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RESEARCH ARTICLE

The impacts of customer involvement and knowledge absorptive capacity on the performance of startups

Quoc Trung Pham [ORCID] and Nhu Trang Nguyen

School of Industrial Management, Ho Chi Minh City University of Technology (Vietnam National University HCM), Ho Chi Minh City, Vietnam

ABSTRACT

The objective of this research is to investigate the effect of customer involvement in different stages of the new product development process and absorptive capacity on the growth performance of startups. In this paper, the linear regression was utilised to analyse the empirical data collected from 152 startups in Vietnam. Results showed that customer involvement has a positive impact on startup growth. Particularly, startups who involve customers more intensively in the ideation stage will yield better growth than those involving customers in the development and commercialisation. The next finding is about knowledge absorptive capacity whose four processes affect startup growth differently. The analysed data revealed that only knowledge acquisition and knowledge exploitation have a significant positive impact on the performance of startups. Other processes of absorptive capacity, which are knowledge assimilation and transformation, have no contribution to performance. Based on results, some recommendations to enhance the startups' performance are proposed.

1. Introduction

Recently, entrepreneurship has increased its contribution to the global economy and has become a key driver for economic growth in many countries, including Vietnam. Locating at the centre of ASEAN whose new entrepreneurial ventures in various industries have received $7.86 billion investment in 2017 (Viettonkin Consulting, 2019), Vietnam is known as one of the fastest growing economies in the region with strong entrepreneurial spirit and government continuous support for starting a new venture.

Despite the phenomenal growth, startups also encounter substantial challenges. The failure rate of startups is 90% according to Griffith (2014). Results in Griffith's survey also disclosed the top reason that made startups fail was the lack of market demand for their products. Vietnamese startups also experience this mismatch with only 12.7% of less than 3.5 years-old startups that are successful (GEM, 2018). In the same report, the prospect of growth in employment rate of Vietnamese startups is also low compared to the average rate of other countries (GEM, 2018). Moreover, the innovativeness of Vietnamese startups is relatively low in comparison to startups in other regions with only 13.9% of new ventures which is considered innovative, ranked 48 in total 54 economies in a survey of (GEM, 2018). The low innovativeness and lack of knowledge-absorptive capability could be possible reasons for the low performance of Vietnamese startups community.

Besides, these undesired outcomes are rooted in the unstable nature of startups' operation, and the shortage of the most important element in creating competitive advantage which is internal knowledge according to the knowledge-based view (Zahra, 1996). In a report, the Australian Trade and Investment Commission (2019, p. 16) also identified the "lack of management and entrepreneurship skill" to be one of the biggest challenges for Vietnamese startups. Furthermore, today's business environment is changing very fast and full of uncertainty due to the constant development of technology and changes in market demand. It requires businesses to have an agile strategy, to use open innovation and knowledge from customers to sustain their businesses. Hence, organisations need to be able to learn and adapt quickly to sustain their growth and satisfy their customers. However, there is a lack of empirical study to show the positive impact of customer involvement and knowledge absorptive capability on the performance of startups in practice.

Although a few studies in external knowledge acquisition, absorptive capacity, and the impact of both factors on firm performance emerged in the last two decades, these literatures only analysed the data from spinoffs which are established organisations or born within a corporate environment (Crescenzi & Gagliardi, 2018; Escribano et al., 2009; Scaringella et al., 2017). While findings in many studies showed that the involvement of customers in the new product

CONTACT Quoc Trung Pham ✉ pqtrung@hcmut.edu.vn School of Industrial Management, Ho Chi Minh City University of Technology (Vietnam National University HCM), 268 Ly Thuong Kiet, District 10, HCMC, Ho Chi Minh City, Vietnam

development process allows firms to gain positive results regarding innovation performance (Fang, 2008), some researchers suggested that businesses may suffer from inefficient process, lower performance, team conflict and complexity increase when involving customers in the product development process (Chang & Taylor, 2016). Besides, previous literature also revealed that the benefit of customer involvement varied from different product development stages which asked for additional research to investigate further into the relationship of these factors (Sandén, 2007). Moreover, other scholars (Caseiro & Coelho, 2019; Larrañeta et al., 2012; Seo & Lee, 2019) conducted studies on new ventures have not yet addressed completely the role of customer involvement in product development process on the performance of startups.

In Vietnam context, in spite that the interest in startup performance study has risen recently in the academic environment, the number of works is still rare. Some notable papers related to this topic have been published by various scholars including Pham (2017), Nguyen (2019), Trinh (2019), Tran (2018), Nguyen and Pham (2018). The findings in these studies reveal that there is a positive effect of business model innovation and dynamic capabilities on the startup performance. Besides, absorptive capacity, or learning process, of the startup will play an important role in turning the customers' knowledge into its competitive advantages and performance. However, a study that investigates the effect of customer involvement, and absorptive capacity on the performance of startups, especially in Vietnam context, has not been existed yet, which left a research gap. Thus, this paper objective is to analyse the empirical data collecting from startups in Vietnam to find out how the involvement of customers in different stages of the new product development process and the ability to absorb new knowledge benefits new venture growth.

This study contributes to the existing literature of startup, entrepreneurship, and knowledge management by examining the influence of customer participation in three distinguished product development stages and four processes of absorptive capacity on startup performance. Moreover, the study also analyzes the effect of these factors on the outcome of entrepreneurial process, which is quantified by growth rather than by innovativeness.

In summary, this study aims to examine: (1) The impact on startup's growth performance of customer involvement during different stages of the new product development process; (2) The association between each process of absorptive capacity and the growth of startup; and (3) Suggest some managerial implications for startups to improve their performance. This paper consists of six sections, starting with an introduction. The study follows the literature review in the second section. Then the third section will reveal the research methods. Following the examination results in section 4. And the discussion with managerial implications will be presented under section 5. In the final section, a conclusion and future research will be described.

