A Network Based Approach to Customer Equity Management

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Abstract

The customer equity concept has attracted substantial interest from academics and practitioners during the last years. While direct drivers of customer equity such as customer transactions, cross- and up-buying behavior have been well understood and researched, indirect effects, and in particular social network effects have been ignored, although it is well known that brand community influence, word of mouth communication and other social effects are powerful influencers of buying behavior and should thus not be ignored in customer management. Thus, we propose that the customer equity perspective should evolve into a customer network equity perspective. In the following, we develop and present a theoretical framework for extending current thinking on customer equity towards the network perspective. In particular, we derive, based on the social network literature, characteristics that are likely to be powerful predictors of a customer's network value. We make propositions for future research and highlight practical implications.

Keywords:

Customer Equity, Customer Network, Customer Lifetime Value, Community, Word of Mouth

A Network Based Approach to Customer Equity Management

Customer relationship management has been the dominant paradigm in marketing over the last twenty years (Iacobucci 1994). The relationship marketing approach emphasizes that firms should have a long term perspective on their customers. Hence, marketing theory and practice have very much concentrated on a *dyadic* understanding of supplier-buyer exchange processes.

The *dyadic relationship marketing concept* has unquestionably represented an important development as compared to the product- and transaction-oriented perspective that had been dominant during the 1960s and 70s, but it also has its limitations. In particular, the relationship marketing literature widely neglects the fact that consumers are consciously or unconsciously connected to each other. Recent research has demonstrated the increasing importance of consumer-to-consumer interaction for customer behavior (Martin & Clark 1996; Muniz & O'Guinn 2001; McAlexander et al. 2002; Algesheimer et al. 2005). Apart from the few exceptions of research on information diffusion processes, on recommendation behavior (Wangenheim & Bayón 2006), on the embeddedness of buyer-seller transations in social relationship (Frenzen & Davis 1990; DiMaggio & Louch 1998; Wathne et al. 2001), or on the effects of customers on other customers at the POS (Grove & Fisk 1997), little research has considered the consequences of interconnectedness between customers.

One important development in relationship marketing is the notion that not all customer relationships are equally profitable for firms, and thus firms should concentrate their relationship marketing efforts on high-value customers. Thus, it is of central importance for firms to derive predictions about their customers' lifetime value (CLV), which is defined as the discounted cash

surpluses generated over the customer lifecycle. By focusing on increasing their customers' CLVs, firms can increase their customer equity (CE), which is the sum of all CLVs and represents marketing's contribution to the financial performance of the firm. However, current approaches to customer equity management (CEM) are based on the dyadic understanding of supplier-buyer relationships implied by the relationship marketing concept, and the effects of customer networks have not been integrated into CLV models. In other words, CE models typically assume their customers' CLVs to be independent of each other. To understand how network effects of this kind may affect customer equity, consider the following two examples:

A long term, loyal and high value customer (i.e., high individual CLV) customer of firm X, becomes a member of brand community x. He actively participates in the community's activities, but because he is making offensive statements and claims, the BC subsequently loses members. This might have a negative impact on the customer's loyalty to the firm, too. Although his individual CLV is highly positive, customer equity (i.e., the sum of all customer's CLVs) of the firm is reduced by acquiring this customer.

A brand community member of firm Y conducts few transactions with the firm, since her disposable income does not allow for more. However, she is a strong supporter of the brand and takes a lot of responsibility within the brand community and supports it growth and its member's commitment. Although her individual CLV is low or even negative, customer equity (i.e., the sum of all customer's CLVs) of the firm is increased by acquiring this customer.

With these examples in mind, it is clear that in the presence of network effects, current approaches to calculate and manage CLV and CE fall short on accounting for interdependence of customer's behavior. This article investigates a network approach to customer equity (CE)

management by integrating the notion of consumer networks and brand communities into customer profitability considerations. Thus, we extend the CE literature by developing a conceptual model for accounting for network effects in CLV determination and giving recommendations on how to capture them empirically. Conversely, we extend the social networks literature by demonstrating how network effects can be quantified.

