International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

# Enhancing University-Based Organic Product Initiatives through Digital Innovation: A Case Study of Dev Bhoomi Uttarakhand University

**Amritanshu Dev Rawat**

Assistant Professor, UI/UX Design Faculty, Dev Bhoomi Uttarakhand University

**Abstract**

This study explores the potential of digital innovation to enhance the organic product initiative at Dev Bhoomi Uttarakhand University (DBUU). Through a mixed-methods approach, including interviews and surveys, we identified key challenges in the current workshop-based production model, such as inefficient order management and lengthy fulfillment times. We propose a mobile application, "DBUU Organic," designed to streamline operations, enhance educational value, and facilitate growth. The app integrates inventory management, order processing, and educational components, addressing current inefficiencies while providing students with hands-on experience in sustainable agribusiness. This research contributes to the growing body of knowledge on integrating technology in agricultural education and sustainable food systems, offering a model for other institutions to emulate.

**Keywords:** Sustainable Agriculture, E-Commerce, Agricultural Education, Organic Products, Mobile Application

## Introduction

The intersection of sustainable agriculture, entrepreneurship education, and digital technology presents unique opportunities for universities to enhance student learning while addressing real-world challenges. At Dev Bhoomi Uttarakhand University (DBUU), an organic product initiative within the School of Agriculture has highlighted both the potential and the challenges of integrating practical, sustainable food production into the academic curriculum.

This study examines the current state of DBUU's organic product initiative, which currently operates on an irregular, workshop-based model. Despite growing interest in organic and locally-produced foods, the university faces significant challenges in transitioning from sporadic production to a consistent, educationally integrated system of organic food production and sales. These challenges include inefficient order management, lengthy fulfillment times, and limited integration with formal educational objectives.

The primary objective of this research is to explore how a tailored mobile application could address these challenges, potentially transforming DBUU's organic product initiative into a more efficient, educational, and scalable program. Specifically, this study aims to:

1. Analyze the current processes and challenges in DBUU's organic product initiative.
2. Identify key user requirements for both student producers and customers.
3. Propose a digital solution that streamlines operations while enhancing educational value.

4. Examine the potential impact of such a solution on operational efficiency and student learning outcomes.

The significance of this study lies in its potential to provide a model for other educational institutions seeking to integrate practical sustainability initiatives with digital solutions and entrepreneurship education. By addressing the unique needs of a university-based organic product initiative, this research contributes to the broader discourse on experiential learning in agricultural education and the role of digital technologies in small-scale, sustainable food systems.

## Literature Review

### A. E-commerce in Educational Settings

The integration of e-commerce into educational settings represents a growing trend in experiential learning. Smith et al. (2019) highlight the potential of student-run e-commerce initiatives to provide real-world business experience. Their study of a university-based online marketplace found significant improvements in students' entrepreneurial skills and understanding of digital business operations.

Similarly, Johnson and Lee (2020) examine the educational benefits of integrating e-commerce projects into business and agriculture curricula. They argue that such initiatives not only enhance technical skills but also develop critical soft skills such as customer service, project management, and adaptability to market demands.

### B. Mobile Applications for Small-Scale Food Producers

The use of mobile applications in small-scale food production has gained traction in recent years. A comprehensive review by Patel et al. (2021) identifies key features of successful apps in this domain, including real-time inventory management, order tracking, and direct producer-consumer communication channels. Their findings suggest that well-designed mobile platforms can significantly reduce operational inefficiencies and expand market reach for small producers.

Garcia and Mendoza (2022) specifically examine the application of mobile technologies in university-based agricultural programs. Their case study of three Latin American universities demonstrates how mobile apps can bridge the gap between classroom learning and practical field experience in sustainable agriculture.

### C. UX/UI Design for E-commerce Platforms

User experience (UX) and user interface (UI) design play crucial roles in the success of e-commerce platforms, particularly in niche markets like university-produced organic products. Wong (2020) emphasizes the importance of intuitive navigation and clear product information displays in fostering trust and encouraging repeat purchases in specialty food e-commerce.

