



## STREP

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## MOBISERVE

### **New mobile services at big events using DVB-H broadcast and wireless networks**

#### **Deliverable1.1: User requirements and specifications (WP1.1)**

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## 1. Introduction

The MOBISERVE project by combining wireless communications, digital TV and home environment brings exciting challenges for the design, development and exploitation of convergent services. Established design principles do not necessarily apply to this new context, therefore there is great need to address the issue of usability, providing guidelines to ensure that applications and services to be created will be both usable and useful.

In order to reach this goal, The "Task 1.1 User needs" of Work Package 1 will perform mainly three streams of activities to:

- Define context of use and target user groups: The project requires data gathered from real prospective users of the services by studying their interactions with other users, and with technological artefacts, as well as the physical and cultural context. As a consequence, an ethnographic methodological approach will be used in this activity.
- Discover user needs in using convergent services in mobility.
- Discover user needs at the content / service production side because the content / service providers are also targeted users of the ISAP platform. (one of the project's innovative research points is to research for solution to associate and synchronize different types of data together with AV program for transmission and presentation, and further on based on this solution, to design and implement tools to facilitate the interactive program production process.)

This task consists of two phase. The Phase 1 is started at the starting point of the project and lasts two months. Its main objective is to get the first understanding of the users' requirements from both end users and content producers sides.

The Phase 2 will re-assess in hindsight the understanding of the users' requirements, especially with the help of the beta version of the MOBISERVE Rich Media Interactive service platform.

The present document is resulted from the Phase 1's researches, which is composed mainly two parts, namely "Content producer needs understanding" (section 2) and "End User requirements analysis" (Section 3). The list of use cases commonly used in the Task1.1, Task1.2, Task1.3 and Task1.4 is listed in the Annexe.

## **2. Content producer needs understanding**

This study is mainly conducted by CiTVC with the investigation and interviews inside CCTV.

### **2.1. Needs on platform**

#### **2.1.1. Robust Audio/video encoding and multiplexing based on DVB-H standard**

##### ***Quality of Audio/Video reception is the must***

After all, Mobile TV is Audio/video content based media. Therefore, it is of primary importance, while looking for an optimal Audio/video compression technology, to ensure the quality of Audio/Video reception for the end users.

##### ***Leverage the usage rate of the available frequencies for broadcasting***

The available frequencies (hence usable bandwidth) are very limited resources for broadcasting TV programs. Therefore, while ensuring an acceptable quality of reception, the rate of the usage of these limited resources needs to be leveraged.

##### ***Dynamic transmission bitrate and flexible resources' allocation***

The feature of the dynamic transmission bitrate and flexible resources' allocation will facilitate the implementation of the data broadcasting and data pushing services, for instance, when TV programs are no more on the air.

#### **2.1.1. Facilitating the production of Audio/Video programs**

##### ***Multiple content sources***

It consists in making TV programs with multiple Audio/Video/Data sources, including the possibility of multiple screens and angles.

##### ***ESG and interactive programs***

The Easy to use system for the production, the broadcast, the renewal and so on of the ESG and the interactive programs is needed.

##### ***Database system of content resources***

The Easy to use database system of content resources, which would facilitate the query, edition and production of the programs, is needed.

#### **2.1.2. Interactive services studio system**

It consists of a sound interactive services studio system together with end user management system.

#### **2.1.3. Safe digital right protection system (such as DRM)**

For the contents and data which need right protection, based on the service subscription system, the recording and downloading feature should be possible but with the location limitation.

#### **2.1.4. Operational gap filler infrastructure**

In addition to the gap filler inherit functions, the location dependent services should be considered.

### **2.2. Requirements for TV program production**

The possibility to produce a large of variety of different styles of TV programs should be provided for production and broadcast.

#### **2.2.1. ESG editing tools**

These tools should be easy to use and integrated with the database system of content resources.

#### **2.2.2. Live program**

##### ***Direct live program broadcast***

End User should be able to perform operations like watching or recording TV program, through ESG, with a fully consideration of user management and DRM.

##### ***Best moments collection***

During the live program broadcast, the best moments could be captured and be made available to the end user either via data broadcast network or via bidirectional network.

#### **2.2.3. Data broadcast**

##### ***Emergency notification***

When the emergency events (such as the earthquake or the terrorism) occur, the public should be notified promptly.

##### ***Practical information***

General interest and practical information such as weather or traffic should be able to reach the end users.

##### ***TV program related data, editing and broadcasting***

The TV program related information can be simultaneously provided to the end user through broadcast channel along with the TV program. For example, in case of the sports related TV program, the related information could be the information on stadium, players, game rules etc.

It is obvious that the adequate editing tools should be made available.

The End User could also be able to personalize information service according to personal preference, thanks to user management system.

### **Consumer oriented information**

The consumer oriented information, such as (online) shopping for match tickets, souvenirs, as well as information about tourism and restaurant, should be considered.

#### **2.2.4. Interactive program**

The Interactive services platform should be able at least to cope with the following features:

- Voting, e.g. for best player, host and program, in order to increase user participation.
- Online gaming or gamer ranking, with a reliable security mechanism to guarantee the fairness of program
- Interactivity between user and host, with a strong content supervision mechanism and program emergency handling mechanism

It is worth noting that a mechanism to guarantee the integrity of user process in a program with several segments of interactivity is needed.

