



Managing Coopetition in Business Ecosystem - A study of the Printing Industry in Malaysia

Gestión de la cooperación en el ecosistema empresarial: un estudio de la industria gráfica en Malasia

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ABSTRACT

Coopetition involves multidisciplinary actors in a competition and cooperation phenomenon simultaneously. There is a large research gap on how a coopetition process is established and managed in a business ecosystem. Through the in-depth analysis of a single printing business ecosystem in Malaysia, this paper finds coopetition is common as the way of doing business among the micro, small and medium sized firms in one industrial park growing into a popular printing ecosystem in Selangor state of Malaysia. This paper identifies the sources of coopetition, challenges faced by different firms in the same industry and the mechanism of these firms surviving in this business ecosystem. Through a case study, our findings showed that informal cooperation more likely than a structured coopetition to achieve short-term success yet a long term resilience for small medium enterprises. The possible tension in coopetition is reduced when trust and friendliness is available to maintain the business ecosystem position. The interchangeable supplier-customer relationships facilitates value co-creation through exchange of resources and capabilities in the geographic, technological and market overlap business ecosystem. The paper suggests the coopetition strategy is the base strategy to build competitiveness of individual firm located in a business ecosystem.

Keywords: Coopetition; Business ecosystem; Value Co-creation; Printing Industry.

RESUMEN

La competición involucra a actores multidisciplinares en un fenómeno de competencia y cooperación simultáneamente. Existe un gran vacío de investigación sobre cómo se establece y gestiona un proceso de competencia en un ecosistema empresarial. A través del análisis en profundidad de un solo ecosistema de negocios de impresión en Malasia, este documento encuentra que la cooperación es común como la forma de hacer negocios entre las micro, pequeñas y medianas empresas en un parque industrial que se está convirtiendo en un ecosistema de impresión popular en el estado de Selangor de Malasia. Este documento identifica las fuentes de competencia, los desafíos que enfrentan diferentes empresas en la misma industria y el mecanismo de supervivencia de estas empresas en este ecosistema empresarial. A través de un estudio de caso, nuestros hallazgos mostraron que la cooperación informal es más probable que una cooperación estructurada para lograr el éxito a corto plazo, pero una resiliencia a largo plazo para las pequeñas y medianas empresas. La posible tensión en la cooperación se reduce cuando se dispone de confianza y

amistad para mantener la posición en el ecosistema empresarial. Las instalaciones intercambiables de relaciones proveedor-cliente valoran la creación conjunta a través del intercambio de recursos y capacidades en el ecosistema empresarial de superposición geográfica, tecnológica y de mercado. El documento sugiere que la estrategia de competición es la estrategia base para generar competitividad de las empresas individuales ubicadas en un ecosistema empresarial.

Palabras clave: Competencia; ecosistema empresarial; Co-creación de valor; Industria de la impresión.

1. INTRODUCTION

Cooperation and competition occur simultaneously giving rise to a novel form of strategic interdependence among firms (Dagnino & Padula, 2002). The creation of value occurs through the integration of complementary and similar resources that are exchanged between firms to create greater value than a firm would have been able to create alone (Bengtsson & Kock, 2000; Gnyawali & Park, 2009).

A current challenging issue within coepetition research is how coepetition should be managed. Prior literature suggested separation and integration (Le Roy & Fernandez, 2015), creating coepetition capability (Bengtsson et al., 2016). Separation and integration are seemed as complementary forces that can be applied simultaneously for effective management of coepetition.

Czakoń et al. (2020) suggested that managing coepetition is often managing tension. The tensions in coepetition can be resolved by improving information sharing (Fernandez & Chiambaretto, 2016), involve influences of a third party to organise relationship management (Gnyawali et al., 2016), create harmonious given and take relationships (Song & Thieme, 2006).

From the systematic literature review of Gernsheimer et al. (2021), there is lack of case study in printing industry, lack of research specifically describe the co-opetition within printing firms in a business ecosystem environment. Hence this study has selected one printing hub (business ecosystem) in TPBS, Malaysia as the case study.

TPBS has turned into a printing hub over the years as it attracted all the stakeholders such as print agent, design studio, Computer to Plate studio, offset printer, digital printer, all type of print finishing supplier, paper merchant, print association to this area. This area consists of shop houses that is cater for small medium enterprises started in the 1980s. The lower rental and the availability of fundamental resources for pre and post printing process had attracted more and more players in the industry to move into TPBS to grow their business.

