

Electronic Enterprise: Strategy and Architecture



Andrew Targowski



IRM PRESS



New Releases from IRM Press

- **Multimedia and Interactive Digital TV: Managing the Opportunities Created by Digital Convergence**/Margherita Pagani
ISBN: 1-931777-38-1; eISBN: 1-931777-54-3 / US\$59.95 / © 2003
- **Virtual Education: Cases in Learning & Teaching Technologies**/ Fawzi Albalooshi (Ed.), ISBN: 1-931777-39-X; eISBN: 1-931777-55-1 / US\$59.95 / © 2003
- **Managing IT in Government, Business & Communities**/Gerry Gingrich (Ed.)
ISBN: 1-931777-40-3; eISBN: 1-931777-56-X / US\$59.95 / © 2003
- **Information Management: Support Systems & Multimedia Technology**/ George Ditsa (Ed.), ISBN: 1-931777-41-1; eISBN: 1-931777-57-8 / US\$59.95 / © 2003
- **Managing Globally with Information Technology**/Sherif Kamel (Ed.)
ISBN: 42-X; eISBN: 1-931777-58-6 / US\$59.95 / © 2003
- **Current Security Management & Ethical Issues of Information Technology**/Rasool Azari (Ed.), ISBN: 1-931777-43-8; eISBN: 1-931777-59-4 / US\$59.95 / © 2003
- **UML and the Unified Process**/Liliana Favre (Ed.)
ISBN: 1-931777-44-6; eISBN: 1-931777-60-8 / US\$59.95 / © 2003
- **Business Strategies for Information Technology Management**/Kalle Kangas (Ed.)
ISBN: 1-931777-45-4; eISBN: 1-931777-61-6 / US\$59.95 / © 2003
- **Managing E-Commerce and Mobile Computing Technologies**/Julie Mariga (Ed.)
ISBN: 1-931777-46-2; eISBN: 1-931777-62-4 / US\$59.95 / © 2003
- **Effective Databases for Text & Document Management**/Shirley A. Becker (Ed.)
ISBN: 1-931777-47-0; eISBN: 1-931777-63-2 / US\$59.95 / © 2003
- **Technologies & Methodologies for Evaluating Information Technology in Business**/ Charles K. Davis (Ed.), ISBN: 1-931777-48-9; eISBN: 1-931777-64-0 / US\$59.95 / © 2003
- **ERP & Data Warehousing in Organizations: Issues and Challenges**/Gerald Grant (Ed.), ISBN: 1-931777-49-7; eISBN: 1-931777-65-9 / US\$59.95 / © 2003
- **Practicing Software Engineering in the 21st Century**/Joan Peckham (Ed.)
ISBN: 1-931777-50-0; eISBN: 1-931777-66-7 / US\$59.95 / © 2003
- **Knowledge Management: Current Issues and Challenges**/Elayne Coakes (Ed.)
ISBN: 1-931777-51-9; eISBN: 1-931777-67-5 / US\$59.95 / © 2003
- **Computing Information Technology: The Human Side**/Steven Gordon (Ed.)
ISBN: 1-931777-52-7; eISBN: 1-931777-68-3 / US\$59.95 / © 2003
- **Current Issues in IT Education**/Tanya McGill (Ed.)
ISBN: 1-931777-53-5; eISBN: 1-931777-69-1 / US\$59.95 / © 2003

***Excellent additions to your institution's library!
Recommend these titles to your Librarian!***

*To receive a copy of the IRM Press catalog, please contact
(toll free) 1/800-345-4332, fax 1/717-533-8661,
or visit the IRM Press Online Bookstore at: <http://www.irm-press.com/>!*

Note: All IRM Press books are also available as ebooks on netlibrary.com as well as other ebook sources. Contact Ms. Carrie Skovrinskie at cskovrinskie@idea-group.com to receive a complete list of sources where you can obtain ebook information or IRM Press titles.

