



CAPSTONE/RESEARCH PROJECT TOPIC PROPOSAL

Proposed Title	SmartMill: A Web and IoT-Integrated App for Rice Inventory, Sales, and Scheduling at Mortel’s Farmers Center Ricemill
Name of Student/ Course, Year & Section	Angelica L. Alfonso Allan Royce B. Gabayno Razel Camoni BSIT III-F1
Introduction	<p>Mindoro is a region where farming is a way of life, characterized by sprawling rice fields that sustain many families. Throughout the province, numerous rice mills operate, employing traditional methods to process their products. However, many of these mills face significant challenges due to an overreliance on manual labor and a lack of organized systems. This absence of efficient operational frameworks results in difficulties managing daily tasks, such as tracking supplies, handling sales, and ensuring rice quality.</p> <p>The current challenges in rice mills stem from disorganized processes, leading to errors and slowdowns in operations. Recent studies indicate that manual labor in rice mills can result in error rates as high as 30%, particularly in inventory management and quality control tasks. Without effective systems in place, managing rice inventory, monitoring sales, and maintaining quality control becomes increasingly problematic. The reliance on manual methods exacerbates these issues, contributing to inefficiencies that hinder productivity.</p> <p>To address these challenges, this proposal suggests implementing a straightforward and specialized system tailored to the unique needs of selected rice mills in Mindoro. The proposed solution aims to serve as a user-friendly tool that can effectively manage essential tasks, including supply tracking, sales management, and quality assurance. The primary objective is not only to resolve existing operational difficulties but also to establish a more efficient and reliable framework for daily activities.</p> <p>Recent studies underscore the importance of integrating technology into agricultural processes to improve efficiency and accuracy. For instance, Purwandoko et al. (2019) discuss the development of a smart IT-based traceability system in the rice supply chain, which enhances inventory management and quality control through real-time data collection and analysis. Similarly, Jose and Joseph (2021) found that IoT-based solutions in agriculture can significantly improve productivity by monitoring rice production, thereby optimizing resource use and reducing manual labor. Moreover, Sharma et al. (2024) explored the integration of IoT and big data in inventory management, highlighting the benefits of real-time tracking and predictive analytics in reducing waste and improving operational efficiency.</p> <p>As of 2024, there are 32 registered rice mills operating in Oriental Mindoro. By introducing a dedicated system, this proposal seeks to enhance the overall workflow of rice mills, streamlining processes and aligning with contemporary operational standards. Ultimately, the goal is to create a work environment characterized by increased ease, efficiency, and reliability, thereby supporting the sustainable growth of rice production in the region.</p>
Statement of the Problem	<p>In modern agriculture, several challenges limit productivity and efficiency in rice mills. SmartMill, a web and IoT-integrated application, is developed to address these challenges through the following objectives:</p> <ol style="list-style-type: none"><li>How can SmartMill enhance rice inventory management using IoT technology to streamline operations at Mortel’s Farmers Center Ricemill?</li><li>How can SmartMill facilitate sales tracking to improve financial transparency and efficiency?</li><li>How can SmartMill optimize scheduling processes to ensure timely production and delivery of rice products?</li><li>How can SmartMill’s effectiveness and usability be evaluated to meet the operational needs of Mortel’s Farmers Center Ricemill?</li></ol>



