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Title of the paper:

**Managing business networks for value creation in facilities and their external environments: a study on co-location**

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# **Managing business networks for value creation in facilities and their external environments: a study on co-location**

## **Abstract**

**Purpose** – The purpose of this paper is to increase understanding of the logic of business network formation among the co-located and external actors of a facility.

**Design/Methodology/Approach** – The research adopts a theory-building approach through developing propositions inductively from the empirical case study on four purposefully sampled modern service station facilities. The focus is on analyzing how a facility and its inherent co-located actors represent an entity that forms a business network with external actors in the facility's environment.

**Findings** – The findings propose that when co-located with a large number of actors, the facility and its actors represent an entity that is connected to a wide business network of multiple external actors. On the other hand, when co-located with a small number of actors, the facility becomes a part of the overall supply in the surrounding business environment with a differentiated offering for competitive advantage.

**Practical implications** – The research suggests that an appropriate co-locating strategy, e.g., when planning the tenant mix of the facility, can contribute to creating a vivid business network in the external environment, which raises the facility to a role of a central entity in such a network.

**Originality/value** – The findings explaining how co-location affects the businesses within the facility and within a wider networked environment are novel to the scholarly knowledge on co-location. The research bridges the theories of co-location and business networks that have been treated as separate discourses in previous research.

**Keywords:** Facilities, Property, Business Environment, Business Development, Networks, Value

**Category:** Research paper

## **Introduction**

In addition to offering gas, automobile spare parts, car repair services, and recreational coffee and snacks for travelers, modern service stations have become entities that include multiple business actors with various kinds of offerings for traveling consumers. The co-located businesses at many modern service stations include fast food restaurants, convenience stores, alcoholic beverage retail stores, and gift shops. Location is often seen as the single most important success factor in consumer businesses, such as retailing (Hernandez and Bennison, 2000; Brown, 1993; Brown, 2006; Clarke et al., 1997). However, little is known about how co-locating multiple business actors within a facility affects the formation of business networks in the business environment of the facility.

Regarding the co-location of retail businesses, Öner and Larsson (2014) and Larsson and Öner (2014) suggest that both small, non-specialized shops selling common goods and highly specialized stores tend to be co-located, while food retailers tend not to co-locate with specialty stores. Perryman and Combs (2012) found that co-located franchisors are frequently used to fill market gaps left by franchisees.

Outside the field of retail, Becker et al. (2003) studied the social implications of co-location and found that office workers appreciate the chance encounters created by physical proximity. Such encounters allow building trust, which in turn is a prerequisite for collaboration (Becker et al., 2003). In addition to financial benefits, Appel-Meulenbroeck (2010) and Sailer (2011) both contend that co-located facilities that enable chance encounters between occupants promote knowledge sharing. In large energy investment projects, co-location of complementary business actors may be necessary to ensure the commercial viability of the entire project (Christie et al., 2014). In the context of healthcare services, Rumball-Smith et al. (2014) have shown how the customer offering may be improved as a result of co-location. While previous research on co-location seems to focus predominantly on social implications within the facility, this research investigates how co-location affects the external business networks of a facility. In the research on business networks, researchers have demonstrated that networks are widely used for organizing production and business in industries such as construction (Eccles, 1981), fashion (Uzzi, 1997), and oil and gas (Olsen et al., 2005), yet the connection between co-location and business networks has not been extensively studied.

The purpose of this paper is to increase understanding of the logic of business network formation among co-located and external actors in the business environment of a facility. The research question is: How does the co-location of actors within a facility affect the business network formation in the business environment of the facility? The empirical research is a case study of four service stations operating under the ABC brand of the nationwide S Group co-operative in Finland. The S Group is a major property owner and user in Finland, and the ABC service stations form a significant business sector within the group. The four selected cases represent modern service stations with a wide variety of actors co-located within the facility, including restaurants, convenience stores, pet supply stores, trekking stores, and pharmacies, among others. As a point of departure for this research, the initial assumption is that this kind of modern service station facility with its co-located actors serves as a central node that establishes a business network with its external actors.

The research strategy follows a theory-building approach: an empirical case study of four service station facilities is used to derive new knowledge regarding how the facility and its co-located actors are connected to a business network of external actors in the surrounding business environment. This new knowledge is presented in the form of two propositions that serve as the main findings of this research and can be tested in future theory-testing studies. The findings entail beneficial practical implications for the property owners and facility managers who create value-enhancing actor networks and vivid business environments by co-locating an appropriate mix of tenants in facilities. While the empirical study addresses modern service station facilities, this paper proposes that the findings can explain the interdependence between the co-location and formation of business networks in other types of facilities as well.

The remainder of the paper is structured as follows. The next section analyzes the literature on business networks and introduces the central concepts used in the empirical study. The research design section addresses the method, case selection, data, and research process. The analysis section includes analysis of the four cases and a cross-case summary. The discussion section includes a cross-case view for discussing the findings and develops two propositions. Finally, the conclusions section includes suggestions for several distinct avenues for future research.