Chen and Dhillon (2021) emphasize the importance of mobile-first design in e-commerce platforms for university settings. Their study of student buying behaviors shows a strong preference for mobile shopping, particularly for locally-produced goods. They argue that effective mobile UX/UI design can significantly increase student engagement with university-based initiatives.

### D. Integration of Practical Experience in Agricultural Education

The integration of hands-on experience in agricultural education has been a subject of significant research. Brown et al. (2022) conducted a longitudinal study of agricultural programs that incorporated student-run enterprises. They found that students who participated in such programs demonstrated higher levels of entrepreneurial self-efficacy and were more likely to pursue careers in sustainable agriculture.

Nguyen (2023) specifically examined the educational impact of organic farming initiatives in universities. Her research indicates that participation in organic product development and sales provides students with a holistic understanding of sustainable food systems, from production to market dynamics. Nguyen argues that these experiences are crucial in preparing students for the complexities of modern agricultural careers. Furthermore, Patel and Sharma (2024) explore the synergy between digital technologies and practical agricultural education. Their case studies of five universities in India demonstrate how mobile applications can enhance the educational value of campus farming initiatives by providing data analytics tools for crop management and creating virtual marketplaces for student-grown produce.

## Methodology

### A. Research Design

This study employs a mixed-methods approach, combining qualitative and quantitative data to provide a comprehensive understanding of the organic product initiative at DBUU and the potential for a digital solution.

1. **Qualitative Component:**
   - Semi-structured interviews were conducted with key stakeholders, including: a) Faculty members from the School of Agriculture b) Student participants in the organic product workshops c) University administrators involved in the initiative
   - These interviews aimed to gather in-depth insights into the current processes, challenges, and aspirations for the organic product initiative.
2. **Quantitative Component:**
   - A survey was distributed to a broader sample of the university community, including: a) Students from various departments b) Faculty and staff members c) Recent alumni
   - The survey aimed to assess interest in organic products, current purchasing behaviors, and preferences for a potential mobile application.

### B. Data Collection Process

1. **Interviews:**
   - A total of 15 interviews were conducted over a four-week period.
   - Each interview lasted approximately 45-60 minutes and was audio-recorded with participant consent.
   - Interviews were conducted in person or via video conferencing, based on participant preference and availability.
2. **Survey:**
   - An online survey was created using Google Forms.
   - The survey was distributed via university email lists and social media channels.
   - It remained open for three weeks, with reminder emails sent at the midpoint and three days before closing.
   - A total of 237 valid responses were collected.

### C. Analysis Methods

1. **Qualitative Data Analysis:**
   - Interview recordings were transcribed verbatim.
   - Transcripts were analyzed using thematic analysis (Braun & Clarke, 2006).
   - Initial codes were generated independently by two researchers to ensure reliability.
   - Themes were developed through an iterative process of coding, discussion, and refinement.

2. **Quantitative Data Analysis:**
   - Survey data were cleaned and preprocessed to remove incomplete or invalid responses.
   - Descriptive statistics were generated for all survey items.
   - Inferential statistical tests (e.g., chi-square tests, t-tests) were conducted to examine relationships between variables of interest.
   - Data visualization techniques were employed to represent key findings graphically.
3. **Integration of Qualitative and Quantitative Data:**
   - A convergent parallel design was used to integrate the qualitative and quantitative findings.
   - Areas of convergence and divergence between the two data sets were identified and analyzed.
   - This integrated analysis informed the development of the proposed digital solution and recommendations.

**D. Ethical Considerations**

This study was approved by the DBUU Institutional Review Board (IRB number: IRB2024-0142). All participants were provided with information sheets detailing the study's purpose and their rights as participants. Informed consent was obtained from all interviewees and survey respondents. Data were anonymized to protect participant privacy, and all raw data were stored securely in accordance with university data protection policies.

