Measurement Service Productivity: The Case Study of the Wedding Photography Businesses in Khon Kaen Province

Mana Kijpruek[1] and Panutporn Ruangchoengchum[2*]

Abstract

There is an attempt of measuring service productivity in order to analyze performance of the service business. Since wedding photography businesses are struggling due to a variety of issues, service productivity has decreased. The purpose of this research is to measure and analyze the service productivity of 15 wedding photography businesses located in Khon Kaen province. In-depth semi-structured interviews were conducted to gather input and output variables over a one-month period from the 15 wedding photography businesses. The collected data were analyzed using Data Envelopment Analysis (DEA) with an input-oriented approach. The productivity measurement of the wedding photography businesses consists of 3 input variables and 2 output variables. The findings indicated that 6 wedding photography businesses were efficient under the CRS model, and 7 were efficient under the VRS model. The guideline from efficient wedding photography businesses is recommended to improve service productivity in the wedding photography business in terms of operations management by using the best practice units as a benchmark for inefficient DMUs. The results of this research are expected to benefit wedding photography businesses operating in similar contexts and contribute to the broader service sector for further study.

Keywords: Service Productivity Measurement, Wedding Photography Business, Data Envelopment Analysis, Khon Kaen Province

Introduction

Productivity for an operation is the efficiency with which input resources are converted into financial benefits for the service provider and value for its customers. As a result of high productivity, the service provider achieved higher profit or benefits while the customers gained more value. There are various studies that approach observing and studying service productivity in the business service sector. Because service productivity is what gives service businesses a competitive advantage. Since service productivity is intangible; therefore, it is hard to measure the service productivity for the business service sector. In past studies, service productivity is always challenging to measure, the researcher has been used different tools and various perspectives to measure service productivity in different businesses. However, productivity in the service sector is intangible, making it challenging to quantify. As a result, Data Envelopment Analysis (DEA) is used in this study to evaluate the efficiency of the business. DEA is a

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[1] Master student, College of Graduate Study in Management, Khon Kaen University

[2] Associate Professor, College of Graduate Study in Management, Khon Kaen University

* Corresponding author: E-mail address: rpanut@kku.ac.th

tool that is frequently used to measure productivity in the service sector since this method does not require the same unit for each input and output. DEA compares the decision-making units (DMUs) with the industry's best practice unit (Sherman & Zhu, 2006; Krishna, 2019).

Furthermore, many studies have shown that service productivity has been utilized in several service businesses, such as library, hotel, bank, hospital, agricultural cooperative, and university (Avkiran, 2006; Nayar & Ozcan, 2008; Pasunon & Tragantalerngsak, 2013; Sripui & Ruangchoengchum, 2016; Vrabková & Friedrich, 2019). These studies have obviously shown that service productivity can measure efficiency by using DEA to evaluate the efficiency of the business. On the other hand, minimal literature focuses measurement of service productivity in the wedding photography business by applying DEA.

Meanwhile, the wedding photography business is a growing business and also important to couples since most of them are likely to capture the wedding celebration as their lifetime memory. Even so, several reports have found that wedding photography businesses have experienced pressure from many issues such as pandemics, customer behavior, and disruptive technologies. Similarly, for the wedding photography businesses in Khon Kaen province, the business service providers have to face the same situation. Since the number of weddings is decline affecting to the revenue in the wedding service industry to decrease as well. This led to the becoming lower service productivity in the wedding photography industry. In terms of lower service productivity for the business from a financial perspective, it means lower revenue (Grönroos & Ojasalo, 2004). From operational perspective, it would come from a lower number of customers using wedding photography services. This has led to the research question that how to measure the service productivity of wedding photography businesses in Khon Kaen province through Data Envelopment Analysis. Measuring the service productivity will assist the service provider of the wedding photography business to know how their business performed and can improve their service productivity. For this reason, the researcher was interested in the measurement and analyze of service productivity for the wedding photography businesses.

