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An exploration of influencing factors**

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Actor-to-actor dissemination of electronic procurement (EP) adoption: an exploration of influencing factors

Marc R.B. Reunis^{a,*}, Erik M. van Raaij^b, Sicco C. Santema^{a,b}

^a*Delft University of Technology Faculty of Aerospace Engineering Aerospace Management & Organization (AMO)
P O Box 5058 2600 GB Delft The Netherlands*

^b*Eindhoven University of Technology Faculty of Technology Management P O Box 513 5600 MB Eindhoven The Netherlands*

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Abstract

The merits of electronic procurement (EP) tools have been widely acknowledged. Achieving these benefits remains a challenge, as companies are experiencing difficulties with human adoption during the implementation of such tools. In this article we focus on the intra-organizational spread of EP adoption from one actor to another. Based on exploratory interviews with experts and representatives of large Dutch purchasing organizations, we have identified nine categories of influences on actor-to-actor dissemination: perceived advantage, communication, demonstration, enforcement, training, involvement, risk reduction, reward, and disposition. This study is beneficial to companies engaging in the implementation of EP tools as it provides a portfolio of interventions that can be used to stimulate the spread of adoption. This article addresses a new area in EP research and opens up possibilities for future research in EP implementation.

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Keywords: Electronic procurement; Technology adoption; Technology dissemination

1. Introduction

In the past few years, electronic procurement (EP) has proliferated and has been applied in an ever-extending set of domains, including industry, health care, and government. More and more companies are making investments in EP tools, but with varying degrees of success.

In the literature, the benefits and applicability of EP tools in specific situations have been widely explored (e.g. Hartmann, 2002; Harink, 2003) and an extensive base of cases is available showing benefits, like increased efficiency and effectiveness in the purchasing process (Knudsen, 2002; De Boer et al., 2002; Subramaniam and Shaw, 2004). However, cases

showing the difficulties in achieving these benefits are also abundant. Apparently, choosing the 'right' tool is not enough to reap the potential benefits. Industry research shows that the biggest 'headache' during the implementation of EP tools are issues of change management and user adoption (Mitchell and Shaw, 2001). This conclusion is also recognized by various purchasing organizations (e.g. Institute of Supply Management) and academia (e.g. Orlikowsky and Baroudi, 1991; Willcocks and Smith, 1995; Osmonbekov et al., 2002; Hartmann, 2002; Santema, 2003).

Three brainstorm sessions with 15 representatives of leading Dutch buying organizations were held to determine current issues in the field of purchasing. These sessions confirmed that insights into the 'soft' human factors in EP implementation are lacking. The question *how* human factors can be addressed in order to persuade or move individuals towards adoption was found to be particularly relevant.

*Corresponding author. Tel.: +31 6 17248024.

E-mail addresses: m.r.b.reunis@lr.tudelft.nl (M.R.B. Reunis), e.m.vanraaij@tm.tue.nl (E.M. van Raaij), s.c.santema@lr.tudelft.nl (S.C. Santema).

Human aspects of the EP implementation process can be studied on different levels. On the level of the individual, innovation adoption behaviour has been studied extensively for the last several decades in the psychological and sociological fields, yielding a variety of influential theorems (see e.g. Oliver, 1980; Davis, 1989; Azzen, 1991; Rogers, 1995; Goodhue and Thompson, 1995).

The support for these different adoption models in explaining adoption behaviour on an individual level is high; however, they are less suitable for explaining the adoption behaviour on an organizational level (Frambach and Schillewaert, 2002; see also Ioo and Kim, 2004). Studying organizational adoption of EP tools constitutes a whole new challenge.

Important aspects in organizational adoption are complex social interactions between groups and individuals and the joint development of structure, roles and systems. These issues have been addressed in the literature on organizational change, such as organizational development (Burke, 1994) and organizational learning (Penland, 1995). They are also dealt with in the literature on implementing technology or technology-driven change, such as studies on the implementation of ERP and ERP systems (Mabert et al., 2003).