### **2.3. Other requirements**

#### **2.3.1. User information**

It is interesting to have the means to cope with the user information and usage information collection, analysis and management, in order to better understand the acceptance of different services provided.

#### **2.3.2. Commercial activity**

The commercial activity should be supported, including E-Shopping etc.

#### **2.3.3. Terminal emulator**

In order to experience first the data broadcasting and interactive services, the terminal emulator (for Windows OS) should be made available.

### **2.4. Findings**

Traditional content producers are very interested in the IPDC broadcasting and interactive services. For the success of interactive services, they think from the end users' side:

- Program logic should be easy to understand
- UI should be easy to use
- Participation should be widely supported -- not to be limited by network or software & hardware in the terminal



From the content producers' side, they need tools that can facilitate the program logic conception and production. From the management platform side, technical analysis and data statistics functions are needed to enable the platform to automatically execute program logic based on the user feed backs. And for the security reason, all feedbacks and interactivity should be under control. When producing complex interactive programs, the platform should take care of the whole process of interactivity and guarantee the program integrity and the validity of the results.

For the time being, the most popular interactive service is the voting service where a simple button push is all what needed for the end users. Innovative complex interactive service can also attract users, but the participation depends highly on the interestingness of the program and the easiness of the operation.

For the WIFI supported local contents broadcasting, the E-Shopping is an attractive service which will probably lead to a new approach for media consuming.

### 3. End User requirements analysis

#### 3.1. Research aims

With the use cases provided by all partners, the WP1 contributors finalize two scenarios for the Phase 1's investigation.

The overall objective of the research plan at this stage is based on the two final scenarios to identify the Olympics related acceptance towards mobile TV functions and services from user side.

To investigate in details:

- Which functions and services in our use-case-list are requested by users
- The interest/acceptance extent of each use case.

#### 3.2. Research methodology

According to the task 1.1 and task 1.2 of WP1, three research focus groups (each group 6 persons) were conducted by BAMC between Nov 06 - 07, 2006.

Each group was composed of a mix of males and females of varying ages between 23 - 45. Participants were recruited from the general population by request of having experience of using mobile devices, having an interest in Sports, having experience of watching Olympics games and experience of watching games in sports stadium.

For collection and analysis of the data, three focus groups were recruited.

- Users with good financial situation
- Mobile “professional”
- Youth (graduate student on campus)

The first group was defined as users with good financial situation, because financial problem is one of the main barriers for the purchase of device with Mobile TV function and this part of users have fewer financial burden.

The second group has great interest in new functions and services of mobile devices. They have the characteristic of initiative.

The last focus group users are graduate student on campus. They are also an important potential part of users.

By the form of “focus group” and during the process of interview, behaviours, beliefs and observations of specific groups are identified, the valuable functions and services according to user's opinions are gathered and the reasons of choice are caught on .

With the “5-degree-form”, we want to see to what extent the users interested in the related functions and services, research to determine which prescribed use cases should be followed in our project and finally achieved the stated outcomes. .

### 3.3. Questionnaire structure and interview process

Areas of investigation:

- The Olympics related acceptance towards mobile TV services
- The Olympics related acceptance towards mobile TV functions
- Key benefits associated with mobile TV service and functions
- When, where and why consumers are expecting to watch mobile TV on the phone
  - What kind of services do they request, when watching TV on mobile? When watching Olympics on mobile?
  - What kind of functions do they request for the mobile device, when watching TV on mobile? When watching Olympics on mobile?
- Perception of typical target user and usage occasions of mobile TV service
- Purchase interest towards the service and potential barriers
- Price perception of both the feature and service
  - Appealing charge mode of the service
  - Consumers' requirement in purchasing a mobile phone with embedded mobile TV feature
- Instrument gap with other video devices

The interview was carried out as a whole, interacting as much as possible with all members of the group. The respondents gave our functions and services many informal, friendly suggestions and critiques during the research.

#### 3.3.1. Warm-up (5 mins)

- Self-introduction, explain self and role as moderator.
- Encourage participation, share of voice. No right or wrong answers.
- Explain timing is about 3 hours and recording.
- Respondents' introduction.
- Topic of today is to talk about the perception, evaluation, acceptance and expectation towards the Mobile TV service and the mobile device functions

#### 3.3.2. Open questions

To gauge:

- The overall interest towards the Mobile TV
- The interest towards sports and the Olympics
- Olympics related expectation and acceptance from the users' side towards Mobile TV functions and services

In this part, some general topics of the investigation were discussed, but not get many advices.

Allow respondents to answer in their own words, briefly or at length. Respondents are asked to supply any kind of information they consider appropriate.

### 3.3.3. The first scenario associated questions

The first scenario consists of 9 episodes, including almost all of the 44 use cases. Therefore this part of questions is the main part in the questionnaire.

By big screen, with words, pictures and videos, we described each function and service in scenario before questions and discussion.

For each function and service, we get spontaneous reactions from the respondents first, and then probe in aspects of acceptance and interest extent.

