

Agent-Based Auction E-Marketplace with Value Added Services and Islamic Shariah Compliance

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INTRODUCTION

In recent times, massive attention has been given to online auction or electronic auctions. Electronic auction is considered as one of the most successful e-commerce applications. Taking one step further, online auction e-marketplace adopted software agent technology in the bidding process. This study starts with the explanation of the concepts of an electronic marketplace (e-marketplace) and the types of e-marketplaces in today's computing environment that is facilitated and driven by the Internet. The concept of software agent and the different types of agents which may exist in an e-marketplace application in the current setting of the global economy is also discussed. Specifically the idea of using mobile agents in the implementation of an e-marketplace is investigated. This article also discuss security issues raised by the use of mobile software agent concerning the protection of platform/host and malicious attacks from a variety of intervening that might alter the information its carries. Another issue which is highlighted is the requirement to ensure that the marketplace provides support for Halal trade and compliancy to Islamic business rules and regulations (Shariah law) in order to fulfill Muslim community needs. This also means ensuring that the marketplace must offer secure and trustworthy trading environment while simultaneously prohibit elements of usury, gambling, uncertainties and price inflation. Incorporating Shariah compliances can be viewed as providing value-added services to such marketplaces as ways to attract and hold onto clients in a very competitive industry. The complex and challenging computing

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environment in which agents operate requires efforts in the standardization and management of agents. Hence the standards may need to be revised to accommodate the recently introduced Halal Standards and certifications.

The concept of conducting business transactions via the electronic media has been an essential part of many businesses during the last few decades. Currently, the Internet which provides a set of interconnected networks has made it possible for individuals and businesses to conduct business transactions electronically. The process of buying, selling, transferring or exchanging products, services, payments and/or information via computer networks such as the extranet, intranet and the Internet is called electronic commerce (Turban, King, Lee, Liang, & Turban, 2015).

To enable distributed buyers and sellers to conduct online business transactions, many new business models have been proposed. The Internet and agent technology have been regarded as the enabling technology to realize many new business models ranging from e-shops, e-procurement, e-auction and e-mall to virtual enterprises and e-marketplaces (Timmers, 1998). These services differ in terms of the technological requirements, the participants involved and the potential benefits that can be harvested by market participants. This chapter elaborates upon the fundamental concepts of e-marketplace trading and how agent technologies help conducting business transaction in such environment. New business trends and current issues such as requirement for e-marketplaces to comply to Shariah rules are also covered.

BACKGROUND OF ELECTRONIC MARKETPLACE

Electronic markets have become a key enabler for inter-organizational collaboration and will maintain an important role in the future. Alt and Klein (2011) 20 years review on electronic market shows that it came from two origins. From the technological side, electronic markets comprise the application of information technology (IT) to support communication and allocation purposes among multiple actors in one or multiple value chain(s). While from the economic side, these technologies and standardization had important impact in particular on the costs of organizing economic activity among organizations. Despite proliferation of emerging technologies such as software agent, standards, semantics and ontologies, technology does not determine the choice of governance structure. Understanding the organizational, strategic and social implications of the IT-based transformation is required to understand the successful adoption and operation of electronic markets. (Alt & Klein, 2011) and discussed different perspectives of electronic market, namely as economic environment, governance mode and business model.

E-marketplaces simplify complex business processes that generate efficiency gain whereby buyers and sellers meet at a single virtual space enabling participants to benefit from economies of scales and liquidity (Rossignoli & Ricciardi, 2015). It levels the barriers allowing even small businesses and retailers to do buying and selling efficiently with less cost. In a centralized e-marketplace, various market providers acting as intermediary between buyers and sellers will help reducing dependencies in value chains.

E-marketplaces can be categorized into four types, namely buy-side, sell-side, third party exchanges and vertical or horizontal marketplace. In the buy-side, there is one buyer and many sellers. An example of a buy-side e-marketplace is an organization that develops an e-procurement system to fulfill the buying and procurement needs of the organization from various registered suppliers. A sell-side marketplace on the other hand is a platform for an organization to sell its products and services to other organizations a portal or a private e-catalogue or via connecting its e-catalogue to other bigger e-marketplaces. In the sell-side, there is one seller and many buyers. A third party e-marketplace is usually comprised of a consortium

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