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Final Report

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Abstract:

The final report is a summary of the key findings of the MODIBEC project and gives proposals and recommendations for further action, including future areas of cooperation

Keyword list:
Mobile Information Services, Digital Broadcasting, China, Europe, Market, Convergence Areas

Control sheet

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CONTENTS

Abbreviations

Abbreviation	Description
3GPP	3G-Partnership Project
A-GPS	Assisted GPS
AVS	Audio/Video Coding
ABS	Academy of Broadcasting Science
BUPT	Beijing University of Posts and Telecommunication
CWTS	China Wireless Telecommunication Standard
CDMA	Code division multiple access
CDMB	China Digital Multimedia Broadcasting
CMMB	China Mobile Multimedia Broadcasting
CI	Corporate Identity
DAB	Digital Audio Broadcasting
DMB	Digital Multimedia Broadcasting
DRA	Specification for Multi-channel Digital Audio Coding Technology
DRM	Digital Radio Mondiale (Digital Rights Management)
DVB-T	Digital Video Broadcasting-Terrestrial
DVB-H	DVB-Handhelds
DVB-S	DVB-Satellite
DVB-C	DVB-Cable
DVB-CBMS	DVB-Convergence of Broadcast and Mobile Services
EDGE	Enhanced Data Rates for GSM Evolution
FDD	Frequency Division Duplex
GPS	Global Positioning System
GUI	Graphical User Interface
GSM	Global System for Mobile Communications
GST	Global System for Telematics
GPRS	General Packet Radio Service
HEAAC	High Efficiency Advanced Audio Coding
HSCSD	High Speed Circuit Switched Data
HSDPA	High-Speed Downlink Packet Access
HDTV	High Definition Television
HSCSD	High Speed Circuit Switched Data
IPR	Intellectual Property Rights
MPEG	Standard for the data compression in the video and audio sector
MMS	Multimedia Messaging Service
MIMO	Multiple transmission antennas and multiple receiver antennas
MII	Ministry of Information Industry
MBMS	Multimedia Broadcast / Multimedia Service
POI	Point of Interest
RAC	The Radio Association of China
SARFT	State Administration of Radio, Film & Television (China)
SJTU	Shanghai Jiao Tong University
SMS	Short Message Service
StiMi	Satellite Terrestrial Interactive Multi service Infrastructure
TIA	Telecommunications Industry Association
TAP	TPEG Automotive Protocol
TD-SCDMA	Time Division Synchronous Code Division Multiple Access
TDD	Time Division Duplex
T-MMB	Terrestrial Mobile Multimedia Broadcasting

UMTS	Universal Mobile Telecommunications System
W-CDMA	Wideband Code Division Multiple Access

1 Introduction

The objective of this report is to provide an overview of the project findings and observations as well as proposals and recommendations for further action, including future areas of cooperation. This information is a summary of the findings of the different project activities, that were held during the two years of the project.

The major activities of the MODIBEC project were: hosting the first and second priority workshop in Brussels; holding the first and second steering committee meeting; organising the 4 workshops in China; hosting a demonstration working group meeting – to consider the possibility of demonstrating both DVB and DMB (It was concluded it was not possible therefore it will not take place); creating MODIBEC promotion materials; launching and maintaining the MODIBEC website; preparing and submitting the National Research Development and Policies study; and compiling information and submitting the first and second versions of the Priority Areas Definition report; preparing and submitting the first and second versions of the Action Plan and compiling the Contact and Activities Directory.

1.1 Target audience

The target audience of this deliverable are both the European and Chinese stakeholders in the area of digital broadcasting, mobile communications and mobile service provisions.

1.2 Summary description of project objectives

MODIBEC intends to promote and support RTD cooperation between EU and China on digital broadcasting technologies, especially the convergence with mobile communications.

It brings European and Chinese key players in digital broadcasting and mobile convergence areas closer to concrete business opportunities and make recommendations for future actions.

To reach its aims, MODIBEC prepares, supports and facilitates the rapid adoption and transfer of technologies and research results; defines R&D priorities and future cooperation areas, and makes recommendations for new innovative digital broadcasting/mobile convergence research activities to be launched in China and the EU.

