

INNOVATION, ENTREPRENEURSHIP, MANAGEMENT SERIES

SMART INNOVATION SET



Volume 10

**Innovation, Between
Science and Science Fiction**

Thomas Michaud

ISTE

WILEY

Innovation, Between Science and Science Fiction

Smart Innovation Set

coordinated by
Dimitri Uzunidis

Volume 10

**Innovation, Between Science
and Science Fiction**

Thomas Michaud

iSTE

WILEY

First published 2017 in Great Britain and the United States by ISTE Ltd and John Wiley & Sons, Inc.

Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms and licenses issued by the CLA. Enquiries concerning reproduction outside these terms should be sent to the publishers at the undermentioned address:

ISTE Ltd
27-37 St George's Road
London SW19 4EU
UK

www.iste.co.uk

John Wiley & Sons, Inc.
111 River Street
Hoboken, NJ 07030
USA

www.wiley.com

© ISTE Ltd 2017

The rights of Thomas Michaud to be identified as the author of this work have been asserted by him in accordance with the Copyright, Designs and Patents Act 1988.

Library of Congress Control Number: 2017937108

British Library Cataloguing-in-Publication Data
A CIP record for this book is available from the British Library
ISBN 978-1-78630-130-7

Contents

Foreword	ix
Introduction	xvii
Chapter 1. The Growth of the Imagination in Industrial Societies	1
1.1. A short history of science fiction	1
1.1.1. From Frankenstein to The Island of Doctor Moreau	1
1.1.2. Jules Verne, the founding father of science fiction	3
1.1.3. Albert Robida, a visionary in the shadow of Jules Verne.	6
1.1.4. Hugo Gernsback, from fictional invention to innovation	8
1.1.5. Hard science fiction	10
1.1.6. The cyberpunk movement	12
1.1.7. The biopunk movement.	16
1.1.8. A map of utopic technologies	18
1.2. The imagination, a cognitive barrier useful for innovation	20
1.3. The organizations' use of science fiction	21
1.3.1. Design fiction and the popularization of technological imagination	21
1.3.2. Science fiction prototyping, a method to innovate.	24

1.3.3. Science fiction and the identity of engineering students.	27
1.3.4. The filter-philter theory	28
1.3.5. Institutional science fiction	29
1.3.6. Future Visions: Microsoft's science fiction	33
1.3.7. China's interest in science fiction and innovation.	44
1.3.8. Forecasting and institutional science fiction	47
1.4. The psychology of organizations and science fiction	51
1.4.1. Normal, subversive or pathological imagination.	51
1.4.2. Stimulating creativity with the imagination.	54
1.4.3. Psychiatry and science fiction	56
1.4.4. Freud-Lacanianism and science fiction	57
1.5. Should we organize a patenting system for utopic technologies?.	59
Chapter 2. Technological Ideologies and Utopias	67
2.1. The space industry and technological utopias	68
2.1.1. Imagining the human colonization of Mars	68
2.1.2. Terraforming Mars, a great project that remains fiction	77
2.1.3. The colonization of the universe, the future of humankind?	79
2.1.4. Space imagination in Lucien Boia and the ESA's ITSF report	81
2.2. Transhumanism and science fiction.	84
2.3. Science fiction and nanotechnologies	90
2.4. Accelerationism for a critical use of science fiction	95
2.5. From technological fiction to innovation	96
2.6. Imagining futures, at risk of the Cassandra syndrome	104

Chapter 3. Science, the Imagination and Innovation	109
3.1. The serious global dangers tackled by science fiction.	109
3.2. The great steps in the history of technologies since the end of the 19th Century	116
3.3. Economic cycles and science fiction	121
3.4. Theories on innovation and theories on the imagination	124
3.4.1. Performative imagination and the creation of cyberspace	133
3.4.2. From science fiction to techno-scientific innovations: virtual reality headsets	134
3.4.3. The imagination before, together with and after science	135
3.4.4. The hypothesis of a basic imagination at the root of science	136
3.4.5. From the prophetic unconscious to the technological imagination	137
3.4.6. Historical dynamics and technological utopianism	138
Conclusion	141
Bibliography	149
Index	169

Foreword

The significance of such fields as the innovation sector can be gauged, among other things, by the existence of *Handbooks* (thus, an encyclopedic work) that tackle questions concerning the creation of innovations in relation to organizations and networks, the role of institutions, the variation of the phenomenon over time and according to the lines of business, its place within the process of economic growth, competitiveness on an international level and its impact on employment, the nature and importance of innovation, and strategies and practices used to benefit from its effects from an organizational standpoint. This is done by dealing with the classic problems related to R&D management, intellectual property, creativity as well as design, social networks, social innovation, open innovation, innovation in business models, innovation ecosystems, innovations in the service industry, innovation platforms and the importance of innovation in terms of environmental sustainability.

