

AskANGELS: A Generative AI Chatbot for Nursing



Team Members Ms Elaine Choo Li Ming, MNH DON
Ms Ngo Thi Hong Hoa
Mr Harry Chan
Ms Linda Marie Nathan

Team Members Ms Siti Samira Binte Kassim
Ms Qin Jing
Ms Tan Lan Sze Denise Megan

1. PROBLEM Statement

Nurses face challenges in manually searching and retrieving hospital documents and form templates, leading to delays and reliance on memory for less common procedures, increasing the risk of errors and compromising patient care.

2. BACKGROUND Information

In a fast-paced healthcare environment, nurses play a vital role to deliver quality care and frequently struggle to locate relevant documents and different forms within SharePoint folders. The current manual process of searching for hospital documents can be time-consuming and even lead to errors. With the increasing complexity of treatment, nurses often rely on memory to recall the steps which can lead to mistakes and adverse events. Significant delays in retrieving documents can also cause prolonged treatment times. A questionnaire was initiated to gather staff feedback.



3. AIM Statement & TARGET

To reduce the average process time taken by nurses to retrieve hospital documents and form templates by at least 50% from March to July 2024, thus improving efficiency to at least 70%.

4. MEASURE & INDICATOR

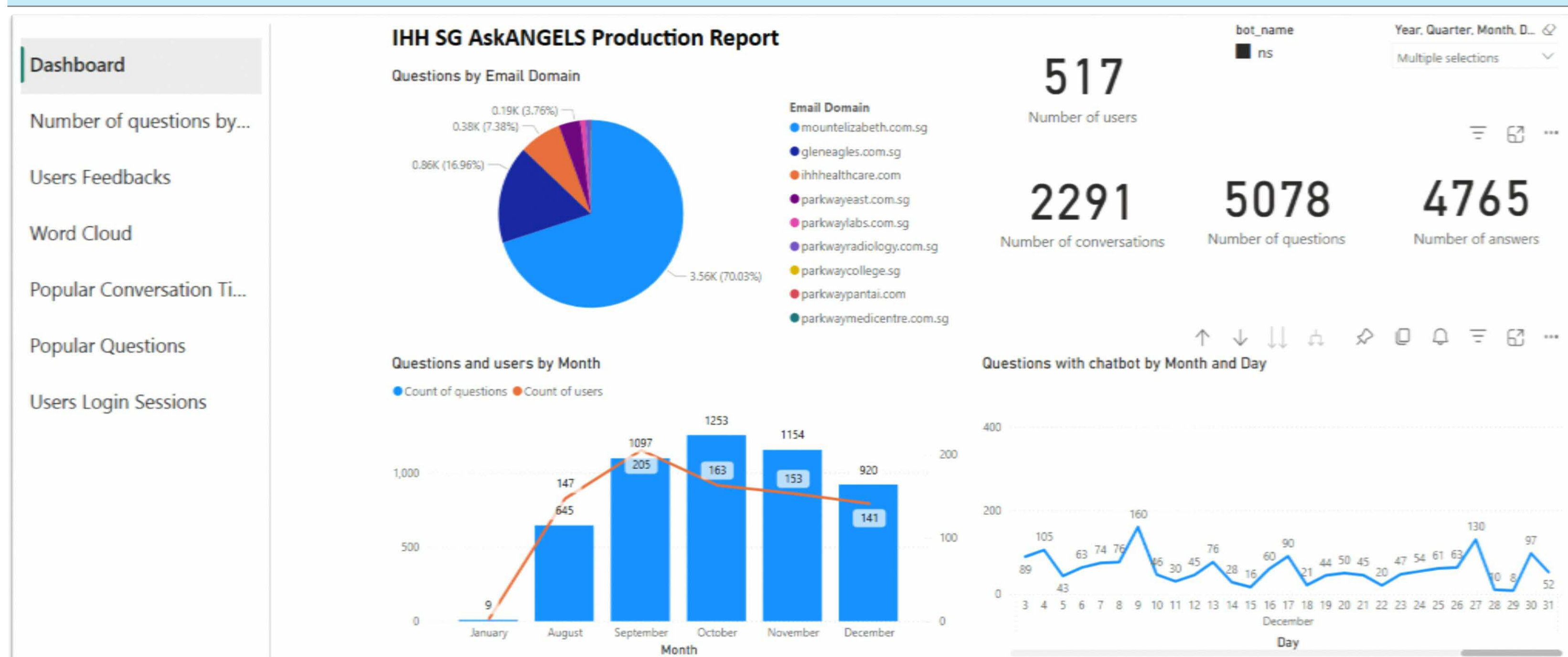
- Average search time** – Refers to the average time taken by users to perform search and retrieve a document.