## **Business networks**

The literature on business networks suggests that networks consist of actors and the relationships that tie actors together. At the micro-level, relationships in the network are formed between individuals as interpersonal ties between actors, and these relationships influence the way individuals interact with each other (Granovetter, 1973). Organizations are connected to other organizations by inter-organizational relationships between individuals. Consequently, the relationships between organizational and individual actors are complexly interdependent. Holmlund and Törnroos (1997) define relationships in the business network as interdependent processes of continuous interaction and

exchange between at least two actors. Similarly, Håkansson and Snehota (1995) characterize business relationships as mutually oriented interactions between two reciprocally committed parties. If we accept the notion that relationships are characterized through activities between network actors, we can then argue that such activities can include different technical, administrative, commercially competitive, or other activities of a company that can be connected in different ways to those of another company (Håkansson and Snehota, 1995). These kinds of activities enhance value creation for individual firms and the whole network, and the activities are affected by earlier activities, events, or incidents that have occurred with individual actors or within the earlier relationships between multiple actors.

A business network can be defined as a dynamic organizational form, which consists of a set of interconnected organizational actors that control different kinds of resources and perform different types of business activities in interaction with each other to create value. This definition is influenced by a perspective typical among industrial marketing scholars (see, e.g., Håkansson and Johanson, 1992; Holmlund and Törnroos, 1997; Halinen et al., 2012), who describe network arrangements through business relationships. Indeed, Håkansson and Snehota (1995) consider business relationships as a sum of activity patterns, resource constellations, and a web of actors. Networks are dependent on the different resources possessed by their actors (Hakanen and Jaakkola, 2012). Resources relate to various competence elements, e.g., technological, material, or knowledge resources (Håkansson and Snehota, 1995). From the perspective of the whole network, each actor in the network – and its relationship to other actors – serves as a resource for the network. The literature on business models can be used to complement the business network perspective by distinguishing between competing and complementary offerings (Casadesus-Masanell and Ricart, 2011) that characterize relationships between firms in the network.

From a business network perspective, a focal actor is an organization that adopts a coordinating role and is therefore connected to all other actors in the network (Jarillo, 1988; Jung, 2011; Hakanen and Jaakkola, 2012). The coordinating role and inherent power of this kind of actor in the business network follows Jarillo's (1988) notion, according to which a hub-firm has the role of a network assembler. This assembler-coordinator has special relationships with other members of the network (Jarillo 1988). Maintaining and developing such relationships in an assembler-coordinator firm can be characterized by routines and the explicit and implicit rules of behavior (Håkansson and Snehota 1995). Guercini and Runfola (2012) have highlighted the role of integration and substitution as two complementary mechanisms for developing and reconfiguring business networks. The actors in the network are heterogeneous, as Eccles (1981) also reported in his findings for the construction industry, and therefore the coordinating effort needed is substantial. Jung (2011) and Hakanen and Jaakkola (2012) have stressed the importance of leveraging both informal social networks and the service contents offered by business actors when selecting actors for a specific business location, such as a service station. Earlier research on business network development has also shown how network development as a purposeful activity coordinated by the focal firm involves careful balancing between the activities of managing the day-to-day interaction in the network and orchestrating changes, such as the introduction of new actors in the network (Ritala et al., 2012). Finally, this paper suggests that when planning and implementing an appropriate tenant mix through co-locating actors in the facility, the facility manager in fact serves as an assembler-coordinator, having the power to create the business network of multiple actors within the facility and in its surrounding business environment.

## **Research design**

The amount of previous research and inherent theoretical knowledge on the connection between co-location and the external business network of a facility is scarce. Therefore, it is a natural choice in this paper to follow a theory-building research strategy; more specifically, new theoretical knowledge is derived from an analysis of rich empirical data and presented in the form of testable propositions. Based on this choice, the research approach adopted for this study is a qualitative case study. The following three reasons support this choice. First, prior research on the interdependence between co-location and business networks is scarce. Consequently, creating new theories inductively from rich and context-

specific empirical data requires an in-depth understanding, supported by the case study approach. Second, case studies are particularly suitable for analyzing contemporary events and new phenomena because of the method's abilities to deal with rich data and a wide variety of evidence (Yin, 2003). Therefore, the case study approach is well suited to the novel theme of this research. Third, the analysis of the empirical data in this kind of inductive study must be based on observations and analysis of detailed data on individuals, including their micro-level activities and purposes. This kind of analysis at the micro-level is facilitated well by the case study approach (Thomas, 2011).

