Business Model Transformation in Digital Era

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Abstract

The objective of this research is to study business model transformation in the digital era. The target group is a group of 557 Gen Y (Generation Y) who are not over 41 years old and Gen Z (Generation Z) who were born between 1997 and 2010. Then the data were collected by convenience selection via online questionnaires and analysed by multivariate analysis of variance (MANOVA). The findings reveal that demographic factors including age, monthly income, and career relate to the business model in the digital era. The perception of information, the Internet use, and creative innovations have a relationship with the business model in the digital era at a significance level of 0.05. Since perceiving information affects consumer behaviour in the digital era, there should be equality in the access of online information; therefore, a policy regarding free internet connection provided by the government agencies such as the National Broadcasting and Telecommunications Commission (NBTC) is recommended.
Keywords: Business Model, Digital Transformation, Generation Y, Generation Z

Introduction

This is a time that digital transformation takes an important role in the business world; therefore, modifying business models in order to be a modern organization focusing on digital technology becomes a key of the administration of a business. Analysts from the Economic Intelligence Centre (EIC) describe the meaning of the digital transformation era as an era where technology is evolving rapidly and this can be seen from data warehouse systems such as Cloud, Big Data, Internet of Things (IoT), smart phones, social media, and other technologies. The key of digital transformation is to apply technology to every part of a business such as operation, product creation, communication, marketing, organizational culture, and business growth planning, so that a business can adapt quickly and can deal with new problems. Hence, a company needs risk management plans and real-time customer service centres for problem solving (Booasang, 2017). Apart from this, being a digital-transformed company could save the costs from less labours and loss from human errors (Chinachoti, 2018).

According to a Forbes survey, 84% of businesses fail in digital transformation due to the lack of accurate analysis in applying digital technology to their businesses and many companies have no proper plans such as a Five Business Model (Chantorn, 2018). Business models are essential for market economies where there are competition, consumer choice, transaction costs, and heterogeneity amongst consumers and producers. Technological innovation creates the needs to bring discoveries to markets and the opportunities to satisfy unrequited customer

needs leading to the necessity of business models, while new business models themself can be a form of innovation (Teece, 2010).

Research Objective

The objective is to study business models and the factors affecting business models in the digital era.

Conceptual Framework

Independent variables include demographic factors, gender, age, monthly income, education level, occupation, community tools, and the perception of information in changes such as online connections, Internet use behaviour, and creative innovations.

Dependent variables are business models in the digital era referred from the theory of digital transformation Five Business Model, including (1) discounting pricing to earn more profits, (2) selling at the price celling, (3) using cutting-edge technology for convenience, (4) testing it first and purchasing it with willingness later, and (5) understanding customers desire exclusively.

Definition

Five Business Model is a business model for digital transformation which can adapt to a wide range of businesses such as retail business, printing media business, manufacturing, the banking and finance industry, the public utility industry, the medical and healthcare industry, cargo transportation, insurance, and logistic business (Chantorn, 2018).

(1) Discounting Pricing to Earn More Profits: This business model aims to get more market share within the industry in order to earn higher profits. It is applied to the big market by focusing on selling merchandise at the lowest price with an agreement between business partners and suppliers.

(2) Selling at the Price Ceiling: Owning big data might not achieve victory in business competition, but the right analysis and proper application are essential tools of business. This method could be applied by quoting the maximum price and offering new and unique innovations which other companies cannot beat. Then the selling company will seek clients who look for the new and unique products because these customers are willing to purchase merchandise at a high price in order to improve their trendy image.

(3) Using Cutting-Edge Technology for Convenience: AI is involved in our daily life in many ways, for example, driverless cars and cashier-less stores. Another interesting ultramodern technology is social media which is a low cost tool used to promote a brand, and the contents will be shared online via many platforms.

