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Intellectual structure of trust in business and management: a co-citation analysis

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Abstract

Purpose – In the past few decades, there has been a lot of literature about trust research for business and management. However, few authors have applied co-citation analysis.

Design/methodology/approach – Trust is one of the most discussed issues in management, as it has proved to have an essential role in business operations. In this study, all citation documents are included in Thomson Reuters ISI Web of Knowledge database from 1992 to 2010.

Findings – By using statistics analysis including factor analysis, cluster analysis and multidimensional scaling, researchers identified four domains, including organizational behaviour, strategic alliance, marketing and social capital. Directions for future research are discussed.

Originality/value – This study is the first to apply co-citation techniques in the fields of trust. Therefore, the major contribution of this study is to provide an intellectual structure and trends within the field of trust from an objective and quantitative perspective.

Keywords SSCI, Trust, Co-citation analysis, Business and management, ISI web of knowledge database

Paper type Literature review

Introduction

Trust is a fundamental factor and also the primary mechanism in many economic activities when establishing interpersonal cooperation (Bradach and Eccles, 1989). In business relationships, the extent of trust influence plays a crucial role that can lead to the achievement of success. For instance, mutual commitment in relationship, uncertainty in decision-making and the transaction cost all rely on trust (Zaheer *et al.*, 1998).

Practitioners often view trust as the most important factor for a business to be successful. Researchers also acknowledge that informal trust relationships can be widespread and important for businesses. Furthermore, in a highly dynamic and uncertain environment, trust can increase organizational and interpersonal efficiency (Gulati, 1995). As a solution for complex realities, trust is seen as a necessary antecedent for cooperation and leads to the constructive and cooperative behaviour vital for long-term relationships (Morgan and Hunt, 1994). Rousseau *et al.* (1998, p. 393) defined *trust* as “the willingness to assume that a partner will bear the vulnerability stemming from the acceptance of risk”. Even though trust has been seen as a critical element of



business administration, few studies have analysed the intellectual structure of trust in business and management. The current study identifies the intellectual structure of trust and seeks to understand the context of each subfield.

Bibliometrics is a mathematical and statistical analysis which detects homogeneous areas in research networks and assesses the movement and interactions within and between fields (Small, 1973; White and Griffith, 1981). One of the well-known structuring methods of bibliometrics is co-citation analysis (Ramos-Rodriguez and Ruiz-Navarro, 2004; Small, 1977).

This study conducts an experiment using data from Web of Science (WoS) (Thomson Reuters) to identify clusters of highly interactive documents on the subject of trust in the business and management domain. This paper analyses the coupling of trust document references cited in previous research works. The analysis of these references can be used to study the research fronts and explore their relationships with other citation measures. Researchers can identify relationships by using an actual example from the trust documents. The goals of this paper are in line with the co-citation method: identify the subfields within trust, graphically map the intellectual structure in a two-dimensional space [multidimensional scaling (MDS) map] and recognize the main trends within trust. To the best of the authors' knowledge, this study is the first to apply the co-citation technique in the field of trust. Therefore, the major contribution of this study is to provide an intellectual structure and trends within the field of trust from an objective and quantitative perspective.

Literature review

Co-citation analysis

In this study, the researchers identify the subfields characterized by the intellectual nature of specialties and the main trends within trust. Co-citation analysis provides an objective and quantitative means to meet these goals. Document co-citation analysis evaluates the network created when documents are linked according to their joint citations by subsequent documents (Acedo *et al.*, 2006a; Garfield, 1972; Small, 1973). This study adopts document co-citation because articles from research journals have gone through a critical review by fellow researchers, and this can enhance the reliability of results (Kuo and Yang, 2014).

A co-citation analysis study begins with the selection of the co-citation objects, together with approaches, which can be based upon either document co-citation or author co-citation (Acedo *et al.*, 2006a; Small, 1973; Small and Griffith, 1974). The document co-citation approach is based on the premise that the most valid and reliable indicator from a school of research, and its scientific assessment or method is its documents in organs or publications with peer-review procedures. It is possible to identify networks of documents belonging to the same discipline by analysing the references. More elaborately, frequently cited documents are likely to have a greater influence on the discipline than those less cited (Acedo and Casillas, 2005; Culnan, 1986; Small, 1973). If two documents are frequently jointly cited, then they are likely to share similar or related concepts (White and Griffith, 1981). By counting and analysing the frequency of two documents cited in the same research, one can identify groups of closely related documents which address the same research topics (Acedo *et al.*, 2006b; Upham and Small, 2010).