2. Literature review

2.1. Theoretical review

2.1.1. Vietnamese startups and startup performance

Ripsas & Troger (Ripsas & Troger, 2014) defined a startup as a firm that deploys an innovative business model with or without advanced technologies, experiences rapid growth in either revenue or recruitment and has less than 10 years in operation. In Vietnam, a similar interpretation for startups is circulated in the legal document supporting small and medium-sized enterprises (SMEs), describing creative startups as SMEs which exploit new technologies, business models, and intellectual property to commercialise new business ideas leading to significant growth (Nguyen, 2019).

Startups are different from established enterprises due to their unique nature, which is the lack of various resources needed to execute the proven business model and paying customers during their nascent stage (Blank & Dorf, 2012). Moreover, startups usually operate in an extremely uncertain environment, persistently seeking new products or services that can help them acquire customers. Regarding the startup life cycle, the length of a startup period varies from 3.5 years to 5 years from its inception (GEM, 2018). According to Zahra (1996), startups go through multiple development phases including nascence, growth, maturity, and decline.

The performance measure of startups has been introduced in numerous works of literature. Seo and Lee (2019) classified the performance of a venture into financial and non-financial one. And they argued that financial performance to some extent is more crucial for startups in their nascent stage, since it has a direct impact on the survival of new ventures, while non-financial performance is linked to long-term growth. However, it is difficult to collect financial data from startups because it's considered sensitive information. Therefore, many studies focus on non-financial measures for evaluating the performance. Although different measures for startups were suggested in existing research, and entrepreneurs need to actively keep the update on their startup performance to ensure their business is on the right path, it is unnecessary to monitor all the information at the same time (Rompho, 2017). Startup owners need to choose the proper measure based on their startup's characteristics and the objective at each development stage.

2.1.2. Customer involvement in different stages of the innovative process

In previous studies, researchers proposed various approaches to breakdown the new product development into phases. Sandén (2007) suggested four phases of product development: "need recognition, idea formulation, development, and commercial diffusion". In another research, Chang (2018) divided the product development process into three stages, including ideation, development, and launch. In a more condensed view, Olson et al. (2001) broke down the new product development process into two main stages: an early phase which consists of product conceptualisation and evaluation, a later phase consists of product production and commercialisation. In between these two stages is the go/no-go point where the major decision whether to continue developing or change is made by the development team (Olson et al., 2001). In alignment with Chang (2018), a three-stage approach which includes ideation, development, and commercialisation is applied in this research. Since goals, essential tasks, and skills required at each stage of this approach are considered distinct.

Throughout these development phases, customer can be engaged by offering knowledge related to their needs/last experience, or providing their ideas related to design and develop a new product or testing prototype and suggesting the communication and sell tactics to occupy the market in the commercialisation stage (Nambisan, 2002). The degree to which the customers are engaged in new product development varies from providing information about potential needs, the expectation for the new product/service to intensive participating as a developer during the process (Leahy, 2013; Sandén, 2007). Generally, the above findings show that involving customers allows entrepreneurs to concentrate on meaningful jobs and optimise their limited resources at different stages during their entrepreneurial process. Certainly, the model forces startup owners in their venture development journey to lean on the customers and their needs before starting building products or services (Bosch et al., 2013).

2.1.3. Absorptive process/capacity

There exists much extensive literature on the topic of a firm's absorptive capacity. One of the most notable studies on this area was Cohen and Levinthal (1990) who defined absorptive capacity as the ability to identify the value of new knowledge that coming from external sources, then assimilate and commercialise it to gain financial benefits. Cohen and Levinthal (1990) also conceptualised absorptive capacity as organisational learning processes including recognition, assimilation, and exploitation. As an extension to Cohen and Levinthal's theory, Kim (1998) suggested the absorptive process should involve knowledge acquisition, assimilation, transformation, and development. This theory was later re-conceptualised by Zahra and George (2002). In Zahra and George's study, they described a group of capabilities that were embedded in organisational routines and processes. According to Zahra and George, the process of knowledge absorptive capacity can be described as follows:

Acquisition: external knowledge that is valuable and relevant to the firm's business will be identified and acquired. The intensity, pace, and direction of the activities mostly affect the outcome of this acquisition (Zahra & George, 2002).

Assimilation: the acquired knowledge in the first process will be included, interpreted, and comprehended through a firm's internal processes and routines. The assimilation ability allows organisations to accelerate the process of learning and product development (Xie et al., 2018).

Transformation: current knowledge and acquired knowledge are merged to create new knowledge. This process represents the capacity of a firm in developing and optimising its internalising routines (Zahra & George, 2002).

Exploitation: new knowledge will be applied for commercial outcomes (Cohen & Levinthal, 1990). Since the outcomes of knowledge application allow a firm to realise the value of new knowledge, hence, a venture having a high capacity in knowledge exploitation can constantly incorporate new knowledge into its operation to develop new products or services (Xie et al., 2018).

Besides, Zahra and George (2002) also organised four processes of absorptive capacity in two categories: potential absorptive capacity (PAC) and realised absorptive capacity (RAC). PAC, which consists of acquisition and assimilation capabilities, addresses the difference in firm's ability to recognise the value of knowledge from external sources then acquire and assimilate it. While RAC including transformation and exploitation capabilities, emphasises the distinguished processes in which new knowledge is transformed and commercialised (Zahra & George, 2002). Furthermore, Zahra and George believed that both sub-sections of absorptive capacity not only existed at the same time (but for any single "idea", the earlier steps had to begin before the later ones) but also kept an important role in increasing business performance.

