

The Application of Technology Devices in Commissary Catering Kitchen Establishments

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Abstract: Technology is undeniably very important in food service industry. This study empirically investigated the application of technology in Malaysia commissary catering establishments and how it implicated the productivity. Using semi-structured interviews with managers and questionnaire survey with employees of four commissary catering establishments, some meaningful insights on the topic of interest were obtained. The application of technology had brought vast benefits to commissary establishments. Technology used not only increased the speed, volume, quality and cleanliness but also helped in smooth running of the food production and most importantly boosted the productivity of the commissary catering establishment. These findings produced significant indicators not only to those who are already in commissary catering but also to those individuals or companies who intent to venture into food service businesses.

Key words: Commissary catering • Technology • Kitchen establishment • Productivity • Foodservice industry

INTRODUCTION

The number of commercial foodservice outlets have grown up nearly four percent in 2008, to reach over 23, 046 from 22, 266 units in 2007 [1]. Key segments of the food commercial categories are eating and drinking establishments and one of them despite being less popular during 80's but now to be one of the fastest growing food service segments in Malaysia is commissary food service system [2]. The commissary foodservice system, also known as central kitchen, central food production, food factory or centralizes food production is a system whereby food is prepared and cooked in the central kitchen and transported to satellites receiving kitchens where it is served to the customers [3].

The increase in customers demand and volumes of production has led many commissary food establishments in Malaysia adopting technologies in their plants. The technology involved is related to storing, serving, preparation techniques, cooking equipments and logistics (distribution). Blast chillers, freezers, steam jacketed kettle, tilting skillets and many others are examples of the equipments that involve technological advancement in the commissary operation. Technologies are used in a wide array of commissary establishments such as airline,

train, buses, hospital and healthcare foodservice. In airline industry, for instance, there is a central production facility near to the airport where the food is prepared, pre-plated, sealed and either chilled or frozen. The pre-plated meals are placed in closed carts and the trays with the cold items are assembled and placed in closed carts. These carts are transported by truck to the airplane (satellite), where the food is placed in the galley. In addition, many fast food restaurants and casual restaurants including catering establishments are using commissary foodservice system in their operation.

Commissary Catering Food Service: There were various studies relating to commissary catering foodservice [4-10]. Crows looks into the food quality produced by the commissary kitchen in the prison. Food quality is obviously a critical factor in the prison and this element as an "essential core service" for the wellbeing of prisoners. In addressing the meal selection in catering outlets from the perspective caterer and the consumer, Eves, *et al.* [6] reveal that despite there were several nutritional implications of food choices from the catering outlets however a large proportion of caterers were ill-equipped to provide healthy meal options to the customers. Another researcher posits that training and education in contract catering management are very important and

there is a need to sustain interest in training to gain maximum output in contract catering organizations [7].

On the importance of food safety in commissary catering business, Kivela, *et al.* [8] assess the expectations and perceptions of the school organizations (caterer's clients), catering managers and catering employees. They suggest that providing training and active on-the-job reinforcement for safe food handling and production methods are the pro active actions to improve the food safety in school catering. In addition, plant and equipments need a proper handling, transport and storage of food materials. Rodgers [9], on the other hand, posits that there is a limited choice of suitable preservation methods that can be applied to manage and improving the food safety design in commissary catering. In looking at the role of food hygiene training in a strategy to manage the food safety in catering industry, Eves and Seaman [10] assert that catering management should invest in giving training on hygiene knowledge to improve the food safety management. In addition, the manager should motivate their employees to follow more effective the hygiene standards. Guillard [11] note that nutrient based quality control is needed in public catering units for the nutritional quality in the catered food.

Technology in Foodservice Industry: Technology in the foodservice industry starts to receive significant attention in the recent decade [12-13]. Liddle [12] note some thought that the tools and technology in the restaurant industry is limited to basic appliances and tools without realising some complex equipments used. Grimes [13] claim that some advanced features have integrated on the kitchen appliances such as timers and digital temperature gauges, reducing or eliminating the need for separate timers or inaccurate temperature dials. Liddle, [12] reported many restaurants and food service operations rapidly adopted the point-of-sale technologies or POS system to increase the overall convenience of the dining experience and technologies improving the restaurant operation as well increased the repeat business [14]. Rodgers [15] alleged that when technology in food service is concerned people always refer it to information technology. Furthermore, Rodgers [15] suggests that investigations need to be undertaken particularly related to kitchen as this department is considered important and contribute to sale and profit to the food service and restaurant business.