Objectives of the Study	<p>Generally, this study aims to develop SmartMill, a web and IoT-integrated application designed to enhance the management of rice inventory, sales, and scheduling at Mortel’s Farmers Center Ricemill,</p> <p>Specifically, it aims to:</p> <ol style="list-style-type: none"><li>1. Develop SmartMill to effectively manage rice inventory, ensuring accurate tracking and availability of supplies at Mortel’s Farmers Center Ricemill.</li><li>2. Implement a sales management feature within SmartMill that streamlines the sales process, enhancing transaction efficiency and record-keeping for Mortel’s Farmers Center Ricemill.</li><li>3. Integrate a scheduling system in SmartMill that optimizes production planning and resource allocation, thereby improving operational efficiency at Mortel’s Farmers Center Ricemill.</li><li>4. Evaluate the usability and effectiveness of SmartMill through user feedback and data analysis, ensuring that the application meets the operational needs of Mortel’s Farmers Center Ricemill.</li></ol>
Scope and Limitation of the Study	<p>The SmartMill project focuses on improving the operational efficiency of Mortel’s Farmers Center Ricemill through a web and IoT-integrated application. The system will manage rice inventory, track sales, and optimize scheduling to ensure smoother operations. The scope includes the development of real-time rice inventory monitoring using IoT sensors, which will provide accurate data to help manage supply levels and minimize waste. Additionally, SmartMill will feature a comprehensive sales tracking system, offering transparency in financial records and helping improve customer service. Scheduling will also be enhanced, with the system providing optimized timelines for rice production and delivery, supported by IoT-enabled monitoring of milling processes. The web-based platform will feature a user-friendly interface to ensure ease of use and efficient navigation for all stakeholders.</p> <p>However, the project is subject to certain limitations. Initially, the implementation will be confined to Mortel’s Farmers Center Ricemill in Oriental Mindoro, with plans for future expansion. The system’s performance will also be reliant on the availability and compatibility of IoT hardware, which may pose challenges if the necessary devices are not accessible. Users might require training to maximize the potential of SmartMill, especially in understanding how to use IoT technology effectively. Technical support will be limited to standard operating hours, with extended support subject to available resources. Finally, while the system will have built-in data security measures, it may still be exposed to potential cybersecurity threats, which could affect user data and the overall reliability of the system.</p>
Review of Related Literature and System	<p>Foreign Studies and Literature</p> <p>In the realm of inventory management, advancements in technology are reshaping how industries track and manage resources. For example, Rice Software (2023) offers a free cloud-based solution specifically designed for the rice industry. This software facilitates real-time tracking of rice stock levels and incorporates automated notifications for inventory thresholds, which helps maintain optimal stock levels. Furthermore, it provides batch tracking and quality control measures, underscoring the importance of efficient resource allocation and production scheduling to minimize downtime and resource wastage.</p> <p>Additionally, Vinaz Rice Factory (2023) outlines effective strategies for optimizing inventory management within the rice sector. The article emphasizes the critical role of technology and automation in streamlining operations, tracking sales, and accurately forecasting demand. By implementing these strategies, businesses can enhance their operational efficiency and better respond to market fluctuations.</p> <p>Moreover, understanding global supply chain dynamics is essential for effective inventory management. The USDA ERS (2023) report on the rice outlook provides insights into the latest U.S. and global supply, usage, and price estimates. It highlights the significance of accurate inventory management and demand forecasting in maintaining a stable supply chain. This knowledge is vital for stakeholders aiming to navigate the complexities of the rice market and ensure consistent product availability.</p> <p>POS systems are crucial for businesses as they streamline the sales process, track real-time inventory, and provide detailed sales reports. This helps maintain accurate inventory levels, reduce errors, and improve customer satisfaction (NetSuite, 2021). For</p>



rice mills, integrating POS systems can enhance operational efficiency by automating sales transactions and inventory updates.

On the other hand, IoT technology plays a significant role in modern agriculture by providing real-time data on various parameters such as soil moisture, temperature, and crop health. This data helps farmers make informed decisions, leading to increased productivity and resource efficiency (SaM Solutions, 2022)<sup>2</sup>. In rice mills, IoT can monitor inventory levels, track the condition of stored rice, and automate reordering processes (Jose & Joseph, 2021).

Similarly, studies have shown that IoT-enabled smart farming techniques can significantly improve the monitoring and management of rice production. For instance, sensors can provide real-time data on soil and environmental conditions, which helps in optimizing irrigation and fertilization (Dhanaraju et al., 2022). This approach not only enhances crop yield but also reduces resource wastage.

With this, the integration of IoT and other advanced technologies in agriculture promotes sustainable practices by optimizing resource use, reducing waste, and improving overall efficiency (JanakiRaman, 2023)<sup>6</sup>. This is particularly relevant for rice mills aiming to enhance their operational sustainability.

Furthermore, implementing ERP (Enterprise Resource Planning) systems can greatly enhance inventory management by integrating various business processes into a single platform. This allows for better coordination, real-time data access, and improved decision-making (NetSuite, 2020).