The objective of this study is to further understand how coepetition evolves and how coepetitors interact in the printing industry in TPBS. This paper identifies the sources of coepetition, challenges faced by different firms in the same industry and the mechanism of these firms surviving in this business ecosystem. This study offers few contributions to coepetition literature. First, it contributes to the theory of coepetition as it focused on competitive dynamic separately and cooperative behaviours for value creation (Mathias et al., 2017). The coepetition of firms in the printing business ecosystem evolve in a circular process via informal contract. Second, this study enhances the understandings of coepetition within the context of a business ecosystem. The possible tension in coepetition is reduced when trust and friendliness is available to maintain the business ecosystem position. The interchangeable supplier-customer relationships facilitates value co-

creation through exchange of resources and capabilities in the geographic, technological and market overlap business ecosystem. The paper suggests the coopetition strategy is the base strategy to build competitiveness of individual firm located in a business ecosystem.

The paper is construct as follows. First, we provide an overview on the coopetition of inter-firm in business ecosystem. Second section offers literature review of previous works on coopetition and business ecosystem. Section three focus on the methods and the case is presented. Next the case's background is presented and empirical findings is discussed. Finally, conclusion is presented followed by the theoretical and practical insights.

2. MATERIALS AND METHODS

2.1 Coopetition

The concept of coopetition was introduced by Brandenburger & Nalebuff in 1996. It is a complex and contradictory strategy as competitors have to cooperate for mutual benefits. The two interaction logics both cooperation and competition occur simultaneously should be separated adequately by firms in different activities in order to make possible coopetitive relationships (Bengtsson & Kock, 2000).

Previous study found that competition seems to deteriorate cooperation at a given point of time, but the dynamic of coopetition will reinforce forms over time (Hoffmann et al., 2018). Balancing competition and cooperation relates to many types of benefits and tensions that may be managed in several ways. The underlying issues to this type of relationship is trust and commitment (Tidström, 2014).

Despite the competitive environment, it is possible to find a cooperative method to work together if common interests exist i.e. to achieve greater competitiveness (Geraudel & Salvetat, 2012). The benefits of cooperation include added value, improved quality, reduction of risk (Dorn et al., 2016). The negative outcomes of coopetition are the tension relationship, however it can be resolved by many ways such as improving information sharing (Fenandez & Chiambaretto, 2016), organisational structures (Chiambaretto et al., 2020), knowledge brokers (Chiambaretto et al., 2019), governance models and coopetition capability (Niesten and Stefan, 2019), firms need to build trustful relationships over time (Jakobsen, 2020).

Prior research has mainly focus on dyadic cooperation between competitors within different manufacturing industries (Czakon & Czernek, 2016; Gynawali & Park, 2011). The understanding of coopetition in a network context is still developing (Volschenk et al., 2016). The characteristics of evolving coopetitive relationships remain under-investigated at an industry level (Pellegrin-Boucher et al., 2013).

Table 1. Reports the literature gap found in the qualitative based research papers that is related to the coopetition in a business ecosystem type of context.

Authors	Methodology	Main Findings	The Gap
Bengtsson et al. (2010)	Conceptual article	Conducting longitudinal studies is relevant to understand the process of coopetition	The dynamic of the entire process without separating both cooperation and competition is not studied enough

Dana et al. (2013)	Longitudinal case study in Waipara wine cluster of New Zealand	The wineries are currently focusing on collaborative action, coopetition appears to be a transitional stage toward increasing cooperation.	Future research could consider other industries or other countries, the cooperative manager's influence in the cooperative process, to focus beyond the new world perspective by including traditional wine regions in Europe
Granata et al. (2017)	Qualitative case study of the wine sector in France	(a) Coopetition can be a relevant strategy for micro-firm competitiveness and growth; (b) coopetition is managed differently from larger firm; (c) individual-level dimensions of coopetition increase with decreasing firm size (d) policy measures should encourage coopetition that are tailored to micro-firm specificities	Coopetition study among SMEs is lacking, under what conditions is informal cooperation is more likely than formalised coopetition?
Jakobsen (2020)	Longitudinal case study of Norwegian R&D alliance	(1) The development of dependencies reduce tension in the paradoxical cooperation between competitors; (2) alliances can contribute to value creation in the form of new industry knowledge and innovation	Comparison of coopetition alliances in cross-industry and/or cross-national context or if they are specific for the industry; consider multi-partner coopetition alliances how they develop over time and handle the possible tensions between several partners
Amata et al. (2021)	Qualitative case study of diversified firm operating in the global semiconductor industry	Formal standard procedures could be crucial in defining a coopetition sequence within a diversified firm, there is a need for third party coordination like corporate headquarters. At the interfirm level,	How intrafirm coopetition makes it possible to target efficiency improvement in the medium and long term; the role of leadership and culture in intrafirm coopetition have not received adequate attention

