Chapter 2

Organizing for Collaborative Procurement: An Initial Conceptual Framework

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INTRODUCTION

Forming collaborative procurement arrangements is suggested to be an increasing trend in purchasing and supply (Carter et al., 2000; Nollet & Beaulieu, 2003; Walker et al., 2003). There is increasing international interest in collaborative procurement arrangements in the public sector in countries such as Canada, Finland, Germany, the Netherlands, the UK, and the U.S. (Aylesworth, 2003; Essig, 2000; Kamann, van der Vaart & de Vries, 2004; Kivisto et al., 2003; Nollet & Beaulieu, 2003; Schotanus & Telgen, 2005). Recent examples in the UK are found in the National Health System (NHS), the police, the Highways Agency and local government, varying from exchanging information and experiences, buying together through an electronic marketplace, using lead-buying arrangements, or through installing a separate buying organization. This increased attention in the UK public sector has been triggered by a central government efficiency review (Gershon, 2004). Although some preconditions for effective collaboration can be found in the literature (Aylesworth, 2003; Rozemeijer, 2000), an overall model that shows which form is suitable in which situation is not in evidence. The aim of this chapter is to develop an initial conceptual framework that can assist in determining when particular forms of collaborative procurement are (ideally) appropriate.

BACKGROUND

Collaborative procurement in this chapter is seen as horizontal cooperation between organizations, the bringing together (or pooling) of the purchasing functions of two or more organisations (Essig, 2000).

Two primary motives for collaboration have been recognized: the improvement of effectiveness and efficiency (Jost et al., 2005). For the first, collaboration is sought when single organizations do not have the knowledge, resources or capabilities. The second is about realizing economies of scale, reduced transaction costs, better development of products/services, or accessing markets and/or technologies, etc (ibid).

For the first motive, constraints play a role in determining the collaborative form (e.g. lead buying or using third parties to ensure expertise) whereas for the second this is not clear. While we acknowledge that constraints (e.g., lack of expertise or resources) can determine the choice for a collaborative form, the purpose of this chapter is to give insight into when which form would ideally be appropriate, focussing on constraints in a later stage. Different forms of collaborative procurement can be recognized, having a different structure (Hendrick, 1997; Aylesworth, 2003; Schotanus & Telgen, 2005, Nollet & Beaulieu, 2005). Yet, in which situation which form would be ideal is not clear. In evolutionary models, collaborative forms are recognized to be dynamic (D'Aunno & Zuckerman, 1987; Johnson, 1999; Nollet & Beaulieu, 2003). Although these models can explain how a form changes over time, these models are not necessarily linear. The last phase is not the final objective, nor do forms differ a great deal between phases (Nollet & Beaulieu, 2003). The evolutionary models do not take into account different contexts or situations, and do not make clear which form to use (or ideally strive for) in which situation.

We acknowledge that the choice for a collaborative form can be the result of organizations imitating each other, based on ad-hoc or political decisions. This explanation for organizational design is supported by neo-institutionalist theory, describing that organizations copy each other because of three types of pressure: coercive, mimetic, and normative (Dimaggio & Powell, 1983, Kamann & Bakker, 2004; Pollitt, 2005). *Coercive* stems from a political influence and a problem of legitimacy, and refers to organizations imitating each other as they deal with similar formal and informal pressures from other organizations or institutions (e.g., government mandates, new taxes, environmental or anti-terror regulations, European Union rules/regulations). *Mimetic* refers to imitation through uncertainty: organizations model themselves on other similar organizations dealing with a similar uncertainty (e.g., a financial

crisis). *Normative* refers to copying out of a sense of "professionalisation," imitating other believed-to-be-professional authorities (e.g., centers of excellence, foundation status hospitals, Beacon status local councils, or "what they do in the US"). The interesting aspect of these processes is that they can proceed without the evidence of increased performance, which means that the copied collaborative form might not always be the most suitable one (ibid). Hence, to fill this gap, the rest of this chapter develops a framework to help determine when which form (ideally) could be used.

In the first section, the procurement literature is reviewed in more detail to identify different forms of collaborative procurement. While particular factors are highlighted as determining collaborative procurement forms, this literature search does not reveal under what circumstances different forms are appropriate. A broader literature review of organization theory, in particular contingency theory, is provided. Within that framework, relating factors to appropriate forms are examined. Supply positioning or portfolio models (e.g., Cousins, 2002; Kraljic, 1983; Olsen & Ellram, 1997) have provided approaches for practitioners in determining supply strategy and the management of supplier relationships. In a similar spirit, in this research we explicitly link supply with organizational design for collaborative procurement, as we see a specific form of a collaborative as an organisational (design) choice. By combining findings from the purchasing and the organization literatures, an initial conceptual framework is developed, supported by a more comprehensive decision-making framework. Conclusions on the possible implications of such frameworks for practice and future research are drawn. The following section examines different forms of collaborative procurement evident in the procurement literature.

DIFFERENT FORMS OF COLLABORATIVE PROCUREMENT

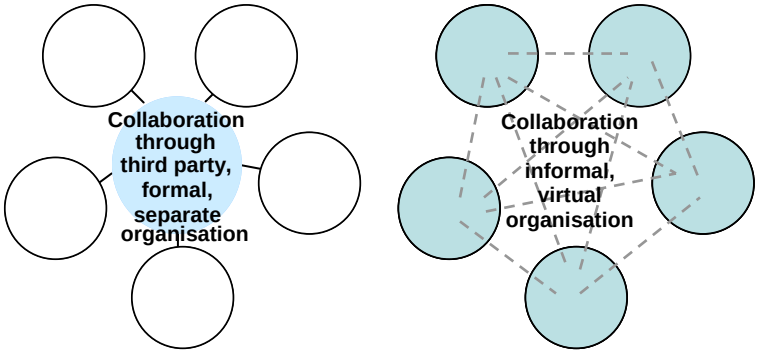
Two distinctive structural forms of collaborative procurement can be recognized in the procurement literature: collaborative forms that are member-owned, informal and virtual organizations, and those that are formal separate third-party organizations (Aylesworth, 2003; Hendrick, 1997; Leenders & Fearon, 1997; Nollet & Beaulieu, 2005). These extreme types can also be recognised in evolutionary models such as by D'Aunno and Zuckerman (1987), Johnson (1999) and

Nollet and Beaulieu (2003). Even when more than two forms are mentioned, such as by Aylesworth (2003) and Schotanus and Telgen (2005), these two extremes are hidden in or form the core of the others. This means only slight variations are added to the extreme forms.

