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Project Coordinator Name	Antonio Navarro
Project Coordinator Organisation Name	Instituto de Telecomunicações (IT)
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Abstract

This document is the Periodic Management Report (PMR) which consolidates the claimed costs of all the contractors in an aggregate form covering the entire duration of the project SUIT over the last year (Feb 2006-Jan 2007). The PMR is submitted for each reporting period as defined by article II.7.4.b of the contract. It is based on relevant information from Annex I of the contract.

Keyword list: Annual Human Resource Allocation, Work description, Major Cost Items, Overview Budget and Actual Costs, Major Deviations.

Periodic Management Report

D0.4_Project_Interim_Progress_Report

SUIT_287

March, 15th 2007

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SUIT- Scalable, Ultra-fast and Interoperable Interactive Television

http://suit.av.it.pt

Participants		Short name	Country
	Instituto de Telecomunicações.	*IT*	Portugal
	IBBT-Interdisciplinair instituut voor BreedBand Technologie Vzw	*IBBT*	Belgium
	URL- Universitat Ramon Llull Fundacio Privada	*URL*	Spain
	R&S-Rohde and Schwarz GmbH and Co Kommanditgesellschaft	*R&S*	Germany
	The University of Surrey	*UniS*	UK
	SA VITEC	*Vitec*	France
	RUNCOM - Runcom Technologies Ltd	*RUNCOM*	Israel
	Institut für Rundfunktechnik GmbH	*IRT*	Germany
	Universidad Politécnica de Madrid	*UPM*	Spain
	Wavecom - Soluções Rádio, Lda	*Wavecom*	Portugal

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1 Justification of Major Cost Items and Resources

1.1 Instituto de Telecomunicações (IT)

1.1.1 Work Performed

WP	Contributions
WP0	• Elaboration of the Action Points list. • Elaboration of the D0.0 - Project Handbook. • Elaboration of the Quality Assurance Plan. • Elaboration of 1st QMR, D0.1.1, 2nd QMR D0.1.2, 3rd QMR D0.1.3, and 4th QMR D0.1.4 • Contribution and reviewing deliverable D2.1. • Reception of the MMReports - February 2006 – January 2007. • Preparation and hosting and coordination of the kick-off meeting held at the Instituto de Telecomunicações, Universidade de Aveiro, Portugal. • Attendance,preparation and coordination of the following meetings: Portugal, Aveiro, Kick-of meeting; Spain, Barcelona intermediate meeting; Spain, Madrid SUIT meeting, Germany, Munich meeting; Belgium, Brussels, EU premises; • Preparation of the agendas and minutes for all the Project meetings. • Elaboration of the initial Website version of the project. • Reception and management of Contract A-forms, CA, CA Amendment, Bank Account Information, first period transfers to partners • Elaboration and actualization of the mailing lists. • Elaboration of the SUIT Logo. • Elaboration and actualization of the FTP – File Transfer Protocol. • Reception of the SUIT partners bank information. • All over administrational coordination. • Establishing the QCC members and report requested. • Elaboration of an internal document to coordinate the work carried out for a demo during the first review – SUIT_146.
WP1	• Definition of the Activity Leaders of Workpackage 1. • Contribution SUIT_3_WP1_Internal_Report.doc. • Definition of Reference Scenarios.

	• Contribution to SUIT_41. • Participation at the WP1, WP3, WP5 meeting at the URL in Barcelona. • Specification of the Requirements. • Definition of Reference Scenarios. • Contribution to SUIT_41_Internal_Presentation. • Contribution to Playout architecture and interfaces. • Contribution to Deliverable D1.1 mainly on video resolutions and summary of requirements. • Definition of SUIT terminal requirements. • Contribution to Deliverable D1.1 mainly on Section 7 - Summing up SUIT Terminals Requirements. • Contribution to Deliverable D1.3 mainly on Section 8 – DVB-T/H/RCT/802.16/802.11g interoperability issues. • Contribution to Deliverable D1.4 mainly on Sections 2, 3, 4.1 and 4.2. A solution for Handover based on Mega-frame has been proposed by IT. • Contribution to Deliverable D1.4 on Sections 5 and 8. • D1.4 review. • Contribution to Deliverable D1.2 mainly on its reviewing.
WP2	• Study of DVB-T modules. • Starting working with IT++ Software and comparison to Matlab. • Contribution to deliverable D2.1 namely on link budget and DVB-T/UHF multipath modelling (COST 207). • Analysing all DVB-T modules in Matlab/Simulink. • Implementation of DVB-T modules in Matlab/Simulink. • Implementation of CTC in IT++ software. • Simulink software development and generation of results. Writing up D2.2.
WP3	• Following JVT activities on SVC. • Study of CBR control strategies on MPEG AVC. • Reviewing the last developments on SVC from JVT. • Study of doc JVT-T202. • Following JVT advances. Analyse/study of JVT reports.

	• Reviewing the last developments in DVB-T2
WP4	• Contribution to the definition of the playout equipment and components interfaces (Madrid Meeting). • Reviewing of RUNCOM's platforms user guides. • Contribution to the discussions about the synchronization of all media with the wall clock. • Analysis and discussion of IP Inserters in SUIT Playout namely on MPE implementation by RUNCOM transceivers.
WP5	• Contribution to the Gateway Architecture and its interfaces towards D5.1- Gateway Specifications. • Review D5.2 and D5.3 suggestions.
WP6	• Integration of both last mile networks. First experiments towards the first audit. IT wrote a doc describing the SUIT platform to be shown in the first audit (one year period). • Update the demo document –Definition of responsibilities, dates and interfaces between partners work. • Implementation of sockets module for interfacing PCs (Playout, Gateway, and Terminal) to the IP network.

WP7	• Dissemination of Results:
	  • Contribution to IDCT AdG in MPEG
	  • Organization of the 3rd International Workshop on Mathematical Techniques and Problems in Telecommunications –MTPT (http://www.mtpt.it.pt/).
	  • Submission of a camera ready paper to MTPT.
	  • Participation in the International Workshop MTPT (Twww.mtpt.it.pt).
	  • A. Navarro and V. Silva, "Fast Conversion between DCT and Wavelet Transform Coefficients," 3rd International Workshop on Mathematical Techniques and Problems in Telecommunications, Leiria-Portugal, Sept 4-8, 2006.
	  • B. Gabriel and A. Navarro, "Multi-carrier Optimization for Compressed Video Streaming," To appear in the IEEE Int. Conf. on Consumer Electronics, Las Vegas, Jan 10-13, 2007.
	  • J. Tavares, A. Silva and A. Navarro, 2006, "H.263 Video Codec Performance with a Fast 8x8 Integer IDCT", IEEE ICME 2006, Toronto, Canada.
	• Paper presentation in IEEE ICCE.
	• Participation in several MPEG meeting.
	• Talk in a Seminar Organized by IT and R&S in Aveiro-Portugal: 70 attendees, mostly from operators and broadcasters.
	• Contributions to Standardization:

1. M. Santos, A. Silva, A. Navarro, “MPEG-4 VLD+IQ+IDCT Implementation on a Virtex-II,” ISO/IEC JTC1/WG11 Doc. M13139, April 2006.

2. A. Silva, J. Tavares, A. Navarro, “MPEG-4 Testbed for Video IDCT Specification,” ISO/IEC JTC1/WG11 Doc. M13140, April 2006.

3. A. Silva, J. Tavares, A. Navarro, “MPEG-4 Test Results for Video IDCT Specification,” ISO/IEC JTC1/WG11 Doc. M13141, April 2006.

4. Arianne T. Hinds, Yuriy A. Reznik, Phoom Sagetong, Honggang Qi, Siwei Ma, Antonio Navarro, “MPEG-4 Test Results for Video IDCT Specification,” ISO/IEC JTC1/WG11 Doc. M13311, April 2006.

5. A. Navarro, “Cross-check of Improved Fixed-Point DCT/IDCT Implementation Scheme with Low Complexity and High Fidelity (M13256),” ISO/IEC JTC1/WG11 Doc. M13376, April 2006.

6. M. Santos, A. Silva, A. Navarro, “H.264 Deblocking Filter Implementation on a Virtex-II,” ISO/IEC JTC1/WG11 Doc. M13620, Jul 2006.

7. A. Navarro, “Crosscheck report on fixed-point DCT/IDCT algorithms,” ISO/IEC JTC1/WG11 Doc. M13701, Jul 2006.

8. Yuriy Reznik, Arianne Hinds and A. Navarro, “On Complexity Criteria and Metrics for MPEG Fixed-Point IDCT Standard,” ISO/IEC JTC1/WG11 Doc. M13703, Jul 2006.

9. A. Navarro, Y. Reznik and A. Silva, “Improved IDCT”, ISO/IEC JTC1/WG11 Doc. M13800, Oct 2006.

10. A. Navarro, Y. Reznik and A. Silva, “Improved IDCT-Replacing M13800”, ISO/IEC JTC1/WG11 Doc. M13803, Oct 2006.

11. A. Navarro, M. Santos, “Hardware implementation of full search H.264 motion estimation”, ISO/IEC JTC1/WG11 Doc. M13989, Oct 2006.

12. A. Navarro, A. Silva, “Performance in MPEG-4 of five submitted integer IDCTs for CD”, ISO/IEC JTC1/WG11 Doc. M13990, Oct 2006.

13. A. Navarro, “Crosschecking an integer 16 bit IDCT (M13791)”, ISO/IEC JTC1/WG11 Doc. M13992, Oct 2006.

14. A. Navarro, “Cross check of proposed additional (CE-stage) IDCT designs”, ISO/IEC JTC1/WG11 Doc. M14003, Oct 2006.

15. A. Navarro, A. Silva and Y. Reznik, “A Correction on Scalable Fixed-Point 8x8 FDCT/IDCT for CD selection”, ISO/IEC JTC1/WG11 Doc. M14078, Jan 2007.