Besides, this service productivity measurement can assist service providers make decisions that will result in input cost savings and the achievement of ideal output targets by identifying efficient and inefficient businesses. Evaluating the operational effectiveness of businesses that offer a variety of services is becoming more and more popular. DEA is a more suitable measurement instrument for service efficiency in this context. By comparing the quality of its services to those of its competitors in the market, DEA might help the business determine its strengths and weaknesses and find opportunities for potential changes (Emrouznejad & Cabanda, 2014). The results of this research would be beneficial to the service providers of wedding photography businesses to measure their service productivity. Since DEA has been used to evaluate and enhance the productivity of service businesses. Additionally, this study would give the anticipated outcomes for the researcher who are interested in service productivity in the service business sector.

Objective

To measure and analyze the service productivity of the wedding photography businesses.

Literature review

Since this research aims to measure and analyze service productivity by using the wedding photography business as a case study. This section will be discussed the theory of service productivity which is the main concept of this research. Then the techniques for measuring service productivity that is Data Envelopment Analysis (DEA) will be explained. After the DEA this research will be described the wedding photography business which is the service business that uses as a case study. Also, variables for service productivity will be discussed in the last topic.

1. Measuring Service Productivity

Productivity is a ratio, volume-based measure that shows how well an organization can transform inputs into outputs. In terms of service sector, the effectiveness of a company's services in its continuing business activities is referred to service productivity. The definition of service productivity referred to the firm's efficiency in service-value creation in existing services (Aspara et al., 2018). Researchers also offered several methods for measuring service productivity, emphasizing the importance of the output and input ratio despite the fact that it is a well-established metric. The output-to-input ratio represents efficiency (Hung & Yuan, 2014). In order to manage service productivity, one must find a balance between effectiveness and efficiency. Service productivity is the ability to generate income by using resources efficiently.

Considering the business has limited resources to produce its output or service. What provides service businesses an advantage over their competitors is service productivity. Service productivity refers to how effectively input or resources are converted into financial benefit for the service provider and value for the customer. From the customer perspective, the efficiency with which the business turns service input resources into customer-valued service outputs in its existing service offerings. With high productivity, the service provider achieved higher profit or benefit while the customers gained more value.

Nevertheless, it has been challenging to apply a similar productivity concept in the services sector. Obtaining a reliable measure of an organization's productivity is a management challenge in an economy of limited expenditures. Research has shown that there is no one productivity measurement that works for all circumstances and purposes. Businesses should instead develop productivity metrics that are suitable for its operations and data requirements (Card, 2006). In addition, the traditional measuring of productivity comes from the manufacturing sector, making it hard to apply with the productivity in the service sector. Service productivity is difficult to measure since service is intangible, interactive, and also involves time factors and social nature. Which affects their productivity and makes it difficult to measure (Djellal & Gallouj, 2013). The difficulty of measuring productivity has been extensively covered. In past studies, service productivity is intangible and particularly challenging to measure. After all, the most

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frequently used method is Data Envelopment Analysis which will be discussed in the next topic.

2. Data Envelopment Analysis

Data Envelopment Analysis (DEA) is one of the methods used most frequently to measure efficiency. To measure service performance from a multidimensional perspective, DEA model variants are put together with additional benchmarking methods. Compared to traditional procedures, employing multi-criteria benchmarking tools can help decision-making units (DMUs) be more productive and efficient overall, especially when controlling and enhancing service performance. DEA is a quantitative technique utilized to create a best practice group of units and to identify which units are inefficient when compared to the best practice groups and how much inefficiency is present. As a result, DEA identifies which units should be able to increase productivity as well as the amount of resource efficiency and output measurements that these inefficient units must attain to reach the best practice units' level of efficiency. The DEA technique has been applied to services in a number of different ways (Djellal & Gallouj, 2013).

