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# IoT & BT: An upcoming frontier in research based business models

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The rapid technological developments have enabled the prolific advancements in the living and well-being now-a-days. Since the dawn of internet of things (IoT), an integrated networking platform, a completely new universe has been unveiled that is intertwined with collecting and sharing of huge data and information in an ultra-fast manner. The technology accompanies with innovation that is further embraced with rigorous research. Remarkably, IoT has proven their mettle with great aplomb in research and development and biotechnology is not an exception now-a-days. The growing awareness and implications of bio-based economy intensify the biotechnological research but the field is still impeded by the crisis of reproducibility that paralyzed the scientific research.

The past decade has witnessed the diversification of major pharmaceutical companies into biotechnological research as a viable investment portfolio. The fascinating research comprises all living domains of life from bacteria to humans meticulously develop a wide panorama for exhaustive research that generates a big data that needs to be stored, inseminated and analyzed properly. Therefore, rising plethora of computational biological tools, the development of agricultural sector, pharmaceutical, bioinformatics, genome editing and currently microbiome offers a wide opportunity to develop novel technologically led business models that boosts the economic growth of the nation.

Till date, the biotech companies works on major four basic business models that includes platform, product, hybrid and vertical models and it was estimated that India reaches only the tip of iceberg in biotechnology sector generating the $11 billion in revenue during past five years and expected to grow up to $100 billion by 2025. Inspite of largest knowledge pool availability in Indian market and reduced cost the biotechnological research is still plagued by multilayered regulatory structures, bureaucratic delays and long gestation periods before commercialization of bio-based products therefore Indian biotech sector only contributes 2 percent of the global biotech industry. Therefore, this paucity drives the wide-scale adoption of IoT in biotechnology lab for getting exhilarating results in reproducible manner and bolsters the productivity. The classic examples for automation in laboratories has come with famous “smartlab projects” “Labvolution” from Germany in which the labs were connected with various high-end instruments that offers online monitoring for the reducing the human errors by fast connectivity.

The biotechnology research will be more streamlined by integrating the different equipment’s in one interconnected platform so the researcher can monitor access and automate their experiments and collaborate for the enhancing their research capabilities. The reproducible and fast results leads to the successful commercialization of various products like biopharmaceuticals, vaccines, enzymes antibiotics, nutraceuticals that boosts the research invested business and strengths the economy of India. Recently, it was speculated that IoT has transformed the business models making biotech sector adapted toward changing market needs and deliver expected returns. This technology has potential to transform the biotech companies into a fully integrated organizational structure with their own research and development, manufacturing and marketing capabilities that offers strong profit margins and high investment returns. The advent of artificial intelligence, cloud computing and automation provides the dynamic platform for novel employment opportunities in biotech sector. Though, the technology is embraced with sparkling glory but the technical limitations pertaining to the complex configuration, authentication standards and data and information security issues need to be resolved at global level. Thus, the futuristic biotechnology research is certainly reach unprecedented heights with integration of various IoT platforms.

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