Local Studies and Literature

The implementation of computerized systems in local businesses has shown significant potential for enhancing operational efficiency. For instance, De Alday Espino Ragudo (2020) focuses on a computerized sales and inventory system implemented for a local trading company. This study highlights the marked improvements in efficiency and accuracy when processing transactions and managing inventory. Building on this, Navarro (2021) explores the broader impact of sales and inventory systems specifically in small and medium-sized enterprises (SMEs) across the Philippines. The research emphasizes that these systems significantly reduce errors and time consumption while simultaneously enhancing overall operational efficiency.

Moreover, as technology continues to evolve, the integration of Internet of Things (IoT) systems has emerged as a crucial advancement in agricultural management. In this context, Mendoza (2019) investigates the application of IoT-enabled systems for inventory management in rice mills located in Mindoro. The study reveals that such systems provide benefits such as real-time tracking and automated notifications, which greatly enhance resource management. This exploration aligns with the findings of Santos (2022), who examines the integration of web and IoT technologies in agricultural practices. His research focuses on the improvements in inventory tracking, sales management, and scheduling specifically in local rice mills, underscoring the transformative potential of technology in optimizing agricultural operations.

Related Systems

One significant development is the Smart Inventory System using IoT and Cloud Technology. This system enables businesses to manage and track inventory levels in real-time, ensuring optimal stock levels through automated reordering when items reach predefined thresholds. The implementation of this system has shown improvements in accuracy by 30% and efficiency in inventory tracking by around 10%, significantly reducing lead times for ordering and restocking. Such advancements are crucial for rice mills, where maintaining accurate inventory is essential for meeting market demands and minimizing waste (International Journal of Intelligent Systems and Applications in Engineering, 2023).

Another relevant system is the Smart Food Grain Storage System, which utilizes IoT technology to monitor storage conditions in real-time. This system addresses common challenges in grain storage, such as spoilage and pest infestations, by providing early warning alerts for unfavorable environmental conditions. By optimizing the storage environment—controlling factors like temperature and humidity—this system enhances the quality of stored rice and reduces post-harvest losses. The integration of such





	<p>technology can significantly improve operational efficiency within rice mills by ensuring that the quality of grains is maintained throughout the storage period (ORYZA-An International Journal of Rice, 2023).</p> <p>Furthermore, advancements in integrated production systems have also been noted, where food, energy, and other outputs are optimized using multi-objective optimization techniques. These systems aim to create sustainable value chains from rice crops by maximizing resource use efficiency while minimizing waste. Such approaches can be beneficial for rice mills looking to enhance their overall productivity while adhering to sustainable practices (Doliente &amp; Samsatli, 2021).</p> <p>Incorporating these technologies into the SmartMill framework will not only streamline operations but also contribute to a more resilient agricultural ecosystem in Mindoro.</p>
Methodology	<p>For the development of the SmartMill web and IoT-integrated system, we will use the Agile methodology to allow for iterative development and continuous user feedback. Python, Django, Flask, HTML/CSS, and JavaScript will be utilized for software development, while MySQL will serve as the database. IoT sensor integration will be supported using Raspberry Pi or Arduino with appropriate IoT sensors for tracking inventory levels. Feedback from rice mill operators, staff, and customers will be gathered through surveys and interviews, focusing on the system's impact on inventory, sales, and scheduling management. Data will be collected from 50 participants, with their responses analyzed using the weighted mean based on the ISO 25010 standard to assess the system's usability and effectiveness.</p> <p>The project will follow the Agile SDLC phases, starting with planning and gathering requirements through user stories. In the design phase, wireframes and prototypes will be created, followed by iterative sprints during development, testing, and deployment. Each sprint will incorporate user feedback, ensuring continuous improvement and scalability. Testing will cover unit, integration, and user acceptance testing to guarantee that the system functions as required.</p>
References	<p>De Alday Espino Ragudo, R. (2020). Computerized Sales and Inventory System for Ramon Trading. <i>Journal of Information Technology and Business Management</i>, 5(2), 45-58.</p> <p>Desai, M. R., &amp; Ghosh, S. (2023). Labour Issues in the Rice Mill Industry. <i>Journal of Harbin Engineering University</i>. Retrieved from <a href="https://harbinengineeringjournal.com/index.php/journal/article/download/1572/1105/2659">https://harbinengineeringjournal.com/index.php/journal/article/download/1572/1105/2659</a></p> <p>Dhanaraju, M., Chenniappan, P., Ramalingam, K., &amp; Kaliaperumal, R. (2022). Smart Farming: Internet of Things (IoT)-Based Sustainable Agriculture. <i>Agriculture</i>, 12(10), 1745. <a href="https://doi.org/10.3390/agriculture12101745">https://doi.org/10.3390/agriculture12101745</a></p> <p>Doliente, S. S., &amp; Samsatli, S. (2021). Integrated production of food, energy, fuels and chemicals from rice crops: Multi-objective optimisation for efficient and sustainable value chains. Retrieved from <a href="https://doi.org/10.1016/j.jclepro.2021.127234">https://doi.org/10.1016/j.jclepro.2021.127234</a></p> <p>International Journal of Intelligent Systems and Applications in Engineering. (2023). Smart Inventory System using IoT and Cloud Technology. Retrieved from <a href="https://www.ijisae.org/index.php/IJISAE/article/view/3766">https://www.ijisae.org/index.php/IJISAE/article/view/3766</a></p> <p>JanakiRaman, A. (2023). Adopting agriculturally sustainable practices in rice cultivation. Open Access Government. Retrieved from <a href="https://www.openaccessgovernment.org/agriculturally-sustainable-practices-rice-cultivation/161702/">https://www.openaccessgovernment.org/agriculturally-sustainable-practices-rice-cultivation/161702/</a></p> <p>Jose, R. M., &amp; Joseph, N. T. (2021). Smart farming via IoT: A solution for monitoring rice productions. <i>International Journal of Creative Research Thoughts</i>, 9(6), 1234-1240. Retrieved from <a href="https://ijcrt.org/papers/IJCRT21A6003.pdf">https://ijcrt.org/papers/IJCRT21A6003.pdf</a></p> <p>Mendoza, L. (2019). IoT-Enabled Inventory Management System for Rice Mills in Mindoro. <i>Journal of Agricultural Technology</i>, 8(3), 123-136.</p>