The remainder of the paper is structured as follows. First, the development from a transactional via a relational to a network perspective and its implications for customer management is discussed. Next, we briefly introduce the network marketing approach, and how it differs from relational and transactional marketing perspectives. Then, a conceptual framework for integrating the network perspective into customer equity is developed and subsequently, research propositions are developed. Drawing from this conceptual framework, we highlight practical implications and identify promising future research opportunities for a network-based approach to customer equity management.

From Sales Marketing via Relationship Marketing to Network Marketing

Marketing in the *industrial age* focused on the settlement of sales. This *transaction orientation* was driven by a seller's market and information asymmetries. Based on market data, companies dealt extensively with the universal market, with the focus on winning consumers as customers. Companies tried to gain economies of scales by mass production in order to increase market share and customer sales in the short run. "Information exchange between firms and their customers was one-sided, expensive, and inefficient. As a result, customers were ill-informed, information was marketer-controlled, and exchanges marketer-initiated" (Sawhney & Kotler

1999, p. 386). Sellers were not interested in individual buyers, because there existed more demand than supply. The relationship between buyer and seller was anonymous. Market transactions were standardized. Production and consumption were treated as separated processes.

With increasing supply, glut has emerged. As a consequence, neither procurement nor production has continued to constitute the market's bottleneck, as was the case in the industrial age. In this kind of buyer's market, sales are the new bottleneck. Thus, the business mentality, understood as the way of developing a culture towards business partners, has changed from the "one-to-all" mentality of the transactional perspective towards a "one-to-one" mentality. Marketing has refocused its view into a *relational orientation* concentrating on the individual long-term exchange relationship with a specific partner. Based on information derived by interactions, the company's objectives are directed towards integrating and tying customers to the firm, in order to increase customer profitability in the long run. As a consequence, organizations are interested in satisfying their customer's needs, and not only in the settlement of sales. The consumer acts as "prosumer", and wants his needs and suggestions to be realized. Furthermore, he demands relevant information to be shared, consumes and gives feedback, or makes complaints to the firm. It can therefore be stated that production and consumption exert an influence over each other.

All in all, both the transactional and the relational marketing perspective always argue from a dyadic perspective between two business partners, in this case a buyer and a seller. Furthermore, the traditional marketing perspective presupposes "…that value for the consumer is materialized in the prescribed benefits of product attributes being offered, and that it is this value which results in consumer satisfaction" (Firat & Shultz II 1997, p. 187). In contrast, the network perspective integrates the relations customers share with their network into the perspective (Achrol & Kotler 1999). Thus, the unit of analysis changes from being the single market exchange incident

(transactional) via the customer relationship (relational) to the customer's network (network perspective). In the following, we will briefly introduce the network perspective and develop theoretically grounded research propositions that should extend current thinking in customer equity management (which to date is also dominated by the relational paradigm) to incorporate network effects.

The Network Marketing Approach

The concept of *social networks* has been developed by social scientists to characterize the structure of relational ties between a set of actors (Burt 1980; Wasserman & Faust 1994). A *structure* is the patterns of who is connected to whom. *Actors*, sometimes called nodes according to graph theory, can be individual (e.g. human, role-specific, or automated electronic agents), or collective (e.g. organizations or groups) social units that are source integrators (e.g. someone who receives an advice), gatherer (e.g. a catalogue), or sender (e.g. someone who gives an advice). An actor is called *ego* if the actor is the focal node. Nodes that surround an ego are called *alters*. A link that connects two actors is called *relational tie*. The ties' attributes determine its *type*. Thus, ties can be directed (e.g. giving advice to someone), or undirected (e.g. physical proximity to your neighbour), dichotomous or not (e.g. kinship) (Borgatti & Foster 2003). Ties can be interpreted as channels for the transfer of resources (e.g. money, goods, support or information), and be valued by their *strength*. They ties' type and strength constitute its dyadic *social relation*. It is assumed that different types of ties function differently, e.g. being in a central position in a "who is related to whom" network is different from having a central position in a "who has conflict with whom"-network. A node's network activity is measured by using the concept of *degrees* that are the number of direct connections a node has. Overall, networks are

seen as defining the actor's environment or context for action and provide opportunities and constraints on behaviour (Borgatti & Foster 2003). Thus, social networks view actors as embedded in a relational system and their characteristics as being determined (facilitated or restrained) by their structural environment. The advantages of network analysis is that it is possible to not only examine macro level effects (e.g. research on network structure, change and stability), or micro level effects (e.g. individual goal attainment), but also mixed level effects (e.g. the relevance of network structure on individuals' motivation to recommend something).

