D7.6 Dissemination of the Results

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Executive Summary

This deliverable *D7.6 Dissemination of the Results* describes the scientific dissemination activities and the promotion and communication activities that have been carried out by the MODUM partners during the duration of the project (1.10.2011 – 31.12.2014).

This document was compiled using information provided by all MODUM partners. It is an update of the “Dissemination Report III”, which covered the dissemination activities of the MODUM consortium until project month 33.

1 Introduction

Scope and purpose of this document

The purpose of this document is to provide an overview of the scientific dissemination as well as promotion and communication activities performed in the European project MODUM (1.10.2011 - 31.12.2014).

Note:
For more information regarding the dissemination and promotion materials produced in the MODUM project, please refer to deliverable *D7.8 Final Dissemination and Exploitations Report*. For a more detailed description of the project’s website, please refer to the deliverable *D7.4 Web Portal*, and for more information regarding the MODUM Conference, please refer to deliverable *D7.9 MODUM Final Conference*.

Document status and target audience

This document is a public deliverable, aiming to inform interested people about the dissemination and communication activities of the MODUM project.

Document structure

This document is structured into the following sections:

Section 1 provides an introduction for this document including a general overview of the project and outlines the purpose, scope, context, status, and target audience of this deliverable.

Section 2 is the main part of this document and describes the dissemination, communication and promotion actions carried out by the partners within the MODUM project.
Section 3 provides a concise summary of the dissemination, communication and promotion activities performed, and gives a brief outlook to planned dissemination activities after the end of the project.

2 Dissemination and communication activities

In order to spread the information about the approach, the progress, the achievements and the results of the MODUM project among interested stakeholders, the consortium partners have established media relations and submitted articles to technical journeys and newspapers. In addition the partners have presented MODUM at national and international events, distributed MODUM promotion material, and included MODUM information in their organisations’ communication channels such as company websites and newsletters. Furthermore, MODUM partners published also scientific papers and presented their MODUM related research work to the scientific community at conferences, seminars and workshops.

In the following chapters the media relations, the scientific publications and presentations, the dissemination actions at events, and other dissemination and communication activities of the partners are described in more detail.

2.1 Media relations

Throughout the course of the project, MODUM partners have initiated / published four MODUM-related articles in technical journals, magazines, and newspapers:

- “A clean break”, journal “Traffic Technology International”, 01/2012; article written by Evtim Peytchev (NTU)
- “To Crack a Nut”, magazine “Thinking Highways”, 08/2014, article written by Dave Marples (Technolution)
- “MODUM: Proefproject dynamische en groene route-planning”, “NM magazine”, 01/2015, article written by Sven Maerivoet (TML)
“A clean break” – that’s the title of an article published in the January 2012 issue of the “Traffic Technology International” journal (www.TrafficTechnologyToday.com), in which Evtim Peytchev from MODUM partner NTU wrote about the MODUM project and its envisaged results.

“Systems for traffic management in Sofia - from theory to practice” – this 3 pages article in the Bulgarian newspaper “Capital” from 11.4.2013 describes the planned activities for enhancing traffic management in Sofia, where MODUM implementation in Sofia is integrated in these activities. This article was initiated by MODUM partner SUMC.

Link to the article:
http://www.capital.bg/politika_i_ikonomika/bulgaria/2013/04/11/2040125_za_izbor_na_marshrut_natisnete_1
Dave Marples from MODUM partner Technolution wrote a MODUM related article for the “Thinking Highways” magazine (thinkinghighways.com). This article was published in the August 2014 edition of “Thinking Highways”.

In December 2014 Sven Maerivoet from TML has submitted an article titled “MODUM: Proefproject dynamische en groene route-planning” to the Dutch “NM Magazine”¹ This article describes how MODUM’s dynamic and green form of route planning works, and what has been accomplished within the project. The article will be published in the forthcoming issue of the magazine.