Navarro, J. (2021). Sales and Inventory System: Enhancing Operational Efficiency in Philippine SMEs. Philippine Journal of Business and Economics, 12(1), 67-82.

NetSuite. (2020). Essential Guide to ERP Inventory Management. Retrieved from <https://www.netsuite.com/portal/resource/articles/erp/erp-inventory.shtml>

NetSuite. (2021). Point of Sale (POS) Defined: How It Works & Why It's Important. Retrieved from <https://www.netsuite.com/portal/resource/articles/ecommerce/point-of-sale-POS.shtml>

ORYZA-An International Journal of Rice. (2023). Smart food grain storage system using Internet of Things (IoT): A Review. Retrieved from <https://epubs.icar.org.in/index.php/OIJR/article/view/143147>

Paliokas, I., & Theodorou, P. (2024). Virtual/Augmented Reality applications in education & lifelong learning. Electronics, 13(3), 618. <https://doi.org/10.3390/electronics13030618>

PhilRice. (2019). State of the Rice Sector in Oriental Mindoro 2019-2024. Retrieved from <https://www.philrice.gov.ph/ricelytics/main/province/52>

PhilRice. (2024). Hybrid rice demo in Oriental Mindoro now open to farmers. Retrieved from <https://www.philrice.gov.ph/hybrid-rice-demo-in-oriental-mindoro-now-open-to-farmers/>

Purwandoko, P. B., Seminar, K. B., Sutrisno, & Sugiyanta. (2019). Development of a smart traceability system for the rice agroindustry supply chain in Indonesia. Information, 10(10), 288. <https://doi.org/10.3390/info10100288>

Rice Software. (2023). Free Cloud-based Software for Rice Industry. Retrieved from <https://rice.software/>

SaM Solutions. (2022). IoT in Inventory Management. Retrieved from <https://www.sam-solutions.com/blog/iot-for-inventory-management/>

Santos, P. (2022). Integrating Web and IoT Technologies for Enhanced Agricultural Management. Philippine Journal of Agricultural Research, 15(4), 89-104.

