Management for Professionals

George Vekinis

The Researcher Entrepreneur

Best Practices for Successful Technological Entrepreneurship

Second Edition



Management for Professionals

The Springer series "Management for Professionals" comprises high-level business and management books for executives, MBA students, and practice-oriented business researchers. The topics cover all themes relevant to businesses and the business ecosystem. The authors are experienced business professionals and renowned professors who combine scientific backgrounds, best practices, and entrepreneurial vision to provide powerful insights into achieving business excellence.

The Series is SCOPUS-indexed.

George Vekinis

The Researcher Entrepreneur

Best Practices for Successful Technological Entrepreneurship

Second Edition



George Vekinis (1)
National Centre for Scientific Research Demokritos
Agia Paraskevi, Greece

ISSN 2192-8096 ISSN 2192-810X (electronic)
Management for Professionals
ISBN 978-3-031-44357-2 ISBN 978-3-031-44358-9 (eBook)
https://doi.org/10.1007/978-3-031-44358-9

1st edition: © The Author 2016

 \odot The Editor(s) (if applicable) and The Author(s), under exclusive license to Springer Nature Switzerland AG 2023

This work is subject to copyright. All rights are solely and exclusively licensed by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Paper in this product is recyclable.

Preface

This book has arisen from the recognition that the process of technology transfer via the setting up of a start-up company, as introduced in my previous book, ¹ frequently comes to a stop or breaks down not because of any particular innate difficulties associated with the new technology but mainly because commercialisation of results (or "exploitation", as it is often called) requires a rather different set of skills and mindset to those needed to conduct good research. This recognition is often not readily obvious to (or appreciated by) researchers and inventors and is particularly evident in the case of researchers attempting the jump to entrepreneurship without adequate preparation. And yet, a good researcher has, potentially, many of the skills needed for good entrepreneurship.

In the previous book, I made a point of (almost) discouraging researchers and inventors from attempting to proceed with the technology transfer (TT) process through their own venture (i.e. a start-up company) as their preferred first course of action. Instead, I argued that they should opt for a collaboration with an existing healthy company which, by virtue of its good standing in its markets, will be in a better position to get the new technology accepted by users. Such collaboration, if possible and if it comes to pass, offers many potential benefits, not least of which is the financial and engineering backing necessary during this crucial early period as well as readily available capability for comparative pilot and field testing.

It remains a fact, however, that this route is not at all easy to follow or to get just right. A large majority of researchers and inventors who attempt technology transfer often feel that they are banging on closed doors and that the "obvious" benefits and competitiveness that their new technology offers (at least, "obvious" as they themselves perceive them) are not appreciated or recognised by potential users. Over time, many become so frustrated by the constant rebuffs and obstacles they encounter that they eventually consider giving up and withdrawing back into the safe haven

¹ "Mastering Technology Transfer: from invention to innovation. A step-by-step guide for Researchers and Inventors", George Vekinis, Springer, 2023. Referred to in this book as "TT Guide".

vi Preface

of their laboratories. This is obviously something which every country tries to avoid; utilisable research results should always find their way to the market or society.

My premise in this book therefore is that, once they have attempted technology transfer via licensing or co-development unsuccessfully, researchers and inventors whose technology is well proven should consider the alternative commercialisation route of *going it alone*, either by setting up a new start-up company or by spinning off one from a university, research centre, or an existing company. After all, if some researchers and inventors have succeeded in establishing and leading successful start-ups, why not others too?

It is this group of researchers and inventors – we may call them *researcher entrepreneurs* – who this book is aimed at. It is true that the difficulties inherent in such a venture are formidable – as attested by the small number of successful technological start-ups. Yet, it is also true that with sufficient support and knowledge of the crucial "dos and don'ts of entrepreneurship" as well as plenty of patience and perseverance, your efforts can pay off handsomely and your own start-up can become one of the success stories.

This book does not purport to offer all the answers. And it is not meant to be a detailed guide on how to prepare, build and run a start-up company. Many good books exist with detailed information and advice on how to set up a start-up company and how to manage the many facets of its operation, from personnel to marketing and sales.

What this book *does* is to consider and discuss many of the *critical aspects* and *questions* that arise both during the preparatory phases and during the early operation of your start-up. Over the course of many years, I have had the opportunity to witness and study the birth and development of a large number of start-up companies, many of which were spun off from research laboratories in an attempt to commercialise research results. As a result, many common misconceptions have become apparent to me, especially on the part of researchers, which seem to crop up time and time again during attempts to set up a start-up. It is these misconceptions and false leads that so often lead to abortive attempts to commercialise otherwise very promising technologies, and it is these which I have tried to clarify in this book. As is so often the case, it is the failures that teach us most of the lessons connected with entrepreneurship. Whether a start-up fails early or late in its (often short) life, such case studies are particularly instructive and therefore many of the chapters in this book draw on real cases that I have had the opportunity to study closely and often be associated with.

In an attempt at brevity, I have deliberately kept the chapters short so as to focus on the most critical aspects that can undermine or facilitate the researcher-entrepreneur's efforts in his or her efforts to leave the lab and become an entrepreneur.