¹ NM stands for Network Management;
In addition to these articles, partners published also MODUM-related press releases:

- MODUM partner SUMC issued a press release about MODUM in Bulgarian and English language in August 2012. The press release is available at www.sofiatraffic.bg
- UNIMAN included MODUM information in a press release published at the Manchester Business School, and has added a link to the MODUM website in an internal press release.
  http://www.mbs.ac.uk/about-mbs/news/view/?guid=77224023-2860-4d2f-9bae-34666ffc0d64

2.2 Scientific publications and presentations

The publication of articles in scientific/technical journals and the presentation of MODUM related research findings at scientific conferences help to reach a wide range of scientists. Thus getting a paper published in an international journal or in conference proceedings supports the objective of promoting the project and its results to the international scientific community. In addition, conferences provide also an opportunity to discuss the findings and results with scientists from different research areas and to establish contacts to other projects.

Within the runtime of the MODUM project, five scientific articles have been published by the project partners:

Traffic Radar: A holonic traffic coordination system using PROSA++ and D-MAS

Reference:
Johan Philips, Bart Saint Germain, Jan Van Belle and Paul Valckenaers, Department of Mechanical Engineering, KU Leuven, article published in full in Industrial Applications of Holonic and Multi-Agent Systems Series: Lecture Notes in Computer Science, Vol. 8062 Subseries: Lecture Notes in Artificial Intelligence

Abstract:
The Paper presents Traffic Radar, a holonic traffic coordination system focusing on the distributed and dynamic nature of traffic systems. Two main architectural assets enable distributed real-time coordination, the holonic PROSA++ architecture and the delegate multi-agent system (D-MAS) pattern. Well proven and accurate first-order traffic models are used to model local traffic behaviour. Link and node holons encapsulate local traffic models and offer services to other holons and D-MAS ants in the environment. Early experiments with the Traffic Radar platform show its ability to forecast traffic flows and densities based on individual user intentions. Moreover, they show the ability to explore different routing solutions incorporating traffic density forecasts.
A Multi-Agent System for Modelling Urban Transport Infrastructure Using Intelligent Traffic Forecasts.

Reference:
Abdallah Namoun, César Marín, Bart Saint Germain, Nikolay Mehandjiev, Johan Philips, Manchester Business School, University of Manchester & Department of Mechanical Engineering, KU Leuven, article published in full in Industrial Applications of Holonic and Multi-Agent Systems Series: Lecture Notes in Computer Science, Vol. 8062 Subseries: Lecture Notes in Artificial Intelligence

Abstract:
This paper describes an integrated approach for modelling transport infrastructure and optimising transport in urban areas. It combines the benefits of a multi-agent system, real-time traffic information, and traffic forecasts to reduce carbon-dioxide emissions and offer flexible intermodal commuting solutions. In this distributed approach, segments of different modes of transport (e.g. roads, bus/tram routes, bicycle routes, pedestrian paths) are simulated by intelligent transport agents to create a rich multi-layer transport network. Moreover, a user agent enables direct interaction between commuters’ mobile devices and the multi-agent system to submit journey requests. The approach capitalises on real-time traffic updates and historical travel patterns, such as CO2 emissions, vehicles’ average speed, and traffic flow, detected from various traffic data sources, and future forecasts of commuting behaviour delivered via traffic radar to calculate intermodal route solutions whilst considering commuter preferences.

The Impact of a Mobile Information System on Changing Travel Behaviour and Improving Travel Experience

Reference:

Abstract:
Our cities are struggling. Increasing growth in urban cohabitation has strained cities’ systems and infrastructural capacity, especially in regards to the transport domain. This paper investigates the impact which mobile information systems can have on travelling behaviour. In our investigation we employ Occy, a simple web-based mobile application which provides bus timetable information to commuters. In this study, we studied the adoption, usefulness and impact of Occy on users’ commuting behaviour over a three week period through a diary study which included 25 participants on one of the busiest bus corridors in the UK. This was consolidated by a separate focus group, which included 8 participants, to shed light
on participants' acceptance of Occy as an intervention for altering their travel behaviour and improving travel experience. The results show that transport information delivered through Occy did influence the behaviour of travellers, who started trusting the system and used it to target specific busses and thus reduce their bus waiting times. The follow-up discussions identified the features of flexibility and trust as crucial to the successful adoption of such mobile applications.