Benner and Veloso [16] contended that the implementation of technology in commissary food service establishments closely associated with the increased in productivity, quality, safety as well as hygiene and cleanliness. Rodgers [15] further noted that

the application of technological cooking equipments and preparation techniques tremendously increased the food production. Wilson, *et al.* [7] on the other hand posited that highly technological in logistic need to be applied when food to be transported. Technologies are also believed to have reduced the operation and labour cost despite its requiring high cost of the initial investment and maintenance [17]. Chow, *et al.* [18] argued that the aim of commissary catering systems developed over recent years not only reducing the operational costs but to overcome the problems of skilled labour shortages. Technology applications in the hotels and fast food restaurants have given significant impacts to their financial performance [19]. Nevertheless, to what extent that the application of technology improves the commissary catering establishments' productivity has not been widely research. There is no reported of such study related to Malaysia. In searching the answers, this study empirically investigated application of technology in commissary catering establishments and its implication to the productivity.

MATERIALS AND METHODS

Instrument Development: A qualitative approach through interview and questionnaire survey was used in this study and the samples were among the managers of catering commissary establishments. Based on information, gathered, there were around 20 catering commissary establishments in the city of Shah Alam. This city is chosen as contextual setting due to the easy access to the researcher. Kumar [20] argued that the semi-structured interview provides the flexibility for the researcher to probe beyond the provided answer. In relation to that, eight semi-structured questions addressing the objectives of the study were developed. All semi-structured questions were presented in Table 1.

As a validation to the manager's point of view, a quantitative survey questionnaire was employed to the employees. The questionnaire is divided into three major sections. Each section contained questions addressing the two different elements namely the benefits of technology application in the catering commissary, production and financial performance.

Six items used in section A to assess the catering commissary employees' feelings towards the benefits technology application in their establishment. Section (B) with four items was designed to measure the relationship between the uses of technology and the production in commissary establishments. The respondents feeling were measured using five point Likert scale ranging from 1= Strongly Disagree to 5 = Strongly Agree.

Table 1: Semi-structured Questions

No.	Items
1	What are the reasons of applying technology in your establishment?
2.	Do you think technology is a necessity in this establishment?
3.	Do you think technology indirectly helps increase the sales volume in this establishment?
4.	Do you think the uses of technology indirectly help improve the profit in this establishment?
5.	How far the uses of technology in your kitchen?
6.	Does your sales volume increase by using technology?
7.	Does the use of technology increase the production volume?
8.	How far do you think uses of technology increases the overall sales performance and profit in your establishment?

Data Collection Process: All managers or owners of 20 identified commissary catering establishments were initially contacted via telephone and email in getting permission for the researcher to conduct the interview. Out of 20 establishments, only 4 establishments agreed to participate with the rest refused to commit themselves. The dates, time for the interviews were then arranged based on the convenience of the managers or owners. With mutual time for both parties, the interview session with the all respective managers were undertaken. Prior to interview session, the respective managers or owners were briefed and informed on the anonymity and confidentiality. At the same time, the questionnaires were also distributed to the respective employees through the managers' assistance. In absent of any obvious problems, the interviews and surveys were successfully undertaken within five days with the full cooperation from the managers or owners. All interview were lasted between thirty minutes to one hour with all sessions were tape-recorded. Information gathered was then transcribed using pen portrait analysis. This is the part where all the words, expressions, pausing were stated in the text form clearly and definitely like the 'voice' form one. The process was done properly to prevent missing of the important ideas. For the employees 40 questionnaires were collected. The questionnaires data are keyed in the SPSS version 16.0.

RESULT AND DISCUSSION

Establishments' Profiles: With the nature of catering business, all four establishments have been in the business for more than 10 years with staff capacity from

10 to 26. All establishments cater for various outlets, events and banqueting like weddings, conferences, social functions, meetings and many more. The implementation of technology in these four commissaries catering establishment are ranging from 30 percent to 70 percents depending on the number of years in operation. All establishments employed professionals' chefs to overlook of the overall operation. The profiles of all restaurants are simplified and presented in Table 2.

Reasons of Applying Technology: The first question asked related to the reasons of applying technology. All four managers/ owner of commissaries catering have given almost identical answers. The main reasons main reasons given are to cope with the increase of the demand from the customers. Technologies also helped to increase the production volume of food and reduced preparation timer as well as stress among the production staffs.

