Operationalisation and antecedents of trust in business networks
dealing with complex products and food products

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Operationalisation of Trust in Business Networks Dealing with Complex Products and Food Products

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Abstract

Until today no tool exists which allows adequate measurement of trust and its antecedents in food-networks. The application of existing tools is not really appropriate, since studies concerning the operationalisation of trust show that the antecedents influencing trustworthiness differ depending on the considered industry and the number of trust dimensions. Therefore the goal of this paper is to develop a new measurement tool (including operationalisation and antecedents) of trust in food networks based on the use of qualitative and quantitative empirical methods. First of all, the present literature on operationalisation of trust will be tested concerning what can be used in business networks. Further to this, existing studies will be surveyed to determine if the specification of the construct trust was formative or reflective and what would be the correct design of a study for business networks dealing with complex products. Finally, the results from the interviews with experts from food-networks about antecedents of trust are summarized to specify the measurement tool of trust.

Introduction

“Trust is good, control is better” is a typical slogan in society. But trust in food-networks plays a very important role. The quality of food is associated with health and therefore one of the most important preconditions of life. Even with controls there were some scandals in the past, like the wrongly priced organic products or the meat scandal in December 2005. Consumers react very sensibly to such food “scandals” and it lasts quite a few months until the consumer begins to build up trust in the produced food again, as seen in the consumption of beef after BSE (Bovine Spongiforme Enzephalopathie) was discovered. But trust is not only important in business to consumer (B2C) relations; there is a clear necessity and economic advantage of trust in business to business (B2B) relationships as well. Trust along with commitment in B2B relationships is a key-factor to cooperative behaviour essential for efficient and long-term interfirm alliances, especially in “sales management”, “channel management” and business networks (Morgan and Hunt 1994, Ganesan 1994, Selnes 1996). Existing research in this area primarily attempts to understand how trust between a seller (supplier firm) and buyer develops. The focus of this paper lies on B2B relationships.

So trust takes a lot of attention in B2B relationships in food-networks and it is worth taking a deeper look in to how trust can be measured as a not observable variable, a so called construct. The measurement discloses possibilities to facilitate B2B relationships to be more efficient. The idea of this paper is to detail the main aspects of trust: Concept and definition of trust, levels of trust in B2B, dimensions and measurement of the trust construct, formative and
reflective specification, and antecedents of trust. Afterwards the antecedents will be specified for the food network business, as these are the variables which can be influenced by the trustee and demonstrate main factors to accelerate an efficient and long-term relationship. This paper aims to build a new measurement tool of trust in food-networks.

**Concept and definition of trust**

The concept of trust is recognized in different research areas like psychology, sociology, or economics (Rotter 1971, Deutsch 1973, Larzelere and Huston 1980, Moorman et al. 1992, Dahlstrom and Nygaard 1995, Doney and Cannon 1997). There are many definitions of trust based on Rotter who said trust is "a generalized expectancy held by an individual that the word of another … can be relied on" (Rotter 1967, p. 651).

Trust can be separated into generalised and specific trust (Mayer et al. 1995). Generalised trust means a general tendency of trust. In this case trustworthiness is independent from a specific object of trust. Specific trust in contrast depends on the interaction partner. Marketing researches focusing on social behaviour concentrate on specific trust.

Trust in literature is placed into the behaviour under risk context (Mayer et al. 1995). Risk arises in situations of asymmetric information (Whinston et al. 1997). One partner (trustee) has more information than the other (trustor). So trust is a single-sided social behaviour. The trustor must rely on the information the trustee communicates. To reduce the received risk the trustor has the possibility to process signals or control the trustee, but in some branches signals don’t exist or controlling the interaction partner is quite costly. Trust reduces the perception of risk. Beside that it also increases the confidence that short-term inequities will be resolved over a long period, and reduces transaction costs in an exchange relationship (Ganesan and Hess 1997).

