**HarvestHQ**



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**Unit Code/Name**: BSD 3106: Final Year Project

**Course**: BSc. Software Development

**Project Title: HarvestHQ**

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**Submission Date: June 9, 20223 2200HRS.**

**Background**

UAYO, a youth-driven agricultural organization, faces challenges in market access, fair trade relationships, and operational transparency. Currently relying on intermediaries, they lack control over pricing and struggle to establish transparency in the supply chain. HarvestHQ aims to transform their operations by providing direct market access, eliminating intermediaries, and empowering UAYO to negotiate fair prices and build transparent trade relationships. With real-time market insights and technology-driven solutions, HarvestHQ enables UAYO to make informed decisions, expand their market presence, and contribute to sustainable farming practices.

**Problem Statement**

HarvestHQ is an innovative online system that aims to solve the problem of limited market access for farmers. It serves as a comprehensive platform connecting farmers directly with buyers, eliminating the dependence on intermediaries. HarvestHQ provides real-time market information, empowering farmers to make informed decisions about their produce, including what to grow, when to sell, and at what price. By removing middlemen, HarvestHQ ensures fair pricing for farmers and improves their profitability. The platform also promotes transparency in the agricultural value chain by facilitating direct transactions between farmers and buyers. With its user-friendly interface and advanced features, HarvestHQ revolutionizes the way farmers interact with the market, providing them with a powerful online tool to access wider market opportunities and maximize their economic potential.

**Proposed System**

**The proposed system for HarvestHQ is an innovative online platform that revolutionizes market access for small-scale farmers and youth-driven agricultural organizations. It goes beyond basic automation and introduces key functionalities and features that empower farmers and facilitate transparent and efficient trade relationships. The major system functionality of HarvestHQ includes:**

**Direct Market Access:** The platform enables farmers to directly connect with buyers, eliminating intermediaries and ensuring fair pricing. It provides a user-friendly interface where farmers can showcase their products, negotiate deals, and establish direct trade relationships with buyers.

Real-Time Market Insights: HarvestHQ leverages data and analytics to provide farmers with real-time market insights. Farmers can access information on market demand, pricing trends, and consumer preferences, allowing them to make informed decisions and optimize their production strategies accordingly.

**Transparent Trade Relationships:** The system fosters transparency by facilitating transparent trade relationships between farmers and buyers. It ensures that both parties have access to accurate information on product quality, certifications, and pricing, promoting fair trade practices and building trust within the agricultural supply chain.

**Collaborative Networking:** HarvestHQ encourages collaboration and networking among farmers and agricultural organizations. It provides a platform for knowledge-sharing, best practice exchange, and the formation of partnerships, enabling farmers to learn from each other and collectively address challenges in the agricultural sector.

**Support and Resources:** The system offers various support mechanisms and resources to farmers, including access to training materials, expert advice, and agricultural best practices. It aims to empower farmers with the knowledge and tools they need to improve their productivity, sustainability, and overall success.

**The proposed system of HarvestHQ goes beyond automation and focuses on transforming the way farmers access markets, conduct trade, and collaborate within the agricultural ecosystem. It leverages technology to empower farmers, enhance transparency, and foster sustainable and profitable agricultural practices. By providing a comprehensive and user-friendly platform, HarvestHQ aims to drive positive change in the agricultural industry and contribute to the growth and success of youth-driven agricultural organizations.**

**Objectives**

**Objectives of HarvestHQ:**

**System Objectives:**

To Develop a user-friendly online platform that connects small-scale farmers with buyers, enabling direct market access and eliminating intermediaries.

To Implement real-time data analytics to provide farmers with market insights, including demand trends, pricing information, and consumer preferences.

To Foster transparent trade relationships by ensuring accurate product information, certifications, and fair pricing practices within the agricultural supply chain.

To Facilitate collaboration and networking among farmers and agricultural organizations for knowledge-sharing, best practice exchange, and partnership opportunities.

To Provide comprehensive support and resources to farmers, including training materials, expert advice, and access to agricultural best practices.

**Research Objectives:**

To Identify the key challenges faced by small-scale farmers and youth-driven agricultural organizations in accessing markets and establishing profitable trade relationships.

