The Development of Chatbots for the Financial and Procurement Office of the College of Arts, Media and Technology, Chiang Mai University

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Abstract

This research aims to develop a chatbot to support the financial, accounting, and procurement services of the College of Arts, Media, and Technology, Chiang Mai University, and to evaluate user satisfaction with the "Fin Dee" chatbot. The research process included designing the chatbot using Dialogflow integrated with the LINE Messaging platform. The study sample comprised 40 College of Arts, Media, and Technology staff members. Data collection tools included focus group discussions, interviews, and questionnaires, with data analyzed using mean and standard deviation. The findings reveal that the development of the chatbot, which utilizes Dialog flow in conjunction with LINE's Official Account, effectively facilitates processes related to disbursement, procurement, and supplies management. The "Fin Dee" Chatbot's unique features include receiving user messages, processing the messages using machine learning, and responding to users accordingly. The user satisfaction evaluation of the "Fin Dee" Chatbot indicates an overall high level of satisfaction. Among the evaluated aspects, design received the highest mean score, followed by content, while usability received the lowest mean score.

Keywords: LINE chatbot, Dialogflow, regulations

Introduction

College of Arts, Media and Technology, Chiang Mai University There are 10 financial and procurement officers, each of whom has deep-seated knowledge (Tacit Knowledge), which is the knowledge that cannot be seen it is the result of training and working until a high level of skill and expertise is achieved. This knowledge is a personal experience that arises from judgment, quick wit, and techniques that are unique to each person. To bring this knowledge to practical use. It is necessary to take the knowledge that is deeply embedded in a person and store it in a systematic form. Moreover, it can be converted into knowledge that can be transferred and used (Explicit Knowledge). This process ensures that important knowledge is not lost. Moreover, it can be reused quickly and efficiently (Vichai Thosuwaninda, 2017).

The college personnel still do not understand the rules, regulations, and guidelines related to the university's finance and supplies work. There are often the same questions. Often, the financial unit has many finance and procurement officers, so sometimes, the information given to service recipients is not complete and consistent. Due to misunderstandings and communication between personnel in the college.

Therefore, to make the work of personnel efficient, it is fast, including good relations among personnel. The “Fin Dee” chatbot plays a crucial role in this aspect. Therefore, it is very important to have a communication channel. Communication tools and communication methods that provide accurate and clear information. Communication channels that will reduce the workload of financial personnel and service users. It is a communication channel that initially has a system to work on behalf of officials. For example, answering questions via chatbot, where the answers will go through an analysis process of finance and supplies officers to be correct and consistent.

In addition to reducing the time of financial officers, the “Fin Dee” chatbot also reduces communication errors. It makes it possible to prepare documents related to disbursement correctly and more efficiently. It can also reduce conflicts between each other. And the officials who disburse the money. There is no need to edit documents many times because you can study to find the correct knowledge and compile it clearly.

Objectives

1. To develop Chatbots for The Financial and Procurement Office of the College of Arts, Media and Technology, Chiang Mai University.
2. To assess user satisfaction with the "Fin Dee" chatbot.

Literature Review

Knowledge Management (KM) is a process by which organizations create, collect, store, share, and utilize knowledge to enhance efficiency and competitiveness. It focuses on gathering explicit knowledge, such as documented information, and tacit knowledge, which includes personal experiences or skills. The knowledge management process consists of key steps: Knowledge Creation, Knowledge Storage, Knowledge Sharing, and Knowledge Application. The tool used to disseminate knowledge in this instance is the LINE Chatbot (Smith, 2020), an automated communication tool that enhances the efficiency of responding to user needs on the LINE platform. It leverages artificial intelligence technologies such as Natural Language Processing (NLP) and Natural Language Understanding (NLU) to answer

questions and provide accurate information. Chatbots can be applied to various business types, including customer service, marketing, and information notifications. Key steps include connecting to the LINE Messaging API, designing message structures, and continuously analyzing user data to improve the user experience. Creating a chatbot on LINE is straightforward and does not require extensive programming knowledge. Several tools, such as Dialogflow and LINE Developers, assist in building chatbots. The main steps (AppDisqus, 2023). in creating a chatbot, including the following:

1. Register and create an account on LINE Developers.
2. Configure the Webhook to connect the Chatbot with LINE.
3. Create Intents in Dialogflow to define the conversations between users and the chatbot.