16. A. Navarro, “Cross-checking 9 LLM11-based scaled algorithms from the CE”, ISO/IEC JTC1/WG11 Doc. M14254, Jan 2007.

17. A. Navarro, “Comments on Evaluation Procedure for CD Selection in Hangzhou”, ISO/IEC JTC1/WG11 Doc. M14255, Jan 2007.

1.1.2 Major Cost

Items	Description	Cost

Labour Costs	• 33.73 person/month spent by the IT	318,739.05 €
Travel	• Preparing and hosting Kick-of meeting, Aveiro, Portugal, February 2006	500€
	• Technical meeting Barcelona, Spain, March 2006	580€
	• SUIT Consortium meeting, Madrid, Spain, May 2006	1,750€
	• SUIT Consortium meeting, Munich, Germany, July 2006	960€
	• SUIT Concertation meeting, EU Premises, Belgium, October 2006	890€
	• SUIT Consortium meeting, Guildford, UK, November 2006	1,250€
	• SUIT Consortium meeting, Algarve, Portugal, January 2007	270€
Total		**324,939.05** €

1.2 Instituut voor BreedBand Technologie Vzw (IBBT)

1.2.1 Work Performed

WP	Contributions

WP1	• Discussion with other partners about the terminal requirements.
	• Detailed study of the DVB-T/H technical specifications and available literature.
	• Study of the WiMax technical specifications.
	• Study of the business case regarding the broadcast versus the unicast approach.
	• IBBT made an internal brainstorming and study of possible scenarios in the context of the two available networks DVB and WiMAX. The result was the definition of a scenario which allows for the possibility to use the WiMAX channel for unicast transmission of the redundant information for DVB-T channel (resilience on demand).
	• Discussion regarding the gateway/no-gateway scenarios.
	• Discussion regarding the moving and static gateway scenarios.
	• Discussion with other partners about the terminal requirements.
	• Contribution to D1.1
	  o Computational capabilities: Entropy decoder complexity , Complexity of MDC versus SDC
	  o Common terminal description protocols: MPEG-21 DIA-UED and CC/PP.
	• Preparation of the Munich SUIT meeting.
	• Study of both “W3C’s composite capability – preference profile” and “MPEG-21 Part 7 Digital Item Adaptation – Usage Environment Description” as terminal description protocols.
	• Writing of part 6 of deliverable D1.1 presenting an overview of both studied terminal description protocols as well as an example.

WP3	• Preparation of the initial presentation at the Kick-Off Meeting. The related document can be found on the ftp site: SUIT_10_WP3-IBBT.ppt • First draft of the planning regarding the collaboration between the partners participating in WP3. • Participation at the Barcelona SUIT meeting. • Assignment of responsibilities for each activities inside the WP3. • Starting from the initial proposed MD coders architectures as given in the SUIT_10_WP3-IBBT related document a redefinition of the third MD coder architecture was proposed in order to meet the resilience on demand scenario.

- Preliminary studies to examine the possibility to incorporate the MD index assignment algorithm into a quality scalable video coder.
- Investigation of FMO tools and additional examination of extended use of FMO.
- It is important to remark that our scientific results on scalable multiple description coding of video have been validated in the context of scalable wavelet-based video coding employing a Spatial-Domain MCTF (Motion-Compensated Temporal Filtering) architecture. These results have been recently accepted for publication in IEEE Transactions on Image Processing. Related paper on the ftp site SUIT_43_TIP-01839-2005_d_col.pdf.
- State of the art study of SVC.
- Preparation of the detailed presentation of the MD-SVC block scheme.
- Investigation of available usage environment description tools and standards.
- State of the art comparison of usage environment description tool: MPEG-21 DIA-UED, CC/PP.
- Preparation of the detailed WP3 work plan and task division.
- Preparation of the presentation for the IBBT-VITEC (WP3+WP5) meeting that took place in Brussels 2nd of June.
- Study of the state of the art SVC coder in order to assess the possibility of separating the entropy coding module. This will allow for the inclusion of the MD module at the end of the close loop coding scheme.
- Preparation of the presentation for the IBBT-VITEC meeting. The meeting concluded that:
    - A common software platform will be taken in consideration for the non real time experiments.
    - For the real time implementation the video coder will not provide entropy coding at the end. This will present the advantage that the MD (multiple descriptions) and the EC (entropy coding) can be seen as a post processing modules allowing for flexibility in the development process.
    - The MD coding module will not be included in the close loop architecture allowing for a full flexible implementation.
- Investigation of the SVC system in order to separate the entropy coder from the entire architecture. In this way a MD index assignment matrix can be developed as a separate block and used in between the video coding architecture and the CABAC entropy coder.
- During the Munich meeting it was pointed out by VITEC that in order to achieve real time implementation of the codec all the modules are needed to be optimized including the MD coding block. Consequently alternative IA matrices are investigated in order to reduce the memory allocation.
- Regarding the MD combiner several issues were discussed and a subsequent document was produced in cooperation with VITEC and UPM.
- Further work was done in order to separate the entropy coder from the entire architecture. This will permit the implementation of several MD index assignment matrices that can be inserted in the coding scheme.

	• Development of the software for the MD coder. A separate C++ class is currently under development. The separation between the video coder and the entropy coder enables the insertion of such a MD component block. The class will allow for implementation of different types of MD embedded index assignments. Consequently, the MD coder can be tailored for different networks conditions. • Start of the study of the provisions for redundant slices in the state of the art SVC specification. • Implementation of the Multiple Description Scalar Quantizers into the AVC. The AVC consists in the base layer for the SVC. The side coder and side decoders are already completely functional and bug free. • MDC using redundant slices: generation of two descriptions from single bitstream. • MDC using redundant slices: study of MDC combining and synchronization issues. • Implementation of the Multiple Description Scalar Quantizers into the AVC. The central decoder is functional. • Writing the Deliverable D3.1 • Study and implementation of NAL header parser • Integration of the MD module in the scalable video coder proposed by VITEC as the SUIT coding platform. The side coders at the level of the base layer are functional. Currently, the work of implementing the MD algorithm at the level of the enhancement layers is pursued. • Description of interface between Extractor and Playout • Implementation of Extractor module for the Audit demo • Study of Vitec encoder & output format
WP4	• Preparation of the initial presentation at the Kick-Off Meeting. The related document can be found on the ftp site: SUIT_65_WP4-IBBT.ppt • Investigation of available usage environment description tools and standards. • State of the art comparison of usage environment description tool: MPEG-21 DIA-UED, CC/PP. • State of the art comparison of usage environment description tool (continued): MPEG-21 DIA-UED, CC/PP, and HTTP Headers". Focus on the description of the terminal capabilities. • Development of the MPEG-21 Usage Environment Description for SUIT terminal. • Design of a web service at the playout for registering terminals and receiving and parsing their UED DIA documents. • Study of MPEG-21 AdaptationQoS tool for use in SUIT; this tool allows mapping available bandwidth to operational parameters for the stream extractor, in a content-dependent, reconfigurable and interoperable manner. • Study of session and description protocols and standards. • Writing of Deliverable D4.2

	• Study and implementation of MPEG-21 DIA-UED and AdaptationQoS in the playout.
WP7	• F. Verdicchio, A. Munteanu, A. Gavrilescu, J. Cornelis, and P. Schelkens, “Embedded Multiple-description Coding of Video, “ IEEE Transactions on Image Processing, Vol. 15, N.10, pp. 3114-3130, 2006.

1.2.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 16.17 PM	61295.92€
Equipment	• Personal Computer	1821.40€
Travel	• SUIT Consortium Meeting Guildford • SUIT Consortium Meeting Algarve	1849.43€ 2071.48€
Consumables	• Training Seminar Kenneth Vermeirsch	234€
Total		67272.23€

1.3 Universitat Ramon Llull Fundacio Privado (URL)

1.3.1 Work Performed

WP	Contributions
WP1	• Discussion with other partners about terminal requirements. • Definition and discussion of reference scenarios and terminal requirements with other partners. • Start the compilation of the play-out requirements. • Definition playout requirements and draft system architecture. The subject was discussed during Madrid meeting and the overall conclusions were the basis of the document SUIT_78_WP4_Madrid_Meeting_Report.doc which elaborates a list of requirements and specification of the playout system. • Refinement of the architecture. Participation to the elaboration of deliverable D1.1 (terminal requirements). • Discussions about overall system architecture according activity 1.3.All IP-requirements.
WP4	• Initial WP4 presentation to all the SUIT partners. Related document (ftp site): SUIT_9_WP4_Internal_Presentation.ppt. • Definition of relations of WP4 with other WPs. • Assignation of a responsible for each activity inside WP4. • Attendance to the WP3 meeting in order to know what kind of content will be delivered to WP4. • Internal discussion and study of requirements. • Study of RTP/RTCP protocols especially regarding synchronisation issues and where they will be used. • Study of classical session management and description protocols (SIP, SDP, RTSP, MPEG21-DIA) and new ones (SDPng). • Definition of the playout architecture modules according the different SUIT reference scenarios and terminals. These modules and interfaces were discussed in Madrid Meeting and were the base for an internal document. • Study and elaboration of an internal document of GSE (Generic Stream Encapsulation), as proposed by DVB-GBS group for use in DVB-S2 standard. Possible advantages and drawbacks for using it in the playout to send IP over DVB-T, instead of standard MPE. • First draft of the general architecture for the playout, based on the scheme discussed in Madrid meeting. • Elaboration of a general scheme of the playout, and the connection between its parts.

