
Editorial

Connecting product innovation management and marketing

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INTRODUCTION

Amgen is not only a leader in the biotechnology industry but also one of the most innovative, successful companies of the past two decades. Gordon Binder, Amgen's chairman, explains that Amgen was and is a unique place because it did things differently from most businesses, beginning with the decision to let research and development lead the way. 'The strongest science determined what products we pursued, as opposed to the conventional method of targeting a desirable market – say, diabetics or people disabled by painful rheumatoid arthritis – and then trying to come up with a drug or device that might benefit them. You might be fairly successful that way, but will your company establish itself as a true innovator?'¹

Binder's observations mirror a fundamental issue of ongoing concern and debate in the broader field of management generally, and in marketing particularly: Should firms focus on technological greatness and thereby shape markets that will secure success, or should they follow customers, and minimise the risks inherent in better mousetraps that no one wants?² Nowhere are these tensions more apparent than in the biotechnology industry. Its paths are littered with great products that never saw the light of day. At the same time, major sums of money have been invested in products dictated by expert customers – who then decided they did not want them after all. Biotechnology needs marketing. But marketing also has much to learn from an industry that invents products and applications that do not just make things a little better – they change the world.

At 35 years old, the biotechnology sector is a global industry of several thousand firms, employing hundreds of thousands of scientists who are currently developing hundreds of drug products and vaccines for diseases such as diabetes, multiple sclerosis, cancer, Alzheimers disease and heart disease. This growth and relative maturity has resulted in increased industry concentration and greater competitive intensity. Biotechnology firms and biotechnology regions around the world must now compete to obtain scientific talent, investor money and market share. Thus, biotechnology firms now face a collection of challenges that make it inappropriate to simply use or imitate the marketing and product innovation strategies of larger and better established firms of the pharmaceutical industry. For, in addition to forming alliances with these pharmaceutical organisations, biotechnology firms compete with them for the same knowledge-based resources and shares of the market. Consequently, biotechnology firms need to develop innovative and contemporary approaches to marketing and product innovation that will help to ensure short-term success, while managing long-term viability.

To address this need, this special issue of *Journal of Commercial Biotechnology* presents seven articles that use interdisciplinary research and conceptualisation to investigate and report on product innovation and marketing practices for biotechnology companies. These involve a range

of concepts and practices that suggest how biotechnology firms should communicate brand information about themselves using their websites; the degree to which different types of biotechnology organisations connect, interact and promote themselves to local and global customers; and why biotechnology marketers should develop levels of organisational slack that enable them to scan, monitor and respond to the discontinuous forces that shape the adoption of their products.

In addition to the multiple disciplines that underpin these approaches to product innovation and marketing, the articles also examine approaches at multiple and related levels. These include the product technology level, the firm level, the cluster level and the industry level, in recognition that the innovation and marketing of biotechnology products involves networking concepts and competition between entrepreneurs, between firm internet sites and between regional clusters of firms around the world.

ABOUT THIS ISSUE

The first paper in this special issue is by Nic Terblanche, Professor of Marketing at the University of Stellenbosch, South Africa. He uses industry analysis methods to identify and evaluate a number of market opportunities for biotechnology firms. These include the need for technologies and products that will treat and minimise the global spread of diseases, viruses and other health threats, due to changes in climate conditions. He also argues that increased levels of collaboration between biotechnology firms are necessary to effectively lobby for and change (increase) patent protection periods. Such collaborations are also required to transform stakeholders' perceptions about the value of biotechnology products, and to change industry value chains so as to accommodate the design and delivery of personalised medicines.

The second paper is by Pierre Berthon, Leyland Pitt, Deon Nel, Esmail Salehi-Sangari and Anne Engstrom, of Bentley College (USA), Simon Fraser University (Canada), Deakin University (Australia) and Lulea University of Technology (Sweden), respectively. Using concepts from *cybernetics*, a form of systems theory, this international team of researchers explain how the complexity of biotechnology firms and the turbulent level of their environment requires these organisations to have appropriate degrees of organisational slack and inter-functionality. These 'holographic' properties are necessary for achieving the levels of learning, experimentation and risk taking needed to innovate, while also ensuring that biotechnology firms mitigate the risks of the organisational stasis that arise from following a drug development process and associated protocols that require highly mechanistic and reliable practices.

