

Experience in EMMA international collaborative research project

2009. 6. 22.



PyeongSoo Mah (pmah@etri.re.kr)

Embedded S/W Research Division

EMMA project (FP6 project in EU)

□ A brief history of EMMA project

- Dr. Konstantinos Glinos, IST Embedded System Director of EU visited Korea, had an interview with the minister of MIC (Ministry of Information and Communication) and proposed a cooperative research (2004. 7. 29.)
 - ◆ Visited ETRI, be introduced research activities of Embedded SW Research Division(2004.7.30)
- EU researchers attended Korea-EU Embedded System Conference in Korea (2005. 4. 20.)
- ETRI researchers attended Workshop on Cooperating Objects in Belgium (2005. 6. 23-24)

- Project leader of EMMA project requested ETRI Embedded SW Research Division to participated in the project (2005.07.04)
- ETRI attended the project selection meeting with EU partners and explained the role of ETRI in EMMA project (2006.3.7, Brussels)

- EMMA project officially launched (2006.5.1.)

EMMA : Embedded Middleware in Mobility Applications

Roles of the EMMA project participants

Roles of participants

No.	Participants		Country	Roles
	Abbr.	Official name		
1	ETRA	ETRA Investigación y Desarrollo, S.A.	Spain	.Project Leader . Application development for validation
2	CRF	Centro Ricerche Fiat	Italy	. Automobile Research Institute . Object implementation for validation
3	TRW	TRW Connekt	UK	. ECU supplier . Sensor technology analysis and HW development
4	UNEW	Univ. of Newcastle	UK	. EMMA evaluation . Validating EMMA project
5	UBonn	Univ. of Bonn & Univ. of Stuttgart	Germany	. Development of EMMA Middleware
6	ITTI	Institute of Communication and Information Technologies	Poland	. Publicizing and coordinating the dissemination of the project's results
7	ETRI	Electronics and Telecommunications Research Institute Embedded S/W Research Division	Korea	. Development of OS and Development Environments for sensor nodes

