

It Takes Two to Tango: Roles of Digital Strategy and Human Creativity in Creating Transformational Technopreneurship

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Abstract. Digital technology has birthed a new generation of creative entrepreneurs known as technopreneurs. However, merely adopting a digital strategy and technological innovations is insufficient without recognizing the importance of human creativity. This study aims to find the influence of digital strategy and human creativity in shaping the transformation of technopreneurship in startups. There needs to be an intuitive process as part of controlling soft information that digital products cannot handle. Sharpness of intuition in doing business and in extracting the value of technological transformation will ultimately lead startups to competitive advantage which is the first step towards success in carrying out technopreneurship transformation. The research used quantitative methods with a sample of 105 startup founders in Indonesia. The reliability and validity of the instrument were tested by Cronbach's Alpha, Average Variance Extracted (Pvc) and Composite Reliability (Pc). The data is processed using SMARTPLS 3.0. The results demonstrated that digital strategy and human creativity significantly influence the formation of technopreneurship transformation in startups. From the Path Coefficient value obtained, it means that the greater the digital strategy and human creativity owned by the startup, the higher the technopreneurship transformation.

1 Introduction

The development of digital technology today has brought startup founders become creative entrepreneurs, and a new generation is born called technopreneurship, which is combination of two words, namely technology and entrepreneurship which shows that the practice of entrepreneurship does not only require entrepreneurial knowledge and experience but also requires individuals who have skills, creativity and technological process. [1]. One indicator of the success of technopreneurship practices at startups is the existence of a value proposition that is able to combine digital technology in a unique way so that it is difficult for competitors to imitate [2]. How startups respond to the presence of various technology devices and applications as a fast solution to process a variety of increasingly complex data and information is an important factor in the growth and development of startups. This increasingly dynamic technological change encourages startups to be willing and able to radically transform to build a business architecture that is in accordance with the value created.

In terms of technology, there are various digital transformations that are currently developing rapidly. One of them is the breakthrough of artificial intelligence that is able to take over the administrative role so that it can make faster, better decisions at a lower cost than humans. The consistency of decisions that adopt the human mindset with an unlimited amount of data and

predictive capabilities, makes Artificial Intelligence considered the advent of new technologies [3]. However, when talking about the complexity of innovation which is dominated by technological adaptation, it turns out that it does not necessarily only favor the role of artificial intelligence and overrides the value of the human resources involved. Because no matter how sophisticated artificial intelligence is developed, there are still limitations in interpreting some "soft information" that can only be handled through human intuition. In this case, creativity increasingly has a broader meaning, not only as a source of new ideas and processes. Sharpness of intuition in doing business and in extracting the value of technological transformation will ultimately be able to direct startups to competitive advantage which is the first step towards success. Therefore, technopreneurship and creativity as the basis for determining digital strategy models still need to involve human elements and roles in them [4].

Digital strategy requires a key element in the form of creativity because it becomes a source of new ideas that underlie the realization of an innovation [5]. Creativity allows for an exploration process that forms the basis for accurate and fast problem solving so that it can become the most essential support system for startup businesses in extracting the value of technopreneurship as part of digital transformation. A study found that the failure to extract the value of digital transformation often stems from creativity in the process of formulating and

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implementing digital strategies that are not appropriate, thus requiring process anatomy to be able to determine the right digital strategy [6]. The adoption of a digital strategy in the startup growth process is influenced by various interrelated elements. Technopreneurship which is the hallmark of startup management can encourage sustainable product innovation when startup actors can explore and study consumer's needs and consumer behavior patterns. Creative design improvements made based on consumer studies can lead to sustainable product development [7]. On the other hand, the ability to observe and adopt technological trends as innovation products is also important because trends and innovations are important elements in the technopreneurship transformation process [8]. This shows the capacity of multiple skills as one of the success factors in the transformation of technopreneurship. By seeing that technopreneurship is the output of the synergy between the capacity for mastering technology and the capacity for complex entrepreneurial concepts, it is necessary to describe a technopreneurship transformation framework that is influenced by digital strategies and human creativity.

This study aims to conduct a deeper study of the technopreneurship transformation framework in startups formed by digital strategies and human creativity.

