SOFTWARE SOLUTIONS: MASTERING MARKET DEMANDS THROUGH STRATEGIC COMMERCIALIZATION

Vasile PODARIU[1], Ana BALAN[1], Ștefan VIZITEU[2], Diana CREANGA[2]

e-mail: creangadianaelena94@gmail.com

Abstract

The lack of innovation within the majority of the Romanian agriculture sector is also due to the low adoption of existing software solutions provided by national or international companies, even though it is known that, through careful planning and execution, the integration of software in agriculture can help increase efficiency, productivity, and sustainability, ultimately leading to a more prosperous and thriving industry. In order to analyse the software market in this area, research is needed to identify current trends and opportunities, as well as any challenges or obstacles that may affect sales and marketing efforts, which can include analysing competitors, studying customer behaviour, and identifying emerging trends in the industry. The current paper aims to study the distinctions between marketing and commercialisation and outline the strategies that can provide valuable insights and guidance for agricultural software companies looking to monetise their products effectively, as the commercialisation of agricultural software is a crucial aspect of the agricultural industry, and it requires a strategic approach.

Key words: digital farming, software applications, commercialisation strategies, customisation services, agricultural software market

The agricultural sector has witnessed a growing need for technological advancements that can enhance its efficiency and productivity in recent years (Barret H., Rose D.C., 2022). As a result, numerous software applications have emerged, intending to address the challenges faced by farmers and other stakeholders in the industry (Chandra R., Collis S., 2021). Nonetheless, despite their potential advantages, these applications have had limited uptake in the Romanian market (ITA, 2022). Besides farmers' insufficient understanding of the functionalities and benefits of these applications, the software developers and vendors could have employed inadequate marketing tactics to promote the applications to the intended audience. Therefore, it is essential to research and optimise marketing strategies for agricultural software applications in the Romanian market to increase their adoption rate and promote their benefits to the target audience. This could involve identifying the needs and preferences of the target audience and developing marketing strategies that are tailored to their needs (McCampbell M. *et al*, 2021). Depending on the strategy, it could also involve using various marketing channels, such as social media, online platforms, and agricultural fairs and exhibitions, to reach out to the target audience and promote the applications (Jayaraman P.P. *et al*, 2015).

MATERIAL AND METHOD

This article describes a qualitative research study investigating the reasons for the low adoption of existing software solutions in the Romanian agriculture sector. The primary objective of this study is to clarify the distinctions between marketing and commercialisation and explore ways to optimise their use to increase the adoption of software solutions.

RESULTS AND DISCUSSIONS

Marketing strategies are focused on creating awareness and generating interest in a product or service among potential customers. The goal of marketing is to communicate the value of the product or service to the target audience, create a strong brand image, and ultimately generate sales. Marketing strategies may include advertising, promotions, public relations, direct marketing, and other tactics aimed at attracting and retaining customers. Commercialization strategies, on the other hand, are focused on bringing a product or service to market and maximizing its profitability. The goal of commercialization is to create a

[1] AXIOLOGIC SAAS, Iași, Romania

[2] Iasi University of Life Sciences, Romania

sustainable business model (Bisht I.S. *et al*, 2020; Clapp J., Ruder S.L, 2020) that generates revenue and profits over the long term. Commercialization strategies may include product development, pricing, distribution, sales, and other tactics aimed at increasing market share, optimising product features, and reducing costs. While marketing and commercialisation strategies are related and can overlap in some areas, they have different goals and focus on different product lifecycle stages. Both are essential for a successful business, and a company must develop effective marketing and commercialisation strategies to achieve its goals.

