Factors affecting radio frequency identification technology implementation: a comparative study of Australian and Chinese supply chains

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Abstract
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Keywords
supply, chains, identification, frequency, radio, affecting, factors, implementation, australian, comparative, study, chinese, technology

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Abstract
Radio Frequency Identification (RFID) technology has emerged as one of the most significant process innovations in supply chain contexts. It is a proven technology with the capability to increase accuracy, efficiency and speed of supply chain processes; reduce inventory and handling costs. The aim of this study is to investigate and compare enabling factors of RFID implementation in Australian and Chinese supply chains. Employing the analytic hierarchy process (AHP) approach this study suggests that managers in Chinese firms have a very different view concerning importance of factors for RFID implementation. Australians firms view technological factor-category as the most important priority, whereas Chinese firms view it as the least important category. Again, Australian firms view organizational factor-category as one of the least important priorities in terms of RFID implementation, whereas Chinese view it by far the most important. With respect to external environment category, there was no agreement – opinions varied widely. For Chinese managers this category of factor is quite important, whereas Australian managers view it as the least important priority. However, with respect to economic factor-category, views were generally in agreement, although levels of importance differed significantly. For effective implementation of RFID in their supply chains, managers in Australian and Chinese firms must take into account priorities associated with these factor-categories and individual factors. In particular, Chinese firm must buy-in top management support, and concentrate on hardware & software cost and tag cost, whereas, Australian firm must concentrate on standards, tag cost and implementation cost.

Keywords
Analytic Hierarchy Process (AHP), Australia, China, Enabling factors, Radio Frequency Identification (RFID) technology

INTRODUCTION
Radio Frequency Identification (RFID) technology which uses radio waves to identify, trace and track products is increasingly being used in supply chains (Sarac et al., 2010). However, application of this technology is not new. Initial applications of RFID include electronic road toll collection (Landt, 2001), railcars tracking and animal tracking (Dew, 2006; Jones et al., 2005). Dell’s assembly line workers build computers based on information provided by RFID tags attached to moving trays (Srivastava, 2004). Boeing Ltd utilises RFID by fastening RFID tags containing critical information to spare parts for maintenance purposes (Asif and Mandviwalla, 2004). Recent advances in RFID technologies, improvements in Internet technologies and lower costs of tags have generated an interest in RFID capabilities as an inter-organisational system. RFID supply
chain applications became popular only following the mandate from retail giant Wal-Mart in 2003 (Prater and Frazier, 2005).

Literature suggests that adoption of RFID technologies can increase accuracy, efficiency and speed of supply chain processes; reduce storage and handling costs (Li et al., 2006). Thonemann (2002) reports that by deploying RFID technologies Wal-Mart and Procter and Gamble reduced inventory by 70% and improved service levels from 96 per cent to 99 per cent. Hoffman (2007) reports that companies that have adopting RFID made significant improvement in key supply chain metrics such as cycle time, per cent on-time delivery, safety stock, changeover time and out-of-stocks. However, such gains are not without challenges such as development and implementation costs, complexity and compatibility of technologies and, privacy and security. The purpose of this study is two folds. First, to assess the criticality of RFID implementation factors in Australian and Chinese supply chains. Second, compare the importance of these factors in the Australian and Chinese supply chain contexts.

The remainder of the paper is organized as follows. First, we review the literature on RFID implementation in the following section and develop a conceptual framework. Next, we provide the research methodology, and background of sample organisations and respondents. Then we present and discuss our results. Lastly, we present our conclusions and limitations of this study.

**LITERATURE REVIEW**

Literature on RFID identifies a number of issues believed to be obstacles to RFID implementation. These include incompatible standards, a lack of infrastructure, and the failure to precisely calculate return on investment (ROI) (Wu et al., 2006). In addition, the factors such as technical limitations, cost constraints and organizational barriers have also deepen the reluctance of top levels of management to embrace RFID (Curtin et al., 2007).

Drawing on extant empirical RFID adoption literature, Brown and Russell (2007) establish the suitability of three categories of factors for analysing the implementation characteristics of RFID technology. These include technological, organisational, and external environmental challenges (Brown and Russell 2007). In addition, economic factors were considered as an important category (Shih et al., 2008). Therefore, our literature includes these four categories. These factor-categories and specific factors are discussed in the following sub-sections.