## Findings

### A. Current State of Organic Product Initiative at DBUU

1. **Production Process:**
   - The organic product initiative at DBUU is currently workshop-based, operating for only two days.
   - Products include cookies, jams, and pickles, produced during these workshops.
   - Ingredients are outsourced and prepared on-site during the workshop days.
2. **Sales and Order Fulfillment:**
   - Orders are taken through various informal channels: in-person, friend referrals, WhatsApp messages, and phone calls.
   - The fulfillment process is lengthy, taking an average of 9 days from order placement to delivery.
   - Most time is consumed in baking and sourcing organic ingredients.
   - Delivery is available anywhere on campus, with a takeaway option from the department.
3. **Inventory Management:**
   - All tracking is done manually using pen and paper methods.
   - They use a format to record customer name, department, order details, and contact information.
   - The university has a cold storage facility with capacity for 20 jam bottles, 20 pickle bottles, and 40 packets of cookies.
4. **Payment Process:**
   - Payments are collected via cash and digital methods like PhonePe.
   - Post-workshop, staff spend approximately 1.5 hours on payment cross-verification.

### B. Stakeholder Needs and Preferences

1. **Survey Results:**
   - High preference for mobile app ordering: 87% of respondents rated 8 or higher (on a 10-point scale) for preferring to place orders through a mobile app rather than in-person or via phone/message.

- Increased likelihood of purchase: 92% of respondents indicated an 8 or higher likelihood of purchasing university organic products if an easy-to-use app were available.
- Comfort with mobile payments: 89% of respondents (rating 8 or higher) expressed comfort with making payments through a mobile app.
- Primary motivations for purchasing: Quality (76%), supporting local production (68%), convenience (62%), and price (57%) were key factors.
- Desired product information: Survey participants expressed interest in seeing ingredients (93%), nutritional information (87%), production date (82%), best-before date (79%), and producer information (71%) in product listings.
- Preferred order update method: Push notifications (76%) and SMS (68%) were the most desired methods for receiving order updates.

**2. Interview Insights:**

- Challenges in Managing Bulk Orders: The unexpected high demand during the workshop days created difficulties in order management.
- Digital Literacy: The team reports good digital literacy and openness to using a mobile app for managing the process.
- Marketing Methods: Currently, they market products through WhatsApp groups, direct student contact, and in-person promotion during workshops.
- Expansion Goals: The immediate goal is to expand within the university, potentially using the university's Instagram page for promotion.
- Demand-based Supply: The team aims to produce based on demand, but faces challenges in scaling production.

**C. Key Challenges Identified**

1. Irregular production schedule (workshop-based) limits consistent availability of products.
2. Manual order management system is inefficient and error-prone.
3. Lengthy order fulfillment time (average 9 days) may deter potential customers.
4. Difficulty in managing unexpected bulk orders.
5. Time-consuming payment verification process (1.5 hours post-workshop).
6. Sourcing organic ingredients and resources is challenging.
7. Limited production capacity due to lack of utensils and electronic equipment.

**D. Opportunities for Improvement**

1. Digitization of the ordering and inventory management processes.
2. Streamlining the payment collection and verification process.
3. Improving production planning to better handle bulk orders and reduce fulfillment time.
4. Expanding product reach within the university and potentially to Dehradun.
5. Enhancing marketing efforts through digital channels.
6. Integrating the initiative into regular coursework for sustainability.

**Proposed Digital Solution**

Based on our research findings and the specific needs of DBUU's organic product initiative, we propose the development of a mobile application tailored to address the current challenges while enhancing the educational and operational aspects of the program.

**A. Overview of the Mobile Application Concept**

The proposed application, tentatively named "DBUU Organic," will serve as a comprehensive platform for managing the entire lifecycle of DBUU's organic products, from production planning to sale and delivery. It will cater to multiple user groups, including student producers, customers (students and staff), and faculty supervisors.

**B. Key Features and Functionalities**

1. **Inventory Management System:**
   - Real-time tracking of available products
   - Integration with cold storage capacity data (20 jam bottles, 20 pickle bottles, 40 packets of cookies)
   - Alerts for low stock or approaching expiry dates
   - Production scheduling tools to align with workshop dates and help manage unexpected bulk orders
2. **Order Processing and Tracking:**
   - User-friendly interface for browsing and ordering products
   - Capability to handle and organize bulk orders efficiently
   - Order status updates to reduce the current 9-day fulfillment time
   - Estimated delivery time calculator to set realistic expectations
   - Options for campus delivery or department pickup
3. **Payment Integration:**
   - Multiple payment options including cash and digital methods (e.g., PhonePe)
   - Automated reconciliation to eliminate the 1.5-hour manual verification process
   - Real-time payment status updates
4. **Product Information Display:**

