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DEVELOPMENT OF INTELLIGENT SUPPORT SYSTEM IN HOUSEHOLD APPLIANCES TROUBLESHOOTING SECTOR

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Abstract

This study concerns the development and implementation of an intelligent support system for troubleshooting household appliances. The article describes the current status of the subject area, the main ways of improvement, key factors in customer support, and describes the process of informatization using intelligent chatbot.

Анотація

Дане дослідження стосується розробки та впровадження інтелектуальної системи підтримки при усуненні несправностей побутових приладів. У статті описано поточний стан предметної області, основні шляхи вдосконалення, ключові фактори в області підтримки клієнтів та відображено інформатизацію процесу з використанням інтелектуальних чатботів.

Introduction

Informatization and global technical workflow automatization have become an integral part of the economic and social aspects that continually forms the future society. Moving from human-based work to technologies and the digital initiatives made it possible to level-up services providing. The great advantage is that these instruments enable us in part to spend smaller units of time that waste on searching the core of the problems. In turn, usage of these tools has generated and opened new horizons of big data that humans' brains can no longer comprehend and for which we need more complicated computing engines and complex algorithms [1]. All this caused the combination of automatization computation, full-time available systems, and intelligent machines. From that perspective, it is relevant to use obtainable possibilities in the repair sphere by improving the 'help desk' sector. The lead part in the household daily grind plays the usage of big household appliances. According to the last research of the home appliances repair market shows that repair or adjustment is the option, which users found more attractive over buying a new device. However, due to a range of negative factors, the number of repair services users haven't increased over the last few years (territorial inaccessibility, inappropriate price, insufficient feedback's information). The utilization of modern opportunities and partial elimination of these negative factors will increase the percentage of the workshops' services market and will provide a set of advantages for human beings.

Formulation of the problem

Scientific progress in the information technology field opens up access to leapfrog in digital human growth. The main deceleration in this scenario is a lack of global distribution and availability of advanced equipment for a common person [2]. These frames induce to look for the solution that is reachable in the context of formed circumstances.

The key advantage of using web-based technology is its global availability and efficiency in the service sector. A better alternative, in this case, is to analyze significant factors and preferences in order to provide better customer service, including workmen's (private entrepreneurs), and to develop and implement a system, which can supply requested features. No least is the choice of system architecture, technologies for its implementation and the adoption of advanced engineering, including artificial intelligence. But the aim is to rectify the connection between customer and services' seller, by involving information technologies.

Major research results

Development and implementation of distributed web-system based on layers' architecture with client-service structure and remoted database brought its benefits (including stability, data security, and computing speed) towards technical implementation. Among the functional additions of the system that includes an ontological structure of help desk information filled by primary breakdowns of devices, availability of personal cabinet, usage of geolocation maps services in order to access to the workshops' location set with a relevant custom-formed rating feedbacks, which implementation and local tests shows an effective usage. After a brief analysis was detected that the main problem is to provide a profitable search and troubleshoot process. Research of the solution to this problem has made to think about the implementation of bot-chat technology. The overviewing of last studies in bots applying among popular platforms allows identifying the huge proliferation of bots, especially because of the rise of the messenger's application, which is explained by the continual growth of people' engaging in messaging, as a result messaging has overtaken social. Involving this technology has become a first-line support component in leading companies' systems. It deals with problem troubleshooting, new user onboarding, and response suggestions, which is efficiently increase the 'help desk' section. According to Drift's 2018 State of Chatbots Report [3], formed use-case chart shows that over 37% of users prefer to use bot-technology in order to get a quick answer to resolve a problem. Reasons, why bots became so demanded, is that this app-part runs where convenient to the customers, efficiently solve a customer's problem and it's natural and intuitive to use. From technical aspect, bots are really focused on application purpose (they are focused on a specific problem, otherwise – they've got to perform one implementation).

In general, bot performing consists of stack of dialogs, but usage of this approach can't be effective when it comes to dealing with real problem-solving situation. That's why it's important to build an intelligent-based chat. That architecture approach can be implemented by using of AI computing and teaching opportunities. A proposed neural network will be making decisions based on set rules with deep leaning algorithms, where the initial stage will depend on the pre-formed data set (tag, patterns, responses, and recommendations). Based on the classification model it will read input text, will perform embedding and by classic neural network's scheme will identify the possibility of what goes next – question, advice, promotion or unidentified situation. As the system is created by orienting on MS tools, the expansion will be including these implements.

Conclusion

The proposed solution in the improvement of the situation in the repair market sphere, which is based on web-based system implementation brought its benefits. Negative aspects, related to appliances' repair unavailability, which system has removed, positively encouraged users to effectively solve problems with home appliances. But with the quick progress in modern humans' needs and with the conditions that have been created by the 'digital era' the system architecture requires appropriate addition. As the problem's core consists of a support solution, it was suggested to improve the system by implementing AI-based conversational bot-component.

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