The notion of citation is fundamental to both the scholarly enterprise and hypertext networks where it provides the primary mechanism for connection and traversal of the information space. Citation analysis was developed in information science as a tool to identify core sets of articles, authors or journals of particular fields of study (Garfield, 1972; Ramos-Rodríguez and Ruíz-Navarro, 2004). In this study, the authors analysed the subject of trust in the management and business literature in the WoS database to discover the most relevant trust documents.

Co-citation analysis has been widely applied in many business and management studies. For instance, it has been used in organizational behaviour (Acedo *et al.*, 2006a; Üsdiken and Pasadeos, 1995), international management (Acedo and Casillas, 2005), strategic management (Acedo *et al.*, 2006b; Nerur *et al.*, 2008; Ramos-Rodríguez and Ruíz-Navarro, 2004; Ronda-Pupo and Guerras-Martin, 2012), accounting (Kuo and Yang, 2014), operation management (Pilkington and Meredith, 2009), marketing (Chabowski *et al.*, 2011), management information systems (Hsiao and Yang, 2011), knowledge management (Ma and Yu, 2010), operations research (Ho and Liu, 2013; Liu *et al.*, 2013), technology management (Ho *et al.*, 2014) and so on. Nevertheless, it is still hard to find similar studies in co-citation research for trust in the business and management literature. The researchers believe that this study can provide useful data for other research on this topic in this field.

Material and statistical analysis

Research material

The authors selected the documents (papers) cited in the WoS database and computed co-occurrence frequencies from the citing articles between pairs of topics. The selection of source documents making up the core data of a theory or discipline is a critical stage in the process. Documents were retrieved with the keyword “trust” during the period from 1992 to 2010. Selected documents focused on trust in business and management issues; thus, the documents in “Business Economics” subset were selected. This process produced a list of 6,532 documents. Documents with 200 or more citations were then isolated. As a result, the beginning 56 documents constituted the set of source documents. However, only seven documents of the 56 were published after 2000. This is a drawback of the citation frequency threshold, as it favours older papers over newer ones because the latter are unlikely to reach the threshold due to the publication date. Thus, the authors added papers published after 2000 by lowering the threshold to 160 citations. This different threshold method is adopted by other co-citation studies (Acedo *et al.*, 2006a). Authors then included four additional documents, two documents published in 2000 and two in 2002. In sum, 60 papers comprised the set of source documents (Table I). Figure 1 details the retrieval procedure.

Statistical analysis

All citations to the selected documents were imported into Microsoft Office Excel and subsequently processed using a Java program to calculate the co-occurrence frequencies. The authors performed various analyses on the co-citation matrix. The result was the basis of all analyses used in this study.

The Java program generates a lower triangular matrix. The number of each cell represents the co-occurrence frequencies. The matrix was then subjected to a factor analysis to extract latent structures from the pattern of document citations. The names

