

Optimizing technology-based business strategies for empowering community partnerships and improving the welfare of women farmers

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ARTICLE INFO:

Received: 2023-06-16
Revised: 2023-07-11
Accepted: 2023-08-19

Keywords:

E-commerce,
Hydroponics, KWT
Al Mina Ciawi
Village, Livestock,
Rapid application
development

ABSTRACT

In this era of technological advances, the rapid, accurate, and precise dissemination of information is crucial, especially for rural communities seeking to enhance their living standards. Farmer women's community (KWT) Al Mina Ciawi Village, established by a women's group in Ciawi Village, operates as a food and animal security program. Activities at KWT Al Mina Ciawi Village involve cultivating various hydroponic vegetables and catfish farming in buckets. However, a significant challenge lies in product sales during harvest, with agricultural and livestock products primarily marketed through WhatsApp and Instagram or waiting for direct buyers to visit the location. The primary aim of this community empowerment initiative is to optimize information technology for the betterment of KWT Al Mina and Ciawi Village. The program supports partners by offering e-commerce training to expand the marketing of KWT Al Mina products within the village. The chosen approach for e-commerce development is the Rapid Application Development (RAD) method, which includes website design planning, initial assessment, outreach, training, mentoring, and evaluation. The evaluation results affirm the program's success. KWT Al Mina members in Ciawi Village experiencing a remarkable 94% skill improvement in accessing technology, as indicated by pre-test and post-test assessments.

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How to cite: Putri, D. A., Kristiyanti, D. A., & Marginingsih, R. (2023). Optimizing technology-based business strategies for empowering community partnerships and improving the welfare of women farmers. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, 8(3), 378-388 <https://doi.org/10.26905/abdimas.v8i3.10828>

1. INTRODUCTION

Agriculture and rural areas are two inseparable components. Agriculture is one of the sectors that fulfills the needs of people in rural areas, especially in Indonesia. Despite the significant role of agriculture for rural communities, this sector as a whole still faces various challenges, making it unable to support the advancement of the farmers' position (Rusdiyana et al., 2022). In today's technological advancements, rapid, precise, and accurate information dissemination has become a primary necessity in this regard.

Like rural communities aiming to improve their living standards, the advancement of information technology can be used as a means of communication and exchanging information related to agricultural activities and developments (Rijayanti & Supriatna, 2018). Information technology continues to advance in parallel with the computer's ability to provide solutions for problems in various fields, be it in the economic, social, organizational, or educational sectors (Kristiyanti & Mulyana, 2020). An example of technological advancement that we can use in our daily lives is the internet. The internet network can connect us to the entire world (Kristiyanti et al., 2021). The internet is one of the technologies that can be used as a communication tool, and nowadays, it is often used for buying and selling goods and services. Furthermore, many entrepreneurs commonly market their products through the internet (Geralda & Kasih, 2020). This fact is evidenced by the increasing prevalence of online transactions conducted through marketplaces and e-commerce platforms, as well as buying and selling activities through social media (Wilis et al., 2023).

A website is a page of information system that can be accessed easily and quickly. The emergence of websites is driven by the development of information and communication technology (Hidayati, 2021). Promoting products using a website can be more advantageous, as it also simplifies the development process and can save costs (Darnis & Azdy, 2019). E-commerce websites play a crucial role in expanding market access, resulting in increased sales revenue (Rahmidani et al., 2019).

Al Mina Women Farmers Group (KWT) in Ciawi Village is a forum of women farmers located in the Ciawi-Bogor area with an address at Jalan KP Tipar No.32, RT.01/RW.04, Bogor Regency, West Java. This women farmers' group was formed on October 31, 2022, based on the Decision Letter of the Head of Ciawi Village (*SK Kepala Desa Ciawi*) with the number SK 141.1/18/KPTS/2022 as part of the government's program implementation for per capita food security in the village. Some of the activities carried out by this group include hydroponic vegetable cultivation, starting from seed sowing, transplanting, rejuvenation, growing on hydroponic pipe media, providing nutrients, and harvesting vegetables. They also engage in catfish farming in buckets and sell the livestock.

