**Initial Post**

by Saleh Almarzooqi - Monday, 1 September 2025, 7:11 AM

KQML and other ACLs have played important roles in the creation of multi-agent systems, and offer a standardized means by which agents can exchange not only data, but intentions and goals (Chalupsky et al., 1992). Based on a speech act theory, ACLs allow agents to execute higher-level communication acts, including request, inform, or achieve, which extend beyond the communication of a message passing by adding semantics and context to communication (Finin et al., 1993). This enables increased autonomy, collaboration, and coordination of agents within open, distributed, and heterogeneous environments. This is due to their interoperability, which makes them especially applicable to real-life solutions like e-commerce, knowledge management, and supply-chain systems where various agents written on distinct platforms have to interoperate (Labrou and Finin, 2000).

Despite these advantages, ACLs present several limitations. They demand that the reasoning capabilities of the agents be highly developed, which raises the complexity of the systems and their computational cost (Shaolong and Qiang, 2010). The parsing and interpretation of performatives is a resource-demanding task, and since it cannot be performed in real-time or high-performance ACLs are not as efficient. Moreover, meaningful communication depends on a common ontology; otherwise, semantic inconsistencies may arise (Soon et al., 2018). This is in contrast to method invocation in languages such as Python or Java, which is easy, efficient, and predictable, but limited to tightly coupled systems where agents already share the same environment and language runtime.

In contrast, method invocation is more appropriate in the context of controlled, intra-language integration of software, whereas ACLs are effective in dynamic and cross-platform environments where autonomy and semantic insight are of paramount importance.

**References:**


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