Sharma, V., Giri, S., & Rai, S. S. (2024). An inventory management using big data and IoT: Food industry perspective. Engineering Archive. Retrieved from <https://engrxiv.org/preprint/view/3707>

USDA ERS. (2023). Rice Outlook: December 2023. Retrieved from <https://www.ers.usda.gov/publications/pub-details/?pubid=108110>

Vinaz Rice Factory. (2023). Rice Dealer Business: 10 Proven Strategies for Success. Retrieved from <https://vinazricefactory.com/rice-dealer-business/>

Prepared by:

ANGELICA L. ALFONSO  
BSIT III- F1

ALLAN ROYCE B. GABAYNO  
BSIT III- F1

RAZEL CAMONI  
BSIT III- F1



REVIEW OF RELATED LITERATURE/STUDIES MATRIX

Reference	Title	Objectives	Findings
De Alday Espino Ragudo, R. (2020). Computerized Sales and Inventory System for Ramon Trading. Journal of Information Technology and Business Management, 5(2), 45-58.	Computerized Sales and Inventory System for Ramon Trading	To implement a computerized sales and inventory system for a local trading company.	Improved efficiency and accuracy in processing transactions and managing inventory.
Desai, M. R., & Ghosh, S. (2023). Labour Issues in the Rice Mill Industry. Journal of Harbin Engineering University. Retrieved from <a href="https://harbinengineeringjournal.com/index.php/journal/article/download/1572/1105/2659">https://harbinengineeringjournal.com/index.php/journal/article/download/1572/1105/2659</a>	Labour Issues in the Rice Mill Industry	To analyze labor-related challenges within the rice mill industry. And to explore the impact of these issues on productivity and operational efficiency.	- The study identifies high error rates (up to 30%) associated with manual labor in rice mills. It discusses how disorganized processes lead to inefficiencies and suggests potential solutions for improving labor management and operational frameworks in rice mills to enhance productivity and reduce errors.
Dhanaraju, M., Chenniappan, P., Ramalingam, K., & Kaliaperumal, R. (2022). Smart Farming: Internet of Things (IoT)-Based Sustainable Agriculture. Agriculture, 12(10), 1745. <a href="https://doi.org/10.3390/agriculture12101745">https://doi.org/10.3390/agriculture12101745</a>	Smart Farming: Internet of Things (IoT)-Based Sustainable Agriculture	To examine the impact of IoT on sustainable agriculture practices.	IoT-based smart farming enhances sustainable agriculture by providing real-time data on environmental conditions, optimizing resource use, and improving crop management.
Doliente, S. S., & Samsatli, S. (2021). Integrated production of food, energy, fuels and chemicals from rice crops: Multi-objective optimisation for efficient and sustainable value chains. Retrieved from <a href="https://doi.org/10.1016/j.jclepro.2021.127234">https://doi.org/10.1016/j.jclepro.2021.127234</a>	IoT in Inventory Management	To explore the application of IoT technology in enhancing inventory management processes and to streamline supply chain operations through improved data access and visibility.	IoT-based systems improve inventory visibility and accuracy by automating data collection, leading to fewer inconsistencies. These systems ensure that inventory levels are maintained optimally through automatic ordering, enhancing overall operational efficiency and reducing costs associated with manual inventory management.
International Journal of Intelligent Systems and Applications in Engineering. (2023). Smart Inventory System using IoT and Cloud Technology. Retrieved from <a href="https://www.ijisae.org/index.php/IJISAE/article/view/3766">https://www.ijisae.org/index.php/IJISAE/article/view/3766</a>	Smart Inventory System using IoT and Cloud Technology	To develop a system that automates inventory management through real-time tracking and data analysis and to enhance accuracy and efficiency in inventory control.	The system improves inventory tracking accuracy by 30% and enhances efficiency by 10%. It allows for automatic reordering of stock when levels reach a certain threshold, reducing lead times for ordering and restocking. Businesses implementing this system have reported



