

# Determining technology trends and forecasts of RFID by a historical review and bibliometric analysis from 1991 to 2005

Chia-Chen Chao<sup>a</sup>, Jiann-Min Yang<sup>b,\*</sup>, Wen-Yuan Jen<sup>c</sup>

<sup>a</sup>Department of Management Information System, National ChenChi University, No. 64, Zhi-nan Sec. 2, Road, Wenshan, Taipei 116, Taiwan, ROC

<sup>b</sup>Department of Management Information System, National Chen Chih University, No. 64, Zhi-nan Road, Sec. 2, Wenshan, Taipei 116, Taiwan, ROC

<sup>c</sup>Department of Information Management, Overseas Chinese Institute of Technology, No. 100, Chiao-Kwang Road, Taichung, Taiwan, ROC

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## Abstract

Radio frequency identification (RFID) has been identified as one of the ten greatest contributory technologies of the 21st century. This technology has found a rapidly growing market, with global sales expected to top US \$7 billion by 2008. An increasing variety of enterprises are employing RFID to improve their efficiency of operations and to gain a competitive advantage. To shed light on RFID trends, and contributions, a historical review and bibliometric analysis are included in this research. The bibliometric analytical technique was used to examine this topic in SCI journals from 1991 through November of 2005. Also, a historical review method was used to analyze RFID innovation, adoption by organizations, and market diffusion. From the analysis of the study's findings, supply chain management (SCM), health industry, and privacy issues emerge as the major trends in RFID. Also, the contributions of the RFID industry and forecasts of technological trends were also analyzed, concluding that RFID will be more ubiquitously diffused and assimilated into our daily lives in the near future.

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## 1. Introduction

The advantage of radio frequency identification (RFID) tags is that they use a memory storage device to store a certain amount of data such as the product identification number, price, cost, manufacture date, location, and inventory on hand. This information can quickly be read by a wireless scanner, so RFID can process large volumes of multiple data sets at the same time and improve efficiency of operations by using identification tags to accurately monitor processes for time, place and person. This technology has been adopted by and diffused into a variety of enterprises to achieve cost-savings and increased efficiency. Many business enterprises and the health industry are applying the advantages of RFID to experimental projects to improve operational efficiency and to gain a competitive advantage (Bilge and Ozkarahan, 2004).

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Many information systems are old, do not meet existing demands, and will soon become obsolete. Therefore, technology is evolving on an almost daily basis and managers must continuously look for new ways to utilize resources (Kodama, 2005). Therefore, it is anticipated that it will become increasingly important for organizations to create new ways of thinking and job processing (Carayannisa and Coleman, 2005). Organizations are not only investing in knowledge capital and information technology (IT) to improve their operational weaknesses (Macpherson, 2005), but managers are also trying to resolve sequential operational crises. They are devoting resources and knowledge to reconfiguring and creating innovative new structures and systems in order to overcome the crises (Li, 2005), pursue more efficient operations (Munday et al., 2005), and gain an economic advantage (Szántó, 2005). Therefore, organizations are integrating learning and teamwork cohesion with innovative technologies to adapt to the changing needs of the business

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\*Corresponding author.

E-mail addresses: [vic@wanfang.gov.tw](mailto:vic@wanfang.gov.tw) (C.-C. Chao), [jmyang@mis.nccu.edu.tw](mailto:jmyang@mis.nccu.edu.tw) (J.-M. Yang), [denise@ocit.edu.tw](mailto:denise@ocit.edu.tw) (W.-Y. Jen).