(4) Testing First and Purchasing with Willingness Later: When customers decide to purchase something, they need product testing for decision-making. For example, customers might have concerns when they are buying new cosmetics. They might worry whether the cosmetics can cause makeup allergies or not. Therefore, if retailers allow customers to test the products, it will create reliability in online businesses,

(5) Understanding Consumer's Desire for Exclusivity: This business model will generate customers demand by creating exclusive goods and services such as name screening on sneakers. These products might be expensive but they are unique.

Research Methods

This study is a quantitative research approach using online collection by convenience selection of the Gen Y and Gen Z population, accounting for 557 samples, and then it was analysed by MANOVA.

Results

After testing the relationship between dependent variables by MANOVA, dependent variables have to be metric variables and they have to be associated. In this study, dependent variables are business models in the digital era as referred to the theory of digital transformation Five Business Model.

Assumptions Test for Appropriate Use of MANOVA

Table 1 Correlation of dependent variables

| Correlations		Discounting Pricing to Earn More Profits	Selling at the Price Ceiling	Using Cutting-Edge Technology for Convenience	Testing First and Purchasing with Willingness Later	Understanding Customers Desire Exclusively
Discounting Pricing to Earn More Profits	Pearson Correlation	1	.465**	.454**	.485**	.342**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	557	557	557	557	557
Selling at the Price Ceiling	Pearson Correlation	.465**	1	.428**	.544**	.544**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	557	557	557	557	557
Using Cutting-Edge Technology for Convenience	Pearson Correlation	.454**	.428**	1	.489**	.552**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	557	557	557	557	557
Testing First and Purchasing with Willingness Later	Pearson Correlation	.485**	.544**	.489**	1	.552**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	557	557	557	557	557
Understanding Customers Desire Exclusively	Pearson Correlation	.342**	.544**	.552**	.552**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	557	557	557	557	557

*Correlation is significant at the 0.01 level (2-tailed)

According to MANOVA assumptions, there have to be at least two variables having a relationship to each one, so it can be seen from Table 1 that each digital business model relates to other ones in the positive direction of the relationship at the significance level of 0.01. This agrees with MANOVA assumptions.

Table 2 Data Distribution

Descriptive Analysis		Statistic	Std. Error	Scheme
Discounting Pricing to Earn more Profits	Mean	8.4111	.05111	
	Variance	1.455		
	Std. Deviation	1.20614		
	Skewness	-.553	.104	-.553/.104= -5.31731
	Kurtosis	.759	.207	.759/.207 = 3.666667
Selling at the Price Ceiling	Mean	7.8187	.05830	
	Variance	1.893		
	Std. Deviation	1.37598		
	Skewness	-.531	.104	-.531/.104 = -5.10577
	Kurtosis	.967	.207	.967/.207 = 4.671498
Using the Cutting-Edge Technology for the Convenience	Mean	8.3393	.05339	
	Variance	1.588		
	Std. Deviation	1.26012		
	Skewness	-1.006	.104	-1.006/.104 = -9.67308
	Kurtosis	2.761	.207	2.761/.207 = 13.33816
Testing First and Purchasing with Willingness Later	Mean	7.8348	.05831	
	Variance	1.894		
	Std. Deviation	1.37606		
	Skewness	-.461	.104	-.461/.104 = -4.43269
	Kurtosis	.494	.207	.494/.207 = 2.386473
Understanding Customers Desire Exclusively	Mean	7.5978	.06240	
	Variance	2.169		
	Std. Deviation	1.47272		
	Skewness	-.667	.104	-.667/.104 = -6.41346
	Kurtosis	1.116	.207	1.116/.207 = 5.391304