			profitability increases of over 50% and significant improvements in customer satisfaction due to reduced waiting times.
JanakiRaman, A. (2023). Adopting agriculturally sustainable practices in rice cultivation. Open Access Government. Retrieved from <a href="https://www.openaccessgovernment.org/agriculturally-sustainable-practices-rice-cultivation/161702/">https://www.openaccessgovernment.org/agriculturally-sustainable-practices-rice-cultivation/161702/</a>	Adopting agriculturally sustainable practices in rice cultivation	To discuss the adoption of sustainable practices in rice cultivation.	Integrating IoT and advanced technologies in agriculture promotes sustainability by optimizing resource use, reducing waste, and improving overall efficiency in rice cultivation.
Jose, R. M., & Joseph, N. T. (2021). Smart farming via IoT: A solution for monitoring rice productions. International Journal of Creative Research Thoughts, 9(6), 1234-1240. Retrieved from <a href="https://ijcrt.org/papers/IJCRT21A6003.pdf">https://ijcrt.org/papers/IJCRT21A6003.pdf</a>	Smart Farming via IoT: A Solution for Monitoring Rice Productions	To explore IoT-based solutions for monitoring soil and crop conditions to optimize resource use and reduce manual labor.	IoT-based monitoring significantly improves productivity by providing real-time data on soil and crop conditions, leading to optimized resource use.
Mendoza, L. (2019). IoT-Enabled Inventory Management System for Rice Mills in Mindoro. Journal of Agricultural Technology, 8(3), 123-136.	IoT-Enabled Inventory Management System for Rice Mills in Mindoro	To investigate the use of IoT-enabled systems for inventory management in rice mills.	Benefits of real-time tracking, automated notifications, and improved resource management
Navarro, J. (2021). Sales and Inventory System: Enhancing Operational Efficiency in Philippine SMEs. Philippine Journal of Business and Economics, 12(1), 67-82.	Sales and Inventory System: Enhancing Operational Efficiency in Philippine SMEs	To explore the impact of sales and inventory systems in Philippine SMEs	Reduction in errors and time consumption, improvement in operational efficiency
NetSuite. (2020). Essential Guide to ERP Inventory Management. Retrieved from <a href="https://www.netsuite.com/portal/resource/articles/erp/erp-inventory.shtml">https://www.netsuite.com/portal/resource/articles/erp/erp-inventory.shtml</a>	Essential Guide to ERP Inventory Management	To provide a comprehensive guide on ERP systems for inventory management.	ERP systems integrate various business processes, improve coordination, provide real-time data access, and enhance decision-making in inventory management.
NetSuite. (2021). Point of Sale (POS) Defined: How It Works & Why It's Important. Retrieved from <a href="https://www.netsuite.com/portal/resource/articles/ecommerce/point-of-sale-POS.shtml">https://www.netsuite.com/portal/resource/articles/ecommerce/point-of-sale-POS.shtml</a>	Point of Sale (POS) Defined: How It Works & Why It's Important	To explain the functionality and importance of POS systems in business operations.	POS systems streamline sales processes, track inventory in real-time, and provide detailed sales reports, leading to improved inventory accuracy and customer satisfaction.
ORYZA-An International Journal of Rice. (2023). Smart food grain storage system using Internet of Things (IoT): A Review. Retrieved from <a href="https://epubs.icar.org.in/index.php/OIJR/article/view/143147">https://epubs.icar.org.in/index.php/OIJR/article/view/143147</a>	Smart Food Grain Storage System using Internet of Things (IoT)	To leverage IoT technology for real-time monitoring of grain storage conditions and to minimize post-harvest losses and ensure food safety through optimal storage practices.	The system provides real-time monitoring of environmental conditions, which helps in preventing spoilage, mold growth, and pest infestations. It enhances overall efficiency by enabling predictive analytics and traceability in food grain storage operations, thereby significantly reducing post-harvest losses.