2 Literature Review

2.1 Digital Strategy

Technopreneurship is defined as a leading technology that is intensive in entrepreneurial activities. In technopreneurship, there is an integration of technological sophistication with the knowledge possessed so that it can provide added value in various products and services [9]. For a startup, technopreneurship is not a commodity that can be traded easily because it includes the complexity of the composition between technology, knowledge, skills, expertise, creativity and intelligence of entrepreneurship actors. There is an intangible aspect that shows that the more sophisticated the technology used, the higher the level of expertise required, especially in dealing with a dynamic environment [10]. To reach that point, startups need to carry out a synergistic transformation of technopreneurship.

Technopreneurship transformation involves several important factors, namely strategy and human creativity carried out by technopreneurship actors. The strategy for technopreneurship transformation is a choice and maneuver taken to achieve business goals. Various technology solutions make business more competitive. With a strategy, market dynamics will provide a new positioning in the business processes carried out [11].

The strategy needed in the transformation of technopreneurship is a digital-based strategy so that it can complement and increase collective understanding

of digital development. The digital strategy is characterized by focusing on the use of technology to improve business performance. Digital strategy is needed to help startups determine the direction to create new competitive advantages with the right technology, processes and tactics needed to achieve this change. Digital strategy allows startups to discover new opportunities related to algorithm management to automate various manual tasks. The involvement of digital technology in strategy implementation will encourage startups to continue to capture value differently so that they can develop dynamic business models and create new challenges and opportunities in business development [12].

2.2 Human Creativity

The success of the practice of technopreneurship is not only determined by efforts to create knowledge and investment but also the need for innovation in the face of an increasingly competitive global world. Aligning digital strategy and human creativity will provide a new perspective in driving organizational characteristics and behavior. Digital strategy involves three important phases, namely the exploratory, building and extension processes where the three phases are multifunctional and mutually sustainable phases [13].

Human creativity is needed in determining digital strategies, especially by looking at the phenomenon of an increase in the number and diversity of startup products that occurs due to an increase in users of technology products in Indonesia and in various parts of the world. Most people today have adopted various startup products in the e-commerce, financial technology, ride-hailing and digital payments sectors which have also penetrated the education, health and retail sectors [14].

Human creativity is the ability to see in different perspectives, including modifying the main idea into something unique. Creativity is also defined as problem solving from previously unsolved problems so that there are new values, namely useful, good, adaptive and appropriate. Human creativity is a fundamental skill that helps you see existing problems from a new perspective, so you can find new opportunities and create new ideas [15-17].

A study found that personal innovativeness and understanding of social knowledge management related to new technology are the determining factors for digital-based human creativity so that it can increase company innovation [18]. Based on the basic concept of technopreneurship which mainstreams strategy and human creativity, these three things are concepts that are interrelated with each other and have a significant impact on the practice of technopreneurship [19-20].

3 Methods

The research method used in this study is a quantitative method that seeks to explore the model which is influence of digital strategy and human creativity on technopreneurship transformation. Data were collected through a structured survey instrument using a Likert scale with five answer options, namely a score of 1 for Never, a score of 2 for Rarely, a score of 3 for Sometimes, a score of 4 Often and a score of 5 Very Often. The survey was conducted with a sample of 105 respondents from several provinces in Indonesia. The sampling technique used is simple random sampling where the population is startup owners with the same level so that it is considered homogeneous. The method of determining the number of samples using the Krejcie and Morgan table, which is about 340 populations, a minimum sample of 103 is taken. From the questionnaires distributed to the population, data is obtained as many as 105 respondents.

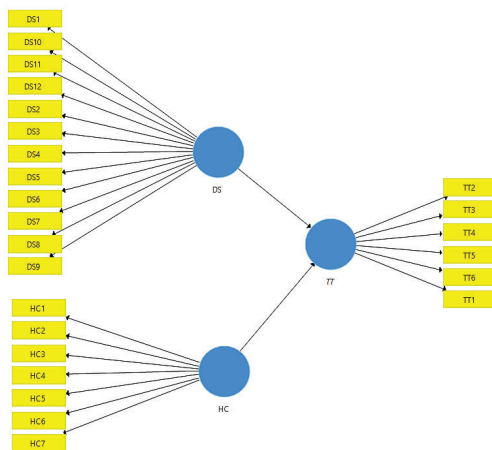


Fig. 1. Research Model

Information:

