Editorial: Frugal Innovation

Chris McPhee, Editor-in-Chief
Deepak S. Gupta, Guest Editor
Mokter Hossain, Associate Guest Editor

From the Editor-in-Chief

Welcome to the April 2018 issue of the *Technology Innovation Management Review*. This month's editorial theme is Frugal Innovation, and it is my pleasure to introduce Guest Editor **Deepak S. Gupta**, Executive Director of Applied Research, Innovation and Entrepreneurship Services (ARIES) at Centennial College in Toronto, Canada, and Associate Guest Editor **Mokter Hossain**, Assistant Professor in the Center for Industrial Production at Aalborg University, Denmark.

For future issues, we are accepting general submissions of articles on technology entrepreneurship, innovation management, and other topics relevant to launching and growing technology companies and solving practical problems in emerging domains. Please contact us (timreview.ca/contact) with potential article topics and submissions, and proposals for future special issues.

Chris McPhee
Editor-in-Chief

From the Guest Editors

Frugal innovation embodies human ingenuity in its rawest, unrefined form. It is a recognition that every human being is capable of innovation, no matter their education, experience, wealth, or access to networks.

Millions of people around the world continue to live in poverty without access to basic resources. Frugal innovation leads to home-grown solutions using local resources to address fundamental needs. It leads to transformational change, enabling people to achieve things they have never done before. Multinational, small firms, and individuals are developing frugal innovation. The quality and number of frugal innovation developed in emerging countries are increasingly significantly.

The frugal innovation concept overlaps with a number of concepts, such as reverse innovation, disruptive innovation, "Jugaad" in Hindi, grassroots innovation, catalytic innovation, and Gandhian innovation. Frugal innovation represents innovation at its democratized finest. It is driven by the direst necessity and often empowers not just millions but also billions of humans. Examples of frugal innovation include the lunch box delivery system developed by Mumbai's "dabbawala" or corporate frugal innovation, such as GE's Ultrasound machine and Tata's Nano – the cheapest car in the world.

Frugal innovations result in the ultimate "minimum viable products". The existing literature indicates that frugal innovations are more sustainable than alternatives (Levänen et al., 2016), diffuse from emerging countries to rich countries (Hossain et al., 2016), and need different business models (Winterhalter et al., 2017).

However, despite substantial recent interest in the topic among practitioners and scholars alike, frugal innovation is in a state of infancy from a theoretical perspective and lacks systematic approaches in practice. In this special issue, the authors offer differing perspectives on the topic while sharing a common call for

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reflection on our current approaches – especially in light of frugal innovation's potential for greater inclusivity and sustainability – and the development of new, systematic approaches that rely on scientific principles and pattern identification.

In the first article, **Mario Pansera** from the University of Bristol in the United Kingdom calls on us to critically reflect on the existing body of literature on frugal innovation, which he argues has not yet delivered on its promise for two reasons. First, the literature's emphasis on the role of scarcity neglects the fact that "scarcity can be socially constructed to deny certain social sectors the access to resources essential for their flourishing". Second, the frugal innovation literature rarely even mentions the underlying causes of the problems it seeks to address, particularly poverty, which is a matter of social justice. He calls for a new wave of frugal innovation literature and practice that engages with the complex politics of poverty and resource allocation.

In the second article, **Anne-Christin Lehner**, **Christian Koldewey**, and **Jürgen Gausemeier** describe their pattern-based approach to developing frugal innovations, which is based on their work at the Heinz Nixdorf Institute of the University of Paderborn, Germany. Their approach is based on a simple assumption: given that different contexts share similar challenges in the development of frugal innovations, we can expect to find similarities in the resulting solutions. The search for solution patterns lies at the heart of their systematic approach, which they describe and validate in this article based on the example of a telemedicine assistant system.

Next, **Hareem Arshad**, **Marija Radić**, and **Dubravko Radić** from Leipzig University in Germany identify patterns among 50 frugal innovations in the healthcare sector. They classified various characteristics of each innovation, such as the country of origin, first launch market, type of innovator, type of innovation, type of care, and geographic diffusion. By examining the identified patterns and discussing the relationships between these variables, they provide a future outlook for the study and practice of frugal innovation in the healthcare sector.

Then, **Mirva Hyypiä** and **Rakhshanda Khan** from Lappeenranta University of Technology, Finland, focus on the development processes for frugal innovations in small and medium-sized enterprises (SMEs). They present a case study of three Finnish SMEs developing mobile learning services for Brazilian markets as part of a development project that leverages action research. Their findings highlight the barriers such companies face in developing frugal innovations for emerging markets, and they suggest how SMEs can overcome these barriers through a broader emphasis on frugality – not only in their products and services, but also in their development processes.

Finally, **Balkrishna C. Rao** from the Indian Institute of Technology Madras applies the "factor of safety" concept to the field of frugal innovation as a means of improving both grassroots and advanced frugal products by grounding their development processes in systematically applied scientific principles. He argues that many frugal innovations suffer from limited lifespans due to premature failure and offers a "factor of frugality" design approach to help overcome such limitations and yield the desired benefits of frugal innovations to business and society.

We hope that this special issue will contribute to a maturation of the study and practice of frugal innovation, including the eventual development of conceptual frameworks for broader adoption to advance towards a more sustainable and inclusive future.

Deepak S. Gupta, Guest Editor
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About the Editors

Chris McPhee is Editor-in-Chief of the *Technology Innovation Management Review*. Chris holds an MASc degree in Technology Innovation Management from Carleton University in Ottawa, Canada, and BScH and MSc degrees in Biology from Queen's University in Kingston, Canada. He has nearly 20 years of management, design, and content-development experience in Canada and Scotland, primarily in the science, health, and education sectors. As an advisor and editor, he helps entrepreneurs, executives, and researchers develop and express their ideas.

Deepak S. Gupta is the Executive Director for Applied Research, Innovation, and Entrepreneurship Services at Centennial College in Toronto, Canada. Previously, Dr. Gupta has worked at NAIT, Pella Corporation, and at the University of South Florida. He has co-founded two companies, and advised several others. Dr. Gupta has a Bachelor of Technology (Honors) degree from the Indian Institute of Technology, Kharagpur, India. His masters' and doctoral degrees in Chemical Engineering are from Washington University in St. Louis. He has co-authored 31 publications, including papers, technical reports, conference proceedings, and a book chapter. His research contributions range from composites processing to smart sensors to new control algorithms. Dr. Gupta is a professional engineer, and a member of Institute of Electrical and Electronics Engineers (senior member status), Sigma Xi, Indian Institute of Chemical Engineers, and Tau Beta Pi.

Mokter Hossain is an Assistant Professor at the Center for Industrial Production, Aalborg University, Denmark, and he a Visiting Scholar at the Institute of Strategy and Venturing in the Department of Industrial Engineering and Management at Aalto University in Finland. He was a post-doctoral researcher at Imperial College London and at Aalto University after graduating with a Doctor of Science degree in Technology and Knowledge Management in 2016 from Aalto University. His research interests include innovation, strategy, and entrepreneurship. He has published over 35 journal articles, book chapters, and conference papers on a range of research topics, including open innovation, crowdsourcing, crowdfunding, frugal innovation, reverse innovation, grassroots innovation, and business model innovation.

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