DEA has been widely used to assess the effectiveness and productivity of a variety of service sectors, including education, healthcare, banking, and financial services. Each service unit is compared to every other service unit using DEA, which also determines which units are operating inefficiently as compared to other units' actual operating outcomes. DEA gives far more information on where efficiency enhancements are possible and the size of these prospective increases than a basic efficiency ratio because it takes into account various inputs and outputs. The DEA technique seeks the maximum proportional input reduction while keeping the outputs generated by each DMU in the input-oriented model. In the output-oriented model, this strategy attempts the highest proportional increase in outputs produced with a given quantity of inputs. Farrell's (1957) measure was expanded by Charnes, Cooper, and Rhodes (1978) to scenarios with numerous inputs and multiple outputs, and they operationalized it using mathematical programming. DEA's constant returns to scale (CRS) model, which makes the assumption that all businesses are functioning at their ideal scale, is the name given to this approach to measuring efficiency. Only when every DMU is working at its ideal scale is the CRS assumption valid. A DMU may not be running at its optimal scale because of imperfect competition limits on finance, etc. Variable returns to scale (VRS) scenarios were proposed as an addition to the CRS DEA model by Bank Charnes and Cooper (1984). By using the VRS specification, it will be possible to calculate TE without considering these SE effects (Emrouznejad & Cabanda, 2014).

In order to increase service performance, managing service productivity focuses on complicated service issues, challenges, and operations and proposes using the right benchmarking tools. With the help of effective benchmarking techniques like DEA, a contemporary method of performance measurement, and other multi-criteria decision-making tools, service organizations have been able to recognize and adopt best practices in order to achieve performance excellence within their organizations. Managers and executives of service companies may desire to compare how well their companies perform in comparison to other companies in the same industry or to know how well individual organizational units perform in comparison to one another (Emrouznejad &

Cabanda, 2014). Therefore, in this study, the service business that the researcher would like to measure and analyze its service productivity is the wedding photography business, which will be discussed in the following topic.

3. Wedding Photography Business

The wedding ceremony is a once-in-a-lifetime event; therefore, most couples want to preserve this memory by using the wedding photography service. The wedding market and business also grow with the development of the wedding celebration. Presently, couples are increasingly willing to spend more on their wedding ceremony which is a lifetime experience (Fadhlillah & Zpalanzani, 2020). As a result, it has been a significant increase in demand for wedding-related services including the wedding photography business. The budget spent on wedding photography would be around 15% of the total budget for the wedding ceremony (Pongsiri, 2014). Recently, in Thailand, the wedding photography business is become more popular making the market for this business expand since more people place a high budget on taking pictures of their wedding day, particularly in Khon Kaen province. According to the bureau of registration administration, the statistic for the last five years (2017-2021) has shown that Khon Kaen province has registered couple around 7,000 couples per year, which is almost the highest number in the North-eastern part of Thailand. This can reflect to the high demand for wedding services in Khon Kaen province.

However, the photography business has been damaged by various issues including the pandemic and technological disruption that would change the customers. The pandemic has affected wedding services, with no new customers and also on-hand customers that cannot have the ceremony for now. The customer has to postpone or cancel the wedding due to concerns about the spread of COVID-19 at the wedding. Along with the government's policy to control the epidemic (Thansettakij, 2021). Given the restrictions imposed by the government regulations, many photographers find it challenging to earn money (Arsana et al., 2021). Not only the pandemic but also the increasing number of technological devices has impacted the wedding photography businesses by suppressing the market growth of this industry (Fortune Business Insights, 2021). By overcoming big challenges, from a financial perspective, reduced service productivity for the company translates into lower income. From an operational perspective, it would result in fewer people hiring wedding photographers. Because the wedding photography business is an incomplete competitive business, the consideration under the assumption VRS is more appropriate than the CRS. Because under the CRS assumption, it is an estimate of technical efficiency whereas VRS is an estimate of pure technical efficiency. Then the data have been analyzed with input-oriented under VRS assumption. Since service productivity requires its own measurement. As a result, this study aims to find variables in order to measure the service productivity of wedding photography businesses.

