Knowledge for Information Infrastructure

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Abstract

Information Infrastructure covers the aspects of formal knowledge representation of information availability, distribution, interoperability and archiving. Here, a systematic view and logical structure of appropriate requirements is developed. Experience from best practice in fields like environmental and geographic information systems that typically are used in multipurpose, distributed complex applications is analysed to separate basic components of logical structure.

In its development over the last decades the term information infrastructure covered the aspects of exchange formats (syntax), the representation of meaning (semantics) and currently the experiences in formalizing action contexts leads to increased awareness of the necessity of finding an appropriate formal logic approach to the pragmatics of information systems.

As databases are not only used for storage and access of data elements but increasingly being element of management information systems that are oriented to terms like use, decision, production and results, the "active" elements of information systems reach the focus of scientific investigation.

Science databases increasingly become operative parts in decision-oriented management information systems. This implies the urgent demand of finding a formal framework of basic requirements to enable access and use of information in multi-actor, multi-disciplinary environments.

Information infrastructure separates those structural elements from current complex systems that have proved best practice in prototype applications and can serve as a basis for being recommended and used in general system development.

Concerning activity representations this principle serves the analysis and specification of multi-user system interaction, the formalisation of agent behaviour as well as the specification of services - granular elements of sytem activities that rely on interoperability of components in general. On the synthetic level, this approach lead to a structured approach for compositional design on action level.

Cooperation is one of the elements of good practice in management. This contribution shows structural elements of current development of formalizing the sociology of information systems by analyzing systems behaviour based on priciples of applying strategies to situations under consideration of contexts.This completes the logical structure representation of formal semiotics of information sytems.

Keywords