**Technology-related Factor Category**

Earlier literature identifies compatibility, and complexity, as challenges influencing the implementation of information technology (Tornatzky and Klein 1982). These challenges are acknowledged in the adoption process of both EDI (Premkumar et al., 1997) and e-business (Beatty et al., 2001). Davenport and Brooks (2004) describe uncertainties about the compatibility of RFID with other systems (including enterprise resource planning [ERP] systems) as a potential obstacle. RFID is a complex set of considerations, with different operating systems, hardware, languages, and architectural structures (Gessner, Volonino et al. 2007). These challenges are compounded by the fact that RFID networks require globally synchronised numbering, frequency and power standards. Research ranks standards as the number one challenge from a list of twelve issues shaping the future of RFID (Viehland and Wong, 2007). RFID requires several important standards to work effectively.

A summary of the technology-related factors is given in Table 1.

<table>
<thead>
<tr>
<th>Technological factor category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>Attaran 2007; Curtin et al. 2007; Tsai et al. 2010</td>
</tr>
<tr>
<td>Complexity</td>
<td>Loebbecke 2007; Park et al. 2009; Wamba 2011</td>
</tr>
<tr>
<td>Standards</td>
<td>Sweeney 2005; Twist 2005; Viehland &amp; Wong 2007</td>
</tr>
</tbody>
</table>

**Economic Factor Category**

Cost is another important issue regarding RFID adoption (Viehland and Wong, 2007). Tag cost, which range between USD$0.05-0.25 (Attaran, 2007), is one of the critical aspects of variable cost. Infrastructure costs also affect adoption intentions with one source estimating the cost of infrastructure as between USD$2-16 million (Chappell et al., 2003). Finally, training costs are often unknown and may at times be greater than the expenses...
on technology (Walker, 2004). These economic factors impact adversely on RFID adoption intentions when compared to the relatively cheap, established costs of barcode technology. A summary of the economic factors is given in Table 2.

Table 2. Economic-related Factors

<table>
<thead>
<tr>
<th>Economic factor-category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware and software cost</td>
<td>Asif &amp; Mandviwalla 2004; Brown &amp; Russell 2007; Smart et al. 2010; Walker 2004</td>
</tr>
<tr>
<td>Tag cost</td>
<td>Lee &amp; Lee 2010; Li et al. 2006; Reyes &amp; Jaska 2007</td>
</tr>
<tr>
<td>Implementation cost</td>
<td>Sarac et al. 2010; Veeramani et al. 2008</td>
</tr>
</tbody>
</table>

Organisational Factor Category

Two organisational factors that may influence the implementation of information technology are organisational size and top management support (Grover, 1993). Research suggests that RFID technologies are expensive and, hence, could be more applicable for larger organisations with the requisite resources (Lin and Ho, 2009). Equally, larger organisations must often choose between risky innovations to remain competitive. Top management commitment to IT initiatives is critical for the adoption of RFID technology (Ngai et al., 2005; Attaran, 2007). Technological readiness includes the critical abilities of being able to source IT skills and partnering with competent technology providers (Sharma et al., 2007). A summary of the organisational factors is given in Table 3.

Table 3. Organisational Factors

<table>
<thead>
<tr>
<th>Organisational challenge-category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management support</td>
<td>Attaran 2007; Wamba et al. 2010; Wang et al. 2012</td>
</tr>
<tr>
<td>Organisational size</td>
<td>Hamilton et al. 2009; Jones et al. 2005; Strüker &amp; Gille 2009</td>
</tr>
<tr>
<td>Organisational IT readiness</td>
<td>Angeles 2009; Kim &amp; Garrison 2010; Lee &amp; Shim 2007</td>
</tr>
</tbody>
</table>

External Environmental Factor Category

Studies suggest that a number of external environmental factors influence the RFID implementation. Firstly, industry pressure affects decisions to adopt RFID (Sharma et al., 2007). For example, Walmart’s mandate to install RFID systems (Reyes and Jaska, 2007), and suppliers’ awareness of the consequences of not complying (Murphy, 2003), resulted in the adoption of the technology. Secondly, security is a major factor in considerations of implementing RFID. Open systems raise serious concerns about corporate espionage, trust, inadvertent disclosure of information to competitors, and threats to infrastructure (Shih et al., 2005). Technology providers are continuously counteracting these issues in order to build confidence in the security of RFID (Backhouse, 2002). Finally, privacy is an issue with consumers concerned about unwanted access to information held on tagged products after they leave the store (Knospe and Pohl, 2004). Benetton, a major international clothing producer, abandoned tagging plans due to consumer boycott actions (Atkinson, 2004). A summary of the external environmental factors is given in Table 4.