To Explore the impact of direct market access and real-time market insights on small-scale farmers' decision-making and productivity.

To Assess the effectiveness of transparent trade practices in enhancing trust, fairness, and profitability within the agricultural supply chain.

To Investigate the role of collaborative networking and knowledge-sharing in empowering farmers and promoting sustainable agricultural practices.

To Evaluate the impact of support mechanisms and resources on farmers' skills development, productivity, and overall success in the agricultural sector.

**Significance of the HarvestHQ**

The significance of the HarvestHQ lies in the benefits it brings to both the organization and society as a whole:

Enhanced operational efficiency: By implementing HarvestHQ, the organization can streamline its processes, automate manual tasks, and improve overall operational efficiency. This leads to cost savings, time optimization, and better resource utilization.

Improved decision-making: HarvestHQ provides the organization with valuable insights and data analytics, enabling informed decision-making. Access to real-time information about inventory, sales, and customer behavior allows for proactive planning and strategic decision-making.

Increased productivity and profitability: With improved inventory management, order processing, and resource allocation, HarvestHQ enables the organization to operate more efficiently, leading to increased productivity and profitability. It reduces stock-outs, minimizes errors, and optimizes resource utilization, resulting in higher customer satisfaction and repeat business.

Enhanced customer experience: HarvestHQ helps the organization deliver a superior customer experience. With features like personalized marketing campaigns, streamlined order tracking, and efficient customer support, it fosters better customer engagement, satisfaction, and loyalty.

Positive societal impact: By empowering the organization with efficient agricultural management tools, HarvestHQ contributes to the overall development and growth of the agricultural sector. This, in turn, positively impacts food security, economic stability, and employment opportunities within the community.

In summary, the significance of HarvestHQ lies in its ability to drive organizational growth, improve operational efficiency, enhance customer experience, and contribute to the overall advancement of the agricultural sector and society as a whole.

**CHAPTER TWO**

**Literature Review**

Crop production practices are of utmost importance for successful and economic cultivation of field crops and national food security at large. Current agriculture direly needs scientific and rational crop production practices to enhance farm productivity with long-term sustainability. Crop production practices can be divided into various categories that farmers make to produce food, fodder and fiber. **Soil and crop management, Nutrient management, Water management, Weed management, pest management**

All these activities are made to farmers doorsteps my intervention of technology (Agri-tech solution) – Shiksha Kendra.2016. Basic Agriculture.pdf. https://cbseacademic.nic.in/web\_material/Curriculum/Vocational/2018/Basic%20Agriculture%20X%20(408).pdf

Researchers on Agri-Food technology industry such as IntelliDigest prioritize frequently on measures they can use to maximize on food production in Africa and rest of the of world using technology and according to Copeland, L.O and McDonald, M.B. (1999). Principles of Seed Science and Technology. Springer US. Agricultural Models need to be user-friendly and requirements specific with creative or innovative components that could otherwise attract farmers to use it. HarvestHQ applies these prioritizes on these priniciples to delivery a very timely, user-friendly and user requirements oriented system. Human Computer Interaction is also a key factor when developing these systems or these models, and from [https://en.wikipedia.org/wiki/Human%E2%80%93computer\_interaction](https://en.wikipedia.org/wiki/Human–computer_interaction) there is a clear indication of the need for users to be involved in day-to-day design of application. There are series of problems in Agri-Food or agricultural models that needs to be addressed.

There are also some key features that need to be taken into account when integrating agricultural models in the modern technology. <https://www.oecd.org/agriculture/key-challenges-agriculture-how-solve/>. These factors range up-to policies that govern Agri-Food industry that should be strictly followed. In setting up platforms such as HarvestHQ these factors are important to take into account. Notably, “Usability is a core terminology in HCI. It has been defined as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use” (Punchoojit & Hongwarittorrn, 2017). Similarly, User experience (UX) encompasses experiences from how user feels, perceive, and reacts mentally and physically when interacting with product or services (Punchoojit & Hongwarittorrn, 2017). Since there are design weaknesses and areas for improvement in the current Agri-food Tech solutions, the goal is designing an application that solves these problems. This is because, continued interaction and using products is correlated with UX (Gonçalves et al., 2019; Punchoojit & Hongwarittorrn, 2017), making it imperative to design the HarvestHQ using modern design tools.

