A Fully Functional Enterprise Resource Planning (ERP) System for Honey Home Company in Indonesia

Mohammed Saleh Mohammed Ba Karman
Faculty of Computer Science, Narotama University, Surabaya, Indonesia
msmakb11@gmail.com

Cahyo Darujati
Faculty of Computer Science, Narotama University, Surabaya, Indonesia
cahyo.darujati@narotama.ac.id

Ani Wulandari
Faculty of Economic and Businessness, Narotama University, Surabaya, Indonesia
ani.wulandari@narotama.ac.id

ABSTRACT
Honey Home Company specializes in providing high-quality honey; however, the company is experiencing numerous difficulties in monitoring the business changes; thus, implementing an ERP system might adjust these issues. This study aims to identify the ERP system's requirements to fulfill the company's needs, design and implement the system, and highlight the benefits of implementing the system in the business. A qualitative method of interviewing the system's users and providing a survey questionnaire was utilized to analyze the impacts of implementing an ERP System on the business. The findings indicate that Honey Home Company benefited from the ERP System regarding time savings, information quality, service quality, user satisfaction, and staff performance.

Keywords:
ERP System, Software Implementation, Waterfall

1. Introduction
Currently, humans live in the era of information and technology, which plays a crucial role in our daily lives; thus, it also assists corporates in being efficient and effective.

Honey Home Company is specialized in providing high-quality honey imported from Yemen. The company is experiencing numerous difficulties in monitoring the changes that occur within the business, especially when it comes to observing the stock and the number of goods that have been stored in the hand of various distributors around Indonesia, which makes it problematic for them to make certain decisions. Additionally, the Accounting Manager has problems storing and organizing the data for sales, making it challenging to search for specific data; therefore, it can be time-consuming. These issues might be easily adjusted by implementing and providing an ERP system for the company.

Humans are currently in the era of information; thus, businesses need to send data quickly to have the upper hand against their rivals and improve sales and efficiency.

This study aims to specify the requirements of the ERP system to fulfill Honey Home Company's needs, design and implement the system and enhance it with its features, and highlight the benefits of implementing the ERP System in the business.
2. Methodology

A. Literature Review

According to (Lavinia & Dana, 2021), the ERP system improves the performance of an organization by 60.7% and increases employee productivity by 27.7%. The main objective of this research is to design and develop an ERP system for Honey Home Company. While there has been multiple software that can help the companies, none of them fulfills all of Honey Home Company’s needs.

There are significant benefits of adopting ERP Systems in terms of time savings, quality of information, quality of service, user satisfaction, and staff performance (Taufanti, et al., 2022). ERP systems, or enterprise resource planning systems, are database systems that collect and process data to help manage medium and large businesses (Ociepa-Kubicka, 2017).

The waterfall model appears to be the simplest way to design software. It is straightforward but idealistic. The waterfall model and its derivatives were immensely popular in the 1970s and are still widely employed in today’s development projects (MALL, 2014).

The Django framework provides a set of design principles and trade-offs, making it one of the most productive frameworks for developing the functionality required by most mid to large online applications (Rubio, 2017).

Django framework is one of the most productive frameworks for developing the functionality required for web-based applications, making it an excellent choice for developing the Honey Home ERP system for several reasons, such as preventing repeatability and having multiple third-party packages.

Web service systems leverage web technologies and principles to provide end-users with simple, ubiquitous, and real-time access to the ERP system while streamlining information flow across systems (Valashani & Abukari, 2020).

Django’s built-in web server is for testing and unsuitable for the production environment; therefore, the developer uses the Apache web server in final production.

The Raspberry Pi series has become one of the leading computer platforms for enthusiasts and educators because of its low cost, flexibility, and extensive operating system support. IT experts are increasingly looking at the Raspberry Pi as an IoT platform and web server. The Raspberry Pi single-board computer series supports many operating systems in both Linux and non-Linux kernels (Membrey & Hows, 2015). The benefit of installing the ERP system of Honey Home Company on a

Figure 1: Waterfall model
Raspberry Pi is the low cost of the board itself, and the system in the current specification does not require high computing power. The cloud server is costly, and the company should pay for the service annually; On the other hand, the Raspberry Pi is only a one-time payment. A Raspberry Pi Model B 4GB is more than enough for the system to run smoothly.

B. Research Method

Honey Home Company is experiencing considerable difficulties, particularly in monitoring the company's changes. Therefore, the company must have an Enterprise Resource Planning (ERP) System to address these problems.