This group has a 450 m² area consisting of three parts: the hydroponic field, the secretariat building, and the area for catfish farming in buckets or ponds. The equipment used by the group in their daily activities includes rocket planting media, seeds or seedlings, water, nutrients, nutrient storage tanks, and hydroponic water systems. Currently, they market their products through WhatsApp and Instagram orders, as well as direct sales to customers who visit the KWT. The existence of the Al Mina Women Farmers Group greatly contributes to empowering women in development programs (Afifah & Ilyas, 2021). However, during the operation of KWT, several challenges have been faced. For instance, the ordering of agricultural and livestock products is currently only done through social media platforms (Instagram and WhatsApp), and sales are conducted through conventional methods (customers visiting KWT Al Mina in Ciawi Village). Ordering through WhatsApp and Instagram is considered to have a limited reach, primarily within the immediate vicinity. According to the results of a survey conducted among micro, small, and medium-sized enterprises (MSMEs) participants, 70% of business owners looking to advance agreed to market their products through online e-commerce platforms.

Therefore, with the use of information technology, creating an e-commerce website and utilizing social media, we can expand our target market and attract new customers (Trulline, 2021). Furthermore, information technology also facilitates buyers in purchasing products without the need to visit the physical location. Sales administration becomes more efficient and faster. The presence of this e-commerce website will have a significant impact on the business's development. Therefore, there will be efforts to create a website and promote its use among our partners.

Based on the existing issues, it is essential to implement the right and effective marketing strategies (Wijaya et al., 2020). The focus of this community service activity aligns with the national

research and community service focus, which is technology-based digital computation economics, specifically digital transformation and software engineering. The goal is to create a website, along with socialization and training, with the expectation that it will enhance the partners' knowledge in using and marketing their products through the internet. They should also become proficient in managing the website as a promotional tool (Bukit et al., 2019). It is hoped that this effort can help address the issues that the partners have been facing, allowing KWT Al Mina in Ciawi Village to thrive and keep up with the advancements in information technology.

2. METHODS

Based on the issues and challenges experienced by KWT Al Mina in Ciawi Village, the approach taken during the community service program at KWT Al Mina in Ciawi Village is a training method. The training method involves providing training to partner members on the use of web-based information technology. The stages of activities carried out during the community empowerment program at KWT Al Mina in Ciawi Village are presented in Figure 1.

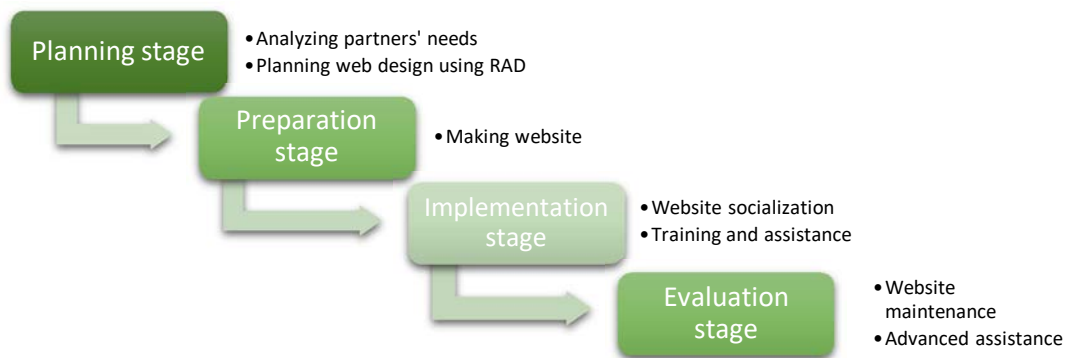


Figure 1. Stages of activities carried out during the community empowerment

Planning Stage

The planning phase is the initial stage, conducted by analyzing the issues faced by the partners and planning the website development. The method used is the system development method. In the research on e-commerce design and development, the Rapid Application Development (RAD) system development method is employed. It's an incremental software development process model primarily used to address projects with short time constraints (Putra & Lolly, 2021). The RAD model is an adaptation of the waterfall model with a high-speed version, utilizing the waterfall model to develop each software component separately. Additionally, the RAD model involves dividing the development team into several groups to work on software components in parallel. The workflow of the RAD method is illustrated in Figure 2.



