Online Enrollment System for Rafael L. Lazatin Memorial Senior High School

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Abstract

The research paper introduces an innovative solution aimed at modernizing the conventional enrollment procedures by implementing an online enrollment system, tailored specifically for the senior high school students enrolled at Rafael L. Lazatin Memorial Senior High School. In this study, a total of 222 students participated, and the system's effectiveness was evaluated through a descriptive analysis based on ISO 25010 standards. The development process adhered to an agile methodology to ensure flexibility and responsiveness to evolving needs. Following the deployment of the system, feedback was collected from both IT and non-IT experts. The results indicated overwhelmingly positive ratings, with teachers assigning a mean score of 4.19, translating to 'Very Good,' students rating it at 3.98, also categorized as 'Very Good,' and IT experts providing a score of 3.81, reflecting the same 'Very Good' assessment. However, despite the overall satisfaction, areas such as security and maintainability were identified for further enhancement to improve user functionalities and ensure long-term sustainability.

Keywords: *Online Enrollment System, Online Enrollment, Students, Senior High School, Senior High School Student*

INTRODUCTION

One of the ripple effects of the stifling competition for education institutes is the growing necessity for schools to enhance their mechanisms for better serving applicant's queries and objections. This is where enrollment systems come into play, simplifying and accelerating student enrollment (Meenu, 2022).

Internet access is a huge challenge. In urban areas, instructors can give lessons over video conferencing platforms, or Facebook Live, but 52.6% of the Philippines' 110 million people live in rural areas with unreliable connectivity. It doesn't come cheap either: research from cybersecurity firm SurfShark found that the internet in the Philippines is among the least stable and slowest, yet the most expensive, of 79 countries surveyed. Internet access assumes, of course, that the user has a device, but in the Philippines that's not a given. Private polling firm Social Weather Stations found that just over 40% of students did not have any device to help them in distance learning. Of the rest, some 27% were using a device they already owned, and 10% were able to borrow one, but 12% had to buy one, with families spending an average of $172 per learner. To put it into perspective, that's more than half the average monthly salary in the Philippines (De Guzman, 2021).

With the progression of technology over time, computers have evolved beyond their initial purpose of computation and are now extensively used for communication and the rapid dissemination of crucial information. Individuals continually seek innovative methods to enhance efficiency and speed in various aspects of life, including work. As a result, colleges and universities are particularly reliant on these advancements, as the evolving technological landscape and the need for comprehensive data reporting have prompted them to assess their primary software systems. An enrollment system plays a great role in school population growth. It is designed to help store, access and retrieve student and enrollee accounts. The increasing number of enrollees annually adds to the burden

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of staffs responsible in the enrolment process and in order to have a much more reliable technique, deliberations and discussions were made to augment the need of the administrative staff as well as the enrollees. This will provide an avenue for universities to be equally-competitive with one another, thus meeting their standards (Campos, 2019). The enrollment system provides an effective and essential source of enrollee and students' information (Panganiban, 2020). Online enrollment has always offered convenience and efficiency, and today's parents are busier than ever. They expect the convenience and ease of submitting their paperwork online, but the benefits of online enrollment systems are not limited to just parents. Administrators and students also benefit from these systems. (Curacubby Team, 2020).

In the study of (Chamilco et al., 2021) the enrollment process of an educational institution becomes very complex when the waiting time is prolonged and crowds of people are created. Technological tools are the most effective way to deal with this problem. Therefore, this research seeks to optimize the processes that make up the enrollment management of an educational institution through the implementation of a digital enrollment system. The development of the digital enrollment system was divided into four phases. Planning: Where the system requirements were described. Design: A simple model was chosen according to the established requirements. Coding: Programming languages were used that helped in the structure, customization and operation of the system. Test: The system was verified for errors. In this sense, the digital enrollment process was optimized, such as student enrollment, registration and reports, allowing the reduction of crowds, time and human effort. It allowed collaborative work at a distance between the institution and the students, being a technological and innovative aid that reduces the time of the enrollment processes, in an equitable and transparent way, guaranteeing freedom of choice and equal access opportunities to remote education in times of pandemic.