Being a third party that procures for its members or being a voluntary virtual collaborative form, in both extreme types some degree of cooperation must exist. In other words, a new organizational form has to be chosen and designed, irrespective of being a third party intermediate or an informal, virtual cooperative (Figure 1). Within each main form of collaborative procurement there are choices to be made; these are discussed next for each extreme form.

The separate, third-party organizations may involve a team of representatives from the member organizations, possibly including board and procurement staff, carrying out operations. Alternatively, they may be completely independent, autonomous groups of procurement people. Relating to control, a form of collaborative procurement might involve a third party doing all of the specifications and supplier selections for its members and controlling the use of the centrally negotiated contracts through formal agreements including penalties. In other situations, member organizations might have some form of control over specifications and have some freedom in using

FIGURE 1
Two Main Forms of Collaborative Procurement Initiatives as New Organizational Forms



the contracts, as in the case of framework contracts without clauses of mandatory participation (Nollet & Beaulieu, 2003). This can leave the third party with a more supporting or facilitating role. These differences are echoed in Aylesworth's (2003) distinction between a regional purchasing agency (a centralized agency with member control on using centralized contracts) a member-owned service bureau (a separate entity with member representatives on the board) and a for-profit enterprise (an independent third party which purchases for members for a fee). Such distinctions are also evident in Schotanus and Telgen's (2005) stated difference between formalized "F1 teams" (an external party with member representation on a steering committee) and "bus rides" (an external third party which purchases for members for a fee).

Informal voluntary organizations vary according to the rules members agree on. For example, there may be completely voluntary relationships, or there might be rules about the commitment to volumes of certain items. Voluntary forms can also differ according to whether all members go through the procurement process together, all influencing the specifications, supplier selection and evaluation, or tasks may be divided between members, such as in a lead-buying approach where only the specification and evaluation phases might be conducted together. The variation lies in how much of the procurement process is done together in cooperation. In the less voluntary organization, in addition to having a few working rules to coordinate procurement activities, special positions can be installed that monitor and guide the cooperation (e.g., UK NHS Confederation boards [Bakker et al., 2006]). This variation in informal forms can be found in Aylesworth's (2003) Local Network (piggybacking or aggregating demand with informal relations between members and few working rules) and Voluntary Confederation (informal, lead-buying arrangement with agreement on division of tasks); or Schotanus and Telgen's (2005) Carpooling (lead-buying) and a relatively informal F1 Team (no separate legal entity, but with steering groups and few working rules and procedures on, for example, joining and leaving the initiative). Obviously, the more working rules are agreed upon between members in an informal form, the closer the initiative moves towards a more formal organization. It has been recognized that some forms, such as piggybacking, are very specific and of limited use in practice (Schotanus & Telgen, 2005).

FACTORS OF COLLABORATIVE PROCUREMENT THAT INFLUENCE FORM

To fulfil our purpose of providing guidance on which collaborative procurement forms are appropriate in which situations, in this section we examine evidence from the procurement literature that relates collaborative procurement form with particular factors. Factors identified in the literature include: size in terms of the number of members, age of the collaborative, size disparity between members, geographical spread of members, homogeneity of members' requirements, procurement maturity, intensity of cooperation, and number of shared activities.

Size in Number of Members and Age of the Collaborative Initiative

When assessing which collaborative form is appropriate, the number of members *of the collaboration* has to be taken into account, as there is a limit to what is manageable informally (Nollet & Beaulieu, 2003). On the other hand, with a small number of members, it does not always pay to install a separate body (e.g., coordination and set-up costs outweighing potential economies of scale). It seems that with a higher number of members, a separate organization with central direction is more appropriate to be able to coordinate all collaborative procurement activities. This relationship is supported in evolutionary collaborative procurement models. Collaborative forms tend to start small as voluntary informal, virtual organizations, and when growing larger evolve into separate, more structured organizations (e.g., D'Aunno & Zuckerman, 1987; Johnson, 1999). This also implies that the age of a collaborative initiative can be another relevant factor that influences form.

Size Disparity between Members

From the different forms mentioned by Aylesworth (2003) and Schotanus and Telgen (2005), one factor that can be recognized as influential on the form is the degree of size disparity of member organizations. If in a collaboration initiative one organization is larger than others in terms of resources and buying volume, this organization tends to lead the buying of all products or services, as they tend to have access to resources and more expertise. In the case of piggybacking, most often no new formal organization emerges, as the smaller organizations only use the contract, and manage their own relationship with the supplier. This form is only

suitable if there is size disparity between the members; otherwise, organizing collaboration through lead buying is more appropriate, using the aggregate demand of the members. In the case of low size disparity (equal organizations) a separate organization can do all the contracting, or lead buying is possible. This can either be arranged through setting up a limited separate organization or through the use of informal contacts in a virtual type organization. Lead buying through a third party based on aggregate demand may be called external lead buying, and if managed by the members itself in an informal unit, may be termed internal lead buying.