| No. | Author (year) |
|-----|----------------------------------|
| 1 | Morgan and Hunt (1994) |
| 2 | Mayer <i>et al.</i> (1995) |
| 3 | Gulati (1995) |
| 4 | Ganesan (1994) |
| 5 | Doney and Cannon (1997) |
| 6 | Ring and Van de Ven (1994) |
| 7 | McAllister (1995) |
| 8 | Rousseau <i>et al.</i> (1998) |
| 9 | Knack and Keefer (1997) |
| 10 | Ring and Van De Ven (1992) |
| 11 | Moorman <i>et al.</i> (1992) |
| 12 | Edmondson (1999) |
| 13 | Tsai and Ghoshal (1998) |
| 14 | Mohr and Spekman (1994) |
| 15 | Berg <i>et al.</i> (1995) |
| 16 | Larson (1992) |
| 17 | Gefen <i>et al.</i> (2003) |
| 18 | Zaheer <i>et al.</i> (1998) |
| 19 | Garbarino and Johnson (1999) |
| 20 | Das and Teng (1998) |
| 21 | Brynjolfsson and Smith (2000) |
| 22 | Bertrand <i>et al.</i> (2004) |
| 23 | Robinson (1996) |
| 24 | McKnight <i>et al.</i> (2003) |
| 25 | Moorman <i>et al.</i> (1993) |
| 26 | Williamson (1993) |
| 27 | Jarvenpaa and Leidner (1999) |
| 28 | Kosfeld <i>et al.</i> (2002) |
| 29 | Barney and Hansen (1994) |
| 30 | Kale <i>et al.</i> (2000) |
| 31 | Hosmer (1995) |
| 32 | Konovsky and Pugh (1994) |
| 33 | Cohen-Charash and Spector (2001) |
| 34 | Lewicki and Mcallister (1998) |
| 35 | Jones (1995) |
| 36 | McKnight <i>et al.</i> (2003) |
| 37 | Robinson and Rousseau (1994) |
| 38 | Kumar <i>et al.</i> (1995) |
| 39 | Cannon and Perreault (1999) |
| 40 | Peng and Heath (1996) |
| 41 | Butler (1991) |
| 42 | Sitkin and Roth (1993) |
| 43 | Zaheer and Venkatraman (1995) |
| 44 | Jones and George (1998) |
| 45 | Glaeser <i>et al.</i> (2000) |
| 46 | Ba and Pavlou (2002) |
| 47 | Poppo and Zenger (2002) |
| 48 | Korsgaard <i>et al.</i> (1995) |

*(continued)***Table I.**
Source documents

| EL | No. | Author (year) |
|-----------------|-----|----------------------------------|
| 34,3 | 49 | Gefen (2000) |
| | 50 | La Porta <i>et al.</i> (1997) |
| | 51 | McEvily and Zaheer (1999) |
| | 52 | Tax <i>et al.</i> (1998) |
| 362 | 53 | Sirdeshmukh <i>et al.</i> (2002) |
| | 54 | Northcraft <i>et al.</i> (2001) |
| | 55 | Leana and Van Buren (1999) |
| | 56 | Whitener <i>et al.</i> (1998) |
| | 57 | Reichheld and Schefter (2000) |
| | 58 | Handy (1995) |
| | 59 | Zeithaml <i>et al.</i> (2002) |
| Table I. | 60 | Lane <i>et al.</i> (2001) |

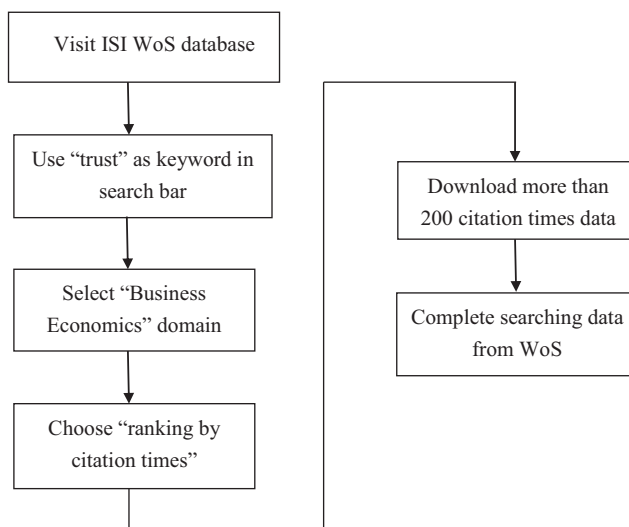


Figure 1.
Retrieval data
processes from WoS

of each factor were given by the documents after investigating the titles themselves. The raw co-citation matrix was entered into SPSS statistics software for further analyses, after being first converted into a correlation matrix.

Factor analysis is a collection of procedures for analysing the relations among a set of variables through the examination and description of the internal structure of the covariance and correlation matrices (Johnson and Wichern, 2002). Factor analysis has an underlying theoretical model which also seeks to study correlations among a number of interrelated variables and group them into a few highly descriptive factors. In this case, documents can contribute more than one factor and usually load most heavily on a single factor, with document loadings of 0.7 or greater as likely to be the most useful for interpretation (Hair *et al.*, 1998). SPSS is commonly used to determine the number of factors with the most explanatory power.