### *Case selection*

The selection of the cases was based on purposeful sampling. Central to building theory from case studies is the logic of analyzing similarities and differences between cases (Eisenhardt, 1989). In the selection of the cases for this research, one criterion used for controlling the variation in results was that the selected cases are similar enough to not include too many intervening influences from external parameters from different contexts. However, at the same time, the selected cases must be different enough to show potential differences in the actual phenomenon under study in the research. The cases selected for this study are similar to an extent as they are all part of the same chain and therefore they are subject to the same national-level chain management. Furthermore, selecting cases from the same country excludes potential uncontrolled effects from variations in national contexts due to legislation and culture, for example. However, the selected cases also differ, e.g., in terms of being positioned in different geographical locations and being governed by two different regional co-operatives. These differences provide understanding of the researched phenomenon in different geographical contexts and under governance structures of different regional co-operatives. With respect to the sampling criteria for the case selection process, the selected cases have differences in their physical size, offering, and co-location strategies. Four service station facilities were selected as cases; while four cases were sufficient to analyze the differences and similarities concerning the researched phenomenon, this small number of cases enabled a rich analysis of the phenomenon in its context with in-depth insights and understanding regarding each of the cases.

Based on the sampling criteria described above, four cases were selected from the S Group co-operative's nationwide ABC service station chain in Finland. The ABC chain included 120 service stations at the end of 2012, each operating under a regional cooperative company. Although they are subject to national chain management, each regional co-operative is a different parent organization for the stations and has a distinct governance structure. The following four service stations were selected as cases: ABC Tapiola, ABC Nihtisilta, ABC Renkomäki, and ABC Heinola. The four service stations are described in Table I. The cases belong to two regional co-operatives: HOK-Elanto and OK Hämeenmaa.

HOK-Elanto is operating in the Helsinki metropolitan region, while OK Hämeenmaa is operating in the Lahti region, which is 100 km north of Helsinki. These co-operatives represent two of the largest regional co-operatives in the S Group in terms of both members and annual revenues. At the end of 2012, HOK-Elanto's fleet of service stations consisted of 35 total stations, with 20 service stations with multiple co-located actors and 15 unmanned filling stations. OK Hämeenmaa operated a total of 31 stations, of which 10 included multiple co-located actors and 21 were unmanned filling stations. Despite the nationally branded design in all service stations, each service station facility differs to some extent in their location and building design.

**Table I.** Four service stations selected for the case study

Case	ABC Tapiola	ABC Nihtisilta	ABC Renkomäki	ABC Heinola
<b>Regional co-operative</b>	HOK-Elanto	HOK-Elanto	OK Hämeenmaa	OK Hämeenmaa
<b>Operational since</b>	2011	2006	2004	2008
<b>Floor area</b>	500 m <sup>2</sup>	1,500 m <sup>2</sup>	4,500 m <sup>2</sup>	4,500 m <sup>2</sup>
<b>Number of staff</b>	12	27	80	50
<b>Opening hours</b>	24 h	24 h	24 h	6 am–12 pm
<b>Fuel retail</b>	Self-service filling station	Self-service filling station, e-car charging	Self-service filling station	Self-service filling station
<b>Convenience store</b>	Small-scale	Large	Two large convenience stores	Large
<b>Restaurant services</b>	City kitchen and coffee bar	Restaurant	Restaurant and fast food restaurant	Restaurant and fast food restaurant
<b>Amenities</b>	Slot machines, restrooms	Slot machines, large restrooms, ATM	Slot machines, large restrooms, postal office box, ATM	Slot machines, large restrooms, postal office box, ATM

### Data

The empirical data was collected during a three-month period between November 2012 and January 2013. The primary data comprises 17 semi-structured interviews. The interviews were conducted face to face by a team of four researchers, at least two of whom were present at each interview. A list of all informants with their respective organization, role, and interview length is presented in Table II. The focus of the inquiry was on different co-located and external actors and their role in the business network. The actors were described through activities and events that the informant considered relevant for characterizing the actor and its role or the actor's relationship to other actors. All interviews were recorded and transcribed. The five interviewed persons at the national-group level were directors and managers responsible for the chain-level management and development activities of the ABC chain. Nine interviewees from the two regional co-operatives included managing directors and managers. All local service station managers in the four cases were interviewed. The people interviewed from the three tenant organizations were the managing directors of their respective organizations. All director-level interviewees knowledgeable about all cases were asked to provide information on actors, activities, and relationships separately for each of the four cases. In addition to the interview data, written material, such as archival data, annual reports, and other documentation, were used in the analysis of the study. Some of the interviewees provided the researchers with service station concepts, strategies, and other documented material. In addition, the researchers conducted field observations during several onsite interview visits to the case service stations.