Compared to traditional business-to-consumer perspectives, the network approach asks for a business-to-(consumer-to-consumer) perspective. This implies that characteristics of the discrete, relational and network treatment of marketing exchanges need to be integrated. Thus, we explain the different ideas that drive those perspectives, the assumptions made by the organizations, the objectives formulated by the organizations, and the nature of communication, production, and consumption.

As analyzed before, the traditional *discrete view* takes on a 'one-to-all' mentality, where the universal market is treated as a whole. Market transactions, which are directed towards geographically separated marketplaces, are standardized and regarded as discrete events. Marketing therefore has a focus on sales. Communication is soliloquized and anonymous. Organizations only share such information with consumers they are interested in. The objective is to reach economies of scale by mass production in order to increase market share and customer sales in the short run. As production and consumption are separated processes, producers have to make sure that they stay in the mind of customers. This is probably best done by price leadership or outstanding brands.

The *relational perspective* can be understood as 'one-to-one' mentality, where organizations concentrate on individual relations with exchange partners. Marketplaces are geographically connected. As a consequence, market transactions have to be customized so that consumers are able to compare value for money in different marketplaces. The objective is to increase customer rentability in the long run by attracting new customers, re-winning lost ones, but especially by retaining existing ones. Communication is therefore one important instrument that works in an interactive and individualized way. Production aims to integrate customers' needs into the very early steps of product design. Thus, consumers want their suggestions to be realized, and they demand relevant information, consume, give feedback or make complaints. Production and consumption are therefore mutually influencing processes.

Out of a *network* perspective, networks are perceived as "formal governance structures" (Achrol & Kotler 1999) that represent a legitimate alternative to markets or hierarchy instead of studying them as informal social structures (Galaskiewicz 1996). Thus, the embeddedness factor is the concept that differentiates a network from economic theories of organization (Granovetter 1973). Achrol and Kotler (1999, p. 148) defined a network organization as "an interdependent coalition of task- and skill-specialized economic entities… that operates without hierarchical control but is embedded, by dense lateral connections, mutuality, and reciprocity, in a shared value system that defines 'membership' roles and responsibilities". They distinguish between internal, vertical, intermarket and opportuniy networks. Within this article, we focus on opportunity networks that are not only organized around customer needs and market opportunities, but that are often founded by the customer itself. Those customers are involved in a social relationship with the company, because the product is an important part of their life, something they identify themselves with, and because of that they receive self-esteem and satisfaction. Thus,

organizations are confronted with interacting and powerful consumer networks. They therefore wish to serve consumers individually, but within their individual consuming environment, and focus on the consumer's need for social approval. This 'one-to-one-in-all' mentality represents the idea of continuously concentrating on customized exchange relations to each customer and specific opinion-leading consumers, while obeying, analyzing and cultivating their social interconnections with fellow consumers. The objective is to increase brand awareness, market share and network profitability (as opposed to customer profitability) in the long run by focusing on the integration of consumers as pro-sumer and advocate. Communication concentrates on customized interactions as well as on indirect stimulations of consumer networks. Production interacts with cohesive consumer networks and reference groups trying to integrate lead users' needs into product and communication strategy. Organizations want to understand production and consumption as an integrated process, but consumer networks independently act and set the tone in the market. Table 1 summarizes the most important aspects and offers an overview of the existing marketing perspectives.

(Table 1 about here)

After this comparison of traditional dyadic b-c views with the network b-(c-c) perspectives, we will use our findings to deduce research and managerial implications for dealing with consumer-to-consumer interactions as described above.