To Stan

Electronic Enterprise: Strategy and Architecture

Table of Contents

Preface	xi
----------------------	-----------

Part I: Enterprise Evolution

Chapter I. The New Informed Business Architecture	1
<i>Introduction</i>	<i>1</i>
<i>Shift of Power.....</i>	<i>2</i>
<i>The Political Perspective</i>	<i>2</i>
<i>The Economic Perspective</i>	<i>2</i>
<i>The Social Perspective</i>	<i>4</i>
<i>Shift in Strategic Resources</i>	<i>6</i>
<i>Shift of the Enterprise Structure.....</i>	<i>7</i>
<i>Shift of Management Control</i>	<i>12</i>
<i>From the Hierarchical to the Networking Model</i>	<i>12</i>
<i>Business Innovation.....</i>	<i>13</i>
<i>The Campus Model</i>	<i>14</i>
<i>From Tasks to Culture Control.....</i>	<i>16</i>
<i>Shifts of Infrastructure</i>	<i>16</i>
<i>From Formative to Informative Products and Economy</i>	<i>16</i>
<i>From Automation Islands to Federated Systems</i> <i>Architecture</i>	<i>17</i>
<i>From National and Traditional to Cross-Culture and</i> <i>Electronic Communications</i>	<i>18</i>
<i>From the Known to Unknown and the Dot.Com Crisis</i>	<i>19</i>
<i>September 11, 2001</i>	<i>19</i>
<i>New Rules of Post-Modern Business</i>	<i>20</i>
<i>Conclusion.....</i>	<i>21</i>
<i>Bibliography.....</i>	<i>22</i>
Chapter II. Enterprise Configurations	25
<i>Introduction</i>	<i>25</i>
<i>Enterprise Classification</i>	<i>26</i>
<i>Off-Line Enterprise</i>	<i>28</i>

<i>On-Line Enterprise</i>	28
<i>Integrated Enterprise</i>	33
<i>Examples</i>	37
<i>Agile Enterprise</i>	38
<i>Informed Enterprise</i>	42
<i>Communicated Enterprise</i>	48
<i>Mobile Enterprise</i>	54
<i>Electronic Enterprise</i>	56
<i>Virtual Enterprise</i>	58
<i>Future Trends – The 21st Century Corporation</i>	62
<i>Toward the Global Rules</i>	65
<i>Conclusion</i>	66
<i>Bibliography</i>	67

Part II: Enterprise Information Infrastructure

Chapter III. Enterprise Information Infrastructure (EII)	70
<i>Strategy and Rationale</i>	70
<i>EII General Architecture</i>	72
<i>Telecommunications Layer</i>	76
<i>Computer Networks Layer</i>	78
<i>LAN</i>	78
<i>MAN</i>	80
<i>WAN and VAN</i>	81
<i>GAN and VAN</i>	83
<i>Internet Layer</i>	85
<i>Internet</i>	85
<i>Intranet</i>	93
<i>Extranet</i>	93
<i>Computing Layer</i>	97
<i>Communications Layer</i>	99
<i>PBX</i>	99
<i>Voice Mail</i>	100
<i>E-mail</i>	100
<i>E-meeting</i>	101
<i>Computer Conferencing</i>	101
<i>Bulletin Board Systems (BBS)</i>	102
<i>Groupware</i>	103
<i>Work Flow Systems (WFS)</i>	104
<i>Teleconferencing</i>	104
<i>Telecommuting</i>	105
<i>Fax</i>	106
<i>EDI</i>	106
<i>EFTS</i>	107

