

# Comparative analysis of bio-business models and justification of their management improvement

Judita Astrovienė, Dr. Jolita Greblikaitė  
Vytautas Magnus university

## Introduction

**Relevance of the topic:** Traditionally, a business model is considered to be the way in which a company creates value for its stakeholders (Shimasaki, 2014). All bio-businesses can be perceived as certain processes consisting of five stages of development: research, expansion, testing and registration, production and trade (Kiškis, M., Limba, T., 2016). The bio-business management system of the organization is also very important for effective development. An organization's management system can consist of many structural elements: a functional position or the administration of managerial tasks that require technology to manage.

**Relevance of the study:** bio-businesses differ from traditional businesses in that they usually have a longer product development process, which can take from a few to several years; bio-businesses are considered risky due to long product development, and such businesses may require significantly higher investments. Bio-business requires constant funding for research and production, IP protection, patenting (Białek-Jaworska and Gabryelczyk, 2016). Although the analyzed studies discuss bio-business models, they emphasize the importance of management in the development of bio-businesses; they lack a broader interpretation and analysis.

**Subject of the research:** bio-business models.

**The aim of the research:** to analyze the business models of bio-businesses and to substantiate the improvement of their management.

## Methodology

The research is based on the analysis, synthesis, systematization and comparison of scientific literature, statistical data and documents.

## Results

Table 1. Comparison of linear bio-business models

Service model	Product model
<i>Open:</i> – focused on early-stage research, – develops research tools for technologies – offers licenses to other companies Models: <i>RIPCO</i>	<i>Open:</i> – developing end products for consumers and other businesses Models: <i>FIBNET, FIDDO, NRDO, BIEM</i> <i>Closed:</i> – developing end products for consumers Models: <i>FIBCO</i>
<i>Vertical</i>	<i>More risky, high added value is created</i>
<i>Horizontal</i>	<i>Less risky, creates average added value</i>
<i>Hybrid</i>	<i>Average risk, creates average added value</i>

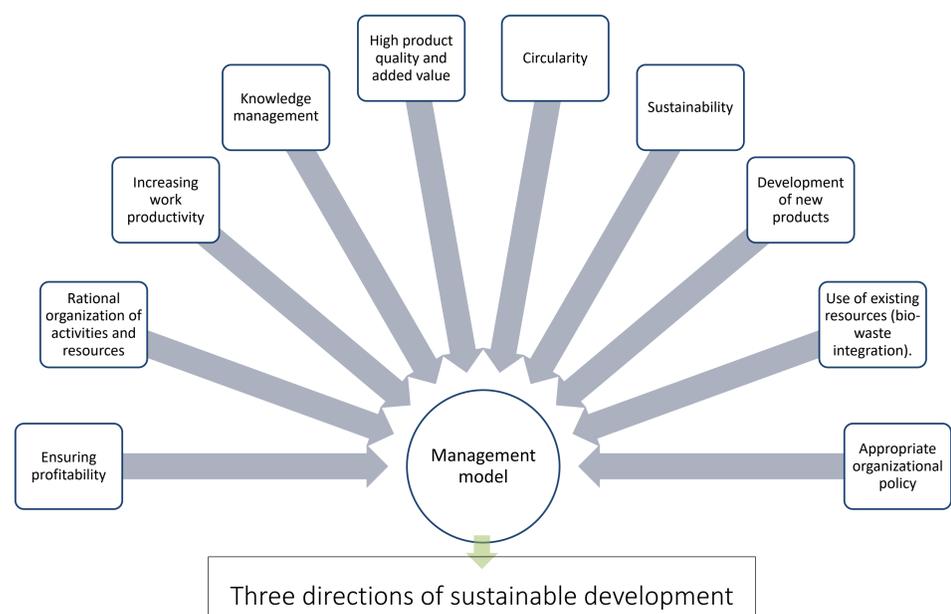
Source: (Almirall, E., Casadesus-Masanell, R., 2017), (Čiurinskaitė, M., Paleckis, K., 2018), (Bourguignon, 2016)

Table 2. Comparison of linear and circular bio-business models

	Linear	Sustainable and circular economy based models
<i>Regard for economic aspects</i>	Yes	Yes
<i>Regard for social aspects</i>	No	Yes
<i>Regard for ecological aspects</i>	No	Yes
<i>Amount of waste generated</i>	Large	Small or none at all
<i>Riskiness</i>	Large	Large
<i>Costs</i>	Can be high	Strives to reduce costs
<i>Advantages</i>	There are no advantages over sustainable models	Additional added value, meets the goals of sustainable development, innovative activities
<i>Disadvantages</i>	Incompatible with the objectives of sustainable development	Requires specific knowledge and managerial skills

Source: (Trapero, F., G., A., Parra, J., C., V., Bosquet, F., J., S., 2018), (Reim, V., Parida, V., Sjödin, D., R., 2019), (D'Amato, D., Veijonaho, S., Toppinen, A., 2020)

Picture 1. Bio-business model management improvement



## Main conclusions

In anticipation of the long-term success of bio-business development, investing in innovation and improving business management processes is crucial. It is essential to have clear innovation strategies or management practices. In this way, it is possible to ensure the innovative development of bio-businesses, the generation of new ideas, and the attraction of external partners for the creation of innovations. Attention is drawn to the need to properly develop the production of high value-added products in order to successfully commercialize bio-businesses.

The difficulty in applying existing business models and their management theories to bio-business organizations is that theories state that only those organizations that are able to turn ideas into products and sell them in a short period of time can develop effectively. In the case of bio-business development, research may take time, but this does not necessarily mean that the company will develop inefficiently. The high value-added business development model must include more new functions and processes that may arise from the development of high value-added products, especially when it comes to business model selection, knowledge, technology management or integration of bio-waste into bio-based or product production processes, linear model transformation to the circular ones.