Table 4. External environmental factors

<table>
<thead>
<tr>
<th>External environmental factor category</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry forces</td>
<td>Boeck &amp; Wamba 2008; Hingley et al. 2007; Loebecke &amp; Reyes 2007; Sullivan 2004</td>
</tr>
<tr>
<td>Security</td>
<td>Alomaur &amp; Poovendran 2010; Langheinrich 2009; Pietro &amp; Molva 2011; Spiekermann 2009; Weber 2010</td>
</tr>
<tr>
<td>Privacy</td>
<td>Alomaur &amp; Poovendran 2010; Angeles 2007; Langheinrich 2009; Spiekermann 2009; Weber 2010</td>
</tr>
</tbody>
</table>
The issues and challenges foregrounded above inform our conceptualisation of factor categories in our work on industry intentions to implement RFID. The enabling factors of RFID implementation and the structure of the problem are shown in Figure 1.

RESEARCH METHODOLOGY

Method of Analysis – Analytic Hierarchy Process

This study employs the analytic hierarchy process (AHP) method for analysis. AHP is a decision-making approach which integrates simultaneously qualitative and quantitative information for prioritizing alternatives when multiple criteria must be considered. Over the last twenty-five years AHP has been widely used to solve decision problems in areas such as supply chain risks assessment (Schoenherr et al. 2008), 3PL selection (Gol and Catay, 2007); supplier selection (Wang et al. 2004). To understand the nature of the AHP applications surveys were conducted in the past (Vaidya and Kumar, 2006; Steuer and Na, 2003; Ho, 2008). Steuer and Na (2003) review the literature of the applications of AHP in the finance area, whereas, Vaidya and Kumar (2006) explore the use of AHP in areas such as education, engineering, government and sports. Ho (2008) reviews the literature of the applications of the integrated AHPs published between 1997 and 2006. More recently, Rahman et al. (2011) investigate the applications of multi-criteria decision making technique AHP and its variants such as fuzzy AHP and ANP in logistics research. With AHP complex decision problems can be decomposed into a set of manageable decision-making problems. Besides providing the consistency in managers' judgement, the main benefit of AHP in relation to other methods, such as obtaining managers preferences through Likert scales, is the fact it is in line with the basic idea of the trade-off concept (Skinner, 1969). It forces managers to make explicit comparisons between priorities. This results in relative importance weights for each priority challenges. Moreover, the AHP analysis not only illuminates the ranking of the priorities, but also assesses how much more/less important a given priority is.

**Figure 1: Structure of the AHP model**

The modeling process of AHP involves four steps:
1. assessment of the key factors of RFID implementation,
2. structuring the problem as a hierarchy and building the AHP model,
3. collection and compilation of experts’ opinions and application of the prioritisation procedure, and
4. determination of critical factors through the synthesis of normalized priority weights and checking the consistency of opinions of respondents.

Step 1: Identification of key factors. The first step involves identification of key factors of RFID implementation. A total of thirteen challenges were identified and classified into four factor-categories (see Figure 1). These

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factors are used for analysis and to identify critical factors of RFID implementation in Chinese and Australian supply chains.

Step 2: **Structuring the problem as a hierarchy.** The structuring step consists of breaking down any complex multiple criteria decision-making problem into a series of hierarchies or set of integrated levels.