In-between the macro-level of organizational change and the micro-level of individual adoption, there is a meso-level of individual actors influencing each other's adoption behaviour which shapes the process of organizational adoption and change. This interplay between individual adoption and organizational change has remained largely unexplored, especially in technology-driven change, like the implementation of EP. In between the state where no-one has adopted the new tool and where all relevant organization members have adopted the tool, a complex process of multiple parallel and sequential individual adoptions takes place. Individual adoption, being largely dependent on social influences (cf. Rogers, 1995; Azzen, 1991), spreads from one person to the next as a result of active or passive persuasive actions (Cooper and Zmud, 1990).

How adoption spreads from one actor to another depends upon the type and effectiveness of the influences one has on the other. People influence each other using both formal and informal techniques. The process of internal dissemination of adoption behaviour could be thought of as a 'viral' spread of adoption throughout an organization. This notion of 'viral spread' underlies what is known in the marketing domain as 'word-of-mouth' (Marilla, 1971) and 'viral marketing' (Heim, 2000), and it is known in social network theory as 'social contagion' (Jones and Jones, 1995; see also Kamann and Bakker, 2004).

The importance of researching the spread of adoption is confirmed in a recent study where various factors

influencing individual adoption were identified (Reunis et al., 2004). In that study, confirmation was found that the majority of controllable factors are related to the social context: adopters can influence non-adopters through various types of influences prior to the actual adoption decision being made by the non-adopter. The dissemination perspective of adoption spreading from actor to actor appears to be a useful means of studying the organizational adoption of EP. The types of influences that take place between individuals to spread adoption from one actor to another provide an interesting opportunity for research.

The objective of this exploratory study is to identify different types of influences on the dissemination of EP adoption between actors in an organization. We build on the notion of 'viral spread' to study the influences on the dissemination of EP adoption. Initially the research focus is limited towards the dyadic dissemination from an individual adopter, actor A, to an adoptee, actor B. In this setting, actor A has previously adopted EP and is influencing actor B to adopt as well. Actor A can exert both passive and active influence to stimulate adoption by actor B. When actor A benefits directly from actor B's adoption of the tool, actor A can be expected to actively influence actor B. This could be the case when actor A is a project leader and actor B is a member of the purchasing function involved in the implementation process of an EP tool. Passive influence can occur when actor A's use of the tool in itself already influences actor B's adoption decision, without any active persuasive efforts from actor A.

In order to identify different types of influences we have executed a total of 42 interviews with both purchasing experts and senior purchasing representatives of large Dutch purchasing organizations. From these interviews, nine categories of influences on the spread of EP adoption from one actor to another were identified. These influences include perceived advantage, communication, demonstration, enforcement, training, involvement, risk reduction, reward, and disposition.

This article starts with a brief theoretical background on EP, intra-organizational dissemination, and adoption behaviour. Then, the method of data collection is explained and the nine categories of influencing factors are presented. Finally, the findings are discussed, and limitations as well as areas for further research are identified.

2. Theoretical background

The core concepts in this study are EP, EP tools, adoption and different forms of adoption behaviour, and actor-to-actor, intra-organizational dissemination of adoption behaviour, for a variety of actor types

2.1 Defining electronic procurement

The definition of EP seems to be open to some discussion (Grigger, 2003). Building on the work of De Boer et al. (2002), we define EP as 'performing procurement electronically'. More specifically, this definition refers to inter-organizational network-based information systems intended to facilitate or support the procurement process. This means that a broad definition of EP is used, which not only includes e-ordering systems and systems for catalogue buying (the narrow definition of EP), but also technologies like e-marketplaces, online exchanges, reverse e-auctions, and e-RFX systems (Van Weele, 2002).

Adoption or non-adoption of EP takes place at the level of the EP tool. This can be defined as an EP functionality or set of EP functionalities that enters the organizational system and is transferred throughout the organization as one entity. One example is an 'off-the-shelf' e-ordering system or an e-requisitioning tool. Individuals do not adopt an EP technology as such, but an application in the form of an EP tool.