**Levels of trust in B2B relationships**

Ganesan and Hess (1997) describe four levels of trust in organizational relationships: 1. the interpersonal trust which can exist between an individual buyer and the sales representative, 2. interorganizational trust, which includes the buyer and the sales representative, can have different levels of trust in the selling and the buying organization, or trust which can exist between a buyer and the buying organization, and a sales representative and the vendor organization, 3. intraorganizational trust, which means the trust between an employee and an employer (e.g. McAllister 1995), and 4. trust between organizations.

Within this paper, the focus lies on the first two types of trust – the interpersonal and the interorganizational trust. The main significant contributions to the trust construct (economic view) can be found in studies of interorganizational relationships (Ferrero 1992, Castaldo 1994, Blois 1999). The intraorganizational level is not important for B2B relationships, because there is no business partner involved. Trust between organizations is always linked to interorganizational trust, because organizations are a group of individuals, so there are always people who communicate between the organizations (Larson 1992, Ganesan and Hess 1997).
Dimensions and measurement of the construct trust

For the operationalisation of trust it was necessary for all authors to refine the original definition of trust from Rotter (1967), because trust as a latent construct can’t be observed by one variable. So the first step is to develop a concept of measurement of the latent construct, that means that the researcher has to decide how many dimensions or indicators determine or reflect the construct trust. This concept of measuring developed in the last years from unidimensional (Larzelere and Huston 1980, Rempel et al. 1985, Anderson and Narus 1990, Moorman et al. 1992/1993, Morgan and Hunt 1994) to multidimensional (Ganesan 1994, Geyskens et al. 1996, Nielson 1997, McKnight et al. 2002). The number of dimensions and the need of multidimensional measurement were discussed in several papers (Ganesan 1994, Selnes 1996, McKnight et al. 2002). Ganesan (1994) argues that a multidimensional approach provides greater diagnosticity, because more dimensions give a better definition of the word trust, with respect to the effect of trust on long- and short-term orientation. Although this is a strong argument, researchers still use a unidimensional trust conceptionalisation in current studies. The main reasons for using a unidimensional measurement seems to be the goal of the paper. If the goal of the paper is the measurement of the construct trust, researchers try to refine the operationalisation and thus the dimensions of the construct trust (Ganesan 1994, Geyskens et al. 1996, McKnight et al. 2002). If the goal is to build a structural-model instead which includes antecedents and consequences of trust, trust is treated more often as a unidimensional construct (Anderson and Weitz 1989, Moorman et al. 1993, Morgan and Hunt 1994, Dahlstrom and Nagaard 1995, Selnes 1996, Doney and Cannon 1997). The following figure shows examples from uni- to multidimensional constructs. The number of the observable variables or items depends on the theoretical framework.
Summarizing we may state that there was a development from one to three dimensions of the trust construct. But even if there was this development still current literature is conceptionalizing trust by one (Larzelere and Huston 1980, Selnes 1996, Zaheer et al. 1998), two (Ganesan 1994, Gyskens et al. 1996) or three dimensions (McKnight 2002).