Statement Of The Problem

The study aims to address the ineffectiveness of the current enrollment system of Rafael L. Lazatin Memorial Senior High School for senior high school students. The system combines traditional enrollment methods with the integration of Google Forms. Stated below are the current difficulties that the school is facing in terms of enrollment. Specifically:

1. Insufficient manpower to manage the enrollment procedure.
2. Inefficient system for documenting student data, leading to inaccuracy and untimeliness of enrollment records.
3. Unreliable method for maintaining student records, causing delays in the dissemination of essential communications.
4. Security vulnerabilities in the existing storage system, jeopardizing the confidentiality and integrity of student information.
5. Difficulty in generating accurate reports based on enrollment details and student information review, resulting in delays in effective enrollment management.

Objectives of the Study

The study aims to develop an online enrollment system for Rafael L. Lazatin Memorial Senior High School. The study aims to streamline the enrollment process, improve administrative efficiency, and enhance the student experience by creating a user-friendly interface. The study seeks to provide students with convenient access to enrollment-related information, course selection options, and relevant services.

1. To reduce the manpower required for managing the enrollment procedure at Rafael L. Lazatin Memorial Senior High School.
2. To develop a system that effectively documents student data for enrollment purposes, ensuring accuracy and timeliness of enrollment records.
3. To establish a reliable method for maintaining students' records, enabling prompt dissemination of essential communications.

4. To enhance the security of the storage system for databases, ensuring the confidentiality and integrity of student information.
5. To create a system that generates accurate reports based on enrollment details and student information review, facilitating effective enrollment management.

Scope Of the Study

Over the course of a year at City College of Angeles, this study will be exclusively focused on the students of Rafael L. Lazatin Memorial Senior High School, exploring the effects of moving from the current enrollment system to an online platform. It aims to uncover the implications, both positive and negative, on enrollment procedures at Rafael L. Lazatin Memorial Senior High School.

Significance Of the Study

This paper aims to produce and evaluate the efficiency of a web-based reading comprehension level of intermediate students. It proves to be beneficial to the following:

1. **To the Students.** The study will likely to encourage students to enroll on a user-friendly platform to conveniently manage their enrollment, access information, and select courses, improving their overall enrollment experience.
2. **To the Teachers.** The study will likely help the school personnel's productivity by reducing paperwork, and administrative tasks.
3. **To the School.** The study will likely enhance administrative efficiency, reduce operational expenses, and improve data accuracy, leading to better management and more informed decision-making.
4. **To the Researchers.** The study will serve as a valuable learning experience to the researchers.
5. **To the Future Researchers.** The study's findings serve as a valuable resource for future researchers, providing insights and best practices for implementing similar systems in educational institutions.

Conceptual Framework

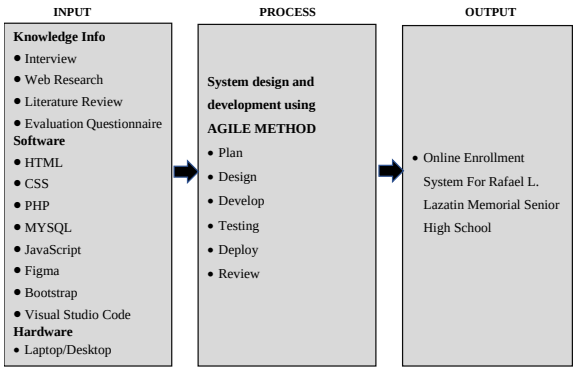

Figure 1. Conceptual Framework

As described by (Dombrowski, U., & Richter T., 2018) The IPO-model (Input-Process-Output) is a widely used and common approach for describing the structure of IT processes. The researchers utilized the input-process-output framework in the context of the system methodology to illustrate the conceptual framework of the study. Through the interviews, the researchers identified that Rafael L. Lazatin Memorial Senior High School's current enrollment process is inefficient. Considering the provided concerns, the researchers developed an online enrollment system to address the mentioned issues.

METHODOLOGY

This methodology consists of several key components. The research design provides an overview of the study, including objectives, methodology, and data collection techniques. The system development methodology involves stages such as requirement specification analysis, system design, and specifications. Participants are individuals or groups involved in the research or system development process. The procedure outlines the step-by-step instructions for the research or system development. Data analysis involves organizing and interpreting collected data. Design and implementation encompass aspects like requirement specification analysis, system design, entity relationship diagram, use

case diagram, and hardware and software specifications. These components ensure effective system development and research execution.