- Identification of the building blocks according to used protocols and ISO/OSI layers.
- Assignation of work to partners involved in this workpackage activities.
- Preparation of Munich meeting.
- Preparation of presentations for next meeting in University of Surrey (6th-8th November 2006)
- Study of the standard for transport of H264 video over RTP, and the standard draft for transport of SVC over RTP.
- Search for RTP implementations.
- Study and comparison between different existing RTP libraries.
- Study of RTCP synchronization.
- Study and discussion with VITEC and IBBT about RTP Encapsulation.
- Starting definition and implementation of RTCP/RTP C++ library to be used by the extractor module. The Library consists on an extension of the jrtplib-3.6.0, in order to support RTP H264/SVC payload.
- Study of RTP encapsulation for H264 SVC/MD.
- In-depth study of open source library for RTP: JRTPLIB.Possible adaptation for supporting H264/SVC payload.
- Study of DVB-T encapsulation (Multi Protocol Encapsulation MPE) RTP/UDP/IP over TS.
- Starting definition of deliverable 4.1 "Synchronisation and encapsulation".
- Discussion about functionalities and modules of Runcom equipment (BST and CPE).
- Study of different Streaming Servers. RTP, RTSP, SDP protocols studied.
- Writing of deliverables D.4.1 "Sychronisation and encapsulation" and D.4.2 "Session protocols". The table of contents of these two deliverables has been made and document sections have been assigned to each partner. URL has been working on its sections in the two deliverables.
- Implementation of the RTP Encapsulator:
    - We have agreed with IBBT the kind of information needed to be delivered to the RTP encapsulator.
- Ongoing development of RTP encapsulator, using Live555 Streaming Media as well as Jrtplib.
- Discussions with IBBT and IRT about signalling in the whole system.
- The existing library Live555 has been modified to be adapted to the multiple description extractor:

1. Adapted to receive the two descriptions from the extractor, creating our own RTP packets with the necessary information to be delivered to the gateway (inclusion of the timestamp delivered from the extractor).
2. Modified to work with two ethernet cards in order to broadcast each description

	to a different subnet (VLAN). • Contributions to deliverable 4.2 "Session protocols", about SDP and SDPng. • Software tests including all playout modules: Encoder, Extractor, RTPEncapsulator and Switch. • Finished deliverable 4.2 "Session protocols", including URL contributions about finally adopted signalling in SUIT. • Software tests including all playout modules: Encoder, Extractor, RTPEncapsulator and Switch. • Participation in the general discussion about interfaces and communication between modules.
WP6	• Contribution to the definition of the first audit.
WP7	• Contribution with articles about DVB-H, MPEG-21 over TS, MPEG-21 over IP, according to a demonstration in IBC 2006

1.3.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 24,00 MM (including 20% of indirect costs)	71,042.46 €
Travel	• Kick-off meeting Aveiro Portugal – February • SUIT Consortium Meeting Madrid/Spain – May • SUIT Consortium Meeting Munich/Germany – July • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	956.60€ 1,223.55€ 1,636.37€ 1,998.15€ 1,472.47
Hosting Meeting	• Technical Meeting Barcelona/Spain – March	436.80€
Total		78,766.4 €

1.4 Rohde and Schwarz GmbH and Co Kommanditgesellschaft (R&S)

1.4.1 Work Performed

WP	Contributions
WP1	• Analysis of requirements for horizontal handover (between DVB-T cells). • Study of WiMAX related documents. • Investigation into channel decoding of non-standard-compliant broadcast signals (e.g. LDPC) in the frontend of the test probe. • Investigation into interfacing external (i.e. non-standard-compliant) channel coding, e.g. LDPC, to the channel coding module of the test signal generator. • Study of possible scenarios for the demonstrator. • Study of reference scenarios. • Participation in WP1 meeting in Barcelona. • Definition of interface for insertion of new channel coding schemes (eg. LDPC) into test signal generator firmware started. • Analysis of QoS requirements for HDTV over DVB-T: • The distribution of HDTV signals over terrestrial networks requires a high quality signal at the terminal to produce a sufficient picture and sound quality for the consumer. The level of the QoS parameters that can guarantee such quality for a high percentage of time were investigated. • Requirements for terminal triggered horizontal and vertical HO: • R&S has worked on the definition of requirements for a test receiver that represents the terminal in the laboratory test set-up. This terminal/test receivers will be capable of initiating horizontal handover between DVB-T/-H signals on different RF frequencies, and a vertical handover between a DVB-T/-H signal and a WiMAX signal. • Identification of QoS parameters to establish objective metric for QoS deterioration caused by HO: • A theoretical investigation was started to identify those QoS parameters which describe with sufficient accuracy the effect of a vertical or horizontal handover on the integrity of the signal at the different layers. The identified QoS metrics will then be implemented on the test receiver platform. • Specification of testsignals for reference scenarios started, especially for handover between systems. • Specification of signals for horizontal handover: • Work has started on the specification and development of test signals for horizontal handover between DVB-T/-H cells. Starting point is the DVB-H Implementation Guidelines document (TR 102377). The requirements for the test signals which consist of different MPEG2 Transport Streams and their modulation into a RF channel, were studied. The first step is to define Transport Streams for DVB-H which contain only partly the same services between which a handover is possible. These Transport Streams are then looped seamlessly for implementation on the testbed equipment. • For the horizontal handover between DVB-T cells the mechanisms applicable for DVB-H are not available. As a result the handover requires the analysis of PSI/SI

	information in the terminal. The current work focuses on the correct information in the tables of the test signals and their validation. • Definition of scenario for vertical HO between DVB-T/-H and WiMAX: • The definition of such a scenario was started based on the assumption that reception of the DVB-T/-H signal is the typical starting point, and the terminal is then moved out of the DVB-T/-H coverage zone but the service is being continued via WiMAX . • Review of components suitable for lab test set-up. Instruments and other components (including software tools) are being evaluated and prioritised for incorporation in the testbed. • Prioritisation of QoS parameters for evaluation of HO impact: • The work at R&S in Act 1.2 focused on the selection of a short list of parameters suitable for HO triggering, and the drafting of a concept how the parameters from the short list can be tested in the lab test set-up (e.g. for delays caused by higher layer parameter evaluation). • The suitability of different QoS parameters (from different layers) for terminal-triggered handover in a broadcasting system is being investigated. The first preliminary results were used to prepare R&S' contribution for deliverable D1.2. A first draft of D1.2 was edited and circulated amongst the partners involved. At a telephone conference on 22 September 2006, the next steps for D1.2 were discussed and a schedule for these steps was agreed. • The contribution to D1.2 was up-dated with regard to actual measurement values for the parameters listed in the QoS requirements. The contributions from other partners were integrated into D1.2 and the editorial work was started. • Revision of test scenarios for laboratory testbed: • In the light of the findings in Act. 1.2, the test scenarios were revised and the specification for the test software was amended accordingly. • For the encapsulation of IP streams in DVB-T, the advantages and draw-backs of realtime and off-line processing are being studied. Emphasis is put on cross-checking and validation of such streams in different test environments and with different equipment, to avoid a closed solution. • A contribution to D1.4 was drafted describing the components for the test set-up for DVB-T/H DVB-T/H (horizontal) handover and DVB-T/H WiMAX (vertical) handover.
WP4	• Study of QoS parameters for horizontal handover in DVB-T/-H networks: • Work has started on the analysis of the most suitable QoS parameters that could trigger a handover in the terminal in DVB-H and DVB-T networks. The pros and cons of physical layer parameters versus link layer parameters for the evaluation of a sufficient QoS level are currently investigated. • Investigation started of impact of horizontal (between DVB-T/-H cells) and vertical HO (between DVB-T/-H and WiMAX cells) on certain QoS metrics: • First test were carried out on a reduced test set-up to obtain a first impression of the impact of certain interruptions of streams and certain drop rates for TS packets or IP packets. • Preliminary tests on HO impact on QoS continued: • Non-automised tests were conducted to obtain more information on the recovery time of the test receiver in the presence of interrupted DVB-T/-H data streams • Theoretical calculations and preliminary simulations were carried out to establish suitable waiting periods after a normal handover (horizontal or vertical) before a subsequent handover in the other direction. The investigation focuses on the

	minimum measurement time required for a reliable statistical value of parameters at protocol layer (typically Layer 2) that are evaluated for triggering a handover. • The investigation into parameters to be used for the triggering of horizontal and vertical HO was ongoing, and the level of acceptable distortions in the case of a handover was analysed. A special focus was on the comparison of Layer 1 versus Layer 2 or 3 parameters in terms of HO reaction time. • The development of control SW for modulator, channel simulator and test receiver was started. The investigation into parameters to be used for the triggering of horizontal and vertical HO is ongoing. For this purpose, certain test scenarios for HO are developed which represent realistic use cases. • The development of control SW for modulator, channel simulator and test receiver was continued. • The development of a user interface for horizontal HO in DVB-T/H systems was started and first tests of the usability were carried out. • The development of control SW for the modulator and channel simulator is being finalised and verification tests of the user interface and the control SW for horizontal HO tests have started. • The control SW for the test receiver is still being developed.
WP6	• On the DVB-T/H test receiver, the implementation of a first set of selected QoS parameters for HO was started. Some problems regarding the control of modulators and test receivers of the HO test set-up were identified and solutions are being worked on. • On the DVB-T/H test receiver, the implementation of a first set of selected QoS parameters for HO was continued. A compensation for the non-seamless variation of some of the modulator parameters is being worked on. • The implementation of QoS parameters focused on the parameters relevant for the RF frontend of the DVB-T/H test receiver and is ongoing

1.4.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 11.35	207,186.36€
Travel	• Kick-off meeting Aveiro Portugal – February • Technical Meeting Barcelona/Spain – March • SUIT Consortium Meeting Madrid/Spain – May • SUIT Consortium Meeting Munich/Germany – July • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	1,191.30€ 837.90€ 1,062.20€ 1.427.00€ 809.00€
Consumables	• VLC Client	17,340.00€
Total		229,853.76€

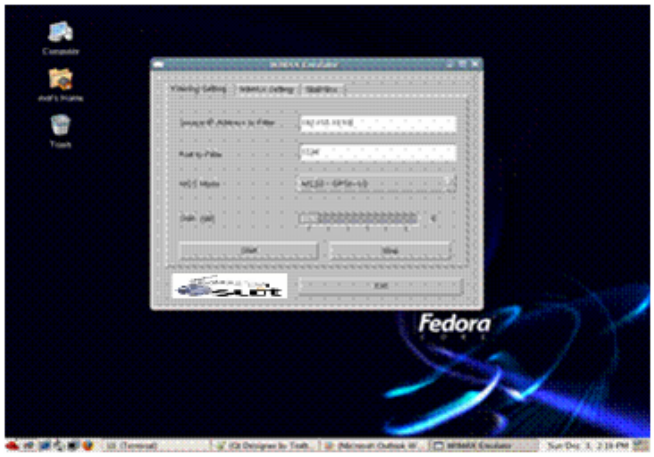
1.5 The University of Surrey (UniS)