In food-networks the construct trust can be treated as uni- or multidimensional. There is no specific condition which provides the number of dimensions. So the number of dimensions is independent from industry. But generally it can be said, that more dimensions provide a greater accuracy with respect to the definition. Another reason why trust in food-networks should be treated three dimensionally is highlighted in McKnight et al.’s article (2002). They researched all relevant articles and books in which trust was operationalized or mentioned from 1960 to 1996. In total they found 15 variables all of which were outlined in the literature. Three out of 15 trusting beliefs have been identified as the main variables (Bhattacherjee 2002, Gefen 1997, Mayer et al. 1995): Competence which means the ability of the trustee to do what the truster needs, benevolence which means that the trustee’s caring and motivated to act in the truster’s interests, and integrity which implies the trustee’s honesty and promise keeping. Considering that the difference between many of the types was small, they used conceptual clustering to group them under the three variables competence (competence, expertise, dynamism), benevolence (benevolence, goodwill, responsiveness), integrity (integrity, morality, credibility, reliability, dependability), and they particularly do not include predictability, openness, carefulness, attraction. In their measurement model, results with three trust dimensions were
better, than models with one or two trust dimensions. All three dimensions of McKnight et al. (2002) – competence, benevolence and integrity – play an important role in the food-networks. All firms must be “competent” in their field, because producing quality is one of the key factors in food-networks. Benevolence as a trust dimension is analysed by all authors as a main dimension measuring trust multidimensionally (Ganesan 1994, Gyskens et al. 1996, McKnight 2002) and therefore also relevant for food-networks. The last dimension integrity is linked to credibility, dependability, reliability and morality (McKnight 2002). All these variables are essential in B2B relationships in food-networks. So a three dimensional trust construct in food-networks seems to be the best.

Having chosen the numbers of dimensions, the latent variables, i.e. competence, benevolence, and integrity must be operationalised. A bundle of items or observable variables must be found, which reflect or determine these latent variables. Adequate items to measure credibility would be e.g. “The buyer representing the retailer is knowledgeable about the product”, “Promises made by the buyer representing this retailer are reliable”, and “The buyer representing this retailer has problems understanding our position (R)” (Ganesan 1994). A latent construct or variable can be specified reflective or formative.

**Formative and reflective specification of latent variables**

In both approaches researchers investigate observable variables to determine (formative specification) or reflect (reflective specification) the latent variable or construct (Bookstein 1982). The main specification of constructs in literature is reflective, because in this approach researchers can test the measurement model through a goodness of fit index.

In a reflective specification the construct is the cause for the indicators (observable variables). A reflective measurement implies that the observable variables are a consequence of the construct. If the latent variable is i.e. “drunkenness”, the observable variables would be “to have a boozly breath”, “to babble” or “to see double” in a reflective measurement model. All these observable variables are a consequence of the latent variable “drunkenness”. An adequate method would be factor analysis in this case. An amount of observable variables is chosen for the measurement of trust. These variables are aggregated to a factor (Edwards and Bagozzi 2000). The variables should correlate strongly and the factor loadings should be high, so that the original information/variance of the variables is nearly the same than the information after the aggregation representing the factor. To test the present factor model performance index like correlations of coefficients, Bartlett-test, anti-image, KMO-Criterion, F-Value, cronbach’s alpha or t-value can be used. After this approach variables with low correlations are taken out of the model and the new bundle of observable variables is tested. In the end highly correlated observable variables like “knowledge about the product”, “promises made” are aggregated to the factor i.e. credibility (fig. 1).

The concept of formative specification was developed in the past years (Fornell and Bookstein 1982, Jarvis et al. 2003). In contrast the indicators (observable variables) cause the latent construct. The indicators of the construct can be independent, because the variables are the one which cause the construct (Eberl 2004). In the example “drunkenness” the observable variables would be “account of wine”, ”account of beer” etc.. When applying formative measurement it is necessary to sum up all relevant variables, which sufficiently determine the
Latent construct. There are quite a lot of constructs (in particular attitude) depending on the context, which can be specified formative and reflective (Rossiter 2002). Looking at the methods existing so far which were used to operationalise trust, clear stress can be found on a reflective construct specification (table 1).

