Hybrid Architecture of DL Knowledge Base in KaSeA*

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KaSeA system has been developed within PIPS (*Personalised Information Platform for life and health Services*) project. PIPS is an R&D integrated e-health project carried out within the 6^{th} Framework Programme of EU. One of the major subsystems of PIPS is Knowledge Management System (KMS), which should manage knowledge providing reasoning system: scalable with respect to number of terms defined in the ontology as well as with respect to number of individuals. Having performed extensive experiments on widely available reasoners such as Jena, RACER and FaCT, we found that no existing knowledge management systems meet this requirement. Therefore KaSeA has been developed, with a special focus on it.

Fulfilling this assumption required development of an architecture of the Knowledge Base (KB) and designing an interface to access it. The knowledge managed by KaSeA system is divided into two parts. *Ontological part* of KB holds data in a form allowing for inferences with respect to defined concepts and roles. This part contains TBox and ABox data and is managed by the Knowledge Inference Engine (KIE) based on the idea of *Knowledge Cartography*. *Data part* of KB (called DBox) holds numerical and string values of attributes of individuals and is managed by DBox Manager. Such division has advantages related to processing compound queries (both concerning DBox and ABox) in parallel and is efficient in systems which use knowledge base not only as a source of knowledge but also as a source of data.

In order to allow interchanging knowledge between a client and KaSeA, the system provides an interface to access its inference mechanisms. DIGUT interface is based on DIG and widens its capabilities by adding three-value logics and expanding DIG expressiveness. Capabilities of KaSeA have been verified and validated against first versions of PIPS system called Demonstrator.

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