4. Variables for Service Productivity

Since service productivity can see from a financial perspective (Grönroos & Ojasalo, 2004); as a result, the input and output variables for measuring will be the cost of operating and income, respectively. Many studies show that one of the most important components in the creation of the service is the cost of operation. As in the previous studies, the cost of operating or expense is included in the input variable

(Grönroos & Ojasalo, 2 0 0 4 ; Avkiran, 2 0 0 6 ; Nayar & Ozcan, 2 0 0 8 ; Pasunon & Tragantalerngsak, 2013). Similarly, the output dimension income would represent this outcome from the financial perspective (Grönroos & Ojasalo, 2004; Avkiran, 2006; Sripui & Ruangchoengchum, 2 0 1 6). Likewise, in the wedding photography business, the expenditure is also the resource or input to create and provide service. And the outcome or benefit in the financial aspect would be the income that gains from the customers. Then this input and output variable will be counted in this study.

Moreover, as mentioned in many studies that another important resource for input variables for the service business is the staff. Since the workers are important to service businesses. In addition, according to several studies, the number of employee or staff is included in the input variable (Avkiran, 2 0 0 6 ; Nayar & Ozcan, 2 0 0 8 ; Sripui & Ruangchoengchum, 2016). Especially in the wedding photography business that needs the photographer (Wang, 2012; Leng & Ban, 2020) as their main person, also the business needs assistance to provide the service. Furthermore, for the photography business, one more input factor that is crucial to the services is working hours.   According to the studies the input is the hours of service or employee hours (Grönroos & Ojasalo, 2 0 0 4 ; Vrabková, & Friedrich, 2 0 1 9). Thus, this input variable for the wedding photography business would be including the number of staff and working hours as well.

For the output variable, the number of services performed or a number of customers that the business served is the other factor that would reflect the performance of the business within a period (Grönroos & Ojasalo, 2004; Nayar & Ozcan, 2008; Backhaus et al., 2011). In case of the wedding photography business, the number of couples is the output variable that can represent the performance of the business. The overall variables for measuring service productivity can be summarized as represented in table 1.

Table 1 The Variables for Service Productivity

Variable for Service Productivity	Types of the Variable	Related Authors
Operating costs or expense	Input Variable	Grönroos & Ojasalo, 2004; Avkiran, 2006; Nayar & Ozcan, 2008; Pasunon & Tragantalerngsak, 2013
Income	Output Variable	Grönroos & Ojasalo, 2004; Avkiran, 2006; Sripui & Ruangchoengchum, 2016
Number of staff or employees	Input Variable	Avkiran, 2006; Nayar & Ozcan, 2008; Sripui & Ruangchoengchum, 2016
Working hours	Input Variable	Grönroos & Ojasalo, 2004; Vrabková, & Friedrich, 2019
Number of services performed or a number of customers	Output Variable	Grönroos & Ojasalo, 2004; Nayar & Ozcan, 2008; Backhaus, Bröker, Brüne, Reichle, & Wilken, 2011

From the literature review mentioned before, the variables for measuring service productivity by using DEA are comprised of input and output variables. The input factors are the cost of operating, the number of staff, and working hours, while the output

factors are income and the number of couples. These variables will use for evaluating the service productivity of the wedding photography businesses in Khon Kaen province.

Methodology

1. Sampling and Data Collection

The number for a sampling of the collecting data is followed by a rule of thumb which demonstrates the relationship between the number of decision-making units (DMUs) and the number of input and output. The number of the DMUs should be greater or equal to three times of sum of input and output (Avkiran, 2006; Toloo et al., 2015). Therefore, since this study has a sum of input and output equal to 5 when multiplied by 3, the study sample will be 15 businesses.

In this study, an in-depth interview was used in-depth interview was used with the semi-structured interview as a tool for collecting data from 15 wedding photography businesses that currently operate in Khon Kaen province. The scope of the study covers the wedding photography businesses located in Mueang Khon Kaen district because this area has a significant demand for wedding photographers. Wedding photography businesses can be classified by the type of services that the business provides. Which can divide into 3 main categories including photography services, make-up and hair styling with renting dresses and suits, and full-service. The code for 15 wedding photography businesses is represented by business A, B, C, ... to business O, respectively.