**Detailed product listings including:**

- Ingredients (prominently displayed as requested)
- Price tags (clearly visible)
- Nutritional information
- Production date
- Best before date
- Producer information (connecting students to their products)

5. **Search and Filter Capabilities:**
   - Advanced search functionality allowing users to filter products by type, ingredients, or production date
   - Easy-to-use interface catering to users with good digital literacy
6. **Resource Management:**
   - Tools to track and manage organic ingredient sourcing
   - Equipment inventory and utilization tracking
   - Forecasting tools to help with demand-based supply planning
7. **Marketing and Communication:**
   - In-app messaging system for order updates and customer communication
   - Integration with WhatsApp for notifications (as it's currently used for communication)
   - Tools to easily share product information and promotions on university social media channels, including Instagram
8. **Educational Components:**
   - Information about sustainable farming practices and organic production methods

- Profiles of student producers and their learning experiences
- Data analytics tools for use in relevant courses (e.g., business, agriculture)

**C. User Interface Design Considerations**

1. **Mobile-First Design:**
   - Responsive layout optimized for various device sizes
   - Intuitive navigation with minimal learning curve, suitable for users with good digital literacy
2. **User-Centric Features:**
   - Personalized dashboards for different user types (customers, student producers, faculty)
   - Easy-to-use order placement and tracking interface
3. **Visual Appeal:**
   - High-quality product images
   - Clean, modern design aligning with DBUU's branding
4. **Simplicity:**
   - Focus on core functionalities without premium features or subscriptions, as per stakeholder preference
   - Clear and concise information display, prioritizing ingredients and price information
5. **Accessibility:**
   - Compliance with WCAG guidelines to ensure usability for all users

**D. Integration with University Curriculum and Operations**

1. **Workshop Planning:**
   - Tools to schedule and manage production workshops
   - Integration with academic calendars to align production with available student resources
2. **Data Analytics for Academic Use:**
   - Sales and production data available for analysis in relevant courses
   - Insights on demand patterns and customer preferences for use in business strategy classes
3. **Project Management Tools:**
   - Task allocation and tracking for student teams involved in production
   - Resource allocation tools to manage limited equipment and facilities
4. **Reporting Features:**
   - Generation of reports on sales, inventory, and customer preferences
   - Financial summaries to streamline accounting processes
5. **Scalability:**
   - Design architecture to allow for future expansion within the university and potentially to Dehradun
   - Flexibility to add new products or adapt to changing production capacities

## Discussion

The proposed "DBUU Organic" mobile application presents a significant opportunity to transform the organic product initiative at Dev Bhoomi Uttarakhand University. This section will discuss the potential impacts of the solution, challenges in implementation, and its broader implications for agricultural education and sustainable food systems.

**A. Potential Impact on Operational Efficiency**

1. **Streamlined Order Management:** The digitization of the ordering process is expected to dramatically reduce the time and effort required to manage orders. By replacing the current manual, pen-and-paper system with a digital interface, the initiative can potentially handle a larger volume of

orders without a proportional increase in administrative overhead.

2. **Reduced Fulfillment Time:** While the current average fulfillment time is 9 days, the proposed system's inventory management and production scheduling tools could significantly reduce this. By providing real-time visibility into stock levels and upcoming workshop dates, the app can help better align production with demand, potentially cutting fulfillment time by 50% or more.
3. **Improved Payment Processing:** The integration of digital payment options and automated reconciliation is projected to eliminate the current 1.5-hour post-workshop verification process. This not only saves time but also reduces the likelihood of human error in financial transactions.
4. **Enhanced Inventory Management:** Real-time tracking of inventory, coupled with the app's cold storage integration, will allow for more efficient use of storage capacity and reduce the risk of product wastage. This is particularly crucial given the limited storage capacity (20 jam bottles, 20 pickle bottles, 40 packets of cookies) and the perishable nature of the products.

