IoT@Work
WP 5 – EXPLOITATION AND DISSEMINATION
D5.1 – Intermediate dissemination and clustering report 1

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Executive summary

The deliverable D5.1 reports on all exploitation and dissemination activities that took place during the first part of the project. During this period the IoT@Work website has been created, with information regarding the project objectives, vision, progress, important events and all achievements. The final deliverables, as well as some of the scientific publications, can be downloaded from the site. Right at the beginning of the project the consortium started to contact interested stakeholders on a bilateral basis. As a next step a stakeholder group was formed out of these contacts to widen the promotional opportunities and at the same time gather valuable feedback from the potential end users. Several third parties from academia and industry have already joined the stakeholder group and expressed their interest to the project results. The current members are summarized with a short description of their expertise in this document.

At present, due to the research-oriented nature of current achievements, all IoT@Work partners have mostly focused to disseminating the innovative concept of the project internally and in other R&D groups, such as in conferences, workshops, and cluster meetings.
Document History

Version History

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1 Introduction

This WP deals with the planning, design, and implementation of the dissemination and exploitation policies in the project. This deliverable presents the early dissemination strategy of the IoT@Work project. It is a fundamental principle of R&D projects that almost all findings and achievements of the project are made available to the public. Besides the normal scientific dissemination (participating in conferences, publishing papers, etc.), additional efforts were undertaken to implement special dissemination activities to also attract an audience from the industrial community.

The intention behind this is, on the one hand to increase the transfer of research results to the EU industry, and on the other hand to gain valuable feedback about market opportunities and technical details. To accomplish this, right at the beginning of the project, contacts to potential stakeholders have been established on a bilateral basis. Most of the members that have agreed to join are industry oriented. Some more details about the IoT@Work stakeholder group are provided in Section 2.1.

Additionally, to keep the IoT@Work stakeholder group informed and engage them further, the IoT@Work consortium will issue a periodic newsletter presenting the project achievements during the corresponding period. The planned content of the first newsletter is summarized in Section 2.5.

In order to ensure impact on the scientific community, the academic partners of the IoT@Work consortium aim to publish research papers in national and international conferences as well as in well-known scientific journals from their activities in this project. The leading conferences in the interest area of the project have been recognized right at the start of the project, which are ETFA, WFCS, INDIN, and KommA. Possible journals would be Transactions on Industrial Informatics (TII) and Transactions on Industrial Electronics (TIE). The current list of publications is provided in Section 2.2.

Finally, in order to introduce the project even more widely, to non-technical audiences, the IoT@Work website has been developed and launched. It is briefly described in Section 2.3. The website provides a brief introduction to the project, offers information about the consortium and allows downloading the existing deliverables and publications. Besides the website, several non-technical dissemination materials that display the project concept have been produced in the form of a project leaflet and various press releases. These activities are highlighted in Section 2.4 and Section 2.6 respectively. The rest of the dissemination activities are described in Section 2.7.
2 Dissemination

Besides some initial scientific publications, the dissemination activities in the first year of the project were focussed on establishing contacts to interested stakeholders of our project.

2.1 Stakeholder group

Establishing a stakeholder group is considered to be a very important activity in the first half of the project. Additional to other dissemination actions during this period the consortium members contacted potential stakeholder group members on a bilateral basis. The stakeholder group has been established to gain additional feedback and input from experts about end-user expectations in order to keep the project in-line with the needs of tomorrow’s factories.

The establishment of the stakeholder group was done in the following ways:

- Existing contacts and networks have been used at the initial phase. Every discussion, feedback, etc. regarding the project was based on bilateral contacts.
- At the next phase the established, bilateral contacts were officially invited to join the IoT@Work stakeholder group.
- Participation in the upcoming kick-off workshop for the stakeholder group which will take place in January at the CRF premises.

Currently, the stakeholder group consists of the members listed in Table 2.1.