Algorithm

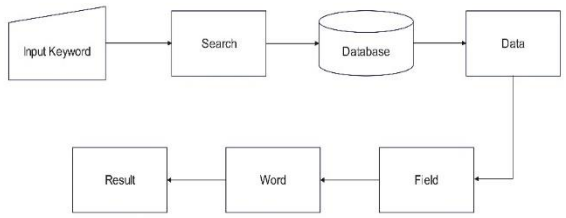

Figure 2. Insertion Sort

In the study of (Shabaz, M., & Kumar, A., 2019), it is the stable sorting algorithm in which starting from the first number from the record, this first number is compared to every adjacent number to find its sorted position. When the position is found, the number is inserted there. Insertion sort holds good for smaller datasets since it is also code inefficient for large data/lists or big numbers.

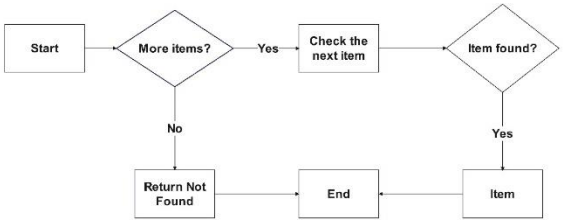

Figure 3. *Linear Search*

As mentioned by (Menta, et al., 2015) In Linear Search, the data to be searched is been compared with each element present in the record till the data matches and if that data is not present then also it will do every comparison. This method, which traverses the array sequentially to locate the desired item, hence it is called sequential search or linear search. Linear search is the least efficient search technique among the quantity dependent search techniques. This technique does not concern about the order of the data. Another related study by (Pathak, 2015), also stated that, Linear search is the type of searching algorithm in which each element of the array is compared with the desired item to be searched for, one by one. This method, which traverses the array sequentially to locate the desired item, hence it is called sequential search or linear search. Linear search is the least efficient search technique among the quantity dependent search techniques. This technique is chosen for searching the records are stored without considering the order.

Research Design

Descriptive research design is the most straightforward and basic type of research study, aiming to depict an accurate picture of a particular phenomenon. It primarily involves observing and recording behaviors or conditions without manipulating any variables, allowing researchers to understand and describe what currently exists within a specific population or situation.

The researchers will utilize a quantitative research design to investigate and analyze the current enrollment process at Rafael L. Lazatin Memorial High School with the use of sampling technique and questionnaires and propose the development and implementation of an online enrollment system.

Participants

As explained by (Shukla, 2020), Participants refers to the set or group of all the units on which the findings of the research are to be applied. Students from Rafael L. Lazatin Memorial Senior High School who were in grade 11 and grade 12 were the target respondents of the study with 222 students. Alongside with the target respondents, the researchers also included 10 teachers and 3 IT Professionals that are knowledgeable to programming and developing specifically: front-end and back-end.

To calculate the sample size of the grade 11 and grade 12 students, the researchers made use of the Raosoft's formula. The Raosoft's formula is used to estimate the sample size needed to create a realistic model using the population size and the acceptable margin of error. The formula shown below is the Raosoft's formula

With a total of 522 grade 11 and grade 12 students at Rafael L. Lazatin Memorial Senior High School, considering a 5% margin of error and other relevant factors, the researchers utilized the following sample size calculation to determine the total of 222 responders.

Sampling is one of the most important factors which determines the accuracy of a study (Bhardwaj, 2019). Sampling as proposed by (Turner, 2020), is of great importance to determine how research findings will be eventually used. It will help the researchers to define which interferences would be chosen to define the target population for the system. In this research, a simple random sampling method was used, as it is mostly used in educational institutions. Participants also get equal opportunity to participate in the study.

Simple Random Sampling, as stated by (Bhardwaj, 2019), is an extensively used sampling method in scientific research. Simple random sampling is selected for populations which are highly homogenous where the members of the research are randomly selected to participate in the research. In this research, a simple random sampling method was used, as it is mostly used in educational institutions. While (Thomas, 2020) describes simple random sampling as most straightforward of all the probability sampling methods, since it only involves a single random selection and requires little advance knowledge about the population. Because it uses randomization, any research performed on this sample should have high internal and external validity, and be at a lower risk for research biases like sampling bias and selection bias.

