Chapter 3.4
Semantic Web Support
for Customer Services

Quan Thanh Tho
Nanyang Technological University, Singapore

Hui Siu Cheung
Nanyang Technological University, Singapore

A. C. M. Fong
Nanyang Technological University, Singapore

ABSTRACT

This chapter discusses Semantic Web support for customer services. Customer service support is an important operation for most multinational manufacturing companies. It provides installation, inspection, and maintenance support for their worldwide customers. However, knowledge integrated in customer service support systems is typically closed in terms of exchanging information. Therefore, the systems do not easily share, reuse, or exchange knowledge. It causes difficulty when customers seek service support for products produced by various companies. In this chapter, we propose to incorporate Semantic Web services into customer service systems to solve such problems. In our system, KSOM neural network is first used to mine knowledge from reported cases. Then, ontology is used as a semantic representation for knowledge discovered and Semantic Web services are used to make constructed ontology accessible from different systems. As a result, users can use semantic knowledge distributed across various sources on the Internet to solve their problems. Performance evaluation on the system is also present in the chapter.

INTRODUCTION

Customer service support has become an integral part of many multinational manufacturing com-

panies that manufacture and market machines and electronic equipment. A customer service department is usually set up to provide installation, inspection, and maintenance support for their customers, which may be located worldwide. Insertion and surface mount machines are expensive and require efficient maintenance during machine down time. Although most customers have some engineers to handle day-to-day maintenance and small-scale troubleshooting, expert advice is often required for more complex maintenance and repair jobs. Prompt response to request from customers is needed to maintain customer satisfaction. Therefore, the multinational corporation has set up a hotline service center (or help desk) to answer frequently encountered problems.

Customer service on faulty machines or customer enquiries is traditionally supported by the service center or help-desk of the customer service department via telephone calls. When a problem is reported, a service engineer will suggest a series of checkpoints to the customers to implement or check as a means to rectify the reported problem. Such suggestions are based on past experience or extracted through a customer service database that contains previous service records that are identical or similar to the current one.

With these checkpoints, the customer attempts problem solving and subsequently confirms with the service center if the problem is resolved. If the problem still persists after all the suggested checkpoints are exhausted, the center will dispatch the service engineers to the customer's premise for an onsite repair. During such trips, the service engineers will carry along with them past records of the customer's machine, related manuals, and spare parts that may be required to carry out the repair. Such a process is inconvenient and often involves bringing redundant materials.

At the end of each service cycle, a customer service report is used to record the reported problem and proposed remedies or suggestions taken to rectify the problem. This is for billing purposes, as well as maintaining a corporate knowledge base. The service centre then updates the customer service report in the customer service database.

This traditional customer support process suffers from a number of disadvantages:

- The process is time-consuming and expensive. More often than not, service engineers are required to travel to a customer's site for an onsite service even for a small problem. As a result, the problem cannot be resolved efficiently and the machine downtime can be significant. In addition, as the customers communicate with the help desk centre via telephone calls, they incur long distance telephone charges as most of them are located overseas.

- A certain number of service engineers are maintained in order to provide the service support. It needs to keep on training new service engineers, and at the same time, come up with new incentive scheme to retain experienced service engineers.

- Expert advice to the problem is given either through the experience of the service engineers or the available past service information in the service database. No automatic provision of expert advice is available.

As can be seen from this mode of operation, the identification of machine faults relies heavily on the service support engineers' past experience or the information drawn from the service database. This method has a problem of training and maintaining a pool of expert service engineers. Thus, instead of relying on the knowledge of service engineers, an intelligent fault diagnosis system that captures the expert knowledge of machine diagnosis to assist customers identify machine faults becomes extremely useful. This system should be able to generate suggested remedial actions automatically or through user-interaction based on the observed fault-conditions.

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/semantic-web-support-customer-services/9494

Related Content

Determinants of Customer Loyalty Dimensions: E-Commerce Context in Emerging Economy Perspective
Doddahulugappa Goutam, Gopalakrishna B. V.and Shirshendu Ganguli (2021). *Journal of Electronic Commerce in Organizations (pp. 1-23).*
www.irma-international.org/article/determinants-of-customer-loyalty-dimensions/265171

"Intelligent Collaboration" the Paradox of "Ethical Agency" and "Corporate Governance"
Tagelsir Mohamed Gasmelseid (2009). *Journal of Electronic Commerce in Organizations (pp. 50-58).*
www.irma-international.org/article/intelligent-collaboration-paradox-ethical-agency/3525

Design Methodology for Effective User Interface Design for E-Commerce Applications
Namratha Birudarajuand Adiraju Prasanth Rao (2021). *Research Anthology on E-Commerce Adoption, Models, and Applications for Modern Business (pp. 385-412).*
www.irma-international.org/chapter/design-methodology-for-effective-user-interface-design-for-e-commerce-applications/281513

E-Commerce Challenges and Policy Considerations in Nigeria
Wole Michael Olatokunand Isola Ajiferuke (2006). *Encyclopedia of E-Commerce, E-Government, and Mobile Commerce (pp. 291-295).*
www.irma-international.org/chapter/commerce-challenges-policy-considerations-nigeria/12552

Trademark Infringement in Pay-Per-Click Advertising
Peter O'Connor (2009). *Contemporary Research in E-Branding (pp. 148-160).*
www.irma-international.org/chapter/trademark-infringement-pay-per-click/7065