A value of statistic/std. error between +/-1.96 indicates a normal distribution. Statistic/std. error may be calculated by dividing the skewness statistic by std. error and dividing Kurtosis statistic by std. error and the results show negative values which are out of the range of +/-1.96. This indicates that five dependent variables have non-normal distribution with a negative skewness that can be seen in Figure 1. Figure 1 (left) shows the actual distribution of data, while the right one illustrates a normal distribution.
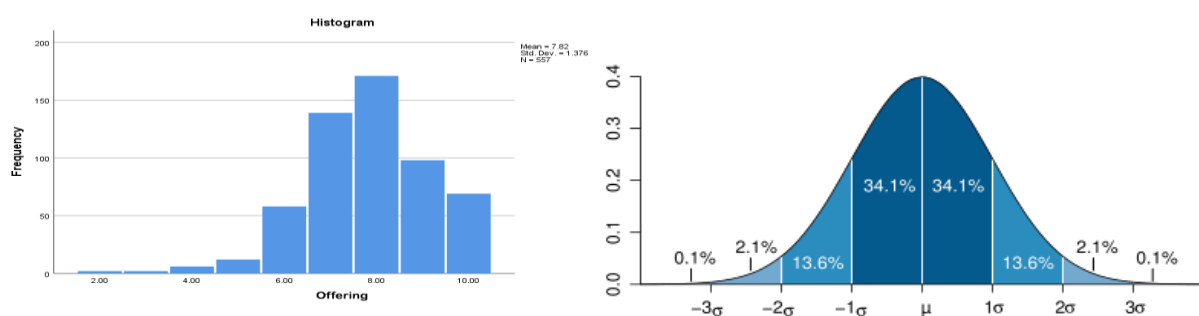
Figure 1 Histogram

Due to non-normal distribution and a negative skewness (Wongsaichue, 2016), the data was adjusted using a power transformation to transform the values by raising the values of the dependent variables to the third power (cube); as a result, the new values are shown in table 3.

Table 3 Distribution (after adjusting by cubing (P3) the dependent variables)

Descriptive Analysis		Statistic	Std. Error	Scheme
P3 Discounting	Mean	665.4282	3.56973	
Pricing to Earn	Variance	59700.803		
more Profits	Std. Deviation	244.33748		
	Skewness	.045	.036	0.045/0.036 = 1.25
	Kurtosis	-1.119	.072	-1.119/0.072 = -15.5417
P3 Using	Mean	632.7618	3.53629	
Cutting-Edge	Variance	58587.699		
Technology for	Std. Deviation	242.04896		
Convenience	Skewness	.161	.036	0.161/0.036 = 4.472222
	Kurtosis	-.747	.072	-0.747/0.027 = -27.6667

From table 3, the data was adjusted by cubing (P3) the dependent variables to fix a negatively skewed distribution and the adjustment of skewness and kurtosis may be calculated as shown below.

Dependent Variable 1 (Discounting pricing to earn more profits)

Skewness 0.045/0.036 = 1.25 (the value changes from -5.31731 to 1.25)

Kurtosis -1.119/0.072 = -15.5417(the value changes from 3.666667 to 15.5417)

Dependent Variable 2 (Using cutting-edge technology for convenience)

Skewness0.161/0.036 = 4.472222(the value changes from -9.67308to4.472222)

Kurtosis -0.747/0.027 = -27.6667(the value changes from 13.33816to-27.6667)

Hence, fixing a left skewed distribution by power transformation with a cube can decrease skewness and the kurtosis value which are shown in table 2. Other three dependent variables including selling at the price ceiling, testing it first and purchasing it with willingness later and understanding customers desire for exclusively, after adjusting by cubic, skewness decrease but kurtosis does not decrease; therefore, actual values were used.

Hypothesis Test Using MANOVA

From table 4, the variance test results tested by Box's Test of Equality of Covariance Matrices[a] indicate that there are statistically significant differences in the between-group variation of independent variables at 0.05. This does not agree with the assumptions, or there are violations of assumptions causing a lack of robustness of the test or a decrease in the power of test. Thus, Wilk's lambda, a common test used in MANOVA, needs to be changed to Pillai's trace which is more robust when assumptions are violated. However, test statistic values usually agree.