The chatbot uses pattern-matching processes to group data and generates responses that align with users through AIML, a standard language structure. It then employs Natural Language Understanding (NLU) to convert text into a structured format that computers can understand. Natural Language Processing (NLP) is also used, which includes tokenization, sentiment analysis, entity recognition, and dependency parsing to enhance the accuracy of responses and understand user needs (Adamopoulou & Moussiades, 2020).

Chatbots also help reduce personnel costs, increase service speed, and can work 24 hours a day. However, research still needs to focus on improving chatbots' ability to understand complex human language and build trust between chatbots and users. In addition to studying knowledge management processes and LINE chatbots, the researchers have reviewed related studies. Sutsanguan and Tangwanwit (2023) researched the development of a chatbot for university information services. The objectives were to study processing algorithms, develop an automatic conversation response system (Chatbot) for university information, and evaluate user satisfaction. The research utilized Natural Language Processing (NLP) techniques and the Fuzzy Wuzzy algorithm. The target group included five computer experts and 30 undergraduate students. The findings indicated that Fuzzy Wuzzy was more suitable, with an average score of 65.28 compared to NLP's 42.04. Experts deemed the developed system appropriate (mean score 4.36, S.D. 0.58), and users were delighted (mean score 4.05, S.D. 0.73), indicating the chatbot system's efficiency and responsiveness. Sukkee and Chatree (2024) researched the development of the "Nong Lamduan" LINE chatbot application to recommend tourist attractions in Sisaket Province. The objectives were to design and develop the "Nong Lamduan" application, a LINE chatbot for recommending tourist attractions in Sisaket, and to evaluate the application's effectiveness. The development utilized Dialogflow and the LINE Messaging API with the Django Web Framework. This system can process messages and automatically respond to them via the LINE Official Account. The research findings indicated that the "Nong Lamduan" application received the highest performance evaluation, with design scoring the highest (mean score 4.73, S.D. 0.31), followed by content and usability. This system effectively enhances access to tourism information and promotes the local economy. Arunsri and colleagues (2023) researched the development of a chatbot system to support the services of the Cooperative Education and Career Development Center at Nakhon Ratchasima Rajabhat University. The objectives were to develop a chatbot system that supports services and to study user satisfaction with the system. The chatbot system was developed using LINE Messaging API, DialogFlow, and Webhook, following the Software Development Life Cycle (SDLC). The research sample included five instructors and 15 students who used the system. The findings indicated that the chatbot system effectively responded to automatic conversations, reduced response time, and increased user satisfaction to the highest level, with an average satisfaction score of 4.55 (S.D. = 0.45). The system

demonstrated the capability to provide information and process human language efficiently, aligning with the development approach of chatbots that can be further enhanced in terms of intelligence and functionality diversity.

Research Methodology

Research Tools

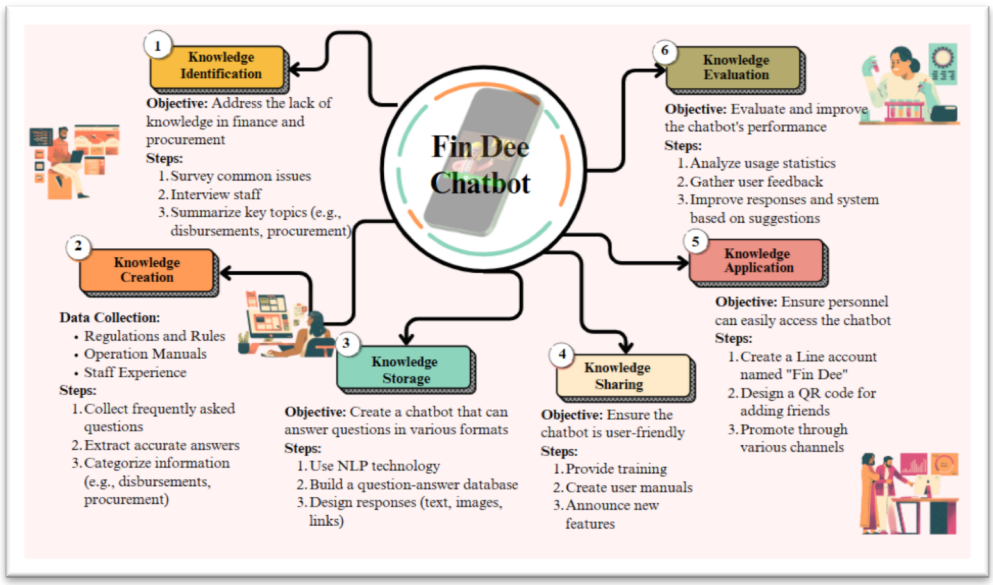
1. Focus group discussions, interviews, and online surveys were conducted twice using two sets of surveys as follows:
    - Set 1: An open-ended survey to identify problems and needs of the financial and procurement services staff.
    - Set 2: A rating scale survey to evaluate user satisfaction with the "Fin Dee" chatbot.
2. LINE Messaging API, DialogFlow, and Webhook.