Nowadays, innovation is a central discourse, with its sentimental “maps”, its “good shapes” (among which the unusable “S-curve” and the naturalism of its declinism), its univocity (in this sense, innovation is identified as success) and therefore its fictional stories (innovation then becomes closer to science fiction and differs from tradition in this

respect). It is also common to mention an obligation in today's world to permanently innovate, which is regarded as a prerequisite for survival ... is it a sort of rationalizing implementation of the improvisation inherent to human actions? Is it a program of a better world in the eyes of tradition, which finds meaning in the past?

Innovation belongs to the family of “portmanteaux”, given how diverse its related meanings are. As for the root of the word – new – the issue we must tackle involves finding out the aspects to which innovation is discussed in relation to: figures (the client, the organization, etc.), an existing situation or uses. Innovation differs from technological assimilation, despite the close interface between these two notions, highlighting thus a technology which is regarded as “high” and yet, lest we forget, is not opposed this way to a technology that may be considered “low”.

Innovation also differs from the notion of “creation”, even if we should point out its inherent vitalistic perspective, which is a way of validating innovation as a form of quiet transgression. In its vitalistic sense, innovation is defined by the idea of a contingency aimed at the restrained socialization in place within the organization. It is in this sense that referring to the process of creation led first to the logic of linear innovation models (from the idea to the product...), resulting today in interactionist and diffusion-centered notions of innovation. In both cases, the assimilation is entrepreneurial and involves a sort of confusion (first-degree confusion – passive fusion) of three figures: the creator, the innovator and the entrepreneur. In terms of current ideological discourse, innovation is also a justification of the income of the companies that are ruling the world (see the staggering margins of the “GAFA”).

Innovation also involves the issue of the desire to innovate together with the “entrepreneur” and “risk” tension that

refers to the entrepreneur anthropology put forward by J. Schumpeter and to a push-technology theorization of innovation. In this context, innovation will involve an approach that reduces uncertainty by converting it into risk. This is the vision that generates innovation. Vision implies “seeing clearly”, which also represents a definition of managerial will in the way it blends judgment in terms of existence (sight is what makes vision possible and the breadth of vision will depend on the focal distance) and value (innovation is the expression of a visionary perspective that includes the idea of temporal projection). This mixture follows, in this regard, the religious inspiration linked to the idea of mission and its associations with guidance, unlike political logic! However, vision is also a resilient guide: it varies in the face of significant changes (or at least it is supposed to do so). Vision is a word that derives from the verb “to see”, but within a temporal context: a vision implies seeing into the future and not only in space. Coupled with a rationalist logic, vision is simultaneously the representation of a desirable as well as possible future, namely a sort of “clairvoyance”. In this sense, vision produces a representation by encouraging us to focus our energy on making this vision become a reality.

As the foundation of a projective logic, innovation happens to structure a discourse. It is in this sense that *success stories* (iPod, iPhone or, further back in history, the Twingo, the Post it, etc.) proliferate. These “stories” are defined by how they highlight a mixture of structural–organizational constraints (which “stifled” the innovative potential unleashed by the project), intuitions, essentially collaborative relationships and the benevolent attitude of general management. The organizational subset forms a system with the rest and gives the impression (at least, this is what emerges from these stories) of ending up involving everything else in its dynamics. It is also in this respect that innovation happens to found an organizational (rather than

financial) version of performance. The other success stories in the field are those that confound innovation and business with such iconic symbols as *Zodiac*, *Tefal*, *Rossignol*, etc. Everything about them is described as “the best”: management, skill, human resources, profitability, market suitability and image. It is in this context that innovation becomes “organizational culture” or even culture in general, ignoring the theme of the possible (or impossible) overflow of jobs from one sector to another, where we once again come across the learning issue, which, however, includes here its social dimension, and the tensions specific to the dynamics of innovation (see the disappearance of “small businesses”).