2.2 Adoption behaviour

In this paper, we define adoption behaviour as making an active contribution towards the implementation or use of the EP tool. Adoption behaviours include using the tool, contributing towards the usage by others, or stimulating the spread of adoption of the tool. This definition implies that an actor can be considered as an adopter of the tool, as soon as the actor contributes to a further spread of the tool, even without using the tool himself.

In general, adoption models only consider positive influences and exclude the possibility of one actor negatively influencing another when it comes to adoption behaviour. Arguably, adoption behaviour does not only have a positive dimension, but can also include a negative dimension, i.e. active deviation of the implementation objective (Frambach and Schillewaert, 2002). This deviation can manifest itself in various ways from hesitation or reluctance towards open resistance or even sabotage (cf. Harris, 2002). This negative behaviour can also spread through interactions between actors, causing competing social networks of adopters and non-adopters within an organization. To include both negative and positive adoption behaviour, the following continuum for the operationalization of adoption behaviour is suggested:

Active non-adoption: non-adoption and use of interaction to spread non-adoption
 Passive non-adoption: non-adoption, without using interaction to spread non-adoption

Passive adoption: adoption, without using interaction to spread adoption
 Active adoption: adoption and use of interaction to spread adoption

2.3 Intra-organizational dissemination of adoption behaviour

In this article, dissemination is defined as the actor-to-actor transfer of adoption behaviour within an actor network. The focus of this article is on the dyadic dissemination process between two actors within the same organizational system. This is quite a simplification, because the actual adoption behaviour of actor B will be determined by the summation of the influences by all the different actors with which actor B interacts. Dyadic dissemination can take place between two actors A and B when a certain relation exists in which actor A can exert active or passive influence on actor B. In an organizational context many such relations exist between different types of individuals, as a result of formal organizational structures or informal social contact. The dissemination between two actors is shown in Fig. 1.

Such a process of intra-organizational dissemination of adoption behaviour is commonly driven by a management decision to implement an EP tool. The objective of an EP implementation process does not have to be that in the end every individual in the organization has to have adopted the tool. The majority of EP tools will apply to a certain subset of employees, or a subset of purchasers, only. For instance, when an e-auction tool is introduced we usually find that only tactical purchasers and sometimes also operational purchasers will have to use the tool, and employees outside the purchasing function will not. There will be a focal group of employees that needs to adopt the tool, for its implementation to be called a success. This focal group should not be defined too narrowly, however. Actors that are indirectly affected should also be addressed. This means that a broader subset of the total organization should be included in the focal group than only the direct users of a new EP tool. Referring to the example of the e-auction tool, employees outside the purchasing function may not actually have to work with the system, but they do have to cooperate in the change process by providing more specific information in the definition stage of the internal request. This cooperation is crucial for the successful implementation of the tool. In this study, actor A and B can be any stakeholder in

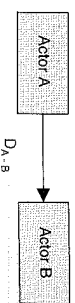


Fig. 1 Dissemination (D) from actor A to actor B.

an organization that is affected by the implementation of a certain EP tool and has a certain degree of influence on the implementation process. This means that actors A and B can be the members of the purchasing department, the IT department or any other stakeholder in the organization.

3. Data collection

A total of 42 exploratory interviews were conducted with people who have relevant experience with EP and with the implementation of EP tools. In these interviews, a generic EP implementation process was used as a guide for the discussion, and interviewees were asked to describe critical incidents with respect to various parties influencing each other to spread the adoption of the tool. The 42 interviewees represent both EP users from industry and EP experts (see Table 1). The industry representatives come from five large purchasing organizations across different industries and their functions cover different roles relevant in the implementation of EP, including operational, tactical as well as strategic purchasing functions. The industry representatives all have direct experience with one or more EP implementations and have had an active role in the change process. The EP experts include academics, consultants and suppliers of EP tools. All of the experts have had direct or indirect experience with EP implementations and have a function of respectively researching, supporting or selling EP tools. Across the 42 interviews, the whole spectrum of different types of EP tools, varying from e-sourcing, e-RFX, e-auction,

e-ordering, ERP integration and collaborative supply tools was covered.

