

Dmytro Shestakov

When Businesses Test Hypotheses

A Four-Step Approach to Risk Management for Innovative Startups

With a foreword by Anthony J. Tether

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The book series “Ukrainian Voices” publishes English- and German-language monographs, edited volumes, document collections, and anthologies of articles authored and composed by Ukrainian politicians, intellectuals, activists, officials, researchers, and diplomats. The series’ aim is to introduce Western and other audiences to Ukrainian explorations, deliberations and interpretations of historic and current, domestic, and international affairs. The purpose of these books is to make non-Ukrainian readers familiar with how some prominent Ukrainians approach, view and assess their country’s development and position in the world. The series was founded, and the volumes are collected by Andreas Umland, Dr. phil. (FU Berlin), Ph. D. (Cambridge), Associate Professor of Politics at the Kyiv-Mohyla Academy and an Analyst in the Stockholm Centre for Eastern European Studies at the Swedish Institute of International Affairs.

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Foreword

This book bridges theory with actionable tenets of hypothesis testing. The author delves into the nuances of maintaining agile flexibility, reimagining capital deployment, and the art of timely pivots amidst unfolding startup uncertainties. The narrative, peppered with real-world startup sagas, ensures readers can vividly see the application of each principle.

Dmytro Shestakov's "When Businesses Test Hypotheses: A Four-Step Approach to Risk Management for Innovative Startups" is a compass for the startup brigade that will guide them through the modern entrepreneurial journey.

Dr Anthony J. Tether

Former Director of the U.S. Defence Advanced Research
Project Agency (DARPA)

Annotated Table of Contents

The Strategic Flexibility of Startups

This chapter delves into understanding the management concepts of innovations, particularly in the context of businesses and startups. It gives a clear distinction between innovative projects, products, processes, affiliated uncertainties, and risks, ensuring that readers have a comprehensive understanding of each concept and a holistic picture of innovative startup risks. The challenges businesses face when evaluating innovative startup projects using traditional valuation methods, such as Discounted Cash Flow and Real Option Analysis, are discussed, along with the need for managerial flexibility to navigate these complexities. The chapter sets the stage for introducing the Hypothesis Testing Framework presented in Chapter II, offering a more practical and effective approach for managing and accessing the strategic flexibility of innovative business projects.

Innovation and Startup Management

The author clearly differentiates between innovations, regular products, and innovative products and projects, emphasizing the importance of understanding their unique features and management abilities in today's competitive business environment. Gaining a solid understanding of these differences is vital for successfully dealing with the challenges associated with innovative ventures. The author clarifies the methodological approach necessary for innovation project management, emphasizing its importance as a foundation for effectively overseeing the success of startups and other innovative projects. In doing so, the author provides a well-defined classification system for various aspects of project management, including project, innovation, innovative, technology, and innovation project management.

This taxonomy enables a thorough analysis of the differences between several traditional concepts, ultimately helping business professionals better understand and navigate the complexities of managing innovative ventures.

Evaluating Uncertainty and Risks

The author looks at the challenges of using traditional methods to evaluate innovative startups and examines the concepts of uncertainty and risk in depth, taking into account their various types and the associated opportunities that may arise in business situations. In the discussion of this book, the challenges of differentiating between general market uncertainty and specific uncertainties that businesses face in the real world are explored. The author also delves into the strategic approach of intentionally addressing and managing specific uncertainties by leveraging a company's unique, proprietary knowledge as a means to gain a competitive advantage. This comprehensive analysis highlights the crucial importance of understanding and effectively dealing with uncertainties in the realm of business, particularly when navigating the complex landscape of innovative products and startups.

Applied Logic of Real Options

The author demonstrates the logic behind real options by examining a straightforward business case, shedding light on how managerial flexibility operates in practice. Thus, by explaining the main types of options and their relevance to managing startups, the author also emphasizes the value of real options as a tool for entrepreneurs navigating the uncertainties associated with innovation. The in-depth exploration presented in this book equips entrepreneurs and startup product managers with the knowledge to make informed decisions and react nimbly to rapidly changing market conditions and manage the dynamic challenges of fostering and scaling innovative ventures.

Differentiating Innovations

The author delves into the various classifications of innovation, seeking to clarify and resolve inconsistencies by offering a well-rounded understanding that encompasses multiple aspects. This approach includes examining innovation in terms of types, levels, degrees, centricity, and dimensions such as modular and architectural, sustaining and incremental, disruptive, breakthrough and radical, demand-side and supply-side, as well as business-model and technology innovations.

The author also underscores the limitations of popular methods such as design thinking and the stage-gate model, implying that a more complex approach to understanding innovation is crucial for thriving in today's competitive business landscape. Thus, by addressing these distinctions and presenting a comprehensive taxonomy, the author aims to provide entrepreneurs with a valuable tool to better identify, navigate, and capitalize on different types of innovation. This clear and concise framework allows businesses to strategically position themselves in the market, tailor their approach to innovation management, and ultimately drive growth and success in an increasingly competitive landscape.