2.2. Research hypothesis

This research is based on dynamic capability theory, which focuses on the capability of an organisation to purposefully adapt an organisation's resource base. Teece et al. (1997) defined dynamic capability as the firm's ability to engage in adapting, integrating, and reconfiguring internal and external organisational

skills, resources, and functional competences to match the requirements of a changing environment. For startup businesses, they must adapt themselves through a learning process to innovate their products or services to sustain their businesses. Therefore, absorptive process and innovative process through customer involvement will be important factors influencing their business performance.

Findings in a previous study (Chang, 2018) showed that some firms involved their customers in a specific stage of the innovation process, whereas customers were engaged throughout multiple phases or across all stages in other ventures. Although the effect of customer involvement varies in different stages, results in many papers also reveal that the customer involvement brings positive results for the new product development process (Bano & Zowghi, 2015; Chang & Taylor, 2016; Chang, 2018; Coviello & Joseph, 2012'Hoyer et al., 2010; Morgan et al., 2018; Sandén, 2007). In other studies, customer involvement is found to be an effective approach to increase innovation success (Conradie et al., 2015; Cui & Wu, 2018; Noblet et al., 2011). Innovation whether in the form of a product or business model, according to Caseiro and Coelho (2019), Ries (2011), and Scaringella et al. (2017), has a positive impact on the performance of startups. Therefore, hypotheses 1, 2, 3 are stated as follows:

Hypothesis 1: The involvement of customers in the ideation stage has a positive impact on startup growth performance.

Hypothesis 2: The involvement of customers in the development stage has a positive impact on startup growth performance.

Hypothesis 3: The involvement of customers in the commercialisation stage has a positive impact on startup growth performance.

Traditionally, firm performance is considered as an outcome of absorptive capacity because of the correlation between capability and performance. Indeed, findings in some empirical studies revealed that absorptive capacity has a significantly positive impact on firm performance (Bergh & Lim, 2008; Wales et al., 2013). Based on the knowledge-based view, Zahra and George (2002) proposed that the capacity of a firm in exploiting knowledge also affects firm performance. Supporting this proposition, the empirical data from Brettel et al. (2011) confirmed that all four processes of absorptive capacity have a positive relationship with firm performance. Findings in another literature (Scaringella et al., 2017) that investigated the relationship between customer involvement, absorptive

capacity, and innovation performance revealed that firms that successfully involve their customers in the innovation process can improve their capacity of knowledge exploitation and increase the probability of commercialisation success. Therefore, hypotheses 4, 5, 6, 7 are stated as follows:

Hypothesis 4: Knowledge acquisition has a positive impact on startup growth performance.

Hypothesis 5: Knowledge assimilation has a positive impact on startup growth performance.

Hypothesis 6: Knowledge transformation has a positive impact on startup growth performance.

Hypothesis 7: Knowledge exploitation has a positive impact on startup growth performance.

2.2.1. Research model

In summary, the proposed research model could be illustrated in the following figure (Figure 1).

3. Research method

Firstly, the quantitative research focuses on Vietnamese startups, which have been going through their early stage and located in major cities Ha Noi, Da Nang, and Ho Chi Minh City, where 90% of startups of Vietnam are located (Viettonkin Consulting, 2019). To increase the number of data points, our targeted audiences for this research were the new ventures that have been operated for at least 1 year until June 2020 and expanded to the startups that were matured (have been in business for >3 years). For the mature startups, they would recall the information of their venture's nascent period to respond to the questionnaires. The questionnaire was bi-lingual with the origin is developed in English and the Vietnamese translation for each query using a collaborative translation procedure. The survey was formulated in a convenient way for informants to be able to complete it within 10 minutes, to increase the response rate (Hansen, 2006).

Secondly, the data sampling method is a convenient method focusing on startups' founders or managers. Unlike long-lasting businesses, whose knowledge may exist in internal procedures or system within the organisational boundary, knowledge which influences the development of new ventures is mostly formed and internalised by its management-level employees or founders (West & Noel, 2009). Therefore, our target for this study is the founders/co-founders, C-level directors, and senior managers of startups. Since it was hard to find a completed list of all startups in Vietnam. Hence, multiple approaches were applied to overcome this challenge, such as: gathering contacts
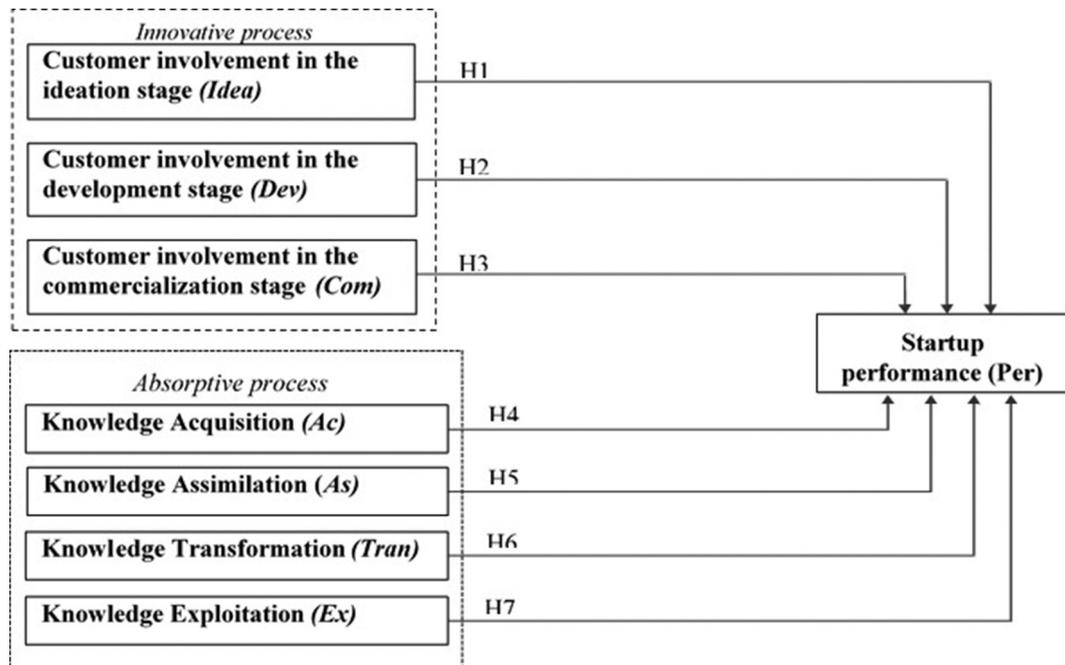
Figure 1. Conceptual framework of the research.

