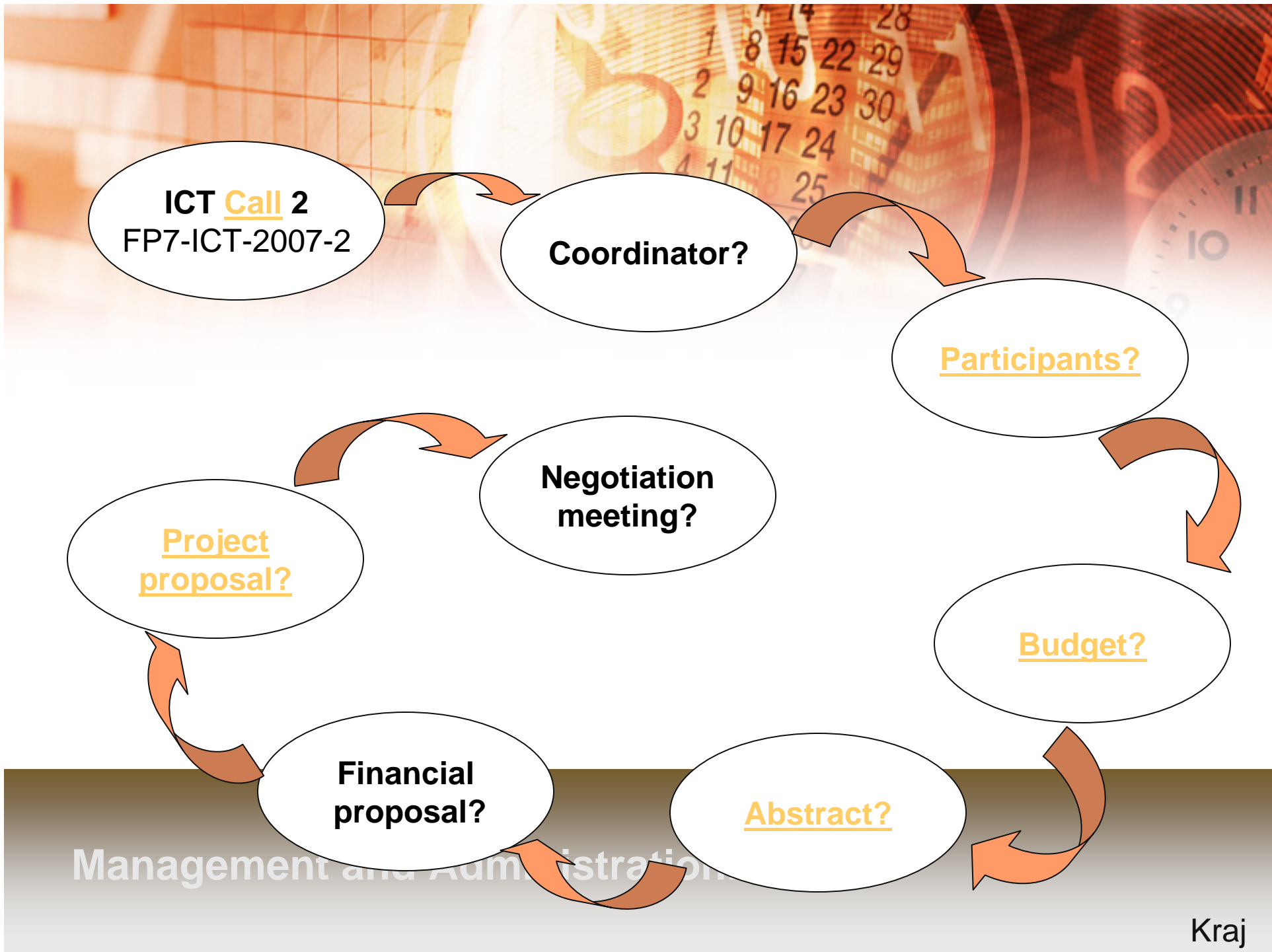


The background of the slide features a warm, orange-toned collage. It includes a grid pattern, a circular dial with numbers (10, 11, 9), and various numerical sequences (e.g., 14, 28, 16, 23, 30, 17, 24, 25, 19, 26, 6, 13, 20, 27).