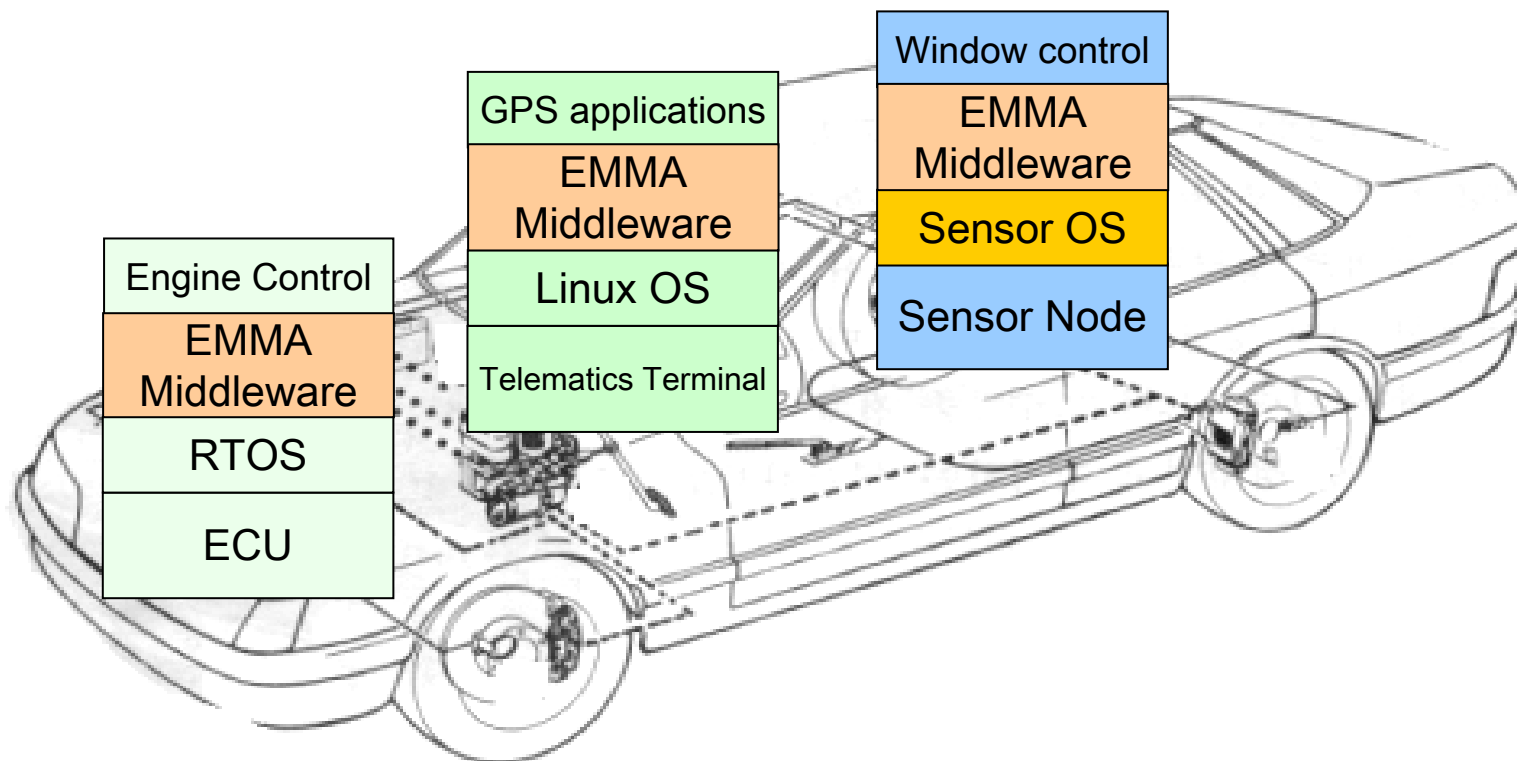
● Duration of research : 2006.5~2009.2 (2 year and 10 months)

● Research budget : Europe 1M Euro/yr , ETRI 1M Euro/yr in matching fund

New Concept of EMMA Project

❑ Sensor Network Technology for automobile domain

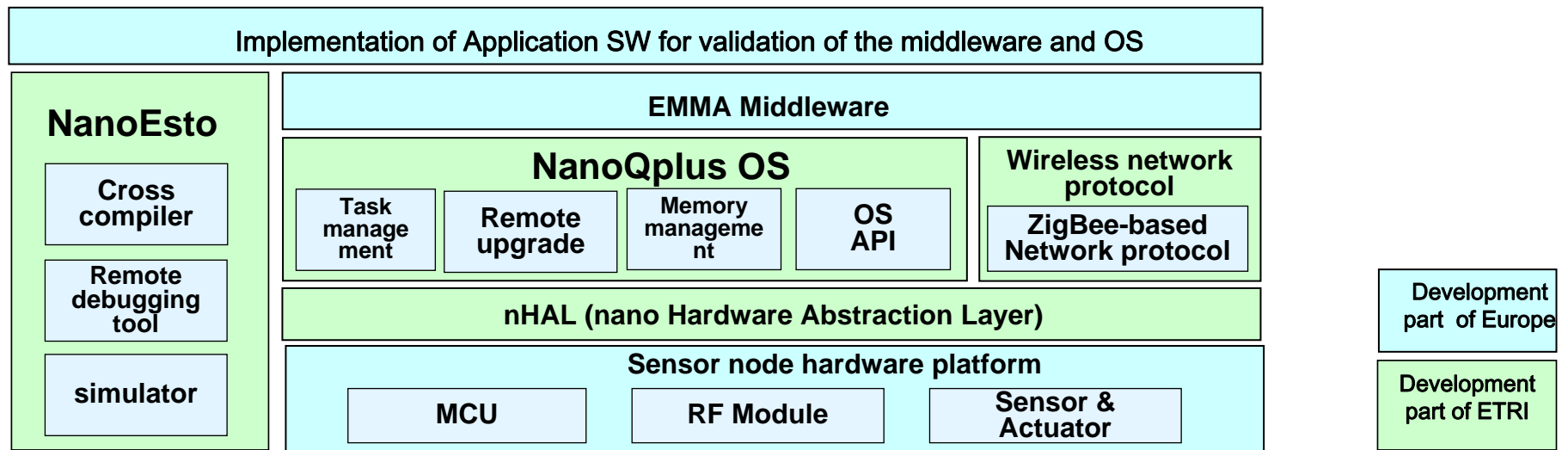
- Necessity of middleware and micro OS development for **wireless and wired communication**
- Development of **middleware** makes it easy to integrate results developed by 3rd party companies
- For air conditioning control, window opening, door opening, seat control, low price 8 bit ECU and **micro sensor OS** which supports wireless sensor communication can be used