		firms often initially cooperate and then compete.	
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Inter-firm coopeitition

Coopetition happens when firms are not able to shape some resources in a timely, standalone manner (Dyer & Singh, 1998; Eisenhardt & Schoonhoven, 1996), resource complementarities among competitors support effective resource integration (Chiambaretto et al., 2019; Gnyawali & Park, 2009) at the interfirm level analysis (Chiambaretto & Fernandez, 2016). The literature explored the roles of resource similarity and market commonality in shaping coopeitition (Bouncken et al., 2020; Klein et al., 2020; Miná et al., 2020), benefits of coopeitition (Dorn et al., 2016), network or ecosystem coopeitition (Sanou et al., 2016; Wegmann et al., 2018).

Hoffmann et al. (2018, p. 3039) focus on *temporal dimension* of coopeitition. Pointed out “a distinction can be made between alliance partners that enter each other’s product markets and begin to compete and long-time rivals that initiate a joint alliance.” While in the *sequential dimension* of coopeitition, the transition from competition to cooperation and vice versa. Alliance portfolio various characteristics enhances the venture’s legitimacy and performance, too. (Prabhakar-Sood, 2021).

2.2 Business ecosystem

The notion of business *ecosystems* is a broad one encompassing an array of business models and strategies that have emerged over the past few decades and are increasingly becoming important options for firms to efficiently search exponentially increasing solution spaces (Altman et al., 2019). It is an improvement over the concepts of supply chain, value chain and network, it captures the essential network dynamics (Lusch et al., 2016).

Business ecosystem comprises of three basic elements i.e. shared value proposition, module of interconnections, orchestrator (the core or central firm that integrate the partners) (Gackstatter et al., 2019). Pidun et al. (2019) defined business ecosystem as a dynamic group of largely independent economic players that create products or services that together constitute a coherent solution. They presented two basic types of business ecosystem i.e. solution and transaction ecosystem. This study takes the definition of Pidun et al. (2019) as there is no orchestrator elements in this case study. The concept of ecosystem is found useful for analysing business strategies in which competitors are also playing the role of complementors (Wegmann et al., 2018)

Ritala (2012) found the success of the coopeitition strategy is strongly affected not only by the alliance and specific factors of firms, but also by the industrial and economic context which they are inserted. The strategic alliance is a type of competitive action among competing firms, cooperation and competition or coopeitition is typical interaction relationships in business network systems (Hu, 2014). Accordingly, we have selected one context i.e. the printing hub as the business ecosystem for this study.

The value of ecosystem is that it brings together multiple players to create, scale and serve markets in ways beyond a single firm can do it alone (Schroek, et al., 2020). Some scholars named the value of ecosystem: value networks which can provide a value proposition that could not be obtained on the basis of a company’s own competencies and resources (Lingens et al., 2019). The values/benefits include but not limited to

sustaining and enhancing revenues, avoiding costs / cost saving, optimising societal benefits, securing license to operate and access to new market, increase of emerging new sustainability-related global business opportunities, reduce risk of ecosystem degradation, firm's operational risk, firm's expansion risk, improve resource efficiency, access critical resources through shared use of the resources of partner, accelerating time to market, providing learnings and generating enterprise value (Schroeck, et al., 2020).

Small and medium-sized firms have chosen to create business networks, consists of firms from the same operation sector in order to overcome common limitations, generating competitive advantages (Chennamaneni & Desiraju, 2011). There are various collaboration structures for this type of business model such as shorter and more flexible deal structures i.e. contractual relationships, platform partnerships and minority shares in venture capital investment and mutual continuous value creation (Lang et al., 2019).