Small or medium-scale focused research project  
(STREP)  
ICT Call 2  
**FP7-ICT-2007-2**

**Complex Power plants  
RObustification by fault  
Diagnosis, Isolation and  
Advanced Control Techniques  
PRODI**

Ministarstvo za nauku i tehnologiju  
Republike Srbije  
juli, 2008.



## Objective ICT-2007.3.7: Networked Embedded and Control Systems

- c) **Control of large-scale complex distributed systems:** New engineering approaches that ensure efficient, robust, predictable, safe and secure behaviour for manufacturing and process plants and for large scale infrastructures such as distributed energy production, energy distribution, airports or seaports etc. Key challenges include (1) developing generic modelling and design methods, dynamically reconfiguring architectures, languages and scalable algorithms for the control of evolvable, distributed and adaptable systems; (2) mastering complexity, temporal and spatial uncertainties such as delays and bandwidth in communications and node availability; and (3) integrating advances in sensor networks for closing the control loop. Research should strengthen and consolidate European excellence in systems sciences and engineering by encouraging the control, computer and communications sciences and engineering communities to work together. International cooperation with the USA, Russia and W. Balkans is encouraged.

# Participants

- Faculty of Electrical Engineering, University of Belgrade (coordinator)
- Department for Electrical and Electronic Engineering, University of Cagliari
- Faculty of Technical Sciences, University of Novi Sad
- Department for Electrical Engineering, Polytechnic University of Valencia
- Bosio, d.o.o., Slovenia
- Victoriaoil, AD, Sid

# Budget

## Funding schemes

- a) CP (STREP only), CSA for source code sharing and for standardisation initiatives
- b) CP (STREP only), NoE
- c) CP (STREP only), CSA for international cooperation

## Indicative budget distribution<sup>12</sup>

47 M€:

- CP 41 M€;
- NoE 4 M€;
- CSA 2 M€

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# Abstract

## Expected impact:

- Control of 10 times more complex systems at 10% of today's effort. Achieve 100% plant availability, reduce maintenance time and cost by 50% and industrial accidents by 30%.
- New services and applications that are tailored to specific needs, seizing new market opportunities.
- More efficient, flexible, secure, easier to maintain and more productive large infrastructures (e.g. power grid, water supply), manufacturing and process plants.
- Enable low-cost monitoring of the environment and natural resources.

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# Project proposal

- **1.1.2. Project objectives**

Particularly, the following research and development activities and results (covered by corresponding work packages) are expected within PRODI:

- Power plant robustification using pattern recognition techniques.
- Development of new techniques for signal processing of the measurements obtained by sensors.
- The objective of PRODI is to design reliable computer architecture for implementation of the developed algorithms, their integration, user friendly communication to the final user (plant operator) and reliable machine-field interface.
- Power plants and biofuels factory analyses regarding applicability of the model-based FDI methodology.
- The design of a knowledge-based expert system for diagnosis of actual plant state with the advisory capacity through man-machine interface.
- Design of new techniques for efficient fault detection in particular devices as synchronous and asynchronous machines.

- **1.1.4 Relevance to the Topics Addressed by the Call**
- PRODI objectives are positioned with respect of the main ICT Challenges of the Work programme, in the section 3.3.
- PRODI targets the Objective ICT-2007.3.7: Networked Embedded and Control Systems (item c: Control of large-scale complex distributed systems) included in the Challenge 3: Components, systems, engineering, of the ICT Work programme 2007-2008. PRODI's work plan is designed in such a way as to cover most of the above objectives:
  - Ø *'New engineering approaches that ensure efficient, robust, predictable, safe and secure behaviour for manufacturing and process plants and for large scale infrastructures such as distributed energy production, energy distributions ...'*; This is the main target established by the project: to improve robustness, safety and efficiency of the complex power plants.
  - Ø *'Developing generic modelling and design methods...'*; Improvement of robustness, safety and efficiency will be achieved through the design of new methods described in the work packages 1, 2, 4 and 5.
  - Ø *'Mastering complexity, temporal and spatial uncertainties ...'*; Complexity and uncertainties are the basic attributes of the power plants. Work packages 1,2 and 3 offer approaches to solve these difficulties.
  - Ø *'Research should strengthen and consolidate European excellence in systems science and engineering by encouraging the control, computer and communications sciences and engineering communities to work together ...'*; PRODI aims getting together academic and industry engineers including Western and Central Europe and the Western Balkans, as well.



**Thank you for your  
attention**