Table 4 Variance test of group 1 dependent variable, demographic variables

Box's M	4631.934
F	30.487
df1	150
df2	1057114.394
Sig.	.000

Table 5 The difference of mean tested by multivariate tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.626	1539.515[b]	5.000	4600.000	.000
	Wilks' Lambda	.374	1539.515[b]	5.000	4600.000	.000
	Hotelling's Trace	1.673	1539.515[b]	5.000	4600.000	.000
	Roy's Largest Root	1.673	1539.515[b]	5.000	4600.000	.000

Effect		Value	F	Hypothesis df	Error df	Sig.
Gender	Pillai's Trace	.039	36.844[b]	5.000	4600.000	.000
	Wilks' Lambda	.961	36.844[b]	5.000	4600.000	.000
	Hotelling's Trace	.040	36.844[b]	5.000	4600.000	.000
	Roy's Largest Root	.040	36.844[b]	5.000	4600.000	.000
Age	Pillai's Trace	.036	16.983	10.000	9202.000	.000
	Wilks' Lambda	.964	17.005[b]	10.000	9200.000	.000
	Hotelling's Trace	.037	17.028	10.000	9198.000	.000
	Roy's Largest Root	.026	24.013[c]	5.000	4601.000	.000
Education Level	Pillai's Trace	.033	15.623	10.000	9202.000	.000
	Wilks' Lambda	.967	15.706[b]	10.000	9200.000	.000
	Hotelling's Trace	.034	15.789	10.000	9198.000	.000
	Roy's Largest Root	.031	28.535[c]	5.000	4601.000	.000
Monthly Income	Pillai's Trace	.062	14.399	20.000	18412.000	.000
	Wilks' Lambda	.939	14.510	20.000	15257.424	.000
	Hotelling's Trace	.063	14.578	20.000	18394.000	.000
	Roy's Largest Root	.040	36.456[c]	5.000	4603.000	.000
Occupation	Pillai's Trace	.080	18.833	20.000	18412.000	.000
	Wilks' Lambda	.922	19.021	20.000	15257.424	.000
	Hotelling's Trace	.083	19.133	20.000	18394.000	.000
	Roy's Largest Root	.051	46.609[c]	5.000	4603.000	.000

The findings from table 5 show that Pillai's trace indicates a relationship between demographic variables and digital transformation at the significance level of 0.05. Besides, other tests including Wilks' lambda, Hotelling's trace, and Roy's largest root show the same trends at the significance level of 0.05.

Table 6 The difference of means tested by multivariate tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.495	911.721[b]	5.000	4654.000	.000
	Wilks' Lambda	.505	911.721[b]	5.000	4654.000	.000
	Hotelling's Trace	.980	911.721[b]	5.000	4654.000	.000
	Roy's Largest Root	.980	911.721[b]	5.000	4654.000	.000
Perception of Information	Pillai's Trace	.066	15.585	20.000	18628.000	.000
	Wilks' Lambda	.936	15.655	20.000	15436.522	.000
	Hotelling's Trace	.067	15.674	20.000	18610.000	.000
	Roy's Largest Root	.028	26.033[c]	5.000	4657.000	.000
Internet Use	Pillai's Trace	.067	12.706	25.000	23290.000	.000
	Wilks' Lambda	.934	12.862	25.000	17290.345	.000
	Hotelling's Trace	.070	12.964	25.000	23262.000	.000
	Roy's Largest Root	.047	43.986[c]	5.000	4658.000	.000
Creative Innovations	Pillai's Trace	.761	76.322	55.000	23365.000	.000
	Wilks' Lambda	.407	84.286	55.000	21615.324	.000
	Hotelling's Trace	1.085	92.054	55.000	23337.000	.000
	Roy's Largest Root	.659	279.844[c]	11.000	4673.000	.000

From table 6, Pillai's trace indicates that there is a relationship between digital transformation and group 2 dependent variables including Internet use and creative innovations at the

significance level of 0.05. Apart from this, other tests including Wilks' lambda, Hotelling's trace, and Roy's largest root show the same trends at the significance level of 0.05.