<table>
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<tr>
<th>Company</th>
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<tr>
<td>AAS</td>
<td>Thilo Sauter</td>
<td><a href="mailto:thilo.sauter@oeaw.ac.at">thilo.sauter@oeaw.ac.at</a></td>
<td>Research</td>
<td>Integrated Sensor Systems</td>
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<td>ICM electronics</td>
<td>Nenad Micic</td>
<td><a href="mailto:nenad.micic@icm.rs">nenad.micic@icm.rs</a></td>
<td>Industry</td>
<td>System integrator (Robotics)</td>
<td>Serbia</td>
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<tr>
<td>Phoenix Contact</td>
<td>Dr. Frank Pössel-Doelken</td>
<td><a href="mailto:ppossel-doelken@phoenixcontact.com">ppossel-doelken@phoenixcontact.com</a></td>
<td>Industry</td>
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<tr>
<td>KW Software</td>
<td>Peter Fuchs</td>
<td><a href="mailto:pfuchs@kw-software.com">pfuchs@kw-software.com</a></td>
<td>Industry</td>
<td>Head of PROFINET business area</td>
<td>Germany</td>
</tr>
<tr>
<td>Fraunhofer IPA</td>
<td>Dr. Carmen Constantinescu</td>
<td><a href="mailto:clic@iff.uni-stuttgart.de">clic@iff.uni-stuttgart.de</a></td>
<td>Research</td>
<td>ActionPlant expert</td>
<td>Germany</td>
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<tr>
<td>Centimfe</td>
<td>Nuno Fidelis</td>
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<tr>
<td>TECOS</td>
<td>Dr. Samo Gazvoda</td>
<td><a href="mailto:Samo.Gazvoda@tecos.si">Samo.Gazvoda@tecos.si</a></td>
<td>Industry</td>
<td>Technology Centre</td>
<td>Slovenia</td>
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The remainder of this section provides a short description of the represented organisations/companies/institutes represented in the IoT@Work stakeholder group.

### 2.1.1 Institute for integrated sensor systems - AAS (Austria)

The 2004 founded research institute follows an interdisciplinary and integrative approach to the research and development of modern, integrated sensor systems. Integration in this context comprises functional, systemic, and circuit design aspects. The institute combines three research teams with long-lasting experience in the areas of sensor technology, ASIC design, and communication technology. The focus of the research is on biomedical, environmental, and automotive sensors, integrated scalable controllers and advanced signal processing techniques for limited computing resources, and networking issues for sensors, including real-time and wireless aspects. In the area of sensor networks, particular emphasis is on security problems in large-scale ad-hoc networks with limited communication bandwidth and resource-limited nodes. Another important topic is high-accuracy clock synchronization in distributed systems. The institute for integrated sensor systems can be categorized within the stakeholder group as an academic organization.

### 2.1.2 ICM electronics (Serbia)

ICM electronics is the leader in automation and industrial robotics in the territory of the former Yugoslavia as well as the Middle East and former Soviet Union and Africa. ICM Electronics integrates industrial robots for various applications such as packaging, palletizing, welding and polishing. In the area of automation ICM does PLC programming, control cabinet assembly, SCADA systems and visualisation of processes. ICM offers complete hardware and software solutions for automation and robotics applications. ICM has a factory site for product development, equipped with industrial robots and flexible conveyor belt systems. In process automation ICM is well established as a leader for food processing automation. The role of ICM within the stakeholder group can be categorized as a solution integrator.
2.1.3 Phoenix Contact (Germany)

Phoenix Contact develops and manufactures industrial electrical and electronic technology products that power, protect, connect and automate systems and equipment. The innovative products and system solutions of Phoenix Contact are found in a huge variety of industrial applications, including:

- Automotive
- Water/wastewater
- Machine building
- Power generation
- Oil and gas

Phoenix Contact has six major product lines, featuring more than 25000 different products, and every year it introduces approximately 20 to 25 product innovations. Phoenix Contact has currently 11000 employees worldwide. In the stakeholder group we will have a representative of the Phoenix Contact business unit manufacturing solutions. Thus, we can refer to Phoenix Contact being in the role of an end user.

2.1.4 KW Software (Germany)

KW-Software is an internationally leading software manufacturer of IEC 61131, SAFETY and PROFINET technologies as well as a provider for solutions and technologies in the field of industrial control and safety technology. Available products of KW Software are the Multiprog PLC programming software and the PLC runtime system ProConOS. Many innovative and worldwide leading manufacturers of automation components in Europe, Asia and the USA count on software solutions by KW-Software. Among KW Software customers are machine and system manufacturers with their own control engineering, system integrators with or without control engineering and of course suppliers with a complete range for automation engineering. KW-Software can be categorized within the stakeholder group as a solution provider.

