Federated Information Management for virtual enterprises

Garita Rodriguez, C.O.

Citation for published version (APA):

General rights
It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations
If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: https://uba.uva.nl/en/contact, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.
List of Figures

1.1 Example of collaborating manufacturing Virtual Enterprises. .......... 2
1.2 Main Virtual Enterprise life cycle stages and associated steps. .... 5
1.3 Role of the Distributed Information Management System for VE support. 11
1.4 PRODNET reference architecture. ........................................... 15
1.5 The PRODNET II consortium. .................................................. 17

2.1 Main distributed information management systems relevant to VEs. ... 28
2.2 Examples of VE-related distributed database management systems. ... 29
2.3 Main VE-related information representation models and standards. ... 32
2.4 VE-related component technologies and tools. .......................... 36
2.5 Classification of approaches for integration of VE distributed information. 41

3.1 General VE Reference Scenario. ............................................... 59
3.2 VE Scenario Case 1 – Basic Interactions among VE member enterprises. 61
3.3 VE Scenario Case 2 – Order-related functionalities among VE member enterprises. 62
3.4 VE Scenario Case 3 – Product design negotiation in VEs. ............. 63
3.5 VE Scenario Case 4 – VE monitoring and coordination. ............... 64
3.6 Focus areas for information management requirement analysis. ....... 67
3.7 Classification of VE information supported by different schema types. 70
3.8 Examples of processing of different DIMS federated queries. .......... 78
3.9 PEER federated information management layer. .......................... 82
3.10 Classification of VE information supported by different schema types. 85
3.11 Example of federated integration/exportation of VE data. ............. 88

4.1 General DIMS three-tier architecture. ...................................... 95
4.2 General DIMS architecture approach. ....................................... 97
4.3 Example of DIMS server multi-threading capabilities. ................. 98
4.4 DIMS use of Oracle programming interfaces and tools. ............... 99
4.5 Partial high-level DIMS integrated schema. ................................ 102
4.6 Examples of VE role hierarchies. .......................................... 107
4.7 Example of Export Schema hierarchy definition on VCL information. 108
4.8 Schema definitions for partner export schema management. ........... 110
4.9 Instance diagram of view hierarchy for regular VE partners. .......... 111
4.10 Export Schema Manager interface. .................................. 112
4.11 Create enterprise EXP schema. ................................. 113
4.12 Create EXP/Dependent-EXP set. ............................... 114
4.13 Federated Query Processing subtasks and interactions. ........ 117
4.14 Interactions of VCL internal modules for FQP support. ......... 121
4.15 VCL Module interactions for informing VE coordinator. ....... 123
4.16 FQP demonstration interface. .................................. 125
4.17 Diversity of implementation environments and interoperation mechanisms used by the development teams of PRODNET modules. 126
4.18 General DIMS - VCL modules interaction. .................... 128
4.19 DIMS - VCL module integration scenario. .................... 130
4.20 Partial definition of VCL parameter list node structure. ......... 131
4.21 Sample definition for DBPMS requested order structure. ....... 132
4.22 Example of run-time service request call from PPC to DIMS. . 134
4.23 Example of run-time interoperation between STEP and DIMS modules. 135
4.24 Partial high-level DIMS integrated schema for DBPMS. ......... 138
4.25 Purchase orders flow in PRODNET demonstration scenario. .... 139
4.26 Definition of Export Schemas. ................................ 141
4.27 Export Schema Set template instantiation example. ............ 145
4.28 Partial data structure definitions for requested-order supervision clauses. 146

5.1 Federation of heterogenous and distributed tourism services. . 151
5.2 Interoperability approach for common access to tourism services. 153
5.3 General architectural components for a VE platform for the tourism sector. ................................................. 155
5.4 A workflow plan for the BP template representing a VAS. ........ 166
5.5 Workflow process definition meta-model. .......................... 167
5.6 Extended DIMS architecture design. ............................ 168
5.7 Example evaluation of DIMS distributed look-up service request. 171
5.8 Part of the information stored in the DIMS internal DBMS. ... 172
5.9 Entity-Relationship diagram for service interface catalogue definitions. 174
5.10 UML class diagram for Service Interface Definitions Catalogue information. ................................. 174
5.11 Description of FetishTypes Java package. ........................ 175
5.12 End-user interface for Service Interface Browser. ............... 177
5.13 End-user interface for browsing service catalogue methods' information. 177
5.14 Example of partial XML definitions for accommodation data types. 178