**Table II.** Interviews carried out for the study

<b>Informant</b>	<b>Organization</b>	<b>Role</b>	<b>Interview length</b>
N1	S Group (Chain management)	Director	71 min
N2	S Group (Chain management)	Senior advisor	68 min
N3	S Group (Chain management)	Development director	76 min
N4	S Group (Chain management)	Area planning manager	70 min
N5	S Group (Chain management)	Development manager	93 min
N6	Co-op HOK-Elanto (Regional)	Chief operating officer	95 min
N7	Co-op HOK-Elanto (Regional)	Sales manager	92 min
N8	Co-op HOK-Elanto (Local)	Station manager	82 min
N9	Co-op HOK-Elanto (Local)	Station manager	72 min
N10	Co-op OK Hämeenmaa (Regional)	CEO	82 min
N11	Co-op OK Hämeenmaa (Regional)	COO	103 min
N12	Co-op OK Hämeenmaa (Regional)	Development manager	84 min
N13	Co-op OK Hämeenmaa (Local)	Station manager	93 min
N14	Co-op OK Hämeenmaa (Local)	Station manager	75 min
N15	Outdoor and sportswear retail	CEO	98 min
N16	Discount book store	CEO	58 min
N17	Organic and local food	Entrepreneur	126 min

### *Research process*

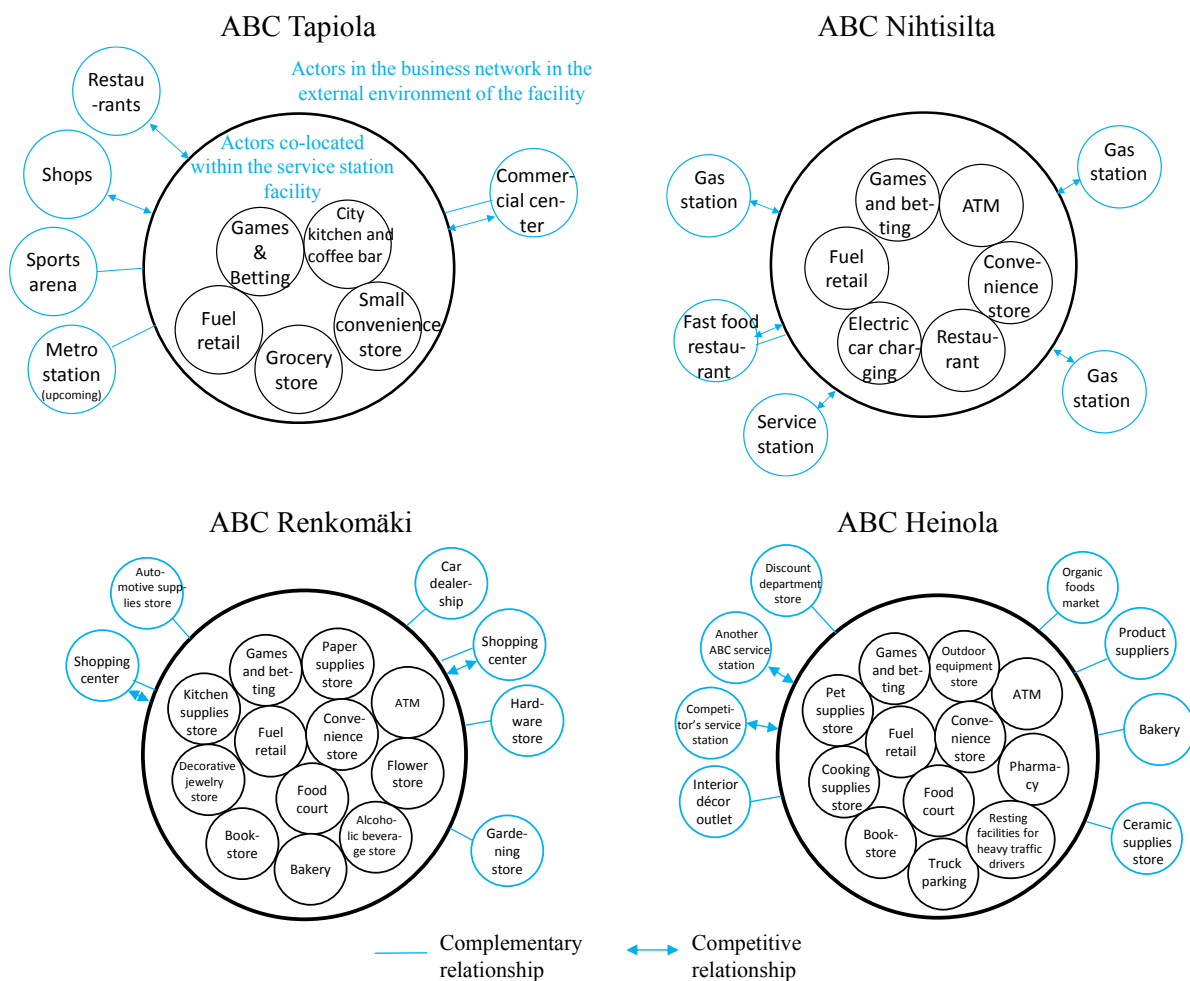
In the data analysis, the relationships between the actors were identified through analyzing detailed micro-level activities and events in time since the start of the operations of each service station. In doing this, a process approach described by Langley (1999) was followed. Observations and the inherent evidence were organized in a database. Actors co-located in the facility, actors included in the business network in the external environment of the facility, and the relationships between the facility and its co-located actors and the external actors in the network were identified through analyzing activities and events, which explained interdependencies between the actors. A distinction between competitive and complementary relationships was made, which was based on whether the network actors' offerings and value propositions for consumers were competing or complementary. Data analysis was done in two phases. Following Eisenhardt (1989), a within-case analysis was conducted first to establish a coherent narrative and characteristics for each case. This was followed by a cross-case analysis, where the cases were compared to identify patterns in the data and to develop theoretical explanations for these patterns.