Typical interview length was 90 min and the interview notes were checked by the interviewee. The interview data were analyzed to extract different influences of one actor towards another to stimulate adoption behaviour. Saturation of the data gathering process occurred after the 42 interviews and no new influences were found. This indicates that sufficient repetitions have been made to assure external validity (Eisenhardt, 1989). The influences were clustered into nine categories. These nine categories are presented in the following section.

4. Influences on the dissemination of adoption behaviour

As said, in this article we focus on one particular aspect of EP adoption in organizations. Given a setting where there are two individuals, actor A and actor B, of which A has adopted an EP tool, and B has not, we explore actor-to-actor influences on actor B's decision whether or not to adopt the EP tool. We assume that actors A and B have a relationship, in the sense that they have some level of interaction, and actor B is aware that actor A has adopted the EP tool.

From the interviews, the following influences for the dissemination of adoption behaviour of actor A towards actor B were identified: perceived advantage, commitment, demonstration, enforcement, training, involvement, risk reduction, and reward. Disposition, as a ninth factor, moderates the effect of the other factors on B's decision to adopt. All influences between actors A and B, except disposition, represent a portfolio of possible

measures that actor A can passively or actively use to spread adoption behaviour. In the following section these nine influences are described.

4.1 Perceived advantage_{A-B}

Perceived advantage_{A-B} is the advantage actor A has created for himself by using the EP tool, as perceived by actor B. Interviewees mentioned that people decide to adopt a tool because they see others working successfully with it. In a peer environment where a person sees a colleague working more effectively or efficiently by the use of an EP tool, s/he might become convinced about the advantages of the tool and copy the behaviour. Non-peers, especially superiors, can also stimulate adoption when they function as role models. Perceived advantage is of a non-verbal nature and is only based on the perception of somebody successfully working with a new EP tool. This influence appears to be particularly significant in less interactive settings, where individuals are quite strongly influenced by merely seeing others. In a setting with close interactions, other influences may play a more important role. Also, in situations with a high level of uncertainty, people seem more prone to turning towards others to guide their behaviour.

4.2 Communication_{A-B}

In nearly all interviews, communication was mentioned as one of the key influencing factors. This finding concurs with earlier research by Mirvis et al. (1991), who have identified peer communication and persuasion as important factors in influencing adoption. Communication_{A-B} is communication from actor A towards actor B about the EP tool, which can be direct communication or indirect communication. Direct communication is communication from actor A towards actor B about the tool, with the intention to influence attitudes and behaviours of actor B with respect to the EP tool. Indirect communication is communication from actor A to actor B that can be identified: tailored messages versus generic messages, rational versus emotional/emphatic communication, informal versus formal, and personal versus professional. Not only verbal communication but also newsletters, presentations, leaflets, and the like can be used.

Indirect communication is communication about the EP tool, without the direct intention of actor A to spread the adoption behaviour. This type of communication does not necessarily include the persuasive techniques that can be adopted in direct communication, but can be merely informative. In this case, people might communicate about an experience with a tool that they have not had themselves, but heard from another party or read somewhere. The many publications on the potential advantages of an EP tool can be a potential

source for such 'word-of-mouth' communications. The interviewees stressed the importance of the mechanisms of informal indirect communication as this 'gossiping' has a major influence on attitude formation, especially of non-adopters.

The effectiveness of the influence of communication depends on the persuasive capabilities of actor A and on the receptiveness of actor B. Actor A can use persuasive techniques like stressing the advantage specific to the situation of actor B. The persuasiveness of the communication depends on the ability of actor A to move actor B through the stages in an adoption process (e.g. from awareness towards commitment and finally involvement). Interviewees mentioned the danger of overdoing the internal 'sales pitch' and creating expectations that cannot be met. A disappointing first experience can inhibit a further spread of adoption behaviour, because one of three things may happen: (1) actor B may decide reluctantly to adopt and not put any effort in spreading adoption, (2) actor B may decide not to adopt, or even worse, (3) actor B decides not to adopt and inhibits the spread of non-adoption, resistance or even sabotage.