Based on the use cases and the scenarios, the following list of services are derived and hence investigated:

<b>No</b>	<b>Function or Service</b>	<b>Relation to use cases (Ref. to Annexe 4.1)</b>
1	Receive city information	7, 41, 6
2	Get tourist information at the airport	40
3	Get Olympic related programs at the airport	40, 5
4	Personalize the preferences on the mobile phone	17,2 5
5	Personalize the preferences on the TV-set	17, 25
6	Automatic usage data collection	18
7	Traffic and map information	7
8	Buy tickets etc through the mobile phone	13
9	ESG	20
10	Scheduled download	15
11	Receive polling alert	3
12	Share diary with others	19, 26, 38
13	Have multi-angle service	2
14	Overlay layer to present different categories of information	24
15	Breach of the rule service	28
16	Watch high quality home-version videos on TV-set	37

<b>No</b>	<b>Function or Service</b>	<b>Relation to use cases (Ref. to Annexe 4.1)</b>
17	Get recommendations in shops	40, 41
18	Pay via the mobile phone	13, 10
19	Get advertisements in shops	40, 41, 10
20	Get Olympic related programs in shops	40, 41
21	Reserve the highlights on mobile phone	33
22	Click products for E-shopping when watching the advertisement	10
23	Receive emergency notification	35
24	Get alerts when interested programs begin	1
25	Languages choice	8
26	Commentators choice	9
27	PVR according to the pre-settings on TV	16
28	PVR according to the pre-settings on mobile	16
29	VOD	29
30	Download clips	33, 15
31	Slow down the motion when watching a local file or a live program	31
32	Freeze the motion when watching a local file or a live program	31
33	Time shifting service	4
34	Use mobile phone watch TV at home	
35	Seamless handover of content from mobile to TV	40
36	Watch programs provided (e.g. VOD) according to the profile on mobile	17, 29

<b>No</b>	<b>Function or Service</b>	<b>Relation to use cases (Ref. to Annexe 4.1)</b>
37	Watch programs provided (e.g. VOD) according to the profile on TV	17, 29
38	Display the interactive information on big screen as well as on mobile	34, 3
39	Interact (e.g. polling) with big screen via remote controller	3,
40	Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)	29, 41
41	Get specific Olympic related programs in restaurants or bars	5, 40, 41, 42
42	Interactive discussion	34, 38
43	Message projected on the big screen	34
44	Message sent to community based on profile	17, 38
45	Play the content of mobile phone on the Household TV set	37, 40
46	Upload and share with public	26, 38
47	Share content with friends on mobile phone	38
48	Share content with friends on TV-set	38
49	Take part in "select" program	34

### 3.3.4. The second scenario associated questions

The second scenario described a “select”-program.

With big screen and a pdf -document participants had well developed and nuanced opinions of the wisdom for the organization and subject of “select”-program are expressed.

### **3.3.5. Business model inquiry**

#### **3.3.5.1. Perception towards typical target users and typical usage occasions**

- To understand the perception of typical target users and usage occasions of Mobile TV service
  1. Who are the target users of the Mobile TV service?
  2. How do you think would target users use the feature? Why?

#### **3.3.5.2. Device and service cost**

- To understand the appealing charge mode of the service
- To understand the perceived price of both the feature and service, as well as the price target consumers are willing to pay for
  3. Device cost
  4. Charge mode and service cost

#### **3.3.5.3. Video functions**

- To gauge the current Video device usage behaviour, focus on portable video devices, like MP4, PMP, portable DVD player and PS II.
- To gauge the appealing extent of video viewing function on Mobile phone compared to on other video devices.
- To gauge the possibility to substitute any of these devices with a mobile phone.

### **3.3.6. Fill the 5 degrees form**

In order to identify the interest/acceptance of the use cases, a 5 degrees' scale has been used. They are as follows:

- Need extremely
- Need a lot
- Need
- Need a little
- No need at all

### **3.3.8. End of the interview**

The interview finished after filling out the 5 degrees form.

### 3.4. Results of analysis

#### 3.4.1. Result 1 – Compilation of user requirements

The following table compiles the collected 5 degrees forms from all the focus groups by number of users' preference by 5 degree / Function or service.

<b>No</b>	<b>Function or Service</b>	<b>Need extremely</b>	<b>Need a lot</b>	<b>Need</b>	<b>Need a little</b>	<b>No need At all</b>
1	Receive city information	3	5	6	4	0
2	Get tourist information at the airport	4	6	5	2	1
3	Get Olympic related programs at the airport	6	7	1	3	1
4	Personalize the preferences on the mobile phone	4	6	6	2	0
5	Personalize the preferences on the TV-set	1	1	2	10	3
6	Automatic usage data collection	0	1	5	6	6
7	Traffic and map information	7	7	3	1	0
8	Buy tickets etc through the mobile phone	8	2	4	2	2
9	ESG	4	6	6	1	1
10	Scheduled download	2	2	7	5	2
11	Receive polling alert	0	0	2	10	6
12	Share diary with others	1	5	3	6	3
13	Have multi-angle service	0	2	8	6	2
14	Overlay layer to present different categories of information	0	0	8	7	3
15	Breach of the rule service	0	0	2	7	9
16	Watch high quality home-version videos on TV-set	4	5	6	3	0

