# Technology in Supply Chain Management and Logistics

Current Practice and Future Applications

#### ANTHONY M. PAGANO

Center for Supply Chain Management and Logistics, University of Illinois at Chicago, Chicago, IL, United States

#### MATTHEW LIOTINE

Department of Information & Decision Sciences, University of Illinois at Chicago, Chicago, IL, United States



## Contents

List of contributors		İχ
Ack	nowledgments	xi
1.	Introduction	1
2.	Technologies in supply chain management and logistics	7
	Anthony M. Pagano and Matthew Liotine	
	Introduction	8
	Supply chain business trends	8
	Motivation for supply chain technology investments	9
	Vendor interviews	10
	Supply chain technology areas	11
	Study findings	12
	Summary	30
	Future vision	30
	References	32
	You Tube Videos	33
3.	Impact of exponential technologies on global supply chain	
	management	37
	Unsal Ozdogru	
	Introduction	37
	Literature review	39
	Identification and implications of exponential technologies in global supply chain	41
	Technology adoption	43
	Technology providers	45
	Barriers, challenges, and limitations	49
	Summary	51
	Acknowledgments	51
	References	52
	Further reading	55
	THE PART OF THE PA	

4.	The supply blockchain: integrating blockchain technology within supply chain operations	57
	Matthew Liotine and Don Ginocchio	
	Introduction	58
	How it works	58
	Comparison of blockchain platforms	62
	Blockchain benefits	63
	Use cases in vertical markets	64
	Smart contracts	67
	Supply chain use cases	73
	Blockchain standards efforts	79
	Blockchain caveats	82
	Prescription for blockchain	86
	Summary and conclusion	87
	References	88
5.	Technologies for dealing with error in supply chain planning	91
	William E. Stillman	
	Introduction	92
	Murphy's law	92
	ERP software	93
	Inventory planning by stock-keeping unit level for every location	94
	Science of inventory optimization	95
	The science of inventory optimization components for planning a perfect order	r 96
	Additional essential capabilities of a world-class inventory optimization solution	99
	Key capabilities of a world-class replenishment optimization solution	102
	Operational questions your inventory and replenishment optimization	
	solutions should be able to answer dynamically	106
	References	109
	Further reading	109
6.	Emerging technologies in the health-care supply chain	111
	JoAnn Verdin	
	Introduction	111
	Background	112
	Typical organization of the health-care supply chain	113
	Impact of new technologies on the health-care supply chain	118
	References	125
	Further reading	126

7.	The emergence of new containers in cold chain	127
	Sang Moon	
	Introduction	127
	Concepts for new containers	130
	Impacts of new containers on cold chain	133
	Case studies of the effects of the new containers on the cold chain	137
	Growth potential for controlled atmosphere containers	138
	Conclusion	139
	Reference	140
	Further reading	140
8.	Unlocking digital innovation: guiding principles for driving	
	digital technology in the supply chain	143
	Matthew Liotine	
	Introduction	143
	The digital supply chain	144
	What is innovation	146
	Barriers to innovation	149
	Innovation philosophy	151
	Innovation techniques	153
	Appraising innovation efforts	161
	Innovation roadmap	163
	Innovation culture	164
	Conclusions	165
	References	166
9.	Case studies of supply chain technology implementation	169
	Anthony M. Pagano, Matthew Liotine and William Stillman	
	Introduction	170
	Company 1 results	170
	Company 2 results	171
	Company 3 results	172
	Company 4 results	173
	Company 5 results	174
	Benco dental	175
	Stuller settings	177
	Steel pipe and supply	179
	Conclusions	181

### viii Contents

10.	Technology in supply-chain management and logistics: what does the future hold?	183
	Mellissa Gyimah-Concepcion	
	Introduction	183
	Whats and whys of the change; implications	183
	Top eight supply-chain technology trends for 2018	185
	Supply chain technology: universities and companies	187
	Focus group methodology	188
	Supply chain and technology—now and the future	193
	Conclusion	197
	References	198
Inde	×	199