

---

## CONTENTS

---

Preface	9
List of Abbreviations	13
Glossary	15
<b>Part one   Theory</b>	<b>25</b>
<b>1. Ontologies</b>	<b>27</b>
1.1 Basic Concepts	27
1.2 Ontology representation languages	32
1.3 Ontology development environments	34
1.4 Ontology visualization	38
<b>2 Knowledge Management in construction</b>	<b>41</b>
2.1 Expert System methodologies	41
2.2 Expert Systems for construction planning	45
2.3 Ontology-based modelling in AEC Industry	53
2.4 Construction workspaces management in AEC Industry	56
<b>Part two  Application</b>	<b>63</b>
<b>3. A Knowledge Base to support Construction Planning</b>	<b>65</b>
3.1 Ontological structure of the Knowledge Base	67
3.2 Modelling domains	70
<b>4. Construction Scheduling Ontology</b>	<b>75</b>
4.1 Specification of modelling objectives	75
4.2 Overall framework of the Scheduling Ontology	75
4.3 Topological structure	78
4.4 Specification of the entities	81
<b>5. Construction Space Ontology</b>	<b>93</b>
5.1 Specification of modelling objectives	93
5.2 Overall framework of the Space Ontology	95
5.3 Topological structure	97
5.4 Specification of the entities	101

<b>6. Construction Product Ontology</b>	<b>107</b>
6.1 IFC-based Building Model exploration	107
6.2 Topological structure	109
6.3 Introduction of BIM data in the KB	112
<b>7. Construction Time Ontology</b>	<b>115</b>
7.1 Topological temporal entities	115
7.2 Specification of entities in the Time Ontology	117
<b>8. Make use of ontologies</b>	<b>121</b>
8.1 OnSITEsimu Expert System	121
8.2 Operational framework and model computerization	125
<b>References</b>	<b>139</b>