1.5.1 Work Performed

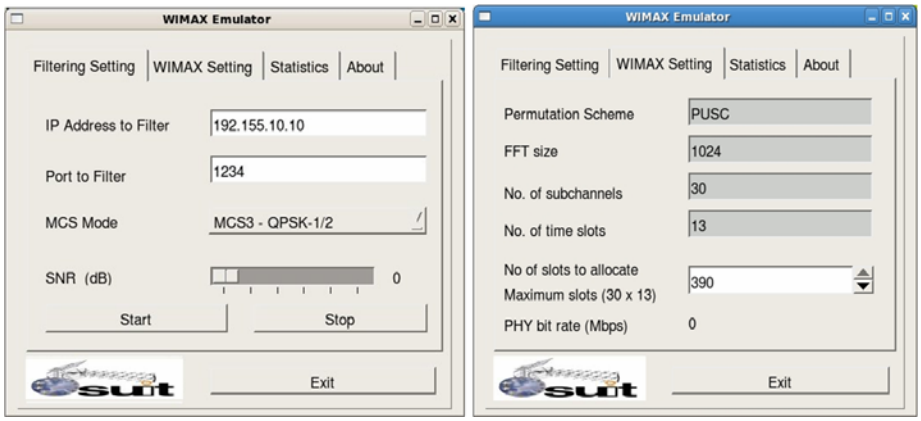
WP	Contributions
WP1	• Elaboration of a presentation about HD cameras for next Madrid Meeting. • Preliminary analysis of existing QoS options in the standards to be used (DVB-T, WiMAX, WLAN). • Analysis of existing QoS options in the standards to be used (DVB-T, WiMAX, WLAN). • Work on contribution towards deliverable, D1.2. • Work on contribution towards deliverable, D1.3. • Provided a discussion of WiMAX QoS issues in the deliverable for activity 1.2. • Writing of deliverable WP1.2. • Worked on a draft for D1.3: All-IP requirements, with a focus on WiMAX issues.

WP2	• Preparation of workplan for WP2, and circulation of the document to partners for comments.
	• Analysis of channel models for use in WLAN model.
	• Finalisation of channel model to use in WLAN simulations.
	• Survey of channel models as preparation for Madrid meeting May 2006.
	• Material finding and reading of topic on IEEE 802.11g baseband model
	• Material finding and reading of topic on IEEE 802.16e baseband model.
	• Implementation of channel model to use in WLAN.
	• Familiarizing of IT++ signal processing library for future coding of baseband model.
	• Writing of deliverable WP2.1 completed. Coordination and assembly of contributions from UniS, RUNCOM, and IT on channel model for DVB-T, WiMAX and IEEE 802.11g. Editing to make the document look consistent.
	• Software coding & testing for baseband modules of IEEE 802.16e.
	• Coding and testing of FUSC & PUSC completed with help from RUNCOM.
	• Coding and testing of Interleaver & QAM modem, OFDM transceiver completed.
	• Coding and testing of convolution coding and puncturing scheme done.
	• Preparation of material for July meeting in Munich:
	  • To finalize system parameters for simulation.
	  • To define simulation parameters.

    - To define test metric use in simulation.
    - To decide usage of CTC & LDPC.
    - To define and clarify Activity 2.5.
- Software coding & testing for baseband modules of IEEE 802.16e.
- Coding and testing of FUSC & PUSC completed with help from RUNCOM.
- Coding and testing of Interleaver & QAM modem, OFDM transceiver completed.
- Coding and testing of convolution coding and puncturing scheme done.
- Channel estimation (perfect channel estimation) done.
- Preparation of material for July meeting in Munich:
    - To finalize system parameters for simulation
    - To define simulation parameters
    - To define test metric use in simulation
    - To decide usage of CTC & LDPC
    - To define and clarify Activity 2.5
- Software coding & testing for baseband modules of IEEE802.11g completed
- Simulated AWGN performance
- Simulated HiperLAN/2 channel A to E performance
- Setup phone conference & send out details.
- Check progress of consortium member on the task and provide help if necessary.
- Prepare deliverable template for next milestone for WP2.
- Integration of IEEE802.16e WiMAX modules and simulator calibration using Runcom simulator.
- IEEE 802.16e Repetition codec programming & testing.
- IEEE 802.16e trace generation / reading C++ routine coding & testing. Preparing trace generation batch file script in TCL.
- Provide assistance to Wavecom/IT on IT++ installation.
- Sanity check of IEEE 802.16e software with convolutional coding. Awaiting software from Wavecom on Convolutional Turbo Coding (CTC) for integration
- Prepare deliverable template for next milestone for WP2.
- Generation of IEEE 802.11g traces started with the pre-decided parameters.
- IEEE802.11g physical link layer simulation and trace generations.
- Generation of IEEE802.11g traces ongoing.

- Generation of IEEE 802.11g link level simulation curves completed. Preparation of graphs for document.
- Writing part of the deliverable for WP2.4.
- First draft of WP2.4 written, send to WP2 list to solicit comments.
- Prepare deliverable template for next milestone for WP2.
  - Collaboration with IT on writing WIMAX software and testing.
  - Generation of WIMAX trace.
  - Writing of deliverable WP2.3 WIMAX Modeling, integrate input from Runcom.
  - Preparation of Linux based emulator for technical audit.
  - **Next tasks apply to Activities 2.3 and 2.4**
    1. Finish off WLAN & WIMAX deliverable, integrating contributions and unified format. Upload trace & simulator software.
    2. Preparation of Linux based emulator for technical audit.
       - Reading and setting up Linux bridge with packet filtering capability. Filtered packet will be dropped according to error pattern files
       - Setup Linux box as 2 ethernet bridge (using 4 ethernet cards) – Test status okay.
       - Write codes on encapsulation of packet over WIMAX MAC/PHY layer. Interfacing error pattern to the emulator and corrupt packet based on the error pattern.
       - Setting up graphical user interface (GUI).
       - 

    3. Used emulator performance tests to specify and order a new computer with Intel Pentium 4 CPU and 4 ethernet interfaces for use in the audit.
  - Installation of require software library and configuration of new PC. Tested WIMAX emulator for SUIT audit. The emulator supports throughput of up to 20Mbit/s.



- The emulation is divided into a two stage process, pre-simulation of error pattern files and a real time packet processing stage (using error pattern files). The pre-simulated error patterns consist of a set of traces for different Signal to Noise Ratios (SNR), and different Modulation and Coding Schemes (MCS). They were generated using the physical layer WIMAX baseband simulator developed in activity 2.3. The packet processing stage utilizes Linux's netfilter capability to capture packets, process the packet (by comparing to error trace), and drop or release the packet again back to the network. As depicted in the figure, the emulator allows the configuration of MCS mode, SNR values, selection of a particular stream (IP & port) and the physical layer bandwidth allocated for transmission.
- Coding, testing of WLAN 802.11g software in IT++.
- Perform simulation and generate error pattern trace. Software and trace is uploaded to ftp
- Writing of WP2.4, coordinate contribution from UPM.
- Preparation of WP2.5, solicit input from IRT on Fransy, the frequency planning tools.
- Participated in discussion in project meeting in Algarve, Portugal
- Prepared minutes and workplan for WP2.5, based on discussions in Algarve SUIT meeting. Sent out workplan for WP2.5.

WP3

- Preliminary studies to examine potential ways to apply Unequal Power Allocation to SVC (Scalable Video Coding).
- Tests have been conducted to examine the effects of packet losses on perceptual quality when SVC (Scalable Video Coding) is used. For this purpose, a loss simulator, which was donated to JVT by the University of Science and Technology of China and Nokia Corporation, has been used. The simulator simply discards SVC NAL units from the input video bitstreams based on error patterns provided, and outputs the lossy bitstreams. This simulator will also be exploited to test the error effects on SVC streams using error patterns produced in WP2 of this project in the future.
- A loss simulator has been created that will be compatible with the error traces to be produced in Workpackage 2. The loss simulator takes as input an SVC bitstream and an error trace. The simulator then uses the error trace to decide when to drop NALU's. Following some initial tests using UMTS channel models (WLAN etc not available yet), modifications are being made to a recent version of the JSVM software. These modifications are to ensure appropriate results in error

prone environments, and are necessary to overcome some deficiencies in current versions of JSVM.

- Experiments are currently being carried out to test the performance of SVC codec using HDTV video inputs. Once an optimal operating point has been determined for such very high resolution video clips, a number of HDTV encoded video bitstreams will be produced for further testing of the UPA system using the loss simulator.
- Contribution to writing of deliverable 3.1 in the form of comments and suggestions. Initial evaluation of performance of JSVM and AVC with WLAN and WiMAX models. Full tests to be completed when a wider range of simulations are available.
- Development of error corruption tool to drop NAL units from an SVC bitstream. WLAN and WiMAX versions were worked on for testing MDC across different networks.
- Study of MDC schemes to consider their implications for the Unequal Power Allocation scheme. This is particularly relevant for redundant slice based MDC, where the redundant slice may be transmitted with lower power, based on the current channel conditions.
- Further study of MDC schemes to consider their implications for the Unequal Power Allocation scheme. Some work was performed using the JSVM software to try and achieve odd-even frame MDC by changing the prediction structure. Further modifications to the source code will be needed to achieve this.
- Examination of past work at Surrey involving joint optimisation of power, source, and channel coding, for multimedia to determine its suitability for application to SVC. The previous work has some relevance as it was carried out on a scalable 3D mesh. However, the mesh is static, meaning that some adaptation will be needed to get the technique to work with video.
- Investigations have taken place into possible distortion models to allow allocation of power settings amongst the various scalable layers. For example, how can power be best allocated when there are temporal, spatial, and SNR scalable layers.