Several interviewees mentioned the need for peripheral communication, also referred to as supportive communication. This is communication about the implementation process and organizational change instead of about the tool itself. Providing clarity about 'what is about to come' is mentioned on various occasions in the interviews as a contribution towards the spread of adoption behaviour. The increased clarity is appreciated, even if the change objective has negative consequences on an individual level. This is demonstrated clearly in the case of operational buyers 'adopting' the situation in which they become redundant. Clarity about the change process and objectives is crucial to inhibit the spread of negative adoption, resistance or sabotage.

4.3 Demonstration_{A-B}

The majority of interviewees agree that seeing a tool work is much more convincing than hearing the advantages. Demonstration_{A-B} refers to actor A showing a working EP tool to actor B. Demonstration not only creates buy-in for the tool, but also increases the confidence of people of being able to work with it (self-efficacy). Demonstrations can have different forms, for instance 'proof-of-concept' sessions, 'conference room pilots', video-presentations, etc. In addition to seeing a working system, the recognizability of the demonstration is mentioned in several interviews. Demonstrations that use a familiar dataset, products or have a similar appearance or layout as hardcopy forms tend to be more convincing than demonstrations without such characteristics.

Table 1
Interviewees

Category	Sub-category	N (N = 42)	Functions
Experts	Academics	5	Professor, Director, Partner, Senior Consultant, Junior Consultant
	Consultants	5	Consultant
	EP Suppliers	5	Sales Manager, Change Director, Business Consultant
Industry practitioners	Electronics company	13	EP Manager, Planning Group Leader, Logistics Manager, System Manager, Supply Chain Manager, Procurement Manager, Procurement Group Leader, Project Leader
	Chemical and pharmaceutical company	5	Demand Chain Director, Business Process Engineer, Manager Purchasing projects, Manager Supply Chain Integration
	Oil and energy company	5	Team Leader EP, EP Team member, Change Manager, Processing Unit Leader, Super User, Data Manager
	Energy company	2	Head of Concern Purchasing, Project Team member, communication & training
	Railway and transportation company	2	Manager Concern Purchasing, Corporate Purchasing Consultant

4.4. Enforcement_{A-B}

Many well-known individual adoption models presume a voluntary adoption decision. However, in an organizational setting, enforcement or hierarchical pressure is often used in implementing EP. Enforcement_{A-B} is the exertion of power (e.g. hierarchical power) by actor A towards actor B to create compulsory involvement or usage of the EP tool. The interviewees mentioned the limited effect of this measure in consensus cultures, such as the Dutch culture, and in certain decentralized and highly autonomous subunits. Examples were given in which enforcement initiated more discussions about the tool, instead of stimulating actual usage. By contrast, interviewees described the successful application of enforcement in the US and in Asian regions, where it did influence adoption behaviour substantially. The implicit threat of using measures associated with a position of power, like increased control, punitive measures, a budget cut, usage in a performance review, are all part of enforcement. Many interviewees mentioned the limited impact of such negative incentives.

4.5. Training_{A-B}

Training_{A-B} is the interactive training executed by actor A for the benefit of actor B, before actor B has adopted the tool. Clegg et al. (1997) and Mintz et al. (1991) identified training and education as an important aspect of internal stimulation and nearly all interviewees mention training as an influence mechanism. First of all, training can contribute to the perceived ease of use, one of the major constructs in the technology acceptance model (Davis, 1989; Davis et al., 1989), by increasing the capability to work with the EP tool. Training often includes hands-on experience with a tool in a safe environment. The perception of the complexity of the tool can be reduced and the triability of the tool can be increased. In addition, training can be applied to address cognitive barriers to adoption behaviour. For instance, sessions can be held to deal with personal disposition towards change or emotion-based resistance. Interviewees mentioned different training programs for different types of tools, depending on the self-explanatory level of the tool and the required change. Several interviewees agree that the best result is achieved with face-to-face training, either personal or in a group, but that second-order training through a train-the-trainer process is often necessary in multi-country, multi-site situations.