2.1.5 Fraunhofer IPA (Germany)

The Fraunhofer IPA was founded in 1959 and incorporated in the Fraunhofer-Gesellschaft in 1971. Of the 57 institutes that make up this prestigious research organization, the Fraunhofer IPA is one of the largest single institutes, employing around 200 scientists. It has an annual budget of approximately 36 million euros, with 50 percent of its revenue stemming from industrial projects. Finding solutions to organizational and technological challenges, particularly within the production environment of industrial enterprises, is the key focus of the research and development work carried out at the Fraunhofer Institute for Manufacturing Engineering and Automation IPA. The research group »Digital Factory« focuses on research, development and applying the methods, instruments and tools for modeling, simulation, visualization and optimization of products, factories, manufacturing resources and processes. The »Grid Engineering for Manufacturing Lab – GEMLab« is the state-of-the-art IT environment for integration and distribution of data, models, engineering tools, simulation applications and computing resources based on Grid Technologies. Fraunhofer IPA can be categorized as a research organization.

2.1.6 Centimfe (Portugal)

Founded in 1991, CENTIMFE – Technological Center for the Mouldmaking, Special Tooling and Plastic Industries – is a solution provider and technological counterpart
in the development of industrial and pre-competitive projects. CENTIMFE, as a pro-
active and dynamic interface organization, acts as:

- an important link towards Industrial Innovation;
- a key-partner in the development of structural and strategic projects for the
  Moulds, Special Tools and Plastic Sectors;
- an important node in the technology transfer between R&D and Scientific
  Institutions and Industrial Companies.

Through a consistent activity of applied research, experimental development,
technology intelligence and networking, CENTIMFE is endowed with intervention
capacities in cutting edge fields such as Rapid Prototyping and Rapid Tooling, High
Speed Machining, Surface Finishing, IT & Collaborative Work or Injection Moulds
Optimisation. Nowadays it gathers more than 200 associated organisations, comprising industrial
companies and public institutions such as IAPMEI (the SME and Investment Support
Institute), INETI (the Portuguese Industrial Technology and Engineering Institute),
IPQ (the Portuguese Institute for Quality) and the Town Councils of Marinha Grande
and Batalha, as well as sector-oriented private organizations such as CEFAMOL
(National Association of the Moulds Industry) and APIP (National Association of the
Plastics Industry). It can be categorized as a solution provider.

2.1.7 TECOS (Slovenia)

TECOS – Slovenian Tool and Die Development Centre – is a technology centre
established in 1994 whose core competence is in the fields of FEM analyses, product
design, toolmaking, optical metrology, reverse engineering and specialised training.
They are able to perform turn-key projects in polymer processing. Through members
of our network they are able to perform larger scale projects in tooling and material
processing branches. TECOS can be categorized as a solution provider.

2.1.8 TTTech Computertechnik AG (Austria)

TTTech Computertechnik AG is an international 200 employee company with
headquarters in Vienna, Austria and other locations in Germany, Italy, Romania, the
United States, Japan, and Korea. Product focus is on solutions for safe and reliable
networks for the transportation and automation industries based on their "Time
Triggered Architecture" approach. TTTech solutions are used, for example, in
applications for the Airbus A380, the Boeing 787 Dreamliner and the next generation
of the Audi A8. The research focus of this company is on distributed, fault-tolerant
hard real-time systems. Some of their research projects can be found on the web
page2 of their favourite partner, the University of Vienna. TTTech can be categorized
as a solution provider.

2.1.9 lesswire AG, IHP (Germany)

lesswire AG is a German company which offers products and solutions for wireless
data transmission and information utilization on mobile devices in "wireless worlds".
lesswire AG is a market pioneer on wireless data transmission combined with
location awareness and the use of mobile terminals in wireless worlds. Examples
include the development of Bluetooth- and WLAN systems and modules.

1 http://www.tttech.com/products/
2 http://www.vmars.tuwien.ac.at/frame-projects.html
lesswire AG was founded in April 1999 as a spin-off company from the Institute for High Performance Microelectronics in Frankfurt(Oder), Germany, a research institute with a focus on wireless communications systems. Reference projects include:

- Volkswagen AG: Bluetooth firewall, Wireless Car-Diagnostic-gateway, Car-2-Car communication - standard
- Hewlett-Packard: Bluetooth/IrDA based location and identification services within the new Daimler Benz museum
- Samsonite: Intelligent Bluetooth luggage module against luggage theft
- Siemens: Car diagnostics via Bluetooth/WLAN
- WAGO: Wireless Realtime IO transmission via Bluetooth

lesswire AG can be categorized as a solution provider.