1.5.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 27.6 (include 20%)	112,257.79€
Travel	• Kick-off meeting Aveiro Portugal – February	893.97€
	• Technical Meeting Barcelona/Spain – March	654.89€
	• SUIT Consortium Meeting Madrid/Spain – May	2,057.57€
	• SUIT Consortium Meeting Munich/Germany – July	1,574.42€
	• Future of Digital Multimedia Services and Broadcast Technologies Brussels/Belgium –	532.22€

	September • SUIT Consortium Meeting Algarve/Portugal – January	1,225.51€
Hosting Meetings	• SUIT Consortium Meeting Guildford/ UK – November	3,220.52€
Consumables	• Interlocking Clipboard • Estates and Facilities BTA Interface • Laptop bag	346.67€ 106.61€ 33.62€
Other Costs	• Staff Recruitment Costs • Currency Exchange Charges	31.46€ 30.84€
Total		122,966.11€

1.6 SA VITEC (VITEC)

1.6.1 Work Performed

WP	Contributions
WP1	• Participation at the WP1, WP3, WP5 meeting at the URL in Barcelona. • Elaboration of a presentation about HD cameras for Madrid Meeting. • Elaboration of SUIT_14_Preparing_Barcelona_Meeting. • Contribution to Reference Scenarios. • Presentation about HD cameras and coder interfaces during Madrid Meeting. • Contribution to SVC decoding computational requirements in deliverable D1.1. • Improvement of contribution in deliverable D1.1. • Contribution to deliverable D1.4 postponed to D1.5. • Starting to contribute to D1.5.
WP3	• Preparation of an upcoming meeting between IBBT and Vitec about the implementation of MD techniques in SVC coding technology. • Common meeting between IBBT and Vitec about the implementation of MD techniques in SVC coding technology. • Completion of an internal report about the implementation of MD techniques in SVC coding technology, named “SVC Reference Platform Definition” • Contribution to deliverable D3.1. • Contribution to deliverable D3.2 (spatial scalability features). • Support for interfacing SVC encoder into MDC framework.
WP5	• Participation at the WP1, WP3, WP5 meeting at the URL in Barcelona. • Elaboration of SUIT_42 presentation for Barcelona Interim Meeting. • Real-time SVC encoder specifications: study of the AVC extension applied in SVC coding and its complexity. • Presentation about the definition of a SUIT SVC Reference Platform during Munich Meeting. • Real-time SVC encoder specifications: definition of an SVC reference platform for the project. • Starting of the development of an SVC reference platform that will be closed to the real-time SVC encoder/decoder package and will help partners to integrate their own works. • Development of an SVC reference platform that will be closed to the real-time SVC encoder/decoder package and will help partners to integrate their own works.

	• First contribution to deliverable D5.1. • Development of an SVC reference platform that will be closed to the real-time SVC encoder/decoder package. • Editing a presentation of the SVC reference platform software. • Deliver to the project, a first release of the SVC reference platform software. • Editing and contributing to deliverable D5.2 concerning the Real-Time SVC Encoder Specifications. • Improving the SVC reference platform that will be closed to the real-time SVC encoder/decoder package. • Starting to study the real-time implementation of the SVC encoder/decoder.
WP7	• Contribution to deliverable D7.1.1. • Analysis of possible SVC fallout and its exploitation.

1.6.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 22	238,713.20€
Travel	• Kick-off meeting Aveiro/Portugal – February • Technical Meeting Barcelona/Spain – March • SUIT Consortium Meeting Madrid/Spain – May • SUIT Technical Meeting Brussels/Belgium – June • SUIT Consortium Meeting Munich/Germany – July • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	1,850€ 650€ 1,640€ 474€ 1,323€ 1,773€ 680€
Total		247,103.20€

1.7 Runcom Technologies LTD (RUNCOM)

1.7.1 Work Performed

WP	Contributions

WP1	• Study of design considerations of DVB-RCT standard and support for Broadcast and intensive multimedia applications.
	• Study of design considerations of Mobile WiMAX (IEEE 802.16e) standard and support for Broadcast and intensive multimedia applications.
	• Preparing end-to-end schematics of DVB-RCT and WiMAX platforms with the available interfaces supporting SUIT MultiMedia and Broadcasting applications.
	• Prepared a document defining interface supporting SUIT multimedia applications (IEEE-802.16e BS Interfaces and Management Architecture), sent on 30th May and resent on 8th June.
	• Elaborations on User terminal interfaces for WiMAX and DVB-RCT.
	• Support for QoS interface requirements were covered by RUNCOM's document, SUIT_98_IEEE-802.16e_BS Interfaces_And_Management_Architecture.
	• Discussions with partners on SUIT_125_D1.3_All_IP_Requirements. RUNCOM's tranceivers will act as bridges, no IP address is required.
	• Runcom has generated and sent its contribution on Mobile WiMAX HO (Hand Off).
	• Also User Manual has been prepared and sent to partners of WP1 (SUIT_147,148,149).
	• Runcom submitted to the D1.2 its contribution on DVB-RCT QoS
	• Runcom has contributed to D1.3 (All IP Requirements) on the following topics:
	  • Description of DVB-RCT and Mobile WiMAX networks
	  • IP traffic over DVB-RCT and Mobile WiMAX systems
	  • Address resolution definitions.
	• Contribution on Network Reference scenario as in[put to D1.4 (Architecture and reference scenarios).
	• Runcom worked and submitted its contribution on Hand Over for the two platforms (DVB-RCT and WiMAX)
	• Runcom continued its effort to complete its commitment on HandOver and IP synchronization issues in the two platforms (DVB-RCT and WiMAX). Runcom has completed its tasks within Deliverable D1.4.
	• Runcom worked and submitted its contribution to Deliverable D2.2 on DBVB-RCT simulation for UpLink and theory (Channel estimation).

WP2	• Study of ITU-R and DVB project documents on Broadband UHF channel modelling including outcome and recommendations of MOTIVATE IST project addressing performance analysis of DVB-T receiver in mobility.
	• Study of available literature on Channel Modelling (propagation loss, multi-paths and fading conditions) in the 1.5- 2 GHz band and the possibility of application these models to higher frequency bands and to UHF band.
	• Preparing initial document on channel modelling for UHF including some profiles.
	• Contribution to SUIT _64 on channel modelling :
	  • DVB-RCT for fixed environment SUI-5
	  • DVB-RCT for Mobile environment COST
	  • WiMAX for high mobility ITU-B
	• RUNCOM has provided all parameters allowing channel modelling.
	• Definition of channels models for fixed and preparation for Mobile DVB-RCT. Definition of channels model for mobile WiMAX. Multipaths profiles were investigated for both fixed and mobile environment.
	• Research on LDPC codes – getting the simulation results, comparing them to other companies and comparing them to CC and CTC FEC.
	• Providing the vectors for the WiMAX simulations.
	• Work continued on channel modelling in 3.5 GHz, which designated as the preferred spectrum for WiMAX operation in Europe.
	• Contribution was provided on channel modelling in 3.5 GHz.
	• Contribution on LDPC has been delivered for AWGN and ITU-B accompanied with conclusions. Runcom has extended the support to simulation work carried out by Surrey.
	• Continued support for LDPC simulation carried out in Surrey.
	• Runcom submitted its contribution on Mobile WiMAX simulation for Downlink.
	• Runcom worked and submitted its contribution for Deliverable D2.3 on simulation in mobile environment for Mobile WiMAX including all code rated and modulation schemes in three speeds (60, 100 and 150Km/h) in two channel models (AWGN and ITU-A, B).
	• Runcom continued its work on simulation for the Uplink according to Channel Model ITU-B and the focus was on 16QAM ¾ and 64QAM ½ . Also we added explanation on LDPC including harmonization contribution.
	• Runcom submitted its contribution on Coverage for Mobile WiMAX and DVB-RCT. Full calculation has been carried out in order to show range and throughput.

WP5	• Preparing block diagrams of the mobile User Terminal and the required interfaces supporting SUIT multimedia applications. • Preparing block diagrams of the DVB-RCT User Terminal and the required interfaces supporting SUIT multimedia applications. • Preparing block diagram of the Mobile WiMAX User Terminal and the required

	interfaces supporting SUIT multimedia applications. • RUNCOM has provided all the basic modules definition for both DVB-RCT and WiMAX. • RUNCOM has provided more detailed modules definition for both DVB-RCT and WiMAX. • More detailed schematic diagrams of the Mobile WiMAX Base Station and User Terminal were provided to the project. Also detailed schematic diagrams of the DVB-RCT Base Station and User terminal were provided to the project. • Runcom prepared PPT presentation on SoC and FPGA towards presentation during SUIT meeting at Surrey. • Runcom prepared and delivered its contribution for D5.1 on relevant components (WiMAX and DVB-RCT Tranceivers) of the Gateway. • Runcom prepared and submitted its contribution as part of Deliverable D5.3 (SoC and FPGA specification). • Improvement was attempted on what has been submitted in December. Additional activity is related to Integrated SoC (System-on-Chip) as a first version, it also included the combiner designed by UPM.
WP6	• Runcom prepared two platforms (DVB_RCT and Mobile WiMAX), made preparation for delivering two days seminar to SUIT member scheduled on November at Surrey. • Runcom prepared and delivered an operational course on DVB-RCT and WiMAX. The DVB-RCT platform was transferred to the coordinator. • Runcom continued its work on DVB-RCT Handoff scheme based on use of two transceivers.
WP7	• Defining RUNCOM exploitation planning. • Preparing template on the level of SUIT Consortium for the use and dissemination of SUIT knowledge. • Preparing TIP (Technology Implementation Plan) template on the level of SUIT Consortium. • Progress on preparation of Deliverable D7.1.1 (Plan for using and disseminating/exploiting knowledge). Collecting partners inputs on dissemination activities. • First draft of Deliverable D7.1.1 (Plan for using and disseminating/exploiting knowledge) was distributed to partners for review and comments. • Collecting partners contributions and finalization of the Deliverable D7.1.1 (Plan for using and disseminating/exploiting knowledge). • A template for D7.1.2 was prepared and submitted to SUIT partners.