Geographical Spread of Members

The ease of managing the collaboration is also influenced by the geographical scope of the collaboration (Aylesworth, 2003; Nollet & Beaulieu, 2003). However, geographical scope cannot always be influenced as it may relate to the geology of a country or the social geography affecting the location of organizations. There are technologies such as telephone, internet, e-mail, and e-marketplaces that can affect the perceived distance and can facilitate cooperation (Rozemeijer, 2000). It appears that the smaller the geographical scope of the collaboration, the easier it is to maintain close relationships as it is easier to have face-to-face contact when necessary. The larger the geographical scope, the more reliance there will be on communication technologies. The number of members and the geographical scope of collaboration can both be seen as indicators of the size of the collaboration.

Homogeneity of Members' Requirements and Procurement Maturity

Rozemeijer (2000) recognizes that different forms work in different situations and that homogeneity of demand of members' buying needs and maturity of the procurement function influence this. Both are internal characteristics to a collaborative form. Some degree of homogeneity is always necessary, as otherwise there is no common ground to collaborate (Arnold, 1997), which would defeat the purpose of collaboration. According to Rozemeijer (2000), the more homogeneous the buying needs of potential collaborators are, the more centralization is possible. However, if the buying needs are complex and dynamic, requiring users to be involved in a flexible way, a decentralized, self-managed virtual form of collaboration would be appropriate. Homogeneity between buying needs hence does not

inform us as to whether a virtual organization or a new separate organization should be used. Also, centralized collaborative forms might be resisted in mature situations where members have their own institutionalized procurement experts. From this it may follow that the more potential members of the collaboration have decentralized, mature procurement units, the harder it will be to centralize procurement decisions and the more likely it is that a self-managed collaborative form is suitable, at least initially.

Intensity of Collaboration and Number of Shared Activities

The recent model by Schotanus and Telgen (2005) recognizes five types of collaboration, which are based on intensity of cooperation and number of different activities. Although this model is insightful, providing a starting point, it is also mentioned that multiple forms can be possible in one situation. This makes it difficult to assess which form is appropriate in which situation. Furthermore, it is not clear in which situations intense cooperation and sharing of a large number of activities are appropriate.

In summary, the procurement literature has highlighted eight factors that appear to be related to form of collaborative procurement. In the following sections we unravel which of these might be independent or determining variables, and which are dependent variables. The unravelling is complicated by the tendency in the literature to mix the variables up as they are shown to be interrelated.

As previous research indicates, the size of the collaboration in terms of the number of organizations working together tends to increase through time and affects the ease of managing and coordinating relationships between members (e.g., Nollet & Beaulieu, 2003, Bakker et al., 2006). The ideal number of members and geographical spread of members (scope) is determined by coordination, and the appropriate type of coordination is influenced by other factors; different types of coordination are appropriate as these factors vary. Appropriate coordination also varies according to the relative benefits of standardization compared to local specialization and customization. Size may well correlate with a certain form, but this does not necessarily imply it causes that form. On its own, size is not a sufficient form influencing or explaining variable. It is a dependent variable and not a sufficient independent

one; it is an internal organizational characteristic and can be seen as a design choice. The evolutionary models of collaborative procurement also show that size is a factor related to age; size tends to increase through time, but these models also show that there is not always a difference between forms and different stages (D'Aunno & Zuckerman, 1987; Johnson, 1999; Nollet & Beaulieu, 2003). Age of a collaborative initiative depends on performance and possibly other factors such as political change (changing priorities). This implies that neither age nor size (in terms of number of members and geographical spread) are useful independent contingency variables for explaining when which form is appropriate (Schreyögg, 1986).

Two other factors - size disparity and having decentralized units of experts (in situations of maturity of procurement amongst members) - are again characteristics that refer to the design of the collaboration. They say something about structural characteristics of (potential) members; these already exist and cannot be influenced directly. These factors do not look at the form of collaboration itself. They refer to selection criteria: which members to include in the cooperation, based on size, and how procurement is organized. Finally, the above description of the different potential relevant factors has shown that homogeneity of demand, intensity of collaboration, and number of shared activities, are insufficient independent contingency factors.

It is evident from the above discussion that the procurement literature does provide some evidence of factors that relate to collaborative procurement form. However, a clear case is not made within this literature to identify which of these variables drive form and which are merely dependent on it (i.e., which are independent and dependent variables). Therefore, a broader literature search into organization theory and forms of collaboration is performed next.

ORGANISATION THEORY AND DIFFERENT FORMS OF COLLABORATION

If collaborative procurement is viewed as a sub-system of a larger system of independent organizations prior to collaboration, organization theory may be helpful to gain an understanding of the new organizational forms as it deals with organization design (Mintzberg, 1979; 1980; Khandwalla, 1977; Robbins, 1987). In this field of organization theory, contingency theory has become a dominant paradigm (Child, 1976; Schreyögg, 1986). Unlike classical and neo-classical approaches to organizational design assuming

there is one best approach, contingency theory acknowledges that what is best depends on the situation and the environment, and recognizes that in different situations different forms can be most appropriate (Greenberg & Baron, 1993). Contingency theory is characterised by two basic elements: causal thinking and an open systems perspective. It can help to explain which form is suitable in which situation/context (Schreyögg, 1986). Contingency theory is useful for procurement as it specifically deals with an external environment - the supply market. Other procurement studies (e.g., Kamann, Karásek & Aouad-El Kadi, 2001; Stonebraker & Liao, 2006) have highlighted its value.