The within-case analysis included writing extensive case reports for each case. These reports described the characteristics of the case and a narrative of actors, activities, events, and relationships between actors. These reports explicitly noted how actors were co-located in the facility, which external actors were included in the network, and what kinds of relationships existed between the external actors and the facility and its co-located actors. Furthermore, activities and events explaining these relationships were recorded in the database. In the cross-case analysis, the cases were compared to infer patterns in the data. Similar patterns across all cases and discrepancies between the cases were both identified. The process was iterative: whenever a new type of activity explaining the interdependence between co-location and the network of actors was identified, other cases were analyzed again and this new type of activity was compared to prior observations of other cases.



## Analysis of co-location and business networks in the case facilities

The following sub-sections present an analysis of each case service station through analyzing actors co-located in the facility, external actors included in the business network of the facility, and the relationships within the network. The co-located actors and the actors in the business network of each of the four cases are illustrated in Figure 1. A summary of the case analysis is shown in the form of a table (Table III) presenting the co-located actors and actors in the business network for the four cases. A distinction between competitive and complementary network relationships in each of the four cases is also included in Table III. The term “actor” is used broadly to refer not only to business organizations, but also to technical or physical devices and components within a facility (e.g., ATM, electric car charging equipment). This broad definition allows for considering both business organizations and physical devices as actors that all contribute to a product or service offering for the customers, and in this way they all increase the business value within the facility and its network.



**Figure 1.** Actors co-located in the facility and in the business network with each of the four case facilities.

### Case ABC Tapiola

ABC Tapiola is situated adjacent to a busy ring road surrounding the capital city of Helsinki. The campus of Aalto University and headquarters of several publicly listed firms are situated within two

kilometers of the station. The nearby Tapiola District is a well-known garden city with a strong heritage rooted in its architectural design from the 1950s.

ABC Tapiola is the smallest of the four analyzed service stations in terms of the number of co-located actors within the facility, and it also has the smallest number of identified external actors in the recognizable business network. The empirical analysis recognized only two external actors that belonged specifically to the business network of ABC Tapiola: the commercial center of the Tapiola area and a nearby sports arena. Additionally, restaurants and shops located in the neighboring commercial area and a planned metro line and station were recognized as actors belonging to the surrounding business environment of the facility. A major sports arena located in the neighboring residential area attracts customers to visit ABC Tapiola:

”For example you notice when there’s a game happening at the sports arena, or some other event there, because we get a lot more people. Because more people are passing by here, so you notice that.” (N9).

ABC Tapiola hosts an onsite grocery store. The grocery store belongs to the same co-operative but is an internal tenant and is therefore a distinct actor that is separate from other service station operations. As the convenience store closes at 9 pm on weekdays and 6 pm on weekends, a small-scale kiosk at the service station complements the grocery store offering outside its opening hours.

The nearby commercial center has a large variety of restaurants and retail shops that are considered to compete with the service station facility’s restaurant and convenience retail businesses. A metro line and a nearby station are under construction, both of which are estimated to be completed in 2016. The metro will increase the customer flow in the area and it is likely that it will have an effect on the business of the service station.

ABC Tapiola strives to differentiate from the traditional service station restaurants by investing in food quality, interior design, branding, and marketing. The onsite restaurant offers meals and products for the specific needs of busy and affluent urban dwellers, such as quick, high-quality take-away meals.

#### *Case ABC Nihtisilta*

ABC Nihtisilta is located 15 km northwest of downtown Helsinki via a major motorway. Several other service stations, a car dealership, a hotel, a convenience store, and a large reuse center are located in the vicinity. Based on the analysis, only five actors were identified as actors belonging to ABC Nihtisilta’s business network. The identified actors include a fast food restaurant and four competing service and gas stations. Additionally, nearby retail stores and restaurants were seen as competitors in the overall supply network in the business environment; however, they were seen as being more remote with no specific emphasis on them being recognizable members in the business network. The informants emphasized the competitive relationships with the actors in the external environment of the facility:

”... there are no restaurants in close proximity, but there are around five or six service and gas stations within 2 km, which makes the fuel retailing a real challenge. The competition is fierce because among other products and services, we also compete in fuel retailing, of course. And then there are large competing convenience stores across the motorway. And yes, further away, there is also competition among restaurants.” (N8).

ABC Nihtisilta differentiates its offering from those of its competitors by offering high-quality customer service and promoting a culture of friendliness among employees and customers. To attract more customers, Nihtisilta has extended its slot machine area. ABC Nihtisilta has also received positive customer and media attention from its differentiated service of providing e-car charging for the eco-conscious city dwellers.