<b>No</b>	<b>Function or Service</b>	<b>Need extremely</b>	<b>Need a lot</b>	<b>Need</b>	<b>Need a little</b>	<b>No need At all</b>
17	Get recommendations in shops	2	1	5	9	1
18	Pay via the mobile phone	4	7	2	0	5
19	Get advertisements in shops	1	1	5	9	2
20	Get Olympic related programs in shops	2	3	6	4	3
21	Reserve the highlights on mobile phone	4	7	3	3	1
22	Click products for E-shopping when watching the advertisement	3	3	10	2	0
23	Receive emergency notification	8	3	5	2	0
24	Get alerts when interested programs begin	3	9	3	2	1
25	Languages choice	4	8	4	0	0
26	Commentators choice	2	2	7	5	2
27	PVR according to the pre-settings on TV	1	1	4	7	5
28	PVR according to the pre-settings on mobile	1	3	8	5	1
29	VOD	1	1	4	8	4
30	Download clips	3	7	5	2	1
31	Slow down the motion when watching a local file or a live program	0	1	6	10	1
32	Freeze the motion when watching a local file or a live program	0	1	5	7	5
33	Time shifting service	2	3	5	7	1

<b>No</b>	<b>Function or Service</b>	<b>Need extremely</b>	<b>Need a lot</b>	<b>Need</b>	<b>Need a little</b>	<b>No need At all</b>
34	Use mobile phone watch TV at home	0	0	4	7	7
35	Seamless handover of content from mobile to TV	5	7	0	4	2
36	Watch programs provided (e.g. VOD) according to the profile on mobile	6	6	4	2	0
37	Watch programs provided (e.g. VOD) according to the profile on TV	0	2	8	6	2
38	Display the interactive information on big screen as well as on mobile	0	0	6	6	6
39	Interact (e.g. polling) with big screen via remote controller	0	0	3	9	6
40	Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)	1	2	11	3	1
41	Get specific Olympic related programs in restaurants or bars	4	6	7	1	0
42	Interactive discussion	4	6	6	2	0
43	Message projected on the big screen	0	0	7	9	2
44	Message sent to community based on profile	0	0	5	9	4
45	Play the content of mobile phone on the Household TV set	6	6	4	1	1
46	Upload and share with public	0	0	6	5	7
47	Share content with friends on mobile phone	8	6	1	3	0

<b>No</b>	<b>Function or Service</b>	<b>Need extremely</b>	<b>Need a lot</b>	<b>Need</b>	<b>Need a little</b>	<b>No need At all</b>
48	Share content with friends on TV-set	4	9	3	1	1
49	Take part in "select" program	8	4	4	1	1

### 3.4.2. Result 2 – Rankings of the functions or services

#### 3.4.2.1. Ranking by interest

The ranking by interest consists in ordering the functions or services by the number of users' preference with the 5 degrees ordered from most needed to less needed (Need extremely, Need a lot, Need, Need a little, No need at all). Therefore, based on the table of the subsection 3.4.1, the following ranking table derived.

<b>Ranking</b>	<b>Function or Service</b>	<b>Original No</b>
1	Share content with friends on mobile phone	47
2	Take part in "select" program	49
3	Receive emergency notification	23
4	Buy tickets etc through the mobile phone	8
5	Traffic and map information	7
6	Get Olympic related programs at the airport	3
7	Watch programs provided (e.g. VOD) according to the profile on mobile	36
8	Play the content of mobile phone on the Household TV set	45
9	Seamless handover of content from mobile to TV	35
10	Share content with friends on TV-set	48
11	languages choice	25
12	Reserve the highlights on mobile phone	21
13	Pay via the mobile phone	18
14	Get tourist information at the airport	2

<b>Ranking</b>	<b>Function or Service</b>	<b>Original No</b>
15	ESG	9
16	Get alerts when interested programs begin	24
17	Download clips	30
18	Personalize the preferences on the mobile phone	5
19	Interactive discussion	42
20	Get specific Olympic related programs in restaurants or bars	41
21	Receive city information	1
22	Watch high quality home-version videos on TV-set	16
23	Scheduled download	10
24	Get Olympic related programs in shops	20
25	Time shifting service	33
26	Commentators choice	26
27	Click products for E-shopping when watching the advertisement	22
28	Get recommendations in shops	17
29	Upload and share with public	46
30	PVR according to the pre-settings on mobile	28
31	Get advertisements in shops	19
32	VOD	29
33	PVR according to the pre-settings on TV	27
34	Watch programs provided (e.g. VOD) according to the profile on TV	37
35	Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)	41
36	Have multi-angle service	13
37	Personalize the preferences on the TV-set	5

<b>Ranking</b>	<b>Function or Service</b>	<b>Original No</b>
38	Slow down the motion when watching a local file or a live program	31
39	Freeze the motion when watching a local file or a live program	32
40	Automatic usage data collection	6
41	Message projected on the big screen	43
42	Overlay layer to present different categories of information	14
43	Share diary with others	12
44	Message sent to community based on profile	44
45	Display the interactive information on big screen as well as on mobile	38
46	Interact (e.g. polling) with big screen via remote controller	39
47	Use mobile phone to watch TV at home	34
48	Receive polling alert	11
49	Breach of the rule service	15

### 3.4.2.2. Ranking by Average

The average is based on the number of users' preference with the 5 degrees by punctuating the different degree as follows:

<b>Degree</b>	<b>Punctuation</b>
Need extremely	5
Need a lot	4
Need	3
Need a little	2
No need at all	1

Therefore, based on the table of the sub-section 3.4.1 (ref. Annex 4.2), the following ranking table is derived.