1.3 Project contractors

Participant no.	Participant Organisation Name	Participant Org. Short Name

1 (Coordinator)	European Road Transport Telematics Implementation Coordination Organisation s.c.r.l.	ERTICO
2	The WorldDAB Forum	WorldDAB
3	The State Administration of Radio, Film and Television / Academy of Broadcasting Science	SARFT / ABS
4	Beijing Jolon Digital Media Broadcasting Co., Ltd	Jolon
5	Shanghai Oriental Pearl (Group) Co., Ltd	OPG
6	China Satellite Navigation and Communications Co., Ltd.	China Satcom
7	China Radio & TV Equipment Industrial Association	CRTA
8	PTV AG	PTV
9	Siemens Limited China	Siemens
10	Blaupunkt GmbH	Blaupunkt
11	Guangdong Mobile TV Media Co., Ltd.	GTM
12	Shanghai Autonavi Software Co.,Ltd.	Autonavi
13	Thomson Grass Valley	TBM
14	Motorola (China) Electronics Ltd.	Motorola
15	Nokia Siemens Networks Ltd. Beijing	NSNB

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2 Proposals and recommendations for future action

2.1 Project Proposals for the 7th Framework Programme and recommended steps

Three concrete project proposals have been discussed by the MODIBEC partners and recommended as future actions.

1. Follow-up project of MODIBEC

The MODIBEC project enabled partners and invited experts to discuss future possible EU-China R&D project priority areas and all agreed that future projects should continue to focus on interoperable and multi-platform solutions working on both European and Chinese standards, and also a focus on developing service and user focused applications rather than just on broadcast and telecoms technology platforms and devices.

The MODIBEC project was considered a success by partners, especially in terms of building co-operation and understanding amongst European and Chinese partners and creating an open environment for information exchange and shared learning. Many of the MODIBEC partners and other experts that attended over the past two years have expressed an interest in continuing the work started in the project. MODIBEC is widely viewed as an excellent platform to discuss and further Digital Broadcasting and Mobile Convergence issues and the continuation of such a platform is critical over the next few years to develop multi-platform solution in both the EU and China that work with multiple standards. MODIBEC partners are ready to take the lead on this follow-up project.

2. File-casting and Multi-media download applications for Mobile Devices

The file-casting proposal focuses on developing applications to enable user-tagging of content and multimedia content downloads, building on existing broadcast website applications and creating dynamic and interactive user-interface for mobile devices and seamless interactive services that combined broadcast and telecoms platforms. Many partners, European and Chinese, including WorldDMB, ABS (SARFT), Beijing Jolon, CRTA, OPG and GTM are interested in the project.

3. In-Car Multi-Platform Application Solutions

The in-car applications proposal focused on developing value-added geo-tagging and interactive applications and also working on in-car systems integration for in-car receivers, including the MMI (man-machine interface) to ensure multi-platform implement (e.g. DAB, DVB, DRM, 3G or CMMB). This will build on the Fraunhofer Institute's work in this area, and in addition to Fraunhofer, many partners expressed an interest in working in this area – including PTV, AutoNavi, ABS (SARFT) and WorldDMB.

Next Steps include:

- To further develop the project proposals with the key participants and to identify the line-up of likely partners and then to develop a detailed proposal paper which clearly outlines the projects objectives and plan.
- The key participants to attend the ICT Proposers' Day in Budapest, Hungary on the 22nd January 2009, which will help researchers with similar or complementary research interests to meet, exchange ideas and to form future potential project consortia.
- To produce the necessary paperwork for proposals to be submitted according to the EC Call4 procedures by March 2009.

2.2 Key Findings and Future Areas for EU-China Cooperation and recommended actions

A comprehensive set of priority areas were defined in the project and key actions to be taken in the EU-China cooperation are recommended for the following areas:

1. Business Models
2. Standardization, regulative bodies and frequency allocation
3. Authentication and Security systems
4. Interactive Mobile Services including in-car services
5. Data Compression (Video/ audio codec)
6. Broadcasting Infrastructure
7. Integration of hardware and receivers in terms of multi-standard devices
8. Applications
9. Content
10. Traffic Information

1. Business Models

Business models usually include the definition of use cases a market entrance requires, definition of crucial points as well as cost and value analysis, distribution channels, cooperation between hardware and software providers as well as the cooperation on the network side.