**Models for optimising dynamic urban mobility (MODUM)**

Reference:

Abstract:
MODUM (Models for Optimising Dynamic Urban Mobility) is a European Commission 7th Framework (FP7) project that aims to develop a new optimisation approach to traffic management, capable of dynamically adapting the overall flows of traffic to unexpected disturbances to minimise carbon emissions within an urban complex environment. In MODUM we developed a traffic flow self-organising mechanism based on ant-like agent technology, as well as a “reverse” route planning based on software agent technology (using real-time data and declared destinations). The system synthesises both approaches into a single integrated model, incorporating the many telecommunication challenges of a realistic demonstrator. As there are many components in the system, we also provide an evaluation and validation framework that asserts that the software is of high quality, the traffic models are verified to reproduce realistic phenomena, and the definition of parameters and indicators for setting up and carrying out field trials. These take place in the cities of Nottingham (United Kingdom) and Sofia (Bulgaria). There, a series of simulation experiments of realistic complexity are constructed using historical and real-time data feeds available from existing transport sensing infrastructure.

**Carbon Efficient Transport Management Using Multi-agent System**

Reference:

Abstract:
This paper presents a carbon efficient transport management system that uses agent-based technology to simulate the existing transport infrastructure of a city. By utilizing real-time information about the current use of transport infrastructure from different data sources (e.g.
road-side sensors) the system is capable of providing guidance to everyday commuters. The guidance is primarily in the form of multi-mode route suggestions with the aim of reducing overall carbon-dioxide emissions. This paper describes the architecture of the transport management system along with the design of multi-agent system. The initial results of the simulations validate the feasibility of the multi-agent system in providing carbon-efficient transport management for an urban city.

2.3 Dissemination at Events

Project partners presented the project and its results at 11 events, which represented an excellent opportunity for MODUM dissemination and know-how transfer. The conference audiences addressed by these presentations and networking activities were either the main target groups such as city representatives, consultants, traffic & transport planners, the scientific community interested in MODUM related research areas, or professionals with interest in the project’s main topic.

MODUM Presentation at Manchester Business School
Nikolay Mehandjievi and Abdallah Namoun presented the work undertaken in MODUM, during a poster session to the dean of the humanities faculty and the various division groups of the Manchester Business School, within the University of Manchester, Manchester, UK, 29, May, 2013.

MODUM Presentation at ARTS workshop in Dublin
Kathy Keeling, from the University of Manchester, participated and presented MODUM in ARTS workshop, Towards Autonomous Road Transport Support Systems, Trinity College Dublin, 4-5 June, 2013.

MODUM presentations at ITS Dublin 2013
A general presentation about the MODUM project (title: MODUM – Models for optimising dynamic urban mobility) was given by Sven Maerivoet, TML, at the 9th ITS European Congress in Dublin, Ireland on June 5th 2013. In the presentation, the goal and setup of the MODUM project were explained in an accessible way to the audience. The focus was on a high-level, i.e., what is the MODUM system about and how can anyone use it (be it traffic controllers or travellers as end-users). The audience (16 people + 5 speakers) consisted of researchers, consultants, policy makers, and producers of ITS technology. The questions were insightful, as they dealt with the complexity of the MODUM system and the link with traffic control models.
Another MODUM related presentation (title: MODUM – Pro-active demand-responsive traffic management delivered to individuals) was given by William Meijer, Technolution, at the 9th ITS European Congress, Dublin, Ireland on June 6th 2013.