This work regards innovation as a discourse – the discourse of science fiction. However, it also highlights its performative dimension, namely its natural ability to create those elements of reality that fit into the logic of the discourse. This is the reason why the author regards innovation as a discourse in the sense given by J. L. Austin (*How to do Things with Words*), which can thus be understood as:

– a propositional (or locutionary) act where the desire to innovate derives from the expression of managerial will;

– an illocutionary act (what is done concurrently with what is said – promise, command, desire) whereby innovation differs from tradition;

– a perlocutionary act (what we produce concurrently with what we say, for example, intimidation), which is to linguistics what self-fulfilling prophecies are to epistemology and organizational sciences. Innovation is then the “creation” of something but also “transgression”.

However, let us recall Austin's types of failures of performative acts with:

– failure, as the act is intended but empty and therefore unfulfilled, owing to the unsuitable reference to a procedure, an undue demand of forbidden acts, but also a practical failure (a botched execution);

– the abuse of a fact of a fulfilled but insincere act.

Failures are most often hidden in the sagas of innovation. With innovation, links between “discourse” and “action” are established, since innovation may be regarded as an “organizational discourse”.

If innovation has to do with a vitalistic perspective, as it has been underlined at the beginning of this work, we must then highlight its evolutionary and selectionist dimension, namely its inherent transgression, on which its specific superiority is therefore based: it is because we innovate that we contribute to the development of society and it is also because we innovate that we better adapt. In both these cases, we can certainly find the logic of science fiction. Innovation is generally considered the manifestation of an evolution (perceived as “positive” but also “progressive”) and, through another conceptual lens, a form of learning. Innovation, just like science fiction literature, relies on the quest for “selectionist” features.

This is also the case for the “innovation – change” interface. Alter¹ represents innovation as a change while also encouraging us to distinguish between “change” and “movement”. According to him, innovation is based on three types of logic: intuition, a notion of good (a “positive” belief) in line with intuition and social recognition, as intuition and imitation play a key role in its adoption.

1 [ALT 03].

In terms of organizational change and innovation, the concept of stability is relegated to second place, in favor of the notion of change, and represents a sort of blind spot of the latter concept. The praise of change as the fruit of innovation, which very often becomes a reality, is then structured against stability and permanence, regarded as inertia. Like innovation, change may be represented in the categories of evolution (it is then seen as an incremental process) or revolution (we refer then to “rupture”). However, with rupture, from an organizational standpoint, we refer more to the idea of “cutting” (which then leaves us the possibility of keeping something – at least a trace of coordination) rather than breaking (in this case nothing would remain, as breaking has more to do with the “clean slate” syndrome). We are also dealing with the issue of permanence, another version of stability, in the face of the impermanence that governs change ... unless this permanence is the permanence of change. Can change only be interpreted in relation to what remains the same? That which is left unchanged constitutes what remains intact. Thus, this is what raises the issue of knowing in which respects change leads to something different.

In relation to innovation, organizational change is very often coupled with organizational learning and each of the two perspectives relies then on the other, while both strengthen each other. Learning is a requirement for the responsiveness to change. The innovating and learning character of an organization is all the more marked as the organization is able to foster some learning. This approach favors interactions, continual adaptations and reconsiderations that stimulate “double-loop” learning. It allows an organization to develop and change the way it works in order to integrate new processes, compatible with its culture, systems and structures.

The point of this work is to consider innovation at the interface of “science” and “science fiction”. In this sense, this book contributes to the ontology of innovation, a notion that is nowadays very often highlighted. Placing innovation between “science” and “science fiction” means making room for the imagination in relation to two types of logic, a discursive and an ideological one. This is the reason why the role of innovation is justified in relation to the milestones of science fiction literature mentioned by the author. The notions of ideology, utopia, myth and imagination are highlighted, and it is shown how science fiction (especially in its cyberpunk and biopunk versions) can lay the imaginary foundations of innovation.

This demonstration underlines the significance of this underground universe, which is in most cases concealed, as well as the ambiguousness of its actors, leading the reader into this living world of multiple and inspiring references. The ways in which science fiction structures innovation are described. The imaginary narrative built by science fiction contributes to the ontology of innovation. Science fiction, especially its cyberpunk strain, significantly lays the foundations for the diffusion of utopic technological representations for engineers and managers. According to the author, science fiction certainly represents an ideology as well as a mythology.