Recommended further action:

- Examine the status quo and expected future trends on the market of Mobile Digital Broadcasting and derive chances / opportunities and risks.
- Search for cooperation between application providers, hardware providers and network providers e.g. in workshops and fairs
- Enquire value chains, organisational structures and define use cases

2. Standardization, regulative bodies and frequency allocation

Network standards and frequency allocation existing in China are a crucial discussion point. Currently two main and general standards for Digital Broadcasting are deployed in China. The governmental driven Chinese standard CMMB – is mostly used for digital mobile video and multimedia applications on small scale screens but also for radio and partially for traffic information in some areas. The European DAB and DAB+ standard is mostly used for digital radio, video on large scale screens and other applications.

Recommended further action:

- Further research in spectrum sharing and frequency allocation to address different broadcasting and communication networks
- Further research on technical solutions in satellite and terrestrial broadcasting and communication systems
- Dialogue between EU and Chinese key decision makers on co-existence of standards

3. Authentication and security systems

Since authentication and security systems can provide both the needs of the end user as well as assurance of revenue for the service provider in the area of authentication and security (Conditional Access or Digital Right Management), we recommend finding a new user authentication method by combining the digital communication system with help of the following activities:

Recommended further action:

- Research on efficient Authentication and security systems such as CAS, DRM, develop the correct authentication and security method
- Exchange experience between European and China Operators
- Exchange and research on interoperability between different rights management technologies
- Cooperation with CAS provider from Europe and Mobile Communication Operator who could provide uplink for VOD
- Cooperation with Media Delivery Platform European Provider and Chinese Mobile communication operator for Digital Radio Mondiale, DTMB and CMMB applications
- Cooperation on TV Mobile service scenarios aspect between European and China R&D department of End to End system manufacturer and operator for Digital Radio Mondiale, DTMB and CMMB applications
- Discussion on IPR and royalty fees

Steps include:

- Set up CAS for operation including scrambles, system manager, Pisys and link with the multiplex of wireless digital TV
- Develop BOSS in terms of different video or data services, pay mode, order mode
- System maintenance and update to meet requirement for service improvement and increase the number of subscribers
- Specify and develop End To End Control and Management system for Digital Radio Mondiale, DTMB and CMMB applications

- Specify and develop relevant TV Mobile scenarios aspect for the Chinese market taken into account their key success in Europe

4. Interactive Mobile Services including in-car services

An interactive process base on consumers; needs need to be worked out to define which kind or how deep the interactivity will drive the best result. The development of interactivity in mobile telecoms and broadcast convergence needs to be promoted.

Recommended further action:

- Draw the standards for interactive service (e.g.: Beijing Jolon will consult BIFS technology which based on MPEG-4 and interactive service which based on the CMCC MBBMS standard)
- Technical cooperation with mobile operator (e.g.: Beijing Jolon has started the test with Beijing Mobile Communication Corporation for the interactive video service)
- Research on the methods to realize the interactivities with personalization for users and Development of receivers
- Encourage the discussion between Chinese and European broadcasters/ telecoms industry regarding implementation of personalized and interactive broadcasting system
- Narrow the gap between broadcasters and the telecoms industry
- Discussion on IPR and royalty fees
- Market research in EU and Chinese interactive television delivers market in terms of interactivity to understand the user needs to customise the interactive services
- Encourage viewers to consume telecom services (Downloading, Voting, Merchandising, etc)
- Research on the development of interactive mobile video services and integrate mobile operators to develop user-friendly interactive mobile services
- Encourage on-going dialogue between EU and China stakeholder

5. Data Compression (Video/ audio codec)

Data compression is concerned with reducing the amount of data required for its reproduction. It is a key component in facilitating the widespread use of digital services — in their various forms, has an essential role in the development of the digital Society and is recognized as an important contributor to freedom of information sharing. The most important issue in the field of Data Compression considered is e.g. the video/ audio codec.

