al. [3] findings found that access/usage time (access time, air time and the time it takes to get familiarized with the handset and services - ease of use) issues of DMB services and handset, was a statistically “important” factor for all age groups when selecting a DMB phone. They state as their conclusion that “when focusing on strategic moves the DMB providers do not have to place as much emphasis on the end-users’ access/usage time.”

This differs from the [2] data which shows that 75% of participants considered that ‘a large service area, and hence access, is a pre-condition to stimulate usage’, and 39% cited the ‘ease of use of the mobile device also as a pre-condition’ to stimulate usage. Regarding access time the [2] research showed that over 50% of users ‘very often’ watched DMB for less than 5 minutes. The survey also showed that less than 35% of users viewed DMB broadcasts for over 1 hour and less than 18% viewed the broadcasts for over 2 hours. The MI-FRIENDS [2] research shows that the majority of users utilised DMB broadcasts for a short period of time of less than 30 minutes. Later in this paper we further explore the interesting results of why users viewed DMBs.

In summary, we propose that *access and usage time* are indeed important factors that Mobile TV broadcasters and handset providers should consider when making strategic decisions in DMB provision.

4.5 Programme Contents

The Shim et.al. [3] findings show significant deviation between teens and other age groups’, perception on programme contents (Video quality / audio quality selection.) They found there is a difference between age groups and their perceived value of DMB programme contents.

The MI-FRIENDS [2] study did not cross-correlate for user-age group but did ask users what kind of programme they wanted to see on DMB. Thirty four percent said they wished to see similar channels to those used in the DMB trial, (Content Providers involved in the MI Friends Project – Antenne Bayern, BLR, D:SF, T Focus, Munchen.tv, Nova Radio, Talk Sport Radio, Plazamedia, Deutsche Welle, Das Erste, Bayerisches Fernsehen and Bayerischer Rundfunk.) whilst 17% wanted additional services to be available on demand and 16% wanted to store TV programmes on their mobile device to watch on demand. Whilst these results do not clearly distinguish the kind of media that participants desired, we think that it is still helpful to look at the timings and reasons for DMB usage to provide some insight into the type of use and hence to hypothesise on suitable programming to attract users.

During the [2] trial 74% of people that used a mobile device to watch Football matches did so as they were “not able to watch it otherwise.” This would imply a high proportion of the demand for such programming is for individuals that are travelling or are away from home.

Sixty three percent watched mobile TV daily and several times a day during the World Cup but only 26% did the same after Fig. 2. This decline shows that a significant proportion of users, who were targeted as World Cup fans, only utilised the DMB broadcast to watch TV that was highly relevant to their preferences.

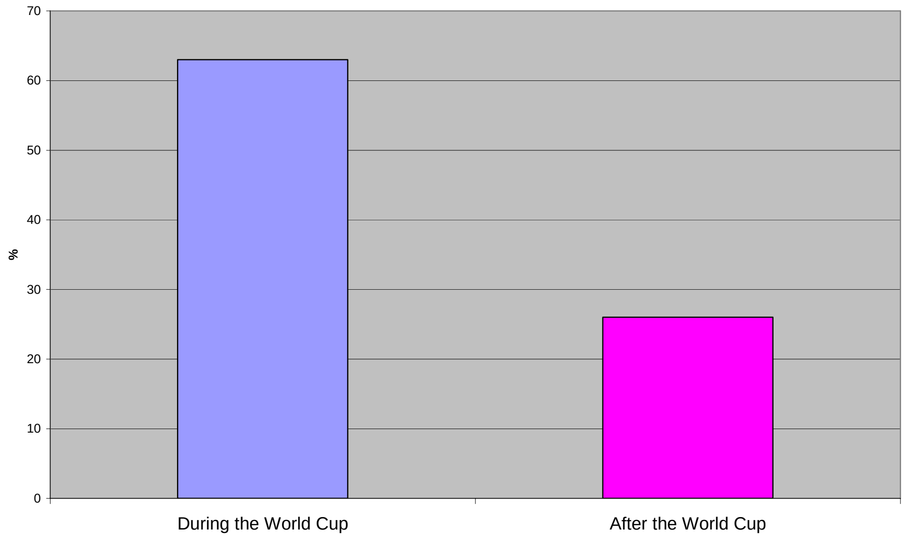

Figure 2 Percentage of users who watched TV daily or several times per day

Interestingly, after the world cup had had finished usage for short periods (less than 10 minutes) increased from 34% during world cup to 57% after, whilst the watching of DMB for a period over 10 minutes decreased from 65% during world cup to 23% after. In addition a total of 13% of users did not watch the DMB broadcasts at all after the world cup had finished – where as all users watched DMB broadcasts during the tournament.

When [2] users were questioned on their motives for watching DMB Broadcasts during the world cup, 26% of users watched to be ‘up to date’ and 25% watched to see ‘specific programmes because they were not at home’. After the world cup 33% of users watched TV to be up to date whilst only 12% watched to view a specific programme because they were not at home.

When [2] users were questioned on where they viewed DMB Broadcasts, 37% used the device when on, or waiting for, public transport. This highlights the particular use of DMB broadcasts for entertainment purposes when individuals are constrained in their choice of activity due to the need to wait for a period of time.

These results lead us to conclude that users without a specific event such as the World Cup will probably utilise DMB broadcasts for short periods of time to stay up to date whist waiting or passing time. This information is extremely pertinent for mobile network operators as it indicates that they should offer a large variety of short programmes that can be viewed whilst on the move and allow users to remain up to date with topics that interest them.

4.6 Service

The Shim et.al. [3] research asked users to rate the importance of DMB services (After service, performance of device, credibility of device maker) when selecting a mobile phone. Their research focused primarily on customer service issues to do with device reliability and credibility. They found that different age groups particularly teenagers derived different perceived value from DMB services. The MI-FRIENDS [2] research did not directly question users on the level of service provided by the mobile operator and provider. We question the validity of [3] as it supposes that teenagers are paying for the mobile devices that they possess. We question if this is a true assessment and whether teenagers themselves in general make an informed decision about the reliability of the device in payment if they are not the income earning purchaser.

5. Conclusion

The MI-FRIENDS [2] research found that a large participant event such as the World Cup can increase the demand for access to DMB broadcasts in order that individuals can *keep up to date*. With 75% of users watching football matches via DMB on a mobile device because "I was not able to watch it otherwise".

Without this critical driver we found that users' normal behaviour was to view DMB for short periods of less than 10 minutes at a time to "keep up to date." The Value of DMB for these consumers appears to be using DMB on a daily or weekly basis when they can't access normal TV feeds.

We recognise the limitations of [2] as data is inherently skewed by the choice of a participant group with a common interest in football who did not pay to use the service. However, the comparisons between [2] and [3] allow us to draw the following conclusions:

- Most demand for DMB broadcasts is from users who are away from home and wish to keep up to date whilst waiting for public transport or similar services.
- The existence of a large event such as the World Cup can significantly impact the usage of DMB broadcasts as evidence by [2] and the 3 results from the UK highlighted at the beginning of this paper.
- Programme contents whilst important are highly individualised so mobile operators should offer a wide variety of content to attract the most users.
- Accessibility and price appear to be important factors that contribute to the uptake of DMB services however the data gathered by [2] and [3] does not allow us to draw significant conclusions on these matters.
- DMB and other additional services are an important emerging revenue stream for mobile operators.

Further research should be conducted in this field, but operators must ensure that whilst offering additional services such as DMB to their customers may yield greater profits, they must continue to provide effective core services such as network availability and mobile phone ease of use to ensure that their core product remains attractive to users.

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