An Agent Based Distributed Workflow–oriented Auditing Architecture:
A Solution to Securing Inter–banking E–trading Transactions

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Abstract

A large number of fraud events committed by authorized insiders within banking institutions have caused great financial losses and damage to reputation and business continuity concerns. Some well-known examples of such fraud cases are the Barings Bank, Daiwa Bank, Sumitomo Bank, Allied Irish Bank, and more recently Société Généralé. All these cases have been caused by authorized insiders, i.e. bank employees, through malicious manipulation of transactional records, falsification of accounting reports, and influence of other employees. All these cases point to the fact that current auditing procedures have failed to detect unauthorized financial transactions performed by authorized insiders before they actually take place. This research has been conducted to identify the causes for this security threat and find an effective solution to secure banking transactions. The research findings have led to the proposal of a novel approach, i.e. a workflow oriented and agent based approach, to detect unauthorized financial transactions performed by authorized insiders. To study and evaluate the efficacy of this approach, two further novel contributions have been made. One is the concept and construction of Automated Banking Certificates (ABCs). The other is the idea of double authentication, i.e. in addition to user identification and authentication, a workflow oriented and agent-based transaction authentication service (TAS) is used to real-time authenticate a electronic transaction. A prototype of this approach has been constructed and evaluations using the prototype can demonstrate that inter-banking unauthorised financial transactions performed by authorised users can be detected promptly and successfully by the proposed workflow oriented security solution.