Recommended further action:

- Find a proper platform for EU–China content providers to share their experience and contents
- Cooperation on the next generation data compression multi-standard of video compression and interoperable solution for the Chinese and European markets
- Develop the universal chipsets support the various standards
- Research on improvement of the performance of encoders (video decoder)

Steps include:

- Set up a video and audio encoding system,
- Cooperation with encoder vendor and set up a front-end system for digital broadcasting and TV
- Develop the data module for stock, weather forecast, traffic, exchange rate and so on
- Develop the protocol, program, software for data encode/decode

6. Broadcasting Infrastructure

Infrastructure is essential access in achieving the goal of digital inclusion, research on certain parts of Infrastructure, such as content distribution network, wireless signal coverage, etc. is also an important aspect. This is in order to reduce the cost of the overall network infrastructure and to solve the issues with in-door reception. Mobile Communication operators and Digital Broadcasting operators can share their experiences and issues with in-door reception to promote future collaboration.

Recommended further action:

- Develop the key equipment to improve signal coverage
- Develop and strengthen national, regional and international network infrastructure
- Exchange the experience on network optimization, system integration and performance improvement of SFN with European counterparts
- Research on interoperability of transmission infrastructure between digital broadcasting and 3G
- Research on the content production and distribution on the current digital broadcasting and digital communication networks
- Research on interoperability of transmission infrastructure between digital broadcasting and 3G

Steps include:

- Build a signal transmission system, set up outdoor digital broadcast SFN
- Estimate the effect of signal coverage and discover the weakness area

- Set up digital broadcast indoor coverage system by combining with mobile communication system based on the convergence/ interactivity of the digital broadcasting and 3G
- Analysis interference influence on signals in different frequency band
- Trial of coverage system on different scene such as building, metro, tunnel

7. Integration of hardware and receivers in terms of multi-standard devices

As countries around the world continue to develop new broadcasting standards it is important to ensure that devices are interoperable. We would like to ensure that Chinese devices will work in Europe and vice versa.

Recommended further action:

- Undertake R&D efforts to make adequate and affordable equipment for end users
- Encourage the professionals in both regions to establish partnerships and networks
- Discussion on IPR and royalty fees
- Research on the development of Chinese and European manufacturers
- Encourage cooperation via workshops and information, etc.
- Encourage dialogue on interoperable devices and chips
- Look for ways to encourage/ entice more manufacturers to include European standards in Chinese devices

8. Applications

The necessity of working together in the field of application engineering was stated from both Chinese and European stakeholders.

Fields of applications, that have to be examined:

- Data services such as video, tv and videoconferencing applications are partially already utilized
- Traffic information: increasing traffic volume in congested areas concerning both – moving people and moving goods.
- In-car applications including traffic information, geo-tagging for localised and personalised services
- Safety-oriented services like car-to-car communication
- Communication applications “everytime and everywhere”
- Complex multi-travel-mode-chains require more reliable information
- Personalised marketing applications such as sweepstakes, voice-mails etc.

9. Content

Content is always crucial to the end user and service provider, in order to improve the performance of video services and data services, which are primary value-added services for digital broadcasting or 3G.

Recommended further action:

- Set up a content aggregation and distribution platform
- Set up a digital broadcast transmission system and improve signal coverage to provide regional mobile TV and data service for local consumer
- Expand and educate the user market
- Explore & develop detail: application concepts & confirm interested participants
- Research on new attractive types of video content for the Chinese and the European markets and interactivity for video on demand
- Research on new data services such as stocks, weather forecast, exchange rate, news, traffic information, especially combine with traffic navigation system
- Research on interactive services which combine the digital broadcasting and Wimax or 3G systems

10. Traffic information

Traffic information as well as security relevant traffic systems is getting more and more attractive as the request for mobility increases tremendously.

Recommended further action:

- Research on how to adjust the TMC standard to the Chinese market
- Cooperate with the European experts to set up the basic information such as location tables and event tables
- Research on distributing different data such as traffic information via Digital broadcasting
- Trial project with local broadcasting companies

3 Standardisation

Electronic mass media are used daily throughout the world. They are therefore influencing the changing environment – including; economic moral/ethical and political issues. At the same this new media allows for an increased individual mobility, which is also shaped by social phenomenon.

In the current media landscape, the convergence of technologies in single devices is taking place. Technologies such as the Internet, digital mobile broadcasting and telecoms applications are now able to be received on a single device. This means that the respective diversity of services offer new possibilities to users, providers and network operators.