2. Data Analysis

After collecting the data, the collected data will analyze with the Data Envelopment Analysis program (DEAP) version 2.1 under constant returns to scale (CRS) and variable returns to scale (VRS) assumption (Emrouznejad & Cabanda, 2014) was applied to measure the efficiency of the wedding businesses under the input-oriented. The CRS model will be used as a pure efficiency score which consists of a pure technical efficiency score from the VRS model and a SE score that can be suggested how the scale of each business should be. The results can be between 0 and 1, 1 means that the DMU is an efficient DMU or best-practice unit (Sherman & Zhu, 2006).

The interpreting results from the DEAP show the service productivity of the wedding photography business, the guideline for improving service productivity will be proposed to improve the efficiency of the wedding photography business. For measuring the service productivity with DEAP the data we need will consist of data of input and output variables from each decision-making unit (DMU). In this study, the DMUs is the wedding photography business. The input variables are including operating costs (IN1), number of staff (IN2), and working hours per month (IN3). For the output, variables consist of income (OP1) and the number of couples per month (OP2). The period for calculating data is 1 month. The input-output variables and units are shown in table 2.

Table 2 Input-Output Variable for Measuring Service Productivity of the Wedding Photography Businesses

Code	Variable	Unit
	Input Variable	
IN1	Operating costs	Baht
IN2	Number of staff	Person
IN3	Working hours	Hour
	Output Variable	
OP1	Income	Baht
OP2	Number of couples	Couple

For the data validity of a DEA model to be valid, the selected variables must show a positive correlation between the input and the output. It indicates that increasing any input should not result in a decrease in any output (Ghosh et al., 2017).

Results

From the collected data, the significant difference between each wedding photography business is the type and number of services provided. There are 2 businesses that provide only photography services which are business A and business B. While the 7 businesses that provide 3 services including wedding photography, make-up, and hair styling, and renting dress and suits services, these shops are business C to business I. For the full-service are 6 businesses, which are business J to business O. The proportions of different types of wedding photography businesses can show in figure 1.
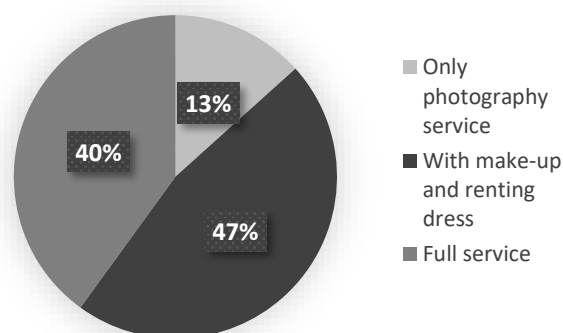

Figure 1 Category of the Wedding Photography Businesses

The data analysis of 15 wedding photography businesses, which is business A to business O. By using in-depth interviews with the key informants that can give the details about the operation of the wedding photography businesses in Khon Kaen province. That are the decision-making units for this study. The information from the collected data during the period of observation has revealed that the minimum operating cost is 63,000 baht, while the highest operating cost is 625,000 baht, and the average cost is 177,460 baht. For the number of staff, the lowest number is 3 people, the highest number is 18 people and the average number of staff is 6 people. The shortest total working hours per month is 52 hours, whereas the longest is 160 hours and the mean for working hours per month is 87 hours. For the output for this calculation, the minimum income is 91,400 baht, and the highest amount is 1,034,400 baht. The average amount

of income is 283,053 baht. The lowest number of couples per month is 4 couples, the highest number is 15, and the average number is 9 couples per month. To summarize the information including minimum, maximum, and mean values from collected data can represent in table 3.

Table 3 Data of Input and Output Variable

Variable	Code	Min	Max	Mean
Input Variable				
Operating Cost	IN1	63000	625000	177460
Number of staff	IN2	3	18	6
Working hours	IN3	52	160	87
Output Variable				
Income	OP1	91400	1034400	283053
Number of couples	OP2	4	15	9

For the validity test of each input and output variable, we can identify the correlation. From the correlation we have identified each input and output variable by seeing the relationship between each factor as follows:

1. Income or output 1 has the highest relationship with the cost of operating with the value of 0.993 followed by the number of staff (0.951) and working hours (0.525). For the lowest correlation with the number of couples with a value equal to 0.266.