However, there are several criticisms of contingency theory. First, an organization is treated as a whole without differentiating between departments or functions. Second, contingency theory assumes an organization reacts to its environment without influencing its own contextual situation. Third, it is evident in practice that organizations that do not "match" their environment can still survive (Schreyögg, 1986; Bakker, 2005). Other factors may be important to explain purchasing behavior and decision-making (e.g., Webster & Wind, 1972, Johnston & Lewin, 1996), in particular social factors (Kamann & Bakker, 2004). Fourth, contingency theory does not take into account the possibility of choice. It sees choice as being determined by the environment; this fails to consider that choice of organizational form is not an objective fact but subject to perception, affected by social influences. This fourth criticism of contingency theory is central to neo-institutionalism (DiMaggio & Powell, 1983; Pollitt, 2005), within which it is appreciated that choice of form is deliberate, according to what is deemed appropriate, rather than determined by environmental factors. As highlighted in the background to this chapter, what is appropriate is a social judgement and companies imitate each other (so-called isomorphic behavior), as they are driven by uncertainty, normative behaviour and or legal constraints (DiMaggio & Powell, 1983). However, although these forces can explain what happens, this does not necessarily mean that the form chosen is also the best possible form, as isomorphic behavior can proceed in the absence of evidence that it makes an organization more efficient (DiMaggio & Powell, 1983).

This chapter does not look at the judgment of appropriateness given others' opinions or actions, nor is it concerned with decision-making on an individual level. Rather, it builds on a positivistic

approach (Burrell & Morgan, 1979) and focuses on the organization as a unit of analysis to explain which collaborative form is required in which situation. Although there are limitations to contingency theory, this chapter deals with appropriateness given the contextual circumstances, not taking subjective perception differences into account or the social processes that determine what is appropriate. The chapter focuses on when which collaborative form theoretically should be chosen, for which contingency theory does seem a suitable starting point to build our framework.

In organization theory, the work of Mintzberg (1979; 1980) on organisational forms can be considered as one of the seminal works in this field (e.g., Robbins, 1987). Also, when addressing the issue of organizing for procurement, references are made to terms like centralization versus decentralization, formalization, coordination and so on (e.g., Baily et al., 1998; Rozemeijer, 2000; Weele, 2000; Lamming, 2002; Leenders et al., 2002; Johnson & Leenders, 2004; Pollitt, 2005). All these terms are dealt with in Mintzberg's discussion of organizational forms (1979; 1980). Mintzberg recognizes that there are five basic organizational forms, which he calls: simple structure, machine bureaucracy, professional bureaucracy, divisionalized form, and adhocracy (ibid). Each of these has different structural characteristics (design parameters) and contingency factors (see Table 1). Although mentioned as a separate structure, the divisionalized form is according to Mintzberg (1980, p. 335) "not so much a complete structure as the superimposition of one structure on others." In other words, this form shows how the other forms can be brought together in one overall form, such as divisions of big multinationals. For our chapter this is not useful, as we are interested in finding out how such a "division," the collaborative procurement initiative, should be (ideally) organized.

Mintzberg recognizes five sets of contingency factors: age, size, power, technology, and environment. Following our earlier discussion from the procurement literature on age and size being dependent and insufficient independent variables, we will not take these into account in building up a contingency framework on organizing for collaborative procurement.

Mintzberg's model also takes into account which so-called internal part (internal stakeholders) of the organization is most

TABLE 1
Mintzberg's 5 Five Forms and their Characteristics

	Simple Structure	Machine Bureaucracy	Professional Bureaucracy	Divisionali-sed Form	Adhocracy
Key coordinating mechanism	Direct Supervision	Standardi-sation of work	Standardis-ation of Skills	Standardi-sation of outputs	Mutual Adjustment
Design Parameters					
Specialisa-tion of jobs: **- horizontal** **- vertical**	 Low High	 High High	 High Low	 Some (between HQ some and divisions	 High Low
Training	Low	Low	High	Some (for Division)	High
Indoctrina-tion	Low	Low	High (retraining)	Some (Managers)	Varies
Formalization of behaviour	Low	High	Low	High (with divisions)	Low
Bureaucratic /organic	Organic	Bureaucratic	Bureaucratic	Bureaucratic	Organic
Grouping	Usually functional	Usually functional	Functional and market	Market	Functional and market
Unit size	Large	Large (at bottom, narrow elsewhere)	Large (at bottom, narrow elsewhere)	Large (between HQ and divisions)	Small (throughout)
Planning and control systems	Little	Action planning	Little	Performance control	Limited action pl. (esp. in Adm.Ad.)
Liaison devices	Few	Few	Some in administra-tion	Few	Many throughout
Decentrali-zation	Centraliza-tion	Limited horizontal decentraliza-tion	Horizontal and vertical decentraliza-tion	Limited vertical decentraliza-tion	Selective decentraliza-tion
Contingency factors					
Age (typically)	Young	Old	Varies	Old	Young (Op.Ad.)
Size (typically)	Small	Large	Varies	Very large	Varies

TABLE 1 (Continued)

	Simple Structure	Machine Bureaucracy	Professional Bureaucracy	Divisionali-sed Form	Adhocracy
Key coordinating mechanism	Direct Supervision	Standardi-sation of work	Standardis-ation of Skills	Standardi-sation of outputs	Mutual Adjustment
Technical system					
- regulation	Low	High	Low	High	Low
- complexity	Low	Low	Low	Low	Low/high (Op./Adm.Ad.)
- automated	No	No	No	No	No/often (Op./Adm.Ad.)
Environment					
- complexity	Low	Low	High	Low	High
- dynamism	High (sometimes hostile)	Low	Low	Low (diversified markets)	High (sometimes disparate)
Power					
- focus	Strategic apex	Technostruct ure,often external	Professional operators	Middle line	Experts
- fashionable	No	No	Yes	Yes	Especially

Source: Mintzberg, (1980, p. 330).

powerful and important, as they will tend to pull towards a certain form (Mintzberg, 1980). Matching the form with the stakeholder situation plays an important role in the success of the collaboration (Alyesworth, 2003; Bakker et al., 2006). Success of the collaboration in other words depends on how well the organizational design fits with stakeholders' positions, allowing for power to be exerted by the "right" parts of an organization. The distribution of power amongst stakeholders determines who is influential in decision-making surrounding collaborative procurement, in turn affecting how the collaboration is operated and which form is chosen. This chapter, however, takes a design perspective and is interested in which part theoretically (or ideally) *may* and/or s*hould* have the power. The latter depends on other factors that require the right stakeholder to exert influence, so success will depend on having a certain form that allows this. Stakeholder power is hence treated as being affected by the organisational form, which implies that stakeholder power is not a sufficient independent contingency factor for designing a procurement collaborative.