Cluster analysis is a convenient method for identifying homogenous groups of objects called clusters. Objects (also called cases or observations) in a specific cluster share many characteristics, but are very dissimilar to objects not belonging to that cluster. Whereas, an object in a certain cluster should be as similar as possible to all the other objects in the same cluster, it should likewise be as distinct as possible from objects in different clusters.

Hierarchical cluster analysis was performed using Ward's method of applying squared Euclidean Distance as the distance or similarity measure (Hair *et al.*, 1998). This helps to determine the optimum number of clusters that should be worked with. The next stage is to rerun the hierarchical cluster analysis with the selected number of clusters, which enables the researchers to allocate every case in the sample to a particular cluster. In the final step, the researchers interpret the solution by defining and labelling the obtained clusters. This can be done by examining the clustering variables' mean values or by identifying explanatory variables to profile the clusters.

MDS is a series of techniques that helps the analyst to identify key dimensions underlying evaluations of objects by respondents. MDS is based on the comparison of objects with any object being thought of as having both perceived and objective dimensions. MDS refers to a broad class of procedures that scale objects based on a reduced set of new variables derived from the original variables (Cox and Cox, 2010). Hence, MDS is specifically designed to graphically represent relationships between objects in multidimensional space. Objects are represented on a plot with the new variables as axes, and the relationship between the objects on the plot should represent their underlying dissimilarity (Kodama *et al.*, 2012; Porter *et al.*, 2010).

Results and discussion

Four factors were extracted from the data. The results of the factor analysis are summarized in Table II which shows the factor loadings for the documents in the four factors. The four factors were derived from those eigenvalues larger than one. Percentages of each component are listed below. The total variance equals 92.7 per cent. The rest of the documents were dropped because their eigenvalue was less than one. The result shows that the 60 documents can be classified into four groups.

Figure 2 provides a visualization of the semantic space derived from the 60 core documents. The interpretation for the analysis result is that trust in the business and

| Factors | Factor 1 Organizational behaviour | Factor 2 Strategic alliance | Factor 3 Marketing | Factor 4 Social capital |
|-------------------------------|------------------------------------------------------------|------------------------------------------------|------------------------------------------------|----------------------------|
| Source document numbers | 2, 7, 8, 12, 23, 24 | 3, 6, 10, 13, 14 | 1, 4, 5, 11, 17 | 9, 15, 22, 28, 45 |
| | 27, 31, 32, 33, 34, 35, 37, 41, 42, 44, 48, 50, 54, 55, 56 | 16, 18, 20, 26, 29, 30, 40, 43, 47, 51, 58, 60 | 19, 21, 25, 36, 38, 39, 46, 49, 52, 53, 57, 59 | |
| Eigenvalues | 22.983 | 16.938 | 12.914 | 2.791 |
| Percent of variance explained | 38.305 | 28.231 | 21.523 | 4.651 |