PROCEDURE

The researchers utilized the following methods and procedures to conduct this study:

1. **Web Researches**
   The researchers rely on web-based research to explore a multitude of reviews and pertinent literature, seeking comprehensive insights and studies that lend support and credibility to their own work.
2. **Literature Review**
   The researchers examined relevant literature and previous studies to gain valuable insights and contribute on the current study.
3. **Interview Questionnaire**
   The researchers utilize questionnaires as a means to collect data from the participants. As mentioned by (Mcleod, 2023) A questionnaire is a research instrument consisting of a series of questions for the purpose of gathering information from respondents.
4. **Evaluation Questionnaire**
   ISO 25010 is a standard that defines quality criteria for software products and systems. In your study, you can use these criteria to evaluate the quality of a particular software product or system. The evaluation questions should be derived from the ISO 25010 criteria and tailored to your research context. For example, you may have questions related to functionality, reliability, usability, efficiency, maintainability, and other aspects outlined in the standard
   a. **Functional Suitability.** The degree to which the software product or system provides functions that meet specified needs when used under specific conditions.
   b. **Performance Efficiency.** The performance level exhibited by the software product or system concerning resource usage under specific conditions.
   c. **Compatibility.** The capability of the software product or system to interact and operate with other systems, software, or components.
   d. **Usability.** The degree to which the software product or system is easy to use, understand, and learn, as well as the extent to which it provides a satisfactory user experience.

e. **Reliability.** The ability of the software product or system to perform specified functions with accuracy and consistency under stated conditions over a specific period.
f. **Security.** The ability of the software product or system to protect information and data, and to ensure that unauthorized access, alteration, or destruction is prevented or minimized.
g. **Maintainability.** The ease with which the software product or system can be modified, corrected, or adapted to meet evolving needs, including the capability to be tested and diagnosed.
h. **Portability.** The ability of the software product or system to be transferred from one environment to another, including various hardware, software, and operational configurations

Data Analysis

Data analysis is the process of fine-tuning, converting, and modeling data to generate meaningful and actionable insights that lead to intelligent business decisions. Data analysis aims to extract vital information from data and implement decisions by leveraging the data analyzed (Zikovic, 2020). This section describes how to examine data gathered from the following sources:

Frequency Count Distribution. A frequency distribution is a representation, either in a graphical or tabular format, that displays the number of observations within a given interval. The frequency is how often a value occurs in an interval while the distribution is the pattern of frequency of the variable. The interval size depends on the data being analyzed and the goals of the analyst. The intervals must be mutually exclusive and exhaustive. Frequency distributions are typically used within a statistical context. Generally, frequency distributions can be associated with the charting of a normal distribution (Young, 2022). The frequency of a value is the number of times it occurs in a dataset. A frequency distribution is the pattern of frequencies of a variable. It's the number of times each possible value of a variable occurs in a dataset (Turney, 2022).

Percentage Distribution. In general, a percentage frequency distribution showcases the percentage of observations for each data point or data group, serving as a prevalent means of expressing the relative frequency of survey responses and other data (JoVE, 2022). The general formula of percentage distribution is as follows:

$$\boldsymbol{P = \frac{F}{N}\ x\ 100}$$

Where: P = Percentage

F = Frequency

N = Number of Respondents

Arithmetic Mean. The arithmetic mean, or simply called the mean is calculated by dividing the sum of all observations in the dataset by the total number of observations. The mean is significantly affected by the outliers, that is, extremely large or small values. The mean is also called as mathematical expectation, or average (Lord et al., 2021). This measurement can take the form of either a basic or weighted arithmetic mean, aiding in the simplification of the population's data points. The researchers will employ this technique to derive the collective average of weighted means.

Weighted Mean. Is a statistical method that calculates the average by multiplying the weights with their respective mean and taking its sum. It is a type of average in which weights assign individual values to determine the relative importance of each observation (Keni, 2019). The researchers will utilize it as a statistical instrument to analyze the data acquired through the questionnaires. The mean will be computed to assess the effectiveness of the system for online enrollment.

Table 1. Likert Scale

Description	Numerical Rating
Excellent	5
Very Good	4
Good	3
Fair	2
Poor	1

Likert Scale. Is a commonly employed rating system in questionnaire-based studies, this approach stands as the prevalent method for scaling responses in survey research, often used interchangeably with the term rating scale.