<i>Further Trends</i>	107
<i>Conclusion</i>	108
<i>Bibliography</i>	109
Chapter IV. Application Layer	111
<i>Strategy and Rationale</i>	111
<i>Semantic Ladder – Arithmetics of Information Processing</i>	112
<i>Asymmetric Information</i>	118
<i>Application Layer Model</i>	122
<i>ERP Systems – Back-Office Automation</i>	127
<i>ERP – SAP R/3 Application Software Model</i>	129
<i>MIS-Management Information Systems</i>	134
<i>EIS-Executive Information System</i>	137
<i>EPM-Enterprise Performance Management System</i>	138
<i>KMS-Knowledge Management System</i>	142
<i>General Architecture</i>	142
<i>Data Warehouse</i>	146
<i>Data Mart</i>	147
<i>Data Mining</i>	148
<i>KMS Generic Architecture</i>	153
<i>EIP-Enterprise Information Portal – Intra-Office Automation</i> ...	154
<i>DMS-Document Management System</i>	157
<i>Information Services</i>	161
<i>SCM-Supply Chain Management – Inter-Office Automation</i>	163
<i>CRM-Customer Relation Management – Front-Office</i> <i>Automation</i>	172
<i>WFS-Workflow Systems</i>	179
<i>m-Mobile Applications</i>	181
<i>EUC-End-User Computing</i>	183
<i>Enterprise Applications Grid</i>	185
<i>Further Trends</i>	187
<i>Conclusion</i>	187
<i>Bibliography</i>	188
Chapter V. Enterprise Electronization and Integration	190
<i>Strategy and Rationale</i>	190
<i>Systems Electronization</i>	191
<i>Systems Standardization</i>	197
<i>CORBA Standard</i>	199
<i>Enterprise JavaBeans (EJB) Standard</i>	208
<i>DNA-DCOM Standard</i>	210
<i>DCOM Architecture</i>	211
<i>Components and Reuse</i>	212
<i>Components and the Enterprise</i>	213

<i>Microsoft .NET Framework</i>	213
<i>Common Language Runtime (CLR)</i>	214
<i>.NET Framework Class Library</i>	216
<i>Communication Protocols</i>	217
<i>Visual Studio .NET</i>	218
<i>Client Application Development in .NET</i>	219
<i>Server Application Development in .NET</i>	220
<i>XML Standard</i>	222
<i>SOAP Standard</i>	224
<i>UDDI Standard</i>	224
<i>WSDL Standard</i>	224
<i>Basic Web Services Protocols</i>	225
<i>Applications Integration</i>	226
<i>Tightly Coupled Logic Integration</i>	230
<i>Loosely Coupled Logic Integration</i>	231
<i>Mobile Integration</i>	234
<i>Enterprise Integration</i>	237
<i>Web-Driven Integration</i>	240
<i>Integration Complexity</i>	241
<i>Further Trends</i>	245
<i>Conclusion</i>	245
<i>Bibliography</i>	246

Part III: The Internet Ecosystem

Chapter VI. The Internet Applications and Business	250
<i>The Internet Economy</i>	250
<i>Internet Usage</i>	250
<i>Economic Impact</i>	251
<i>The Internet Ecosystem</i>	253
<i>E-Commerce</i>	256
<i>E-Commerce Applications</i>	257
<i>E-Commerce Business Models</i>	258
<i>E-Commerce Architecture</i>	260
<i>Electronic Payment Systems</i>	266
<i>E-Commerce Security</i>	268
<i>Good-Bye to Fixed Pricing</i>	269
<i>E-Business</i>	274
<i>"Dot-Com" Companies</i>	280
<i>Rethinking the Internet</i>	284
<i>Future Trends</i>	287
<i>Conclusion</i>	288
<i>Bibliography</i>	288