Manager of Establishment B Verbatimly Said That: *"Highly demand from customers, technology applied in our production helps us to cope with it. We believe technology is the best option since we cater more than 5,000 packs at one time. Staffs also are more efficient in producing food for our clients. They are happy with the technology as is able to produce high volume production and reduce time usage"*

Production manager of Establishment C on the other hand stated that the standardization of the food produced is also the main reason for company in applying the technology. He said that, *"We used all sort of technology in our kitchen ranging from combination oven, tilting skillet pan, up to serving and logistic equipments.*

Table 2: Commissary Catering Establishments' Profiles

Establishment	Year of established	No. of employees	Nature of Business	Percentage of Application of Technology
A	2003	10	Small-sized Catering	30%
B	1984	26	Medium-sized Catering	70%
C	2001	17	Franchised catering	50%
D	1994	13	Outlets-chained catering	60%

Using these equipments helped to standardize our product as we produced them in bulk production”.

Similar notion was also given manager of Establishment C and D which agreed that the application of technology is for the standardization of the quality of products produced. They strongly believed that the standardization will lead to customers’ satisfaction and in turn encourage them to use their services.

With regard to the necessity of the technology, all managers of the establishments having the same opinion that the technology is very important in their establishments as it helped the daily routine production running smoothly. Despite this they also agreed that the application of technology in all facets of the establishments is costly. Therefore, their willingness to invest on the technology is depending on their financial performance and needs. Some of the answers given were as follows:

“We will invest on technology if our financial permit us to do that as it benefits us in many ways”.

“If we really need and without it our production becomes slow, we surely get the technological equipments”.

“If we know that our sales will increase with the use of technology, we will be surely find ways to get it”.

Technology and Production: Four questions were probed to see the relevancy between the use of technology and the food production. Such questions were:

- Does the use of technology increase the volume of production?
- Does the use of technology increase the speed of production?
- Does the use of technology increase the quality of production?
- Does the use of technology increase the cleanliness of production?

In response to the first question in this section, most managers sharing the same views that volume of the food production has increased with technological equipments particularly when the equipments applied suit to the requirement of the production. They revealed that there were vast differences before and after applying some of the technological equipments. Manager of Establishment B for instance said that:

“Yes, technology has increased our volume of food production. Before our food production volume are only confined on certain quantity. However, after using few

technological equipments the food production was tremendously increased and in fact, much more efficient”.

On the second questions, majority of managers again admitted that technologies speed up the food production processes. Manager of establishment C stated that their production speed has increased two fold after the application of technology especially on the preparation equipments as well as other gadgets. He contended that;

“We have ‘Rendang tok’ in our menu. This popular dish is very complicated to prepare as it consumes a lot of time. Before using the technological equipments, it took 5-6 hours to cook. However, with steam jacketed kettle, it just takes us around 2-3 hours. In addition, our kitchen staff not really tired than before”.

The manager of establishment D however argued that the speed of production is slower when the technological equipments broke down. Literally he noted that;

“We experienced slow in the production when the equipments broke down. This is really disturbing the momentum of the production. Nevertheless, it seldom happened as we always maintain our technological equipments”.

The relationship between the uses of technology and quality of food is another aspect concerned. All respective managers having identical views that the quality of food production significantly increased with the uses of technological devices since the output of the products meeting the required standard or meeting the customers need. The manager of Establishment B for instance claimed that:

“No doubt technologies not only speed up the production but also maintained the quality of the food products. This is evidence when our customers happy and we seldom received complaint from them than before”.

In addition, the manager of establishment C stated that technological equipments apply in his establishment helps to standardize the quality of food products. In fact, they deem to maintain the standard quality of the food by optimize the usage of technology in their operation.

The last question in this section is assessing the relationship between the application of technology in commissary kitchen and the cleanliness of food production. All managers positively viewed that the application of technology in their operations have improved the cleanliness of the food production as it directly reduce the human contact compared to the uses of manual equipments which required much employees’ attention. Quoted from manager of Establishment B;

“Talking about cleanliness, I’m sure that using technological equipments in our kitchen has increased the hygiene of the working environment compared to the use of manual equipment. In preparation of ‘sambal belacan’ for instance the traditional method would require longer time if it is prepared in bulk. However, with the use of ‘Robot Coupe’ (technological equipment) it become much easier and most importantly it reduce messiness”.

He Further Added That: *“In this food industry, the challenge is there. Dealing with food means you dealing with many possibilities such as the quality of food, cleanliness and most essential issue is food poisoning. As a caterer, our image is very important. Therefore, the cleanliness besides other things is one of our main concerns. So, we don’t want to take a risk!”.*

For that reason, it can be concluded that the application of technology enhancing level of cleanliness of the food production. Indirectly it also helps the caterers to deal with many possibilities in the industry.

To this end, some useful insights relating to the topic interest have been achieved. However, the answers obtained are only from the managers’ point of view. Therefore, to strengthen and validate the managers’ answer a small quantitative survey to the employee of each the commissary kitchen is analysed.