Note: Total variance explained: 92.71%

Table II.
Factor analysis results

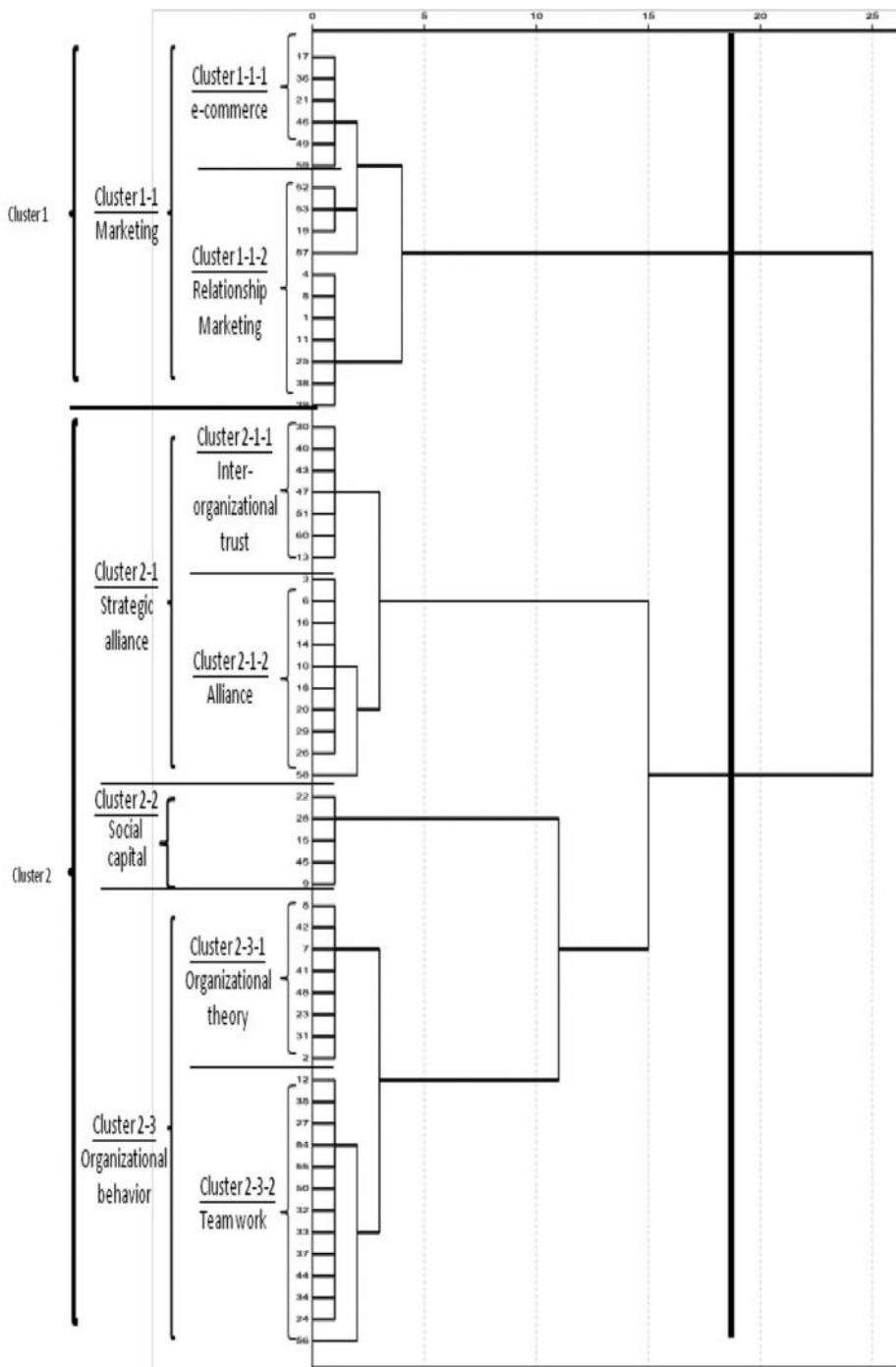


Figure 2.
Hierarchical cluster
analysis of trust

management literature is composed of four different subfields: organizational behaviour, strategic alliance, marketing and social capital. These four factors help to understand the intellectual structure of trust in the business and management domain (Figure 3).

Factor 1: organizational behaviour

The view of trust as a foundation for social order is mentioned in many intellectual disciplines and at multiple levels of analysis. Scholars have seen trust as an essential factor in a healthy well-being state, which is the foundation to build interpersonal relationships (McAllister, 1995). Trust is also viewed as a foundation for cooperation, and the basis for stability in social institutions and markets. Factor 1 consists of many topics, including interpersonal trust, citizenship, philosophical ethics, psychological contracts, commitment, attachment and procedural justice. The factor addresses a multidisciplinary view of trust in organizations. The viewpoint of trust in organizational behaviour can be observed from the importance to organizational effectiveness. In Factor 1, we have two sub-clusters to introduce: organizational theory and teamwork.

Organizational theory. Rousseau *et al.* (1998) introduced a special issue in the *Academy of Management Journal*, which included papers featuring several areas of trust including multilevel trust (individual, group, firm and institutional), trust within and between organizations, multidisciplinary trust, multiple causal roles of trust (trust as a cause, outcome and moderator), trust as impacted by organizational change and new, emerging forms of trust.