- TT : Technopreneurship Transformation
- TT1 : Digital Savvy Leader
- TT2 : Digital Savvy Team
- TT3 : Administration Automation
- TT4 : Communication Automation
- TT5 : Personal Development
- TT6 : Output
- DS : Digital Strategy
- DS1 : SEO Implementation
- DS2 : Keyword Implementation
- DS3 : Link Implementation
- DS4 : Content
- DS5 : Ads
- DS6 : Payment
- DS7 : Other Revenue
- DS8 : Brand Awareness
- DS9 : Customer Engagement
- DS10 : Competitor
- DS11 : HRIS
- DS12 : Management Reporting System
- HC : Human Creativity
- HC1 : Data Gathering
- HC2 : Managerial System
- HC3 : Expert System
- HC4 : Information Update
- HC5 : Feedback
- HC6 : Customer Satisfaction
- HC7 : Customer Loyalty

Based on the study of theories and models, the hypotheses of this research are

- H1: Digital strategy has a significant effect on technopreneurship transformation
- H2: Human creativity has a significant effect on technopreneurship transformation

The data analysis method was carried out using structural equation modeling (SEM) to determine the causal relationship between the latent variables contained in the structural equation. Data analysis using Smartpls 3.0. The reliability and validity of the instrument were tested by Cronbach's Alpha, Average Variance Extracted (Pvc) and Composite Reliability (Pc). Cronbach's Alpha coefficient is greater than 0.6 to ensure the validity of the research instrument. Composite reliability (Pc) is more than 0.6 and Average Variance Extracted is greater than 0.5.

4 Results and Discussion

4.1 Sample Description

The data collection process is carried out by distributing research instruments to startup founders. The results of demographic data from 105 respondents in this study are as follows.

Table 1. Respondents Profile

Demographic	Attribute	Percentage
Gender	Male	44.9 %
	Female	55.1 %
Age	<20 years old	0.7 %
	21 – 30 years old	22.6 %
	31 – 40 years old	33 %
	41 – 50 years old	25.6 %
	>50 years old	18.1 %
Education	Below High School	0.2 %
	High School	16.8 %
	Diploma	7.3 %
	Bachelor	43 %
	Magister	25.2%
	Doctoral	7.5%

4.2 Reliability and Validity through the Outer Value Model

The value of the Outer Model can be seen through 3 things, namely:

1. Outer loadings

Outer loadings is a table containing loading factors to show the correlation between indicators and latent variables. The loading factor value must be greater than 0.7 then it is said to be valid. The outer model test uses the help of the PLS Algorithm procedure. The analysis

phase of the outer model is measured using validity and reliability testing. There are 2 measurements of the outer model (outer model) of the PLS SEM, namely the measurement of the reflective and formative models. The first PLS SEM model measurement in the outer model is the reflective measurement [21].

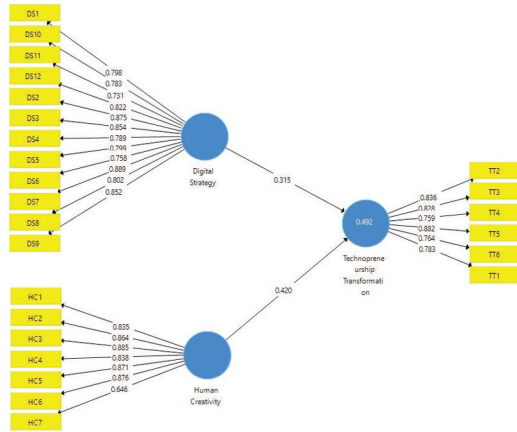


Fig. 2. Outer Loadings

The results show that all Digital Strategy indicators have a loading factor > 0.7 so that they already have a good convergent validity value. There is one indicator on Human Creativity which has a value of 0.646. However, there are sources who say that loading Factor > 0.6 is considered good, so this indicator will still be used. From the figure, it can be seen that Digital Strategy contributed 0.315 to Technopreneurship Transformation and Human Creativity contributed 0.420 to Technopreneurship Transformation. That is, the role of Human Creativity is greater than Digital Strategy in determining how Startups are able to develop Technopreneurship Transformation.

2. Path Coefficient

The measurement model was assessed using reliability and validity. For reliability, Cronbach's Alpha can be used. This value reflects the reliability of all indicators in the model. The minimum value is 0.7 while ideally it is 0.8 or 0.9. In addition to Cronbach's Alpha, the value of c (composite reliability) is also used which is interpreted the same as the value of Cronbach's Alpha. The reflective indicator should be omitted from the measurement model if it has an external standard loadings value below 0.4. In the outer model, we know 2 types/types of indicator relationships in the construct, so the test is carried out according to the form of the indicators, namely reflective indicators and formative indicators [21].