Step 3: **The next step is the application of the prioritization procedure** to determine the relative importance of criteria (factor-categories and factors) in each level. Criteria in each level are compared pair-wise in terms of their importance to a criterion in the next higher level. Starting at the top of the hierarchy and working down, a number of preference (square) matrices are generated in the process of comparing criteria at a given level. A generic matrix is as follows:

\[
A = \begin{bmatrix}
\frac{w_1}{w_1} & \frac{w_1}{w_2} & \cdots & \frac{w_1}{w_n} \\
\frac{w_2}{w_1} & \frac{w_2}{w_2} & \cdots & \frac{w_2}{w_n} \\
\vdots & \vdots & \ddots & \vdots \\
\frac{w_n}{w_1} & \frac{w_n}{w_2} & \cdots & \frac{w_n}{w_n}
\end{bmatrix}
\]  

(1)

where rows indicate ratios of weights of each factor with respect to all other factors. The scale used for pair-wise comparisons in AHP is called a one-to-nine scale. For a set of \( n \) factors in a matrix, \( (n^2 - n)/2 \) judgments are needed because there are 1’s on the diagonal (comparing factors with themselves) and the remaining judgments are reciprocals (\( a_{ij} = 1/a_{ji} \)).

Step 4: **The fourth and final step of AHP is the determination and synthesis of normalized weights.** The normalized weights can be determined using either the eigenvector method or the simple row average method. The preference matrices generated in step three are translated into largest eigenvalue problems and solved to find unique and normalized vectors of weight to factors in each level of hierarchy. When matrix \( A \) (Eq. 1) is multiplied by the transpose of the vector of weights \( w \), we get the resulting vector in \( nw \),

\[
Aw = nw,
\]

(2)

where \( w = (w_1; w_2; \ldots; w_n)^T \) and \( n \) is the number of rows or columns. Further, Eq. (2) could be rewritten as:

\[
(A - nI)w = 0,
\]

(3)

where \( n \) is also the largest eigenvalue, \( \lambda_{\text{max}} \), or trace of matrix \( A \) and \( I \) is the identity matrix of size \( n \). For a further mathematical discussion of this method, see Saaty and Vargas (1982). The overall weights of the decision alternatives are determined by aggregating the weights throughout the hierarchy. This is done by following a path from the top of the hierarchy to each alternative at the lowest level and multiplying the weights along each segment of the path and the best alternative is chosen for the decision purpose.

AHP offers not only a methodology to rank alternative courses of action but also provides a direct measure of consistency of judgment elicited by the decision makers. Saaty (1977) demonstrated that \( \lambda_{\text{max}} = n \) is a necessary and sufficient condition for consistency. Inconsistency may arise when \( \lambda_{\text{max}} \) deviates from \( n \) due to inconsistent responses in pair-wise comparisons. Therefore, the matrix \( A \) should be tested for consistency using the formula:

\[
CI = (\lambda_{\text{max}} - n)/(n - 1)
\]

(4)

\[
CR = CI/RI
\]

(5)

where \( CI \) is the consistency index, \( RI \) is random index generated for a random matrix of order \( n \), and \( CR \) is the inconsistency ratio. The \( CR \) refers to the degree to which decision-makers adhere to the rank order specified and measures the extent to which an established preference is kept. A \( CR \leq 0.1 \) is recommended as acceptable (Saaty and Kearns, 1985). If \( CR > 0.1 \), it is suggested that the decision-makers reevaluate their judgments. Homogeneity of factors within each group, smaller number of factors in the group, and better understanding of the decision problem would improve the consistency index (Saaty, 1993).

**Sample Firms and Respondents**

A two-part questionnaire was employed for data collection. Part A contained questions (in AHP format) designed to capture experts’ (decision-makers) opinions on the relative importance of factors, whereas, Part B contained general questions about the company and experts’ background. First the questionnaire was designed in English and then was translated in Mandarin by one of the authors for use in China. Before the primary study was implemented, the questionnaire was pre-tested by two senior logistics managers (one from China, in Shanghai region and one from Australia, state of Victoria). The readability and understandability of the instrument was subsequently improved based on the comments and suggestions from these respondents.
The critical case sampling method was used to identify the cases for this study. Critical case sampling is a type of purposive sampling (Neuman, 1991) that looks for cases that are ‘particularly information rich’ in relationship to the questions under consideration (Yin, 2003). The following guidelines were used to select the sample companies and respondents for interviews:

- companies who intent to implement RFID in their supply chains, and,
- respondents who have experience with barcode technology and have some exposure to RFID implementation.

All respondents were assured that their answers would be kept confidential. Neither the Australian nor the Chinese managers were familiar with the AHP data collection procedure. Therefore, the following two steps were considered:

- respondents were explained the meaning of the integer scores of the 1-9 scale used for data collection.
- respondents were explained how these scores need to be considered while making the pairwise comparisons between any two factors.