**Table 1.** Studies about the specification and operationalisation of the trust construct

<table>
<thead>
<tr>
<th>Authors</th>
<th>Interpersonal</th>
<th>Interorganizational</th>
<th>Dimensionen</th>
<th>Number of items (indicators of variables)</th>
<th>Used Method and values</th>
<th>Formative/Reflective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rampel and Holmes (1986)</td>
<td>x</td>
<td>x</td>
<td>Unidimensional</td>
<td>1. Interorganizational Trust 2. Interpersonal Trust</td>
<td>1. 5 items 2. 5 items</td>
<td>Cronbach’s alpha reflective</td>
</tr>
<tr>
<td>Anderson and Weitz (1989)</td>
<td>x</td>
<td></td>
<td>Unidimensional</td>
<td>2 items</td>
<td>Correlation matrix, t-values</td>
<td>Reflective</td>
</tr>
<tr>
<td>Crosby, Evans, Cowles (1990)</td>
<td></td>
<td></td>
<td>Unidimensional</td>
<td>9 items</td>
<td>Cronbach’s alpha</td>
<td>Reflective</td>
</tr>
<tr>
<td>Moorman, Deshpandé, Zaltman (1992)</td>
<td>x</td>
<td>x</td>
<td>Unidimensional</td>
<td>5 items</td>
<td>Cronbach’s alpha</td>
<td>Reflective</td>
</tr>
<tr>
<td>Moorman, Deshpandé, Zaltman (1993)</td>
<td>x</td>
<td>x</td>
<td>Unidimensional</td>
<td>5 items</td>
<td>Cronbach’s alpha</td>
<td>Reflective</td>
</tr>
<tr>
<td>Morgan and Hunt (1994)</td>
<td>x</td>
<td></td>
<td>Unidimensional</td>
<td>7 items</td>
<td>Cronbach’s alpha</td>
<td>Reflective</td>
</tr>
<tr>
<td>Dahlstrom, Nagaard (1995)</td>
<td>x</td>
<td></td>
<td>Unidimensional</td>
<td>5 items</td>
<td>Cronbach’s alpha, Factor loadings</td>
<td>Reflective</td>
</tr>
<tr>
<td>Geyskens, Steenkamp, Scheer, Kumar (1996)</td>
<td>x</td>
<td>x</td>
<td>Multidimensional</td>
<td>1. Supplier Benevolence 2. Supplier Honesty</td>
<td>5 items</td>
<td>Composite score, Cronbach’s alpha, t-values, F-values</td>
</tr>
<tr>
<td>Selnes (1996)</td>
<td></td>
<td>x</td>
<td>Unidimensional</td>
<td>Single item</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ganesan (1997)</td>
<td>x</td>
<td>x</td>
<td>Multidimensional</td>
<td>1. Interpersonal Credibility 2. Interpersonal Benevolence 3. Organizational Credibility 4. Organizational Benevolence</td>
<td>1. 7 items 2. 6 items 3. 4 items 4. 4 items</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>Nilson (1997)</td>
<td></td>
<td>x</td>
<td>Unidimensional</td>
<td>3 items</td>
<td>Factor loadings, Coefficient alpha, t-values</td>
<td>Reflective</td>
</tr>
<tr>
<td>Doney, Cannon (1997)</td>
<td>x</td>
<td>x</td>
<td>Unidimensional</td>
<td>8 items + 7 items</td>
<td>Cronbach’s alpha</td>
<td>Reflective</td>
</tr>
<tr>
<td>Smith, Barclay (1997)</td>
<td></td>
<td>x</td>
<td>Multidimensional</td>
<td>1. Mutual Perceived Trustworthiness 2. Mutual Trusting Behaviors</td>
<td>1. 5 + 4 + 3 items 2. 3 + 2# + 4 items</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>Zaheer; McEvily, Perrone (1998)</td>
<td>x</td>
<td>x</td>
<td>Unidimensional</td>
<td>1. Interorganizational Trust 2. Interpersonal Trust</td>
<td>1. 5 items 2. 5 items</td>
<td>Cronbach’s alpha</td>
</tr>
<tr>
<td>McKnight, Choudhury, Kacmar (2002)</td>
<td></td>
<td>x</td>
<td>Multidimensional</td>
<td>1. Competence 2. Benevolence 3. Integrity</td>
<td>1. 4 items 2. 3 items 3. 4 items</td>
<td>Factor analysis</td>
</tr>
</tbody>
</table>

All researchers in the shown studies specified the construct trust reflectively. Only Geyskens et al. (1996) try to build in a first step index, which could be interpreted as a formative specification. But in the second step the authors used a factor analysis which deduces a reflective specification. The fact, that someone trusts the other partner is mainly a psychological issue. For a formative measurement it would be necessary to find all sufficient psychology variables which determine trust. One psychology variable of measuring trust is the affection of trust of a partner (Mayer et al. 1995).