### *Case ABC Renkomäki*

ABC Renkomäki is located in the Renkomäki District and is conveniently accessible for people traveling from Helsinki to the north on a motorway passing the city of Lahti. ABC Renkomäki is situated just a few kilometers south of downtown Lahti. Altogether, 18 actors were identified belonging to ABC Renkomäki's facility and its business network of external actors. The co-located actors within the facility, such as an alcoholic beverage store, a design store, a bakery, a florist's, a jeweler's, a kitchen supplies store, and a discount bookstore, extend the range of offerings within the service station facility. The actors in the external environment comprise a hardware store, a car dealership, a shopping center, a car supply store, and a gardening supply store. A nearby shopping center was also identified as an actor in ABC Renkomäki's business network.

The alcoholic beverage and large convenience store were described as highly attractive brands from the customer point of view. While the bakery is seen partly as a competitor to the convenience store, it is also seen as increasing the value for customers through widening the overall offering of the facility. The kitchen supplies store and the discount bookstore complement the service station's convenience products offering with specialized consumer goods:

“ ... there has been a clear demand for gift shops in connection with the service station: if we have those here in the service station, then it makes it easy for people on the road [and going to visit someone] just to pass by and buy a gift. This probably justifies the co-locating of these [gift shop] businesses here ...” (N12).

ABC Renkomäki's nearby business actors, especially the hardware store and the car dealership, complement its offering. Customers who park in the joint parking lot between the ABC Renkomäki facility and the hardware store can easily visit both facilities in one stop. Joint marketing campaigns are arranged between actors within the ABC Renkomäki facility and the external car dealership in which both actors are advertising each other's campaign offerings. A shopping center, which is a large competitor for ABC Renkomäki, is operating across the road. ABC Renkomäki and this shopping center share both a competitive and complementary relationship with each other. The shopping center has proved beneficial since the total customer flow in the area has significantly increased after its opening in 2009. In addition, an automotive supplies store and a gardening retailer are two external actors operating in close proximity that belong to ABC Renkomäki's business network.

### *Case ABC Heinola*

ABC Heinola is located in the Vuohkallio industrial district of Heinola near a motorway running to the north from Helsinki, which passes the city of Lahti. A tall pylon advertising the station is clearly visible to road users approaching the station from both directions. Dedicated truck parking and recreational facilities are available for long-distance commercial vehicle drivers. The co-located actors within the facility provide an attractive mix of offerings. A cooking supplies store is described as an attractor due to its premium gift items. The outdoor equipment store acts in close collaboration with other actors in the service station facility, for example, through organizing joint marketing campaigns. The discount bookstore complements the overall offering of the facility with consumer goods. Betting and gaming services within the facility are offered by a specialized organization. Four business actors are located in close proximity to ABC Heinola, the following three of which are described as attractors: the organic food market, the discount department store, and the interior décor outlet center. The organic food market, which is famous nationwide for its organic and locally produced food, is one of the major reasons for customers to visit the area and simultaneously bring business to the service station:

”The organic food market on the other side of the parking lot is really valuable for us. Our customer feedback shows this ... it [the organic food market] is the reason why many of the customers take this exit from the motorway and come to us.” (N14).

Relationships between the within-facility actors and the three attractors (described above) in the external environment are complementary. The restaurant services provided within the facility focus on traditional homemade style food, whereas the organic foods market and its organic food restaurant increase customer value by increasing the offering with options for organic meals. The discount department store has found its customer base from the local customers, and traveling customers stopping at ABC Heinola also frequently pay a visit to the location. Similarly, the furniture décor outlet has positioned itself in the same local market and therefore complements the offering and increases the value especially for the local customers.

The relationships between ABC Heinola and the two nearby service stations along the same motorway have become increasingly competitive. In particular, the relationship with another ABC service station located 35 km further to the north along the motorway but owned by another regional co-operative was described as being especially competitive as it offers the motorway travelers another option for a stop-by. ABC Heinola differentiates its offering by having a custom-made buffet table for children in the shape of a sailboat and offering locally produced food in the restaurant. In order to further attract travelling families with small children, a children’s playground, which is larger than the playgrounds usually found in most ABC facilities, is located within the facility.

*Summary of the case analysis*

Table III presents a summary of the case analysis with co-located actors and actors in the business network in each of the four cases as well as notions regarding the complementary and competitive relationships of the external network actors in each case facility and its co-located actors.

