Contents

Acknowledgments xii

1 Introduction 1
  1.1 Major Requirements in terms of Information Management 3
  1.2 Application Cases: an Overview 4
  1.3 Thesis Contribution 7
  1.4 Organization of the thesis 8

2 Information Integration Approaches, Mechanisms, and Tools 11
  2.1 Introduction 11
  2.2 A Taxonomy for Information Integration 12
    2.2.1 Distributed Systems 14
    2.2.2 Integrated Systems 17
  2.3 Further Classifications and Categorizations 28
  2.4 Discussion 29

3 WATERNET: Intelligent Supervision and Control in Heterogeneous and Distributed Application 31
  3.1 Introduction 32
  3.2 Water Environment and General application requirements 33
    3.2.1 Water Network Structure and Management 35
  3.3 Information Management Approach 38
    3.3.1 The WaterNet Architecture 38
    3.3.2 Simple Scenario for Subsystems interaction 39
  3.4 Distributed Information Management System (DIMS) 40
    3.4.1 The PEER Federated Layer 41
    3.4.2 Schemas Management in WATERNET Using PEER 42
  3.5 Extended Integration Approach 45
    3.5.1 Data Adapters Supporting Openness 47
    3.5.2 The WATERNET System Implementation 48
  3.6 Conclusion and Discussion 48
    3.6.1 Major Characteristics and Benefits of Federated Approach in Waternet 49
    3.6.2 Contribution to GFI²S 49