2.3 Value co-creation

Cooperation and competition merge together to form a new kind of strategic interdependence between firms, giving rise to a cooperative system of value creation (Dagnino et al., 2009, pp. 25-26). Brandenburger and Stuart (1996) suggested value creation covers all activities that are structured within and across organisational boundaries to increase the amount of such value. This process is taken place in a business ecosystem.

Value co-creation is a way of sharing, combining and renewing each other's resources and capabilities between firms and active users to create value through new forms of interaction, service and learning mechanisms (Zwass, 2010). Co-creation of potential value is accomplished via four resource categories: people, technology, value propositions connecting internal and external service systems, and shared information (e.g. language, laws, measures, and methods) (Spohrer et al., 2007).

Ritala and Tidstrom (2014) and Czakon et al. (2014) confirm that there are both conceptual and empirical gaps in our understanding of value creation in network contexts. As firm increasingly involved in alliances with their competitors, they might start considering them as potential partners in the business ecosystem as they share the large common knowledge based and having mutual earning objective. Building trust with partner might reduce possible tensions in cooperation. Trust and generosity between firms takes time but it is important to firm to achieve an increased value creation with their competitors over time (Jakobsen, 2019).

2.4 Design and Sample

In this study, a single case study design (Yin, 2013) was used to investigate the cooperation management process in a business ecosystem. We believe that a qualitative approach is helpful to conduct an in-depth study in order to understand the cooperation logic in a business ecosystem, because it is also consistent with Bengtsson et al. (2010) suggestion to use a case study approach to understand cooperation.

Furthermore, in the recent literature, qualitative approaches (Bouncken et al., 2015) especially case studies (Amata et al., 2021; Jakobsen, 2019; Ritala et al., 2014; Fernandez et al., 2014; Tidström, 2014) had been used for cooperation studies. Qualitative case studies are suitable for understanding complex and context-dependent phenomena (Eisenhardt, 1989), especially the processes and dynamics of relationships which are not limited to structural conditions (Jack et al., 2010).

There were some specific criteria to select this case as a business ecosystem that included competing firms. First, the aim of the research is to contribute to the co-opetition literature, hence the selected case fits the criteria as it consists of firms within the same industry that compete in different degrees within the same markets. Second, following to increase focus on co-opetition as part of a firm's alliance portfolio (Bengtsson & Johansson, 2012; Park et al., 2014), a criteria on multi-partner co-opetition (more than two competing firms) within one particular industry was to set. Most of the previous research focus on dyadic co-opetition relationships between two firms (Jakobsen, 2020).

The printing industry in this business ecosystem is a context in which co-opetition is increasingly observed. This traditional sector has a long history of cooperation and competitive dynamic environment in TPBS, characterised by numerous co-opetition relationships among micro and small medium firms. Independent printer cooperates while remaining in direct competition, making this printing hub an interesting environment to study co-opetition in a business ecosystem.

This study might show what and how organisational mechanisms lead to the dynamics of inter-firms co-opetition. Such a methodological approach supports the investigation of the origin of cooperation within a competitive context, why they follow a specific path (Eisenhardt, 1989; Gerring, 2006).

2.5 Data collection

The data collection includes interviews of 8 informants from the business ecosystem. The researcher had direct and complete access to the standard operating procedures and production process of the various firms due to the more than 12 years experiences in the business ecosystem.

The primary sources of information are semi-structured interviews. We interviewed highly knowledgeable informants of the ecosystem from different firms in various functional areas with specific educational backgrounds (Eisenhardt & Graebner, 2007). Purposeful sampling (Miles & Huberman, 1994) was used to identify a case that provided insight into technology changes, how it effects on co-opetitive relationships and theoretical development (Eisenhardt, 1989). The selected informants have been working in the industry for more than 10 years.

The interview Was conducted and recorded in the period spanning from Jun 2021 to April 2022. The interview questions were divided into themes related to firm's motivation to move into this business ecosystem, the challenges and value generated from the involvement, the interaction between the firms in the business ecosystem. The interview questions are listed in interview protocol as a guide to ensure all relevant topics are covered. The goal of the interview is to establish a conversational style where the interviewees talked as freely as possible around the topics (Patton, 2015).

We also included insights from observational data and project descriptions as part of the data collection. The data gave us more understanding to pursue further question with the informants (Patton, 2015). The informants were encouraged to describe their involvement in the co-opetition alliance from its beginning to the present with minimum interruptions by the researcher. We do not use theoretical concepts explicitly during the interview to avoid bias.