**Table III.** Summary of the case analysis

<b>Case</b>	<b>ABC Tapiola</b>	<b>ABC Nihtisilta</b>	<b>ABC Renkomäki</b>	<b>ABC Heinola</b>
<b>Actors within the facility</b>	Fuel distribution, small convenience store, restaurant and cafeteria area, grocery store.	Fuel distribution, electric car charging, convenience store, restaurant, slot machines.	Fuel distribution, convenience store, several restaurants, alcoholic beverage store, decorative jewelry store, kitchen supplies store, flower store, paper supplies store.	Fuel distribution, convenience store, several restaurants, cooking supplies store, outdoor equipment store, discount bookstore, pet supplies store, pharmacy, resting facilities, truck parking.
<b>Number of co-located actors within the facility</b>	5 actors	6 actors	12 actors	12 actors
<b>Efforts to differentiate the offering</b>	Urban concept restaurant, food quality, interior design, branding.	Positive customer and media attention through e-car charging, culture of friendliness.	Advertising and campaigns, often jointly with actors in close proximity. Services for local individuals living nearby.	Emphasis on family-focused services and resting facilities.

<b>External actors in the business network (and their complementary vs. competitive relationships with the facility)</b>	A sports arena ( <i>complementary</i> )	A fast food restaurant ( <i>complementary and competitive</i> )	An automotive supplies store, a car dealership, a hardware store, and a gardening store bring customer flow ( <i>complementary</i> )	A restaurant, a discount store, a home décor supplier, a bakery, and a ceramic supplies store are operating in the vicinity ( <i>complementary</i> )
	Commercial center ( <i>complementary and competitive</i> )	Several service and gas stations densely located in close proximity ( <i>competitive</i> )	Two shopping centers operate in close proximity ( <i>complementary and competitive</i> )	Two other service stations. The area has developed into a large retail concentration ( <i>competitive</i> )
<b>Number of external actors in the business network</b>	3 actors	5 actors	6 actors	8 actors

Table III illustrates that ABC Renkomäki and ABC Heinola have extensive networks of actors both within the facility (12 actors each) and in their external environment (6 and 8 actors, respectively). These two service stations also have a large number of both competing and complementary relationships with the external actors. Meanwhile, ABC Tapiola and ABC Nihtisilta have a smaller number of identified actors both within the facility (5 and 6 actors, respectively) and in their external environment (3 and 5 actors, respectively). Furthermore, in ABC Tapiola and ABC Nihtisilta, the relationships between the service stations and their external actors are more competitive and the service station offerings in these stations are focused through a few specific brands. ABC Tapiola features an urban restaurant concept that emphasizes diverse high-quality take-away offerings that could be conveniently purchased on the way home from work, while ABC Nihtisilta focuses on attracting owners of electric vehicles by offering quick recharge services. These stations clearly focused on specific market segments through their specific offerings; however, at the time of conducting this study, the penetration of electric cars in Finland was still low, with less than a thousand electric cars registered in the entire country. We can conclude that ABC Tapiola and ABC Nihtisilta are characterized by specific offerings from only a few actors within the facility that attract customers by differentiating themselves from nearby businesses. In contrast, the other two stations, ABC Renkomäki and ABC Heinola, have a broad offering and extensive network of actors within the facility, which tends to connect them more tightly to specific external actors in the business network, with a rich sphere of both collaborative and competitive relationships.

## Discussion

This article contributes to new knowledge on co-location by explaining how co-location within a facility affects the formation of a wider business network. This research has three main contributions. First, the co-located actors within a facility are illustrated in relation to actors in the external environment of the facility, which serves as a novel approach to presenting the wide business network that expands to the surroundings of the facility. Second, the findings suggest that when co-located with a large number of actors, the facility and its co-located actors tend to form a vivid network of business actors in the facility's external environment. This network of external actors in the surrounding environment expands the understanding of the wider geographical boundaries of the facility in terms of defining businesses in the external environment that affect or are affected by the facility. On the other hand, without a rich core of multiple co-located actors, the facility tends to build its business scheme through a distinct brand and narrowly focused offering rather than through a networked setting with external actors. Third, this research bridges the theories of co-location and business networks that have been treated as separate literature discourses in previous research. Regarding the connection between the physical-functional

facility and the living and continuously changing network of organizations, it can be argued that this study adopts a novel approach to including both business organizations and technical or physical devices in the illustration of the actors in the business network. In other words, in addition to business organizations, this research also recognizes amenities as actors that are essential for value creation within the facility and in its business network. For example, the presence of electric car-charging equipment and ATMs are important actors that contribute to creating value for the customer. The justification of this approach comes from the notion that the technical or physical devices and components of the physical facility – and not just the business organizations alone – all contribute to a notable product or service offering in the facility and its surroundings. The theoretical justification for including physical and non-living actors in the network of living organizations of humans and vice versa can be found in the actor network theory (Law and Hassard, 1999).

In all, based on these findings, two testable propositions were developed that serve as a basis for future research. These propositions were derived from the empirical research addressing modern service station facilities; however, this paper suggests that the propositions can also explain the interdependence between the co-location and formation of business networks in other types of facilities. Based on this reasoning, future research is needed for testing and further developing these propositions in different facility contexts.