2. Number of couples or output 2 the highest is the working hours with the value of 0.749 followed by the income (0.266) and cost of operating (0.207) and have the lowest correlation with the number of staff with the value of 0.147.

3. Cost of operating or input 1 has the highest correlation with the income (0.993) followed by the number of staff (0.973) and working hours (0.517). The lowest value of correlation is the number of couples which equals 0.207.

4. Number of staff or input 2 has the highest correlation with the cost of operating with a value equal to 0.973 followed by income (0.951), working hours (0.517) and the number of couples with the value of 0.147.

5. Working hours or input 3 have the highest correlation with the number of couples with the value of 0.749 followed by income (0.525), cost of operating (0.517) and number of staff (0.495)

As the correlation from each factor of input and output, it has shown that all of the input and output have a positive relationship with each other. The correlation table is represented in table 4.

Table 4 Input-Output Variable Correlation

	OP 1	OP 2	IN 1	IN 2	IN 3
OP 1	1				
OP 2	0.266734	1			
IN 1	0.993520	0.207612	1		
IN 2	0.951718	0.147290	0.973273	1	
IN 3	0.525523	0.749865	0.517648	0.495524	1

According to the calculation of the collected data, it has shown that the businesses that got a technical efficiency score of 1.000 in every model including CRS, VRS, and Scale Efficiency (SE) are businesses A, D, E, I, J, and K. While the business G has technical efficiency score equal to 1.000 only under VRS model. The details of the results from the Data Envelopment Analysis Program (DEAP) are shown in table 5.

Table 5 Technical Efficiency Score (TE) from CRS and VRS model, Scale Efficiency Score (SE) and the scale condition of the Wedding Photography Businesses

Business	CRS	VRS	SE	Scale Condition
A	1.000	1.000	1.000	Constant
B	0.824	0.895	0.920	Increasing
C	0.891	0.933	0.955	Increasing
D	1.000	1.000	1.000	Constant
E	1.000	1.000	1.000	Constant
F	0.842	0.914	0.921	Increasing
G	0.762	1.000	0.762	Increasing
H	0.784	0.997	0.786	Increasing
I	1.000	1.000	1.000	Constant
J	1.000	1.000	1.000	Constant
K	1.000	1.000	1.000	Constant
L	0.735	0.740	0.993	Decreasing
M	0.846	0.911	0.929	Increasing
N	0.781	0.921	0.849	Increasing
O	0.703	0.712	0.986	Increasing
Mean	0.878	0.935	0.940	

Note: Constant = Constant return to scale, Decreasing = Decreasing return to scale, Increasing = Increasing return to scale

As reported by the calculations, it was found that the wedding photography businesses in this study had Technical Efficiency (TE) under the CRS model equal to 0.878 or 87.8%. There are 6 effective wedding photography businesses, which have an efficiency score equal to 1.000. The wedding photography businesses in 7 out of 15 places have a higher score than the average efficiency score. Which can identify the source of efficiency operations in two components including technical efficiency and scale efficiency.

1. Technical efficiency under the VRS model has 7 efficient wedding photography businesses which have an efficiency score equal to 1.000. The mean efficiency score is 0.935 or 93.5%. Eight wedding photography businesses have a higher score, and the other 7 businesses have a lower score than the mean efficiency score.

2. Scale efficiency has shown that 6 wedding photography businesses have an efficiency score equal to 1.000. The mean efficiency score is 0.940 or 94.0%. Nine wedding photography businesses out of 15 places have a higher score than the mean efficiency score. Whereas the 6 wedding photography businesses have a score lower than the mean efficiency score. The results of these data have shown in table 6.