Quantitative Analysis: Before proceeding on the analysis, the data were tested for reliability using the Cronbach alpha procedure. The two sections in questionnaire were calculated separately and produced coefficient alpha value at 0.61 for section A and 0.67 for section B. Further,

despite all four are catering establishments, it was assumed that employees who are working with establishment A may have different perceptions of technology used from those who in establishment B, C and D or vice versa. With that, a comparative analysis between employees of the catering establishments were initially undertaken to determine the homogeneity of the data obtained. The results of One-way ANOVA and post-hoc (Scheffe test) showed that no statistical significant differences appeared on any of the 14 items with a significance level of $p > 0.05$, $p > 0.01$ and $p > 0.001$. In other words, there were no fundamental underlying differences between perceptions of the respondents. Therefore, regardless establishment the employees’ perceptions were identical. With that, all the data have been treated as homogeneous for further analyses.

Benefits of Using Technology Devices in the Kitchen:

The descriptive statistic looking at the mean scores of the all items related the benefits of using technology in the kitchen. The findings are presented in Table 3.

Looking at the table, majority of employees expressed their agreement in all items in this section. As such, they believed that the adoption of technology devices in the kitchen eases in daily routine work ($M=3.66$), technology is user friendly ($M=3.60$), help in reaching the production target ($M=3.82$) and ease in terms of efficiency ($M=3.60$). In addition, majority of employees’ strongly agree that technology used helps in maintaining the quality of products ($M=3.96$) and keep the production flow smoothly ($M=3.70$). The employees’ feelings fit well with the answer given by most of the managers in the interview sessions.

Table 3: Mean scores rating on given Benefits of Using Technology Devices in the Kitchen

Item	n	Mean	S.D
Technology in the kitchen eases in daily routine.	40	3.66	.519
Technology used in the kitchen is user friendly.	40	3.60	.495
Technology in the kitchen can help in reaching the production target.	40	3.82	.388
Technology in the kitchen eases in terms of efficiency.	40	3.60	.495
Technology in the kitchen helps in maintaining the quality of products.	40	3.96	.638
Technology in the kitchen helps the production flow smoothly.	40	3.70	.614

Table 4: Mean scores rating given on the Impact Technology to the Production

Item	n	Mean	S.D
The use of technology in the kitchen increases the speed of production.	40	3.66	.557
The use of technology in the kitchen increases the volume of production.	40	3.68	.513
The use of technology in the kitchen increases the quality of production.	40	3.82	.661
The use of technology in the kitchen increases the cleanliness of production.	40	3.60	.495

Technology and Production: Result of the section B analysis is tabulated in Table 4. The magnitude of the mean scores above 3.50 indicates that employees were agreeing with the all items probed in this section. They believe that the use of technology in the kitchen increases the speed of production (M=3.66), the volume of production (M=3.68) and the cleanliness of production (M=3.60). It is interesting to note that the quality of production seems to be the highest mean score (M= 3.83) given by the employees.

What could be said from above result is that besides increasing the speed, volume, cleanliness of the production, the application of technology enhances the quality of product produce in the commissary kitchen. Again, this result directly supports the managers' views. In sum, the overall results of these sections analysis strengthen the managers' point of views in the qualitative section.

CONCLUSION

Technology without doubts of giving huge benefits not only to the large food establishment but also to little one like commissary catering operations. Those individuals or new establishments who are interested in endeavouring into the commissary catering businesses need to consider to at least getting some of the useful technological equipments or machineries in their plants. However, as it involve with high cost, a thorough or careful planning should be undertaken by the owner or a responsible manager before any technological the equipments could be purchased. This could be done through a rigorous investigation and cross referencing with those companies who already used such equipments. In addition, the manager should also check the needs of the intent purchase equipments and cross checking with company financial performance. By looking at these criteria, it will directly avoid miss utilized of the company money and in turn evade the equipments becoming a white elephant to the establishments.

Technology not only improves the overall operations but increases revenue, minimizes the labour costs and enhances the competitive advantage. This positive indication provides useful guidelines not only to the present catering commissary establishments but also to those individuals who intent to venture into this business in the near future. This in particular refers to Malaysian caterers whereby commissary catering business is considered just booming in Malaysia as compared to the developed countries. Therefore, if commissary catering

establishment wants to move ahead or successful in the long run and be more competitive in the food service industry the owners or the managers and those who are intent to venture in this so called small business should not hesitate to invest of getting some of the advance technological equipments or gadgets in their operation. Although, it would incur some cost at the beginning or at initial stage but with a careful planning it will definitely fruiting at the end of the day or contribute the profit to the company.

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