**B. Educational Benefits for Students**

1. **Practical E-commerce Experience:** Students involved in managing the app will gain hands-on experience with digital marketing, e-commerce operations, and customer relationship management – valuable skills in today's job market.
2. **Data-Driven Decision Making:** The app's analytics features will provide students with real-world data to analyze, enhancing their understanding of market dynamics, consumer behavior, and business strategy.
3. **Sustainable Business Practices:** By participating in this initiative, students will gain practical insights into the challenges and opportunities of running a sustainable, local food business.
4. **Interdisciplinary Learning:** The project has the potential to involve students from various disciplines – including agriculture, business, IT, and marketing – fostering cross-departmental collaboration and learning.

**C. Scalability and Future Growth Possibilities**

1. **Expansion Within the University:** The app provides a solid foundation for expanding the initiative's reach across the entire university community, aligning with the stated goal of growth.
2. **Potential for Local Market Entry:** While the initial focus is on the university, the scalable nature of the app allows for potential expansion into the Dehradun market in the future, should the university decide to pursue this avenue.
3. **Model for Other Universities:** If successful, this initiative could serve as a model for other universities looking to integrate sustainable agriculture, entrepreneurship, and technology in their curricula.

**D. Challenges in Implementation and Adoption**

1. **Initial Investment:** Developing and implementing the app will require financial investment and technical resources. The university will need to weigh this against the potential long-term benefits.
2. **Training and Change Management:** While the team reports good digital literacy, there will still be a learning curve associated with adopting the new system. Comprehensive training programs will be crucial for successful implementation.
3. **Integration with Existing Systems:** Ensuring smooth integration with the university's existing IT infrastructure and academic systems may present technical challenges.

4. **Balancing Education and Business Goals:** As the initiative scales, there may be tension between its educational objectives and pressure to operate as a profitable enterprise. Clear guidelines will be needed to maintain this balance.
5. **Regulatory Compliance:** As the initiative grows, especially if it expands beyond the university, attention must be paid to food safety regulations and e-commerce laws.

**E. Implications for Sustainable Food Systems in Higher Education**

1. **Bridging Theory and Practice:** This initiative represents a novel approach to integrating sustainable agriculture theory with practical business experience in higher education.
2. **Promoting Local Food Systems:** By facilitating the production and sale of local, organic products, this project contributes to the broader movement towards sustainable, localized food systems.
3. **Technology in Agriculture Education:** The project demonstrates the potential for technology to enhance traditional agricultural education, preparing students for the increasingly digital future of farming and food production.

## Conclusion

This research has explored the potential for a digital solution to enhance the organic product initiative at Dev Bhoomi Uttarakhand University (DBUU), addressing current operational challenges while amplifying educational benefits. Through a comprehensive analysis of the existing processes, stakeholder needs, and industry best practices, we have proposed the development of the "DBUU Organic" mobile application.

**A. Summary of Key Findings**

1. The current workshop-based organic product initiative at DBUU, while valuable, faces significant operational challenges, including manual order management, lengthy fulfillment times, and inefficient payment processing.
2. Stakeholders, including students and staff, have expressed a strong interest in a digital solution, with high willingness to use a mobile app for ordering and managing organic products.
3. The proposed "DBUU Organic" app addresses these challenges through features such as real-time inventory management, streamlined order processing, integrated payment systems, and educational components.
4. The digital solution has the potential to significantly improve operational efficiency, reducing order fulfillment time and administrative overhead while enhancing the educational experience for students involved in the initiative.

**B. Implications for University-Based Organic Product Initiatives**

This project demonstrates the potential for technology to transform small-scale, educational organic product initiatives. By integrating e-commerce capabilities with sustainable agriculture education, universities can create dynamic learning environments that prepare students for the future of food systems and agribusiness.

The "DBUU Organic" app serves as a model for how educational institutions can leverage technology to:

1. Bridge the gap between theoretical knowledge and practical experience in sustainable agriculture and business.
2. Enhance the visibility and reach of university-produced organic products.
3. Provide students with hands-on experience in managing digital platforms and data-driven decision-making.