of startups through online community of Vietnamese startups, LinkedIn, Facebook ... Then a total of 704 emails with a link to the Google Form survey were sent separately to each targeted personnel of 704 ventures. Four follow-up emails were delivered to remind the recipients in every two weeks, 166 responses to the questionnaire were collected. Lastly, with two visiting trips to Saigon Innovation Hub which is one of the highly rated co-working spaces in Ho Chi Minh City, other 12 startup co-founders and senior managers were approached and participated to answer the questionnaires directly. In total, 716 question forms were distributed, the author received 178 responses which account for 25% of the total deliverables. After a visual review process, 26 cases were eliminated due to the untrustworthy responses showing in straight-lining answers, 152 cases were valid to proceed with the next step. In this research, there are 26 questions were proposed, thus, the ratio between the number of responses and the number of observed items was 5.8 (>5). Therefore, the sample size is sufficient for analysis (Hair et al., 2014).

Thirdly, multiple measures with interval scale and five-point Likert scale were employed for this research since it is comprehensible for informants to address their points (please see appendix 1 for more details). Most measurement variables use an agree – disagree manner, but some variables adopt an infrequently – frequently or an insignificant – significant manner. Selected control variables are firm age, firm size, and industry, which are consistent with other similar research on firm performance. The customer involvement in innovative process constructs and scale to measure the degree to which the startups involve

their customers during the product development process are adapted (translating to Vietnamese and adapting a little bit in wording for making them easy to understand and suitable with Vietnamese context) from Sandén (2007), Morgan et al. (2018), and Chang (2018). For customer involvement in commercial stage, there are 2 additional scales based on the discussion of Sanden (Sandén, 2007) and deep interview results with 10 owners/managers of startups. The observational variables of each process of absorptive capacity including knowledge acquisition (3 items), knowledge assimilation (4 items), knowledge transformation (4 items), and knowledge exploitation (3 items) were developed by Flatten et al. (2011) and Zahra and George (2002). They were measured using a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree. Since most startups are still in the early stage of their entrepreneurial process when many of them could only sell a small number of products or services, therefore the financial indicators like profit or return on investment may not be proper in performance evaluation. The observational variables of this construct were applied to analyse the performance of startup in its growth are the incremental rate in employment, capital, and revenue because they are often used in previous studies and easy to collect. All three items were measured with the scale represented the increase in value from 1 = not at all, 2 = slightly, 3 = moderately, 4 = significantly, 5 = very significant.

The data were then assembled and imported into SPSS application. The reliability, completeness, consistency, and clarity of the questionnaire responses were checked after collecting all the data. Afterward, the response to each question was transferred to

a relevant code. A descriptive analysis was performed to draw an overall picture of the characteristics of startups. Followed by the test to check the model reliability by measuring the Cronbach's alpha value. The convergent and discriminant validity of the model was measured using Kaiser-Meyer-Olkin (KMO) and Barlett's test before an exploratory factor analysis was conducted. Finally, all the research hypotheses were tested using a linear regression analysis. Based on the results, some managerial implications were suggested for improving the growth performance of startups in Vietnam.

4. Results

4.1. Description of data

The result in the table below shows that, among participants in the study, co-founders are the largest group which accounts for 69.7% of respondents. The C-level employees are the second largest group with 36 informants, accounting for 23.7% of all respondents. The last 10 informants work as senior managers in startups. Regarding gender category, male respondents are dominant among participants with 123 people which accounts for 80.9%, whereas there were 29 female informants account for 19.1%. Although the ratio of female leaders in Vietnamese new ventures is still low, this proportion is better than other countries. Since the proportion of female leaders at startups in many regions of the world is very low (Seo & Lee, 2019). The data of Table 1 represented the ratio of males and females in each role among informants consolidates this finding with further details. The outcome of this table reveals that, among 152 participants, the percentage of women

in the role of co-founder, C-level director, and senior manager is 18% (19 people), 22.2% (8 people), and 20% (2 people) respectively.

Further investigation was conducted to yield deeper insight into how startups involve their customers in each stage of the innovation process. In the ideation stage, the most popular involving activity is exploring customer's potential needs. In this activity, more than a half of startups (63.8%) involved their customers as informants, 12.5% of startups involved customers as experts, there was 2.6% of startups worked with their customers as partners and only 0.7% of new ventures assigned their customers as the primary developers. 20.4% of startups who did not engage their customers at all on this exploring activity. Idea screening was the activity that had the lowest level of customer involvement in this stage when less than half of startups involved customers (42.8%), only 15.8% of startups engaged their customers as experts, and 40.8% of startups did not engage their prospects at all.

In the product development stage, the lowest level of involvement occurred in design and engineering activities when only 27.6% and 17.8% of startups engaged their potential customers as informants. The proportion of startups that did not involve their customers in these two activities were 61.2% and 75.7%. With regards to product or prototype testing, almost half of new ventures did not involve their customers (48.7%); whereas the percentage of startups involved their prospects as informants and experts for this activity were 32.2% and 14.5%. The proportion of startups involved customers for three observed activities in the commercialisation stage was also low with 45.4%, 61.8%, and 76.3% of startups did not engage their customers at all.