These two steps were critical to ascertain the accuracy of data.

Chinese Firms

Six firms in China were chosen for this study. These are large firm with employees ranging between 300 and over 2500. Six senior managers were chosen from these companies (one from each company) who have experiences in both bar code and RFID technologies. All six interviews were conducted face-to-face by one of the authors using the mandarin version of the questionnaire and each interview lasted approximately 45 minutes. All managers have working experience with both barcode and some experience with RFID technologies, hence they were in a position to make judgments on the factors that would impact adoption of RFID. Interviewee answers were recorded using the AHP matrix. A summary of the companies and respondents is given in Table 5.

<table>
<thead>
<tr>
<th>Firm</th>
<th>No. of Employee</th>
<th>Job title of respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>&gt; 2500</td>
<td>Deputy General Manager</td>
</tr>
<tr>
<td>BB</td>
<td>300-500</td>
<td>Senior IT Manager</td>
</tr>
<tr>
<td>CC</td>
<td>1001-1500</td>
<td>Managing Director</td>
</tr>
<tr>
<td>DD</td>
<td>1001-1500</td>
<td>General Manager</td>
</tr>
<tr>
<td>EE</td>
<td>1001-1500</td>
<td>IT Manager</td>
</tr>
<tr>
<td>FF</td>
<td>501 - 1000</td>
<td>General manager</td>
</tr>
</tbody>
</table>

Table 6. Characteristics of Firms and Respondents in Australia

<table>
<thead>
<tr>
<th>Firm</th>
<th>No. of Employee</th>
<th>Job title of respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td>XA</td>
<td>&gt; 500</td>
<td>Supply Chain Manager</td>
</tr>
<tr>
<td>XB</td>
<td>&gt; 500</td>
<td>IT Manager</td>
</tr>
<tr>
<td>XC</td>
<td>20 - 200</td>
<td>Logistics Manager</td>
</tr>
<tr>
<td>XD</td>
<td>&gt; 500</td>
<td>Distribution Manager</td>
</tr>
<tr>
<td>XE</td>
<td>&lt; 20</td>
<td>Manufacturing Manager</td>
</tr>
<tr>
<td>XF</td>
<td>20 - 200</td>
<td>Manufacturing Manager</td>
</tr>
<tr>
<td>XG</td>
<td>&gt; 500</td>
<td>E-business Manager</td>
</tr>
<tr>
<td>XH</td>
<td>20–200</td>
<td>Technical Manager</td>
</tr>
<tr>
<td>XI</td>
<td>20–200</td>
<td>Technical Manager</td>
</tr>
<tr>
<td>XJ</td>
<td>20–200</td>
<td>Business Development Manager</td>
</tr>
<tr>
<td>XK</td>
<td>&lt; 20</td>
<td>Business Development Manager</td>
</tr>
<tr>
<td>XL</td>
<td>20 - 200</td>
<td>Business Development Manager</td>
</tr>
</tbody>
</table>

Australian Firms

To assess the criticality of factors affecting RFID implementation in Australia twelve firms were chosen. The size of the firms ranged from quite small, with 20 or fewer employees, to larger organisations represented by
more than 500 staff. From these firms twelve senior managers were identified to conduct face-to-face interviews and each interview lasted approximately 45 minutes. Managers who participated in the study were assured that all details of their organisations would remain strictly confidential, in line with ethics approval. All managers have working experience with both barcode and some experience with RFID technologies, hence like managers in the Chinese firms, they were also in a position to make judgments on factors that would impact implementation of RFID. Interviewee answers were recorded using the AHP matrix. A summary of the companies and respondents is given in Table 6.

RESULTS AND DISCUSSION

In order to determine the priority weight of each factor-category and each factor, judgment matrices, based on managers’ interviews, were translated into the largest eigenvalue problems, and then calculated the normalized and unique priority vectors of weights by using the Expert Choice® Software. The overall inconsistency index of judgments was then calculated for performance measures and critical challenges. This was done taking all responses together using geometric means of six responses for Chinese firms and twelve responses for Australian firms.