In the following, two propositions are presented that arise from the analysis of the similarities and differences identified in the business networks of the four cases. ABC Tapiola and ABC Nihtisilta only have a small number of co-located actors within their facility. These facilities and their co-located actors formed an entity that networked only with a few business actors in the external environment. The few identified external actors in the rather shallow network mostly had a competitive relationship with the facility and its co-located actors. Leslie et al. (2012) made similar observations. On the other hand, ABC Renkomäki and ABC Heinola had a large number of co-located actors within the facility, and these facilities can be considered as entities that were connected to a wide and versatile business network in their external environment, with vivid complementary and competing offerings among the network actors. The following is therefore proposed:

**Proposition 1. When co-located with a large number of actors, the facility and its actors represent an entity that is connected to a wide business network of multiple actors in the external environment.**

In addition to having only a few external actors in their network, ABC Tapiola and ABC Nihtisilta also have a narrower and more focused branded offering. ABC Tapiola has a city kitchen and a coffee bar directly aimed at providing a new type of service station experience to meet the needs of urban dwellers. It also has distinctive interior design supporting the urban concept. Similarly, ABC Nihtisilta offers the possibility for electric car charging, which is a very focused smaller-scale service. In addition to the notion that a small number of co-located actors within the facility constitute a distinct entity that is more independent and even isolated than it is networked with actors in its external environment, there seems to be a need to differentiate these kinds of facilities by the offering and brands. In other words, the facilities with a small number of co-located actors tend to become an independent part of the overall supply network in the surrounding competitive business environment, with no particularly rich or strong network relationships with external actors. In this respect, the observations of this research are in line with earlier research carried out in the healthcare sector that has shown how the co-location of multiple disciplines is associated with a networked entity with broader customer offering than the co-location of a small number of disciplines (Rumball-Smith et al., 2014). Based on the above observations, the following is therefore proposed:

**Proposition 2. When co-located with a small number of actors, the facility and its actors represent an entity that becomes a part of the overall supply in the surrounding business environment, including multiple competitive offerings. This kind of entity must therefore differentiate its offering from other offerings in this overall supply in order to increase its competitive advantage.**

The propositions increase the understanding of how business networks – comprising both competitive and complementary businesses – are associated with the co-location of actors in the facilities. The two propositions serve as concrete findings that add new knowledge to previous scholarship on co-location. They also entail practical managerial implications for co-location strategies in the planning of the tenant mix of the facility. These findings and the resulting propositions complement the earlier research with similar results reported by Larsson and Öner (2014) and Felzenstein, Gimmon, and Carter (2010).

Previous research has identified several benefits from co-location, including knowledge sharing within organizations and collaboration of employees (Becker et al., 2003; Appel-Meulenbroeck, 2010; Sailer, 2011), financial and operational benefits (Felzenstein, Huemer and Gimmon, 2010; Wu and Lee, 2014), and marketing benefits (Felzenstein, Gimmon and Carter, 2010). This paper expands this perspective by explaining how co-location affects the businesses within the facility and even within a wider sphere of the networked environment with external actors. Business relationships have been described as requiring continuous interaction between the actors (Holmlund and Törnroos, 1997) and the mutual commitment of the actors (Håkansson and Snehota, 1995). This paper argues that those prerequisites could be extended to include physical proximity, which not only promotes business relationships, but also strengthens the overall business network.

### **Conclusions and future research**

This research increases the understanding of the logic of business network formation among co-located and external actors of a facility. The research contributes to new knowledge on how co-location within a facility affects the business network formation in the facility's environment. The findings suggest that when co-located with a large number of actors, the facility and its co-located actors tend to form a vivid network of business actors in the facility's external environment. The relationships among the network actors can be competing or complementary. On the other hand, the findings suggest that without a rich core of multiple co-located actors, the facility tends to build its business scheme through a distinct brand and differentiated offering rather than through a networked setting with external actors. The findings of this research complement previous studies on co-location in other contextual settings, the most notable of which include studies conducted by Felzenstein, Gimmon, and Carter (2010); Felzenstein, Huemer, and Gimmon (2010); Larsson and Öner (2014); Rumball-Smith et al. (2014); and Öner and Larsson (2014).

This research opens up four avenues for future research. First, the propositions can be examined and tested in future research in relation to co-location in different types of facilities in various contextual settings. Second, while this research investigated the business network formation from the perspective of selecting facilities and their co-located actors as a central entity, future research is welcome in similar contextual settings on the attributes in the surrounding business environments. Third, business networks typically emerge gradually and are sensitive to changes in external environments. Therefore, longitudinal in-depth analysis of the development of business networks related to co-located actors is fruitful for investigating the dynamism in business networks and the effective managerial practices to create value with such networks in the long-term. Fourth, this research did not focus on specifically analyzing the increase in business value that different kinds of co-location strategies and their inherent business networks offer to different actors and their businesses. Therefore, future research is welcome on different co-location strategies and their potential to increase value for the facility and its multiple business actors.

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Title of the paper:

**Managing business networks for value creation in facilities and their external environments: a study on co-location**

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