2.1.10 FGA SpA (Italy)

The FIAT Company (Fabbrica Italiana Automobili Torino) manufactured its first car in 1899 and since then it has produced more than 90 million vehicles. At the present Fiat Group Automobiles distributes its products in more than 90 Countries worldwide and the Company's Brands are: Fiat (cars and light commercial vehicles); Lancia (cars, since 1969); Abarth (cars, since 1971); Alfa Romeo (cars, since 1987). Its global reach has increased as a result of the integration with Chrysler Group, through which its portfolio has recently been expanded to include the Jeep and Chrysler brands, with models produced in North America now being distributed in Europe through the new Lancia-Chrysler and Jeep sales networks, which together count more than 1,000 dealers.

The company's businesses include Vehicles, Spare Parts & Accessories, After Sales Services, Financial Services, Long-Term Rental/Fleet Management. Fiat Group Automobiles can be categorized as an End user.

2.1.11 Iveco SpA (Italy)

As a major player in the global transport world, Iveco is an international leader in the development, manufacture, marketing and servicing of a vast range of light, medium and heavy commercial vehicles. It also manufactures passenger transport vehicles and special vehicles for defence, civil protection and specific missions like fire-fighting. The vehicles adopt the latest engineering technologies, applied to a comprehensive range of engines running on diesel and alternative fuels. These include natural gas (CNG), bio-fuels, hybrid technologies and electric engines. The product range is complemented by a range of financial and after-sales services, and used vehicle activities. Iveco can be categorized as an End user.

2.1.12 Comau SpA (Italy)

Comau is a technology and innovation leader committed to the continuous improvement of products, processes and services, through the production of advanced manufacturing systems. Comau oversees their products from the idea and design phase, through to completion, training and maintenance. These products consistently exceed the needs and expectations of the Comau customers in industry segments such as, automotive, aerospace, heavy industry, military, and recreational. Comau, worldwide leader in the manufacturing of automatic flexible systems, always played the role of protagonist in the evolution of Industrial Robotics. Comau Robotics is one of the worldwide leading manufacturers of high quality industrial robots. Since 1978, Comau Robotics has been engaged in the design of automated integrated solutions, offering its Customers the highest grades of performance and reliability.
The continuous improvement of products, processes and services, through the application of the most advanced innovative technological solutions, allows Comau Robotics to contribute to its Customers’ competitive advantage. Comau Robotics is working alongside the Customer acting as a partner in all phases of technological process, measuring up to the challenge of assuring its future growth and that of its partners. Comau SpA can be categorized as vendor of industrial robots.

2.1.13 DFKI – German research center for artificial intelligence (Germany)

Contacts with DFKI are a result of cooperation with Siemens in the context of DFKI’s SmartFactoryKL initiative. This initiative is a manufacturer-independent demonstration and research platform in which innovative ICT technologies and their use in a realistic industrial production environment are tested and developed. The DFKI has also several contacts to both large industries and also to many small and medium enterprises operating in the field of factory automation. DFKI can be categorized as a research organization.

2.2 Publications

2.2.1 Journal publications


2.2.2 Conference publications


2.3 Project website

The consortium of the IoT@Work project has developed a website presenting the project and project related content like publications, selected reports, member organizations, and the people behind it. The website is hosted under the project name and is reachable with the URL http://www.iot-at-work.eu. The website was hosted during the first year by Siemens and a screenshot of its initial page is shown in Figure 2.1.

With the help of the website analysis tool Google analytics an overview of the page hits can be generated. Main focus is put on the source of visitors and how they reached the website and which content was of interest for the visitors. Current statistics cover the period from November until December. During this period some enhancements of the content lead to increased number of visitors around the update dates. Peaks around the publishing times of deliverables and publications show interest of visitors in project progress and technical details discovered. As well as technical data and descriptions the persons behind the project were in the focus of the visitors. Both topics cover the majority of page hits on the IoT@Work project website.

