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Analysis the Application of E-business for the Tourism Enterprises' Performance Evaluation in China

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Abstract

Today the internet provides, at modest cost, an unprecedented level of connectivity and the ability to communicate efficiently and effectively directly with customers. The emergence of the internet has led to the rapid growth of e-business, and this had an effect on the business of the tourism enterprises. One of the crucial issues in the e-business is to provide an appropriate level of quality of tourism service. E-business service providers strive to provide quality-based services by investing significant amount of money and resources in the e-business technologies such as web design, user interfaces, advertisement, security and reliability, and web server performance. In this paper the research focuses on the performance of e-business for the application to the tourism enterprises. As is known to all, performance of the tourism enterprises plays a key role in the provision of quality-based services. A number of solutions have been proposed to improve the performance of e-business services for tourism consumers to purchase the tourism product and tourism service.

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Keywords: E-business; performance; tourism enterprises; China

1. Introduction

The tourism industry is regarded as one of the largest sectors in the world which has generated an estimated 11% of the global gross domestic product (GDP) and employed 200 million people and serving 700 million tourists worldwide – a figure which is expected to double by the year 2020.The Internet can be applied to promoting tourism products and services for the tourism enterprises as it provides, at modest cost, an unprecedented level of connectivity and the ability to communicate efficiently and effectively directly with tourism customers. The Internet's capacity to access, organize and communicate information

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in a more efficient way provides new formulas for the relationship between tourism consumers and tourism enterprises leading to the emergence of new types of economic agents and new business models. Some researchers believed the development of e-business offers great opportunities for both tourism consumers and tourism enterprises, but it also presents important challenges for organizations, demanding an in-depth review of marketing strategies and consumer knowledge. In particular, since the Internet constitutes a new way of shopping proposed by Vijayasarathy and Jones (2000), we especially aim at analyzing the effects of individual innovativeness on acceptance of tourism e-business.

Tourism is often viewed as the availability of a clean e-business without the security issues as the industry. These include for example web server clustering (Menasce, 2002), caching strategies (Meer, 2004), and scheduling mechanisms (McWherter, 2004). This paper investigates the scheduling mechanisms of e-business of tourism enterprises and proposes a class-based priority scheme, which classifies e-business requests into high and low priority requests of tourism consumers. Such classification is driven by the fact that some requests are considered more important than others. However, the number of low priority requests is significantly higher than higher priority requests. Existing research shows that the percentage of tourism customers who buy items is significantly lower than those who usually browse or search the web for information such as finding air fares or ticket prices. The number of tourism customers who buy items from the internet is reported to be 15%. A large number of searches and browses of requests have performance consequences for e-business of tourism enterprises. One way to resolve this problem is to assign distinct priorities to different classes of e-business of tourism enterprises. When both high and low priority requests compete for resources, high priority requests should be given preferential treatment over low-priority requests. It is believed that by assigning class-based priorities at multiple service levels, e-business web servers can perform better and can improve the performance of high priority requests without causing adverse effects on low priority effects.

2. Reviews

In e-business of tourism enterprises, tourism consumers interact with e-business web servers through a series of requests in order to acquire required information or buy products, which have been developed in order to improve the performance of web servers. Though the theory of Meer (2004) for improving web server performance our review is targeted at scheduling mechanisms as these are closely related to the work presented in this paper. Elnikety(2004) aimed to improve the performance of e-business applications. This work proposes a method for admission control and request scheduling for multi-tiered e-business applications. This method differentiates between the different types of requests and devises a preferential scheduling policy in order to assign different priorities to different requests. E-business of tourism enterprises is developed that enables admission control and implements the preferential scheduling policy. The preferential scheduling is based on the shortest job first (SJF) policy. However, such a policy may fail to improve the response time if E-business requests are homogeneous, that is, requiring the same service time. Harchol-Blater(2003) employ a preemptive version of SJF scheduling, called shortest remaining processing time (SRPT) first policy. SRPT is used to improve the performance of web servers. However, this work considers static web pages such that priority is given to requests for small files or requests with shortest remaining file size. McWherter(2004) propose a priority mechanism for transactions in classical database systems. This work presents a detailed analysis of the resource utilization by transactions of tourism product and tourism service in a database system. It also improves the performance of high priority transactions of tourism product and tourism service in classical database system. Kamra(2004) propose a control-theoretic approach for multi-tiered web applications. It aims to prevent overload and to ensure high throughput and to maintain absolute response time. The proposed approach is implemented as a proxy system which is claimed to be non-invasive and which avoids

frequent operator intervention.