Five classic methods that can be used to develop effective marketing strategies for agriculture software solutions: individual interviews, market research, competitive analysis, focus groups, and SWOT analysis. Individual interviews involve speaking to stakeholders to understand their needs, while market research involves gathering data to identify trends and user preferences. The competitive analysis involves studying competitors to identify strengths and weaknesses, and focus groups involve group discussions to identify effective strategies (Kenny U., Regan A., 2021). Finally, SWOT analysis examines strengths, weaknesses, opportunities, and threats to develop effective marketing strategies

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Figure 1 **Steps and recommended methods on strategic commercialisation**

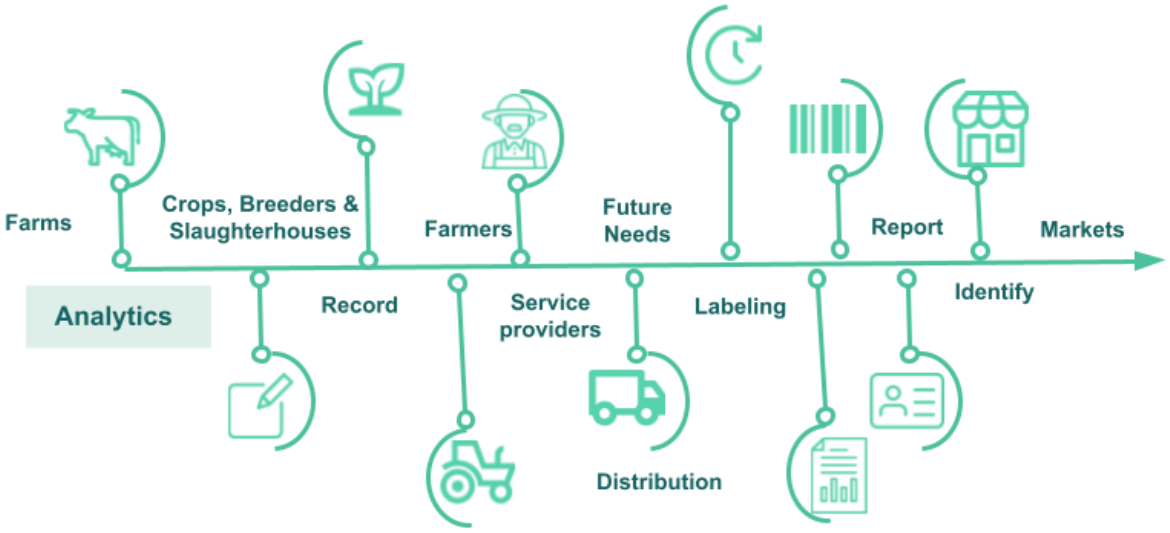

Figure 2 **Factors to be considered while developing a commercialization plan for agricultural software products.**

Each methodology can be useful in different situations, and choosing one or more depends on the research's objectives and resources. For instance, individual interviews and focus groups can be useful in understanding end-user needs and requirements, while market research and competitive analysis can provide a more comprehensive understanding of the market. SWOT analysis can be beneficial for developing long-term marketing strategies. Selecting the right approach depends on the objectives and resources of the research (Abbas A., 2021).

The process of bringing a new product or service to market involves a series of steps, beginning with market research to identify the target audience, understand their needs and preferences, and assess the competition (Bronson, 2019). Market segmentation can be employed to divide the agricultural market into various segments, and software solutions can be designed to meet the specific needs of each segment. A marketing plan is then developed, which includes branding, pricing, distribution, and advertising strategies. Content marketing could be an effective strategy for educating and informing the target audience in agriculture, thereby retaining customers and attracting new ones. Partnerships and collaborations with other agricultural organisations and companies can help create a promotional network and reach more customers (Agyekumhene, 2020).

A prototype or sample is created and tested to gather feedback from potential customers and refine the product or service (Turner, 2020). Offering free demos and trials can enable potential customers to test the software solutions before investing in them. Funding is secured through various financing options, and production and distribution channels are established. Finally, the product or service is launched, and its success is monitored through sales tracking and customer feedback analysis. Finally, email marketing can be a powerful communication tool for regularly reminding customers about the available software solutions and offering special promotions during peak seasons. Adjustments are made as necessary to ensure the product or service meets the needs of its intended audience. This process requires careful planning and execution to ensure the success of the product or service and may involve a degree of trial and error.