4.6. Involvement_{A-B}

An important critical success factor recognized in change management literature is the involvement of people in the change process. This was recognized by

many interviewees and paraphrased by one as 'no end-result, without including end-users'. Involvement_{A-B} is the perception of actor B of being included by actor A in decisional matters in the implementation process. Involvement takes place in close interaction between actor A and B, for instance through sessions like design workshops or group decision processes. More formal possibilities of involvement are including actor B in a test environment, shadow stage or in a pilot Actor B can also be included in a project team and be given responsibilities for the implementation process. In the interviews, the involvement of key-users and highly motivated innovators is advocated. The increased feeling of ownership creates adoption behaviour and can also invoke a high degree of participation in the project.

4.7. Risk reduction_{A-B}

One of the promises that actor A can make to actor B to convince him/her to adopt an EP tool is risk reduction. Risk reduction_{A-B} refers to actor B's expectation of reduced risk during adoption of the EP tool due to expected future actions of actor A. The promise of support and facilitation in the adoption process can reduce the risk for actor B to make mistakes in using the new tool and working method. Another form of risk reduction by actor A is reducing the personal consequences for actor B if the EP project fails, thus providing personal security. This especially applies for actors who take a personal risk when adopting in an early stage of the project, for instance people who are involved in a pilot or in the role of project leader. In addition, the risk for loss of responsibilities, damage to the personal career and even work enjoyment were mentioned.

The risk reduction related towards responsibilities and enjoyment were mentioned most often in the interviews. For instance, respondents expressed worries about the effect an EP tool might have on relationships with suppliers. An EP tool may lead to a loss of personal contact with suppliers which could reduce job satisfaction. The same could apply for some individuals when the negotiation and awarding process is electronically facilitated. Mitigating the risks of decreased levels of job satisfaction or career development could include changing responsibilities from operational towards more tactical tasks. Risk reduction is closely related to psychological theories of needs. The individual need is an internalized state that makes certain outcomes attractive and causes a stimulation or drive to achieve these outcomes. The need for security, enjoyment and achievement all coincide with basic need theories (e.g. Maslow). The implication of the need theories for managers is that alignment of change goals and individual needs seems to be a powerful change tool.

4.8. Rewards_{A-B}

Rewards_{A-B} refers to incentives actor A presents to actor B for adopting the EP tool. Bhattacharjee (1998) stresses the importance of incentives. Such rewards can include a bonus, perks or a promotion. Informal favours can be promised as well. Some interviewees mentioned the politics of negotiating favours before adopting a tool at senior management level. Furthermore, symbols, awards, distinction or recognition can be promised. Interviewees mention a limited effect of all types of incentives on adoption behaviour as compared to the other influences.

This is somewhat surprising as rewards take up a central position in motivational and expectancy theories (Westbrook, 1982; Deci et al., 1999). Motivation theory is directed towards establishing, influencing, and aligning individual motivation and provides a foundation of many current managerial practices. In addition, the expectancy theory builds on the notion that people act depending on the attractiveness of the expected outcome to the individual. These theories assume a deliberate and careful consideration of rewards by those who are expected to adopt, while this does not always take place in practice. Several interviewees cast doubt over this assumption of the rational, calculative adopter, by mentioning the disinterested passiveness of a large majority during the change process.

4.9. Disposition_{A-B}

Some individuals will be inclined to adopt an innovation earlier than others, irrespective of any management efforts and social influences. Agarwal and Prasad (1998) recognize this human characteristic as the personal dispositional innovativeness (PDI), which describes an individual's willingness to adapt to an innovation, independent of internal or external influences. Goldsmith and Holacker (1991) show that PDI is domain specific. This suggests inherent differences between for instance the procurement domain and the IT domain. Other traits of a person might influence the PDI or the adoption directly. Some authors stress certain individual factors related to PDI like innovativeness, computer self-efficacy, and experience (Venkatesh and Davis, 2000).