Calculus-based trust is based on rational choice – characteristics of interactions based upon economic exchange. In other words, this kind of trust is a low-level form of trust that results when someone carefully calculates that he/she has more to gain than to lose. The second form is deterrence-based trust. This kind of trust has the qualities of low distrust/low trust, and the most fragile relationships are contained in this form of trust. One violation or inconsistency can destroy the relationship. Relational trust is the

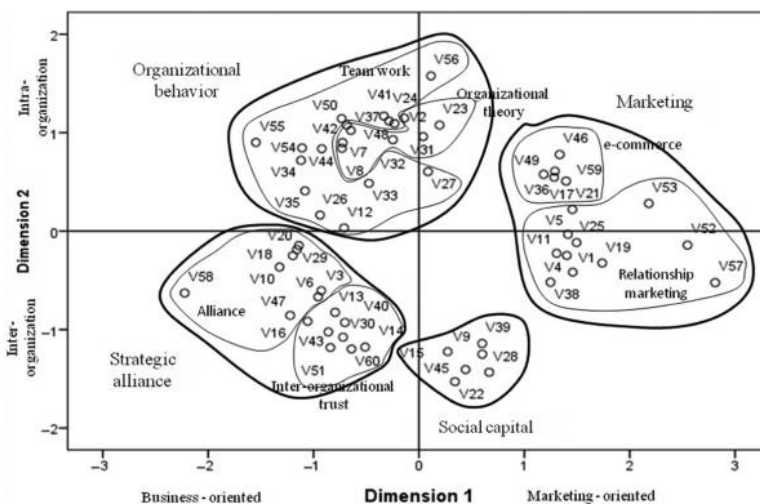


Figure 3.
MDS analysis of
trust

third form. Relational trust derives from repeated interactions over time between trustor and trustee. Information available to the trustor from within the relationship itself forms the basis of relational trust. Reliability and dependability in previous interactions with the trustor give rise to positive expectations about the trustee's intentions.

Teamwork. In the realm of organizational behaviour, results of many previous studies all demonstrated that trust could enhance teamwork, organize the collective goal of members in the network and strengthen cohesion (McAllister, 1995). Trust can inspire individual creativity, develop an initiative spirit and facilitate the appropriate shape of an organization, such as network relations. Modern organizational behaviour considers trust as very important in human relations within organizational effectiveness. For a global view of trust, creating and maintaining trust in a global virtual team is another issue in trust research (Jarvenpaa and Leidner, 1999). Members of the virtual team are often concerned about transcending time, space and culture. The results suggest that global virtual teams may experience a form of swift trust, but such trust appears to be very fragile and temporal, and describes communication behaviours that might facilitate trust in global virtual teams.

Factor 2: strategic alliance

The topics in Factor 2 are primarily about trust in an alliance, inter-organizational relationship, joint venture, buyer-supplier relationship, franchises, company consortia and various forms of network organizations. Business firms in many industries have been entering into a variety of inter-organizational relationships to conduct their business deals. Previously, these transactions were often performed through either discrete market transactions or internal hierarchical arrangements (Gulati, 1995). In Factor 2, there are two sub-clusters to introduce: inter-organizational trust and alliance.

Inter-organizational trust. Edmondson (1999) introduced a new concept for team trust. Team psychological safety is a shared belief held by members of a team to ensure that the team is safe for interpersonal risk-taking. Edmondson's model concentrated on the effects of team psychological safety and team efficacy together with learning and performance in organizational work teams. Kale *et al.* (2000) indicated that building relational capital and managing conflicts in an integrative manner are important to the success of alliances. Companies can benefit substantially by possessing a superior capability of managing these aspects of alliance management. Their findings also pointed out that the prior alliance knowledge of the firm is important to build or use appropriate routines and mechanisms to build relationship capital and manage conflict.

Alliance. Strategic alliance is an agreement between two or more parties to pursue a set of agreed upon objectives needed while still remaining independent organizations. Das and Teng (1998) pointed out that cooperation- and coordination-related successes are assumed to have separate effects on alliance outcomes. For instance, improved cooperation is assumed to lead to higher performance independent of coordination efforts and vice versa. In other words, trust has been argued as an important determinant of effective partner collaboration.