This leaves us with two contingency factors that influence collaborative forms and which we did not find in collaborative procurement literature: (a) technology and (b) environment. To understand the effects of these factors, we go back to the theories that underlie these two contingency factors.

TECHNOLOGY AS A DETERMINANT OF FORM

Technology was first proposed to be a contingency factor determining organizational design by Woodward (1958). This has since been recognized by others as an important factor influencing how to organize procurement tasks and decisions (Johnston & Lewin, 1996, Kamann, Karásek & Aoulad el Kadi, 2001; Webster & Wind, 1972). Technology originally refers to the technology used in primary production processes, which can vary in complexity through interdependence and variance. Woodward (1958) differentiates between custom, mass and continuous production. Although other typologies can be recognized (e.g. Greasley, 2006; Hayes & Wheelwright, 1984), Woodward's three main types are still represented within these. Her typology can also be recognized in a typology in technologies for service provision (cf. Greasley, 2006), making the link with buying both services and products possible.

Woodward's typology is useful for translating the influence of technology on organizational form into a collaborative procurement context. While in collaborative procurement there is no production process, technology does play a role in terms of the technology of the buying need: the technology incorporated in the goods and services bought. This is the essence of collaborative procurement: together trying to fulfill a need in a more efficient and effective way than when acting alone. In this way, Woodward's typology can be translated in Robinson, Faris and Wind's (1967) buying need typology, referring to three situations that vary in complexity of the buying need (products and/or services).

Robinson, Faris and Wind (1967) differentiate between the new task, modified re-buy, and straight re-buy situation. The situations differ in the amount of information needed and consideration of alternatives. A new task situation resembles a custom-made production as it is a new problem that requires a lot of new information and there are many alternatives possible. A modified re-buy resembles mass production, as a new batch could mean a new

problem due to changing specifications or changing legal requirements, needing a moderate amount of new information and the consideration of a few alternatives. A straight re-buy resembles continuous production, as no new problem is involved (or can even be considered due to standards when used by other products/machines in the process that do not allow for changes to be made in specifications), hence it does not require much new information.

Following Woodward's effects of technology on organizational design, the more a collaborative initiative involves cooperation around the extreme case of new task buying needs, the less standardization and centralization is possible (e.g., expert users need to be involved). Therefore, smaller organization unit sizes are suitable as mutual adjustment is important; this is likely to be more effectively achieved in relatively small groups. As experts/professionals play an important role and are hence powerful, collaborating on new-task situations fits with the adhocracy and professional bureaucracy structure from Table 1. The more the collaboration revolves around the other extreme, the straight re-buys, the more standardization is possible (e.g., using catalogue buying through an e-market place). Here, more centralization and larger unit sizes are possible. Based on the importance of strict coordination and standardization, collaboration around straight re-buys fits with the simple structure (control through direct supervision) and machine bureaucracy (control through standardization of work) (see Table 2). Collaborating around modified re-buys will fall somewhere in between the two extremes and could use standardization of outputs to coordinate activities, as modified re-buys allow the use of functional specifications to fulfill a certain need. In these circumstances, the output or result is already specified, but how this need should be fulfilled is not.

In terms of the two extreme collaborative forms recognized in collaborative procurement literature, a straight re-buy lends itself better for standardization and coordination through a separate organization that does framework contracts or sets up a standardized e-procurement model such as e-catalogues. In a new task situation, local expert input is more crucial to ensure a collaborative purchase fulfills the complex local need and a more self-managed organization seems appropriate. The modified re-buy situation falls in between the two extremes and would suit a combination form, having expert input where appropriate (e.g., when risks are high, uncertainty is high through the complexity of the technology involved in a product is high,

or when financial stakes are high) and strong central direction where the above does not hold. Furthermore, with re-buys, quantity guarantees can be provided to suppliers, in effect formalizing the collaboration (Nollet & Beaulieu, 2003). In the case of a new task situation, this is more difficult and an informal organizational form is required to keep flexibility. Overall, using the two extreme forms of buying needs – straight re-buy versus new-task – as a procurement translation of technology being a contingency variable that affects form, Table 2 can be drawn up.

TABLE 2
The Link between Buying Need Technology and Form

Production technology (cf. Woodward, 1958)	*Buying need technology (cf. Robinson Faris & Wind, 1967)*	*Organizational form (cf. Mintzberg, 1979, 1980)*	*Collaborative form*
Project / small batch	New task	'Adhocracy' or 'Professional bureaucracy'	Informal, self managed by members
Process / continuous	Straight re-buy	'Simple structure' or 'Machine bureaucracy'	Separate entity (third party), formal, managed centrally.

Although the newness of the buying need affects to what extent coordination through a third party is possible, whether this is actually done also depends on the degree of influence a member organization *wants* to exert over the collaboration around a buying need. This determines to what extent an independent third party should be allowed to be responsible for fulfilling this need. The need for control depends on the importance of the buying need for an organization: long-term strategic and short-term operational importance. Hence, to fully understand the impact of technology on collaborative forms in terms of complexity of the buying need, we also need to pay attention to the importance of the (simple or complex) technology that is bought (technology as represented in the product or service that has to fulfill a buying need). Below, we explain this and show how it links to Mintzberg's model.