Tightly coupled Cooperative Research

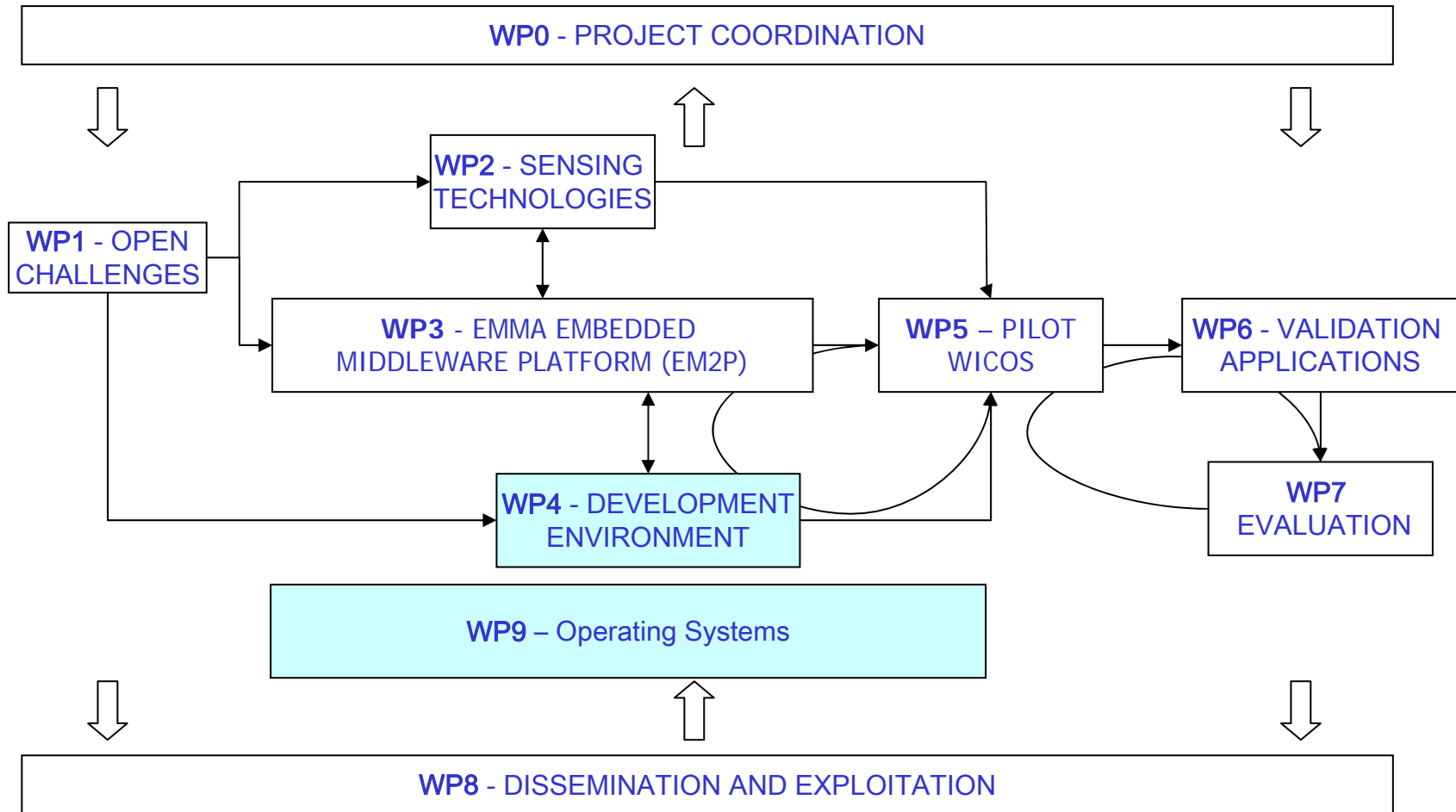
- ETRI developed

- A small-scaled embedded OS (NanoQplus) with high reliability for sensor nodes
 - ◆ Developed highly reliable OS kernel supporting Multithreading feature
 - ◆ Fault-tolerant wireless communication protocol for sensor nodes
- Application SW Development tool (NanoEsto) for sensor nodes
 - ◆ Integrated Development Environment for application SW using OS and Middleware



Collaborative research among the project partners

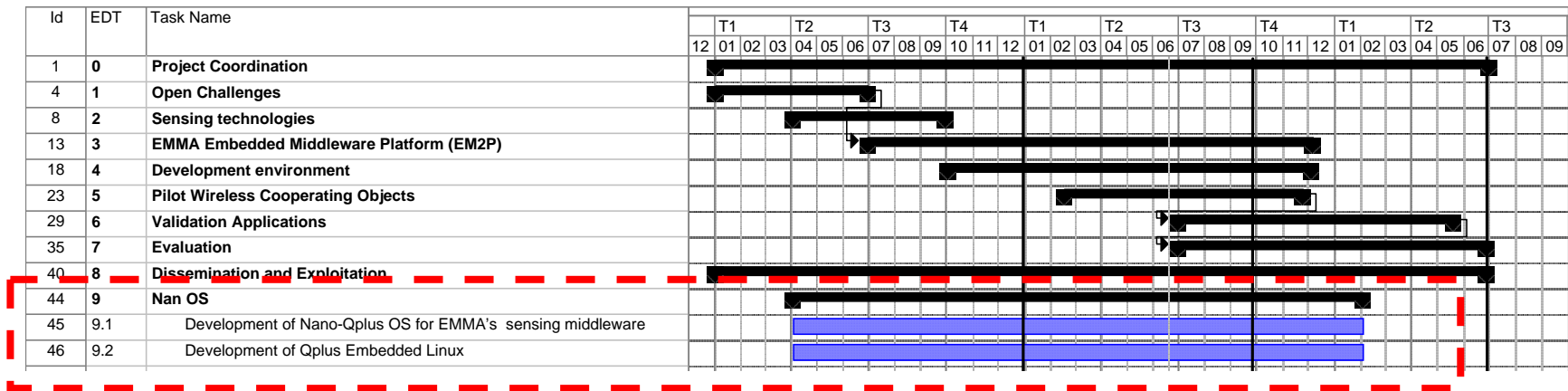
- ❑ Clear Division of responsibilities among partners and build a concrete cooperation



The process of Collaborative research

□ Regular Check and Development based on milestone

- The progress of the project is managed based-on the schedule which was made from the start of the project
- Proceeded without changing the schedule and objectives



□ Hold a regular meeting every three months

- Met at each European Institution to discuss the technical details of work-packages and report the issues to be solved