Figure 2. Rapid Application Development (RAD) workflow

The workflow of the RAD method is divided into three stages, including: 1) Requirement Planning. This phase is where the analysts meet with users to determine the objectives of the system to be developed, identify the information requirements that will emerge to achieve those objectives, and analyze all the systems required by the users (Trimahardhika & Sutinah, 2017); 2) Design System. In this phase, the active involvement of users is crucial for achieving the goals because it involves the design process and corrections if there are discrepancies between the user and the analyst. A user can provide direct feedback if there are discrepancies in the design, designing the system based on the user requirements documentation created in the previous phase. The output of this stage is the software specification, which includes the overall system organization, data structure, and other elements (Wahyuningrum & Januarita, 2014); and 3) Implementation. This phase is the development stage by programmers based on the approved program design by users and analysts. Before being implemented in an organization, the program undergoes testing to determine whether there are any errors or not. In this phase, users typically provide feedback on the system that has been created and give their approval for the system (Wahyuningrum & Januarita, 2014).

Preparation Stage

In this stage, the implementation team prepares everything that will be used during the activity, such as the creation of the e-commerce platform for KWT Al Mina in Ciawi Village by the implementation team. This e-commerce website is developed to support the partners' marketing needs and expand the reach of information about the partners.

Implementation Stage

The implementation phase involves the socialization of the e-commerce website, demonstrating its use from both the admin and user perspectives, training administrators on how to use the website, and assisting partner members in using the KWT Al Mina in Ciawi Village e-commerce site. In the community service activities, there are four methods used, including: 1) Presentation and Q&A session. In the socialization process at each meeting, presentation methods are used to inform participants about the training that will be conducted to improve the welfare of the partners. In addition to presentations, the implementation method also involves a question-and-answer approach (Amalia & Uswatun, 2019). The use of this method is implemented as a form of interaction or communication that takes place between the implementation team and the participants. The question-and-answer method aims to satisfy participants' curiosity about the training being conducted. The question-and-answer method can be a practical approach when the implementation team feels the need to demonstrate practices to the participants. This allows participants to see and practice directly, enhancing their knowledge and maximizing application (Hernawati & Amin, 2017); 2) Practice. The practice method is conducted in such a way that training participants can immediately apply the information acquired through the presentation and question-and-answer methods. To facilitate participants in deepening their knowledge, the instructor also demonstrates several implementation examples, such as when trying to access the KWT Al Mina in Ciawi Village website. The training method to be conducted includes direct guidance to participants to demonstrate the training process; and 3) Evaluation planning. During the implementation of this Community Partnership Program, there are several criteria that serve as the fundamental targets to achieve through the program. The basic targets of the program include conducting activities according to the predetermined schedule and total number of meetings. This can be realized due to the excellent cooperation between the implementation team and the participants from the partner organization. Another fundamental target is to provide clear explanations and guidance on the materials being socialized so that participants can practice independently. Throughout this process, several aspects

are evaluated, such as difficulties in accessing the e-commerce website, missing product images, and additional features that may be needed. Maintenance is also conducted to ensure user convenience.

Evaluation Stage

This evaluation phase is carried out by performing maintenance on the website to address the issues faced by partner members when accessing the website. This involves modifying the default parameters from the initial website creation and adding functionalities needed by the partners.