The third paper in this special issue is by Heidi Rajamäki of the University of Kuopio, Finland. She explores the features that make biotechnology marketing practices different from those in more established industries. She explains how technological uncertainty significantly influences the propensity for and subsequent growth trajectory of a biotechnology product. This in turn impacts how marketers must monitor and guide such products. She also explains how biotechnology products can experience an untimely death due to competitive products, changes in legislation and reductions in healthcare funding. The paper also presents examples of how negative and positive product side effects, which emerge long into the product lifecycle, can drastically alter the direction and life of a product.

Focusing on the level of regional clusters, the fourth paper is by Monica Salazar of the Colombian Institute for the Development of Science and Technology (Colciencias) and Martin Bliemel and Adam Holbrook of Simon Fraser University, Canada. They explain how the success of biotechnology firms around the world is often attributed to regional innovation dynamics, what is commonly termed 'the cluster phenomenon'. Consequently, to ensure sufficient funding and government support, and to help attract and retain talent, it is important for regional



biotechnology industries to be able to communicate to the world that they are a 'cluster'. To help address this challenge, their paper presents a framework of indicators that allow biotechnology firms and industry and government stakeholders to measure and communicate the size of their cluster using a range of objective and subjective measures. By using this framework to formally quantify the size of a cluster, the resulting information can be used to market the cluster. This in turn creates a reinforcing loop of success, whereby a cluster's reputation and brand helps to attract further financial resources from investors and collaborators, that can be used to enhance the inward migration of biotechnology talent from around the world.

The fifth paper explores how biotechnology firms communicate brand personalities via their websites. It is by Lisa Papania and Colin Campbell of Simon Fraser University, Canada, Robert Ankomah Opoku of King Fahd University of Petroleum and Minerals (Saudi Arabia), Maria Styven of Lulea University of Technology, Sweden and Jean-Paul Berthon of Richmond University (UK). Focusing on the websites of the top ten biotechnology firms in the world, they report how significantly different web brand personalities are. These personalities reveal characteristics that relate to the strength, glamour, reliability and creativity of the biotechnology firms. With such strong messages being conveyed, the researchers argue that it is essential for the managers of biotechnology firms to ensure that their website personalities are congruent with the image and messages they wish to portray.

The next paper is by Pierre Berthon, Ekin Pehlivan and Philip DesAutels of Bentley College (USA). They discuss and explain the importance of the role of marketing managers in biotechnology firms. In particular, they focus on the need for marketers who understand how biotechnology products interact with and shape society, and how society influences the trajectory and success of a biotechnology product. They present a model that explains how biotechnology products can be subject to intentional (subversion and diversion) and unintentional (emersion and aspersion) forms of change. Consequently, the paper argues that marketers must develop tools and systems for identifying and managing the forces associated with these types of change.

The final paper in the special issue by Ian McCarthy and Martin Bliemel of Simon Fraser University examines how the networks of biotechnology firms dedicated to product development are different from the networks formed by biotechnology firms focused on contract research. The paper presents data that compare the geographic aspect of the networks of dedicated biotechnology firms and contract research organisations in Vancouver, Canada. The researchers find that for dedicated biotechnology firms, the key actors (organisations and individuals) they network with are globally located (ie not local), despite the fact that many of the dedicated biotechnology firms originated from the same local university. In contrast, contract research organisations are more likely to network with local actors, and with actors on the same continent. The distribution of the dedicated biotechnology firms providing performance data is consistent with recent developments in structural embeddedness theory (ie network coupling theory). This suggests that the firms' performance may be inhibited if they are under- or over-embedded in their network, with the greatest opportunity for success occurring at the medium range of coupling.

In summary, we hope that this collection of articles from innovation and marketing experts from across the world will inform and help to convince *Journal of Commercial Biotechnology* readers of the need to rethink how the products of biotechnology firms should be developed and marketed. In particular, the message that runs through each of the articles is that the uncertainty of developing and exploiting biotechnology products requires product, innovation and marketing approaches that are both interdisciplinary and multilevel in nature. To be able to survive in such conditions requires firms to develop brands and reputations which help to attract significant levels of resource capacity, which are then organised in such a way as to achieve above

average to long-term market returns. At the same time we trust that the journal's audience of marketers will be simultaneously intrigued and tested by the astonishing opportunities and challenges that the field of biotechnology presents. It will raise challenges they have never faced before, yet at the same time provide an arena to implement hard won skills.

Leyland Pitt and Ian McCarthy

Segal Graduate School of Business, Simon Fraser University,

500 Granville Street, Vancouver,

BC V6C 1W6, Canada

Tel: +1 778 782 3708

Fax: +1 778 782 4920

E-mail: lpitt@sfu.ca, imccarth@sfu.ca

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