Link to the event: http://www.itsineurope.com/its9/

**MODUM Presentation at Erlang User Conference 2013**

A MODUM related presentation (title: Making our Traffic Jams Disappear) has been given by Paul Valckenaers from KU Leuven at the Erlang User Conference in Stockholm, Sweden, on June 13th 2013.

**MODUM Presentation at MobiWIS 2013**

Nikolay Mehandjiev, from the University of Manchester, presented a conference paper about its work undertaken in MODUM at MobiWIS2013 conference, Paphos, Cyprus, 26-28th August, 2013. The research carried out by UNIMAN investigated the effect of bus timetable data, provided using a mobile device, on overall travel behaviour. The presentation received positive feedback from a myriad of researchers interested in mobile web information systems.

**MODUM Presentations at HoloMAS 2013**

Two MODUM related papers describing the two technological systems (models) of MODUM were presented by Johan Philips in a joint presentation, given at the 6th International Conference on Industrial Applications of Holonic and Multi-Agent Systems in Prague, on August 28th 2013 by KU Leuven and University of Manchester:

The title of the presentation was “MAS in Transportation Systems” and received positive feedback from the HoloMAS audience, which is a mix of industrial professionals and researchers in Multi Agent Systems for Industrial Applications.

**MODUM Presentation at Innovations in Transport 2013**

The University of Manchester organised the event “Innovations in Transport” in partnership with the Manchester Chamber of commerce and Institute of Engineers on the 31st of October 2013. The day included a transportation workshop session followed by a showcase exhibition, at which MODUM was a key presenter. An expert panel from industry and political fields debated regional and national transport issues to close the evening. There were approximately 60 attendees throughout the event. The session was promoted through a campus poster campaign, university newsletter and social media communications and publicity was supported through the Manchester Science Festival, with which the event was associated.
Sven Maerivoet, from TML, presented a conference paper titled “Models for optimising dynamic urban mobility (MODUM)” and a poster about MODUM at the TRA 2014 in Paris, France, on 14th of April 2014.

MODUM Presentation at the MODUM Conference “Building the Bridge from Research to Sustainable Urban Transport Management”

On 24th of September 2014 the consortium organised a conference in Nottingham (UK), where the project’s approach and products were presented to interested participants (mainly from the UK). More details regarding this conference can be found in the deliverable D7.9 MODUM Conference Report.
MODUM Presentation at WETICE 2014 conference

A MODUM related research paper “Carbon Efficient Transport Management Using Multi-Agent Systems” was presented by Abdallah Namoun from MODUM partner University of Manchester at the 12th Adaptive Computing (and Agents) for Enhanced Collaboration (ACEC) Conference Track @ IEEE WETICE 2014 conference, which took place in Parma, Italy, 23-25 June 2014.

2.4 Other dissemination and communication activities of the partners

Besides publishing articles and papers and giving presentations at well-known events, MODUM partners have also utilised more informal dissemination channels such as personal talks, distribution of MODUM promotion materials, inclusion of MODUM information in the partner organisations’ communication channels (e.g., company newsletters and websites), and spreading the knowledge of MODUM in the personal networks of the partners:

- TML has put a link on their company website to the MODUM website; http://www.tmleuven.be/project/modum/home.htm
- TML was involved in several consortia submitting proposals to the recently open H2020 call and informed the other participating partners about MODUM.
- TML informed partners, with whom TML cooperates in other European projects and proposals, about MODUM.
- FGM-AMOR has put a link to the MODUM website on their company website; http://fgm.at/index.php?id=2340&ID1=2142&stat=0&projekt_id=64#M
- FGM-AMOR informed all staff of the company about MODUM via an internal project presentation, so that they can spread the word and promote MODUM among the partners of other consortia they are working with.
- FGM-AMOR has published an article about MODUM on the company’s website; http://www.fgm.at/index.php?ID1=2137&id=2137
- FGM-AMOR informed its contacts at the European cities’ associations and networks POLIS, EUROCITIES, CIVINET, and Cities For Mobility about MODUM and especially those aspects and products of MODUM that are interesting for city councils.
- UNIMAN presented the MODUM project to the dean of the faculty and internal staff at Manchester Business School to promote the research ideas of MODUM and to foster internal collaboration.
- UNIMAN included MODUM information in a press release published at the Manchester Business School, and has added a link to the MODUM website in an internal press release. http://www.mbs.ac.uk/about-mbs/news/view/?guid=77224023-2860-4d2f-9b9e-34666f00d64
- Technolution promoted MODUM at the Intertraffic 2014, the International trade fair for infrastructure, ITS traffic management, safety and parking. This event, which took place...
in Amsterdam in March 2014, is one of the biggest traffic and transport events in the
world, with ten halls at the RAI filled with all aspects of transport management activities.