Ranking	No	Average	<i>The Mobile TV function and service probe form</i>					
			<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>
1	7	4.11	Traffic and map information	7	7	3	1	0
2	47	4.06	Share content with friends on mobile phone	8	6	1	3	0
3	25	4.00	Languages choice	4	8	4	0	0
4	23	3.94	Receive emergency notification	8	3	5	2	0
5	49	3.94	Take part in "select" program	8	4	4	1	1
6	36	3.89	Watch programs provided (e.g. VOD) according to the profile on mobile	6	6	4	2	0
7	45	3.83	Play the content of mobile phone on the Household TV set	6	6	4	1	1
8	3	3.78	Get Olympic related programs at the airport	6	7	1	3	1
9	48	3.78	Share content with friends on TV-set	4	9	3	1	1
10	41	3.72	Get specific Olympic related programs in restaurants or bars	4	6	7	1	0
11	4	3.67	Personalize the preferences on the mobile phone	4	6	6	2	0
12	8	3.67	Buy tickets etc through the mobile phone	8	2	4	2	2
13	42	3.67	Interactive discussion	4	6	6	2	0
14	9	3.61	ESG	4	6	6	1	1
15	24	3.61	Get alerts when interested programs begin	3	9	3	2	1

Ranking	No	Average	<i>The Mobile TV function and service probe form</i>					
			<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>
16	2	3.56	Get tourist information at the airport	4	6	5	2	1
17	16	3.56	Watch high quality home-version videos on TV-set	4	5	6	3	0
18	21	3.56	Reserve the highlights on mobile phone	4	7	3	3	1
19	30	3.50	Download clips	3	7	5	2	1
20	35	3.50	Seamless handover of content from mobile to TV	5	7	0	4	2
21	1	3.39	Receive city information	3	5	6	4	0
22	22	3.39	Click products for E-shopping when watching the advertisement	3	3	10	2	0
23	18	3.28	Pay via the mobile phone	4	7	2	0	5
24	40	2.94	Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)	1	2	11	3	1
25	28	2.89	PVR according to the pre-settings on mobile	1	3	8	5	1
26	33	2.89	Time shifting service	2	3	5	7	1
27	10	2.83	Scheduled download	2	2	7	5	2
28	20	2.83	Get Olympic related programs in shops	2	3	6	4	3
29	26	2.83	Commentators choice	2	2	7	5	2

Ranking	No	Average	<i>The Mobile TV function and service probe form</i>					
			<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>
30	12	2.72	Share diary with others	1	5	3	6	3
31	17	2.67	Get recommendations in shops	2	1	5	9	1
32	13	2.56	Have multi-angle service	0	2	8	6	2
33	37	2.56	Watch programs provided (e.g. VOD) according to the profile on TV	0	2	8	6	2
34	19	2.44	Get advertisements in shops	1	1	5	9	2
35	31	2.39	Slow down the motion when watching a local file or a live program	0	1	6	10	1
36	14	2.28	Overlay layer to present different categories of information	0	0	8	7	3
37	29	2.28	VOD	1	1	4	8	4
38	43	2.28	Message projected on the big screen	0	0	7	9	2
39	5	2.24	Personalize the preferences on the TV-set	1	1	2	10	3
40	27	2.22	PVR according to the pre-settings on TV	1	1	4	7	5
41	32	2.11	Freeze the motion when watching a local file or a live program	0	1	5	7	5
42	6	2.06	Automatic usage data collection	0	1	5	6	6

Ranking	No	Average	<i>The Mobile TV function and service probe form</i>					
			<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>
43	44	2.06	Message sent to community based on profile	0	0	5	9	4
44	38	2.00	Display the interactive information on big screen as well as on mobile	0	0	6	6	6
45	46	1.94	Upload and share with public	0	0	6	5	7
46	34	1.83	Use mobile phone watch TV at home	0	0	4	7	7
47	39	1.83	Interact (e.g. polling) with big screen via remote controller	0	0	3	9	6
48	11	1.78	Receive polling alert	0	0	2	10	6
49	15	1.61	Breach of the rule service	0	0	2	7	9

### 3.4.3. Findings

Participants demonstrated an uneven acceptance, interest and expectation extent to the Mobile TV functions and services.

On the one hand, they have heard a fair amount about the Mobile TV in the context of mobile phone and other areas, and they are not surprised that Mobile TV feature is being applied to mobile phone.

On the other hand, most were vague about the details. Few participants could report on any direct functions or service experience with Mobile TV. For the most part, participants had heard about Mobile TV as a new technology with great potential, but they knew very little about how it was being applied.