Discussion

The findings indicate that demographic factors affect digital transformation, excepting gender and education level which have no relationship with some models such as selling at the price ceiling and testing it first and purchasing it with willingness later, respectively. Perception of information, internet use, and creative innovations, have a significant effect on digital transformation model. These findings agree with the study of Dumrongpong (2018) who stated that entrepreneurs are able to create new products. This idea is equivalent to the creative innovations of this study causing differences by using digital marketing such as online system or e-commerce. Therefore, it creates the global business competition leading to business sustainability in the digital economy era. Chesbrough and Rosenbloom (2002) define a business model as "the creating where many viewpoints are accumulated to set the framework and to connect to each other using specific technology and potentiality as materials in order to transfer customers and markets into economic products." They also define the six components used to create a business model. The first model is that free goods and services are offered, but income comes from ads and critical mass. This model is popular in many online start-ups. For example, Facebook is a free service, but their income comes from selling advertisements. This is beneficial for customers; however, this model is awful for start-ups who have inadequate funds. This model is similar to the findings of this study, where a target group agrees with offering free services and earning profits afterward. This method might profit by selling advertising or by gaining popularity that will lead to the purchase of goods and services later on. Another model is to offer free products but collect payment for services after that. The products are offered for free, but the clients will be charged for the installation, adjustment, training, and other services. This model agrees with the findings that customers agree with the idea of free products, but they will pay for the services with willingness later on.

Recommendations

The findings of this study shows that perceiving information affects consumer behaviour in the digital era and the study of Meechunek (2017) confirmed that Generation Y is active social media user. They prefer exclusive experience rather than having cool products and they has a natural propensity to spend money and time on products which promote their lifestyles. Therefore, using social media literacy and viral marketing can impact Generation Y social behaviour. Due to this reason, a policy regarding free internet connection provided by the government agencies such as the National Broadcasting and Telecommunications Commission (NBTC) is recommended. The public free Internet should be available widely and easy to be accessed.

In addition, the results show the relationship between demographic factors and business model in digital era. This finding is in accordance with Karnreungsiri and Praditsuwan's study (2017) stating that the essential components of a marketing strategic model are defining customers based on the their age, career, income, attitude, personality, and lifestyle, promoting positive value of a product benefits, and improving product's packaging, branding, and variety of a products. It is obvious that entrepreneurs can create new business concepts based on the demands of target groups which have differences in gender, age, education, income, and occupation, and this method is called niche marketing.

References

Booasang, P. 2017. "Digital Transformation: Transform the business with digital concepts." **Money and Banking** (429): 1-4.

Chantorn, K. 2018. **5 Exotic Business Models that Arise in the Digital Transformation Era.** Retrieved from stepstraining.co/entrepreneur/5-business-model-digital-transformation-era.

Chesbrough, H. & Rosenbloom, R. 2002. "The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies." **Industrial and corporate change** 11 (3): 529-555.

Chinachoti, P. 2018. "The Readiness of Human Resource Management for Industrial Business Sector towards Industrial 4.0 in Thailand." **Asian Administration and Management Review** 1 (2): 123-131.

Dumrongpong, N. 2018. "Factors Affecting Business Capacity of the SMEs Entrepreneur for Digital Economy in Thailand." **Journal of Modern Management Science** 11 (1): 239 - 255.

Karnreungsiri, I. & Praditsuwan, N. 2017. "Factors Influencing Buying Behavior and Buying Decision Process of Customers: An Examination on Relationship using One-Way Analysis of Variance." **PSAKU International Journal of Interdisciplinary Research** 6 (2): 76-84.

Meechunek, K. 2017. "Using Social Media Affecting Lifestyle and Social Behaviors of Generation Y in Bangkok Metropolitan, Thailand." **PSAKU International Journal of Interdisciplinary Research** 6 (2): 103-110.

Teece, D. 2010. "Business Models, Business Strategy and Innovation." **Long Range Planning** 43: 172-194.

Wongsaichue, T. 2016. **Non-normal Distribution and How to Fix the Skewness and Kurtosis? - Descriptive Statistics.** Retrieved from www.youtube.com/watch?v=o21 Mnq8paIg.