The informants were contacted first by WhatsApp and interviewed online or face to face depending on their availability. Interviews generally lasted approximately 60 minutes and were complemented by on-site visits, observation and dialogue.

During the semi-structured interviews, our informants described why and how they identify and manage the cooperation process (Table 2). The researcher has open access to the interviewees and conduct personal observations. This makes it possible to triangulate facts (Jick, 1979). The knowledge acquired from earlier interviews is considered as probes in later interviews to achieve accurate and triangulated information and further enhance the study's construct validity (Denzin & Lincoln, 2002).

Table 2. Key information about the interviews at TPBS

Respondents / informants	Interview (hours)	Focus of interview
Firm NPW – Printer NPW owner	1.5	-business strategy
Firm H – press machine solution provider	1.5	-the cooperation process in TPBS
Firm G – Printer, alliance of NPW	1	-the uniqueness of TPBS
Firm E – Printer, alliance of NPW	1	-the origin of cooperation
Firm A - Paper supplier	1	-the business culture of TPBS
Firm N - Packaging Finishing supplier	1	-the underlying issue in TPBS
Firm K - Binding Finishing supplier	1	
Firm T - Print agent	1	

Raw data from the interviews and supplementary information were organised and coded following the principles of open, axial and selective coding (Corbin & Strauss, 1990) into thematic areas. Data collection ceased when the last information added no new information for the analysis (Cook & Campbell, 1979).

2.6 Data analysis

We analysed the data based on a thematic content analysis (Miles & Huberman, 2003) to understand how the firms individually and collectively manage cooperation. We read and read the interview transcripts to become familiar with the case and develop the ability to identify general patterns across cases (Eisenhardt, 1989). The variety of respondents and diversity of terms that were used led us to opt for a more manual analysis.

We performed several levels of coding. In the first level, we categorized the interviews' transcriptions including firm and individual level information (e.g. age of the firm, gender, number of employees and nature of business). It was then transcribed to improve our understanding and define a second level of coding, the level of cooperation management. There were codes emerging during the data collection such as the notion of friendliness that was not uncovered in the initial theoretical review. This is relevant to how firms cooperate.

After the initial coding procedure, we grouped the data into a smaller number of categories, pattern codes, which can identify an emergent explanation (Miles et al., 2014). Interestingly, the classification of the categories was consistent among the firms in the business ecosystem. The verification through conversations

with other outside TPBS informants such as printing machine supplier and paper merchant were organized to obtain additional feedback. The codification process ended when all new data could be immediately classified (Lincoln & Guba, 1985). The combination of different data sources helps in obtaining an in-dept description of the coopetition management process in TPBS.

2.7 Quality of research

We used three tactics to ensure that the research reflects the objective of the research and represents the phenomena in study. First, multiple sources of evidence were used. The interviews were conducted with printing firm, press machine supplier, paper supplier, finishing firm, print buyer. Second, we triangulated interview data with secondary data (observational data, written documents, directory) and information collected online (the firms webpage, and press articles). The secondary data was used to confirm or disconfirm the data from the interviews. Third, we let key informant read the draft of the paper to check if our interpretation resembled his or her experiences. The feedback from them will confirm that we had described the case in accordance with their experiences and reduced the risk of focusing on incorrect constructs.

Further, to increase the internal validity, we tried to look for data that support explanations (Patton, 2015) to reduce the contradiction of the explanations.

3. RESULTS AND DISCUSSION

3.1 Case Background

TPBS is established since 1980s and slowly grow into a printing hub that hosts more than 100 SMEs supporting the printing industry in one place. The businesses in this ecosystem consists of print agent, design studio, Computer to Print studio, printer (mostly offset and digital), paper merchant, machine engineers, different type of print finishing suppliers for die cutting, spot UV, lamination, binding, etc.

They all carrying the know-how of printing in their respective firm. All firms can complement each other through their services; hence they can compete and cooperate to share resources (machines, manpower, forklift) at any time. Coopetition plays an important role in the TPBS printing industry ecosystem. This study will focus on how, why things emerge, develop, grow or terminate over time (Langley et al., 2013:1).