IPR provisions and implications of EMMA project

□ Intellectual Property Right Provisions

- IPR resulting from the project belongs to the participant who generates it
- during the project
 - ◆ A participant can request access to another participant's pre-existing know-how or knowledge if it needs them for carrying out its own work
- After the collaborative research,
 - ◆ for commercial use, IPR and the result of EMMA project should be purchased based on a contract
 - ◆ Impossible to reject transferring the result of the project to other partners
 - ◆ The result of the project should be provided with reasonable price

□ Implications of EMMA project

- EU partners want to make the middleware an international standard
- If the middleware is commercialized, the OS ETRI developed can have a chance to be used in European automobiles
- EU partners also have a chance to commercialize the middleware in Korea

Project evaluation process in EMMA project

□ Project assessment meeting in one day

- Before the assessment of the project proposal, project coordinator from EU headquarter examined the project proposal for one month
- Hold a Q&A session with all members of consortium participants
- Discussed the contents of project plan through the 4 hrs of meeting
- Reported the acceptance or rejection of the project proposal in the meeting

□ Evaluation system to improve the applicability of the project

- Project evaluating time : 8 hrs.
- 3 Evaluators: Project Coordinator, 1 professor, 1 member from a company
- Briefing by project leader and detailed explanation by each participant (2hrs)
- All the evaluators read the submitted report in advance and asked detailed questions that are very relevant to the project (5hrs)
- No project is decided to be dropped in the evaluation meeting
- Evaluators commented the way how to improve quality of the project result

Experience from the International Collaborative Research

□ Difficulty of making a domestic project

- MIC (Ministry of Information and Communication) approved the international collaborative research and sent an official document to indicate the participation of ETRI in EMMA project
- MIC made an internal policy to build a cooperative research center in Korea by foreign countries and it delayed the starting of EMMA project
 - ◆ EMMA project started on May, 2006, whereas ETRI received budget for the project from Korean government on December, 2006.

□ Difficulty of handling both international and domestic project

- Have to consider requests from both Korean and European partners
- Have to make Korean and English document
- Selected as a representative project in Korea and have to keep on reporting and demonstrating to Ministry of Information and Communication and ETRI

MOU agreement with ETRA, Spain

- MOU to cooperate research and commercialization in automobile domains
 - make a treaty between ETRI & ETRA when the president of Korea visited Spain (2007.2.13)



Experience from the international collaborative research

□ Response from the ETRI researchers

- Some researchers with poor English are very passive
- Most researchers think the oversea business trip as a benefit
- Have envy to the project management process of EU
 - ◆ EU research is focused on identifying core technology and potential of it
 - ◆ Commercialization is focused in the following-up project

□ Response from the European Institution Research about ETRI

- Satisfied with ETRI for the quality of OS support
 - ◆ In project evaluation meeting, ETRI received the best assessment among the partners in EMMA project
- In some part, European partners showed dissatisfaction on lack of support from the team which was not participating in EMMA project.

Experience from the international collaborative research

□ Opinion on European participant institution

- EU partners considered cooperation with various institutions from various countries as a necessity to produce the best result
 - ◆ In Korea, cooperation with other teams is difficult even in the same company
- EU partners considered standardization and acquiring IPR as a goal
 - ◆ In Korea, implementation and technology transfer is a goal
- EU partners try to analyze the current problem to get long term result
 - ◆ In Korea, short term result is required to continue the project on the following year

□ Opinion on European research system

- Focused on solving actual problem rather than reporting formal documents
 - ◆ Purpose of evaluation process is not selecting out worst project but helping risk conditions of the project
 - ◆ Project participants report actual condition without any exaggeration

Summary

❑ Lack points in EMMA project

- Cannot get an opportunity to commercialize the developed OS to European companies
- Cannot participate in the follow-up project for EMMA project, since it is for telematics services, rather than developing technologies for inner part of a car

❑ Benefit from EMMA project

- Development and Validation of stable sensor node OS for automobile domains
- The fact that we received applause from European institutions would be useful when persuading the board of directors of Hyundai Motor Company
- Experienced a better project development process
- Experienced a research with many institutions with cooperative mind