TEA: A Generic Framework for Decision Making in Web Services

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ABSTRACT

This paper proposes TEA: a generic framework for decision making in web services, which integrates the environment (6 Ps) of decision making, the behaviors (6 Cs) of decision makers, and inner activities (another 6 Ps) of decision makers. This framework unifies what the decision makers can “eye” (the above-mentioned first 6Ps), should “think” (the above-mentioned another 6 Ps) and “act” (6 Cs), whenever making decisions in web services. The paper also examines interrelationships among the first 6 Ps, 6 Cs, and another 6Ps, and their influences on decision making in web services. The proposed approach will facilitate research and development of decision making and decision support systems in web services.

Keywords: Customer Decision Making, Decision Making, E-Business, Service Computing, Web Services (WS)

INTRODUCTION

Web services are Internet-based application components published using standard interface description languages and are universally available via uniform communication protocols (ICWS, 2009). Web services can be more simply considered as the provision of services over electronic networks such as the Internet and wireless networks (Rust & Kannan, 2003). Web services portray a new computing paradigm that has drawn increasing attention in information technology (IT) (Deitel, Deitel, DuWadt, & Trees, 2004), information systems (IS), and are continuing to play a pivotal role in the field of service computing and service intelligence (Singh & Huhns, 2005; Leung, Chiu & Hung, 2011). Web services are viewed as a new business paradigm that is playing an important role in e-business, e-commerce and business intelligence into the future (Wang, Cheung, & Liu, 2006).

The key motivation behind the rapid development of web services is the ability to discover services that fulfill user demands, negotiate...
service contracts and have the services delivered where and when a user requests them (Tang, Jiang, Ding, & Wang, 2007). The fundamental philosophy overarching web services is their ability to meet the needs of users precisely and thereby increase market share and revenue (Rust & Kannan, 2003). Web services have helped users reduce the cost of IT operations and allow them to closely focus on their own core competencies (Hoffman, 2003). At the same time, for business marketers, web services have been proven to be very useful for improving inter-organisational relationships and generating new revenue streams (Sun & Lau, 2007). Furthermore, web services can be considered an evolved development in terms of e-commerce and e-business, because they are service-focused business paradigms that use two-way dialogues to build customized service offerings, based on data, information, knowledge and experience about users to build strong customer relationships (Rust & Kannan, 2003). One of the most intriguing aspects effecting web services is that they cannot avoid the similar challenges which are encountered in traditional services such as how to make decisions in order to either make associated services successful or to obtain the most satisfactory services online. Informed and intelligent decision making (DM) is essential for the success of web services (Sun, Meredith, & Jia, 2009).

The dramatic development of e-business and web services have enabled engaged customers to have a more informed process of DM in regards to selecting and purchasing goods online and to access web services (Sun, Sun, & Meredith, 2010). Customers can now use web-based tools such as search engines, online social networking services and free web services to break through the traditional physical and geographical limitations associated with an international market in order to reach globally provided goods and services (Schneider, 2011). This ability provides customers with a stronger bargaining position over prices and quality of goods and services owing to price and information transparency. O’Keefe and McEachern (1998) looked at what parts of the customer decision process can be supported using web tools and customer decision support systems (DSSs). However, they did not discuss the inner world of the customers and this can be argued as being clearly very important for any decision making in web services and it is often neglected by academics and decision makers.

Customer decision making (CDM) is closely related to marketing and web based marketing systems (O’keefe & McEachern, 1998). Successful marketing has usually been modelled by using the existing P⁶ model consisting of 6 Ps: price, people, place, process, product and promotion (Booms & Bitner, 1981; Chaffey, 2009; Sun, Sun & Meredith, 2010). This P⁶ model evolved from the original P⁴ model of the marketing mix introduced by McCarthy in 1960. McCarthy considered the marketing mix as an essential part of developing a marketing strategy (Chaffey, 2009: 448). McCarthy (1960) proposed that the marketing mix consists of 4 Ps: product, price, place, and promotion. However, the weakness of these 4 Ps is symptomatic of a push approach towards marketing and importantly does not recognise the needs of customers and the intrinsic role of participation of customers. In order to mitigate this weakness, Lantenborn (1990) integrated 4 Cs (Customer, Cost, Convenience, and Communication) to replace the P⁴ model. Lantenborn’s 4 Cs is a mixture of customer’s perception (Cost, Convenience), behaviour (Communication) and customer itself (Customer). However, Lantenborn did not consider the relationship between CDM and the above-mentioned 4 Ps or 6 Ps. Sun, Meredith and Jia (2009) examined the 6 Cs for DM in web services by proposing a C⁶ model, and argued that the 6 Cs: communication, competition, coordination, cooperation, collaboration and control play an important role in DM for all web service decision makers in web services. The core idea behind the C⁶ model is to address what the web service decision makers should “act” when they make decisions in web services. However, the existing architectures or models of e-business and
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