The commercialisation of agricultural software is a crucial aspect of the agricultural industry, and it requires a strategic approach. In this article, we explore several strategies that can be implemented to monetise agricultural software effectively.

The first strategy is to offer a subscription-based model for agricultural software. This model would require customers to pay a monthly or annual fee to access the software. This model provides a recurring revenue stream for the software provider and ensures a steady income stream.

The second strategy is to offer a commission-based model for agricultural software. This model would involve the software provider taking a percentage of the profits generated by the customers who use the software. For example, if the software helps farmers increase their crop yields, the software provider could take a percentage of the increased profits generated by the farmers as a commission.

The third strategy is to offer a pay-per-use model for agricultural software. This model would

involve charging customers for each use of the software, similar to how utility services charge for usage. This model can be attractive to customers who may only need to use the software on a limited basis and do not want to commit to a subscription or commission-based model.

The fourth strategy is to offer customisation services for agricultural software. This involves tailoring the software to meet the specific needs of individual customers or groups. This can include developing new features, integrating with existing systems, or providing training and support services. This model can be attractive to customers who need a specialised solution that is not offered by off-the-shelf software solutions. In conclusion, the successful commercialisation of agricultural software relies on a well-planned and targeted approach. The strategies outlined in this article can provide valuable insights and guidance for agricultural software companies looking to monetise their products effectively.

Start by defining target customers based on factors such as demographics, psychographics, location, and behaviour (Eastwood, 2019). The demographics for agriculture vary depending on the country or region. The agriculture sector tends to have an ageing population, with many farmers and workers over the age of 50. Younger generations are often less interested in pursuing careers in agriculture due to factors such as low wages, long hours, and difficult working conditions. Women play an important role in agriculture, particularly in developing countries, where they make up a significant portion of the agricultural workforce. However, women often face challenges in accessing resources and services, such as credit and training, which can limit their participation in the sector.

The level of education of those involved in agriculture can vary widely, with many farmers and workers having only primary or secondary education. However, there is a growing trend towards more educated and skilled workers in the sector, particularly in developed countries. Agriculture is a rural-based industry, with many farmers and workers living in rural areas. However, there is also a growing trend towards urban agriculture, particularly in urban and peri-urban areas, where space is limited, and there is a growing demand for locally grown produce. Income levels in agriculture can vary widely, with many small-scale farmers and workers earning low wages and struggling to make ends meet. However, there are also larger-scale commercial farmers and agribusinesses that generate significant profits.

Identifying target customers will help better understand their needs and preferences and tailor sales and marketing strategies accordingly. In order to identify the target audience, market research and data analysis methods can be used, which provide a deep understanding of the needs and requirements of customers. These could include small and medium-sized farmers, agricultural organisations, seed and fertiliser producers, agricultural equipment suppliers, local authorities and other companies in the agricultural industry (Higgins V., Bryant M., 2020).

Conduct research on the market to identify current trends and opportunities, as well as any *lenges or obstacles that may affect sales and marketing efforts. This can include analysing competitors, studying customer behaviour, and identifying emerging trends in the industry.

Based on the research results, develop a sales and marketing strategy that is tailored to the target customers and market conditions. This may include developing a unique value proposition, identifying the best channels (Emeana E.A. *et al*, 2020) to reach the customers, and creating a messaging strategy that resonates with the audience. In terms of developing the marketing message, it is important to identify and emphasise the unique advantages and benefits that software applications offer, such as increased productivity, reduced costs and improved efficiency. This message can be communicated through well-crafted marketing materials such as presentations, brochures and websites. Developing a clear and compelling marketing message is important to emphasise the advantages and benefits offered by agricultural software applications (Carolan M., 2018).

