Science Business: The Promise, the Reality, and the Future of Biotech

Gary P. Pisano
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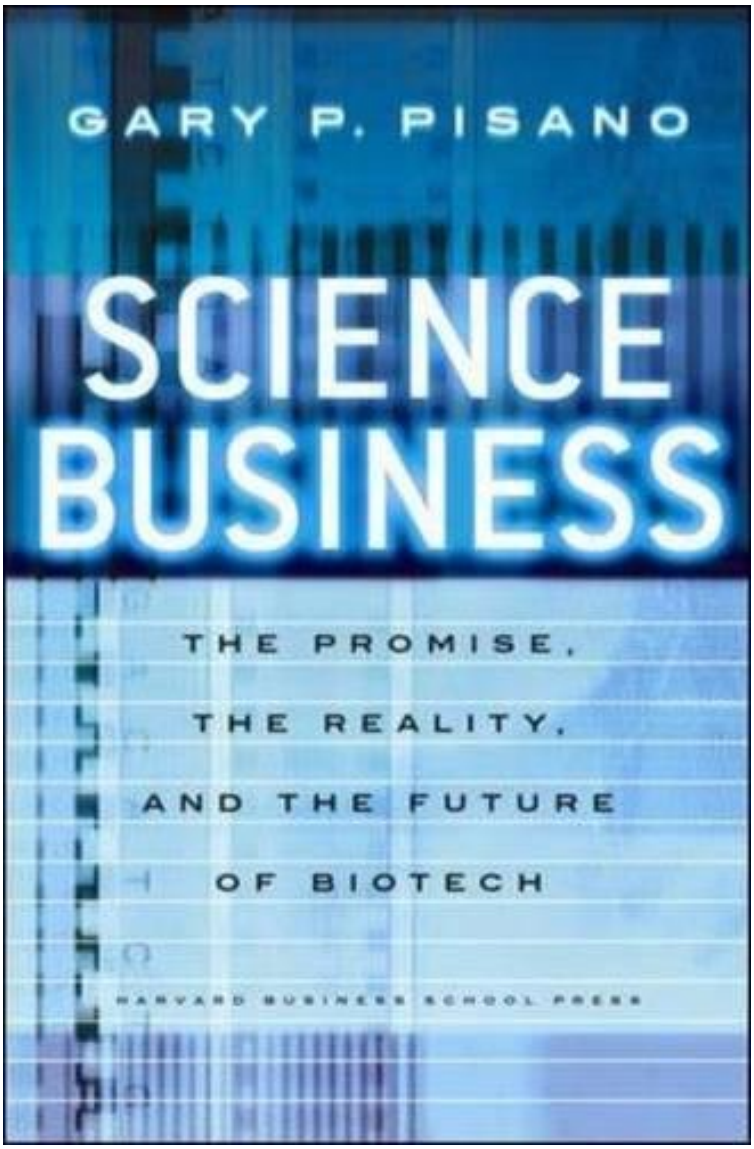

#435320 in Books 2006-11-14Original language:EnglishPDF # 1 9.48 x 1.04 x 6.44l, 1.17 #File Name: 1591398401256 pages | File size: 23.Mb

Gary P. Pisano : Science Business: The Promise, the Reality, and the Future of Biotech before purchasing it in order to gage whether or not it would be worth my time, and all praised Science Business: The Promise, the Reality, and the Future of Biotech:

0 of 0 people found the following review helpful. What is the next Pharmaceutical Business Paradigm?By RajaIt feels like a climactic moment is fast approaching in the evolution of the pharmaceutical industry business paradigm. This