Target Group

The College of Arts, Media, and Technology personnel, totaling 40 people, are divided into 10 financial and procurement officers—30 other related personnel, such as course coordinators, project coordinators, lecturers, and project leaders.

Research Steps

Figure 1
Research Implementation Steps



The steps and processes for knowledge management to develop a chatbot that supports financial and procurement services and addresses the issue of staff lacking an understanding of regulations related to disbursement and asset management can be carried out in six steps as follows:

1. Knowledge Identification
    - Identify which areas of regulations staff lack knowledge and which are important.

    - Conduct surveys and interviews with staff or review errors in work performance caused by misunderstandings.
    - Use questionnaires to survey understanding of regulations.
    - Identify recurring issues.
2. Knowledge Creation
    - Develop and create explicit, easy-to-understand knowledge about regulations suitable for the chatbot.
    - Create question-and-answer sets about regulations in a format that staff can easily access.
    - Prepare documents or summary content of regulations, rules, and other relevant laws.
    - Create FAQs (Frequently Asked Questions) about regulations or issues related to financial and procurement services.
3. Knowledge Storage
    - Record knowledge about regulations in a format ready for use in the chatbot.
    - Upload regulatory content into the chatbot's database.
    - Categorize regulatory information by topic.
    - Use the chatbot's NLP (Natural Language Processing) technology to find answers quickly.
4. Knowledge Sharing
    - Ensure staff can easily access regulatory information through the chatbot.
    - Encourage staff to use the chatbot to find answers about regulations by providing training or creating a user manual and notifying staff about new chatbot features.
5. Knowledge Application
    - Promote staff use of the chatbot when they have questions about regulations before directly asking officers.
    - Encourage staff to use the chatbot in real situations.
    - Install the chatbot on the faculty's LINE official account and website.
6. Knowledge Evaluation
    - Evaluate whether the chatbot helps solve understanding issues regarding regulations and adjust the information in the chatbot accordingly.
    - Analyze the frequency and content of frequently asked questions to improve the chatbot, including collecting usage data such as the number of answered and unanswered questions.
    - Survey staff opinions on the chatbot's effectiveness.

The Statistics

The statistics used in the research include the mean and standard deviation. The criteria for interpreting the mean are as follows (Best & Kahn, 1993):

- A mean of 4.51 - 5.00 indicates the highest level of satisfaction.
- A mean of 3.51 - 4.50 indicates a high level of satisfaction.
- A mean of 2.51 - 3.50 indicates a moderate level of satisfaction.
- A mean of 1.51 - 2.50 indicates a low level of satisfaction.
- A mean of 1.00 - 1.50 indicates the lowest level of satisfaction.

Research Results

The chatbot development to support financial and procurement services at the College of Arts, Media, and Technology found that the "Fin Dee" chatbot was developed using Dialogflow. This tool enables the chatbot to understand human conversations. Machine learning processes the conversations in the background, allowing immediate use without developing NLP independently. The development process began with:

(1) Collecting frequently asked questions to ensure the chatbot can respond accurately and comprehensively.

(2) Extracting correct answers from reliable sources such as regulations, agency guidelines, and staff experiences in solving real issues.