- Technolution had several speaking roles at the ITS European Congress 2014, and
  promoted the use of the MODUM platform for mediated access to traffic control systems
  among the participants of this large event, which took place in Helsinki in June 2014.

- Technolution has integrated the concepts from MODUM into its own commercial product
  offer. MODUM concepts are now embedded in MobiMaestro, which is increasingly
  finding application in ‘personal mobility’ rather than ‘vehicle centric’ environments. This
  work will also continue after the end of the project since this is Technolution’s core
  business and the organisation, as a commercial organisation, is much more focussed on
  exploitation rather than just dissemination.

- KUL promoted MODUM during the networking events and workshops at the 2014 IEEE
  International Conference on Robotics and Automation, which took place in Hongkong in
  June 2014 and which had around 2000 attendees.

- KUL promoted MODUM at the euRobotics Forum, a networking event with about 400
  participants from industry and academia, which took place in Rovereto, Italy, in March
  2014.

- KUL also promoted MODUM during the Robotics Science and Systems conference in
  Berkeley, CA. This conference took place in July 2014 and had almost 1000 attendees.

- SUMC regularly informed the city council of Sofia in detail about MODUM during
  personal meetings

- SUMC put information about MODUM on the company’s website, and promoted
  MODUM also via SUMC’s Facebook account.

- MUSAT has published an article about MODUM on the company’s website
  musat-bg.com:
Promotion of MODUM in the trial sites Sofia (BG) and Nottingham (UK)

Flyers to promote MODUM were placed in the public transport ticket vending places in Sofia.

Figure 2: Promotional flyers for the MODUM implementation in Sofia

On the carfree day 2014 SUMC promoted MODUM by distributing promotion flyers in Bulgarian language at a dedicated stand in the city of Sofia to passersby.

Figure 3: Promotion of MODUM at the carfree day in Sofia (BG)
Representatives of the MODUM partners SUMC and UNIMAN achieved an agreement with VIVACOM, a big Bulgarian telecommunications company: VIVACOM agreed to help with the promotion of the MODUM app in Sofia:
- VIVACOM made the Bulgarian version of the MODUM app available in their app store
- In September 2014 VIVACOM printed 3000 brochures and distributed them in their offices in the trial area in Sofia
- In October 2014 VIVACOM made three SMS campaigns to its users travelling in the trial area in Sofia
- In November 2014 VIVACOM made two more SMS campaigns (to approximately 10-15 thousand people each).

NCC presented the MODUM trial and promoted the use of the MODUM application at the conference in Nottingham to commuters travelling to and from work and to other interested groups such as Public transport, Municipalities and City Councils.

Figure 4: NCC promoted the MODUM trial at the conference in Nottingham, and via distribution of English folders describing the MODUM trials.

The promotion of the MODUM trial in Nottingham was targeted towards habitual users, commuters, and people with “repetitive” behaviour. In order to reach these people, MODUM information was placed at parking lots, at YouTube, Facebook, and Twitter, and was communicated to employees of the municipal transport organisations.
2.5 Cooperation with other relevant initiatives

In addition to the dissemination and communication activities mentioned in the previous chapters, MODUM strived to exploit the participation of the consortium or its single members in EU networks and communities in order to utilise synergies with other initiatives, projects and clusters.

