CONTENTS

PREFACE			xiii
A	ACKNOWLEDGMENTS		
P	٩RT	I CHALLENGES OF THE DIGITAL AGE	
1		E CRISIS HAS NOT GONE AWAY: PORTUNITY BECKONS	3
	1.1	Introduction / 3	
	1.2	Challenges with Current Technology Paradigms: Chronic Issues of Time to Market and Flexibility / 9	
	1.3	The Emergence of Packaged Applications / 11	
	1.4	The New Front: Information; Big Data Is Not New; What Is New Is Unstructured Information / 12	
	1.5	Enterprise Architecture: Current State and Implications / 14	
	1.6	The Intelligent Enterprise of Tomorrow / 15	
	Refe	erences / 15	

VIII CONTENTS

PART II AN ARCHITECTURE FOR THE INTELLIGENT ENTERPRISE

2 EFFICIENCY AND AGILITY

- 2.1 Introduction / 19
- 2.2 The Process-Oriented Enterprise / 19
 - 2.2.1 Becoming Process Oriented / 23
 - 2.2.2 Why Must We Choose? / 24
 - 2.2.3 Design and Execution / 25
- 2.3 Role of Outsourcing in Creating Efficiency and Agility / 26
- 2.4 Role of Technology in Efficiency and Agility / 29
 - 2.4.1 Current Challenges with Technology / 30
 - 2.4.2 BPM Software / 30
 - 2.4.3 Role of Methodology / 32
 - 2.4.4 Agile Not Equal to Agility / 33
- 2.5 A New Technology Paradigm for Efficiency and Agility / 35
 - 2.5.1 Technology and the Process-Oriented Architecture / 35
 - 2.5.2 RAGE AITM / 38
 - 2.5.3 RAGE Abstract Components / 39
 - 2.5.4 RIMTM An Actionable, Dynamic Methodology / 40
 - 2.5.5 Real Time Software Development / 43
- 2.6 Summary / 44

References / 46

3 INSIGHT AND INTELLIGENCE

- 3.1 Introduction / 51
- 3.2 The Excitement Around Big Data / 52
- 3.3 Information Overload, Asymmetry, and Decision Making / 54
 - 3.3.1 Information Overload / 54
 - 3.3.2 Information Asymmetry / 56
- 3.4 Artificial Intelligence to the Rescue / 59
 - 3.4.1 A Taxonomy of AI Problem Types and Methods / 60
 - 3.4.2 AI Solution Outcomes / 61
 - 3.4.3 AI Solution Methods / 66

51

i.

- 3.5 Machine Learning Using Computational Statistics / 68
 - 3.5.1 Decision Trees / 69
 - 3.5.2 Artificial Neural Networks (ANNs) / 71 Kernel Machines / 74
 - 3.5.3 Deep Learning Architectures / 76
- 3.6 Machine Learning with Natural Language / 78
 - 3.6.1 The "Bag-of-Words" Representation / 78
 - 3.6.2 Sentiment Analysis / 80
 - 3.6.3 Knowledge Acquisition and Representation / 82
- 3.7 A Deep Learning Framework for Learning and Inference / 83
 - 3.7.1 Conceptual Semantic Network / 89
 - 3.7.2 Knowledge Discoverer / 91
 - 3.7.3 Computational Linguistics Engine / 92
 - 3.7.4 Impact Analysis / 95
 - 3.7.5 Formulation of the Impact Analysis Problem / 96
- 3.8 Summary / 96

References / 99

4 THE INTELLIGENT ENTERPRISE OF TOMORROW 109

- 4.1 The Road to an Intelligent Enterprise / 109
- 4.2 Enterprise Architecture Evolution / 113
 - 4.2.1 Technology Evolution / 113
 - 4.2.2 Flexible, Near Real Time Software Development / 121
 - 4.2.3 Machine Intelligence / 122
 - 4.2.4 E4.0 Architecture / 123
- 4.3 Humans versus Machines / 126
- 4.4 Summary / 130

Appendix: A Five-Step Approach to an Intelligent Enterprise / 130 References / 131

PART III REAL WORLD CASE STUDIES

5 ACTIVE ADVISING WITH INTELLIGENT AGENTS 135

5.1 Introduction / 135

- 5.2 The Investment Advisory Market / 135
- 5.3 What Do Investors Really Need and Want / 137
- 5.4 Challenges with High-Touch Advisory Services / 137
 - 5.4.1 Questions of Value and Interest / 137
 - 5.4.2 The Massive "Wealth Transfer" Phenomenon / 138
 - 5.4.3 The Rise of Robo-Advisors / 139
 - 5.4.4 Technology for HNWI's Unique Needs / 140
- 5.5 Active Advising A Framework Based on Machine Intelligence / 140
- 5.6 A Holistic View of the Client's Needs / 142
- 5.7 Summary / 149

Appendix: The RAGE Business Process Automation and

Cognitive Intelligence Platform / 150

References / 151

6 FINDING ALPHA IN MARKETS

- 6.1 Introduction / 153
- 6.2 Information Asymmetry and Financial Markets / 154
- 6.3 Machine Intelligence and Alpha / 157
- 6.4 How Well Does It Work? / 162
 - 6.4.1 Data / 162
 - 6.4.2 Measuring Lead-Lag Relationship / 162
 - 6.4.3 Back-Testing Results / 164
- 6.5 Summary / 167

Appendix: Snapshot of the Operating Model at a Sector Level for the Oil and Gas Industry / 168 References / 168

7 WILL FINANCIAL AUDITORS BECOME EXTINCT? 171

- 7.1 Introduction / 171
- 7.2 The External Financial Audit / 173
 - 7.2.1 Client Engagement / 173
 - 7.2.2 Audit Planning / 173
 - 7.2.3 Fieldwork / 174
 - 7.2.4 Review and Draft / 176

153

i.

- 7.3 An Intelligent Audit Machine / 176
 - 7.3.1 Client Engagement / 179
 - 7.3.2 Audit Planning / 180
 - 7.3.3 Fieldwork / 181
 - 7.3.4 Existence Tests / 181
 - 7.3.5 Rights and Obligations / 182
 - 7.3.6 Substantive Analytical Procedures / 182
 - 7.3.7 Closing Balance Tests / 182
 - 7.3.8 Analyze and Issue Financials / 183
 - 7.3.9 Audit Standards / 183
 - 7.3.10 Workflow/Configuration / 183
- 7.4 Summary / 184

References / 184

INDEX

187