(3) Designing a chatbot with Dialogflow involves defining Intents and Responses. The chatbot's responses can Create a chatbot using Dialogflow, which involves defining intents and responses. The chatbot's responses can be configured to display in three formats:

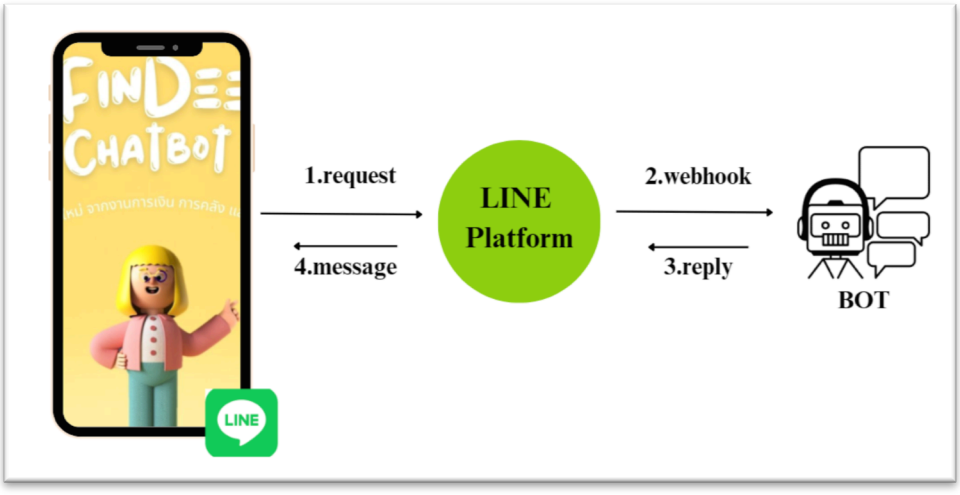
- Text: Answering questions that can be explained in sentences, e.g., "The documents required for disbursement are..."
- Link: If the answer involves detailed information, the chatbot will link to a document or website, e.g., "Read more in the disbursement manual."
- Image: Examples of completed forms or step-by-step images, e.g., "Steps for claiming speaker fees."

Figure 2

Creating a Chatbot With Dialogflow

Figure 3

The Working Principles of Webhook in the LINE Messaging API

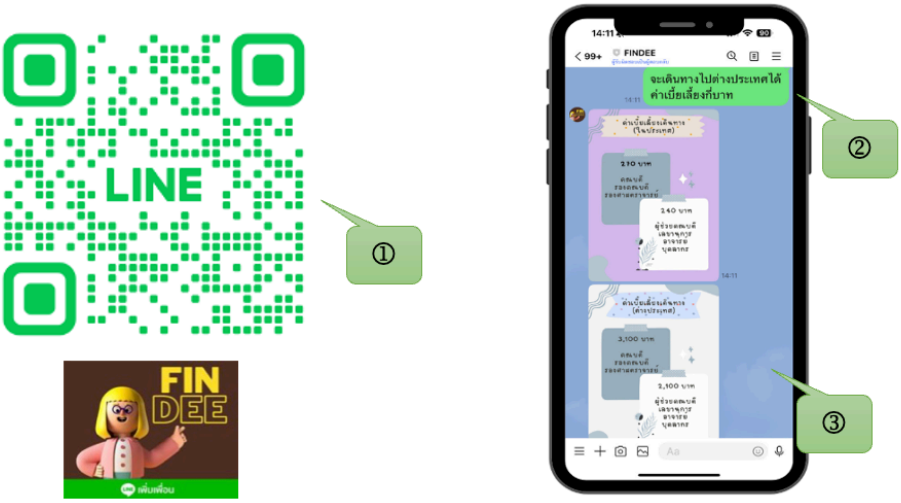


(4) Using the Chatbot via LINE: Staff can access the Chatbot through LINE by adding it as a friend via a QR code displayed on all organizational communication channels, such as the LINE official account, website, announcements, or promotional emails. The Chatbot's LINE account is named "Fin Dee." The usage steps are as follows:

1. Add the chatbot as a friend on LINE by scanning the QR code.
2. Send a question in the chat, e.g., "How much is the per diem for international travel?"
3. The Fin Dee chatbot will respond with the appropriate information.

Figure 4

How to Use the "Fin Dee" LINE Account



The study on user satisfaction with the "Fin Dee" chatbot found that the overall average satisfaction level was very high (X = 4.51, S.D. = 0.35). When considering individual aspects, the design aspect had the highest average satisfaction, followed by the content aspect. The aspect with the lowest average satisfaction was usability.

