

---

# Contents

---

<b>Chapter I. Introduction.....</b>	<b>1</b>
<b>1.1. MOTIVATION.....</b>	<b>4</b>
<b>1.2. PROBLEM STATEMENT .....</b>	<b>5</b>
<b>1.3. OBJECTIVES .....</b>	<b>7</b>
<b>1.4. THESIS DEVELOPMENT CONTEXT .....</b>	<b>9</b>
<b>1.5. THESIS STRUCTURE.....</b>	<b>10</b>
<b>Chapter II. Background.....</b>	<b>13</b>
<b>2.1. MODELING LANGUAGE CUSTOMIZATION .....</b>	<b>14</b>
<b>2.2. THE OO-METHOD MDD APPROACH .....</b>	<b>24</b>
<b>2.3. THE <i>I*</i>FRAMEWORK .....</b>	<b>29</b>
<b>Chapter III. Related Work .....</b>	<b>33</b>
<b>3.1. PLANNING THE SYSTEMATIC REVIEW .....</b>	<b>34</b>
<b>3.2. REVISION OF INTEROPERABILITY APPROACHES.....</b>	<b>38</b>
<b>3.3. A COMMON INTEROPERABILITY FRAMEWORK .....</b>	<b>46</b>
<b>3.4. CONCLUSIONS.....</b>	<b>48</b>
<b>Chapter IV. Achieving MDD Interoperability.....</b>	<b>49</b>
<b>4.1. AN MDD INTEROPERABILITY MODEL .....</b>	<b>50</b>
<b>4.2. CHALLENGES FOR INTEGRATION OF MODELING LANGUAGES .....</b>	<b>57</b>
<b>4.3. THE MDD INTEROPERABILITY PROCESS .....</b>	<b>60</b>
<b>4.4. CONCLUSIONS.....</b>	<b>63</b>
<b>Chapter V. The Integration Metamodel .....</b>	<b>65</b>
<b>5.1. BACKGROUND.....</b>	<b>68</b>
<b>5.2. IMPROVING THE INTEGRATION OF MODELING LANGUAGES.....</b>	<b>69</b>
<b>5.3. SYSTEMATIC DEFINITION OF AN INTEGRATION METAMODEL.....</b>	<b>73</b>
<b>5.4. IMPLEMENTING THE INTEGRATION METAMODEL .....</b>	<b>78</b>
<b>5.5. BENEFITS OF THE INTEGRATION METAMODEL .....</b>	<b>79</b>
<b>5.6. CONCLUSIONS.....</b>	<b>82</b>
<b>Chapter VI. Automatic UML Profile Generation .....</b>	<b>85</b>
<b>6.1. BACKGROUND.....</b>	<b>87</b>
<b>6.2. IDENTIFICATION OF METAMODEL EXTENSIONS .....</b>	<b>89</b>
<b>6.3. INTEGRATION METAMODEL TRANSFORMATION .....</b>	<b>95</b>
<b>6.4. APPLYING THE TRANSFORMATION RULES .....</b>	<b>107</b>

<b>6.5. CONCLUSIONS.....</b>	<b>109</b>
<b><u>Chapter VII. Generation of Model Interchange Mechanisms.....111</u></b>	
<b>7.1. BACKGROUND.....</b>	<b>113</b>
<b>7.2. MODEL INTERCHANGE PROPOSAL.....</b>	<b>115</b>
<b>7.3. APPLYING THE INTERCHANGE PROPOSAL.....</b>	<b>119</b>
<b>7.4. COMPARING THE MODEL INTERCHANGE APPROACH.....</b>	<b>126</b>
<b>7.5. CONCLUSIONS.....</b>	<b>127</b>
<b><u>Chapter VIII. Linking UML and MDD Approaches .....</u>131</b>	
<b>8.1. INTRODUCTION .....</b>	<b>132</b>
<b>8.2. THE APPLICABILITY OF THE UML ASSOCIATION IN MDD PROCESSES.....</b>	<b>133</b>
<b>8.3. THE SEMANTICS PROPOSED TO CUSTOMIZE THE UML ASSOCIATION .....</b>	<b>135</b>
<b>8.4. INTEGRATION OF THE PROPOSED SEMANTICS INTO UML.....</b>	<b>141</b>
<b>8.5. COMPILING THE EXTENDED UML ASSOCIATION .....</b>	<b>149</b>
<b>8.6. CONCLUSIONS.....</b>	<b>153</b>
<b><u>Chapter IX. Linking Goal-Oriented Modeling and Model-Driven Development.....155</u></b>	
<b>9.1. INTRODUCTION .....</b>	<b>156</b>
<b>9.2. BACKGROUND.....</b>	<b>157</b>
<b>9.3. APPLYING THE INTEROPERABILITY APPROACH TO <i>i</i>* AND OO-METHOD.....</b>	<b>160</b>
<b>9.4. ANALYSIS OF THE PROPOSAL AND DISCUSSION.....</b>	<b>171</b>
<b>9.5. CONCLUSION.....</b>	<b>173</b>
<b><u>Chapter X. Automatic Verification of Models for MDD Interoperability.....175</u></b>	
<b>10.1. INTRODUCTION .....</b>	<b>176</b>
<b>10.2. BACKGROUND .....</b>	<b>177</b>
<b>10.3. INTEGRATION OF VERIFICATION MEASURES INTO THE <i>i</i>* FRAMEWORK .....</b>	<b>182</b>
<b>10.4. APPLYING THE <i>i</i>* VERIFICATION MEASURES .....</b>	<b>192</b>
<b>10.5. EVALUATING THE VERIFICATION APPROACH .....</b>	<b>198</b>
<b>10.6. OVERALL ANALYSIS .....</b>	<b>210</b>
<b>10.7. CONCLUSIONS .....</b>	<b>211</b>
<b><u>Chapter XI. Conclusions.....213</u></b>	
<b>11.1. THESIS CONTRIBUTIONS.....</b>	<b>215</b>
<b>11.2. FUTURE WORK.....</b>	<b>219</b>
<b>11.3. PUBLICATIONS .....</b>	<b>221</b>
<b><u>References.....225</u></b>	
<b><u>Appendix I. Transformation of <i>i</i>* Models into MDD-Oriented Models.....245</u></b>	

<b>A1.1. INTRODUCTION.....</b>	<b>246</b>
<b>A1.2. THE PHOTOGRAPHY AGENCY PROJECT .....</b>	<b>247</b>
<b>A1.3. THE <i>J*</i>METAMODEL .....</b>	<b>249</b>
<b>A1.4. THE <i>J*</i>TRANSFORMATION PROCESS.....</b>	<b>252</b>
<b>A1.5. CONCLUSIONS.....</b>	<b>263</b>
 <b><u>Appendix II. Doctoral Thesis Development.....</u></b>	 <b>265</b>
<b>A2.1. THE DESIGN RESEARCH .....</b>	<b>266</b>
<b>A2.2. APPLYING THE DESIGN RESEARCH .....</b>	<b>268</b>