![Figure 2.1: IoT@Work project website](image)

The average number of pages viewed per visit shows a purposive handling of the website. Typical visitors are heading directly to the documents of interest which is possible by direct navigation on the website. The following three graphs show the location of visitors, the traffic sources and the page views, respectively (cf. Figure 2.2, Figure 2.3, and Figure 2.4).
Figure 2.2: Location of visitors of www.iot-at-work.eu
Figure 2.3: Traffic sources of www.iot-at-work.eu

Figure 2.4: Page views of www.iot-at-work.eu
2.4 Project leaflet

In order to be able to inform a broader audience about our project, the IoT@Work consortium has created a leaflet, which summarizes the main vision of the project, along with its objectives and other important facts and figures about the project. This activity is considered to be very important, especially when exhibiting on trade fairs, conferences, and other similar events. The project leaflet is shown in Figure 2.5.

Figure 2.5: IoT@Work project leaflet
2.5 Project newsletter

In order to inform the IoT@Work stakeholder group and other interested parties, the IoT@Work consortium will start to distribute a newsletter, once every six-months which summarizes the achievements during that period. The content of the first newsletter issue will provide a short introduction of IoT@Work including the vision of the project and the current status of the system architecture. The newsletter will conclude with an interview of one of the consortium members which addresses specific issues related to the project objectives.

2.6 Press review

To further raise project awareness in the broader public, several press releases were issued. In the first year of the project more than 5 press releases were published in different magazines and newspapers (e.g. Lippische Landeszeitung, idw-online, Siemens Pictures of the Future, etc.).

Figure 2.6: Press release “Lippische Landeszeitung”, October 2010 [1]
knowledge generated by such EU projects are more valuable than an injection of capital,” Sebastian claims.

Internet of Things. One such project is the “Internet of Things at Work” (IoT@Work), in which scientists under the direction of Siemens CT study the Internet of the future, which will link machines rather than people. “Our goal is to make communication between industrial machines and Internet technologies more intelligent,” says Project Manager Dr. Amine Houyou. The aim is to make the commissioning and replacement of defective components as simple and fast as exchanging USB sticks in a PC. Assembly lines in the auto industry could then be retrofitted more rapidly, and production networks could respond autonomously to defects and reconfigurations.

This would make production more flexible and allow manufacturers to produce variable small lots for different customers instead of having to rely solely on mass production. At the same time, the Internet of things will help to prepare factories for extreme events in the future. “IT security wasn’t really an issue in the the early days of the Internet,” says Houyou. “But in our project, security solutions are developed in parallel at every step, leading to an overall concept in the end.” For one thing, industrial facilities will be made more secure against hacker and virus attacks.

The European Commission selected only one tenth of all the applications for the IoT project. Because of its technical excellence, Houyou’s concept was among those chosen.

With her Siemens colleagues in mind, Sebastian searches for suitable projects such as IoT, forwards the information to them, and assists them with their applications. The latter can be as long as 80 pages and must include not only objectives, work package descriptions, and process phases, but also a list of possible partners. After a unit has been approved for a project, coalition negotiations are immediately initiated. Each partner is granted rights of use for the results, and patent distribution issues are negotiated in detail.

If negotiations have not concluded after six weeks, the EU can rescind a project’s application. Houyou’s team includes security experts from the European Microsoft Innovation Center and staff from City University London, as well as Italian consulting firm TXT. Also on board are software architecture specialists, Centro Ricerche Fiat (which is demonstrating some of the project results at its facilities), and

Figure 2.7: Press release “Siemens Pictures of the Future”, May 2011 [2]
Figure 2.8: Corporate Technology press release “Siemens Corporate Technology”, September 2011 [3]
### 2.7 Other dissemination activities

A selection of different other dissemination activities during the first 16 months of IoT@Work is given in Table 2.2.