There are more than 100 firms in this TPBS. All the shops are within walking distance to each other. “It is one of the full flesh offset printing ecosystem in Malaysia” said the Firm H representative. Any new player who come and set up a print shop here will be able to get job as there are print buyer moving this this area and they might also get job with other printer who is also their competitor. The survival rate is high for printer in TPBS. At the same time, some of the printers compete furiously for price and facilities and the print agent can easily move around to compare prices. Sometimes, the printers cooperate to join forces in order get a job done.

Coopetition is becoming a special norm in TPBS as the interchangeable supplier-customer relationships facilitates the exchange of resources and capabilities (Gnyawali et al., 2018). The ecosystem of this printing ecosystem set up the best-case scenario for this study on the coopetition orientation.

Another group of actors is the print agent. Most of the print agent do not own any/many assets, they create value through relationship and network. They are active in performing the role of customer (beneficiary) that also involve another actor (service provider). We pay attention to the printing business operation process that produce a wide range of printed materials such as packaging boxes, sustainability report, annual or integrated report, coffee table book, brochures, manual booklet, etc..

We change the firm's real name to guarantee its privacy in this research. The first informant is NPW is an award-winning SME established in 1997, its revenues reached more than 11 million Ringgit Malaysia in 2021. NPW is the first printing firm that is known for its holistic approach to offer eco printing in Malaysia. NPW has their own printing machineries, logistic team and create some business alliances.

Alliance partners with market overlap like in this case are current direct competitors, while current non-competitor partners may become competitors in the future with enhanced similar technological competencies (Hung & Chang, 2012). The unit of analysis is the effect of cooptation at an ecosystem level.

3.2. Discussion

Finding mutual benefits is the key driver for cooptation relationship. In this study, the different printer (SMEs) work together to offer the solution to the client with the goal to maintain trust of client on their capability to deliver fast and quality product. One printer invites complementors (another printer) to create differentiated offers that simultaneously compete with their own solution (Zhang et al., 2020). According to Teh, this happen when they unable to fulfill the print capacity requested by client and they will invite another printer to jointly do the print job in order to secure the order. Sometime, it is the limitation of their own equipment that they will need to outsource/subcontract the job to another printer that is able to print in a more economical way. In this case, both printers will be able to enjoy some profit from the same print order. The smaller ones are more likely to have a cooptation mindset and engage in the cooptation relationship (Helen et al., 2019).

The print partner was selected based on trust commitment and common benefits (Bouncken et al., 2016). There was no formal contract for this partnership and no monetary agreement. Just as the findings of Helen et al. (2019), the cooptation relationships are often friendly, less formal and built around communities with a sense of common purpose and a collectively positive attitude towards collaborating.

As they are all geographically connected in TPBS, they become easily strategic alliance (Chim-Miki & Batista-Canino, 2017; Mariani, 2016) and achieving the network effect (Pellizzoni et al., 2019; Trabucchi & Buganza, 2021). However, it is more contingencies based and per job basis. All players in TPBS are 'born cooptitors' (Pattinson et al., 2018), they tend to involve in cooptation willingly for visible 'blind faith' benefits (Pattinson et al., 2018). In another word, they are ever ready for cooptation in a circular process as in Fig 1.

The benefits include but not limited to expand market share, lower operational cost, faster turnaround and better print quality. If it is a win-win sceanario, the cooptation engagement behaviors are more likely to become mutual in the long term (Dyer & Singh, 1998).

They are influenced by customer to upscale their printing capacity, upgrade their equipment, upgrade their process to meet certain certification requirement or customer's product requirement in order to grow their business.

Teh shared that for business to succeed in TPBS, one needs to understand the business position, business trend, plan for continual growth and be mentally prepared for competition. The barrier to enter TPBS is low, hence there is always a new competitor. All of them developed their network interactions using the same printing logic. “The printer needs to build their own unique selling position (USP) for others to collaborate with you and for you to outperform your competitor.”

Teh also works with a bigger player in the TPBS while at the same time building their own USP by offering eco printing with an eco label for printed material. They continue to monitor market trends and work closely with suppliers to equip themselves with the latest print technology and equipment to improve service quality. Even though they have the latest equipment, they continue to maintain the pricing for existing customers. Hence, customers are getting eco-printed material for the same competitive price. The new equipment is able to reduce wastage and offer higher productivity, therefore they are able to offset the high investment with more print jobs.