**Methodologies**

**Research methodologies**

**Data Collection Methods**

HarvestHQ conducts literature reviews, field observations, case studies, and focus groups to gather insights and knowledge from farmers, agricultural professionals, and market experts.

**Target Market**

Farmers: HarvestHQ focuses on farmers engaged in various types of farming, leveraging their specific needs and challenges to develop tailored solutions.

Agricultural Professionals: Researchers, agronomists, and extension agents provide expertise and insights to shape HarvestHQ's solutions.

Technology Providers: Collaborating with technology companies enables HarvestHQ to incorporate innovative solutions into the platform.

Market Experts: Collaborating with market experts ensures alignment with market needs and economic aspects of agriculture.

**Sampling Techniques**

Stratified Sampling: HarvestHQ selects samples from distinct farmer groups based on factors like crop type, farm size, or location.

Convenience Sampling: Participants are selected based on accessibility and availability for data collection.

Snowball Sampling: Referrals and recommendations help identify additional participants who fit the research criteria.

**Design Methodology**

**System Thinking and Modeling Methodology**

HarvestHQ adopts the System Thinking and Modeling Methodology as its development approach. This methodology emphasizes understanding the complex interactions and inter dependencies within the agricultural ecosystem to design effective solutions. It involves the following key aspects:

**System Thinking:** HarvestHQ analyzes the agricultural system holistically, considering interconnected elements for effective intervention.

**Modeling**: HarvestHQ uses simulations to understand the impacts of different scenarios on the agricultural system.

**Iterative Approach:** The methodology allows for continuous learning, stakeholder involvement, and adaptation to evolving needs.

By adopting the System Thinking and Modeling Methodology, HarvestHQ ensures a holistic understanding of the agricultural system and enables the development of innovative and effective solutions to address the challenges faced by farmers and the broader agricultural sector.

**Project Budget**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Quantity** | **Cost** | **totals** |
| Laptop (8gb Ram,512gb SSD) | 1 | 75000 | 75000 |
| Internet | (6months) | 3000 | 18000 |
| Flash drives(4gb) | 1 | 1000 | 1000 |
| Testing Team Token | 3 | 300 | 900 |
| Note book | 1 | 750 | 750 |
|  |  |  |  |
| subtotal |  |  | 96000 |
| Total |  |  | 96000 |

**Project Schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Description | Task  No. of days |  | Planned  Start  Date | Planned  Completion  Date |
| Project Idea | 2 |  | 01/06/2023 | 03/06/2023 |
| Project Proposal Development | 5 |  | 07/06/2022 | 12/06/2023 |
| Proposal Presentation | 1 |  | 13/06/2023 | 13/06/2023 |
| Software Requirement Specification Development | 5 |  | 15/06/2023 | 21/06/2023 |
| Software Design Specifically | 10 |  | 25/06/2023 | 06/07/2023 |
| Coding | 60 |  | 10/06/2023 | 11/08/2023 |
| Project Implementation | 5 |  | 12/08/2023 | 17/08/2023 |
| Testing and User Manual | 3 |  | 20/08/2023 | 23/08/2023 |
| Documentation | 3 |  | 24/08/2023 | 27/08/2023 |
| Final Presentation/Final report | 5 |  | To be communicated | To be communicated |

**References**

Shamat, N. A., Sulaiman, S., & Sinpang, J. S. (2017). A systematic literature review on user interface design for web applications.*Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, *9*(3-4), 57-61. <https://jtec.utem.edu.my/jtec/article/download/2918/2045>

Copeland, L.O and McDonald, M.B. (1999). Principles of Seed Science and Technology. Springer US.

Shiksha Kendra.2016. Basic Agriculture.pdf. https://cbseacademic.nic.in/web\_material/Curriculum/Vocational/2018/Basic%20Agriculture%20X%20(408).pdf

Punchoojit, L., & Hongwarittorrn, N. (2017). Usability studies on mobile user interface design p atterns: a systematic literature review. *Advances in Human-Computer Interaction*, *2017*. <https://doi.org/10.1155/2017/6787504>. <https://www.oecd.org/agriculture/key-challenges-agriculture-how-solve/>.