Disposition_{A-B} can be seen as actor B's personal disposition towards influence in general and specifically towards the influence from actor A. The disposition towards actor A is based on the perceived relational aspects of trust, reliability, seniority, respect, reputation, hierarchical distance and status. This perception does not necessarily have to be based on previous interaction with actor A and does not have to be rational.

Emotional issues can have a major influence on the disposition towards another person.

Within an organizational setting, specific relational aspects may play a more important role in actor B's disposition towards actor A, as these aspects are based on the organizational structure of responsibilities and knowledge. Actor A could also be seen as an 'opinion leader', which means that for many actors of type B Disposition_{A-B} is high. Also the power balance between actor A and actor B as perceived by actor B has influence on the disposition towards the influence from actor A. When the power balance is greater, actor B will be more inclined to be receptive towards the influence of actor A. Specific to an EP tool, some actors will have a more important role in the process than others. The perception of the importance of the role that actor A plays in the process could also influence the personal disposition of actor B towards actor A. This could be either a formal role, like program manager or project leader, or an informal one, like an enthusiastic early adopter.

In particular, the role of an opinion leader was stressed in the interviews and his/her pivotal role in stimulating and facilitating the spread of adoption behaviour. Ideally, the role of the project leader should be that of an opinion leader or a charismatic leader (instead of a manager) who is the project owner or sponsor.

The receptiveness of people towards influences depends not only on the persuasive capabilities of the sender and the effectiveness of the influences as a whole, but also on the receiver himself. Disposition contains an intrinsic component based on individual character or personality. This internalized disposition towards external influences in general determines the degree in which the individual is prone to conformance or compliance. These concepts have been extensively researched in sociological studies.

4.10. Conceptual model

We clustered the various influences according to the character of the interaction between actor A and B. Perceived advantage has its influence on dissemination without any deliberate interaction between actor A and B (although previous interaction between A and B is likely to have an effect on perceived advantage). Communication, demonstration, and enforcement are based on one-way action from A towards B. Training and involvement require an interaction between actor A and B. Risk reduction and reward are founded upon promises of future action by actor A towards B.

The categories of influencing factors can be seen as a portfolio of possible influences that actor A can use to convince or persuade actor B to adopt a certain EP tool, thus contributing to the spread of adoption behaviour.

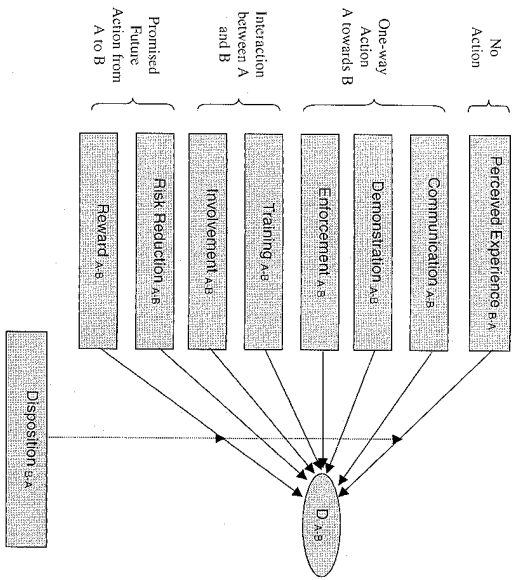


Fig. 2. Influences for $D_{A,B}$ clustered according to the type of interaction between A and B.

through the organization Fig. 2 shows a conceptual model of the clusters of influences and their impact on the dissemination of adoption behaviour.