event has been foreshadowed in the last several years. There appear to be 4 major paradigm possibilities: 1) big pharmaceutical companies acquiring other major players to get their pipeline of drugs (i.e. Pfizers bid to acquire Astrazeneca, Abbvies bid to acquire Shire, and Valeants bid to acquire Allergan), 2) big pharmaceutical companies re-aligning and streamlining to focus on specific therapeutic areas (i.e. BMS selling the diabetes franchise to focus on oncology, the Novartis, Glaxo, and Eli Lily trading of therapeutic divisions), 3) big pharmaceutical companies shifting resources to focus on outsourcing activities to a CRO/CMO (i.e. big pharmaceuticals trying to become more like a virtual biotech), 4) Institutions and Universities becoming the innovative discovery and technology pipeline for the pharmaceutical industry (i.e. Pfizer Center of Therapeutic Innovation, Academic Drug Discovery Consortium, SPARC consortium led by Eli Lily and Indiana University Medical School, successful startups that get sold to larger pharmaceutical companies). So which one will evolve as the winner? Or will it more likely be a combination of a few of the above? What is best for the economy (in terms of jobs) and the best for innovative medicine? Many have written about the evolving pharmaceutical industry paradigm including John LaMattina, Matthew Herper, David Shaywitz, Bruce Booth and others.What I would suggest to all the pharmaceutical professionals that want to be well informed and have an impact in shaping the future of the industry is to reflect on the history of the pharmaceutical industry. As we know, even though history may not necessarily repeat itself, we can learn a lot from it. One way of doing this is to read some of the good books that have been published in the last several years. That is what I am doing. The book I am recommending today is Science Business by Gary Pisano.Science Business focuses on the business model pathway (#4 above). What I enjoyed the most of the authors method of conveying these messages was the use of not only data, also stories and examples. In Science Business, Gary Pisano theorizes that there are three major challenges with the pharmaceutical/biotech startup model, and they are risk management (by monetization of intellectual property), integration, and learning.Pisano presents in detail the challenges of the drug development process and at the same time makes it understandable. He gives a good overall background of the drug development process to lay the foundation so all the readers are on the same page and then delves into some of the challenges. According to Pisano what makes RD breakthroughs in the pharmaceutical industry more difficult than in other industries is 1) pharmaceutical RD is a high risk endeavor so it is about mitigating risk by gathering and interpreting different data, 2) risk is based on prior knowledge and how good the predictive screening models are given that a deep theoretical understanding is not available in many areas of biomedical science, 3) pharmaceutical RD is not a modular process like in other technologies such as microprocessor development, it is an integrative technology, where components in a system are dependent on each other.To further add to the uncertainty is that research has widened to a large range of targets and potential therapeutic compounds. This presents a scenario where there is a general understanding of a broad range as opposed to a deep understanding of a narrow range of possibilities. As the author points out in this age, the rapid pace of scientific advancement is limited by the long lead times for validating.It is key to understand the evolving business paradigm in the biotechnology industry. As the author points out every industry sector has an anatomy, and this involves 3 aspects: the roles and strategies of all the participants, the institutional arrangements, and the rules of interacting. The history of the biotechnology sector has had 3 generations of anatomy paradigms and the author details each. The biotechnology sector has thrived on the basis that they have been the link between exciting discoveries occurring in the universities and pharmaceutical companies. Biotechnology companies work in that gap between basic scientific discovery and applied development. At the same time the author shows that the success of biotechnology has not been as good as perceived and that productivity of biotechnology companies is not much better than pharmaceutical companies. There have been a few great biotechnology company successes, but also many more failures.As the author indicates the business of biotechnology is keyed by three major forces: technology transfer between universities and firms, venture capital markets, and the market for know-how where younger firms trade intellectual property rights for funding from established companies and form strategic partnerships. The market for know-how can be shown by the fact that information and visibility of research occurring at universities is not the best, so some institutions that are closer to the research would know more about it and others that are farther away would not be aware of it. Venture capital is less likely to invest in early stage, high risk ventures that they know less about and would like to get assurance of a return on investment in a three year time period. One way for a biotechnology company to mitigate risk and be in a better position for a Venture Capital investment is to establish a corporate partnership or a strategic alliance. In this model paradigm the biotechnology company is like the middle man in the pharmaceutical development supply chain process. As a biotechnology company there are three main strategies, 1) develop the product to the point where it can be licensed to pharmaceutical companies, 2) if it is an innovative tool then become a contract service for pharmaceutical companies, 3) vertically integrate the company to take the product from research through commercialization.Overall I highly recommend this book. Beyond the understanding of the business of science, the book also provides some interesting factoids, which I enjoy. For example, the groundbreaking research by R. Bruce Merrifield in solid phase peptide synthesis in the early 1960s, the basis for combinatorial chemistry, led to his winning the Nobel Prize in 1984. Another one, in 1902 Archibald Garrod, a research physician, was the first person to demonstrate that diseases have a genetic component while doing research on alkaptonuria. How about Fred Sangers invention of gene sequencing in the mid-1970s or Kary Mullis invention of the polymerase chain