*Table 2.2: Other IoT@Work dissemination activities*

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</tr>
<tr>
<td>Embedded World (Nuremberg)</td>
<td>Siemens</td>
<td>External</td>
<td>Project presentation.</td>
</tr>
<tr>
<td>Presentation of findings to other interested Siemens business units</td>
<td>Siemens</td>
<td>Internal</td>
<td>A multitude of meetings with Siemens Business Units (Siemens Industry, Siemens Cities and Infrastructure, Siemens Corporate Technology) to discuss exploitation strategies of project results.</td>
</tr>
<tr>
<td>Presentation of findings to other interested teams within the company</td>
<td>EMIC</td>
<td>Internal</td>
<td>Meetings and interactions with potentially relevant teams across the company, in order to disseminate project activities, and particularly expose requirements and trends.</td>
</tr>
<tr>
<td>Education and teaching</td>
<td>inIT</td>
<td>Internal</td>
<td>Introducing the IoT@Work concepts and scenarios in the education of M.Sc. and Ph.D. students at the department of electrical engineering and computer sciences of the Ostwestfalen-Lippe University of Applied Sciences in Lemgo.</td>
</tr>
<tr>
<td>Project presentation to visitors</td>
<td>inIT</td>
<td>External</td>
<td>Presentation of the IoT@Work concept in the context of the “Lemgo model factory” to visitors of inIT.</td>
</tr>
<tr>
<td>IoT International Forum, Berlin</td>
<td>TXT</td>
<td>External</td>
<td>Contribution on capability based access control</td>
</tr>
<tr>
<td>Presentation of findings to other interested teams within the company</td>
<td>CRF</td>
<td>Internal</td>
<td>Meetings with potentially relevant and interested teams in different sectors of FIAT group, in order to disseminate project activities and vision, discuss exploitation and share requirements.</td>
</tr>
</tbody>
</table>
2.8 Showcasing and workshop activities

A first IoT@Work internal workshop was organized by inIT at Lemgo, Germany. Altogether three project partners participated. Siemens attended the workshop with five researchers, EMIC with one, and two researchers from inIT were present. The main goal of it was to introduce the Lemgoer Model Factory (LMF) as a possible platform for showing project results in a real manufacturing process. Furthermore, the main engineering concepts of today’s factory automation systems were introduced and practically applied using the LMF.

TXT was actively contributing to showcasing and workshop activities with presentations of the project and its objectives to:

- *European Footwear ETP Meeting* (Barletta – Italy, October 8th 2010),
- *Regione Puglia: Festival dell’Innovazione 2010* (Bari – Italy, December 1st – 3rd 2010),
- Bari University Computer Science Department, seminar to students of the Course “Gestione della Conoscenza d’Impresa” (Bari – Italy, January 20th 2011),
- Politecnico di Bari - Dipartimento di Elettrotecnica ed Elettronica, seminar to students of the Master Degree in Ingegneria Gestionale (Bari – Italy, February 7th 2011).


## 3 Cluster activities

The consortium has been actively participating in cluster activities, especially the IERC and related projects. All relevant events are shown in Table 3.1.

*Table 3.1: IoT@Work cluster activities*

<table>
<thead>
<tr>
<th>Cluster activity and location</th>
<th>Partner</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDRA programming workshop</td>
<td>Siemens</td>
<td>Evaluate the possibilities of using the HYDRA middleware platform.</td>
</tr>
<tr>
<td>ICT conference 2010, Brussels</td>
<td>Siemens</td>
<td>Contacts to other related projects and activities have been maintained and strengthened.</td>
</tr>
<tr>
<td>Future Internet Assemblies, Budapest</td>
<td>Siemens</td>
<td>Contacts to other related projects and activities have been maintained and strengthened.</td>
</tr>
<tr>
<td>Organization of the IERC meeting (activity chains application scenarios and exploitation), Bonn</td>
<td>Siemens</td>
<td>Kicking-off the activities within those activity chains, consolidating their structures and defining their goals.</td>
</tr>
<tr>
<td>IOT-A Stakeholder meeting</td>
<td>Siemens</td>
<td>Some elaborated scenarios and requirements have been provided to IOT-A.</td>
</tr>
<tr>
<td>IOT-A Stakeholder meeting</td>
<td>CRF</td>
<td>Contribution to IOT-A scenario definition.</td>
</tr>
<tr>
<td>Collaboration with IoT-A</td>
<td>Siemens</td>
<td>Coordination and know-how transfer, for instance feedback at several instances to the IOT-A team on the IoT reference model has been provided.</td>
</tr>
<tr>
<td>IERC AC04-AC05 meeting, Brussels</td>
<td>TXT</td>
<td>Presentation of the capability based authorization approach.</td>
</tr>
<tr>
<td>IERC meeting, Budapest</td>
<td>TXT</td>
<td>Presentation of the IoT@Work project.</td>
</tr>
<tr>
<td>Provision of details on the capability based authorization approach to the ETSI TC M2M chairman (Mrs. Marylin Arndt)</td>
<td>TXT</td>
<td>Result of the attendance of the IERC AC04-AC05 meeting.</td>
</tr>
<tr>
<td>The same document has also been provided to the IERC reference people (Mr Ovidiu Vermesan, Mr Peter Friess, and Mr Patrick Guillemin)</td>
<td>TXT</td>
<td></td>
</tr>
<tr>
<td>Future Internet Week – Internet of Things: Workshop (Poznan 27/10/2011)</td>
<td>Siemens-TXT</td>
<td>AC11 session organization.</td>
</tr>
<tr>
<td>Event Description</td>
<td>TXT</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
</tbody>
</table>
4 Exploitation strategy