Numerical analysis was conducted in two stages: (1) determination of weights of each higher level factor-category; (2) determination of weights of each factor under each higher level factor-category. Hence, the outcome of the first stage would identify the degree of importance for each factor-category as a percentage of total importance over all measures in RFID implementation considered. Based on the outcome of this evaluation, factors contributing to each higher level factor category in RFID implementation could be prioritised, so that firms adopting RFID can choose the appropriate levels of those factors in their implementation projects.

Figure 2 shows that the main factor-category in adopting RFID in China is related to organizational challenges, with an overall weight of 0.292. The second most important factor-category is economic (weight = 0.276), the third is external environment (weight = 0.221), and the forth is technological factor (weight = 0.210). However, the range of weights is narrow, suggesting that each factor-category contributes significantly to the implementation of RFID.

The main factor-category in adopting RFID in Australia is the technological factor, with an overall weight of 0.4465. The second most important factor-category is economic (weight=0.4274), the third is organisationl (weight = 0.276), and the fourth is external environment (weight = 0.0394).

From Figure 2 it is clear that managers in Chinese firms have a very different view concerning importance of factors for RFID implementation. Australians firms view technological factor-category as the most important priority, whereas Chinese firms view it as the least important category. Again, Australian firms view organizational factor-category as one of the least important priorities in terms of RFID implementation, whereas Chinese view it by far the most important. With respect to external environment category, there was no agreement – opinions varied widely. For Chinese managers this category of factor is quite important, whereas Australian managers view it as the least important priority. However, with respect to economic factor-category, views were generally in agreement, although levels of importance differed significantly.
In the second stage of evaluation, weight priorities of RFID implementation factors on respective higher level factor-category and overall importance were considered. Figure 3 displays that the top five important factors in adopting RFID in Chinese firms are Top management support (weight = 0.141), Hardware & software cost (weight = 0.133), Tag cost (weight = 0.127), Industry force (weight = 0.107), Compatibility (weight = 0.101) and Implementation cost (0.068). The least three important factors found in the analysis are Firm size (weight = 0.030), Complexity (weight = 0.031), and Data volume (weight = 0.037).

For Australian firms the top six important factors are Standards (weight = 0.218), Tag cost (weight = 0.210), Implementation cost (weight = 0.103), Compatibility (weight =0.094), complexity (weight =0.077) and Security (weight = 0.072). Out of top six factors, three factors such as Tag cost, implementation cost and compatibility are common for firms from both countries.

Figure 5 encapsulates the differences (or similarity) in factor priorities as perceived by Chinese and Australian firms.
managers. It indicates that the managers are in agreement on five out of thirteen factors. These are compatibility, data volume, Firm size, IT readiness and security. These are also relatively low priority challenges for managers in both countries. Australian managers view standards as the top factor whereas Chinese managers view top management support as the most important factor. Concerning industry force, there is no agreement – opinions varied widely. The results provide insights to critical factors for RFID implementation in Chinese and Australian supply chains. The firms in Australia and China who would plan to implement RFID in their supply chains must take into account the relative importance of these enabling factors.

![Figure 5: Comparison of weight priorities of RFID implementation factors in Chinese and Australian firms](image)

**CONCLUSIONS**

RFID technology has emerged as one of the most significant process innovations in supply chain contexts. RFID promises to increase visibility in supply chains, to reduce labour and inventory costs and to improve supply chain coordination and product availability. However, literature has not yet comprehensively addressed the issue of successful implementation of RFID. The objective of this study was to compare RFID implementation factors between Australian and Chinese firms. Results demonstrate that managers in Chinese firms have a very different view concerning importance of factors for RFID implementation as compared to Australian managers. Australians firms view technological factor-category as the most important priority, whereas Chinese firms view it as the least important category. Again, Australian firms view organizational factor-category as one of the least important priorities, whereas Chinese view it by far the most important. However, with respect to economic factor-category, views were generally in agreement, although levels of importance differed significantly. It also demonstrates that indicates that the managers are in agreement on five out of thirteen factors. Concerning industry force, there is no agreement – opinions varied widely. The firms in Australia and China who would plan to implement RFID in their supply chains must take into account the relative importance of these enabling factors. Although the use of limited number of firms is adequate given the methodology employed, it is recommended to conduct empirical study using a large sample data set in the future.

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