TOVE Digital City Programming Manual  
Part I: Information Architecture

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# Introduction

The advent of Smart Cities has seen an explosion of research, development and deployment of applications that take advantage of the convergence of technologies such as Artificial Intelligence, Web-based information systems, mobile technologies, and the Cloud. But lurking underneath these applications is a city-wide information system whose architecture is rooted in the previous century. Just as cities have physical infrastructures that are over 100 years old, city information infrastructures are often legacy system over 20 years old. The Urban Operating System for future cities seeks to redefine how the information systems that underly cities operate.

Broadly focused tasks, such as infrastructure projects or social services, require high degrees of coordination across city services to be effective and efficient, which in turn require greater integration of data and processes.

Diagram

Description automatically generated

Figure 1: URBAN OPERATING SYSTEM AGENTS

At its core is distributed, cooperative problem solving model composed of intelligent agents that cooperate and coordinate their decisions and actions in order to achieve city goals (Figure 1). This network of Intelligent Agents dynamically interact to flexibly and contextually achieve the goals of the city and its residents(Figure 2).

Diagram

Description automatically generated

Figure 2: AGENT INTERACTIONS

Theis series of manuals describe both the ontology extensions to ISO/IEC 5087 and the functions that can be used to manipulate instances of the ontology and perform inference. The following diagram outlines the information architecture.



# References

Cox, S., and Little, C. (2020), “Time Ontology in OWL”, OGC Document Number OGC 16-071r3, <https://www.w3.org/TR/owl-time/>. Downloaded 3 February 2021.

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