However, using the past information stored in the log files describes the tourism customers' profiles, which is constructed even if a tourism customer visiting a web site does not buy items. Another alternative is to use registration information to classify tourism customers into occasional buyers. That is, registered tourism users are more likely to buy as compared to non-registered users who are less likely to buy. It is unrealistic to assume that registered users will buy items each time they visit an E-business web site. Zhou (2004) proposed a two-dimensional (2D) service for classifying on-line transactions into inter-session and intra-session transactions. The former provide differentiated QoS to the sessions according to customer classes, while the latter provide differentiated QoS according to states of a particular session. Singhmar(2004) propose an LIFO-Pri priority scheduling scheme in order to give service priority to revenue generating (such as payment) requests over the browsing requests. This scheme is based on a large number of queues which are extremely difficult to manage. The proposed scheme works by moving revenue generating requests from one queue to another queue based on its current state during its processing. This requires that requests are tracked throughout their entire execution. It may be manageable for small numbers of requests but will show performance degradation for larger numbers. Awan and Younas (2004) employ active network priority scheduling mechanisms in order to improve the performance of transaction commit protocols in Web-database applications. These approaches give preferential treatment to the processing of decision messages over data related messages. This paper will apply the theories mentioned above to find approaches to improving the performance of high priority tourism enterprises with the application of e-business.

3. Methodology

3.1 Scheme

The π-calculus was used to specify the scheme, by which the motivation for constructing a formal specification was to allow us to rapidly investigate a number of alternative schemes of e-business applied to the tourism enterprises, and to act as a framework for the implementation. The π-calculus was chosen because of its support for mobility (to be addressed in future work). In order to collect experimental results of the performance of the scheme of e-business applied to the tourism enterprises, it was necessary to specify a client component. The behavior of the client is independent of the protocol used to process its queries, and is simple: it sends a number of browse and revenue generating queries to a server, waiting for a response to each query before sending the next. After all n queries have been processed the client terminates. The client sends its response action as a parameter so it can receive a reply from the server once the query has been processed. The specification shows the client making a non-deterministic choice between browse and buy queries; this is appropriate since the purpose of this specification is to describe how the components may interact, not why a particular action occurs.

Before it can be shown that the proposed scheme improves on existing practice, it is necessary to provide a point of comparison. This is done by examining the performance of a simple server which serves requests in a strictly FIFO order, regardless of their priority. The server is made up of a buffer component and a processor component. The processor receives queries from the buffer, processes them, and responds to the appropriate client. The buffer maintains a sequence of the queries in the order they arrive. If the buffer is full (i.e. has m elements in it) when a new query arrives, then the new query is dropped. A sequence is an ordered collection of items enclosed in square brackets. The specification of the proposed scheme requires a new component whose purpose is to direct incoming queries to the correct buffer. A population of clients and a single server are composed together, connected by a single action service used to request a service from the server. As described above, either definition of the

Server component could be used in this composition, allowing for a true comparison of the performance of the two schemes.

3.2 Implementation

An implementation of the π-calculus specification was constructed following the techniques, with those aspects of the behavior that were abstracted from in the specification being fully defined. It was chosen as the implementation language for pragmatic reasons, and an implementation in Java is also being constructed. The client was the only contrived part of the implementation; the other components described below could be used without modification in a production version of the protocol. The non-deterministic choice in the specification was transformed into a probabilistic choice, with 85% of queries of e-business applied to the tourism enterprises being browse requests of e-business applied to the tourism enterprises. It was decided that a client would terminate after generating 500 requests of e-business applied to the tourism enterprises. Performance results were obtained with populations of up to 50 identical clients running concurrently. The client was augmented to include calls to a reporting object when its queries were processed or rejected. The specification of this component is conveniently translated because it allows nesting of tasks (active processes) within other tasks, allowing the processor and buffer components to be translated as tasks without them being visible to the clients. A thread-safe bounded buffer component was used to implement the sequence from the specification; given the relatively small population of clients, the size of the buffer was fixed at 20 queries of e-business applied to the tourism enterprises.