Table 6 The Results of the Analysis of the Productivity Measurement of the Wedding Photography Businesses by Using Data Envelopment Analysis Program

No.	Model	CRS	VRS	SE
1	Number of studied wedding photography businesses	15	15	15
2	Number of efficient wedding photography businesses	6	7	6
3	Mean efficiency score	0.878	0.935	0.940
4	Max efficiency score	1.000	1.000	1.000
5	Min efficiency score	0.703	0.712	0.762
6	Number of wedding photography businesses that have a higher score than mean efficiency score	7	8	9
7	Number of wedding photography businesses that have a lower score than mean efficiency score	8	7	6

For the scale efficiency, if the score is equal to 1.000, it means that the scale of the input of the DMUs is a constant return to scale (constant) or considered an optimal scale. In contrast, if the score is not equal to 1.000 it can interpret that the DMUs are too small and should increase its scale (increasing) or too small and should decrease its scale (decreasing) the amount of input to have high efficiency. In accordance with the scale efficiency, when divided follow to the type of services, the efficient services for the business that provides only photography business is 1 out of 2, or 50%. For businesses that have make-up and hair styling, renting dresses and suits, the efficient DMU is 3 out of 7 places or 43%. The full services have efficient DMU in 2 out of 6 places, or 33%. When compared overall, 6 wedding photography businesses are efficient by getting the SE score of 1.000 which are business A, D. E, I, J, and K. While the 9 wedding photography businesses are scale inefficient, their scale condition for 8 places should be increased and 1 business should be decreased which is business L. These results are represented in table 7.

Table 7 Number of efficient and inefficient businesses under Scale Efficient (SE) score

	Scale Condition	Number of Business	Name of Business	Percentage	
Only wedding photography services					
Efficiency	Constant	1	A	50%	
Inefficiency	Increasing	1	B	50%	
Provided make-up and hair styling, renting dresses and suits					
Efficiency	Constant	3	D, E, I	43%	
Inefficiency	Increasing	4	C, F, G, H	57%	
Full-services					
Efficiency	Constant	2	J, K	33%	
Inefficiency	Increasing	3	M, N, O	50%	67%
	Decreasing	1	L	17%	
Total					
Efficiency	Constant	6	A, D. E, I, J, K	40%	
Inefficiency	Increasing	8	B, C, F, G, H, M, N, O	53%	60%
	Decreasing	1	L	7%	

From the calculation of the efficiency score for the wedding photography business. The result can show that some of the wedding photography business has

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inefficiencies in their operations. If the wedding photography business can improve its efficiency as its benchmark or best-practice units it can achieve higher productivity.

In this study, since this study measures from the input-oriented approach, the researcher would like to focus on the input-oriented by reducing operating costs, reducing employee numbers, and shortening working hours. To achieve these goals, the service providers can focus on investing in reducing operating costs can increase service productivity while also improving the business's profit. In some businesses, the number of employees can be reduced by giving other employees the task that some positions may only require one person to perform. However, the company must be delicate to avoid lowering the quality of the work. Although having a set schedule for working hours may be challenging for service providers, collaborating with customers and using trained employees can help minimize waiting or other unneeded time when providing services. Regardless, in terms of overall operation service providers should be considered the output as well. By increasing the number of customers and income in order to enhance and gain higher service productivity.

Discussion

The results from the analyzed efficiency score in terms of productivity of the 15 wedding photography businesses in Khon Kaen province under input-oriented, VRS assumptions. Under the calculation of the VRS model, there will be 7 wedding photography businesses out of 15 that have an efficiency score equal to 1.000 or 100%. On the other hand, 6 wedding photography businesses have a high-efficiency score by having an efficiency score equal to 1.000 or 100% under the Technical Efficiency Score of the CRS model and Scale Efficiency Score. As mentioned in the results of this research the service providers of the inefficient businesses should increase their service productivity.