5 Discussion

Based on 42 exploratory interviews, we have identified nine categories of influences for the dissemination of EP adoption behaviour between two actors in an organization. This research project has both academic and practical relevance as it addresses the human aspects in organizational adoption of EP. Human adoption of EP is widely acknowledged among practitioners as a difficult part of managing the organizational implementation of EP tools. Several existing theoretical perspectives do provide a basis for managing organizational adoption, however, links with the individual level and the application domain of EP remain unexplored. This article makes a contribution to the literature by opening up the academic discussion of actor-to-actor dissemination of EP adoption. In addition, the incidence and to some extent the effectiveness of influencing factors in actor-to-actor dissemination are explored.

5.1 Limitations

This article focuses solely on influencing factors that could explain the spread of EP adoption from one

individual actor to another. Although this kind of interaction-based influence is recognized as an important aspect of the human issues during an implementation process of EP, other aspects of the change process remain relevant as well. This paper therefore does not cover the whole spectrum of change issues that are relevant for EP implementation. For instance, the issues that underlie the feasibility of using the EP tool are not discussed in this paper and are seen as a prerequisite before adoption dissemination can take place. Relevant issues in this respect include technical infrastructure, licenses, standardization, and legal issues.

In this article we do not make a distinction between different types of actors A and B. We expect, however, that it may be worthwhile to categorize actor types A and B on the basis of functions or hierarchical levels. In the interviews we have seen some indication for a different relative impact of influence factors depending on which hierarchical level actor A and B belong to. Enforcement, for instance, will be a more effective influence when actor A has a higher hierarchical position than actor B. Another example is perceived advantage, which is most likely to be of influence when actor A and B are peers. In addition, in an organizational setting, actor B will not only be influenced by actor A, but by many actors inside and outside of the organization. The actual adoption behaviour of actor B

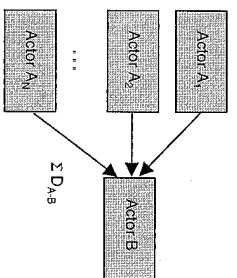


Fig. 3. Dissemination (D) from multiple actors A to actor B.

will depend on the sum of all these interpersonal influences. This idea is shown in Fig. 3. The distinction between different types of actors and the combined influence of multiple actors form the basis for future research discussed later on.

Finally, there are methodological limitations inherent to an exploratory study of this kind. The 42 interviews were chosen to cover a wide range of functions within five large companies, complemented with academic experts, consultants and EP suppliers. As a consequence, the range of companies represented in this study is limited, which restricts the generalizability of the findings. Still, this study provides interesting initial insights in the influences between actors, which opens up a number of perspectives for future research.

5.2 Future research

This project is of an exploratory nature and yields initial insights into the factors that may cause EP adoption behaviour to spread from one actor to another. These insights provide the basis for more formal research techniques. Further studies could extend the study of influences towards different types of actors, for instance based on different functions or hierarchical positions. A network of different types of actors can then be developed in which the incidence and effectiveness of influences between actors differ according to the position of the actors in the network. Propositions can be developed based on this exploratory study, on further literature studies, and the aforementioned network of different types of actors. These propositions can then be empirically tested. A simple network is already likely to yield interesting insights into the dissemination process of EP and how influences vary between different types of actors. Naturally, the complexity and the scope of the network can easily be extended, to include also actors from outside the boundaries of the organization. Influences of suppliers, consultants, and other experts could then be included. Further extensions could include more complex inter-

action relationships, like actor C influencing the dissemination of actor A to B and vice versa.

The exploratory study presented in this article is a part of a research agenda with the objective of identifying the effectiveness of interventions for managing the organizational adoption process of EP. Here, an approach is used that builds on the concepts of intra-organizational dissemination of adoption, thereby recognizing the dynamic process of different types of people influencing each other and causing adoption behaviour to spread throughout an organization. The key assumption of the research agenda is that understanding the effectiveness of influences or interventions between people in various situations provides the key towards managing the process of the organizational adoption of EP. This article has presented some initial support for this assumption, and we call for more work to be done in this area in order to unravel the complex social interactions that determine the success or failure of the implementation of electronic procurement tools in organizations.

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