Table 1. Description of startup characteristics participated in the research.

Category	Range	Frequency	Percent
Role in startups	Co-founder	106	69.7
	Non-founding employee, C-level (CEO, CTO, CFO, etc.)	36	23.7
	Non-founding employee, senior management	10	6.6
	Total	152	100.0
Gender	Female	29	19.1
	Male	123	80.9
	Total	152	100.0
Entrepreneurial experience	No	82	53.9
	Yes	70	46.1
	Total	152	100.0
Number of years in operation	Up to 2 years	88	57.9
	3 years to 5 years	52	34.2
	Above 5 years	12	7.9
	Total	152	100.0
Number of employees	Below 10	64	42.1
	Up to 30	58	38.2
	Above 30	30	19.7
	Total	152	100.0
Customer type	B2B	29	19.1
	B2C	75	49.3
	Both	48	31.6
	Total	152	100.0
Industry	Manufacture	16	10.5
	IT/Software	79	52.0
	Service	57	37.5
	Total	152	100.0

Regarding the capability to absorb new knowledge, the absorptive capacity of Vietnamese startups is relatively high with the average mean value of each process is > 3. Specifically, the knowledge exploitation process had the lowest score among the four processes (mean = 3.33), while the ability to acquire new knowledge gained the highest score (mean = 3.66). However, using independent sample t-test, the mean differences between knowledge absorptive capacity are not significant. From the data (please see appendix 2), we can see that startups whose founder has prior entrepreneurial experiences have a higher capability in knowledge acquisition, transformation, and exploitation. They only had a lower score than their counterparts in knowledge assimilation (mean = 3.34). New ventures which operate in the B2B market also have higher absorptive capability than the ventures that are active in other markets in three processes, except the knowledge transformation capability (mean = 3.33). In this process, firms that serve both B2B and B2C customers have a higher capability to transform new knowledge. In the industry category, although manufacturing startups have a higher level of knowledge acquisition and assimilation (mean = 3.53 and 3.48 respectively), their scores in knowledge transformation and exploitation were the least (mean = 3.31 and 3.13). While startups in the service industry have the highest capability in transforming and exploiting new knowledge (mean = 3.39 and 3.23 respectively).

4.2. Reliability and validity of the model

There is a limitation of avoiding bias between those startups who participated early in the survey and the ones who made their response lately. Based on the independent sample t-test, there is no significant difference in terms of the mean value of each variable between the data points of the early informants and the late informants. In Levene's test, the Sig. value of all comparable conditions is greater than 0.05, except the score of the "Dev" variable which has a p-value equal to .026. However, Sig. (2-tailed) value of this item in the t-test for equality of means is 0.076 which is greater than 0.05. Therefore, there was no bias found between the early informants and late informants.

Next, Cronbach's alpha value was measured to test the reliability of the scale. As presented in Table 2, six of eight latent variables have Cronbach's alpha value greater than 0.70, which is a good indicator. The Cronbach's alpha value of two independent variables, "knowledge acquisition" and "knowledge assimilation" are 0.611 and 0.683 respectively. These values are not high, but at a satisfactorily level (≥0.6) for the reliability analysis (Hair et al., 2014). Additionally, the value of Cronbach's alpha does not increase when one observation of latent variables is removed, which means that these items are closely related to each other. Hence, the scale used for this study is internally consistent.

Before performing factor analysis, Kaiser-Meyer-Olkin (KMO) and Barlett's test were conducted to ensure the collected data is suitable. The correlation among variables exists and the data is sufficient for factor analysis when the KMO value is greater than 0.5 and the p-value of Barlett's test is less than 0.05. As a result, the KMO value is 0.8, hence, the data is valid for factor analysis. The significant outcome of Barlett's

Table 2. Reliability statistics and item-Total statistics.

Latent variables	Cronbach's Alpha	Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Customer involvement in ideation stages	.838	IDEA1	3.46	1.707	.715	.762
		IDEA2	3.76	1.656	.729	.748
		IDEA3	3.69	1.712	.661	.816
Customer involvement in development stages	.799	DEV1	3.06	1.672	.693	.677
		DEV2	3.25	1.950	.662	.733
		DEV3	2.81	1.347	.634	.777
Customer involvement in commercialization stages	.848	COM1	2.97	2.337	.715	.790
		COM2	3.14	2.186	.730	.779
		COM3	3.38	2.688	.721	.794
Knowledge acquisition	.611	KAC1	6.99	1.695	.353	.601
		KAC2	7.13	1.426	.480	.433
		KAC3	7.83	1.096	.456	.476
Knowledge assimilation	.683	KAS1	10.18	3.220	.533	.572
		KAS2	10.21	3.253	.482	.608
		KAS3	10.35	3.474	.481	.609
		KAS4	10.49	3.775	.371	.675
Knowledge transformation	.790	KTR1	9.95	3.832	.601	.739
		KTR2	10.06	3.394	.624	.726
		KTR3	10.26	3.612	.614	.731
		KTR4	10.16	3.701	.561	.757
Knowledge exploitation	.703	KEX1	6.43	1.796	.468	.689
		KEX2	6.93	2.088	.512	.626
		KEX3	6.63	1.786	.592	.518
Startup performance	.885	PER1	4.52	3.218	.782	.838
		PER2	4.19	2.659	.769	.857
		PER3	4.42	3.080	.799	.820

test (approximate Chi-Squared = 1858.738 with p-value = 0.000) also indicates that there is a correlation among observed items. Exploratory factor analysis was conducted to investigate the validity of the construct. In this study, the analysis was performed with the Principal Axis Factoring extraction method and the Promax rotation method. The result found that 26 observed variables were distributed into eight factors with Eigenvalues of these factors are greater than 1. And the accumulative extraction sum of squared loading is 57.831%, which means these eight factors can explain 57.831% of the variation of the data.