Part IV: IT Development and Management

Chapter VII. IT Development	290
<i>Introduction</i>	<i>290</i>
<i>IT Centers</i>	<i>290</i>
<i>IT Development Center</i>	<i>291</i>
<i>EII Development Methodologies</i>	<i>291</i>
<i>EII Development Strategies</i>	<i>292</i>
<i>Strategic Use of IT</i>	<i>294</i>
<i>Development of Subroutine, Object and Component</i>	<i>297</i>
<i>Middleware-Driven Interfacing</i>	<i>298</i>
<i>EAI-Enterprise Applications Integration</i>	<i>300</i>
<i>Workflow-Driven Integration</i>	<i>302</i>
<i>Legacy Systems Integration</i>	<i>303</i>
<i>BPR-Business Process Reengineering</i>	<i>304</i>
<i>BPI-Business Process Integration</i>	<i>308</i>
<i>B2B Integration</i>	<i>310</i>
<i>E-Market Integration</i>	<i>310</i>
<i>Mobile Integration</i>	<i>311</i>
<i>IT Developmental Vision for the 21st Century</i>	<i>312</i>
<i>Beyond COBOL – IT Skills for the 21st Century</i>	<i>314</i>
<i>Computer Controversies</i>	<i>316</i>
<i>Conclusion</i>	<i>319</i>
<i>Bibliography</i>	<i>319</i>
Chapter VIII. IT Management	321
<i>Introduction</i>	<i>321</i>
<i>IT as a New Business Function</i>	<i>321</i>
<i>IT Management Key Indicators</i>	<i>324</i>
<i>IT Management Levels</i>	<i>326</i>
<i>IT Management Trends</i>	<i>335</i>
<i>Business and IT Strategies Integration</i>	<i>337</i>
<i>Business Aims</i>	<i>337</i>
<i>Business Aims</i>	<i>339</i>
<i>IT Aims</i>	<i>342</i>
<i>IT Mission</i>	<i>343</i>
<i>IT Creed</i>	<i>344</i>
<i>IT Culture</i>	<i>344</i>
<i>IT Paradigms</i>	<i>344</i>
<i>IT Goals</i>	<i>346</i>
<i>IT Strategy</i>	<i>347</i>
<i>IT Targets</i>	<i>348</i>
<i>Application Strategic Domain</i>	<i>349</i>
<i>IT Differential Advantage</i>	<i>350</i>

<i>Strategic Trust</i>	350
<i>Conclusion</i>	352
<i>Bibliography</i>	352
List of Acronyms	355
About the Authors	358
Index	359



Preface

The purpose of this book is to provide big-picture strategies and system architectures which evolve an enterprise. The synthesis of about 300 IT technologies is presented in a consistent manner under the form of graphic modeling. To analyze each of these technologies one must read about 300 books, which is a tough task. However, if we look at the library shelves, such an amount of different books on IT applications in an enterprise exists, if not more.

Therefore the book is recommended for those readers who are interested mainly in general solutions of IT in the enterprise. Among such readers one can include:

- Business executives
- Information executives
- IS/CIS/MIS major students of the cup-stone curriculum courses
- MBA students who take a course on IT management
- IT technicians who would like to understand how their specific solutions fit into a bigger-picture solution

The book concept is presented in the following model.

Chapter 1 analyzes paradigm shifts in enterprise management caused by the applications of information technologies (IT). As a result of it, a new set of business rules is defined.

Chapter 2 defines eight evolutionary enterprise configurations triggered by the implementation of advanced applications of IT. This is a very important approach in understanding how to manage the development of IT applications to achieve the right end-solution at a given time.

Chapter 3 portrays five layers of the Enterprise Information Infrastructure (EII), which evolves from islands of automation. To manage a modern enterprise it is necessary to understand how to develop and manage EII, which is composed of hundreds information technologies.

Chapter 4 defines architectures of major application systems within the framework of the enterprise-wide solutions. These architectures identify endless number of components and their relationships, which control the flow of information (“content”) in decision-making processes of an enterprise.

Chapter 5 describes major solutions that determine so called enterprise electronization and integration. Several emerging standards which support these processes are presented. Also their relationships are provided under the form of a web’s services.

Chapter 6 defines the Internet Ecosystem in terms of its layers and major applications in business. The “dot.com” issue is analyzed and its impact upon the future of the Internet.

Chapter 7 present the major trends in developing IT solutions, among them such ones as design strategies and methodologies and 10 specific developmental approaches. Some future trends of IT developments are sketched.

Chapter 8 depicts issues and solutions on how to manage an IT-driven enterprise. The fundamental rule is to integrate business and system strategies and choose the right strategic applications. A set of management key indicators, based upon a balance scorecard, how to manage such enterprise is provided.

The author is very grateful to anonymous reviewers who provided very important suggestions on how to improve this book.

Andrew S. Targowski

The Book Architecture