The Likert scale is a five-point scale that is used to allow an individual to express how much they agree or disagree with a particular statement. The Likert scale provides five possible answers to a statement or question that allows respondents to indicate their positive-to-negative strength of agreement or strength of feeling regarding the question or statement (McLeod, 2022).

Likert Scale Interpretation Evaluation Result. The data collected from participants by the researchers during the implementation and evaluation phase will be utilized to analyze and comprehend the findings. Overall, Likert scale interpretation of data involves analyzing the numerical ratings, considering the directionality of the scale, examining central tendency and variability, identifying response patterns, and conducting comparative analyses to draw meaningful conclusions about people's attitudes or opinions (SurveyPlanet, 2022)

Table 2. Likert Scale Equivalent

Description	Numerical Rating
Excellent	4.20 – 5.00
Very Good	3.40 – 4.19
Good	2.60 – 3.39
Fair	1.80 – 2.59
Poor	1.00 – 1.79

RESULTS

This section covers the results and findings obtained during the study. It includes screenshots of the system outputs as well as feedback from students, teachers, and IT experts who participated in the evaluation.

EVALUATION RESULTS

In the evaluation results, the content in the tables - and - shows the evaluations carried out by the participants, which include the three (3) IT experts. The data gathering process made use of the ISO-25010 as a survey instrument. The study involved 232 non-IT experts and three (3) IT experts making the total number of respondents 235 respondents.

Table 3. Evaluation Results of IT Experts

Criteria	Mean	Descriptive Rating
Functional Suitability	4.00	Very Good
Performance	4.22	Excellent
Efficiency	3.50	Very Good
Compatibility	3.72	Very Good
Usability	3.91	Very Good
Reliability	3.46	Very Good
Security	3.60	Very Good
Maintainability	4.11	Very Good
Portability		
Overall Mean	**3.81**	**Very Good**

Table 3 illustrates the assessment findings from IT experts, involving the participation of three (3) specialists in the system review. The Overall Mean obtained a score of 3.81, reflecting a **Very Good** level of performance across all evaluated aspects.

The **Functional Suitability** of the system achieved a score of 4.00, indicating a **Very Good** level. This underscores the alignment between the system's functions and its intended purpose and requirements.

The **Performance Efficiency** score was 4.22, also classified as **Very Good**. This reflects the system's efficient resource utilization and operational behavior, contributing to the successful achievement of its main purpose.

Compatibility: Scoring 3.50 within the **Very Good** range, the seamless integration of the online enrollment system with the mobile application significantly enhances the user experience.

The **Usability score** was 3.72, indicating a **Very Good** level. Users found the system easily accessible and straightforward to use, highlighting the pleasing user interface design.

The **Reliability** score was 3.91, categorized as **Very Good**. This suggests that users experienced no errors, bugs, or unexpected issues while utilizing the system and mobile application, emphasizing the seamless and dependable performance.

The **Security** of the system achieved a score of 3.46, also **Very Good**. Users expressed trust in the system's strong security measures, enhancing their overall perception of the security features.

The **Maintainability** score was 3.60, falling within the **Very Good** range. Users expressed satisfaction with the system's ease of maintenance, update methods, and overall support, contributing to a positive user experience and system longevity.

The **Portability** score was 4.11, indicating a **Very Good** level. This suggests that users were highly satisfied with the application's flexible accessibility.

Table 4. Evaluation Results of Non-IT Experts (Teachers)

Criteria	Mean	Descriptive Rating
Functional Suitability	3.98	Very Good
Usability	3.98	Very Good
Reliability	4.00	Very Good
Security	3.99	Very Good
Overall Mean	**3.98**	Very Good

Table 4 presents the assessment results conducted by 10 teachers. The overall mean rating of the system is 4.19, indicating a **Very Good** grade. Due to complexity, only four criteria were utilized for evaluation.

Functional Suitability received a rating of 4.27, signifying an **Excellent** classification. This underscores the system's efficacy in meeting its primary objectives, characterized by completeness, accuracy, and appropriateness.