According to the pattern matrix results, there are two items that were loaded in more than one factor includes IDEA1 and KEX1. Although IDEA1 has belonged to both factor 4 and 5 with the respective factor loading are 0.107 and 0.729, the difference in factor loading at these two factors are more than 0.3. Thus, this item was kept as a contribution to factor 5 where its loading value is higher. The item KEX1 was placed into factors 6, 7, 8 with corresponding loading values are 0.126, 0.294, 0.466. Therefore, this item was removed from the study since the variation in loading values at different factors of this item was less than 0.3. Other items that represent each latent variable are fully loaded in the same single factor. Other items of the measure have factor loading values higher than 0.5, except items KAS3, KAS4, and KAC1 whose loading values are 0.498, 0.388, and 0.316 respectively. While these values are modest, they only contribute to a specific factor, hence, they are sufficient to use for research. The result of the research model retains eight factors (after removing 1 item KEX1), and the model is validated as convergence and discrimination.

4.3. Hypotheses test results

After completing all the reliability and validity checks, the model was sufficient to proceed with the next step which was regression analysis. The results verified the research model fit. Since the R-value of the model is 0.745, a high level of correlation existed. The adjusted R-square is 0.534 which implies that 53.4% of the variance in the growth performance of startups can be explained by the level of customer involvement in each new product development stage and the absorptive capacity of startups. The result of the F-test was obtained and presented in Table 3 – ANOVA. This test aims to check how well the regression model predicts the dependent variable. In this case, the F value was 25.735 with a p-value was 0.000 (<0.05). Hence, the result implies that this regression model can significantly predict the growth performance of Vietnamese startups. Coefficients data, as displayed in Table 4, will allow us to test the research hypotheses by checking whether each independent variable can predict the outcome of dependent variables via the unstandardised coefficients (β value), and at 0.9 significant level (p-value <0.1). The data from this table shows that H5 and H6 are not supported, while other hypotheses are supported.

5. Discussion

5.1. Research findings

In general, the result reveals that involving customers in each stage of the new product development process positively affects the growth of startups. Nevertheless, the positive impact is notable in all three stages, including ideation (at 95% significant level), development, and commercialisation (at 90% significant level). A significantly positive relationship was found

Table 3. ANOVA[a].

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	59.240	7	8.463	25.735	.000[b]
1	Residual	47.354	144	.329		
	Total	106.594	151			

a. Dependent Variable:Per.
b. Predictors: (Constant), Ex, As, Dev, Ac, Tran, Idea, Com.

Table 4. Coefficients[a].

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	−1.593	.470		−3.391	.001		
Idea (H1)	.420	.089	.312	4.729	.000	.707	1.415
Dev (H2)	.161	.091	.117	1.771	.079	.703	1.423
Com (H3)	.131	.077	.117	1.707	.090	.662	1.511
1							
Ac (H4)	.252	.095	.163	2.662	.009	.824	1.213
As (H5)	.001	.080	.001	.013	.990	.975	1.026
Tran (H6)	.095	.088	.069	1.084	.280	.753	1.328
Ex (H7)	.411	.080	.328	5.134	.000	.757	1.321

a. Dependent Variable:Pe.

when customers were involved in the ideation stage. This finding ties well with previous literature wherein empirical evidence was provided to demonstrate the positive impact of customer involvement in the first stage of the new product development process on market performance (Chang, 2018; Sandén, 2007). This important result can be explained by the natural condition of new ventures in which new products or services are developed with scarce resources, while the business ideas are still uncertain. Hence, startups will seek acceptance from their potential customers for their ideas about new products or services before developing it. This approach enables startups to create the right product that the customers want, which has been proved that the top reason for startup success (Griffith, 2014). With this study, customer involvement in the ideation stage was also confirmed to have the greatest impact among all contributing factors to the growth performance of new ventures in Vietnam context.

Regarding customer involvement in the development stage, although the result supports the second hypothesis, contrary to what was found in previous studies. The result in an existing study disclosed that customer involvement at this second stage had a negative relationship with the financial performance of new products (Chang & Taylor, 2016). While the result in this research confirms that customer involvement during the product development stage has a direct positive effect on the growth performance of startup. The empirical data in Chang and Taylor (2016) study showed that the intensive involvement of customers during the development stage will delay the launching time as well as it is not associated with the innovativeness of the new product. Finding in Change & Taylor research is challenged by the fact that the participation of the customer in product development tasks can give them the opportunities to create a customised product to fit with their own personality and taste or satisfy their specific business requirements. The success of Nike, Lego, and open-source software has provided good evidence to support this argument (Sandén, 2007). Nonetheless, the fact that these activities and their effect may vary depends on the industry and business type of startups. Thus, further investigation of startups in a specific industry will need to clarify this conflict.

A positive result is also seen for the relationship between customer involvement in the commercialisation stage and startup performance. This direct impact is significant at 0.09 level, which is the least effective among five contributing factors of this model. This finding is in accordance with the result reported by Gruner and Homburg (2000), and Sandén (2007). A popular explanation for this positive relationship implies the assumption that most products or services introduced by startups are replications from the existing products of other startups. In this scenario, the business ideas have been validated previously either in foreign countries or in the local market. Therefore, new ventures who offer the same products or services to the market will activate the competition with the existing startups to gain market share. This motivation leads to more efforts from businesses to involve customers in the commercialisation stage to acquire more customers as well as increase their retention. The involvement of customers in this stage may include developing a community of experienced customers to support other customers, or to share their success stories, or to promote the new product by inviting customer's friends to try it.