Importance is, for instance, determined by the financial impact of the buying need and its value or impact on being able to serve one's customers (impact on operations/services that should deliver what the customer wants/needs) (e.g., Kraljic, 1983; Gelderman, 2003). Looking at the distinction between short term operational and long-term strategic importance, means a buying need can be important for management or for operations experts respectively. This would suggest that different structural forms are appropriate for different buying situations when taking into account different types of importance. This is supported in Mintzberg's forms (1979; 1980), as he refers to "focus of power" (see Table 1). He recognizes that where this focus of power lies within an organizational form, depends on which organizational part is key (e.g., strategic apex vs. operational core). The notion of which part is key can be translated into importance to whom, therewith referring to the stakeholder situation. Hence, by taking into account importance of a buying need for assessing when which form is appropriate, indirectly stakeholders are taken into account (but from a design perspective and an ideal situation looking at who should be involved, not an "as-is" situation). In terms of ability to influence in collaborative procurement, "top-management" is able to influence strategic important buying needs in Mintzberg's "simple structure." Experts (specialists, users) are able to influence buying needs with operational importance in Mintzberg's adhocracy structure and a bit less so in the professional bureaucracy. Or, following a core-competency approach, the more important a buying need is, the less an organization should collaborate and the less important, the more the procurement of this buying need can be outsourced (Prahalad & Hamel, 1990). This means in general that the less important a buying need, the more appropriate it is, theoretically, to have a formal separate entity that manages and coordinates collaborative procurement for its members.

ENVIRONMENT AS A DETERMINANT OF FORM

Environment is another main contingency variable that gained significant attention through mainly the works by Burns and Stalker (1961) and Lawrence and Lorsch (1967). There are other authors that mention environmental variables (Aldrich, 1980; Emery & Trist, 1965; Katz & Kahn, 1978), but they do not specify the link with form. This leaves the studies by Burns and Stalker and Lawrence and Lorsch as the main original sources to understand the link between

environment and collaborative form (cf. Khandwalla, 1978; Robbins, 1987; Schreyögg, 1986). Burns and Stalker mention as the main variable the dynamics of the environment in terms of rate of change in technology (e.g., rate of innovation) and markets (e.g., demand, competition) (1961). The more dynamic an organization's environment, the more a so-called "organic" form is appropriate, whereas in a stable environment, a so-called mechanistic form is suitable. Using Burns and Stalker's results (1961) and other references to this work (Khandwalla, 1977; Robbins, 1987), Table 3 shows the initial link that can be made between environment, organizational form and collaborative procurement.

Lawrence and Lorsch (1967) added the dimension of diversity (heterogeneity) to dynamics as determining the uncertainty of the environment an organization has to cope with. The more dynamic and

TABLE 3
The Relationship between Burns and Stalker's Model and Collaborative Procurement

Environment	Stable	Dynamic
Organisation	Mechanistic	Organic
Structure	Centralized	Decentralized
Communication and interaction	Formal and Vertical	Informal and lateral
Task specialisation	Strong	Little
Nature of task	Inflexible, rigid, programmed	Flexible, varied
Description of tasks / responsibilities, methods, power	Narrow, precise	Broadly defined, continuous redefinition in interaction with others
Decision making	Authoritarian	Democractic, participative
Influence in organisation	Based on authority, position	Based on expertise, knowledge
Control	Hierarchical	Little (self-management)
Focus of cooperation	Given direction	Exchange of information
Collaborative procurement form	Formal separate organisation	Informal, virtual, self managed by members

heterogeneous the environment, the more uncertainty there is. Uncertainty, influenced by dynamics and heterogeneity, therefore becomes the key variable of the environment that determines form. In a more uncertain environment, they found that organizations require more differentiation and more integration through means other than formal rules, hierarchy and procedures (e.g. using liaison functions, informal interpersonal orientation). In a more certain environment, less differentiation was needed and integration through rules, hierarchy and procedures was required. Although overall they found that more integration supported a better performance, their study showed that the type of integration needed is dependent on the environment and that only then this better fit between form and the uncertainty of the environment may lead to better performance (Khandwalla, 1978; Lawrence & Lorsch, 1967; Robbins, 1987).

The central role of uncertainty has also been recognized by other authors as the core environmental characteristic determining form (Thompson, 1967, Robbins, 1987). When there is uncertainty (due to the environment one is in), there is a gap between information required and information present (Galbraith, 1977). Uncertainty also is known to trigger the process of sensemaking (processing raw signals or data into information) and that in certain (stable) environments routines (cf. standardization) are (or can be) used (Weick, 1995). Uncertainty of the environment requiring information fits with information requirements around buying needs, hence forming a link with the discussion of the technology around buying needs that affect form, which will enable us to make links between the two later in this chapter.

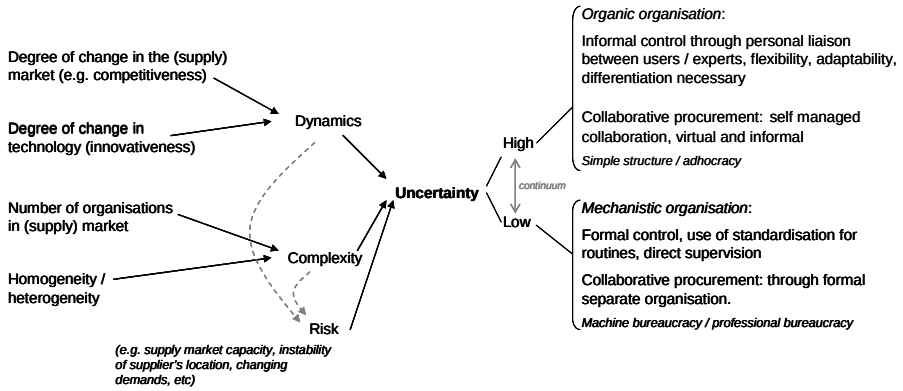
Next to dynamics, Mintzberg (1980, see Table 1) and Robbins (1987) mention environmental complexity as a determinant of uncertainty, complexity being influenced by number of components in the environment (number of organizations, e.g., customers and suppliers) and their heterogeneity (in size, demand, etc). Also related to uncertainty – and influenced by complexity and dynamics – is the phenomenon of supply risk (Kraljic, 1983). A high risk can be due to, for example, a competitive supply market where demand exceeds supply, instability in the supplier's home country, complexity of transportation, changing user demands, or difficulty to compare tenders when there is a lack of standards. The higher the risk, the more uncertain the outcome will be.

