

DISTRIBUTED COORDINATION STRATEGIES IN CLOUD-EDGE CONTINUUM

Cătălin Negru*, Bogdan-Costel Mocanu*,
Ion-Dorinel Filip*, Florin Pop^{*,**,***29}

**University Politehnica of Bucharest, Bucharest, Romania*

***National Institute for Research & Development in Informatics,
Bucharest, Romania*

****Academy of Romanian Scientists, Bucharest, Romania*

catalin.negru@upb.ro, bogdan_costel.mocanu@upb.ro,
dorinel.filip@upb.ro, florin.pop@upb.ro/florin.pop@ici.ro

Distributed coordination represents managing inter-dependencies between positions and activities performed to achieve goals. Henry Mintzberg has defined the following mechanisms that can be applied to coordinate dependencies between positions and activities [1]: *Direct Supervision* (a central service takes all decisions by issuing instructions to agents and monitoring their actions), *Standardization of Work* (the specification of technical activity of the agent, step by step, without the possibility to negotiate, conflicts are reported to the supervisor), *Standardization of output* (agents coordinate by specifying the result), *Standardization of skills* (the specification of the competencies needed for the activity), and *Mutual Adjustment* (coordination by process of informal communication between agents). For distributed intelligent system design, such as Cloud-Edge Continuum [2], this means that agents have social abilities in the sense that they can interact and reason about each other's interfaces, knowledge and competencies, and activities to achieve, without hardly any standardization or protocols.

We proposed an architecture that has an essential layer for agent communication, management, and message transportation, as well as a specification for the abstract architecture and applications layers (see Figure 2).

²⁹*Speaking author: F. Pop*

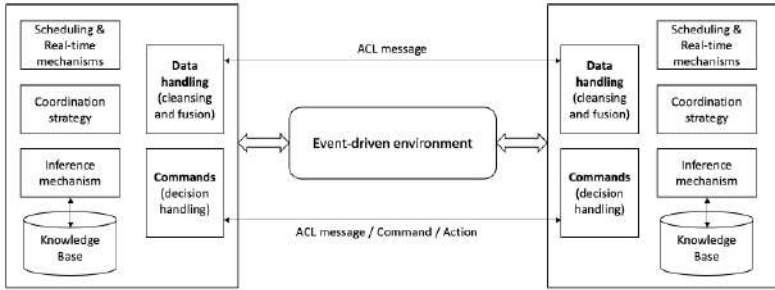


Figure 2: *Proposed architecture using coordination and scheduling strategies*

References:

1. H. Mintzberg. *Structures in fives: designing effective organizations*. Englewood Cliffs, N.J. Prentice Hall, 1993.
2. G.R. Russo, V. Cardellini, and F.L. Presti. Serverless Functions in the Cloud-Edge Continuum: Challenges and Opportunities, *2023 31st Euromicro International Conference on Parallel, Distributed and Network-Based Processing (PDP)*, (2023), 321–328.