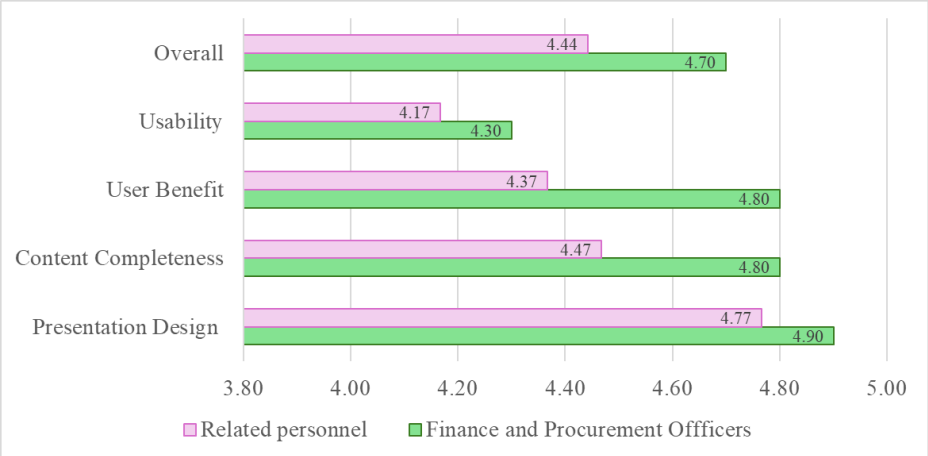
Table 1

Overall Satisfaction Analysis Results for the "Fin Dee" Chatbot

Evaluation of Satisfaction	$\bar{x}$	S.D.	Satisfaction Level
1. Presentation Design	4.80	0.41	Highest
2. Content Completeness	4.55	0.50	Highest
3. User Benefit	4.48	0.60	High
4. Usability	4.20	0.46	High
Overall	**4.51**	**0.35**	**Highest**

Figure 5

Satisfaction Analysis Results for the "Fin Dee" Chatbot by Target Group



It can be observed that the satisfaction levels of different target groups vary in each aspect. Therefore, the "Fin Dee" chatbot should be improved to maximize the satisfaction of the relevant personnel.

Discussion

The "Fin Dee" chatbot research aimed to develop a chatbot to support financial, fiscal, and procurement tasks and evaluate user satisfaction. The research results demonstrated the chatbot's effectiveness in reducing workload and increasing convenience in accessing relevant regulations and rules. The results can be discussed as follows.

1. Reasons for the Research Results
    - 1.1 Appropriate Design DialogFlow, in conjunction with the LINE Messaging API, allows the chatbot to receive questions, process them, and respond in various formats, such as text, images, and links. These capabilities make the chatbot user-friendly and easy to use.
    - 1.2 Comprehensive Data Collection The content of the questions and answers is extracted from regulations, rules, and the experiences of finance and procurement officers. This ensures the chatbot can provide accurate answers that meet the users' needs.
    - 1.3 Evaluation and Improvement Based on Feedback Using questionnaires and interviews to assess user satisfaction helps researchers improve the system to meet the needs of the target groups better.

2. Consistency With Previous Research
    - 2.1 Consistency with Previous Research. The research by Pisarn Sukkee and Jetsada Chatree (2024), which developed a chatbot for recommending tourist attractions using DialogFlow and the LINE Messaging API, found that using the chatbot reduced the time spent searching for information and increased service convenience. Similarly, "Fin Dee" reduces the workload of finance and procurement officers. Narittha Sutsanguan and Sakchai Tangwanwit research found that chatbots using NLP and specific processing techniques could answer questions effectively. This aligns with "Fin Dee," which can accurately answer regulatory questions.

2.2 Differences from Previous Research. The "Fin Dee" research focuses on solving organizational workflow issues, such as disbursements and procurement, while some previous studies focused on providing general information, such as tourism or student services.