3. RESULTS AND DISCUSSION

Results

In an effort to address the challenges faced by our partner, KWT Al Mina in Ciawi Village, which includes a lack of knowledge and skills in using information technology such as managing e-commerce, the community service team from Bina Sarana Informatika University and Multimedia Nusantara University has undertaken various community empowerment activities. One of these activities involves providing socialization, creating, and training in the use of e-commerce for KWT Al Mina in Ciawi Village.

The e-commerce website for KWT Al Mina in Ciawi Village can be accessed by users by using the keyword 'KWT Al-Mina' in search engines like Google or by typing the URL <https://www.kwtalmina.com> in their browser. The e-commerce site for KWT Al Mina in Ciawi Village features several functions such as a shopping cart, product catalog, profile, and the latest news about KWT Al-Mina. The creation of this e-commerce platform is highly beneficial as it simplifies product purchases for users and enables our partner to manage sales transactions, generate product sales reports, and ensure the security of transactions. This is because transaction history is stored in the database of the KWT Al Mina in Ciawi Village e-commerce administrator. The appearance of the KWT Al Mina in Ciawi Village e-commerce website is shown in Figures 3, 4, and 5.



Figure 3. View of the KWT Al Mina E-Commerce homepage, Ciawi Village

Figure 4. KWT Al Mina Village Ciawi E-Commerce login display

Figure 5. Display of KWT Al Mina E-Commerce product categories in Ciawi Village

Implementation Stage

The implementation phase is a part of the various stages of community service program activities for KWT Al Mina in Ciawi Village. There are five processes within the implementation phase, including website creation planning, initial evaluation, socialization, website usage training, and final evaluation. The implementation phase in this community service program is illustrated in Figure 6.



Figure 6. Implementation stage

Website design planning

In this stage, the implementation team holds Focus Group Discussions (FGD) to prepare what is needed for the website creation, such as the type of website to be created, website platform, hosting, and domain. Afterward, website settings are configured for buying and selling transactions and determining the information that will be included on the website.

Initial evaluation

The website creation process is tailored to the needs of the partner, and the website design is made to be user-friendly. In this stage, the implementation team will review the results of the website that has been created. The website will be tested to identify any necessary additions or improvements.

Socialization

In this stage, the implementation team conducts socialization to introduce the e-commerce website that the partners will use, especially for the prospective administrators who will handle the website. The content of the e-commerce website socialization presented to KWT Al Mina in Ciawi Village is shown in Table 1.

Table 1. KWT Al Mina Village Ciawi E-Commerce website socialization activities

Material	Chapters
E-Commerce Website	Introduction of the team. Socialization of the KWT Al Mina Ciawi Village e-commerce website. Explanation of the use and workings of the e-commerce website created by the implementation team. The practice of using the KWT Al Mina Desa Ciawi e-commerce website from the User side. The practice of using the KWT Al Mina Desa Ciawi e-commerce website from the Administrator side.

Practice on using website

The implementation team demonstrates to the partners how to use the e-commerce website from both the user and admin sides, explaining the available features on the website and the transaction flow when there is a product order. In this stage, the participants, who are members of the partner organization, are asked to access the e-commerce website that has been created by entering the URL <https://www.kwtalmina.com> in their browser. The goal is to see if there are any issues during the website access process.

Final evaluation

The final evaluation stage is to assess what has been functioning well and what needs improvement. In this case, the evaluation focuses on the usage process of the KWT Al Mina in Ciawi Village e-commerce. During the trial access of the website by partner members, there were several challenges such as difficulty accessing the website, missing product images, and the need to add some features. Therefore, the KWT Al Mina in Ciawi Village e-commerce website needs maintenance to ensure ease of access and the inclusion of all necessary features.

The socialization was conducted directly by the implementation team with the partners at KWT Al Mina in Ciawi Village. The activities and the e-commerce website socialization at KWT Al Mina in Ciawi Village are shown in Figures 7 and 8. With the knowledge imparted by the implementation team, it is hoped that it can enhance the understanding of business owners and be continuously utilized in managing their businesses, promoting and marketing their products to consumers.