Preface vii

Perhaps you are reading this book to help you make up your mind, or perhaps you are already convinced to "go it alone" and industrialise or commercialise your brainchild via a start-up or a spin-off company. Whatever your motive, I sincerely hope that you will enjoy reading it as much as I enjoyed writing it and that it will help you on your journey to entrepreneurial success!

Agia Paraskevi, Greece July 2023 George Vekinis

The original version of this book was revised, and the author biography has been included in the front matter of the book on Page xi.

Contents

1	Researchers and Entrepreneurship	1
2	Bridging Two Worlds	9
3	Nothing Ventured, Nothing Gained	13
4	Decisions, Decisions	19
5	An Invention Is not an Innovation	25
6	Opportunities Are Everywhere and if There Aren't, Create Them!	29
7	Can You Manage as well as You Research?	35
8	Strong Foundations	39
9	Aim for Perfection	43
10	Strategise like a 5* General	47
11	There Is More than One Way to Rome	53
12	Be Disruptive But Don't Disrupt!	57
13	Think Ahead and Fit the Purpose	61
14	Is Your Financial Base Solid?	65
15	In Agreements We Trust	71
16	Timing Is Critical	75
17	Risk Wisely	81
18	Protect Your Technology But Not Too Much!	87
19	Viability, Not Just Feasibility	91
20	Skilling and Re-skilling	95
21	The Market Is Your Guide	99
22	Position, Position, Position	103

x			Contents

23	Commercialisation Readiness Index	107
24	Obstacles Are Just Challenges	113
25	There Is Always That Little Bit Extra You Can Offer	119
26	Consolidate First, Diversify Later	125
27	Diamonds from Ashes	129
28	Open a Window to the World	135
29	A Final Thought: Proactivity Beats Reactivity Every Time	139
Fur	ther Reading	143

About the Author

Dr. George Vekinis is Director of Research at the National Research Centre "Demokritos" (NCSRD) in Greece. In the past, he served as Director of the Education Office of NCSRD, President of the Researchers' Association, President of the Hellenic Society of Condensed Matter and in numerous scientific committees of various conferences. In the past, he worked as a Chief Researcher at the Council for Scientific and Industrial Research in South Africa and as an associate researcher at the Engineering Department of the University of Cambridge, UK. He is currently teaching post graduate courses in Innovation Management at the Technical University of Crete and in Advanced Materials at the Aristotelian University of Thessaloniki. In the past, he was a visiting professor and speaker to many institutions in Europe, Asia, and the USA, a senior consultant in Technology Transfer and Entrepreneurship for the European Commission and a reviewer and impact assessor of many international research projects. He is the President of AIT SA and has mentored a number of start-up companies. He has published nearly 300 publications, reports, and conference presentations, two monographs on technology transfer and entrepreneurship and a popular science book entitled "Physics in the kitchen."

List of Figures

Fig. 1.1	A simplified flowchart of the <i>research process</i> which by Stage 8 produces a range of feasible solutions to a need or	0
Fig. 1.2	phenomenon	2
Fig. 2.1	The research world is bridged to the business world of the start-up via many critical activities and checks which help to ensure successful technology transfer. These correspond to the activities in Stages 4–8 of the TT process as discussed in the TT Guide	10
Fig. 6.1	Breakthroughs, instabilities, or imbalances are all fertile grounds for new technological enterprises	31
Fig. 8.1	The quality and completeness of the foundation pillars are critical for the success of the enterprise	40
Fig. 9.1	All links in the development and commercialisation chain must be as strong as possible to ensure the integrity of the whole chain	45
Fig. 12.1	(a) A new process (or device, material, etc.) may be used in parallel with an existing process and gradually replace the existing process. No disruption to operations required. (b) A new process may be included in the production as an assisting process, increasing efficiency and eventually replacing the existing process. No or minimal disruption to operations required	58
Fig. 14.1	Various funding sources available for start-ups and associated issues	68
Fig. 17.1	The main categories of risk for technology commercialisation via a start-up company. For more details and SWOT analysis and strategies for analysing, predicting, and handling risk,	
	see the TT Guide	84

xiv List of Figures

Fig. 22.1	Six market positioning dimensions with illustrative examples	
	for three generic technologies: M, advanced material; CG,	
	computer game; S, sensor; VAR, value-added reseller; OEM,	
	original equipment manufacturer	104
Fig. 25.1	Functional convergence analysis to identify potential alternative	
	areas of application of your technology	121

List of Tables

Table 23.1	A scoring matrix to determine your aggregate Commercialisation	1
	Readiness Index (CRI) (scores shown refer to a real case)	108
Table 23.2	The CRI matrix of the case study in Table 23.1 after	
	improvements in design and prototype production ideas	110
Table 24.1	The main sources of operational problems and their main	
	repercussions during the early life of a start-up	114
Table 26.1	A scoring system for deciding the most optimum debut market	
	for your technology. Use zero (0) for "Nothing" and "5" for	
	"Maximum". Scores shown refer to a real case, as discussed	
	in the text	127
Table 27.1	Common reasons for failure of a technology commercialisation	
	attempt and possible responses for remediation	132
Table 28.1	Suggested technology information dissemination channels	
	according to type of technology	136