Factor 3: marketing

The core concept of this factor is marketing. The topics in this domain are mostly on buyer-seller relationships, customer relationships, customer evaluations, dealer attitudes, commercial friendships and brand trust. Evidence showed that trust will lead

to constructive and cooperative behaviour and can develop into a long-term relationship (Morgan and Hunt, 1994). Such relationships rely on relational forms of exchange characterized by high levels of trust. The high levels of trust enable parties to focus on the long-term benefits of the relationship, ultimately enhancing competitiveness and reducing transaction costs. Therefore, establishing, developing and maintaining successful relationships are very important and cannot do without trust. In Factor 3, there are two sub-clusters: relationship marketing and e-commerce.

Relationship marketing. Morgan and Hunt (1994) noted that relationship marketing establishes, develops and maintains successful relational exchanges. It also constitutes a major shift in marketing theory and practice. The authors also indicated that successful relationship marketing requires relationship commitment and trust. Ganesan (1994) indicated that long-term orientation in a buyer/seller relationship has two main factors: mutual dependence and the extent to which they trust one another. Dependence and trust are related to environmental uncertainty, transaction-specific investments, reputation and satisfaction in a buyer/seller relationship. Cannon and Perreault (1999) revealed six dimensions that characterize the manner in which buyers and sellers relate and conduct relationships. Their research measures for these relationship connectors include information exchange, operational linkages, legal bonds, cooperation and relationship-specific adaptations by buyers and sellers.

E-commerce. In e-commerce, e-loyalty, commitment, frictionless transaction, the Technology Acceptance Model and supply assurance and security are discussed. Studies suggest that buyers often hesitate to work with online vendors because of uncertainty about the vendor or the perceived risk of having personal information stolen by hackers (Gefen *et al.*, 2003; McKnight *et al.*, 2003). Hence, the most important reason for this uncertainty is lack of trust. Trust is a prerequisite of social behaviour, especially regarding important decisions. Trust plays a central role in helping consumers overcome perceptions of risk and insecurity. Trust makes consumers comfortably share personal information, make purchases and act on Web vendor advice – behaviours essential to widespread adoption of e-commerce (McKnight *et al.*, 2003). Both familiarity with an internet vendor and its processes and trust in the vendor influenced the respondents' intentions to complete the whole transaction.

Factor 4: social capital

Factor 4 is mostly about the relationship between social capital and economic performance. These papers include the relationship among interpersonal trust, norms of civic cooperation, economic performance and other links through which these dimensions of social capital may have. Studies view trust or social capital as a propensity for people in a society to cooperate to produce socially efficient outcomes and to avoid inefficient non-cooperative traps (Knack and Keefer, 1997).

Conclusion

In this study, co-citation analysis was applied to the topic of trust in the business and management literature. The findings provide academic professionals a different perspective that heretofore had not been discussed. The results help to identify the most productive and prominent documents on trust in the business and management field, the documents that are cited, the number of times they are co-cited with other documents and the documents that appear in similar subject areas.

This study introduced document co-citation analysis by using the WoS citation database, based on a custom co-citation matrix generation system. This study also used matrix and factor analysis, hierarchical cluster analysis and MDS results for further discussion. Based on factor analysis, the authors analysed the content for each factor. The most clarified factors are Factors 1, 2 and 3, which are organizational behaviour, strategic alliance and marketing, respectively. Factor 4 stands for social capital. These four factors show the main trends in trust in the business and economy field.

The managerial implication of this study is that trust clearly has a great influence in daily business and management activities. For instance, trust plays a critical role in supply relationship management. Inter-organizational trust provides a basic role for business operation. In organization management, trust is crucial for teamwork. Many studies have proved that trust can enhance teamwork and performance. Trust is also the fundamental role for customer relationship management. Trust is an important issue to maintain the long-term buyer and seller relationship. In the e-commerce environment, many buyers hesitate to transact with online sellers because of uncertainty about the sellers or the potential for personal information to be stolen by hackers. Hence, in cyberspace, trust is critical for e-commerce activities.

Trust occurs not just in business and management, but also in many other fields, such as psychology, sociology, economics, medicine, history, engineering sciences and more. For future study, it is suggested that scholars focus on e-commerce or m-commerce. Given the growth of the mobile environment, m-commerce will be a new lifestyle which will impact many people. Trust in m-commerce takes time to develop. A further study topic is determining how trust and a secure environment in m-commerce can be developed.

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