reaction in the early 1980s, or Hunkapiller/Hoods development of analytical instrument to read genetic code.0 of 0 people found the following review helpful. Five StarsBy hueygreat book2 of 2 people found the following review helpful. Important backgroundBy P. ShanksThis book is an excellent example of applied academic research. Pisano and his Harvard team have dug deep into the economics of biotech. What he describes is an industry that is not performing as expected, and he points to some possible reasons for this. Perhaps my favorite single sentence in the book is, "Deals alone can never create value." A more speculative statement from the same paragraph is: "As a percentage of the total workforce, biotech may have more people involved in business development than any other industry (almost certainly the highest per dollar of revenue)." Why? Well, that should be the subject of another book.Highly recommended to those digging into biotech issues; not at all for those who want a quick-fix-read to tell them what to think. That's a compliment, but does point up that the audience for this is limited.

Why has the biotechnology industry failed to perform up to expectationsdespite all its promise? In Science Business, Gary P. Pisano answers this question by providing an incisive critique of the industry. Pisano not only reveals the underlying causes of biotech's problems; he offers the most sophisticated analysis yet on how the industry works. And he provides clear prescriptions for companies, investors, and policy makers seeking ways to improve the industry's performance. According to Pisano, the biotech industry's problems stem from its special character as a science-based business. This character poses three unique business challenges: how to finance highly risky investments under profound uncertainty and long time horizons for RD, how to learn rapidly enough to keep pace with advances in drug science knowledge, and how to integrate capabilities across a broad spectrum of scientific and technological knowledge bases.The key to fixing the industry? Business models, organisational structures, and financing arrangements that place greater emphasis on integration and long-term learning over shorterterm 'monetisation' of intellectual property. Pisano maintains that all industry playersbiotech firms, investors, universities, pharmaceutical companies, government regulatorscan play a role in righting the industry. The payoff? Valuable improvements in health care, and a shinier future for human well-being.

"Pisano argues that as a business, the biotech sector hasn't matched the innovations of its science." -- BusinessWeek Online, December 20, 2006"Science Business" provides a fascinating history of pharmaceuticals and biotechnology. -- The Wall Street Journal, January 3, 2007From the Back Cover"A very insightful analysis of the remarkable evolution of the biotech industry. This is required reading for all involved in this process, biotechnology entrepreneurs, venture capitalists, academics, research centers, policy makers and investors.- Henri Termeer, Chairman, President and CEO, Genzyme CorporationIn this startling and cogent diagnosis of, and prognosis for, the biotechnology industry, Gary Pisano weaves a powerful economic argument that all is not well in biotechnology, an industry that should be the best hope for a better healthcare for us all. We in the industry need better to grapple with the challenges posed by this provocative book."- Dr. Josh Boger, President and CEO of Vertex PharmaceuticalsThe industrial structure that has arisen in the United States to develop and exploit the potential of biotechnology is widely regarded as extremely effective. But is it? Few biotech firms have made a profit, and the rate of introduction of new effective pharmaceuticals is not impressive. Gary Pisanos fine study is the first to bring these ideas into the open, analyze them, and reflect on what they might mean for the future of biotechnology.- Richard Nelson, George Blumenthal Professor of International and Public Affairs, Business and Law, Emeritus, Columbia UniversityGary Pisano's analysis uncovers surprising facts about the industry's innovation power and productivity, challenging conventional wisdom. Science Business is refreshing and inspiring for anyone who is interested in the future success of biotechnology, including life science executives, investors, policy-makers and, most importantly, the patients who it has the potential to help the most"- Dr. Daniel Vasella, Chairman CEO, Novartis AGAbout the AuthorGary P. Pisano is the Harry E. Figgle Jr. Professor of Business Administration and Head of the Technology and Operations Management unit at Harvard Business School.