#### 3.4.3.1. Favourite function and services

During the Interview process, participants thought that the functions or services below are their favourite:

<b>No</b>	<b><i>Function or service</i></b>
4	Personalize the preferences on the mobile phone
8	Buy tickets etc through the mobile phone
6	Automatic usage data collection
16	Watch high quality home-version videos on TV-set
18	Pay via the mobile phone
22	Click products for E-shopping when watching the advertisement
23	Receive emergency notification
42	Interact discussion
24	Get alerts when interested programs begin
10	Scheduled download
35	Seamless handover of content from mobile to TV
47	Share content with friends on mobile phone
48	Share content with friends on TV-set
49	Take part in "select" program
45	Play the content of mobile phone on the household TV set

### 3.4.3.2. Already existing functions and services

Participants considered the following functions or services of Mobile TV same or similar to the current services:

<b>No</b>	<b><i>Function or service</i></b>
1	Receive city information
2	Get tourist information at the airport
4	Personalize the preferences on the mobile phone
14	Overlay layer to present different categories of information
23	Receive emergency notification

30	Download clips
47	Share content with friends on mobile phone
46	Upload and share with public

They think such use cases can not be seen as being approved by new technology, also can not be seen as new functions or services of Mobile TV.

### 3.4.3.3. Less used functions and services

It is agreed by most people that the less used functions or services are:

<b>No</b>	<b><i>Function or service</i></b>
15	Breach of the rule service
39	Interact (e.g. polling) with big screen via remote controller
11	Receive polling alert
43	Message projected on the big screen
46	Upload and share with public
13	Have multi-angle service
34	Use mobile phone to watch TV at home

Here are the reasons:

- Most participants recognized that they did not need the “Breach of the rule service”.
- They saw “Interact with big screen via remote controller” as not convenient for use.
- Participants considered that in the process of live match, any types of alerts or information means disturb.
- For “polling”, most participants figure out its transparency is too low, and the probability of win is also little, so they have no interest.
- The acceptance extent of “Message projected on the big screen” is very low, most participants are not interested in this service.
- For “Upload and share with public”, participants would like to share with their familiar friends more.

- For most participants, they think the “multi-angle service” can be substituted by the huge screen in stadium, while a few respondents expected that via this function they can follow some target athlete.
- Most participants think that they don't need to use mobile phone to watch TV at home, because TV screen is bigger.

### 3.4.3.3. Comments on other functions and services

#### ◇ Automatic receive some information or alerts

Firstly, the Participants don't want to be a passive receiver, they like to personalize the preferences on their mobile phone.

Secondly, whether to accept is also depend on the content.

Finally, if the objective is useful and the charge for receive is free, participants do not reject.

#### ◇ Buy tickets etc through the mobile phone

#### ◇ Click products for E-shopping when watching the advertisement

#### ◇ Pay via the mobile phone

Participants who were more familiar and sympathetic with E-shop on internet expressed the view that the benefits of these services may outweigh the risks. They emphasize the convenience and trust the normal E-Bank, like E-Bank of China Construction Bank or Industrial and Commercial Bank of China. Level of knowledge about E-Bank and charge system of mobile phone was obviously correlated with how people saw the risk/benefit tradeoffs. Most participants like and accept this service, as long as the online payment is secure enough.

Opinions about price of tickets and other products varied considerably among participants. One side, some of them can accept a more expensive price, since by mobile phone the problem is easier to be solved. On the other side, others think that only with a cheaper price they would buy and pay via a mobile phone.

The key word here is convenience, which should be carried out in each step of the buy and pay Process.

#### ◇ Get advertisements in shops

#### ◇ Get recommendations in shops

All of the participants think both services are with little obvious benefit to the consumer, but men were more likely than women to accept this type of service for convenience and saving time. Some women considered that they enjoy the course of shopping.

- ◇ **Interactive discussion group**
- ◇ **Message projected on the big screen**
- ◇ **Message sent to community based on profile**

For some participants, in bar, their purpose was to meet old friends instead of knowing new friends, so this kind of respondents doesn't need the services.

For other respondents, who like to make new friends in bar, they considered the three services very interesting.

- ◇ **Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)**
- ◇ **Get specific Olympic related programs in restaurants or bars**
- ◇ **Get Olympic related programs in shops**

It was clear that participants need this kind of service.

They demonstrated great interest in them.

Comparatively, participants have lower interest in getting Olympic related programs in shops.

- ◇ **Share diary with others**

Participants like the function, but a point was mentioned by all groups, that they will not write and compile the diary in a stadium when watching a live match.

As a result they tended to use the function in parties or weddings in stead of in stadium.

- ◇ **PVR according to the pre-settings on TV**
- ◇ **PVR according to the pre-settings on mobile**
- ◇ **VOD**
- ◇ **Time shifting service**
- ◇ **Display the interactive information on big screen as well as on mobile**

For these functions, participants think they do not need very much.

The "pre" prefix had a positive connotation for some participants, who like make plan.

These functions were unfamiliar to most participants and not preferred.

Virtually all participants said that the main usage of a mobile phone is phone calling, they don't need too much and too complex functions on their phone. Instead, they expect their phone only have the functions they in deed need.

#### **3.4.3.4. Comments on business model inquiry**

##### **◇ Typical target user**

There are often many ways to define and divide, such as by age group, sex, personality, hobby and profession, but it is difficult to identify a target user because it is hard for an individual to make the difference between an acceptance and an exception.

According to our study, the typical target users are:

- Youth
- Mobile professional
- Users with good financial situation

##### **◇ Typical usage occasions**

- Waiting for bus
- Waiting for people
- Leisure time
- Noon break
- Traffic jam

##### **◇ The appealing charge mode**

- Monthly charge should between 10 to 50 RMB
- Charge for film or clip should between 1 to 5 RMB
- Emergency notification and alert should be free of charge

##### **◇ Device Cost**

- The reasonable price for Mobile TV should under 5000 RMB
- The reasonable price for the feature additionally should between 500-1000 RMB

##### **◇ Appealing extent of video viewing on mobile phone**

- The mobile phone screen is small
- Depend on the hardware, UI design, content source, etc.