1.7.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 40.57	308,284.00€
Equipment	• Material for WiMAX platform	24,733.00€
Travel	• Kick-off meeting Aveiro Portugal – February • SUIT Consortium Meeting Madrid/Spain – May • SUIT Consortium Meeting Munich/Germany – July • Brussels Concertation Meeting • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	0€ 0€ 1,232.00€ 0€ 0€ 3,498.00€
Total		397,736.00 €

1.8 Institut für Rundfunktechnik GmbH (IRT)

1.8.1 Work Performed

WP	Contributions

WP1	• Preparation work for Interim-Meeting in Barcelona (e.g. travel preparation, study of circulated documents).
	• Participation Interim-Meeting in Barcelona.
	• Initial work on requirements for SUIT-terminal and IRT's MHP/IPTV platform (e.g. adaptations required for the SUIT-network environment.
	• Investigation work on user-terminal-requirements.
	• First study on required adaptation work on IRT's MHP/IPTV platform for SUIT.
	• Investigations of compatibility issue between IPv6 and IPv4
	• Initial work on Reference Scenarios.
	• Analysis of identified Reference Scenarios and further study.
	• Apply for WiMAX licences (deadline was 28th February 2006) at Federal Network Agency.
	• Work on reference scenarios.
	  • Work on user-terminal-requirements.
	  • Work on requirements on IRT's MHP/IPTV.
	  • Investigations on QoS mechanisms of IPv4 & IPv6.
	  • Study of technical related documents for real time streaming.
	  • Study of technical related documents for WiMAX.
	  • Writing of Deliverable D1.1 .
	  • Work on contribution towards Deliverable D1.1
	  • Study of technical related documents for IPTV.
	  • Revision of the WiMAX licence application form.
	  • Work on a first Draft version on Architecture Requirements, D1.4.
	• Investigations on available QoS mechanisms of IPv4 & IPv6.
	• Study on potential reference scenarios.
	• Work on a first Draft version on Architecture Requirements, D1.4.
	• Final work on Deliverable D1.1 .
	• Work on a first Draft version on Architecture Requirements.
	• Definition and contribution towards D1.2 , in particular chapter on WIFI related QoS

	requirements. • Discussions about potential impacts for the support of Multicast via WLAN802.11 networks. • Contribution towards D1.3 , in particular section on MHP-IPTV scenario. • Continued work on Architecture Requirements (Activity 1.4) and identification of open questions. • Writing of Deliverable D1.4. • Collection and integration of contributions from partners into Deliverable 1.4 • Discussion of open questions related to D1.4. • Clarification of remaining questions. • Final editorial work on D1.4.
WP2	• Detailed Study of IRT contribution to WP2. • Reconsideration about IRT contribution towards A2.2 and A2.3 to achieve coherent work. • Definition and contribution towards D1.2 , in particular chapter on WiFi related QoS requirements. • Discussions about potential impacts for the support of Multicast via WLAN802.11 networks. • Preparation of several slides for discussion at Algarve meeting. They depict the work to be planned in A2.5 and provide information about the IRT frequency planning tool FRANSY. It is intended to use a possible scenario (not definition) related to the trial, perform link budget calculation and get the throughput map using the terminal threshold and supported physical layer bit rate. As a result, graphical coverage maps providing the expected data throughput (respectively capacity in units per second) for the area of field-trials (Munich) will be processed. The calculations may be performed iteratively to optimise the transmission system in respect to the envisaged trials.
WP4	• Contribution to the SUIT Playout architecture: Proposal for integration of IRT's MHP-IPTV (DVB-IPI conform). • Investigations about possible mechanisms for the service announcement, based on DVB-IPI. • Work on a written contribution in respect to D4.1 (DVB-IPI encapsulation and adaptation to SUIT). • Written contribution towards D4.1 (section about DVB-IPI encapsulation and adaptation). • Study of service announcement mechanisms for SUIT based on DVB-IPI. • Start of work on a written contribution towards D4.2 (Service Detection& Selection based on DVB-IPI solution). • Investigation and decisions on protocols as well as the session and service description to be used.

	• Preparation of a dedicated input towards D4.2 (Service Detection& Selection based on DVB-IPI solution. • Discussions about Handover in WiMAX, in particular in respect to the resulting delay at handover process.

WP6	• First investigations work how to adapt IRT's MHP/IPTV receiver to SUIT environment.
	• Initial preparation work for setup testbed (e.g. room for integration, DVB-T demonstration platform, distribution of signals …).
	• Acquisition of time restricted WiMAX transmission licences.
	• Initial planning for the setup of the testbed like:
	  • Organisation and reservation of a dedicated integration-room for system integration.
	  • Initial investigations about required measurements equipment to perform system integration.
	  • First investigations about how existing equipment (like IP-Encapsulator, …) will fit project requirements.
	  • Considerations about needed potential investments (e.g. IP-router)
	  • Application for a permit to mount WiMAX antennas on a transmission tower owned by the BR (Bavarian public broadcaster) for the duration of the field trials.
	  • Planning about how to interconnect the playout with the transmission equipment (e.g. optical link to a power amplifier which might be located close to the transmission tower.
	• Preparation work for the setup of the testbed:
	• Correspondence with the German Federal Networking Agency. Further clarifications of details in respect of the agreed WiMAX-licences:
	  • maximum height of transmission antenna
	  • maximum allowed transmission power
	• Work on IPTV Playout.
	• Generation of Service Information for SD&S server.
	• Work on support for HD&SD (ACV) for MHP-IPTV.
	• Investigations, which channels in the UHF-band are not occupied in the Munich field trial area and candidates for licence application for DVB-T/RCT frequencies.
	• Discussions about possible solutions for the installation of WiMAX equipment (base stations, amplifiers and antennas) on the transmission tower. The most appropriate candidate for a solution with RUNCOM equipment (no outdoor equipment) is to install the base station at ground (in a container) and feed of the antennas (90 m above ground) using cables with very low attenuations.
	• Identification of relevant requirements for a dedicated car to perform the field trials (e.g. power supply (230V), space for measurement equipment, possibility for

	installation of antennas). • Arrangement of a car for the field trials (mobility tests). • Detailed discussions in respect to the envisaged scenarios, in particular the required WiMAX coverage. Identification of issues needed to be solved to the setup field trials. For example, extra power amplifiers have to be deployed in order to perform mobility tests due limited output transmission power of the WiMAX base stations. • Preparation of a document with information about the WiMAX licence auction (Germany) finished in December 2006.
WP7	• Attendance at the WIMAX World Europe Conference (22nd to 24th May 2006) in Vienna and submission of an abridged report to the Public German Broadcasters and the SUIT Consortium.

1.8.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 17.07	225,734.34€
Travel	• Kick-off meeting Aveiro Portugal – February	1,280.06€
	• Technical Meeting Barcelona/Spain – March	529.90€
	• SUIT Consortium Meeting Madrid/Spain – May	2,648.56€
	• SUIT Consortium Meeting Munich (R&S) - July	25.34€
	• SUIT Consortium Meeting Guildford/ UK – November	2,881.86€
	• SUIT Consortium Meeting Algarve/Portugal – January	1,917.75€
Consumables	• WiMAX Transmission Licence fees for 2006	130.00€
Total		235,017.81€

1.9 Universidad Politecnica de Madrid (UPM)

1.9.1 Work Performed

WP	Contributions
WP1	• Preliminary analysis of All-IP paradigm within Suit project objectives. • Participation on the definition of different scenarios. • Analysis and identification of the All-IP support requirements within Suit project. • Elaboration of a preliminary draft with the identified requirements. • First proposal of structure and workplan for D1.3 “All-IP requirements”. • Contribution to D1.3 “All-IP requirements” regarding the All-IP concept and Internet Protocol descriptions. • Contribution to D1.3 “All-IP requirements” with respect to Wi-Fi networks. • Organization of follow up phone conferences for D1.3. • Contribution to D1.3 “All-IP requirements” regarding interoperability issues among the wireless networks and edition of the contributions to D1.3 from other partners. • Final integration and conclusion of D1.3. • Collaboration in the definition of architecture and reference scenarios.
WP2	• Preliminary analysis of channel models for use in the transmission model. • Preliminary work on a test environment for WiFi transmission analysis at the packet level. • Channel modelling. • Survey of channel models for IEEE802.11g. • Software coding & testing for baseband modules of IEEE 802.11g. • Study of packet analysis tools for wireless transmission. • Initial set up of test environment: selection of the appropriate WLAN hardware. • Initial SW developments for packet transmission analysis over WLAN. • Identification of suitable channel models for WLAN transmission. • Definition of parameters for the test environment. • Selection of the most suitable channel models for WLAN transmission. • Set up of the test environment to gather real data and first round of measurements.

	• Development of SW tools to format the obtained data. • Development of a first version of an algorithm to generate Gilbert-Elliot (GE) models • Generation and analysis of preliminary GE models. • Participation in follow-up conference calls. • Analysis of the approach based on Hidden Markov Models (HMM) for discrete network modelling. • Development a preliminary algorithm to generate HMM-based models. • Generation and analysis of the first discrete models based on HMMs. • Beginning of data gathering for the different scenarios specified. • Data gathering for the WLAN modelling task. • Software development for Gilbert, HMMs and PER-classes discrete WLAN models • Measure of the first model statistics for Scenario #1 • Analysis of the first results for feedback. • Conclusion of the data collection for three different scenarios. • Final development and training of the three proposed models. • Generation of simulated traces for each model. • Contribution on discrete WLAN modelling for D2.4. • Conclusions and revision of D2.4.
WP3	• Analysis of MD-SVC coding approaches aimed to examining optimized rate control strategies at the gateway. • Analysis of SVC coding approaches aimed to examining optimized rate control strategies at the gateway. • Analysis of the implication of D.1.1 “User terminal requirements” regarding the use of scalability coding. Contribution to D.1.1. • Analysis of an internal report (SUIT_120) from VITEC and IBBT about real-time considerations for the SVC codec. This internal presentation discusses the JVT SVC. • Analysis and contribution to WP3 workplan. • Analysis of VITEC report about real-time considerations for the SVC codec. • Preliminary study of rate control strategies for optimization at the gateway. • Comments to D3.1. • Study of rate control strategies for optimization at the gateway. • Optimization of basic gateway modules.

