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**Dr. Tahi J. Gnepa** earned his Ph.D. at the University of Wisconsin, Madison in 1989. Currently he is a professor of international business at California State University, Stanislaus, and Managing Editor of the Journal of International business and Economics.

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# STRATEGIC APPLICATIONS OF TECHNOLOGY ADOPTION CYCLE IN BIOTECH INDUSTRY

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## ABSTRACT

*The adoption of biotech products in the healthcare industry conforms and varies from the traditional technology adoption life cycle model created by Rogers and his contemporaries. The Innovator and Early Adopter stages are effectively eliminated by the biotech product approval process, i.e., the patent process, clinical testing, and the FDA approval process, eliminate barriers to adoption (Harrison and Samson, 2002). Commercialization of biotech products usually enter at the Early Majority stage. Biotech product adoption also follows and deviates from Moore's concepts of the Chasm, the Bowling Alley, the Tornado, and Main Street. High demand for biotech products contributes to rapid adoption that leaps over the Chasm, skips the Bowling Alley, and enters directly into the Tornado. While most biotech products are still in the Tornado, some have reached Main Street. There are several characteristics of the market that removes the risk of adopting biotech products. Existing pre-commercialization of products, the FDA process, and strong communication channels between healthcare professionals and organizations provide dissemination of information. Several characteristics of the market also create high risks not to adopt. These include the lack of competitive products, undesirable alternatives for nonuse, market pressures for healthcare organizations to be technology leaders, and acceptance of the products by formularies.*

**Keywords:** *Technology Management; Technology Strategy, Product Life Cycle, Biotechnology, Technology Adoption, Healthcare.*

## 1. INTRODUCTION

Biotechnology is the new and emerging technology that will affect the lives of everyone on the planet. Biotech firms have greatly contributed to scientific knowledge regarding molecular genetics, and have developed more than 100 new genetically based therapies for ailments such as cancer, cardiovascular disorders, diabetes, renal disease, respiratory disorders, sexual dysfunction, skin disorders, and infectious diseases. Several biotechnological healthcare products are already generating hundreds of millions of dollars annually (Harrison and Samson, 2002).

### 1.1 Technology Adoption

To effectively market these new products to ensure return on R&D development and to maximize return on investment, biotech product marketers must have an understanding of the adoption life cycle of these products. (NOTE: rest of the introduction is deleted from here!)

## 2. LITERATURE REVIEW

Early pioneering research that led to the creation of the TALC model was conducted in the early to mid 1900's and is well summarized in the classic book, Diffusion of Innovations (Rogers, 1962). Another work on the traditional model is "A Propositional Inventory for New Diffusion Research", by Gatignon and Robertson (1985). The model has gained widespread acceptance and is presented in several college marketing textbooks, often without reference to the early researchers.

Recent modifications to TALC were published in popular books written by Geoffrey A. Moore. In Crossing the Chasm (Moore, 1999), Moore discussed the existence of gaps between the five adopter categories, especially a significant chasm between early adopters and the early majority. While the TALC suggested smooth transitions between categories, Moore's work proposed that a firm's failure to recognize transitions and to adjust their marketing strategies accordingly, could lead to the early failure of a product. In Inside the Tornado (Moore, 1995), Moore discusses three stages that occur after crossing The Chasm to the early mainstream market. These stages are The Bowling Alley, The Tornado, and Mainstreet. Successful marketing of an innovation in the early mainstream market depended on recognition of these stages and adopting an appropriate strategy for each. Moore's work ...