Formula	Goal
Total search time / Number of searches for all work activities (in minutes)	To reduce average search time by 50%

- Work efficiency rate** – Refers to the overall reduction of total process time taken to complete a process or task, including all steps and activities, from start of user starting to search to retrieval and printing of information.

Formula	Goal
100% - (Total time spent on work activities / number of activities x 100%).	To improve efficiency by reducing the total process time to complete a work process by 70%

5. CHANGE STRATEGY



Categories Identified	Implementation	Outcome
Material/Equipment	Implemented a real-time and intuitive support system using generative AI chatbot to provide instant access to hospital documents, including department protocols, workflows and form templates.	Enhanced efficiency: <ul style="list-style-type: none"> Reduced time taken by more than 50% to retrieve hospital documents and form templates, allowing nurses to focus more on bedside patient care.
Method	Incorporated enhanced features that include: <ul style="list-style-type: none"> Prioritized document retrieval Direct links to actual documents and enable printing capability Understand the context of current questions based on previous interactions, creating a conversational and efficient experience. 	Improved accuracy: <ul style="list-style-type: none"> Nurses receive relevant document tailored to their specific queries. Minimize reliance on memory which prevents unnecessary errors.
People	<ul style="list-style-type: none"> Flyers posted to announce the phased implementation. Promoted implementation during daily roll call sessions and department meetings. Regular user feedback gathered. 	Continuous system enhancement: <ul style="list-style-type: none"> Regular user feedback enabled improvement to AI accuracy and relevance.

6. RESULTS

The implementation of AskANGELS has achieved remarkable outcome, with 68% of 278 nurse respondents expressing extreme satisfaction with the use of the AI chatbot. It resulted in a significant reduction of 84% in average time spent to search and retrieve hospital documents, decreasing from 9.615 minutes to 1.51 minutes with a difference of 8.1 minutes. The new project has enabled easy document searching, quick access to relevant information, improved knowledge and more confidence in delivering care. Evidently, the project has demonstrated improved work efficiency to 79% by empowering nurses to render more effective care to patients.

Healthcare Environmental Sustainability	Impact
Carbon emission reduction	<ul style="list-style-type: none"> Reduced carbon emissions by 40% due to less printing of hardcopy documents. Reported 88% of improved efficiency using digital hospital resources. Minimize delays in carrying out clinical processes with instant access to resources.
Energy savings	<ul style="list-style-type: none"> Reduced energy consumption due to optimized AI model through transfer learning using pre-trained chatbot language model. Continuous updating & refined dataset containing conversations. User feedback & knowledge transfer by understanding user queries better with language patterns. Less electrical energy consumption due to lesser printer usage.
Population Health	
Health Equity	<ul style="list-style-type: none"> Quick accessibility to accurate clinical information using desktop, laptop and mobile phone, enable critical decision-making. Equal access to AskANGELS by all IHH staff, including non-nursing.
Health Literacy	<ul style="list-style-type: none"> Improve healthcare staff knowledge through real-time, access to evidence-based information.

7. LESSONS LEARNT

- Effective feedback system and regular engagement with users are imperative to understand their challenges faced, developing an intuitive system to meet their needs.
- Good collaboration with different stakeholders, such as IT, Quality Management and other stakeholders, enables smooth implementation of project and able to reach out to more users within their own teams.
- Phased timelines enable thorough testing and system improvement, enabling successful launch of project in a timely fashion.
- Continuous enhancement of system enhances sustainability of project and increases users' satisfaction rate.