The activity began with introductions from the implementation team, both in-person (offline) and online. The event was attended by the implementation team and partner members from KWT Al Mina in Ciawi Village. After introductions, the next step was to explain about the e-commerce website. Partner members were provided with an explanation of what e-commerce is, how it works, its positive impacts, and website maintenance. Then, examples of the website's content from both the user and administrator perspectives, which were created by the implementation team, were shown.

The community service activity organizers then demonstrated how the KWT Al Mina in Ciawi Village e-commerce could be used from both the administrator and user sides. When the implementation team conducted e-commerce training from the admin page, participants were asked to try accessing the website from their mobile phones by entering the URL <https://www.kwtalmina.com>. The goal was to see who could create an account on the website because user information registering on the e-commerce site goes into the administrator's database.

Below are the evaluation results of the community service activities regarding the e-commerce website application, which can be seen in the knowledge improvement of KWT Al Mina partners, as shown in Table 2.

Table 2. E-Commerce website application knowledge level

Level	Before socialization (Pre-Test)		After socialization (Post-Test)	
	Frequency (Person)	Percentage	Frequency (Person)	Percentage
Very high	1	6	11	65
High	1	6	5	29
Moderate	2	12	1	6
Low	2	12	0	0
Very low	11	64	0	0
Total	17	100	17	100

Based on the evaluation results, it can be concluded that prior to the socialization, the partners had very limited knowledge about the application of e-commerce websites. However, after the socialization on the e-commerce website application, there was a significant increase in knowledge among the partners, with a percentage of 94%. The utilization of information technology by the implementation team had a very positive impact on the partners' knowledge of e-commerce website applications.

There were some challenges when attempting to access the website, such as difficulty accessing the website or logging in or registering for an account. This may be due to weak network connectivity or browser issues. The implementation team then provided an example of how the ordering process works on the website, starting with product selection, adding them to the shopping cart, the final purchase, and entering the shipping address. In this process, the site used to select delivery services was not yet suitable as it had not been customized to the partner's location. Eventually, the orders demonstrated by the implementation team would be entered into the website administrator's database. The implementation team also demonstrated how the administrator handles orders until the products are ready for shipment.

Based on the challenges encountered during the training, the implementation team immediately performed maintenance to address these issues and added features that were not yet available on the e-commerce website but were needed by the partners.



Figure 7. E-Commerce website socialization activities at KWT Al Mina Ciawi Village

Although there were several obstacles that arose during the implementation of the activity, overall it went smoothly. Partner members were very enthusiastic in participating in this activity, as seen from the active question and answer session of partner members with the implementation team to explore this e-commerce site. There was an increase in partner members before and after the socialization of the e-commerce site, they became more knowledgeable about the e-commerce site, especially KWT Al Mina Ciawi Village. With the launch of KWT Al Mina Desa Ciawi e-commerce, partner members can increase their knowledge and skills in the field of information technology and contribute to the development and marketing of KWT Al Mina Desa Ciawi products. At the end of this activity, the implementing team gave symbolic souvenirs from Bina Sarana Informatika University to partner representatives, namely the chairman of KWT Al Mina Ciawi Village.

Discussion

The community service program activities involved the utilization of information technology as part of a strategy to advance KWT Al Mina in Ciawi Village through training and mentoring. The implementation of the community service program, which consisted of training and mentoring, aimed to enhance the knowledge of partner members on how to develop marketing and product promotion for KWT Al Mina in Ciawi Village by utilizing e-commerce. This was supported by the communication provided by the partner organization to its members regarding the impact that the partner organization would receive.

Based on the results of unstructured interviews between the implementation team and partner members who participated directly in the program from the beginning to the end of the meetings, the

implementation of the community service program by the teams from Bina Sarana Informatika University and Multimedia Nusantara University produced positive outcomes. The community service program has improved the skills and knowledge about digital marketing through e-commerce to expand the product marketing reach of the Women Farmers Group Al Mina in Ciawi Village.