Other promising findings were about the relationship between four processes of knowledge absorptive capacity and performance of startups. The results of this paper demonstrate that each process of absorptive capacity has a different impact on new venture performance. This is to some extent in line with prior studies which broke down knowledge absorptive capacity into four processes and investigated the relationship between each process and the product innovation (Brettel et al., 2011; Seo & Lee, 2019). However, our findings are not fully consistent with the results in these examinations. According to the data in the results section, only two processes which were knowledge acquisition and knowledge exploitation were found to have a positive impact on the performance of Vietnamese startups at a significant level are 0.000 and 0.009, respectively. Whereas no significant effect was found between knowledge assimilation, knowledge transformation, and startup performance.

This result implies that the interrelationship among each process of absorptive capacity may exist because of the existence of both direct and indirect impact on the performance, which is also mentioned in previous study of Vasconcelos et al. (2019). This finding adds more complexity to the current literature on this topic. Therefore, the conflicted argument about the relationship between absorptive capacity and business performance remains. While the high mean value in knowledge assimilation and transformation of startups may be explained by the fact that most startups are operated under a special condition in which resource and business scope are limited, thus, business activities are quite simple and narrow with few functional tasks performed. Further, since the organisation of a startup is relatively agile, there is no specialisation among team members at this nascent period. As a result, there would be no fixed description in terms of responsibility among team members, hence, the assimilation and transformation of knowledge through sharing and communicating in this small group of people can be taken place at ease in many startups. Besides, because the assimilation and transformation process of the startups are internally

focused, they are related to the learning process, invisible, and not applicable for a less structured context like startups, so, they may have less impact on the growth performance of startups. On the other hand, the acquisition and exploitation of new knowledge requires startups to interact with external sources to access tacit knowledge, which are more challenging tasks. Therefore, the recognition, acquisition, and exploitation of new knowledge become two major functions of the absorptive capacity of new ventures. And this ability will set apart the high-performance startups from their low-performance counterparts.

Besides, the relationship between knowledge absorptive capacity and startup performance is influenced by various factors, including the type of knowledge transferred, the stage of startup development, and the presence of barriers in knowledge management implementation (Jiang & Murmann, 2023). Additionally, the absorptive capacity of startups is linked to their ability to diffuse innovation, with higher absorptive capacity contributing to the successful diffusion of innovation in startups (Pereira & Farias, 2023; Pham & Pham, 2022). Furthermore, the absorptive capacity of startups is affected by their strategic alliances, as these alliances provide access to resources such as machinery, equipment, and expertise, which can enhance the startup's absorptive capacity (Cacciolatti et al., 2020).

5.2. Managerial implication & recommendations

The empirical data in this research show that while Vietnamese startups have a high absorptive capacity, the level of customer involvement at all product development stages is relatively low. This involvement was verified to have a direct positive relationship with the growth of startups. Hence, through this study, the recommendation for founders and managers of startups in Vietnam is to pay more attention to involve customers during the new product development process, especially for first-time entrepreneurs, and startups in the IT/software industry or in the consumer market. They should put more effort to connect and interact with potential customers as early as in the ideation stage since this activity will allow their startups to identify either exposed problems that the prospects have been suffering every day or a latent one that is currently hidden (Blank & Dorf, 2012). As a result, firms increase the chances to develop a robust product that customers love and buy. Moreover, maintaining customer involvement at all development stages will provide venture the latest insights about their customer, especially the tacit knowledge about their behaviour and trend. This latent knowledge can become a competitive advantage of startups, which is also a factor that has a positive impact on performance (Potjanajaruwit, 2018).

Startups should consider adopting the lean startup method in which understanding user/customer is the heart of the product development process, and customer development is the core activity at the initial stage (Blank & Dorf, 2012). Joining the startup supporting organisations like incubators or accelerators is a good choice for new ventures to enrich their network as well as knowledge. Other activities to involve customers in the ideation stage for startups to consider are product idea screening and prototype validating. In the second stage, when the product is fully developed, the new solutions for either product design or technology which are co-created with customers can help ventures yield better performance. For example, in the IT industry, open-source software which allows users to access the application codes to identify potential issues and fix it, or to improve it. This also gives customers chances to develop add-ons to the original product to expand its capability to satisfy the complex needs of customers. Besides, co-developing a technically intensive product is only suitable for some specific customers who have high technical competence. Involving customers in the commercialisation stage also allows startups to improve market share and increase customer loyalty. For example, startups should encourage their advocated customers to invite people to the customer's network to use new arrival products or services. In the IT/Software industry, especially for business- to-business firms, a similar approach can be adopted (Pham, 2017). In this case, new ventures invite their key customers, which are usually well-known enterprises, to publicly share their success stories in using the startup's new products. The sharing from these respectful sources will increase the trust of prospects for a brand-new company and its products, which can turn into new deals.

Although Vietnamese startups have a relatively high absorptive capacity, a recommendation arises for managers to improve startup capability in knowledge acquisition and exploitation of which impact on growth performance is confirmed notable. Startup managers should encourage their organisations to expand their knowledge base beyond the boundary of their home industry. This can be beneficial for new ventures to some extent. The newly acquired knowledge from other industries could inspire a solution for current product issues or new business opportunities, which creates chances for startup to enhance its performance. Additionally, regarding knowledge exploitation, new ventures should also regularly review and adopt the latest innovation or technology that is relevant to their business. These innovations will allow startups to improve their product quality, which could lead to better outcomes in terms of sales and customer loyalty (Santisteban et al., 2021). These types of knowledge mostly come from a variety of external sources

from academic institutions, research labs, venture capitalists, industry associations, industry experts, or even startup's customers and competitors. Therefore, developing a partnership or maintaining a good relationship with relevant organisations or professionals to leverage their knowledge and complementary skill set is another valuable implication for startup managers.