Table 2. Path Coefficient

	Cronbach's Alpha	Average Variance Extracted
Digital Strategy	0.954	0.663
Human Creativity	0.926	0.696
Technopreneurship Transformation	0.895	0.656

The table shows that the Cronbach's Alpha value is > 0.7 so it can be concluded that the latent variable has good reliability. The AVE value describes the variance or diversity of the manifest variables that can be owned by the latent construct. Thus, the greater the variance or diversity of the manifest variables that can be contained by the latent construct, the greater the representation of the manifest variable on the latent construct. While the AVE value has shown a value of > 0.5 so it can be concluded that the latent variable has good convergent validity.

3. Discriminant Validity

Discriminant validity shows that the root of the AVE value is $>$ from the correlation value between latent variables so it can be concluded that the latent variable has good discriminant validity.

4.3 Hypothesis Testing

1. T Statistic

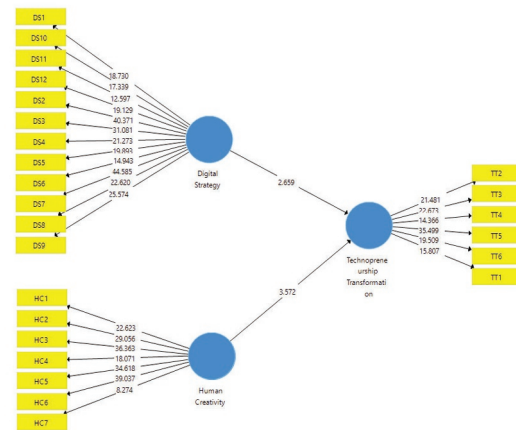


Fig. 3. T-statistic Result

T-statistics is a value that is used to see the level of significance in hypothesis testing by finding the value of T-statistics through the bootstrapping procedure. Test function t test: To estimate the mean interval. To test the hypothesis about the average of a sample. To determine the limit of acceptance of a hypothesis. t-test is used when information about the value of the variance (variance) of the population is not known.

In hypothesis testing, it can be said to be significant when the T-statistics value is greater than 1.96, whereas if the T-statistics value is less than 1.96 then it is considered insignificant [21]. T Statistic Digital Strategy to Technopreneurship Transformation of 2,659 and Human Creativity to Technopreneurship Transformation of 3,572 indicate that the relationship between significant variables or exogenous latent variables affect Technopreneurship Transformation.

2. P Value

The probability value (P-Value) can be interpreted as the magnitude of the observed probability (probability)

from the test statistic. 0.05 is the significance level, alpha, the probability of rejecting H0 is true. The significance level can be other than 0.05 such as 1% or 10%. When p is less than 0.05, it means that the opportunity is in the alpha region so reject H0. Usually the term significant is used in the interpretation of the regression results. The p value is very sensitive to the number of samples. Although the effect size is very small, the p-value can be very significant when the sample size is large. If the results are significant, then the study is considered 'successful' to find a significant effect, whereas on the contrary, if the p value > 0.05 means the researcher has not succeeded in finding a significant relationship.

The results show that the P Value of Digital Strategy is 0.008 and the P Value of Human Creativity is 0.000. This shows that the relationship between the latent variables is significant.

3. Path Coefficient

The path coefficient shows the direct effect of the variable determined as the cause on the variable determined as the effect. Path Coefficients with positive values indicate a positive relationship. Value seen from the Original Sample table.

Table 3. Original Sample Table

	Original Sample
Digital Strategy	0.315
Human Creativity	0.420

The results show that the value of Digital Strategy and Human Creativity is positive, so it can be interpreted that the greater the Digital Strategy and Human Creativity a Startup has, the Technopreneurship Transformation will be higher.

4. R-Square

R-Square is a number that ranges from 0 to 1 which indicates the magnitude of the combination of independent variables which together affect the value of the dependent variable. The closer to number one, the model issued by the regression will be better.

R-Square serves to determine how big the percentage of the connection of the independent variables simultaneously to the dependent variable. The R-Square value is said to be good if it is above 0.5 because the R-square value ranges from 0 to 1. If the R-square value is small, it means that the error component is large. The R-Square value is categorized as strong if it is more than 0.67, moderate if it is more than 0.33 but lower than 0.67, and weak if it is more than 0.19 but lower than 0.33 [22].