WP5	• Preliminary work on the design of the gateway functional architecture. • First draft of the gateway functional architecture. • Preliminary analysis of RTP/RTCP protocols and available implementations. • Contribution to the gateway functional architecture draft to include a proposal of the protocol stack. • Analysis and update of the gateway functional architecture regarding the use of MD. • Analysis of the implication of D.1.1 “User terminal requirements” for the WiFi segment. • First analysis of structure and workplan for D5.1 “Gateway specifications”. • Analysis of RFCs and drafts on RTP and AVC/SVC encapsulation within RTP. • Analysis of the RTP encapsulation suggested by URL and its implications in the gateway. • Proposal of structure and workplan for D5.1 “Gateway specifications.” • Analysis of the implications of RTP implementation at the gateway. • Follow up of the discussions on RTP encapsulation. • Analysis of RTP/RTCP libraries. • First proposal for the TOC in D5.1 (Gateway specifications). • Preliminary approach to gateway software structure. • Follow up of the discussions on SVC NAL and RTP encapsulation. • Definition of Gateway interfaces. • Implementation of basic gateway modules: NAL and RTP level synchronization. • First integration of components. • Preparation of the SUIT gateway for the Audit. • Adaptation of the RTP decapsulator as an input to IT.
WP7	• Dissemination of results to Spanish companies (Telefónica I+D) and to Spanish Administration authorities (Ministerio de Industria). • Elaboration of the local SUIT web page.

1.9.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 19.3	150,498.49€

Equipment	• Equip. (depreciation)	2,437.47€
Consumables	• Various	511,00€
Travel	• Kick-off meeting Aveiro Portugal – February • NEM Meeting Brussels • Technical Meeting Barcelona/Spain – March • SUIT Consortium Meeting Munich/Germany – July • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	933.65€ 642.88€ 823.95€ 2,284.64€ 1,307.41€ 778.20€
	Total	160217,69€

1.10 WAVECOM – Soluções Rádio Lda (Wavecom)

1.10.1 Work Performed

WP	Contributions
WP1	• Backbone Network architecture requirements analysis. • WiMax and backbone network architecture requirements analysis. • Analysis of the WiMax radio regulation scenario. • Study of a multiband WiMAX transceiver (2.5GHz band and 3.5GHz band) using RUNCOM existing chipset. • All IP requirements for transmission circuits between playout and Base Stations (both WIMAX and DVB).
WP2	• Analysis of available air interface models for the 3.5GHz band. • Investigation of available system models for broadband wireless technologies. • IT++ start up and evaluation. • Analysis of convolutional turbo codes to implement the corresponding block for the system simulator. • Wimax channel modelling.
WP5	• Investigation of WiMAX technology in terms of: market, equipments, equipment certification and compatibility and also frequency allocation. • Investigation of IEEE standards supporting WiMAX: IEEE802.16 and IEEE802.16e.

1.10.2 Major Cost

Items	Description	Cost
Labour Costs	• person/month spent on the project during period: 12.4	72,716.51€
Travel	• SUIT Consortium Meeting Madrid/Spain – May • SUIT Consortium Meeting Munich/Germany • SUIT Consortium Meeting Guildford/ UK – November • SUIT Consortium Meeting Algarve/Portugal – January	315.37€ 543.25€ 784.96€ 775.80€
Durable Equipment	• PC DI Intel D 915 2.8GHZ, HDD (3) (depreciation)	15.64€

Total		75,151.53€

1.11 Budget versus Actual Costs

Cost Budget Follow-up Table								*) total budget figures - not EC funding	
Contract N°:	28042	Acronym:SUIT					Date:	15/03/2007	
PARTI-CIPANTS	TYPE of EXPENDITURE (as defined by participants)	BUDGET	ACTUAL COSTS (EUR)					Pct. spent	Remaining Budget (EUR)
			Period 1	Period 2	Period 3	Period 4	Total	Total	
		e	a1	b1	c1	d1	e1	a1+b1+c1+d1/e	e-e1
Part. 1-IT	Total Person-month	67	33.729				33.729	50%	33.271
	Personnel costs	633150	318,739.05				318739.05	50%	314410.95
	Equipment						0	0%	0
	Consumables						0	0%	0
	Travel	14714	6200				6200	42%	8514
	Hosting meetings						0	0%	0
	Audit certificates	1500					0	0%	1500
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	649364	324939.05	0	0	0	324939.05	50%	324424.95
Part. 2- IBBT	Total Person-month	50	16.166				16.166	32%	33.834
	Personnel costs	341722	61295.92				61295.92	18%	280426.08
	Equipment	5000	1821.4				1821.4	36%	3178.6
	Consumables	500	234				234	47%	266
	Travel	12671	3920.91				3920.91	31%	8750.09
	Hosting meetings						0	0%	0
	Audit certificates	2000					0	0%	2000
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	361893	67272.23	0	0	0	67272.23	19%	294620.77
Part. 3- URL	Total Person-month	42	24				24	57%	18
	Personnel costs	207900	71042.46				71042.46	34%	136857.54
	Equipment						0	0%	0
	Consumables						0	0%	0
	Travel	15204	7287.14				7287.14	48%	7916.86
	Hosting meetings	1000	436.8				436.8	44%	563.2
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	224104	78766.4	0	0	0	78766.4	35%	145337.6
Part. 4-R&S	Total Person-month	23.5	11.35				11.35	48%	12.15
	Personnel costs	430884	207186.36				207186.36	48%	223697.64
	Equipment						0	0%	0
	Consumables	2000	17340				17340	867%	-15340
	Travel	10355	5327.4				5327.4	51%	5027.6
	Hosting meetings						0	0%	0
	Audit certificates	3356					0	0%	3356
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	446595	229853.76	0	0	0	229853.76	51%	216741.24
Part. 5-UniS	Total Person-month	44	27.6				27.6	63%	16.4
	Personnel costs	316800	112257.79				112257.79	35%	204542.21
	Equipment						0	0%	0
	Consumables	1000	486.9				486.9	49%	513.1
	Travel	11150	6938.59				6938.59	62%	4211.41
	Hosting meetings	4000	3220.52				3220.52	81%	779.48
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs		62.3				62.3	#DIV/0!	-62.3
	Total Costs	332950	122966.1	0	0	0	122966.1	37%	209983.9

Cost Budget Follow-up Table							*) total budget figures - not EC funding		
Contract N°:	28042	Acronym:SUIT					Date:	15/03/2007	
PARTI-CIPANTS	TYPE of EXPENDITURE (as defined by participants)	BUDGET	ACTUAL COSTS (EUR)					Pct. spent	Remaining Budget (EUR)
			Period 1	Period 2	Period 3	Period 4	Total	Total	
		e	a1	b1	c1	d1	e1	a1+b1+c1+d1/e	e-e1
Part. 6- Vitec	Total Person-month	44	21.991				21.991	50%	22.009
	Personnel costs	477426	238713.2				238713.2	50%	238712.8
	Equipment						0	0%	0
	Consumables						0	0%	0
	Travel	16394	8390				8390	51%	8004
	Hosting meetings						0	0%	0
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	493820	247103	0	0	0	247103.2	50%	246716.8
Part. 7- Runcor	Total Person-month	73.5	40.57				40.57	55%	32.93
	Personnel costs	735000	308,284				308284	42%	426716
	Equipment	50000	24733				24733	49%	25267
	Consumables						0	0%	0
	Travel	27788	4730				4730	17%	23058
	Hosting meetings						0	0%	0
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	812788	337747	0	0	0	337747	42%	475041
Part. 8- IRT	Total Person-month	45	17.07				17.07	38%	27.93
	Personnel costs	624150	225604.3				225604.34	36%	398545.66
	Equipment						0	0%	0
	Consumables	308	130				130	42%	178
	Travel	16000	9283.47				9283.47	58%	6716.53
	Hosting meetings						0	0%	0
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	640458	235018	0	0	0	235017.81	37%	405440.19
Part. 9- UPM	Total Person-month	30	19.3				19.3	64%	10.7
	Personnel costs	276000	150498.5				150498.49	55%	125501.51
	Equipment	2000	2437.47				2437.47	122%	-437.47
	Consumables	297	511				511	172%	-214
	Travel	10000	6770.73				6770.73	68%	3229.27
	Hosting meetings						0	0%	0
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	288297	160218	0	0	0	160217.69	56%	128079.31
Part. 10- Wave	Total Person-month	30	12.4				12.4	41%	17.6
	Personnel costs	208320	72716.51				72716.51	35%	135603.49
	Equipment	43056	15.64				15.64	0%	43040.36
	Consumables						0	0%	0
	Travel	17256	2419.38				2419.38	14%	14836.62
	Hosting meetings						0	0%	0
	Audit certificates						0	0%	0
	Third Party						0	0%	0
	Others costs						0	0%	0
	Total Costs	268632	75152	0	0	0	75151.53	28%	193480.47