For other startup supporting organisations in Vietnam like incubators, accelerators, educational institutions, or venture capitalists, some recommendations also arise from findings in this study. With a diverse network of partners and connections, these establishments can either help connect startup with potential customers or provide suitable technological infrastructure or offer practical training/coaching programs with industry experts or other entrepreneurs regarding customer developments and entrepreneurship (Fu & Qian, 2023; Ridwan et al., 2022). These contributions are indeed beneficial for new ventures during their entrepreneurial journey, which is full of uncertainty. It does not only increase the survival rate of startups but also allows them to go beyond the country border to enter the global market where Vietnamese startups can make a greater impact.

6. Conclusion & future research directions

In this paper, the ordinary linear regression was utilised to analyse the empirical data collected from 152 valid informants who represented for 152 startups across industries, business type, and size throughout Vietnam. All the data and variables of the model were confirmed to be reliable and validated for the analysis. Results from the analysis show that customer involvement in each stage of the new product development process has a positive impact on startup growth. Particularly, startups who involve customers more intensively in the ideation stage will notably yield better growth, whereas involving customers in the development and commercialisation stage will have limited effects on the growth performance. The next finding is about knowledge absorptive capacity whose four processes affect startup growth differently. The analysed data revealed that only knowledge acquisition and knowledge exploitation have a significant positive impact on the growth performance of startups. Between the two, knowledge exploitation tends to have a higher impact on startup performance. Other processes of absorptive capacity which are knowledge assimilation and transformation have no contribution to growth performance.

In summary, this paper argued that to enhance growth, startups should put more effort to acquire more knowledge, especially the latent one, and apply it more frequently to their new products or services creation. The most valuable knowledge usually comes

from customers. Therefore, startups should also increase the involvement of their potential customers during different stages of the new product development, especially in the ideation stage.

Although valuable results were found and described in this paper, this study has some limitations. First, the amount of data collected in this research is relatively small to examine the broad range of new ventures in terms of industry, company size, business type. Moreover, the absorptive capacity is a multidimensional concept whose relationship among its processes is complex. Besides, the analysis results based on regression method could be improved by using modern techniques, such as: PLS-SEM. Hence, future research should consider following improvements: (1) increasing the sample size and extending the scope; (2) applying structural equation modelling (SEM) for data analysis; and (3) providing further investigation in the interrelationship between innovative process and absorptive proces (Rogers, 2003)s. In addition to it, in prior papers, many factors that directly contribute to startup performance were identified such as capital, cultural and social factors, or partnership, and network. Thus, a question about how these elements and customer involvement related to each other affect the growth performance of a startup is worth considering in future research.

Disclosure statement

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ORCID

Quoc Trung Pham http://orcid.org/0000-0003-4197-3725

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Appendices

Appendix 1 – The measurement scales

Items	Latent and Observed variables	References
	Customer involvement in the ideation stage	Sandén (2007)
IDEA1	To what degree, your venture involves customers to explore their needs/potential needs?	
IDEA2	To what degree, your venture involves customers to generate product/service ideas?	
IDEA3	To what degree, your venture involves customers to screening product/service ideas?	
	Customer involvement in the development stage	Sandén (2007)
DEV1	To what degree, your venture involves customers to design the new product?	
DEV2	To what degree, your venture involves customers to engineer the new product?	
DEV3	To what degree, your venture involves customers to test the prototype/new product?	
	Customer involvement in the commercialization stage	
COM1	To what degree, your venture involves customers to introduce new product to prospects?	Adapted from Sandén (2007)
COM2	To what degree, your venture involves customers to share their success story in using the new product?	Proposed by author
COM3	To what degree, your venture involves customers to support other customers in sharing experiences when using your product?	
	Knowledge acquisition	Flatten et al. (2011)
KAC1	The search for relevant information concerning our industry occurs daily in my company.	
KAC2	The employees in my company are motivated to use information sources within our industry.	
KAC3	The employees in my company are expected to manage information beyond our industry.	
	Knowledge assimilation	Flatten et al. (2011)
KAS1	New ideas and concepts are communicated via cross-departmental communication in my firm.	
KAS2	My firm emphasises the support across departments to solve problems	
KAS3	There is a quick information flow in my firm.	
KAS4	Employees across departments in my firm exchange ideas, issues through periodical meetings	
	Knowledge transformation	Flatten et al. (2011)
TRAN1	My employees can organise and used collected knowledge.	
TRAN2	My employees can link existing knowledge with new insights.	
TRAN3	My employees are used to absorb new knowledge as well as to prepare it for further.	
TRAN4	My employees are able to transform new collected knowledge into practices.	
	Knowledge exploitation	Flatten et al. (2011)
KEX1	My firm supports the prototype development.	
KEX2	My firm regularly adapts relevant technologies in accordance with new knowledge.	
KEX3	My company has the ability to work more effectively by adopting innovative technologies.	
	Startup performance	
PER1	How significant the capital value of your venture has been raised since inception?	(Cassar, 2004)
PER2	How significant the revenue of your venture has been increased since its start?	
PER3	The number of employees of your venture have been grown throughout the years.	(Bruderl & Preisendorfer, 2000)

Appendix 2 – Mean values of absorptive capacity across categories

Latent variables		Mean	Non-exp.	Exp.	B2B	B2C	Both	Man.	IT/Soft.	Service
Knowledge Acquisition	Ac	3.6579	3.47	3.52	3.57	3.45	3.51	3.53	3.47	3.52
Knowledge Assimilation	As	3.4359	3.52	3.34	3.50	3.43	3.41	3.48	3.40	3.47
Knowledge Transformation	Tran	3.3701	3.36	3.38	3.33	3.38	3.39	3.31	3.36	3.39
Knowledge Exploitation	Ex	3.3311	3.16	3.28	3.31	3.21	3.17	3.13	3.22	3.23
Startup performance	Per	2.1886	2.13	2.26	2.44	2.26	1.93	2.06	2.17	2.25