Traditional media services have also evolved to the point were 'new media' needs to be redefined to include mobile, interactive, individual and commercial applications. In the nearer future there will be media services for every purpose. These digital technologies offer possibilities for new business concepts while at the same raise consumer expectations and demands.

The necessity and willingness to invest in new infrastructure, standards and technologies are vital for creating additional business opportunities. This not only affects end users and suppliers of software and hardware devices (B2C business) but also broadcasters, network operators and administrative institutions (B2B and B2A business).

Today, consumers must decide which services they want to use and as there are only limited services supported in the current market their decision is also limited. Typically, a consumer must invest in new hardware and sometimes in new software licences in order to be able to use new services. This is a major obstacle for establishing new technologies. In the end it is the consumer who decides whether a new service or technology is worth the investment. Therefore a framework for a free and self-regulating market is necessary to encourage powerful companies to invest in new technologies. In addition hardware devices and consumer access to services must be future proof. Thus basic requirements for all links of the value chain have to be defined.

In October 2007 the German "Forum Digitale Medien" stated that the necessity and willingness to invest are important pillars for new value potentials. To create market structures that allow the development of a free market and that support competition are a prerequisite for the further development and internationalisation of the whole market. Therefore

- Admitted norms or
- common market standards are needed

The "Forum Digitale Medien" as well as WorldDMB do not propose full regulation but rather recommend general conditions under which free market development for all stakeholders can take place.

In their "Global Broadcasting Update" from January 2009 WorldDMB lists the current DAB/DAB+/DMB figures around the world. They also dedicate one chapter to

“potential building blocks and regulators”. Here they mention and explain the common threads of the market. “It is impossible and potentially dangerous to attempt to impose common regulation, or to suggest that one country’s regulatory regime would work in any other. However, it does make sense that within any collection of separate regulator regimes, there should be some common threads.”

The following is also listed:

- License period
- Programme content
- Bit-rate of Audio Services
- Analogue Switch off
- Spectrum Scarcity

In fact it seems that most of the market development is driven by private companies who are building their own “regulatives”. In some areas global players are creating “faits accomplies” in others they are influencing associations that are willing to regulate important frameworks. In any case private companies are looking to collaborate with other stakeholders in order to protect their own interests.

Research institutions, regardless if they are working on national or international projects are needed to provide advisory to both, private companies, regulation associations and to administrative institutions. Proposals can be submitted in the field of technical development as well as in economic matters.

Associations that endeavour to harmonise data structures of broadcasting, data compression, security and authentification or applications (soft- and hardware) usually consist of members from industry, research and development, consultants and administrative institutions. This ensures that all aspects of the market can been taken into consideration.

Standardisation can be best achieved when all stakeholders that may be concerned as well as those who represent superior interests define common cornerstones. The concrete market development then will take place within a suitable framework and will be driven by the market participants themselves.

4 Conclusions

The information collected and analyzed for MODIBEC reaffirms the essential and interactive mobile services in EU and China. Our recommendations pertain to all parties involved in the standards groups, digital broadcasting operators, mobile service providers, hardware manufacturers etc.

The MODIBEC project has been a tremendous success, as evidenced by the final Event held in China in October 2008 where more than 150 delegates from both China and the EU converged to discuss Digital Broadcasting and Mobile Convergence issues.

The project has mapped out priority areas based on discussions with key stakeholders at the MODIBEC events and individually, research, and questionnaires and has identified key areas in which further EU-China cooperation would greatly benefits both markets. Recommended further action has been provided for these key areas.

Three concrete proposals were also made in terms of projects for the EC's 7th Framework Programme in the area of Digital Broadcasting and Mobile Convergence. The project partners are committed to continuing the work initiated in MODIBEC and working on proposals for new projects to further this work.

Partners with strong interest in the continuation of project activities include SARFT-ABS, CRTA, OPG, GTM, PTV, Jolon, AutoNavi, Nokia Siemens and WorldDMB. External entities that have informed the project of their interest to participate in future project proposals related to mobile broadcasting include ETSI, Mobilè Italy, Hambourg University, Qinghua University and University of Oslo.

The project has also looked at standardisation issues and has concluded that standardisation can be best achieved when all stakeholders that may be concerned as well as those who represent superior interests define common cornerstones. The concrete market development then will take place within a suitable framework and will be driven by the market participants themselves.