Innovation in IoT-based Smart Farming in Vietnam and the Strategies of Business Ventures

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1 Objective: Industry 4.0, climate change, and food security challenges necessitate a transformation in Vietnam's agriculture sector, which employs 45% of the population but struggles with low productivity. IoT-based smart farming solutions, a type of smart connect product, integrates IoT devices like sensors in areas like livestock management, precision farming, and greenhouse monitoring, which could bridge the technological gap and improve productivity. This research addresses the following questions:

RQ1: How can the IoT-based smart farming solutions offered by Vietnamese business ventures be characterized, and how do they differ from those foreign solutions available in the market?

RQ2: What are the key enablers and barriers to IoT-based smart farming solution adoption in Vietnam?

2 Conceptual framework: Porter and Heppelmann (2014) identify four key categories of smart connected products: monitoring, control, optimization, and autonomy, each expanding functionality substantially.

3 Methods: This research uses a qualitative methodology with a multiple-case-study approach. Three well-established IoT-based smart farming business ventures in Vietnam were selected, including MimosaTEK, NextFarm and AgrHub. Primary data was collected through semi-structured interviews with the CEOs of these ventures. Thematic coding analysis was then employed to extract the findings from the transcripts of these interviews.

4 Results

a. Characteristics: IoT-based smart farming solutions by Vietnamese business ventures offer substantial cost reduction, optimized performance level more focused functionality. The cost of these ventures' solutions are 40-50% lower than foreign alternatives. This is achieved through effective cost management strategies like economies of scale and modular product design. Additionally, by making functional tradeoffs, these solutions become tailored to local conditions (i.e., small farms cultivating multiple crops simultaneously).

b. Enablers and barriers: Several factors influence the adoption of IoT-based smart farming solutions in Vietnam. Enablers like local centricity, business competency, partnership with Viettel, and increasing ICT penetration in Vietnam… drive growth. Conversely, barriers like weak agricultural value chain, standards, fluctuating demand, lack of agriculture engineers, data availability… hinder widespread adoption.

5 Conclusion: This study identifies the characteristics, enablers, and barriers influencing the adoption of IoT-based smart farming in Vietnam. The findings provide important implications for smart farming businesses, universities, research institutions, and policymakers, in shaping the future of the industry.

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