Enhancing Customer Equity Models to Incorporate Network Effects

What are the implications of adopting a network perspective for customer equity modeling and management issues? The customer equity and lifetime value literature focuses on customer

lifetime value and profitability as the key figure to maximize (e.g, Rust et al. 2004). Current published research suggests that customer equity is the sum of all customer lifetime values (CLVs) (e.g., Gupta et al. 2004). However, such a perspective does not take network effects into account. When one customer's behavior affects other customers' purchase behavior, her economic worth from the companies' point of view may be much different from her CLV: So far, we are only aware of two studies that attempt to link word of mouth effects (WOM) to customer profitability (Hogan et al. 2004; Wangenheim and Bayón 2006), but even those studies fall short on a network perspective by restricting themselves to WOM. Network effects, as explained above, can be relevant for customer profitability in a number of ways. First, as just mentioned, WOM effects have to be included, because some customers may not be highly valuable for the firm because of their transactions, but because they are important actors in the marketplace by influencing others' product and service choices. Second, customers may be embedded in a social network in which their behavior is viewed and perceived by other actors and thus influence other's purchase behaviors consciously and unconsciously. Examples of such social networks may be brand communities (Algesheimer et al. 2005; McAlexander et al. 2002; Muniz & O'Guinn 2001), shared interest groups and other social circles in which customers interact with each other. Third, following the ideas of Frenzen and Davis (1990), by purchasing and consuming products or services, customers derive utility from the product itself, but also from the exchange. Thus, the acquisition utility and the exchange utility, defined as "contributions made to strong social relations" (Frenzen and Davis 1990, p. 2), can be distinguished by their respective sources (product vs. social relations) and by their properties (alienable vs. inalienable). As shown in the Frenzen and Davis (1990) study, the amount of exchange utility present in an embedded

social relation had a significant positive impact on the likelihood of a purchase in the setting of samples home parties.

Hence, the customer equity perspective must evolve into a customer network equity perspective. In the following, we develop and present a theoretical framework for extending current thinking on customer equity towards the network perspective. In particular, we derive, based on the social network literature, characteristics that are likely to be powerful drivers of a customer's network value.

Conceptualizing Network Value and Its Determinants

The general model that we propose is that customer network profitability equals customers' individual profitability without considering network effects, plus positive network effects, minus negative network effects. Thus, we define the *Customer's Network Lifetime Value (CNLV)* as the discounted cash surpluses generated over the customer lifecycle plus increases by network effects minus decreases by network effects. Network effects arise in so far as the value of a potential customer to a company is dependent on the expected increase in sales to other customers that result from marketing to the focal customer. This increase is defined as a customer's network value (Domingo & Richardson 2001). A customer's network value depends on a series of factors that are related to a) the customer's position in her own personal network, b) relationships between the customer and other network actors and c) characteristics of the customer-product relationship. Below, we describe each of three dimensions in turn.

Customer Network Position

There exists a plethora of research on the value of connections that is based on social support (Walker et al. 1994) and social resource theory (Lin 1988). Marketing research on the value of connections has grown under the concept of social capital (Granovetter 1973; Coleman 1990; Putnam 1995). Social capital emphasizes specific benefits that arise from interaction and cooperation, reciprocity, and information associated with social networks. Social capital generates value for the people that are connected to each other, and sometimes for bystanders as well. The following figure illustrates central concepts in measuring network value.

(Figure 1 about here)

Centrality

Centrality is one of the key concepts in network analysis and is defined as the amount of ego's quality relations to his alters. While cohesion describes personal "we-ness" in a set of nodes, centrality is related to distance and reachability. As centrality is a function of the ego's position in the network, a central positioned ego is able to occupy benefits because of his position in the network. Thus, central egos are important to the relations in the network, and the flow of resources within it (Iacobucci 1998), because they have the most direct *and* the most qualitative connections in the network.

Empirical work supports the idea that more central actors are important for the acquisition of new customers, because the act as "information gatekeepers" (Brown and Reingen 1985). As Both Hogan et al. (2004) and Wangenheim and Bayón (2006) point out, the value of new customers

generated through network effects and word-of-mouth must be added to CLV calculation models. Thus, we postulate:

P1: The more central a customer is positioned within her own network, the higher is her CNLV.

