



ACCUS

Adaptive Cooperative Control in Urban (sub) Systems



EXECUTIVE *summary*

ACCUS aims to provide an integration and coordination platform for urban systems to ease the deployment of cross-domain application/services to optimize the combined performance of interacting urban processes (e.g. environment, energy, traffic, security, etc.). ACCUS addresses the efficient composition of Systems of Systems thus achieving more flexible, more efficient, safer and more robust integrated urban systems and managing their emergent behaviours.

CONTRIBUTION *to SRA*

- > Reduction of system design cost between 15% and 35%. Cost optimized demonstrators exploiting commonalities with other ongoing developments will be used.
- > Reduction in development time of new services by 25-40%.
- > Achievement of cross-sectorial reusability of embedded systems from 15% to 25%.
- > Reduction of effort and time for re-validation from 20 to 40%.

MARKET INNOVATION *& impact*

Future Urban Environments will face tremendous challenges regarding public and private transport, logistics, streets

management, building automation and smarter interaction with the citizens living in those spaces. The challenge of ACCUS is to provide R&D results with commercial impact within a 3 to 5 years' range by pushing innovative solutions into the market and by proposing an open coordination platform and increased interoperability capabilities.

ACCUS is actively aiming at end user and stakeholder's involvement.

ACCUS technological achievements will be demonstrated in the Gdansk (Poland) pilot in line with the new Smart Cities concepts under evolution, thus reinforcing the EU industrial competitiveness in this area.

RELEVANCE & CONTRIBUTIONS *to Call 2012*

Relevance in relation to ASP3

- > ACCUS will integrate, coordinate and control urban subsystems (horizontal interoperability) and converged applications (vertical interoperability).
- > ACCUS will rely on existing standards and promote new standards wherever suitable.
- > The ACCUS system will be tested and validated in real application contexts.

- > The ACCUS platform assure semantic interoperability among connected subsystems and and applications (components). Components to be plugged in the ACCUS platform “understand” and “share” the same ontologies, so they will integrate and interoperate seamlessly.

Relevance in relation to ASP7

- > The ACCUS project will provide a reference architecture that enables a flexible and evolvable interaction of urban subsystems coming from different domains and a multitude of vendors.
- > The ACCUS project will provide methodologies and guidelines, as well as development tools that will support reuse of existing and composition of new functionalities.

R&D INNOVATION *and technical excellence*

ACCUS aims at three major innovations.

- > First innovation: provision of an integration and coordination platform for urban subsystems to build applications across urban systems like monitoring, management and control that can reach beyond the borders of the individual subsystems.
- > Second innovation: provision of an adaptive and cooperative control architecture and corresponding algorithms for urban subsystems in order to optimize their combined performance.
ACCUS focuses on the following fundamental control problems: *Stable closed-loop systems, controllability of networks of dynamical systems, robustness of control, robust topologies and dependable networked control.*
- > Third innovation: provision of methodologies and tools for creating real-time collaborative applications in a System of Systems context.

Platform and control architecture (innovations 1 and 2) are brought into practice via matched development methodologies and tools. The methodology and tool innovation covers the entire life-cycle (i.e. from design to operation, maintenance and possibly retrofitting) of applications for the integrated urban subsystems domain. Results include a *reference system architecture, platform software* (middleware, standard ACCUS services, legacy software interfaces), *design tools, model-based design environment for application development, validation tools for application development, monitoring and visualization tools to track the system level operations. The emphasis is on selecting and reusing existing tools (wherever possible) and on establishing interoperability interfaces among them to create a tool-chain for system development.*

PROJECT *partners*



www.artemis.eu

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ACCUS

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WEBSITE

START

June 2013

DURATION

36 months

TOTAL INVESTMENT

€12.02 M

PARTICIPATING ORGANISATIONS

27

NUMBER OF COUNTRIES

8