Thus, it can be ensured that the message is received and understood by the potential customers. The use of the right marketing channels can be achieved through well-trained marketing teams that understand the needs and behaviour of customers in the agricultural industry (Bronson K., 2018). These channels may include online advertising, promotion through social networks, advertising in agricultural magazines and newspapers, and organising events and presentations at agricultural conferences and exhibitions of agricultural equipment and technologies.

Collaboration with strategic partners can be an effective approach to increase the degree of adoption of software applications for agriculture (Lowenberg-DeBoer, J., Erickson B., 2019). By collaborating with agricultural organisations, agricultural equipment companies, and seed and fertiliser suppliers, as well as with local authorities (Wiseman L. *et al*, 2019), a larger base of potential clients can be reached, and additional support can be provided in the use of software applications (Balan A. *et al*, 2023).

Overall, studying effective approaches for reaching target customers and boosting sales requires a deep understanding of the customers, the market, and the competition. By taking a strategic and data-driven approach, one can identify the most effective strategies (Ayre M. *et al*, 2019) for driving sales and growing the business. Providing support and training to users is important to increase the adoption of software applications (Ofori E. *et al.*, 2020). They must understand how to use the application and how to benefit from the advantages offered.

CONCLUSIONS

This integration of software in agriculture has the potential to revolutionise the industry, but the success of its implementation depends heavily on the chosen commercialisation strategy. There is no one-size-fits-all approach that can guarantee success, but thorough research on target customers, market validation, and understanding their needs, preferences, challenges, and difficulties can greatly increase the likelihood of adoption. By taking the time to truly understand the industry and its stakeholders, businesses can create more effective and tailored solutions that meet the unique needs of the agriculture sector. Through careful planning and execution, the integration of software in agriculture can help increase efficiency, productivity and sustainability, ultimately leading to a more prosperous and thriving industry.

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REFERENCES

Abbas A., Montijn van de Ven E., Zuiderwijk A., Agahari W., 2021 - *Bussiness Data Sharing through Data Marketplaces: Systematic Literature Review,* available online at https://www.researchgate.net/publication/356806

Agyekumhene C., de Vries J.R., Paassen A., Schut M. & MacNaghten P., 2020 - *Making smallholder value chain partnerships inclusive: Exploring digital farm monitoring through farmer friendly smartphone platforms.* Sustainability, 12(11), 4580. https://doi.org/10.3390/su12114580

Ayre M., Mc Collum V., Waters W., Samson P., Curro A., Nettle R., Paschen J.-A., King B., Reichelt N., 2019 - *Supporting and practising digital innovation with advisers in smart farming.* NJAS–Wageningen Journal of Life Sciences, 90–91, 100302. https://doi.org/10.1016/j.njas.2019.05.001

Balan A., Tan A., Kourtit G., , Nijkamp K. P., 2023 - *Data-driven Intelligent Platforms - design of self-sovereign data trust systems for digital healthcare*, LAND Journal, (forthcoming)

Barrett H., Rose D.C., 2022 - *Perceptions of the fourth agricultural revolution: What's in, what's out, and what consequences are anticipated?* Sociologia Ruralis, 62, 162–189. https://doi.org/10.1111/soru.12324

Berthet E.T., Hickey G.M., Klerkx L., 2018 - *Opening design and innovation processes in agriculture: Insights from design and management sciences and future directions.* Agricultural Systems, 165, 111–115.

Bisht I.S., Rana J.C., Pal Ahlawat S., 2020 - *The future of smallholder farming in India: Some sustainability considerations*. Sustainability, 12(9): 3751.