Projects and initiatives to which MODUM partners have established contacts:

- SIMPLI-CITY (FP7): FGM-AMOR, who is partner in MODUM and in SIMPLI-CITY, informs the consortia of both projects mutually about the work and findings of the projects, and seeks for possibilities of joint dissemination activities and synergies.

- ECOSTAND: TML, who is partner in MODUM and in ECOSTAND, informs the consortium about interesting findings and results. ECOSTAND’s cooperation with MODUM is specifically based on the field trial going on in Sofia, Bulgaria.

- M2MGrids: Technolution, who is a partner in the IMAGINET consortium, has utilised an adaption of the MODUM approach for a next-generation electricity system project (M2M grids).

- HoPE: TML works together with other private companies, research organisations, national authorities, and city councils in the European project HoPE (which started in April 2014), and within HoPE the consortium will actively use the MODUM system.

- AMITRAN, SUPERHUB, MOBIS, MOBINET, TEAM, Eco-Driver, e-COMPASS, COLOMBO, REDUCTION, PEACOX, ICT-EMISSIONS, GETSERVICE, DECOMOBIL, CARBOTRAF, SIMPLI-CITY: The MODUM coordinator TML established contacts to all these projects at the EC FP7 ICT Call 7&8 Concertation Workshop, which took place in Brussels on 30.4.2014. The participants of this workshop informed each other about the work and results of the projects, and discussed cooperation possibilities and synergies.
**Cooperation with the Bulgarian telecommunication service provider VIVACOM:**

As already mentioned, the MODUM partners SUMC and UNIMAN have had several meetings with the big Bulgarian mobile phone service provider VIVACOM, and have achieved a cooperation agreement with VIVACOM: VIVACOM agreed to publish and promote the Bulgarian version of the MODUM app in the VIVACOM app store during the trial period.

However, the cooperation with VIVACOM didn’t stop after the end of the MODUM trials. At their meeting with VIVACOM on 29th of December 2014 SUMC and UNIMAN discussed possibilities of how to provide the app in a final version, with a map covering the whole city and the possibility to choose different points of traveling, in order to make it really useful for the people in Sofia. VIVACOM expressed their interest to include such an enhanced MODUM app in their VIVAApps store. Also after the end of the project, the MODUM partners will stay in contact with VIVACOM and will further discuss with them the commercial and technical aspects and details of such a take-up of the MODUM app by VIVACOM.

*Figure 5: Screenshot of the Bulgarian MODUM App*
3 Summary and Outlook

As described in more detail in the previous chapters, MODUM partners have made a range of outreach activities in order to spread the knowledge and the results of the MODUM project to the main target groups, which comprise city councils, traffic and transport planners, the scientific community, consultants active in the field of sustainable urban transport, and professionals interested in the project’s topics.

Besides utilising more “informal” channels such as personal talks, and distribution of information materials, the partners have also made use of piggyback-style dissemination activities, such as inclusion of MODUM information in the company newsletter or the organisations website. In addition the MODUM partners have informed relevant stakeholders about their work in MODUM and about the approach and results of the project also by MODUM related presentations at well-known events and by publishing MODUM related articles and scientific papers.

During the project duration (1.10.2011 – 31.12.2014)

- 5 MODUM related scientific papers have been published
- 12 MODUM related presentations have been given
- 4 MODUM related articles have been published in newspapers and technical journals

**Dissemination activities planned by the partners**

The MODUM project has ended by 31.12.2014, but partners have already planned further dissemination and outreach activities, which will take place only after the end of the MODUM project:

- UNIMAN plans to publish a MODUM related article in a journal of Multi Agents System/Scalable Computing in early 2015.
- UNIMAN plans to publish a MODUM related article in a journal of Intelligent Transportation System in 2015.
- TML will publish an article on MODUM in the first 2015 issue of the company’s newsletter