During the implementation of the community service program, several factors supported the successful execution of the program, including: 1) Support from the partner organization, which provided facilities for the program's implementation and had its members directly involved in the training, contributing to the success of the community service program in the form of training; 2) The interest and enthusiasm of the participants were evident throughout the activities. This was reflected in the stable number of participants and their active engagement during the training sessions. Participants also demonstrated their interest through questions and discussions aimed at obtaining information from the implementation team; and 3) The absence of other activities that could interfere with the ongoing community service program, as the program had received prior approval from the neighborhood's RT, RW leaders, and local authorities. Additionally, since the participants were already familiar with each other as members of the partner organization, there was no hesitation or shyness among them, ensuring smooth communication during the program.



Figure 8. Active participants as supporting factors in activities

However, there are several obstacles that are felt during the implementation of the community service program, including: 1) Because this activity is held in person, it is necessary to practice the material presented to participants, such as e-commerce; (2) When practicing the trial in accessing the KWT Al Mina Desa Ciawi website, there were still many participants who had difficulty accessing the website; (3) Lack of facilities for activities, such as a place for outreach activities that is less extensive so that some participants who do not get a place outside are diverted to the room of the house. This is still within reasonable limits because the facilities used are facilities owned by the local RT and RW areas; and (4) There are a few obstacles in the form of the implementation method of this training where sometimes there are participants who still need assistance in the form of guidance to inform them about the steps that must be carried out.

4. CONCLUSION AND RECCOMENDATIONS

This research reveals that the implementation of information technology, especially e-commerce, as a technology-based business strategy, can empower community partnerships and improve the welfare of the Women Farmer Group in Al Mina Village, Ciawi. In the context of rural Indonesia, the agriculture sector plays a crucial role in meeting the needs of the population. However, farmers often

face challenges in marketing and selling their agricultural products. KWT Al Mina Desa Ciawi is one of the women farmer groups facing these challenges.

By applying the Rapid Application Development (RAD) system development method, the implementing team successfully developed an e-commerce website that facilitates members of KWT Al Mina Desa Ciawi in marketing and selling their products online. Through socialization training, participants gained knowledge and skills useful for designing logos, managing websites, and utilizing YouTube Channels as a promotional tool. The evaluation results show that this program had a positive impact on the members of KWT Al Mina Desa Ciawi, with a 94% increase in skills based on the evaluation before and after training.

Here are some suggestions based on the research findings to enhance community partnership empowerment and the sustainability of the business of Kelompok Wanita Tani Al Mina Desa Ciawi: 1) Continuously improve the understanding and skills of members of Kelompok Wanita Tani regarding the use of information technology. Strong knowledge will help them maximize the use of information technology to expand their marketing network and enhance their business competitiveness; 2) Collaboration with educational and research institutions can be a strategic step. Through training and mentoring programs involving experts from various fields, partners can overcome technical challenges and improve product quality and business efficiency; 3) Always be prepared to address technical challenges that may arise during the implementation of information technology, such as difficulties in accessing websites and the development of additional features; and 4) Support from the government and relevant institutions is crucial in supporting community partnership empowerment in rural areas. With strong support, community partnerships can continue to grow and make a positive contribution to the welfare of Kelompok Wanita Tani Al Mina Desa Ciawi and rural communities as a whole.

ACKNOWLEDGEMENT

The community service team would like to express our gratitude to the Ministry of Education, Culture, Research, and Technology, Bina Sarana Informatika University, Multimedia Nusantara University, and the Women Farmers Group (KWT) Al Mina in Ciawi Village for their support in making this activity successful and smooth. We would also like to thank the Women Farmers Group (KWT) Al Mina in Ciawi Village for their participation in this activity from start to finish.

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