When implementing an ERP system, the system's requirements must be specified with an expert's assistance since most businesses cannot determine their requirements, leading to ERP disasters (ElFarmawi, 2019). The development of the ERP System begins once all Honey Home System Requirements have been declared and documented. The waterfall model is the researcher's approach for Honey Home Company's ERP System's Development Life Cycle (SDLC). For analysis the Impacts of implementing the ERP System for Honey Home Company on the business, a qualitative approach was chosen.

a) Data Collections:

The system's data was collected using the waterfall method, which indicates that the project has multiple stages: requirements, analysis, design, coding, testing, and maintenance, with sequential deployment. The following explains each stage detailed.

Requirements Stage

The implementers of an ERP system must have extensive knowledge about the business and its operations to study and collect the requirements for establishing the system for the company. Therefore, data may be gathered by observing how the company works and questioning corporate employees. Consequently, the researcher gathered the Honey Home ERP System's requirements based on their needs.

A. Observation: The researcher observed that the company faces many challenges for the company's staff, including; the CEO struggling to monitor the business, which makes it difficult for him to make certain decisions; the company's inability to manage its distributed goods; and the difficulties faced by employees such as the accounting manager when processing calculations manually. The researcher investigated the business's activities for implementing an ERP system to address the issues.

B. Interview: The researcher conducted three interviews with the company's staff since observation alone is insufficient to gather the system requirements. The initial interview suggested implementing an ERP System for the company and collecting general information about the company's operations. The purpose of the second meeting is to gather detailed system requirements and provide the company with a first glance at the system specifications. After analyzing the requirements, the third meeting was held to revise the system requirements and approve the Software Requirements Specification (SRS).

Analysis Stage

The researcher deeply understands the system's requirements following the second discussion with company representatives. Then, the researcher has begun reviewing and documenting the system's Software Requirements Specification (SRS). The company received the SRS in the third meeting and approved the system's specifications.
Design Stage

The system was designed using UML Diagrams, the following illustrate them:

According to the preceding figure of the system use case, the system has multiple users in various positions including: Human Resources, Warehouse Admin, Accounting Manager, Social Media Manager, Designer, Distributors, and CEO who has all the functions of (human resources, warehouse admin, accounting manager, and social media manager).
The diagram ensures that the system will recognize the kind of system user and connect them to their dashboard.
The ER Diagram shows all database models that have been created in the MySQL workbench. The database models are recreated in Django models to have better access to the database.

Coding Stage

According to the waterfall method, once the requirements have been thoroughly defined, analyzed, and the system has been designed and documented, the system's implementation, which entails coding, may initiate.
The Python programming language and Django framework used to develop the system's backend. For managing the database MySQL programming language used. JavaScript, HTML, CSS, and the Bootstrap Framework used to design the system's frontend. The server run Ubuntu as its operating system and use an Apache server. SSH is the best option for uploading project files.

Testing Stage
The system tested in two stages: the first stage by the system's developer to remedy any issues, and the second by the company's staff to catch any errors that the developer did not identify. Following the second stage of testing the system, the researcher begins collecting data to indicate the benefits to the business in terms of time savings, information quality, service quality, user satisfaction, and employee performance.

Maintenance Stage
Here is the final stage of the system development life cycle, where all flaws and errors are fixed, and the system is supported and updated with new features.

C. Analysis Methodology:
This research contains two variables: identifying the ERP System's requirements for Honey Home Company and implementing the system. The outcomes of this research illustrate the impacts of developing an ERP System on the company.

A qualitative method by providing a survey questionnaire was utilized to analyze the impacts of implementing an ERP System on the business.

Analyzed the data using a qualitative method by distributing a survey questionnaire to Honey Home ERP system users as the most suitable methodology for this type of research.

3. Result and Discussion
Honey Home Company faced many difficulties that may have been readily solved by implementing an ERP System. To accomplish this kind of task, the system requirements must be identified before beginning to develop it; however, most companies are unable to define their requirements, resulting in an ERP failure; therefore, an IT specialist must become involved and assist them in defining the system requirements. Following the System requirements specification, the data must be analyzed and documented; then, the system must be designed and prepared for the following phase, the system implementation. The last aspect of this research is to indicate the system's impacts on the company; consequently, after developing the system, a questionnaire survey was given to system users, and the questionnaire results were reviewed in this section.

Overall, the researcher determined the requirements for the Honey Home systems through employee interviews and observation of the company's operations. The system has seven different types of users; it's divided into eight apps—one for each position and one for the system's "main" app, which contains the system's common features.

The researcher limited the system requirements; nevertheless, the researcher expects to regularly add new features to the system.

The researcher recommends breaking up the implementation of an ERP system into phases, putting the most crucial features in the first phase. The system should then be continuously updated to add new features, giving businesses a chance to assess whether the system meets their requirements or whether the requirements were incorrectly defined.
The Honey Home Company's ERP system was implemented using the waterfall methodology. The system was designed using UML Diagrams, featuring an ER Diagram, a sequence diagram, and use case diagram. The system's frontend is implemented using HTML, CSS, and JavaScript. The system's backend is built using the Django framework, a library for Python programming language. The system's host is a Raspberry Pi (single-board computer), the host's operating system was an Ubuntu server, and the system server was an Apache server.