3. Benefits and Applications
    3.1 Improving Work Efficiency
        3.1.1 Reducing Staff Workload: Helps reduce the time staff spend answering repetitive questions about regulations and procedures, such as disbursements and procurement. This allows staff to focus more on important or strategic tasks.
        3.1.2 Increasing Accuracy in Answering Questions: Information in the Chatbot is verified by reliable sources, such as regulations and operation manuals, thus reducing communication errors.
    3.2 Enhancing User Convenience
        3.2.1 Access to information anytime, anywhere: Users can inquire about information through the chatbot on the LINE Official Account 24/7 without waiting for staff to respond.
        3.2.2 Quick and diverse responses: The Chatbot answers questions through text, images, and links, helping users understand procedures and information more easily.
    3.3 Enhancing Satisfaction
        3.3.1 Reducing user waiting time: Users can find answers immediately without waiting for staff responses, increasing convenience and reducing dissatisfaction.
        3.3.2 Increasing confidence in received information: The Chatbot's answers are verified for accuracy, ensuring the information is correct and up-to-date.
    3.4 Organizational Support
        3.4.1 Improving knowledge management efficiency: The Chatbot is a repository and disseminator of knowledge in an easy-to-use format, facilitating knowledge transfer within the organization.
        3.4.2 Reducing human resource costs: By decreasing the staff needed to answer repetitive questions, labor costs can be reduced, or resources can be reallocated to more important tasks.
    3.5 Further Development
        3.5.1 Foundation for integrating AI into the organization: The "Fin Dee" system can be further developed into a self-learning chatbot capable of processing more complex information.
        3.5.2 Supporting usage in other contexts: The Chatbot can be adapted to support functions in other departments, such as human resources or legal advisory services.

The Fin Dee chatbot enhances efficiency and reduces workload in financial and procurement tasks, making operations more convenient, faster, and more accurate. Additionally, it increases user satisfaction and creates opportunities for developing digital innovations within the organization.

4. Limitations of the Fin Dee Chatbot
    4.1 The Chatbot may be unable to answer questions beyond the configured database, such as outdated regulations or procedures. If there are changes, such as

amendments to laws or new regulations, staff must continuously update the database, which can be an additional burden.

4.2 Answering Complex Questions: The chatbot may not provide complete answers for complex questions or those requiring in-depth analysis, such as consultations that need to consider specific contexts.

4.3 Understanding Human Language: Despite using Natural Language Processing (NLP), the chatbot has limitations in interpreting questions with specific terminology or informal language. It may not understand contextual meanings or ambiguous questions.

4.4 Resistance to Change: Some personnel may not be familiar with using the chatbot or may still prefer asking staff directly.

Conclusions

The research concluded that the Fin Dee chatbot enhances efficiency, reduces workload, increases user satisfaction, and creates opportunities for developing digital innovations within the organization.

References

Adamopoulou, E., & Moussiades, L. (2020). An overview of chatbot technology. *Proceedings of IFIP Advances in Information and Communication Technology, Springer Cham, 584, 373-383.* https://doi.org/10.1007/978-3-030-49186-4_31

AppDisqus. (2022, Febuary 4). *How to build LINE chatbots with Dialogflow*. AppDisqus. https://www.appdisqus.com/how-to-line-chat-bot-dialogflow/

Arthitaya Arunsri, Thidanuch Puttasimma, Aditap Sapapuk, Anawil Khumpet, Puchit Pubanchuen & Sakdinon Hanpanom. (2023). The Development of Chatbots for The Cooperative Education and Career Development Center Nakhon Ratchasima Rajabhat University. *Journal of Academic Applications of Information Technology, 9*(2), 88–96. https://ph02.tci-thaijo.org/index.php/project-journal/article/view/251878/170010

Best, J. W., & Kahn, J. V. (1993). *Research in education (7th ed.).* Allyn and Bacon.

Bhisan Sookkhee & Jesada Chatree. (2024). Developing the "Nong Lamduan"Line Chatbot Application to Recommend Tourist Attractions in Sisaket Province. *Journal of Information Technology Applications*, *10*(1), 84–93. https://ph02.tci-thaijo.org/index.php/project-journal/article/view/251930/170815

Naritta Sudsanguan & Sakchai Tangwannawit. (2023). The Development of Chatbot for University Information services. *Journal of Information Technology Applications, 9*(2), 98–110. https://ph02.tci-thaijo.org/index.php/project-journal

Smith, J. (2020). *Developing LINE chatbots with AI: A practical guide.* Tech Publishers.

Vichai Thosuwanchinda. (2017). *Knowledge management for modern organizations*. Witthayapattana Publishing.

Wasin Permsup. (2023). *ChatGPT AI revolutionizing the world*. Provision.

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