As above, the ability to nest tasks within tasks made the implementation of this component convenient, and the buffer task from the previous section was re-used in defining the separate browse and buy buffers. The capacity of these buffers was set to eight each, ensuring the total amount of buffering was the same as above.

The first results compare the throughputs achieved with both schemes to ensure that the priority scheme of e-business applied to the tourism enterprises did not introduce excessive processing overheads. As expected, the throughput reaches a maximum when the arrival rate ensures that the processor is fully utilized of e-business applied to the tourism enterprises. There is no significant difference in the results obtained from both schemes, indicating that the priority scheme does not add an extra computational burden. Note that the tourism users' arrival rates were varied by increasing the number of clients generating queries.

Since browse and purchase queries are not separated, it is no surprise that their response times are the same. As expected, the response time is related to the length of the buffer. Note the sharp increase in response time that occurred when the processor is fully utilized and the buffer starts to fill. After this point the rate of increase of response time slows, which is explained by the increasing number of requests dropped by the scheme because the buffer is full, queries are not dropped until the processor is fully utilized. The difference in the slopes of the lines is explained by the difference in the probabilities with which the different types of queries are generated.

3.3 Performance evaluation

The first results compare the throughputs achieved with both schemes to ensure that the priority scheme of e-business applied to the tourism enterprises did not introduce excessive processing overheads. As expected, the throughput reaches a maximum when the arrival rate ensures that the processor is fully utilized of e-business applied to the tourism enterprises. There is no significant difference in the results obtained from both schemes, indicating that the priority scheme does not add an extra computational

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The results of response times for queries for the priority scheme show an enormous improvement for purchase queries of e-business applied to the tourism enterprises, though this is at the expense of browse queries. In particular, the rate of increase for browse queries does not tail off as it does in the simple scheme; this is to be expected because of the priority given to purchase queries of e-business applied to the tourism enterprises. It is shown that no purchase queries of e-business applied to the tourism enterprises are dropped under the conditions of the experiment, but that the total number of queries dropped is consistent between both schemes. The fact that browse queries start to be dropped a little earlier is due to buffer sizes being small and the processor being occupied largely with purchase queries.

In order to analyze the efficiency of the model proposed so as to explain the impact of innovativeness on the adoption of online shopping for tourism e-business users. A Confirmatory Factor Analysis (CFA) by the maximum likelihood estimation method was carried out in order to analyze the efficiency of the proposed model. Such methodology allows the psychometric properties of the scales used in the study to be contrasted, especially regarding reliability, as well as convergent and discriminatory validity. A first analysis highlighted the need to eliminate one of the items from the scale proposed for the measurement of innovativeness of tourism enterprises' management within the framework of new technology. A system of structural equations is considered for estimation of the acceptance model of the online shopping for tourism product or service. A first assessment of the structural model shows that the perceived control does not significantly affect the online shopping intention. As a result, a re-specification of the structural model must be performed according to these results, thus eliminating the corresponding relationships. Adjusted goodness of fit indexes shows an appropriate specification of the new model, with statistics values being higher than the minimum referent value or very close to them in all cases.

4. Conclusions

The formal specification of the scheme of e-business applied to the tourism enterprises allowed us to consider alternative approaches and refine the one chosen, as well as providing a framework for the implementation, increasing our confidence that we correctly implemented the scheme we designed. The experimental results show a marked improvement of the performance of high priority queries of e-business applied to the tourism enterprises, though low priority queries experience reduced performance including rejected requests. Thus, in the context of our assumptions about the behavior of clients, the priority scheme meets the aims. It is also easily extensible: further priority levels can be defined simply by including extra buffer components to sort queries appropriately. Additionally the scheme can accommodate multiple web servers since the buffers can be accessed by n servers as easily as by one.

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