##### **◇ Possibility to substitute any of digital video devices with a mobile phone**

- Portability is the most not substitutive reason

##### **◇ The most suitable content:**

- News

- Sports
- Film or sport clips
- City Information

#### ◇ **The new ideas and suggestions of participants**

The participants have few new ideas of functions and services about Mobile TV, mainly they talk over the provided terms. They make two suggestions as following:

- Provide service of intro-information or VOD about the holding programs before entering bars or restaurants
- Provide service of online cartoon network game

## 4. Annex

### 4.1. List of Use cases

The following table contains the list of use cases collected from the MOBISERVE partners at the very beginning of the project and which are served as starting point for the different tasks of WP1.

<i>ID</i>	<i>Use Cases</i>	<i>Description</i>
1	Alerts from the events on the air.	Alert on noticeable events such as a interested tennis match might be reaching the end of match (match points) and offer the possibility to the user to switch directly to that channel. The alerts could be also grouped by interest. This kind of service could be subscribed.
2	Zoom (Multi-Angle)	The TV program can be enjoyed from different angle such as focusing on the interested player.
3	Polling	Collection of the end users' feedback (e.g. voting) or play (e.g. betting).
4	Time-Shifting (Smart Pause)	The ability to record the actual viewed program while switch to another activity such receiving a phone. As such, the user would not loose any piece of the viewed program.
5	Program associated information	The TV program related information is broadcasted along with the associated TV program. For instance, the description about the teams participating to the football match. Inside this information, there may be some links (URL) which allows user to get further information on a specific interested issue like a player biography.
6	Program independent data	Broadcast of the program independent data such as weather, traffic
7	Stadiums' Guide (with MAP)	To be guided on the way to go inside and outside the stadiums

<b>ID</b>	<b>Use Cases</b>	<b>Description</b>
8	Multi-Language	Multi-lingual for the TV program as well as the broadcasted information
9	Selection of preferred commentators	While viewing a competition, one may have the possibility to choose the preferred commentators (sportscasters)
10	Online shopping (associated with program)	TV program triggered online shopping. That is, the goods are shown in the TV program, the online shopping of those goods are suggested.
11	User feedback	User may want to express his/her opinion regarding the viewed programs or other suggestions.
12	Online Gaming	Game download via broadcast channel, local or online play and online ranking.
13	Multi payment modes	Different payment modes may be offered to the users, namely, by theme (for instance football or formula 1), pay-per-view, daily, weekly, monthly, etc.
14	Live program	Repurpose (retransmission) of the live TV program
15	Download (scheduled)	Any kind of data could be scheduled to be downloaded via the broadcast channel.
16	PVR	Based on the usage profile stored on both the mobile device and the home entertainment system, all relevant and potentially interesting services (Audio/Video and applications) can be stored in the PVR system.
17	User profile and preference (user initiated)	User might be able to define his/her profile and preference.
18	Automatically usage statistics data collection (system initiated)	The usage statistics such as which programs have been seen by whom, for how long, at what time, etc.

<b>ID</b>	<b>Use Cases</b>	<b>Description</b>
19	Diary	Record one's own daily experiences: what did I see? What is my opinion? Etc.
20	ESG	Electronic Service Guide
21	Rich Media enabled ESG	
22	Rich Media function support	AV control, Media library, VoD
23	Access to Internet thru Rich Media interface	
24	Overlay information of choice	
25	Top list recommendation	Based on the profile and the preference of the user.
26	Content upload	User might want to upload content in order to let other people share his/her experience.
27	3D scene analysis	A 3D model of the current game situation may be present to the user. By performing gestures with the pen on the touch screen, the user is able to rotate and zoom into the scene. Important details like offside (football game), defence assignment (basketball game) will be highlighted.
28	Breach-of-the-rule detection	The end-user device detects automatically potential breach-of-the-rule situations and highlights the scene and gives a comprehensive description. The user can compare the device decisions to those of the referee.
29	VOD	Video on Demand
30	Intelligent ESG presentation	channels of interested to a customer can be grouped together at the end-user device.
31	Local (re)play	This means the possibility offered by the terminal to slow down the motion and freeze). It can be applied to both the live TV program and recorded one.

<b>ID</b>	<b>Use Cases</b>	<b>Description</b>
32	Usual Mobile phone functions while watching TV	Still being able to use the usual mobile phone while enjoying the TV program.
33	Exciting spots (clips) available while watching the live TV program	For instance, during a basketball, the content provider cuts the interesting moments (clips), such as a nice shoot, along with the competition and notifies the user whenever these clips are available
34	Interactivity with the TV programs	Being able to influence the broadcasted program's progression, whether pre-recorded or live
35	Emergency notification	Emergency events which are needed to be broadly announced to the public such terror, accident, earthquake, ...
36	Relay from DVB-H to WiFi	
37	High quality video transforming from Mobile to TV	The image/video on the mobile is sometimes unsuitable to be shown on the big screen due to the poor resolution and quality.
38	Content sharing in the community	Sharing your collection with those friends who have common interest.
39	Indoor non-interruption	Handover to WiFi network when DVB-H signal is weak.
40	Location dependent content	While the main program may still come from DVB-H, based on the location, what happened around could be also enjoyed such as more views on a match when you are at the stadium.
41	Location dependent application	At the airport, everything about your flight; in the shopping centre, price comparison; in a coffee shop, selection of the programs best fit your disposal time and profile.
42	Mobile TV to home computer	No conflict with your love ones provided that different programs can be shown simultaneously on different devices.