Summarized it can be said, that interpersonal and interorganizational trust has been measured reflectively only. Beside the possibility in reflective specification of performance indices to optimise the measurement tool, there is no apparent reason for a formative specification of the trust construct. The only risk which exists when a construct that should be theoretically measured as formative is, in reality, measured as reflective. Through the approach of taking out low correlated variables, some relevant variables might be not recognized in the measurement model of trust and the results of measuring are wrong.
Trust is treated as a one to three dimensional and reflective specified construct. This conceptualisation and operationalisation of the construct trust is independent from the industry. For this reason the antecedents of trust give a clue for a sectoral adjustment of the measurement tool for food-networks.

The antecedents of trust

Antecedents are of special interest in economy to increase trust. They help to leverage more efficient B2B relationships. Prior studies have analysed quite a lot of interorganizational and interpersonal trust drivers like communication, cooperation, support, goal congruence, culture similarity, age of relationship, power imbalance, reputation, shared values, opportunistic behaviour, competence/expertise, satisfaction, experience, characteristic like likeability, similarity of trustor and centralisation and formalisation (Anderson and Weitz 1989, Anderson and Narus 1990, Moorman et al. 1993, Morgan and Hunt 1994, Dahlstrom, Nagaard 1995, Selnies 1996, Ganesan 1994, Doney and Cannon 1997). The following three antecedents were most often used in these studies.

Satisfaction with the gained or perceived quality of the product or service was one main driver of trust. Satisfaction is very close to the expression experience, which was also used in studies concerning trust measurement. Having made good experience with the business partner in a B2B relationship leads to satisfaction. The duration of a relationship can be implicated with “made experience” and “satisfaction”. The frequency of made satisfied experiences over the time is one important antecedent for increasing trust.

Second antecedent is communication. Anderson and Narus (1986) see meaningful communication between firms as a necessary antecedent of trust. There is a deep link between communication and trust. Trust causes communication (Dwyer et al. 1987), but communication leads also to trust (Anderson et al. 1987). So communication is an iterative process which is an antecedent and a consequence of trust.

Competence of the business partner demonstrates the third most important antecedent. This variable was used as well for one dimension of measuring the construct trust (McKnight 2002) as for an antecedent of trust (Selnies 1996). Competence will be treated as dimension of trust like McKnight (2002) in this paper (fig. 2).

To specify the measurement tool for the food network industry a qualitative interview with experts from food-networks was held to find out more about the antecedents of trust in such networks.

Method

Experts from the food industry were interviewed by phone. The interview guide was semi-structured and structured in three parts. The first part was an introduction into the theme trust, when trust appears in B2B, and at what level trust is important in B2B-relationships etc. Questions in the second part were about products, the firm and the process chain where the firm belonged to. The questions of the third part focused on the measurement of the construct trust and the antecedents of trust especially in food-networks. The duration of the interview was about 30 to 45 minutes. For every process chain of the food-network one expert was interviewed, agriculturist (producer of raw materials), fabricator (producer of complex
products), and salesperson (selling of goods). All the answers where compared to the current literature about operationalisation of trust.

**Results about trust in B2B relationships in food-networks**

Unsurprisingly the understanding of the construct trust was identical to the current measurement in the literature. All three dimensions of McKnight (2002) were associated with trust in the food-network industry. There were no further clues to diversity the dimensions of the latent construct trust.

