A Neural Network-Based Agent Framework for Mail Server Management

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ABSTRACT

Amidst the era of e-economy, one of the difficulties from the standpoint of the information systems manager is, among others, the forecast of memory needs for the organization. In particular, the manager is often confronted with maintaining a certain threshold amount of memory for a prolonged period of time. However, this constraint requires more than technical and managerial resolutions, encompassing knowledge management for the group, eliciting tacit knowledge from the end users, and pattern and time series analyses of utilization for various applications. This paper proposes a framework for building an automated intelligent agent for memory management under the client-server architecture. The emphasis is on collecting the needs of the organization and acquiring the application usage patterns for each client involved in real time. Due to the dynamic nature of the tasks, incorporation of a neural network architecture with tacit knowledge base is suggested. Considerations for future work associated with technical matters comprising platform independence, portability, and modularity are discussed.

Keywords: automata; automatic intelligent agent; computer-supported collaboration work; human-computer interaction; information resource management; knowledge base; knowledge management; memory management; neural networks; tacit knowledge

INTRODUCTION

Integrated information systems for distributed organizations comprising the information technology (IT) infrastructure and generic business applications, such as enterprise systems (ES), supply chain management (SCM), customer relationship management (CRM), and knowledge management system (KMS), are by far one of the vital assets to sustain the competitive edge in e-economy. At the same
time, however, administrators of these information systems often are confounded with a vast array of management problems, which, in large, may be classified into the following:

- Selection and upgrades of hardware platform, middleware, and applications combination;
- Information resource management;
- Integration of applications; and
- Security management.

This paper discusses problems associated with information resource management (IRM) and suggests a development framework for reconfiguring the server as well as clients for moderately large-scale information systems.

Among others, one of the difficulties concerning IRM from the standpoint of the information systems manager is the correct forecast of overall memory needs for the organization. In particular, the manager often is confronted with maintaining a certain threshold amount of memory for a prolonged period of time. One may argue that the cost of memory is declining rapidly, and its management may not be a factor affecting IRM. Contrary to this common misbelief, however, a number of authors suggest that there should be a certain threshold for memory management (Applen, 2002; Kanawati & Malek, 2002; Kankanhalli et al., 2003; Lansdale, 1988; Mathe & Chen, 1998; Pinelle & Gutwin, 2002; Pinelle et al., 2003; Roos et al., 2003) within a prescribed time window, analogous to budgetary considerations. In essence, memory management affects overall performance for both client-server
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