<i>ID</i>	<i>Use Cases</i>	<i>Description</i>
43	Mobile TV to laptop at backyard	No hassle with messy cables and go wherever you want in your home

#### 4.2. List of Functions or services with average and its variance

<i>No</i>	<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>	<i>Average</i>	<i>Variance</i>
1	Receive city information	3	5	6	4	0	3.39	1.08
2	Get tourist information at the airport	4	6	5	2	1	3.56	1.32
3	Get Olympic related programs at the airport	6	7	1	3	1	3.78	1.59
4	Personalize the preferences on the mobile phone	4	6	6	2	0	3.67	0.94
5	Personalize the preferences on the TV-set	1	1	2	10	3	2.24	1.07
6	Automatic usage data collection	0	1	5	6	6	2.06	0.88
7	Traffic and map information	7	7	3	1	0	4.11	0.81
8	Buy tickets etc through the mobile phone	8	2	4	2	2	3.67	2.12
9	ESG	4	6	6	1	1	3.61	1.19
10	Scheduled download	2	2	7	5	2	2.83	1.32
11	Receive polling alert	0	0	2	10	6	1.78	0.42
12	Share diary with others	1	5	3	6	3	2.72	1.51
13	Have multi-angle service	0	2	8	6	2	2.56	0.73
14	Overlay layer to present different categories of information	0	0	8	7	3	2.28	0.57
15	Breach of the rule service	0	0	2	7	9	1.61	0.49

No	Function or Service	Need extremely	Need a lot	Need	Need a little	No need at all	Average	Variance
16	Watch high quality home-version videos on TV-set	4	5	6	3	0	3.56	1.08
17	Get recommendations in shops	2	1	5	9	1	2.67	1.18
18	Pay via the mobile phone	4	7	2	0	5	3.28	2.45
19	Get advertisements in shops	1	1	5	9	2	2.44	0.97
20	Get Olympic related programs in shops	2	3	6	4	3	2.83	1.56
21	Reserve the highlights on mobile phone	4	7	3	3	1	3.56	1.44
22	Click products for E-shopping when watching the advertisement	3	3	10	2	0	3.39	0.84
23	Receive emergency notification	8	3	5	2	0	3.94	1.23
24	Get alerts when interested programs begin	3	9	3	2	1	3.61	1.19
25	Languages choice	4	8	4	0	0	4.00	0.53
26	Commentators choice	2	2	7	5	2	2.83	1.32
27	PVR according to the pre-settings on TV	1	1	4	7	5	2.22	1.17
28	PVR according to the pre-settings on mobile	1	3	8	5	1	2.89	0.88
29	VOD	1	1	4	8	4	2.28	1.09
30	Download clips	3	7	5	2	1	3.50	1.14
31	Slow down the motion when watching a local file or a live program	0	1	6	10	1	2.39	0.46
32	Freeze the motion when watching a local file or a live program	0	1	5	7	5	2.11	0.77
33	Time shifting service	2	3	5	7	1	2.89	1.21

No	Function or Service	Need extremely	Need a lot	Need	Need a little	No need at all	Average	Variance
34	Use mobile phone watch TV at home	0	0	4	7	7	1.83	0.58
35	Seamless handover of content from mobile to TV	5	7	0	4	2	3.50	1.92
36	Watch programs provided (e.g. VOD) according to the profile on mobile	6	6	4	2	0	3.89	0.99
37	Watch programs provided (e.g. VOD) according to the profile on TV	0	2	8	6	2	2.56	0.69
38	Display the interactive information on big screen as well as on mobile	0	0	6	6	6	2.00	0.67
39	Interact (e.g. polling) with big screen via remote controller	0	0	3	9	6	1.83	0.47
40	Get specific VOD in restaurants or bars (the program is designated for the restaurants or bars)	1	2	11	3	1	2.94	0.72
41	Get specific Olympic related programs in restaurants or bars	4	6	7	1	0	3.72	0.76
42	Interactive discussion	4	6	6	2	0	3.67	0.89
43	Message projected on the big screen	0	0	7	9	2	2.28	0.42
44	Message sent to community based on profile	0	0	5	9	4	2.06	0.50
45	Play the content of mobile phone on the Household TV set	6	6	4	1	1	3.83	1.25
46	Upload and share with public	0	0	6	5	7	1.94	0.72
47	Share content with friends on mobile phone	8	6	1	3	0	4.06	1.16

<i>No</i>	<i>Function or Service</i>	<i>Need extremely</i>	<i>Need a lot</i>	<i>Need</i>	<i>Need a little</i>	<i>No need at all</i>	<i>Average</i>	<i>Variance</i>
48	Share content with friends on TV-set	4	9	3	1	1	3.78	1.06
49	Take part in "select" program	8	4	4	1	1	3.94	1.39