Performance Efficiency achieved a score of 3.63, classified as **Very Good**. This highlights the system's adeptness in operational behavior, resource utilization, and capacity, demonstrating successful realization of its core objectives.

Usability secured a rating of 4.36, also labeled as **Excellent**. This suggests that both users and evaluators perceived the system as easily learnable and usable, regardless of their prior experience with computer systems. Additionally, it implies a well-crafted and user-friendly graphical interface.

Reliability performance earned a score of 4.50, falling within the **Excellent** range. This further affirms the system's reliability, as perceived by users and evaluators alike.

Table 5. Evaluation Results of Non-IT Experts (Students)

Criteria	Mean	Descriptive Rating
Functional Suitability	4.27	Excellent
Performance Efficiency	3.63	Very Good
Usability	4.36	Excellent
Reliability	4.50	Excellent
Overall Mean	**4.19**	**Very Good**

Table 5 presents the assessment results conducted 222 students. The overall mean rating of the system is 3.98, indicating a **Very Good** grade

The **Functional Suitability** attained a commendable score of 3.98, marking it as **Very Good**. This underscores the system's efficiency in fulfilling its core objectives with completeness, precision, and relevance.

Performance Efficiency achieved a rating of 3.98, placing it within the **Very Good** category. This highlights the system's adeptness in operational behavior, resource utilization, and capacity, reflecting successful achievement of its primary goals.

Usability garnered a solid score of 4.00, earning it a **Very Good** rating. This indicates that both users and evaluators found the system easy to navigate and operate, regardless of their prior experience with computer systems. Moreover, it suggests a well-designed and user-friendly graphical interface.

Reliability performance earned a score of 3.99, also falling into the **Very Good** range. This further confirms the system's reliability, as perceived by users and evaluators alike.

DISCUSSION

This presents the summary and conclusions of the researchers derived from the evaluation results. Recommendations and suggestions are also stated that could be used for future enhancements and further research.

Summary of Findings

The aim of the online enrollment system is to aid the students of Rafael L. Lazatin Memorial Senior High School with their enrollment queries. The developed system helps students to enroll with ease without leaving their respective homes.

Developing this system is a significant alternative regarding the enrollment process, as it gives accessible and reliable service for senior high school students.

In developing the system, the researchers used the following applications and languages. Firstly, the front-end consists of HTML, CSS and Bootstrap. For the back-end, it consists of JavaScript, PHP, MySQL. Lastly the compiler used compile the code is Visual Studio Code.

Drawing from various sources and studies has been instrumental for the researchers, providing a robust foundation that enhances the credibility and reliability of this study. The online enrollment system developed has successfully met the criteria outlined in ISO 25010, encompassing functional suitability, performance efficiency, compatibility, usability, reliability, security, maintainability, and portability. To further support the efficacy of the system, it received an overall rating of 4.08 which translates into 'Very Good' rating and 3.81 from the IT Experts which also translates into 'Very Good'. With these achievements, the application emerges as a user-friendly, secure, and highly beneficial tool for its users, delivering ease of use and valuable functionality.

Conclusions

The study's outcomes and advancements have resulted into the following key conclusions:

Initially, the online enrollment system is an alternative enrollment process for the students of Rafael L. Lazatin Memorial Senior High School and has ensured that all the requirements need were followed and addresses all the issues encountered.

Secondly, the current enrollment system at Rafael L. Lazatin Memorial Senior High School faces significant challenges that hinder its effectiveness. These include insufficient manpower, inefficiencies in documenting student data, unreliable record maintenance methods, security vulnerabilities, and difficulties in generating accurate reports. These issues collectively impact the administrative efficiency and student experience of the enrollment process.

Lastly, to address these challenges, the study proposes the development of an online enrollment system. This system aims to streamline the enrollment process, reduce manpower requirements, ensure accuracy and timeliness in enrollment records, establish reliable methods for record maintenance and communication dissemination, enhance security measures to protect student information, and facilitate the generation of accurate reports for effective enrollment management

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Recommendations

The study was intended to focus exclusively on regular students, but it's essential to recognize that an online enrollment system should not be restricted solely to them. There's room for further enhancement in functionality, such as implementing a scheduling system tailored for irregular students, generating reports, grade management, enrolling students manually, portal-like features, a mobile app, clearance management, and improving the user interface and experience to encourage greater interaction with the system.

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