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Emerging Technologies for Emerging Markets

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John Vong—*Devon, Neuman, and Susan*
Insu Song—*Yi Pin, Lulu and Cisu*

Foreword

The potential of nations—how successful they may be—is largely determined by just three factors: geography, demographics, and technology. How well the nations achieve their potential is largely dependent on only two factors: economic policy and political culture, for they dictate how talent is gathered and developed to deliver success for the nations.

Technology is a major enabler of success. It can overcome geographical limitations. It can turn the table on destabilizing demographics, whether it be a population with low literacy, or an aging population. Technology allows a “leapfrogging” over the barriers created by geography or anthropologised by demographics. Thus it has particular importance for developing countries, which need not be constrained to follow the same developmental path as today’s developed countries, but can instead leapfrog with the emergence of new, more efficient, and more effective technology applications.

The subject of emerging technologies for emerging markets offers critical insights and opens unbounded possibilities on what developing countries can become, and how they can speed-up to get there. To anticipate these emerging technologies is to position a nation well for the unfolding opportunities. This is what makes this reference book for business and technology particularly significant and useful.

The authors have uniquely focused their research on the things hoped for, but are as yet unseen. Their discourse looks at the current and postulates toward the future. The result is a book which is immediately useful for those whose focus is to create the future rather than take incremental steps from the present. It is for those who want to move early and quickly, and to do it not in a haphazard manner but with thoughtful understanding and purposefulness.

The discourse can be read from many aspects. From the education standpoint, the smart technologies discussed follows an education track often referred to as STEM – science, technology, engineering, and mathematics. These are the important subjects to be taught at schools, and to be inspired by teachers, to ensure economic progress in rapidly developing countries. The knowledge of STEM sets the foundation for real goods and services to be produced.

From the technology innovation perspective, the book introduces low-cost ways to deliver the most basic and necessary services to society. This idea rests on frugal innovation, an appropriate terminology for emerging economies, where capital is scarce and risks are high. Yet this is not a book on theories of technology. It dives immediately into applications of technology using frugal approaches to empower communities for a sustainable society. The focus of the technology applications is on education, health, and financial payments, which are the most critical enablers for developing countries to create opportunities for improving the lives of their citizens.

The authors have cleverly woven these different aspects together to call their book *Emerging Technologies for Emerging Markets*. It makes interesting and important reading for technopreneurs, inventors, angel investors, development specialists, and public policy makers to bring rapid progress to many nations. The policy makers of emerging economies should carefully consider the implicit or explicit recommendations of this book because they offer real insights into making things happen, bring progress, and create a differentiation from countries that are simply expecting or waiting for things to happen.

Finally, I take particular pride in noting that this book is being written, published, and launched in Singapore. Once an emerging economy, Singapore, by embracing technology under a bold and forward-looking leadership, is a living example of what and how a nation can deliver, over a space of just 50 years, on the standards of living and the levels of education, health, and financial services, which much of the world wonders about and hopes for.

Lim Siong Guan
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Preface

Many thought leaders have articulated that, within the next 10 years, the emerging markets will be deeply influenced by emerging technologies such that business operations, societal interactions, and the geopolitical landscape will be significantly changed. These emerging technologies are related to information technology, wireless data communication, man–machine communication, on-demand printing, bio-technologies, and advanced robotics. The emerging markets, regardless of how they may be called—BRIC, BRICS, or BRIICS—will be the main consumers of these new technologies. The markets will, in return, offer ideas to influence technological innovations that are more affordable. By then, firms may have to shift their product development, sourcing and marketing functions to these emerging markets to reap the benefits of affordable innovations. These new technologies and innovations are likely to focus on the three pillars of economic and social developments—financial services, health, and education—due to the multi-cultural settings and demographics of the population in the emerging markets.

There are three trends that challenge the stability of economic and social development in the emerging markets. The first trend is the rising cost of financial services. It will come at a time where only the wealthy are able to have a bank account. The current service charges levied by financial institutions to transact, transfer, and make payments are high enough to push customers away to more cost-effective alternatives. The unbanked populations, which may be as high as 80% of the total national population in emerging markets, living at the base of the pyramid, need access to affordable financial services. The second trend is the rising cost of public and private health services, which has become a deterrent for many to seek medical care. Alternative low-cost approaches for conducting a diagnosis, recommending a prognosis, and providing therapy have to be found. The third and last trend is the huge demand place upon the education systems that will rise with population growth. Students and parents will increasingly face the escalating cost of education.

The authors have dedicated their lives to research on emerging technologies that will drive the sustainable development and growth of emerging markets. The authors strongly believe that these technologies will innovate in tandem with

the growth of the emerging markets. Furthermore, the focus of the new technologies will be related to financial services, health, and education. The technologies discussed in this book are affordable, easy to implement, and frugal. For these reasons, the audience for this book is likely to be like-minded people who intend to infuse such technologies and their applications into these rapidly growing markets. Based on the three trends stated above, they are presented in 14 content-filled chapters: Financial Services (Chaps. 2–6), Healthcare (Chaps. 7–10) and Education (Chaps. 11–14).

The authors hope that this book will inspire the creation of new technologies and frugal innovation. Hopefully, it will ignite a creative spark in research and development directed towards emerging technologies in emerging markets.

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We are grateful to all who have reviewed, edited, proofread, and formatted this book within a tight deadline. They had to focus on the key messages that emerged from the various papers. We particularly thank participations, contributions, and feedback from Shah Atiqur Rahman, Baying Lei (Nanyang Technology University, Singapore,) and postgraduate students at James Cook University Singapore Campus who reviewed the first drafts. The book could not have been published without the

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John Vong
Insu Song

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