4.1 Siemens AG (SAG)

Siemens AG provides a broad spectrum of offerings for industry, energy control and building automation where the IoT@Work results can be applied.

Most prominent among these offerings are the PROFINET based products, covering industrial Ethernet, I/O modules and the software needed to program and manage installations of those products.

The PROFINET technology is driven by the European-centred organisation PI (PROFIBUS & PROFINET International), which comprises more than 1400 members worldwide, where Siemens has been heavily engaged from the very beginning. The PI uses the ISO standardization body to recommend a standard and members of the working groups have also been active in several standardization bodies such as IEEE. The IEEE Ethernet and QoS standardization work attempts to influence the QoS extensions to standard Ethernet to include industrial requirements. More concretely, and during the first year, the standardization work on IEEE 802.1aq known as “Audio Video Bridging” have been influenced by results and further investigations in IoT@Work. The ideas of defining an industrial communication profile in a standard originally destined for providing QoS for home-entertainment Ethernet network, is defended by the Siemens industrial business units. However, the evaluation of the scenarios and use cases where such a standard might be useful and its possible extensions can be influenced by IoT@Work results.

The application areas of interest for Siemens include manufacturing, SCADA systems, networks in ships, buildings, energy distribution networks, and more. Siemens also offers remote services for maintenance and support for the relevant products, as well as planning support and tools for the latter. Constantly improving these products and the service and planning business is vital for the company. There is a trend that unique selling points of products are not so much hardware or software quality or costs of single devices, but more the intelligence needed to adapt to different application domains and the intelligence to cut operational costs. The Siemens teams involved in the IoT@Work project have also successfully applied for EU projects destined at using IoT technologies in specific application areas such as smart grid. The Future Internet PPP project “Future Internet for Smart Energy” (Finseny), as an example, includes not only the research departments from Siemens but also business units investigating the aspects of connecting renewable energies and smart things to a future internet infrastructure.

On a longer term, we expect significant knowledge and improved core technologies for the future generations of solutions for industrial automation in general and specifically for PROFINET-based concepts and products. While the first candidate for applying the results might be in the area of factory and process automation, dissemination into other areas as mentioned before is also planned – already today PROFINET technologies are heavily used, e.g., for energy substation automation. As the success of the European PI organisation proves, a competent mix of partners is required to cover a reasonable broad range of requirements and to develop mature and innovative solutions. Thus IoT@Work brings together major European players in the area of industrial communication and automation to push for Plug&Work concepts, to feed them back into the PI and of course to be able to offer outstanding products and solutions in the mid-term future.
4.2 European Microsoft Innovation Center (EMIC)

EMIC's exploitation strategy in IoT@Work is aimed at impacting Microsoft product roadmaps and future offerings. Microsoft is a leading provider for software technology and platforms. This covers the entire lifecycle of software and system development, such as design, implementation, monitoring, and control. Specific targets of Microsoft businesses include the Windows Embedded Business and the Server and Tools Business. The Windows Embedded Business in particular tries to bring smart devices towards service oriented devices, which could be used for industrial automation, home automation or process monitoring and control. The integration of heterogeneous infrastructures and the investigation of how various devices and actuators can be connected with the backend, such as MS Dynamics or SQL Server, are furthermore key aspects for Microsoft and are meant to support the flexible and easy integration of large-scale heterogeneous environments. This also includes monitoring and management of such infrastructures as in scope of the System Center suite of products inside the Server and Tools Business.

EMIC exploitation activities in the first period of the IoT@Work project mostly comprise various meetings and discussions with internal interested groups across the Microsoft company, where we have presented project scenarios, technology requirements, and Plug&Work trends, and where we have tried to further identify and concretize synergies and opportunities.

In addition, the close collaboration with universities pushes an early exposure of industry perspective and insights towards the academic world, enabling uptake in research and education.