The system's design and implementation were limited by a variety of factors, such as the sequence diagram's restrictions on user login, the system's lack of some features from the initial plan due to time constraints, and the fact that the system's host is a Raspberry Pi board, which limits the system's specifications. If the system has been expanding, the host's specifications will not be adequate; however, the system host can be transformed.

Due to the Raspberry Pi's low cost and one-time fee compared to cloud computing, which requires annual or even monthly payments, the researcher suggests utilizing it as a server for small businesses ERP systems with limited capabilities.

After testing the system, a survey questionnaire was distributed to users to get feedback on the company adopting the ERP system. The survey questionnaire collected 14 samples, six employees...
and eight distributors, as shown in the following figure.

Each user was asked five questions to determine the impact of adopting an ERP system on Honey Home Company; the questions were as follows:

1. Did the system assist you in saving time?
2. How do you rate the quality of information you obtain from the system?
3. What level of assistance do you get from using the system?
4. Are you satisfied with using the system?
5. Did adopting the system improve your performance?

As input answers, all questions are presented on a linear scale, and the answers are scales from 1 to 5; the table below indicates the total outcome of the questionnaire.

<table>
<thead>
<tr>
<th>Question</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>4</td>
<td>4.43</td>
<td>4.21</td>
<td>4.21</td>
<td>3.86</td>
</tr>
<tr>
<td>Median</td>
<td>4</td>
<td>5</td>
<td>4.5</td>
<td>4.5</td>
<td>4</td>
</tr>
<tr>
<td>Mode</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Range</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Minimum</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Maximum</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sum</td>
<td>56</td>
<td>62</td>
<td>59</td>
<td>59</td>
<td>54</td>
</tr>
<tr>
<td>Number of Samples</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The final result of the questionnaire survey shows that the Honey Home ERP System saves time by 80%, improves the quality of information by 88.6%, delivers high-quality services, and assists users by 84.2%, raising user satisfaction by 84.2%, and employees' performance by 77.2%.

The findings indicate that Honey Home Company benefited from the ERP System regarding time savings, information quality, service quality, user satisfaction, and staff performance. Thus, every startup business and growing organization should implement an ERP system to boost productivity and achieve a competitive advantage. Adopting ERP systems early in the business's life span is preferable, and they must consult an expert to define their system's requirements; otherwise, an ERP devastation might arise.

The result matches the researcher's expectations and coincides with previous research indicating that the ERP System positively impacts the business.

The questionnaire result was limited to Honey Home Company; therefore, ERP systems might negatively impact other businesses; however, when a company decides to implement an ERP System, they must call for an expert to aid them in specifying the system's requirements.

4. Conclusion

In conclusion, the researcher determined the requirements for the Honey Home systems through employee interviews and observation of the company's operations. Honey Home Company's ERP system was designed and implemented using the waterfall methodology. A questionnaire survey was conducted among users of the Honey Home ERP System to analyze the impact of adopting the
system on the business. The final result of the questionnaire survey shows that the Honey Home ERP System saves time by 80%, improves the quality of information by 88.6%, delivers high-quality services and assists users by 84.2%, raising user satisfaction by 84.2%, and employees' performance by 77.2%. The result matches the researcher's expectations and coincides with previous research indicating that the ERP System positively impacts the business.

The reason for choosing the waterfall Method lies in several advantages, such as easily defining project milestones because the completion of each phase represents a significant achievement point. The researcher analyzed the data using a qualitative method by distributing a questionnaire to the ERP system users. This method is the most suitable methodology for this type of research since all data consists of words.

Due to the Raspberry Pi's low cost and one-time fee compared to cloud computing, which requires annual or even monthly payments, the researcher suggests utilizing it as a server for small businesses' ERP systems. Adopting ERP systems early in the business's life span is preferable, and they must consult an expert to define their system's requirements; otherwise, an ERP failure might arise.

Acknowledgements

Firstly, I thank all mighty god Allah for giving me the strength to finish this research. I thank Mr. Cahyo Darujati the head of the faculty of computer science at Narotama University and my supervisor for helping me and guiding me to accomplish this work. I thank Mrs. Ani Wulandari for assisting me in doing this work as my second supervisor. I thank Mr. Ibrahim the CEO of Honey Home Company for trusting me to finish this project and for giving me his time and resources to complete this work. I thank Mr. Saleh Ba Karman and Mrs. Fawzia Bamhir my lovely parents for encouraging me, pushing me forward, and supporting me where ever I was. I thank my beautiful wife for being with me through thick and thin, she is the light of my life. And finally, I thank all my friends, classmates and everyone helps me arrive at this point. Thank you very much.

References