The Hypothesis Testing Method

This chapter presents the Hypothesis Testing Method in detail, explaining the four-step process that allows businesses to assess the potential success of innovative products while accounting for various development stages and inherent risks. The author underscores the critical role of evaluating the strategic flexibility of startups by introducing the hypothesis testing framework and demonstrates its applicability and relevance in various business scenarios. In addition, the chapter discusses the issues of mathematical accuracy and subjectivity that may arise when using the hypothesis testing method and advocates for adjusting

risk evaluations using benchmark multipliers and internal rate of return (IRR) logic.

Assessing Strategic Options

The author analyses the pitfalls associated with customer-centricity, product commoditization, and differentiation challenges. This section discusses the assessment of strategic flexibility using well-known conventional methods such as Discounted Cash Flow (DCF), Decision Tree Analysis (DTA), and Real Options Analysis (ROA). This book section emphasizes the drawbacks of these techniques in accurately capturing the risks linked to innovative startups, explaining the shortcomings through the lens of deterministic cash-flow approaches, contingency logic, capital-at-risk perception, and both classic and risk-neutral probabilities. The author makes a strong case for the necessity of an alternative method that more effectively addresses the distinct challenges and uncertainties inherent in the innovation process.

The Hypothesis Testing Framework

The author emphasizes the necessity of moving from a limited product-centric mindset to a more comprehensive view that encompasses the entire project lifecycle and incorporates flexibility as a core aspect. This framework sheds light on and provides a comprehensive understanding of the nature of innovation in startups by introducing five principal hypotheses that can be further broken down into specific assumptions, which exhibit convexities and overlap as the project progresses, contingent upon the degree of innovativeness. A detailed comparison is provided between the Hypothesis Testing Method (HTM), Stage-Gate Model (SGM), and lean approach, highlighting their key distinctions in the context of proactive, agile, iterative, and incremental decision-making processes that are crucial for managing and evaluating innovative projects effectively.

Four-step Hypothesis Testing Method

The author outlines a four-step process for evaluating the appeal of an innovative product, factoring in its development and implementation stages, as well as the associated risks. This approach is demonstrated by examining an investment case involving a disruptive startup in its initial idea stage. By following this four-step process, entrepreneurs and managers can gain a better understanding of the potential success of their startups and make strategic decisions that maximize the chances of achieving their business objectives.

The author also tackles the concerns of mathematical accuracy and subjectivity in the multiplier approach used in the case study above within the context of high uncertainty of innovations. Two perspectives are explored to mitigate this subjectivity: Analyzing market depth using the TAM-SAM-SOM approach and determining the required rate of return adjusted for risk. The discussion acknowledges the challenges in finding benchmark revenue multipliers for startups and introduces the concept of Internal Rate of Return (IRR) to calculate risk-adjusted growth multipliers.

Startups and Economic Prosperity

In this chapter, the author investigates the role of innovation-driven economies in fostering postwar recovery and the significance of startups and venture capital industries in promoting economic growth. The Silicon Valley role model is discussed as a methodical and scaled example of successful economic development. The HTM is considered a potential catalyst for the systemic development of innovation ecosystems and startups, especially in countries facing postwar economic recovery. By connecting the book's central theme of strategic flexibility in innovative startups to real-world business scenarios, this chapter

demonstrates the broader implications of applying the HTM, ultimately showcasing its value for businesses and startups alike.

The Secret Sauce of the Israeli Miracle

The essence of the Israeli miracle, as an innovation-driven economy and postwar recovery, is examined in the context of fundamental ecosystem development. The author highlights the crucial role of startup and VC industry predecessors and their innovative project focus, such as the United States Defense Advanced Research Projects Agency (DARPA), the Israeli Maf'at Agency, and the Office of the Chief Scientist. This analysis underscores the importance of fostering a strong innovation ecosystem and the significant impact that government-backed initiatives can have on driving economic growth and recovery in challenging circumstances.

Piloting Silicon Valley

The author delves into the establishment of the United States DARPA and the proliferation of the triple helix model as one of the most significant and transformative economic development frameworks of the 20th century. This model contributed to the emergence of Silicon Valley and facilitated the transition from closed, centralized innovations to an open-centric approach that promotes collaboration, idea networking, and coopetition. By fostering the development of a conducive infrastructure, the triple helix model has become instrumental in driving innovation and reshaping the business landscape, enabling organizations to thrive in increasingly competitive markets.

Postwar economic recovery

The author examines the economic progress of Ukraine prior to the large-scale Russian invasion in February 2022, focusing on the country's shift toward an innovation and knowledge-driven economy. This transformation was propelled by the exceptional

growth of startup and IT ecosystems, which played a crucial role in transitioning from an oligarch-dominated system to an entrepreneurial one. Implementing the HTM is seen as a catalyst for the systematic development of innovation ecosystems and startups, particularly vital for postwar economic recovery. The author emphasizes the importance of further research on this topic to better understand its implications and potential benefits for future economic development.