It should be noted that there exist several centrality measures in network research: The three main ones are degree centrality, betweenness centrality, and closeness centrality. Below, we briefly introduce and discuss each of these measures in brief. An overview of the mathematical definitions of centrality can be found in Bonacich (1972) or Freeman (1978).

Degree centrality is defined as the variation in degrees of vertices divided by the maximum possible variation in a network of the same size. Thus, the star network as can be seen in figure 1, is an example of a highly centralized network. In star networks, one can propose that the more variability in centrality scores exist, the greater is the graph centralization.

The concept of degree centrality accounts for the number of ties that are related to a node. While common wisdom argues that "the more links exist, the better it is", this is not always true. It is also important to (a) whom those ties lead to and (b) how they connect the otherwise unconnected.

In figure 1, node D has the highest first-order degree, much more than node H has. Nevertheless, while nodes A-H obviously form a clique where everyone is connected to almost everyone, node H is between this clique and the nodes I and J. Thus, this node is crucial for the information flow between the clique and nodes I, J, and vice versa. Node with a high betweenness have great influence on the flow of information in a network, but also are a possible single point of failure, where information is not delivered. Betweenness centrality is defined as the degree to which an

actor lies on paths between all pairs of other actors. An actor is therefore *uniquely positioned* if he has access to limited resources, or has a most critical betweenness position.

Why is this important for determining a customer's network value? Empirical research has found strong relationships between an individual's betweenness centrality to significant outcomes such as power (Emerson 1962; Cook et al. 1983; Brass & Burkhardt, 1993; Kilduff & Krackhardt, 1994), individual performance (Baldwin, Bedell and Johnson, 1997; Sparrowe, Liden, Wayne, & Kraimer, 2001), or the quality and quantity of resources controlled by the actor's alters (Lin 1982, 1988, 2001). In turn, power, individual performance and access to social resources have a crucial influence on market transactions (Borgatti and Foster 2003). Within the example, node D has the highest degree centrality, but is not able to get access to information on, or from nodes I and J without contacting H. Thus, node H is in a highly powerful position, and controls resources from nodes I and J to the clique, and vice versa. H, in that sense, has a high network value.

In figure 1, node D has the highest first-order degree, but the structure of the ties of node F or G facilitates a quicker connection to all other nodes than anyone else in the network. Thus, node F and G are close to everyone else, because they have the shortest path to all others. Although they don't have direct access to the important node H, the intermediary node, they can monitor the flow in the network as no one else can do. Closeness centrality is defined as the number of other vertices divided by the sum of all distances from ego to all others.

Considering the flow of information in a network, it is quite important to identify the hubs, people with a high degree and betweenness centrality like D, as well as the intermediary nodes like H, and the monitoring nodes F and G. The latter ones are in a quite well position to information from different sides of the network, and are therefore suitable as idea generators.

These nodes have a high network value. Empirical research has shown that monitoring nodes like F and G have high levels of individual creativity (Perry-Smith & Shalley, 2003), tend to entrepreneurship (Baron & Markman, 2003; Shane & Stuart, 2002) and are important for team performance (Hansen, 1999; Tsai, 2002). Thus, we propose:

P2: The higher a customer's (a) first-order and (b) second-order degree centrality, the higher is her CNLV.

P3: The higher a customer's betweenness centrality, the higher is her CNLV.

P4: The higher a customer's closeness centrality, the higher is her CNLV.

However, not only the formal position of a customer in a network determines the flow of information and the value of a customer's network. Whether or not influential exchange is taking place in a network is determined by the relationship of the individual customer with other network actors, i.e., with her social ties. Hence, it is important to understand how the customer interacts with her social network.

Customer Social Network Relationships

In a path braking work, Granovetter has introduced the concept of strong and weak ties (1973). Strong ties are characterized by reciprocity, solidarity, and trust and work as foundation for social influence. The total number of strong ties per node is limited as strong ties need resources to cultivate the relation.

