## **Technology Entrepreneurship**

A Treatise on Entrepreneurs and Entrepreneurship for and in Technology Ventures

**VOLUME 2** 

by Wolfgang Runge



## CONTENTS

PREFACE	<b>v</b> ii
How to Read and Use this Book	<b>xv</b> i
APPROACH	xvii
1. CONTEXTUAL SETTINGS	3
1.1 Setting the Stage	3
1.1.1 Technology Entrepreneurship and New Technology-Based Firms	3
1.1.1.1 Entrepreneurship and Technology Entrepreneurship	8
1.1.1.2 New Technology-Based Firms and Research-Based Startups	15
1.1.2 The Conceptual Skeleton of Entrepreneurship	20
1.2 Systems, Change, Innovation and the Future	32
1.2.1 General Systems Theory and Systems Thinking	32
1.2.2 Outlining Relevant Systems for Technology Entrepreneurship	78
1.2.3 Systems, Intelligence, and Learning	94
1.2.4 The Technology Entrepreneur in Capitalistic Systems	1 <b>0</b> 0
1.2.5 Innovation, Technology, Competition and Growth	., 109
1.2.5.1 Innovation, Its Adoption and Technology Classes	1 <b>0</b> 9
1.2.5.2 Aspects and Perspectives of Value	1 <b>30</b>
1.2.5.3 Industry, Markets, Growth and Competition	137
1.2.6 The Science & Technology System, the Innovation System and New	
Technology-Based Firms	156
1.2.6.1 Differentiating Groups of Technology Entrepreneurs	1 <b>88</b>
1.2.6.2 Technology Incubation, Science or Technology Parks and Clusters	1 <b>97</b>
1.2.6.3 Technology Transfer to Small and Medium-Sized Enterprises	207
1.2.7 The Financial Subsystems in the US and Germany	210
1.2.7.1 Financial Sources for Technology Entrepreneurship	210
1.2.7.2 The Components of the Financing Subsystem for Technology	
Entrepreneurship	223
1.2.7.3 Options for Financing New Technology Ventures	2 <b>4</b> 4
2. THE ENTREPRENEUR AND THE ENTREPRENEURIAL TEAM	255
2.1 The Entrepreneurial Personality	256
2.1.1 Personality and Systems Theory	256
2.1.2 Personality and Behavior	257
2.1.2.1 Psychometric Approaches to Entrepreneurial Personality and Proble	m-
Solving	272
2.1.2.2 Creativity, Imagination and Inspiration for Entrepreneurship	280
2.1.2.3 The Culture Factor	283

•

٠

	2.1.2.4 Education, Age and Work Experience of Technology Entrepreneurs	297
	2.1.2.5 Foundation Motivations – Technology Entrepreneurs and Entrepreneur	Irial
	Teams as Systems	311
	2.1.2.6 The Gender Factor for NTBFs	347
	2.1.2.7 Visions, Missions and Values	352
	2.1.2.8 Ethics in Technology Entrepreneurship	356
	2.1.2.9 Conceptual Particulars of Applied General Systems Theory for	
	Observation, Measurement and Practice	374
	2.2 The Corporate Entrepreneur - the Intrapreneur	382
	2.2.1 Corporate Culture, Shaping Elements and Processes for Intrapreneurs	nip
		388
	2.2.2 Large Firms' Problems with Disruptive Innovation	398
	2.2.3 Bootlegging in Large Firms	403
3.	IDEAS, IDEATION AND OPPORTUNITIES	407
	3.1 Business Ideas and Problem-Solving	408
	3.2 The Idea and the Opportunity	427
	3.2.1 Hierarchies for Segmenting Macro-Trends for Revealing Opportunity	454
	3.2.2.2 Opportunity Evaluation and Feasibility	478
	3.3 Ideation	488
	3.3.1 More on Principles of Ideation: Technological Paths, Combinations and	
	Transfer	495
	3 3 2 The Eugzy Front-End of Ideas	513
	3.4 Specifics for Software Firms and Technology-Based Services	515
	3 A 1 Entrenreneurshin in Video and Computer Cames	531
	3.4.1.1 Comptered AC and Zunga Jon	542
	3.4.2 Special Estrepropeurchin in Brofessional Secial Networks	561
	3.4.2 Special Englehediship in Professional Social Networks	551
	5.4.2.1 Aing AG and Linkeun Colp	551
4.	A 1 Deserved of Superson of Entropyonourship	.007
	4.1 Perspectives of Success of Entrepreneurship	. 559 272
	4.1.1 Fluggen Champions – a German Business Success Conliguration	5070
	4.2 Entrepreneurial Risk-Taking and Decision-Making	500
	4.2.1 RISK Taking	. 390
	4.2.1.1 Kisk-Taking by Customers and Suppliers	.002
	4.2.2 Decision-Making	.003
	4.2.3 The System of Fallures and the Pitfalls for the Start-Op and Early Grow	
	Phase	.017
	4.3 Approaches to New Lechnology Venture Growth	.035
	4.3.1 Life-Cycle Models and Stage-Based Views	.641
	4.3.2 The Initial Architecture and Initial Configuration	.659
	4.3.3 Resource-Based Views	.684
	4.3.3.1 Bootstrapping a Technology Startup	.690
	4.3.4 Cybernetic Principles and Concepts for Technology Entrepreneurship	.695
	4.3.5 A Bracket Model of New Technology Venture Development	.708
	4.3.5.1 The Bracket Model	.718
	4.3.5.2 The Bracket Model for Framing Empirical Observations and Explainin	g
	NTBF Development	.735
	4.3.5.3 Selected Quantitative Applications of the Bracket Model	.770
	4.3.6 Expectations of Growth of Technology Ventures	. 783

.

5 BATHS OF TECHNOLOGY ENTREPRENEURSHIP	810
5.1 Eirm's Foundation of Sustame Dasian	013
5.1 Finnis Foundation as Systems Design	024
5.2 The Startups Evolvements for Growth,	031
5.5 Some Concluding Remarks	040
	64/
NOTES	924
	935
A.1 Entrepreneur, Company and Market Cases	935
A.1.1 The Biofuels Bubble and the Related Outburst of Entrepreneurship a	nd
Intrapreneurship	935
A.1.1.1 The Origins and the Drivers	936
A.1.1.2 The Technologies and Products' Situation	943
A.1.1.3 Intrapreneurship and Entrepreneurship in Biofuels: The Biomass-to	-
Biofuels Boom	951
A.1.1.4 The Special Algae-to-Biofuels Boom	. 1002
A.1.1.5 Structuring Entrepreneurship in Biofuels	. 1051
A.1.1.6 The Shift from Biofuels and Co-Products to Biobased Chemicals as	the 👘
Primary Target of Entrepreneurship	. 1 <b>112</b>
A.1.2 William Henry Perkin and Industry Genesis in the Last Third of the	
Nineteenth Century	. 1133
A.1.3 Structures and Issues of Current University-Industry Relationships	. 1138
A.1.4 Foundation and Development of SAP AG in Germany	. 1146
A.1.5 Entrepreneurship Cases Referring to Ionic Liquids	. 1150
A.1.6 Formalization of Structures of Founder Teams and Architectures of N	lew
Firms	. 1171
A.1.7 Special Networking Effects for Entrepreneurship: The "PayPal Mafia"	.1182
APPENDIX B	. 1191
B.1 Background Information on the NTBF Selections	. 1191
B.2 List of NTBFs and Other Companies Surveyed by the Author	. 1193
B.3 Publicly Available Case Documents of Companies	. 1199
Glossary	1200
Acronyms	1218
INDEX	1225
Company Index	1225
Subject Index	1236

.