In terms of procurement uncertainty, supply markets can be dynamic when new buyers and suppliers enter the market, organisations cease to trade or relocate internationally, suppliers merge, and there are frequent product innovations. Supply markets can be complex when there are many buyers and sellers (e.g., making it difficult to estimate capacity), and when there is a large diversity within buying and selling organizations (different demands, different portfolios, differences in size, turn-over, etc). In terms of Mintzberg's (1979; 1980) organizational forms, when uncertainty is high (in a dynamic environment), a simple structure or adhocracy is suitable (both classified as organic), whereas in a more certain environment, machine and professional bureaucracies are suitable (both classified as mechanistic) (cf. Table 1). In collaborative procurement terms, this can be translated in having self-managed virtual and informal organizations or third party, separate, formal organizations retrospectively. This results in the following picture of influences on uncertainty with implications for collaborative form (see Figure 2).

DEVELOPING AN INITIAL CONTINGENT CONCEPTUAL FRAMEWORK

Organization theory, in particular contingency theory, has provided factors that require a certain organizational form, which are useful for collaborative procurement. Technology can be interpreted in terms of the buying need, which is ultimately what collaborative

FIGURE 2
Environment, Uncertainty and Collaborative Form

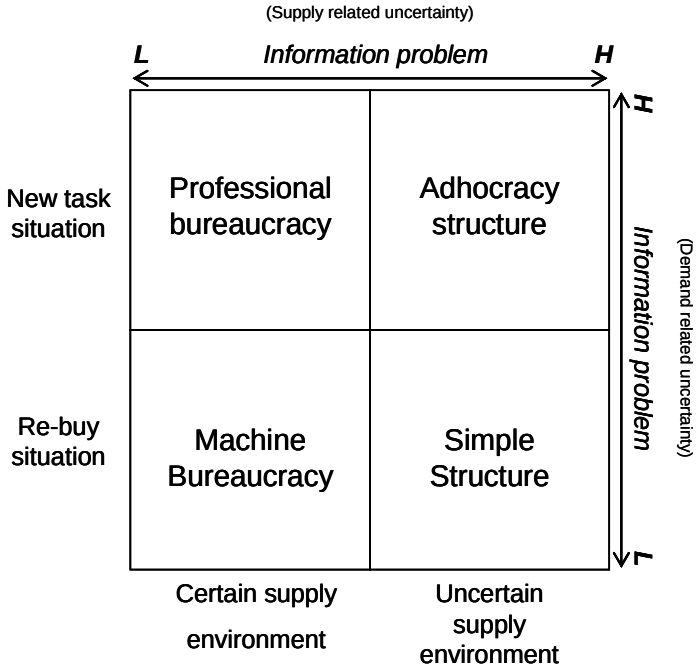


procurement revolves around and provides a "raison d'être." Consideration of environment is appropriate to collaborative procurement since procurement is a boundary spanning function in contact with and is influenced by its environment, mainly and most directly its supply market. The other factors found in collaborative procurement literature do not apply or provide handles on when which collaborative procurement form is appropriate.

To develop an initial contingent conceptual framework, we made a pragmatic decision to strive to condense it into two dimensions. We considered whether the influence of the environment and that of the buying need could be combined. The buying need (around which collaboration takes place) varies in extremes from a new task situation to a re-buy situation. This affects a collaborative form, as different needs have a different degree of uncertainty with respect to satisfying a need. This uncertainty (i.e., demand related uncertainty) is influenced by the complexity of a buying need as it affects the information required to reduce the uncertainty (level and/or amount of information). Uncertainty caused by the environment due to its dynamics, complexity and risk (i.e., supply related uncertainty) also refers to an information problem as it also requires information to reduce uncertainty. This enabled us to combine environmental uncertainty with buying need uncertainty and end up with a 2-by-2 matrix of 4 extreme situations: new task and uncertain environment; new task and certain environment; re-buy and uncertain environment; and re-buy and certain environment.

Our next step was to assess which form aligns with which procurement situation by combining Table 2 and Figure 2, using Mintzberg's forms (1979; 1980). In a new task situation, there are two Mintzbergian-type structural forms possible, the adhocracy form and the professional bureaucracy. Combining this situation with environmental uncertainty, adhocracy only fits with the situation of high environmental uncertainty, leaving the professional bureaucracy form for the situation in which there is low environmental uncertainty. Doing the same for the re-buy situation, the simple structure matches the situation in which there is a high environmental uncertainty, leaving the machine bureaucracy, which fits the situation of low environmental uncertainty. This builds up the following framework (Figure 3).

FIGURE 3
Contingency Factors for Procurement and the Different Mintzbergian-type Structures



Finally, we then sought to combine these different Mintzbergian-type structures (including their main structural characteristics) with the extreme forms of collaboration we found. Also, although not causal contingency factors, we included the other design factors that need consideration in collaborative procurement initiatives such as size, scope, the size disparity of members and the degree of centralization of the procurement function amongst members (c.f. procurement maturity). The integration is set out in Table 4.