The strength of a tie affects the probability of transmitting information, and therefore a nodes network value (Krackhardt 1992; Hansen 1999). A set of strong ties often lead to the creation of a

clique, because friends of friends will get to know each other. Thus, the flow of information among strong ties is very often redundant. In opposite to this, weak ties are characterized by loose acquaintances. Granovetter emphasized the "strength of weak ties", because weak ties are more likely to deliver new, non-redundant information, and are more likely to bridge long distances in a network (Burt 1992). Burt argues that if a person's friends were all friends, the probability of novel information is lower than if the person's friends belonged to separate social circles (1992). Against the backdrop of the importance of the diffusion of recommendations, weak ties seem to be more important for the flow of information than strong ties. On the other hand it is very important that ego has strong influence on his alters' ratings, and has many alters who are easily being influenced by rating prediction. Thus, strong ties are necessary to enable this influence. Overall, we argue:

P5: The stronger the sum of customer's ego ties is, the more important is degree centrality for determining her CNLV.

As mentioned before, besides looking at a nodes' degree it is also important on how they connect the otherwise unconnected. Lorrain and White (1971) introduced the idea of structural equivalence to determine which nodes play similar roles in the network. Thus, nodes in a network are identified not by whether they themselves are interconnected, but rather by the similarities in their connections to other nodes. Wangenheim and Bayón (2006) find that the a customer's word-of-mouth is more likely to lead to new customer acquisition when socially similar ties are receiving the information. Hence,

P6: The higher a customer's network equivalence, the more important is degree centrality for determining her CNLV.

However, customer networks are entirely useless for firms and products when the network does not communicate about them. Hence, the customer-product relationship is central in determining customer lifetime network value**.**

Customer-Product Relationship

As is well known from many consumer research studies, customers do only interact with the social exchange partners about products that they are personally interested in (Dichter 1966). Hence, involvement is a key dimension related to CNLV, as Wangenheim and Bayón (2006) empirically verify – according to their study, customers that are high in either product, marketplace or situational involvement are more likely to initiate discussions with others, and are more influential on other's purchase decisions. Further, the entire network must be involved in a product category in order to function as a catalyst for the information coming from the focal customer. We refer to this phenomenon as network involvement. For example, brand communities are social networks in which network involvement for a certain product category and brand is extremely high, and consequently, a lot of communication exchange about them is going on. This is why researchers and practitioners attach so much importance to them (Muniz and O'Guinn 2001).

P6: The higher a customer's involvement, the higher is her CNLV.

P7: The higher a network's involvement, the higher is her CNLV.

Figure 2 illustrates our model of network value.

(Figure 2 about here)

Conclusion

The idea of word-of-mouth marketing has long been known, but given the technological developments of the last 15 years, now there exist more possibilities to share information and influence others than before. It is therefore cost-effective for companies to concentrate not only on customers with a high CLV, but also on those with high CNLV. Instead of focussing on mass markets or those customers with high transaction values, firms should concentrate on customers that represent promising targets with regards to their network value.

According to the above proposed model, a good customer to market to is one who has a powerful position in his network (betweenness and closeness centrality), has many alters in his network as well as his alters have many alters in their network (degree centrality), has more influence on his alters then they have on him (strength of ties), has a low level of alters that play similar roles in the network (network equivalence), is highly involved in the product and gives the product a positive rating (product involvement), and who actively recommends the product to its alters and motivates them to recommend the product to their alters (activity rate). We believe that both the customer equity and the social networks literature could benefit from empirical work that tests and extends the above described model. If the identified variables are indeed useful predictors of network value, they will represent important variables for value-based customer segmentation.

Obviously, such research is not without difficulties and obstacles, of which the most obvious is that social networks are almost infinite. A big question in this context is whether the proposed model will also work well if the market researcher does not oversee the entire network and thus has to work with incomplete information. Further, social networks are often subject to substantial dynamics (i.e., structure, size and relations within a social network change) and hence

the stability of the key characteristics of high network value consumers in such a system must be understood. More research is needed onto mathematical development of the focal concepts, and validation of the model. Further fruitful research directions might be to study optimal network shapes for the distributions of recommendations, or clustering huge networks into traceable parts without a loss on CNLV.