There are internal structural changes such as obtaining international certification (ISO9001, ISO 14001, Forest Stewardship Council (FSC) and Eco Label), recruiting talents, increasing training for operators using high technology equipment, installing management software, enhancing relationships with suppliers by having frequent communication with suppliers. All this effort is made to differentiate themselves from their peers in the ecosystem. The phenomena align with the notion “rivals compete intensely to win and retain customers. Without vigorous competition, a cluster (business ecosystem) will fail (Porter, 1998, p. 2).

It is a multi-actor competition in TPBS. The source of competition is mutual benefits, however there is no formal contract for this mutual benefit, see Table 3. They will join forces to integrate the resources (printing machines / technologies capacity, eco labels and certification, manpower) for value co-creation to service their clients by meeting their requirements (e.g. quality of printed material, eco label, time of delivery). The cooperation decision is made between the business owners through verbal discussion as it will be faster based on their industry experience (Lieberman-Yaconi et al., 2010).

Informants in our study said they do not consider each other as direct competitors as they focus on their own institutional effectiveness. The formalization of competition in the business ecosystem encourages the maintenance of a collaborative mindset. They tend to develop informal exchange, which is perhaps essential for the competition against another printer. Competition seems to have a positive effect on quality production and thus achieve a win-win scenario.

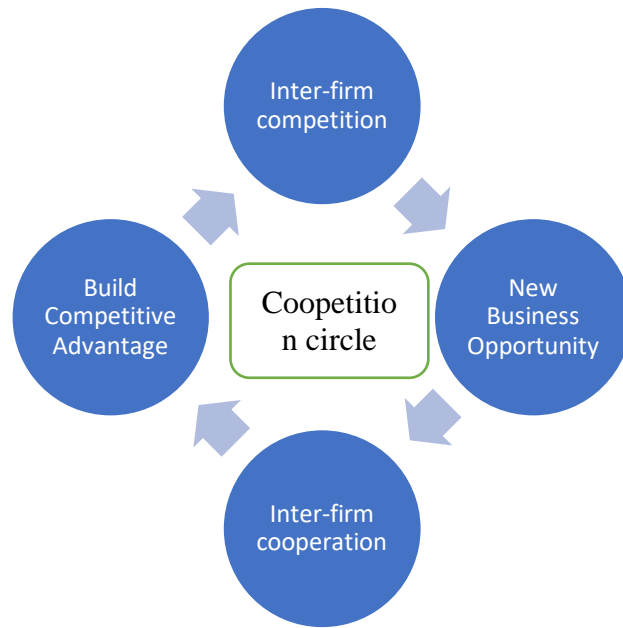


Figure 1. Circular view of interfirm competition process in business ecosystem

Our results lead us to propose an alternative approach to the definition and analysis of competition and ecosystem. Fig 1 illustrated the firms stay is a competition stages in the business ecosystem until a new business opportunity arises (either through a tender process or a obtain a higher revenue job that require bigger capacity), then firms will cooperate with their competitor to integrate resources to deliver the job for client. When the job is done, firms will continue to build their own competitive advantage (either through upgrading their machines or acquire certain standard required by client). Their own competitive advantage will keep them in the market and circle of competition continue in the business ecosystem.

The informants interact in a tight and loose couplings (Vargo & Akaka, 2012) relationship based on shared understandings and institutional arrangement, as reflected by Lusch et al. (2016). The actors are responsive to others' actions but still preserve their own identity, uniqueness and distinctiveness (Lusch & Nambisan, 2015) and remain separate (Mustak & Plé, 2020). Table 3 reports the summary of some of the interviews performed.

Table 3. Summary of findings from primary sources

Coopetition process	Themes	Findings	Reference
Source of Coopetition	Geographic	<p>Firm NPW – There are multipoint of cooperation with printers, finishing suppliers here</p> <p>Firm H / A - Centralise with various related solution provider, convenience for client</p> <p>Firm G - Centralise with lower entry barrier for new player, cheaper entry cost</p>	Amata et al. (2021)

	Resourceful	Firm NPW - Successful cooepetition relationship configurations is only effective in the short term during resources integration	Ricciardi et al. (2021)
Challenges	Price competition	All firms - Client can easily compare pricing at the same location. When cooperate with other firm, the profit margin will reduce.	Our elaboration from interviews
	Balancing act	Firm NPW – small firm always need to find the right balance between cooperation and competition	Granata et al. (2017)
Mechanism of surviving	Trust	Firm NPW - Trust is important in our alliances to form strong networks of relationship. However, there is no formal contract in the inter-firm relations.	Cullen et al. (2000); Yang et al. (2008) Schaper et al. (2005)
	Friendliness	Firm NPW / G – do not see others as direct competitor, intend to stay competitive in a harmonious way	Our elaboration from interviews