1.12 Person-Months Status Table

Person-Month Status Table

CONTRACT N°: 028042
ACRONYM: SUIT
PERIOD: 1/02/2006-31/01/2007

			Partner - Person-month per Workpackage											AC - own staff				
			TOTALS	Coord. IT	IBBT	URL	R&S	UniS	Vitec	Runcom	IRT	UPM	Wavecom	AC TOTALS				
Workpackage 0:	Project	Actual WP total:	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0				
	Management	Planned WP total:	7.5	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0				
Workpackage 1:	Architecture Requirements	Actual WP total:	48.9	3.8	2.7	3.0	5.3	5.1	4.3	6.8	8.9	5.0	4.0	0				
	and Specifications	Planned WP total:	46.4	4.3	3.0	3.0	3.8	6.0	4.0	5.0	9.7	4.0	3.7	0				
Workpackage 2:	Channel and Systems	Actual WP total:	60.5	9.4	0.0	0.0	0.0	17.0	0.0	19.0	0.6	7.0	7.5	0				
	Simulations	Planned WP total:	57.3	9.7	0.0	0.0	0.0	15.0	0.0	14.0	2.7	7.0	9.0	0				
Workpackage 3:	Robust Scalable Video	Actual WP total:	25.6	4.9	9.2	0.0	0.0	5.3	4.0	0.0	0.0	2.2	0.0	0				
	Communications	Planned WP total:	38.5	5	21.0	0.0	0.0	5.3	5.0	0.0	0.0	2.2	0.0	0				
Workpackage 4:	Playout, Terminal and Network	Actual WP total:	37.6	4.3	4.2	20.1	4.7	0.0	0.0	0.0	4.2	0.0	0.0	0				
	Resource Management	Planned WP total:	39.6	4.9	4.2	21.3	4.5	0.0	0.0	0.0	4.6	0.0	0.0	0				
Workpackage 5:	Components	Actual WP total:	29.5	2.1	0.0	0.0	0.0	0.0	12.7	9.0	0.0	4.9	0.9	0				
	for the Testbed	Planned WP total:	31.6	2.0	0.0	0.0	0.0	0.0	15.6	9.0	0.0	4.1	0.9	0				
Workpackage 6:	Integration, Performance	Actual WP total:	10.9	0.8	0.0	0.8	1.5	0.0	0.0	4.0	3.8	0.0	0.1	0				
	Evaluation and Validation	Planned WP total:	12.2	0.6	0.5	0.9	2.0	0.0	1.3	4.0	2.7	0.0	0.2	0				
Workpackage 7:	Exploitation and	Actual WP total:	4.4	0.8	0.0	0.1	0.0	0.2	1.0	1.9	0.2	0.2	0.0	0				
	Dissemination	Planned WP total:	4.5	0.8	0.3	0.3	0.0	0.0	1.0	1.6	0.3	0.2	0.0	0				
		Actual total:	224.9	33.7	16.2	24.0	11.4	27.6	22.0	40.6	17.8	19.3	12.4	0	0	0	0	0
Total Project Person-month		Planned total:	237.6	34.9	29.0	25.5	10.3	26.3	26.9	33.6	20.0	17.5	13.7	0	0	0	0	0

1.13 Major Deviations

The following tables are copied from the 4th Quarterly Management Report.

Current Overall Planned Manpower – Annex I

Originally Planned Human Resource Allocation – Annex I of the Contract										
Partner	**Short Name**	**WP0**	**WP1**	**WP2**	**WP3**	**WP4**	**WP5**	**WP6**	**WP7**	**Total**
P01	IT	17	5	11	17	7	5	2	3	**67**
P02	IBBT	0	6	0	28	9	0	5	2	**50**
P03	URL	0	3	0	0	27	0	9	3	**42**
P04	R&S	0	4.5	0	0	6	0	11	2	**23.5**
P05	UniS	0	6	18	14	3	0	0	3	**44**
P06	VITEC	0	5	0	5	0	26	4	4	**44**
P07	RUNCOM	0	6	15	0	0	30	16.5	6	**73.5**
P08	IRT	0	11	4	0	5	0	22	3	**45**
P09	UPM	0	4	7	6	0	10	0	3	**30**
P10	WAVECOM	0	4	9	0	0	5	10	2	**30**
Total		**17**	**54.5**	**64.0**	**70.0**	**57.0**	**76**	**79.5**	**31.0**	**449.0**

Planned Human Resource Allocation

Originally Planned Human Resource Allocation– Reporting Period										
Partner	**Short Name**	**WP0**	**WP1**	**WP2**	**WP3**	**WP4**	**WP5**	**WP6**	**WP7**	**Total**
P01	IT	7.548	4.332	9.664	5.000	4.887	2.000	0.630	0.818	**34.879**
P02	IBBT	0.000	3.000	0.000	21.012	4.200	0.000	0.500	0.300	**29.012**
P03	URL	0.000	3.000	0.000	0.000	21.340	0.000	0.860	0.300	**25.500**
P04	R&S	0.000	3.750	0.000	0.000	4.500	0.000	2.000	0.000	**10.250**
P05	UniS	0.000	6.000	15.000	5.300	0.000	0.000	0.000	0.000	**26.300**
P06	VITEC	0.000	3.992	0.000	4.992	0.000	15.600	1.274	1.000	**26.858**
P07	RUNCOM	0.000	4.992	14.000	0.000	0.000	9.000	4.000	1.569	**33.561**
P08	IRT	0.000	9.667	2.664	0.000	4.636	0.000	2.742	0.300	**20.009**
P09	UPM	0.000	4.000	7.000	2.200	0.000	4.099	0.000	0.200	**17.499**
P10	WAVECOM	0.000	3.660	9.000	0.000	0.000	0.850	0.200	0.000	**13.710**
Total		**7.548**	**46.393**	**57.328**	**38.504**	**39.563**	**31.549**	**12.206**	**4.487**	**237.578**

Cumulative Expenditure of Manpower

Spent Human Resource Allocation – Cumulative										
Partner	**Short Name**	**WP0**	**WP1**	**WP2**	**WP3**	**WP4**	**WP5**	**WP6**	**WP7**	**Total**
P01	IT	7.548	3.813	9.424	4.900	4.344	2.100	0.800	0.800	**33.729**
P02	IBBT	0	2.733	0	9.2	4.233	0	0	0	**16.166**
P03	URL	0	3	0	0	20.10	0	0.82	0.08	**24**
P04	R&S	0	5.25	0	0	4.65	0	1.45	0	**11.35**
P05	UniS	0	5.1	17	5.3	0	0	0	0.2	**27.6**
P06	VITEC	0	4.331	0	3.997	0	12.664	0	0.999	**21.991**
P07	RUNCOM	0	6.750	19	0	0	8.950	4.00	1.870	**40.57**
P08	IRT	0	8.9	0.64	0	4.24	0	3.77	0.22	**17.77**
P09	UPM	0	5	7	2.2	0	4.9	0	0.2	**19.3**
P10	WAVECOM	0	4	7.45	0	0	0.85	0.1	0	**12.4**
Total		**7.548**	**48.877**	**60.514**	**25.597**	**37.567**	**29.464**	**10.94**	**4.369**	**224.876**

1.13.1 Deviations from Person-Month Budget

The total planned PM was 240.655 PM and the actual spent was 222.676 PM. The deviation is less than 10%. Furthermore, see also IBBT/WP3 deviation below.

WP0
This WP presents no major deviations.

WP1
This WP presents no major deviations.

WP2
This WP presents no major deviations in the total figures. However, IRT spent 0.64 PM in WP2 instead of planned 2.67 PM (linear assumption). The deviation of 2 PM is due to internal planning, as link budget calculations /bandwidth coverage calculations, as well as a written contribution to Deliverable D2.5 are planned to be performed in May 2007 [Activity 2.5 is still ongoing and will finish end of July 2007 (M18)]. This plan change is aligned with the 3rd Quarterly Month Report which states:

> IRT requested to move all PM from activities A2.2 and A2.3 to A2.5. Based on the reasons presented by IRT, the WP2 Leader, the Project Coordinator and the PB approved this change.

RUNCOM has spent more than planned due to their strong involvement in radio channel and links characterization. As the transceivers are manufactured by RUNCOM, their involvement (19 PM) was slight higher than planned (14 PM).

WP3
This WP presents a deviation. It has been spent 2/3 of the total planned PM. The main reason is an extension of Activities 3.1 and 4.2 until M18 requested to the Project Board by IBBT in consequence of the delay in MDC architecture definition for SUIT. We should point out that SVC standardization in MPEG has been suffering some delay. In A3.1, IBBT will refine and prepare MDC-2 (Multiple Description Coding, solution 2) to be inserted into the demonstrator. In A4.2, IBBT needs to invest more time in evaluating the best way of extracting SNR (Signal-to-Noise Ratio)

figures from the CPE (receivers) and its mapping into MPEG-21 terminal descriptors. Furthermore, we need to invest some effort in the implementation and preliminary testing of MDC-2 in the demonstrator.

WP4
This WP presents no major deviations.

WP5
This WP presents a very small deviation. VITEC started the project one month later. During Dec 2005 and Jan 2006, Vitec did not receive e-mails from the Coordinator. Some problems with Vitec+IT e-mail server.

WP6
This WP presents no major deviations.

WP7
This WP presents no major deviations.

1.13.2 Deviations from Cost Budget

IT
IT cost budget presents no major deviations.

IBBT
IBBT actual costs present a deviation. The budget item mainly responsible for the deviation was the human resources. IBBT spent less than planned. See the reasons in Section 1.13.1. It is expectable a peak of personnel costs in the first semester of the second period.

URL
URL actual costs present a deviation. The budget item responsible for the large deviation was the Labour costs. The cost/person month is 40% lower than originally planned. The lower person-month cost may allow URL to provide extra person-months during the second year that will be used for completing developments in WP4.

R&S
R&S cost budget presents no major deviations.

UniS
UniS actual costs present a deviation. The actual personnel costs depend on who is working on the project at the time. At the beginning of the project, UniS could not get enough research fellows to do the work, so UniS paid PhD students instead. Obviously, PhD student cost less than research fellow. UniS now have research fellows, so the cost will actually be slightly higher in the second half of the project.

Vitec
Vitec cost budget presents no major deviations.

RUNCOM
RUNCOM cost budget presents no major deviations.

IRT
IRT cost budget presents no major deviations. IRT leads WP6 where most of the PM was planned for the second period.

UPM

UPM cost budget presents no major deviations in the total costs.

Wavecom

Wavecom cost budget presents no major deviations.