4.3 TXT e-solutions (TXT)

TXT's IoT@Work exploitation is mainly focused on the market segments in which its TXT Next Business Unit operates. These are specifically:

- The Aerospace & Defense market segment for TXT Next activities on Digital manufacturing and Managed Service & Consulting: in this market segment manufacturers have to face increasing complexity of production equipment and systems, as well as increasing relevance of production delocalization and/or co-design and co-production on new products (e.g. Boeing 787 Dreamliner), with more stringent constraints on timeliness, cost control, safety measures, production processes and plant monitoring, etc.;

- The High Tech Manufacturing market segment, where companies have to face a progressively increasing challenging and dynamic scenario that envisages shorter products life cycles, the need to optimize and maximize the usage of the production systems, and to readapt the production systems to new productions or to dynamically share these systems to concurrently produce different products according to real-time demand.

TXT Next solutions often have to be designed and developed according to specific software development standards (e.g.: MIL-STD-498, RTCA/DO-178B, DO-200/201, CMMI).

Obviously, ICT solutions for these market segments have to be able to provide a high level of reliability, adaptability and re-configurability, have to heavily reduce human intervention, (re-)configuration time and error rates, provide a wider and more controlled access to production data and systems and offer extensive support for all manufacturing phases and departments (Engineering, Manufacturing, Support, etc.).

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The IoT@Work research areas and prototypes fit therefore in the TXT Next strategies and market needs, both as a way to improve its knowledge and know how, for exploring new approaches and technological solutions, and to validate in real contexts these approaches and solutions, so that they can be engineered and embedded in TXT Next solutions and technical expertise.

The following IoT@Work R&D areas are of particular relevance for the TXT Next business unit:

- Device self-configuration and self-adaptability features;
- IoT awareness (which means taking into account the availability of network and production devices having more intelligence and connectivity capability);
- Technologies for production plant data collection, management and provision;
- Technologies for advanced access control systems that are able to operate in production environments envisaging many internal and external subjects (e.g. suppliers, maintainers, etc.), and to scale and reduce management overhead;
- Applications for near-real-time production data analysis;
- Resiliency and security features.

Finally, IoT@Work focuses on high features and research areas that are relevant for the TXT Corporate Research division, which is the TXT division actually involved in the IoT@Work project, in its R&D activities, especially in view of the need to experiment with new technological trends and approaches in the area of IoT, Agile Manufacturing, Distributed Manufacturing and Virtual Factories and Enterprises.

The TXT Corporate Research plans to exploit IoT@Work outcomes on new R&D projects. For example, synergies with IoT@Work and NMP CORENET and the Factories of the Future PPP MSEE (Manufacturing Service Ecosystem) projects are under evaluation currently.

The exploitation of IoT@Work activities within the TXT Next division is being performed with internal periodic meetings, currently focused on transferring information. In the second half of the project these meetings will be more focused on demonstrating IoT@Work partial achievements and prototypes, to finally focus on transferring outcomes, knowhow and expertise.

### 4.4 FIAT Research Center (CRF)

System trials based on CRF’s manufacturing scenario will showcase the technology and prepare the way for further exploitation. The target of CRF’s exploitation is then expected to be based on specialized and customized solutions towards the FIAT Group’s different companies. CRF is engineering leader in manufacturing technologies and its size and visibility will ensure a great visibility of project results in the manufacturing area and their additional transfer to other sectors. Exploitation will be achieved by demonstration of CRF’s pilot case to FIAT group’s ICT manufacturing experts. In order to encourage the exploitation of the results into FIAT group, CRF will involve FIAT group’s experts in the stakeholder meetings. This will focuses the project’s results to test cases of interest improving thus the acceptability of the research lines of the project towards FIAT group’s sectors.
5 Glossary

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETSI</td>
<td>European Telecommunications Standards Institute</td>
</tr>
<tr>
<td>INDIN</td>
<td>IEEE International Conference on Industrial Informatics</td>
</tr>
<tr>
<td>KommA</td>
<td>Kommunikation in der Automation</td>
</tr>
<tr>
<td>LMF</td>
<td>Lemgo Model Factory</td>
</tr>
<tr>
<td>WFCS</td>
<td>IEEE International Workshop on Factory Communication Systems Communication in Automation</td>
</tr>
</tbody>
</table>

6 References