Bronson K., 2018 - *Smart farming: Including rights holders for responsible agricultural innovation.* Technology Innovation Management Review, 8(2), 7–14. https://doi.org/10.22215/timreview/1135

Bronson K., 2019 - *Looking through a responsible innovation lens at uneven engagements with digital farming.* NJAS–Wageningen Journal of Life Sciences, 90–91, 100294. https://doi.org/10.1016/j.njas.2019.03.001

Carolan M., 2018 - *'Smart' farming techniques as political ontology: Access, sovereignty and the performance of neoliberal and not-so-neoliberal worlds.* Sociologia Ruralis, 58(4), 745–764. https://doi.org/10.1111/soru.12202

Chandra R., Collis S., 2021 - *Digital agriculture for small-scale producers: challenges and opportunities.* Communications of the ACM, 64(12), pp.75-84.

Clapp J., Ruder S.L., 2020 - *Precision technologies for agriculture: Digital farming, gene-edited crops, and the politics of sustainability.* Global Environmental Politics, 20(3), 49–69. https://doi.org/10.1162/glep_a_00566

Eastwood C., Klerkx L., Ayre M., Dela Rue B., 2019 - *Managing socio-ethical challenges in the development of smart farming: From a fragmented to a comprehensive approach for responsible research and innovation.* Journal of Agricultural and Environmental Ethics, 32(5–6), 741–768. https://doi.org/10.1007/s10806-017-9704-5

Emeana E.M., Trenchard L., Dehnen-Schmutz K., 2020 - *The revolution of mobile phone-enabled services for agricultural development (m-Agri Services) in Africa: The challenges for sustainability. Sustainability*, 12(2), 485. https://doi.org/10.3390/su12020485

Higgins V., Bryant M., 2020 - *Framing agri-digital governance: Industry stakeholders, technological frames and smart farming implementation.* Sociologia Ruralis, 60(2), 438–457. https://doi.org/10.1111/soru.122975

International Trade Administration (ITA), 2022 - *Romania - Country Commercial Guide; Agricultural Products*, available online at: https://www.trade.gov/country-commercial-guides/romania-agricultural-products

Jayaraman P.P., Palmer D., Zaslavsky A., Georgakopoulos D., 2015 - *"Do-it-Yourself*

Digital Agriculture applications with semantically enhanced IoT platform," 2015 IEEE Tenth International Conference on Intelligent Sensors, Sensor Networks and Information Processing (ISSNIP), Singapore, 2015, pp. 1-6, doi: 10.1109/ISSNIP.2015.7106951

Kenny U., Regan A., 2021 - *Co-designing a smartphone app for and with farmers: Empathising with end-users' values and needs.* Journal of Rural Studies, 82, 148–160. https://doi.org/10.1016/j.jrurstud.2020.12.009

Lowenberg-DeBoer J., Erickson B., 2019 - *Setting the Record Straight on Precision Agriculture Adoption. Agron. J.*, 111: 1552-1569, available online at: https://doi.org/10.2134/agronj2018.12.0779

McCampbell M., Schumann C., Klerkx L., 2021 - *Good intentions in complex realities: Challenges for designing responsibly in digital agriculture in low-income countries* https://doi.org/10.1111/soru.12359Citations:

Ofori E., Griffin T., Yeager E., 2020 - *Duration analyses of precision agriculture technology adoption: what's influencing farmers' time-to-adoption decisions?", Agricultural Finance Review,* Vol. 80 No. 5, pp. 647-664, available online at: https://acsess.onlinelibrary.wiley.com/action/showCitFormats?doi=10.2134%2Fagronj2018.12.0779&mobileUi=0

Turner J.A., Horita A., Fielke S., Klerkx L., Blackett P., Bewsell D., Small B., Boyce W.M., 2020 - *Revealing power dynamics and staging conflicts in agricultural system transitions: Case studies of innovation platforms in New Zealand.* Journal of Rural Studies, 76, 152–162. https://doi.org/10.1016/j.jrurstud.2020.04.022

Wiseman L., Sanderson J., Zhang A, Jakku E., 2019 - *Farmers and their data: An examination of farmers' reluctance to share their data through the lens of the laws impacting smart farming.* NJAS–Wageningen Journal of Life Sciences, 90–91. 100301. https://doi.org/10.1016/j.njas.2019.04.007