Therefore, the guideline from efficient wedding photography businesses can use as a benchmark for improving their service productivity. In terms of input-oriented the business can be reducing its resources in order to have higher service productivity. Also, efficient DMUs can increase their productivity by following the guideline of efficient DMUs as well. Reputation and excellent customer satisfaction are the characteristics that efficient wedding photography businesses have in common. Referring to Chanpueng (2020), the reputation of the studio and the availability of various services affect the decision to use more services. In consequence, the wedding studio should be focusing on quality to meet customers' needs instead. According to experienced wedding planners, there have been more requests for themed wedding photo sessions. A photographer must guarantee customer satisfaction in order to sustain a profit because positive reviews are more likely to recommend the photographer to others or hire them for further services. A differentiation between the identical service and output produced by a competitor must be exclusivity and signature style (Wang, 2012; Pongsiri, 2014; Fadhlillah & Zpalanzani, 2020). Creating a competitive advantage is a key aspect and would be crucial to the existence of the business. The business can achieve competitive advantages when they can reduce costs compared to rivals and differentiate their services (Na Phayap & Jankingthong, 2023). Besides, managing customers relationship

that has directly impacted business performance, and also can increase the efficiency of the businesses both financially and non-financially. A business can also be informed about issues and recommendations from customers for using its advantage in the future.

Another approach would be to offer a range of pricing and services for customers to choose from. As Saetang (2016) has suggested that for the operational policy of the wedding business, the price of packages should be diverse choices for the couples to make the decision. Nasution and Naufal (2020) pointed out that pricing and packages offered by the provider are preferred by customers when selecting wedding photography and are considered to be the most key factors. Even though, customers also take into account service convenience and perceived quality. But price and package are crucial considerations during the decision-making process. The greatest alternative for the new approach is to create new prices and packages. However, sustaining and developing the business so that it can continue to be sustainable is the real challenge. Since the competition is so diverse, all new photographer needs to understand how to survive. Moreover, the wedding photography business should use social media marketing to receive feedback from customers to attract new customers to consider using their services. Therefore, the wedding photography business should be active regularly, to build relationships with customers continuously (Chanpueng, 2020; Fadhlillah & Zpalanzani, 2020). Moreover, couples might tend to choose the full-service business more than other businesses. Whereas businesses that do not provide full service can cooperate with other vendors as a partner to offer convenience and attract customers. Moreover, for a long-lasting, sustainable business, a company that lacks team members and does not have many reputations needs a plan for connecting with other wedding industry vendors (Nasution & Naufal, 2020).

In conclusion, the service provider should know their target customers in order to maintain their services and also make old customers bring new customers. The full-service wedding photography business comes with various types of services, that would attract more customers to use their businesses. Meanwhile, it would be more beneficial for businesses that did not provide full service to be a partner with other vendors. Another crucial factor is the reputation and popularity of the business. The signature and style are also important to have a unique identity and keep high service quality to maintain customer satisfaction. The study has found that successful studio has high satisfaction with their customers. Which can attract new customers in the future and would be the key success factor for this wedding photography business. In addition, the branding of the wedding photography business is also important. One strategy is to do marketing, especially social media platforms, and keep updating and active continuously to reach and engage new customers. This guideline would be applicable to the wedding photography business. However, each business has to adapt to make this suitable for their business as well.

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Suggestion

Suggestions for Applying the Research Results

This study is an approach to service productivity or the operation of the wedding photography business also this study has shown the concept of productivity in the service business. Therefore, based on academic purposes the suggestion from this study is to learn and apply the concept of service productivity with the DEA approach in the service business sector. Since DEA has been used frequently to assess efficiency, it can make suggestions for inefficient businesses in order to improve their service productivity. On the contrary, the efficient business would find strength and can boost its performance as well. In accordance with the management, the contribution is for service providers of the wedding photography business where they can have a guideline to improve their service productivity and enhance performance in terms of operations. The suggestion from this study for the wedding photography business is to apply this guideline including building connections with other wedding vendors, providing excellent customer service, improving skills, creating unique styles, and offering packages. This guideline can be proposed and adapted to each wedding photography business in order to attract more customers and increase the number of couples who used their service or can decrease the operating costs and also gain higher profit.

Suggestions for Further Study

1. The service provider perspective is the main topic of this study. The following study should concentrate on consumers or couples to determine how they perceived the service.

2. The variables can be adjusted in another study to obtain the other aspect of service productivity.

3. The qualitative approach should be used for further studies to acquire findings from other aspects and to be more comprehensive.

Acknowledgment

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