4. Contribute to the development of local, sustainable food systems.

**C. Limitations of the Study**

While this research provides valuable insights, it is important to acknowledge its limitations:

1. The study focuses on a single institution, and findings may not be universally applicable to all university settings.
2. Long-term impacts of the proposed digital solution have yet to be empirically verified.
3. The research did not extensively explore potential regulatory challenges that may arise with expansion beyond the university.

**D. Recommendations for Future Research**

To build upon this study, future research could:

1. Conduct a longitudinal study to assess the long-term impact of the digital solution on educational outcomes and operational efficiency.
2. Explore the potential for similar initiatives in diverse educational contexts, including institutions with different resources and agricultural focuses.
3. Investigate the broader economic and social impacts of university-based organic product initiatives on local communities.
4. Examine the integration of emerging technologies, such as blockchain or AI, in enhancing transparency and efficiency in university-based food production systems.

**E. Final Thoughts**

The "DBUU Organic" initiative represents more than just a technological upgrade to a university program. It embodies a forward-thinking approach to agricultural education that combines sustainability, entrepreneurship, and digital innovation. As the global food system faces increasing challenges related to sustainability and food security, initiatives like this play a crucial role in preparing the next generation of agricultural professionals.

By embracing digital solutions, DBUU is not only addressing immediate operational challenges but also positioning itself at the forefront of agricultural education. This project has the potential to inspire similar initiatives across other institutions, contributing to a broader movement towards sustainable, technologically-enhanced food systems.

**Final Call to Action**

As we conclude this research, it is clear that the potential benefits of implementing the "DBUU Organic" app extend far beyond the confines of our university. This project represents a significant step towards modernizing agricultural education and sustainable food production practices.

We call upon:

1. **University Administration:** To seriously consider the implementation of this digital solution, providing the necessary resources and support to bring this vision to life.
2. **Faculty Members:** To engage with this initiative, integrating it into their curricula and research projects, thereby enriching the educational experience of our students.
3. **Students:** To embrace this opportunity for hands-on learning in sustainable agriculture, e-commerce, and entrepreneurship.
4. **Local Community:** To support this initiative by engaging with and purchasing from DBUU Organic, fostering a stronger connection between the university and local consumers.
5. **Other Educational Institutions:** To consider similar initiatives, adapting this model to their own con-

texts and contributing to a network of sustainable, technology-enhanced agricultural education programs.

By taking these steps, we can transform DBUU's organic product initiative from a small-scale workshop project into a beacon of innovation in agricultural education. Together, we can cultivate not just organic produce, but a new generation of agricultural professionals equipped to tackle the challenges of tomorrow's food systems.

The journey towards sustainable, technologically-enhanced agriculture begins here, with a single app and a committed community. Let us seize this opportunity to make a lasting impact on our university, our local food system, and the future of agricultural education.

**References**

1. Chen, Y., & Dhillon, P. (2021). *Mobile-first design in university e-commerce platforms: Understanding student preferences for local goods*. Journal of Digital Commerce in Education, 12(3), 56-72.
2. Garcia, J., & Mendoza, R. (2022). *Bridging the gap: Mobile technologies in university agricultural programs*. Latin American Journal of Sustainable Agriculture, 9(2), 98-113.
3. Johnson, M., & Lee, S. (2020). *E-commerce projects in agriculture curricula: Enhancing technical and soft skills*. Journal of Agricultural Education, 15(1), 44-59.
4. Patel, S., & Sharma, V. (2024). *Mobile applications in university agricultural initiatives: Enhancing educational value through technology*. Indian Journal of Agricultural Education and Technology, 14(1), 34-47.
5. Patel, R., Kumar, P., & Srinivasan, N. (2021). *Technological innovations for small-scale food producers: A review of mobile applications*. Journal of Agribusiness Technology, 17(4), 233-245.
6. Smith, A., Brown, T., & Wilson, L. (2019). *Experiential learning through student-run online marketplaces: A case study of entrepreneurial education*. Journal of E-commerce in Higher Education, 8(2), 112-130.
7. Wong, T. (2020). *The role of UX/UI design in niche e-commerce platforms: Best practices for specialty food markets*. International Journal of E-commerce Design, 11(2), 77-89.