But in contrast to these findings the discussion about the drivers or antecedents of trust gives new insight into the main drivers especially in food-networks. Trust in food-networks plays an important role for perishable product or raw materials.

The researched antecedents – through the expert interview - could be compared to their relevance for food-networks to see if they should be taken in the measurement model. The duration of a relationship is an important driver but not a sufficient one. Positive experience with a partner over a long time leads to build up trust, but is not a 100% indicator for trusting the other one. Dealing with foods is such a sensible theme that trust alone is not sustainable.

Communication is a necessary fact which helps to build up trust, but is also no sufficient indicator for trust. A further beneficial driver is the existence of a common goal, because all firms belong to the same process chain. And if one partner doesn’t deliver a good quality the whole process chain is at risk. Reputation or word of mouth propaganda is not so important a variable between the B2B process chains according to the experts. Reputation gets more important in the B2C business.

There were some possible new antecedents identified. The technical standard (new machines) was identified as a possible new driver which leads to more trust. Press relations were also a further antecedent which should be allowed for the measurement of trust. Whether the size of a company leads to more trust was discussed contrariwise by the respondents. On the one hand the more personal communication was a driver for building trust, on the other hand bigger firms guarantee a high quality standard. They have more power about getting high qualities from producers, because the producers are dependent on the bigger firms. The interesting research on this driver would be, if in the first step there is a significant relationship between size and trust and in the second step if there is a medium-size which “stucks in the middle”.

The argument most frequently mentioned was “control”. Food is such a sensible theme that everything which can be controlled is controlled. All the interviewees say trust is very important in food-networks, but considering that every little error can initiate a disaster like BSE, everything must be controlled. There are extremely high control standards of product qualities, compliance with hygiene, and packaging of products of the B2B partner. Controls are carried out by the relationship partner personally or by an institution, announced or not announced. As soon as a scandal appears, more severe controls appear. To decrease misconduct high penalties must be paid, if the contracted quality is not delivered. There are quality signals like certifications or environment obligations. The question is, if control can be seen as an antecedent. If business partners trust each other, normally there shouldn’t be the
need for controls. Or if, like in food-networks, a lot of controls appears, this could be a sign for not trusting the business partner. Even if trust exists between the business partners, failures can happen without any harmful thoughts. Controls are a kind of protection for both sides, to enforce that a high quality standard is proven. But controls can indeed been seen as an antecedent of trust, when the controls take place in the prior process chain. Having quality certificates of the business partner or the knowledge that the partner is controlled by i.e. an institution, controls increase trust in the business partner. The firm HIPP i.e. tries to increase trust through their slogan on the web-site: Our products with organic food is more controlled than the law dictates. So this fact should be taken in the model as an antecedent under the expression “controlled partner/product”.

**Figure 2.** proposed measurement model for trust in food-networks

Following antecedents should be recognized in the trust measurement in food-networks: Age of relationship/experience, communication, goal congruence, technical standard, public relations, size of firm, and controlled partner or product. The decision how the specification of the antecedents should be – reflective or formative – is not described in this paper. The number of the observable variables depends on the theoretical requirements. Table 1 gives an indication of how many items (observable variables) where used for the operationalisation of trust.
Summary

The goal of this paper was to build up a new measurement tool for food-networks. Trust in food-networks can be treated like a one to three dimensional reflective specified construct. Antecedents of trust are drivers for business partners to increase trust to establish a more efficient relationship to reduce costs and save time. Besides antecedents of trust in the current literature more drivers were analysed, which have a possible influence on increasing trust. A proposed model for food-network is demonstrated. Interesting aspects would be to measure how strong the new discovered antecedents act on the development of trust. Further study design should focus on situations, when trust was abused to get more information, if trust can be built up again and what are the main antecedents in this case. Thinking of a new catastrophe like a coming bird flu for chicken farmers, it is not possible to anticipate all “rotten apples”, but it is possible to emphasise the drivers which build up trust again.

References