IMPLICATIONS FOR PRACTICE AND FUTURE RESEARCH

The framework in Table 4 can be used as a decision-making tool for collaborative procurement initiatives to help decide which form and structural characteristics would be suitable in which situation.

TABLE 4
A Decision-making Framework for Organizing Collaborative Procurement: Different Forms in Different Contexts

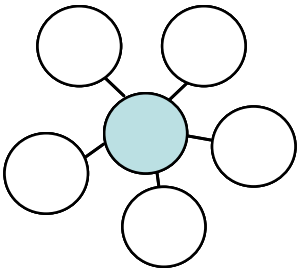
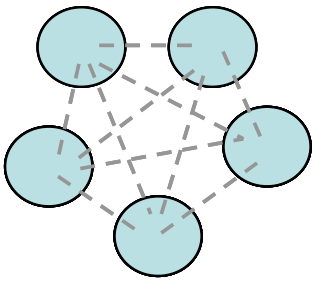
Contingency factors: Environment Buying need complexity Buying need importance	Certain Re-buy Low strategic and low operational	Certain New task Low strategic and medium operational	Uncertain Re-buy High strategic	Uncertain New task High operational
Mintzbergian type structure *(Mintzberg, 1979, 1980)*	'Machine Bureaucracy'	'Professional Bureaucracy'	'Simple Structure'	'Adhocracy'
Key structural characteristics:				
Bureaucratic / organic	Bureaucratic	Bureaucratic	Organic	Organic
Key coordinating mechanism	Standardization of work	Standardization of skills	Direct supervision	Mutual adjustment
Specialisation of job: - Horizontal - Vertical	 High High	 High Low	 Low High	 High Low
Formalisation of behaviour	High	Low	Low	Low
Liaison devices	Few	Some (in administration e.g. data collection)	Few	Many throughout
Decentralization	Limited Horizontal decentralization	Horizontal and vertical decentralization	Centralization	Selective decentraliza-tion (to experts, specialist users)
Collaborative procurement forms: 2 extremes: formally managed through a third party versus self-managed in an informal virtual organisation				

TABLE 4 (Continued)

Collaborative procurement forms	Independent third party, autonomous, responsible for whole procurement process, Agreement with members include penalties and mandatory commitments	Independent third party, member representatives (staff / board) work with third party and influence specifications. No clauses on participation, degree of flexibility. *External lead-buying.*	Informal, virtual. Not all members involved in all stages of procurement process. Few working rules, limited specific role/position to coordinate work. *Internal lead buying. Piggy-backing possible.*	Informal, virtual organisation, members working together during whole procurement process, flexibility, no rules, informal interpersonal relations.
Other 'design' decisions				
Size in number of members	H ← → L			
Size in geographical scope	H ← → L			
Size disparity possible	H ← → L			
Centralisation of procurement amongst members	H ← → L			

Depending on (a) the uncertainty of the environment, (b) the importance of a buying need, and (c) newness of the buying need, a certain form appears to be more appropriate than others. These factors result in either of the two extreme collaborative forms recognized in collaborative procurement literature, with variations within them in terms of key characteristics. Lying outside the framework, but based on the framework and a core competency approach (Prahalad & Hamel, 1990), it can be hypothesized that the less important a buying need is, the more it is a re-buy situation, and the more one deals with a certain environment, the more the procurement of this buying need can be fully outsourced to third parties. On the other extreme, it can be hypothesized (especially in competitive environments) that the more strategic and/or operational important a certain buying need is for an organization and the more one deals with a new task situation in an uncertain supply

environment, the more organizations should not collaborate for this buying need (or at least only to the degree of exchanging information and best practices).

The framework also shows that a one-size-fits-all approach for collaboration is not always the most effective answer. Single organizations that are potential members of collaborative initiatives in general have diverse buying needs, which involve different environments as they are part of many different supply chains. Having different buying needs, dealing with different supply chains, implies that different collaborative forms can be required, resulting in a collaborative form with several sub-forms. This is supported by the findings in the contingency study of Lawrence and Lorsch (1967).

A limitation to the framework is that it has not explicitly taken into account factors that could practically constrain the choice of one of the ideal forms. Constraints to setting up a separate organization could include the following: when the set-up and coordinating costs are higher than the potential benefits from installing a central body, when suppliers do not have the capacity to deal with a larger consolidated demand, or when there is no member and executive commitment/support. Constraints to keeping collaboration localized are: when local members do not have the knowledge/expertise or capacity (resources) to deal with complex purchases or gain information in dynamic markets. This is a second step to developing our model further.

Although further research is needed, this chapter provides an initial conceptual framework built on empirical work of others and established theories. As we present a generic framework, the inescapable limitation is that it is a somewhat simplified abstraction of reality for assessing which form is most suitable, based on few environmental characteristics and ideal types. There will be collaboration initiatives that are likely to use hybrid forms, but following Mintzberg (1980), we claim that some sort of configuration will be preferred to create consistency between the internal elements and the environment. The framework we designed can be used as a diagnostic tool in the design of collaborative procurement. Although the framework seems static and does not explicitly deal with the evolution or growth of collaborative forms, it does not deny this. We believe that as collaborative initiatives evolve, they can do so as the context changes (e.g., a new task turns into a re-buy, or industry

standards are reached). This allows using the framework in dynamic situations when looking at the situation at different moments in time.

In future research, we propose to test this framework by looking at different collaborative initiatives, their form, enablers and constraints of this form, and whether these differ for different buying needs and/or environments. Also, future research should look at whether the forms that fit their contingency factors as proposed in the framework are performing better than those that do not fit their circumstances. Further, attention should be paid to how and why collaborative forms change over time and how the framework can be used in dynamic situations. Finally, future research should focus on procurement-specific filling in of the structural details in different situations and pay attention to the factors that determine environmental uncertainty related particularly to procurement.

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