R Square

Matrix	R Square	R Square Adjusted
Technopreneurship Transformation_	0.492	0.482

Fig. 4. R-square

The table above shows that R square of 0.492 means that all independent variables simultaneously have an influence of 49.2% on Technopreneurship Transformation. While the remaining 50.8% is influenced by other variables not tested in the study.

5. F- Square

F-Square is the change in R-Square when exogenous variables are excluded from the model. f-square is the effect size (F-Square >= 0.02 indicates small; F-Square >= 0.15 indicates moderate effect; F-Square >= 0.35 indicates large effect).

f Square

Matrix	Digital Strategy	Human Creativity_	Technopreneurship Transformation_
Digital Str...			0.066
Human C...			0.118
Technopr...			

Fig. 5. F-square

The table above shows that Human Creativity shows a smaller effect than Digital Strategy.

5.4 Discussion

Model test can be done by looking at the value of the Standardized Root Mean Square Residual (SRMR). If the value is in the range between 0.05 – 0.08, it can be said that the model is fit.

Model_Fit

	Saturated Model	Estimated Model
SRMR	0.080	0.080
d_ULS	2.057	2.057
d_G	1.659	1.659
Chi-Square	809.235	809.235
NFI	0.707	0.707

Fig. 6. Model Fit

The results of the SRMR value in the table of 0.080 indicate that the research model is fit. This model shows that the technopreneurship transformation implemented by startups will be successful when knowledge creation efforts and innovation strategies are realized in the face of an increasingly competitive global world. Alignment of digital strategy and human creativity will assist in providing a new perspective in driving organizational characteristics and behavior which will ultimately form a transformative organizational culture [13].

Technopreneurship is predicted to dominate most of the business processes that will be carried out in the future. This can be seen from the various technological advances that are increasingly rapidly producing findings and innovative products that are increasingly diverse. Entrepreneurship practices will be more

optimal when there is technology involved in it that allows for acceleration, convenience and a wider reach.

5 Conclusions

The transformation process in technopreneurship is an activity where entrepreneurship practices are carried out to be maximized after involving various technological roles. There is an added value that makes startup businesses run and managed differently. Technopreneurship transformation in the startup business will produce novelty in every business process that is carried out. One of the main characteristics of technopreneurship transformation is the involvement of technology. In a world full of disruption and turbulence, transformation will help startups generate new value which in turn can open up new opportunities, drive new growth, provide new efficiencies so that they can be the basis for predicting the survival of startups in the future.

The results showed a significant relationship between digital strategy and human creativity on transformational technopreneurship. The digital strategy in the technopreneurship transformation process does not only involve the process of determining vision, goals, opportunities, and activities but also exploring the benefits of technology so that it can maximize digital initiatives for startups. The digital strategy seeks to maximize the involvement of the use of technology that can encourage increased business performance. The establishment of a digital strategy will help startups to create new competitive advantages that are colored by the latest technology. In addition, in the process of establishing a digital strategy, various tactics and process stages will be explored to achieve this transformation. Digital strategy will help startups outline and create clear paths in achieving strategic goals. Determining the benchmarks to be achieved, and the tactics to be implemented are strategic steps to build to define emerging opportunities, discover unexpected value, and create new business by leveraging the full power of digital.

Digital strategy will be able to be determined and executed optimally when it involves elements of human creativity. Human creativity talks about the resource capacity of startup actors in generating or recognizing ideas, alternatives, or possibilities that may be useful in solving problems. Creativity involves mental resources, experience and capacity to define the novelty of ideas so that they have different added values. Creativity opens the mind and a wider perspective. Human creativity allows someone to see and solve problems more openly so that it becomes a source of innovation. In the process of technopreneurship transformation, startup business readiness to maximize human creativity and implement digital strategies also needs to pay attention to various other factors. This study still has limitations because it only determines two latent variables so that there are other latent variables that may have an impact on the formation of transformational technopreneurship startups. Therefore, this research still requires further

study to provide a complete and comprehensive picture that supports the success of startups in optimizing technology.

This research provides a novelty where referring to previous similar research, the digital strategy variable and human creativity stand separately [4, 13] Previous research mostly focused on the technical and hard aspects of technology and the human inventing the technology. Meanwhile, in this study, the two variables were studied together to see their impact in building transformational technopreneurship at startups in Indonesia. In the context of start-up business actors in Indonesia, it is not enough to carry out a digital strategy, but there is an aspect of creativity from human resources that are jointly owned to realize transformational technopreneurship up to the paradigm shift of the business actor.

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