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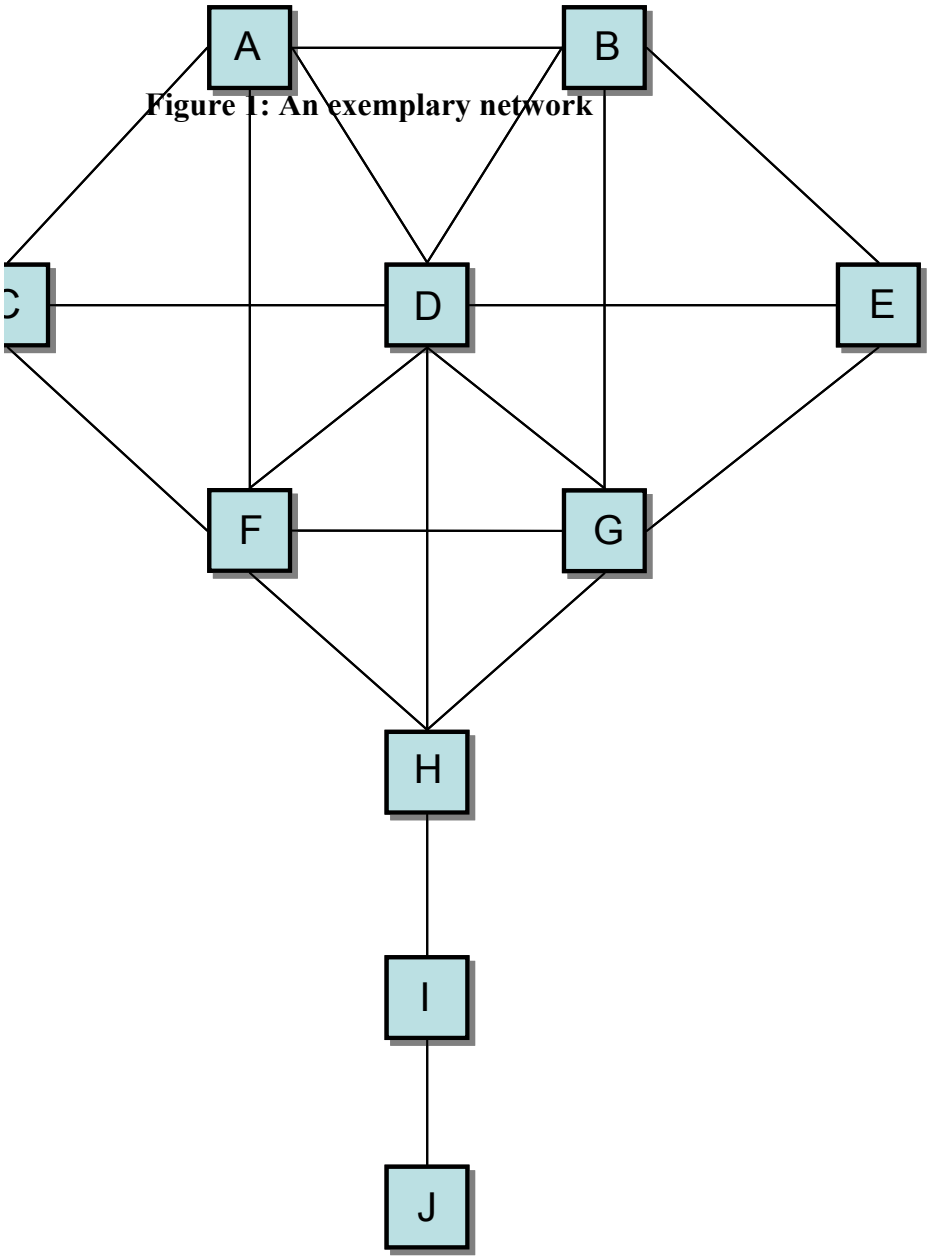

Figure 1: An exemplary network