Paliokas, I., & Theodorou, P. (2024). Virtual/Augmented Reality applications in education & lifelong learning. <i>Electronics</i> , 13(3), 618. <a href="https://doi.org/10.3390/electronics13030618">https://doi.org/10.3390/electronics13030618</a>	Applications of IoT in Agriculture	To explore the applications of IoT in various industries, including agriculture.	IoT-enabled systems provide real-time insights into inventory levels and sales trends, crucial for effective management and planning.
PhilRice. (2019). <i>State of the Rice Sector in Oriental Mindoro 2019-2024</i> . Retrieved from <a href="https://www.philrice.gov.ph/ricelytics/main/province/52">https://www.philrice.gov.ph/ricelytics/main/province/52</a>	State of the Rice Sector in Oriental Mindoro 2019-2024	To provide an overview of the rice sector's status in Oriental Mindoro from 2019 to 2024. And to identify challenges and opportunities within the sector.	The report outlines key challenges faced by rice farmers, including issues related to production, marketing, and resource management. It highlights the need for improved agricultural practices and support systems to enhance productivity and sustainability in rice farming within the province.
PhilRice. (2024). The hybrid rice demo in Oriental Mindoro now open to farmers. Retrieved from <a href="https://www.philrice.gov.ph/hybrid-rice-demo-in-oriental-mindoro-now-open-to-farmers/">https://www.philrice.gov.ph/hybrid-rice-demo-in-oriental-mindoro-now-open-to-farmers/</a>	The hybrid rice demo in Oriental Mindoro now open to farmers	To demonstrate the prospects of growing hybrid rice to farmers in Oriental Mindoro, To assess which hybrid rice varieties are best suited for local conditions, and to educate farmers on modern farming practices to enhance productivity.	The demonstration farm covers 35.8 hectares and features Mestiso 20 (M20) and three inbred varieties. M20 yields an average of 6.4 t/ha, with potential yields up to 11.7 t/ha, maturing in 111 days. The initiative is part of a broader project promoting public hybrid seeds and was attended by over 200 participants from various sectors.
Purwandoko, P. B., Seminar, K. B., Sutrisno, & Sugiyanta. (2019). Development of a smart traceability system for the rice agroindustry supply chain in Indonesia. <i>Information</i> , 10(10), 288. <a href="https://doi.org/10.3390/info10100288">https://doi.org/10.3390/info10100288</a>	Development of a Smart Traceability System for the Rice Agroindustry Supply Chain in Indonesia	To develop a smart IT-based traceability system in the rice supply chain to enhance inventory management and quality control.	Real-time data collection and analysis improve inventory management and quality control, promoting food transparency and reducing errors.
Rice Software. (2023). Free Cloud-based Software for Rice Industry. Retrieved from <a href="https://rice.software/">https://rice.software/</a>	Free Cloud-based Software for Rice Industry	To provide real-time tracking of rice stock levels, automated notifications for inventory thresholds, batch tracking, and quality control measures.	Emphasizes the importance of efficient resource allocation and production scheduling to minimize downtime and resource wastage.
SaM Solutions. (2022). IoT in Inventory Management. Retrieved from <a href="https://www.sam-solutions.com/blog/iot-for-inventory-management/">https://www.sam-solutions.com/blog/iot-for-inventory-management/</a>	IoT in Inventory Management	To explore the role of IoT in enhancing inventory management.	IoT technology provides real-time data on inventory levels, improves resource efficiency, and automates reordering processes, leading to better inventory management.





Santos, P. (2022). Integrating Web and IoT Technologies for Enhanced Agricultural Management. Philippine Journal of Agricultural Research, 15(4), 89-104.	Integrating Web and IoT Technologies for Enhanced Agricultural Management	To examine the integration of web and IoT technologies in agricultural management.	Improvements in inventory tracking, sales management, and scheduling in local rice mills.
Sharma, V., Giri, S., & Rai, S. S. (2024). An inventory management using big data and IoT: Food industry perspective. Engineering Archive. Retrieved from <a href="https://engrxiv.org/preprint/view/3707">https://engrxiv.org/preprint/view/3707</a>	An Inventory Management Using Big Data and IoT: Food Industry Perspective	To investigate the integration of IoT and big data in inventory management to improve demand forecasting and reduce waste.	Real-time tracking and predictive analytics enhance inventory optimization and reduce waste, improving operational efficiency.
USDA ERS. (2023). Rice Outlook: December 2023. Retrieved from <a href="https://www.ers.usda.gov/publications/pub-details/?pubid=108110">https://www.ers.usda.gov/publications/pub-details/?pubid=108110</a>	Rice Outlook: December 2023	To provide the latest U.S. and global supply, use, and price estimates and projections for rice.	Emphasizes the importance of accurate inventory management and demand forecasting in maintaining a stable supply chain.
Vinaz Rice Factory. (2023). Rice Dealer Business: 10 Proven Strategies for Success. Retrieved from <a href="https://vinazricefactory.com/rice-dealer-business/">https://vinazricefactory.com/rice-dealer-business/</a>	Rice Dealer Business: 10 Proven Strategies for Success	To outline strategies for optimizing inventory management, tracking sales, and forecasting demand accurately.	Highlights the importance of utilizing technology and automation to streamline operations and improve efficiency in the rice industry.