3.3 Theoretical contributions

There is limited empirical studies on simultaneous strategic use of cooperation and competition (Hoffmann et al., 2018). This study contributes to providing insights into cooepetition for academicians and practitioners. First, this study contributes to the theory of cooepetition as it focused on competitive dynamic separately and cooperative behaviours for value creation (Mathias et al., 2017). Second, this study enhances the understandings of cooepetition within the context of a business ecosystem.

Our results disrupt the previous research findings that firms in cooepetitive relationships should establish effective protection, control and governance mechanisms, requires formalised cooperation contracts (Bengtsson & Kock, 2014; Bouncken et al., 2016; Czakon, 2009; Le Roy & Fernandez, 2015) and a focal firm approaches (Adner, 2017). The case demonstrates the cooepetition capability of the firms is dynamic, not static to respond to the cooepetition by continuously adjust their relationship with competitor, assess situations, makes sense of realities and responds to change effectively (Yoo et al., 2020).

The case provides examples of important management issues that enrich the research on cooepetition. Firms is willing to cooperate for value creation but turn their positions to be competitors when it comes to value capture (Brandenburger & Nalebuff, 1996; Zhu & Liu, 2018). Firms only experience direct competition when they are invited and want to enter the tender process for big (higher revenue) job, this is consistent with the literature that tensions are intensified under the condition of scarcity (Miron-Spektor et al., 2018).

This study extends prior literature on ecosystem by complementing the dynamic view (Mouzas et al., 2008). In this case, the integration of co-competition and ecosystem by multi-actors provide an infrastructure for small medium size firms to access customer, managing the production process, reduce the cost and reduce risks of business without a focal firm (Adner, 2017) in ecosystem

3.4 Managerial implications

Firm is able to cooperate with their competitor (Nalebuff & Brandenburger, 1997) for new business opportunity like emergent job on short term basis to complement their service for their client. They cooperate for resources like sharing of man power and machine technology to complete the job for client. This study suggests the co-competition capability of firm that is willing to change for the growth of the company is taking advantage of the business ecosystem context.

It is important that managers build the ecosystem concept, and do not narrow their work scope just within their immediate or direct network relationships, do not limit to formal contract to prepare themselves for changing marketplace.

The analysis may be replicated by the managers of business ecosystem with the purpose of leveraging co-competitiveness. The motivation of each actor joining the ecosystem is to access to larger customer base and resources.

3.5 Limitations and future research

This research is a single case in a specific industry. In the future, we can analyse and compare different industry to enhance the level of universality.

The sample cases all based in Malaysia, in the future research can include samples from developed countries to enrich the findings.

From this study, we noticed some co-competition take places when the firm work with their competitor who carry the eco label to meet the eco label demand of their client. Further research on sustainability driven co-competition will further enrich the understanding of the co-competition relationship between firms.

4. CONCLUSION

This study was developed in response to calls for better understanding the dynamics of co-competition (Bengtsson & Kock, 2014; Tidström & Hagberg-Andersson, 2012) and how ecosystem context influences co-competition strategy (Wegmann et al., 2018). This study focuses on one business ecosystem of printing industry, which itself is a network linking the various actors' contributing to deliver products and services across the economy. Co-competition capability become a must have in TPBS to maintain a shared positioning as a printing hub and compete to grow their own market share in the printing industry. The geographic and resourceful criteria such as technological and market overlap help to stimulate co-competition.

Using the TPBS case, the challenges in this ecosystem is price competition and the balancing act of competition and cooperation. However the mechanism of survival in this ecosystem is based on trust and friendliness. This study illustrated the informal verbal communication is effective institutional drivers for

encouraging interfirm collaborations for short-term success and long-term resilience as illustrated in coopetition circle.

Coopetition strategy increase the possibility to leverage the resources to meet the heterogeneity of the printing process in a print ecosystem like TPBS. The coopetition process is a circular process for the printing firms in business ecosystem. TPBS provide the fundamental support for every player to survive. Coopetition build competitiveness of individual firm located in a business ecosystem.

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