Therefore, let us hope that this work, which has opened new perspectives in terms of how innovation is usually considered, will not be forgotten.

Yvon PESQUEUX
Professor of “Development of
Organizational Systems”
CNAM

Introduction

Innovation starts complex processes that involve the imagination on different levels. Although it is difficult to say which scientist or science-fiction writer is behind an innovation, every new technology or product is part of the imagination that goes hand in hand with its invention, origin and diffusion. Science existed before science fiction, yet the latter is increasingly mentioned by businesses and organizations when they present or justify investments or strategic policies. Although science fiction has spread scientific discoveries for a long time, while also enhancing them through utopic and futuristic technologies, it has become one of the driving forces of the dynamics of capitalism. Science-fiction creativity belongs to an age that uses storytelling to manage and publicize its innovation policies. How can we explain the tendency of the global productive system to make the impossible, namely science fiction, possible?

The belief that science fiction has the gift of prophecy is widespread among certain fans, some of whom try to unlock the secrets of the future by reading these stories. It is challenged by other more rational actors, who think that it may at best accompany the diffusion of prototypes of inventions and consider the uses and practices related to scientific discoveries or promising inventions. The debate

about the prophetic function of science fiction will be discussed in greater detail further on. What is, however, the impact of the imagination on the way the economy works, and particularly on the unfolding of the economic cycles brought about by innovations? The imagination, be it Max Weber's religious imagination or a technical type of imagination, plays a significant role in the creation of individual and collective identities. A society must unite the population around imaginary representations in order to be stable. In societies with a long history, this imagination revives the memory of great events or men. In young societies, like the USA, the social contract pivots on representations of the future, namely of a planned history still to be written. If it is often said that it is the winners who have the right to write history, for the USA this becomes a legitimacy to plan a global future achieved following the country's involvement in 20th Century conflicts. American hegemony relies in part on the dissemination of futuristic stories that foreshadow the great techno-scientific challenges to come. Science fiction reveals the dreams of nations or organizations. It is significant that it was invented in France [STA 16] and Great Britain during the industrial revolution, when these two powers were ruling the world, thanks, in particular, to their colonial empires. Americans have laid claim to this art of anticipation while creating a hegemonic power. Science fiction celebrates the values of a global order ruled by the USA. It is commonly believed that it has heralded most of the great innovations of the 20th Century. However, some great authors, such as Neal Stephenson, have lamented over the past few years that science fiction is producing a large quantity of dystopic works, as if now it could only describe a nightmarish future – evidence of a present society in jeopardy. What if science fiction, which has existed for around two centuries, could no longer dream of futures that have for the most part become a reality? We will consider how this genre may be plagued by a

period of doubt and be in a creative lull, at the end of a cycle dominated for 30 years by the cyberpunk movement, and at the beginning of a new era that is still to be imagined. It is also likely that the success of transhumanism, which represents the ideological apotheosis of science-fiction imagination, raises issues about its role in the process of innovation and the possible dangers related to a neo-technocratic recovery of its futuristic inventions.

If science fiction is the product of industry and science, it has progressively become more autonomous, putting forward the perspectives that are relatively or completely unexplored and useful for processes of innovation that increasingly use the imagination.

The histories of technosciences and science fiction are closely interconnected, so much so that some sectors, like the space industry, IT and ICT openly accept their relationship with a kind of imagination that is, however, morally condemned by the greatest thinkers and philosophers. The industrial revolution also entailed the creation of a system suitable for the development of these types of imagination, especially with the invention of cinema, television and the Internet. Democracies are using it as fuel necessary for the expression of organizations and individuals.

Science fiction is known for its description of future scenarios. Most of its stories depict the future, thus raising the issue of its prophetic function. Imagining the future is also necessary for those organizations and societies whose social contract relies on innovation. Innovating means creating the future. Consequently, is science fiction actually prophetic? Does it really foreshadow the most innovative scientific discoveries and technologies? If so, does it favor the capitalist system, or should we dread the advent of a Promethean science potentially harmful to humankind? Scientists occasionally acknowledge the influence of science fiction on