Purpose: The aim of this research is to manage the customer waiting problem in Taiwanese fast food restaurants through reengineering of the APP ordering process.

Design/methodology/approach: This research uses a literature review to identify different approaches of reengineering and use them to improve the APP ordering process used in Taiwanese fast food restaurants.

Findings: This research has identified six approaches of reengineering, which can be applied to improve the APP ordering process in fast food restaurants. The application of the reengineering approaches, in the APP ordering process in Taiwanese fast food restaurants, generated four suggestions of how to improve the original APP ordering process.

Research limitations/implications: The subsequent research can apply other research methods to improve the reliability and validity.

Practical implications: The application of reengineering approaches to improve the APP ordering process in fast food restaurants can be used in other country’s food industry and be adapted to other industries as well. The research could also provide a basis for companies that want to implement the APP ordering system.

Originality/value: This research clarifies the customer waiting problem in the APP ordering process in Taiwanese fast food restaurants and applies reengineering approaches to improve the original APP ordering process.

Keyword: Customer waiting time, Reengineering, APP, fast food.

Paper type: Research paper

INTRODUCTION
When customers like the product or service provided by a fast food restaurant, the problem of customer waiting time occur. This is a critical issue that most fast food restaurant managers need to focus on. This is the reason why this paper addresses the topic of improving waiting
time in Taiwanese fast food restaurants. The first issues to consider in the design of a fast food service organization are what to offer and how to satisfy the customers (Parasuraman, et al., 1991). In the present, fast tempo life-style environment, the use of time has become more and more important to customers (Lai and Lee, 2013). Depending on the diversification of service quality, customers have started to pay attention to, the problem of waiting time. Now, long waiting times usually is a reason why customers feel dissatisfied and complain (Chang et al., 2003). Therefore, improvement of waiting times in fast food restaurants is an important research topic in today’s intense and competitive environment in order to enhance the service quality and to satisfy the customers.

The approaches companies use to communicate with their customers have changed radically since the arrival of the APP. Companies can use APPs to realize the demand from customers and they can allow customers to use APPs to buy online. In addition, companies can use APPs to share marketing information and for other branding purposes. In order to tackle the problem with long customer waiting times in individual restaurant sites, many restaurant chains have launched own APP ordering services to allow the customers to order directly online. The advantage of using the APP ordering system is that the meal can be ordered anytime, no matter where the customer is located. In addition, the customer does not need to worry about the clerk forgetting the order by phone or misunderstanding the order. For the restaurants managers, the APP ordering system can scatter crowds effectively, prepare for food material more accurate, and expand the customer base.

McDonald’s, the largest fast food restaurant chain in America, begun to test the APP ordering system in 2011, due to the customers decreased tendency to dine out, and launched it in 2013 (Lutz, 2013). KFC in Britain begun to test the APP ordering system, in the 10 restaurant sites located in London, during 2013 (Kana, 2013). The APP ordering system allows the customers to order before they come to the restaurant site to decrease the waiting time (Williams, 2013). In addition, the fast food restaurant chains Domino's Pizza Hut and Grill Chipotle Mexican have launched APP ordering systems. This shows that different fast food restaurant chains across the world have begun to develop and launch their own APP ordering systems. However, the APP ordering process in one country is not necessarily suitable for another one. For example, the culture, languages, and consumption patterns differ. In addition, Taiwan is a tiny country with short distances between home and work. Therefore, the APP ordering processes used in Taiwan probably are different.

Although customers currently enjoy the convenience of shorter waiting times by using the existing APP ordering systems, the available systems are not completely developed and many of them are still just tests. Most of the available APP ordering systems on the Taiwanese food market, have been developed by the large fast food restaurant chains. If the outcome of using APP ordering system is good for both the customers and the restaurant chains, and when the APP ordering system has become more developed, many small and medium-sized restaurants will follow. Hence, in addition to large fast food restaurant chains, small and medium-sized restaurant owners in the future probably can enhance their competitiveness by developing own APP ordering systems. They can use the APP ordering systems available on the market as reference to reduce the cost of development and testing.

The aim of this research is to manage the customer-waiting problem in Taiwanese fast food restaurants through reengineering of the APP ordering process. This issue has been examined in three subsequent steps. Firstly, a literature review has been conducted to identify various reengineering approaches that can be used to improve the APP ordering process in fast food
restaurants. Secondly, the existing APP ordering systems provided by fast food restaurant chains in Taiwan (such as KFC and MOS) have been tested in order to develop a general APP ordering process. Finally, the identified reengineering approaches have been applied on the developed APP ordering process to propose improvements of the process.

LITERATURE REVIEW
This section describes a background of APPs and the usage of them. In addition, different reengineering approaches, relevant for this study, are described. The two issues are described in turn below.

APP
The way companies communicate with its customers has changed drastically since the APP technology was introduced. The huge increase in APP usage has resulted in that companies have stated to use APPs to provide marketing services and for other branding purposes. For example, the Italian fashion company, Gucci, has their own APP in the iPhone APP store to get customers to look (browse) at the latest news and products. In addition, people use APPs to interact and connect with each other. This implies that many companies are interested in entering the APP market (Cortimiglia et al., 2011).

In the beginning, only one platform existed where APPs could be downloaded and used. This platform was provided by Apple and allowed people to download APPs from Apple’s APP store to their iPhones and iPods. Today, several other platforms also exist where APPs can be downloaded. For example, Google’s Android market, Blackberry’s APP world, Nokia’s Ovi store, Microsoft’s Windows market (Ayalew, 2011).

There is currently no standard for the classification of APPs in the different downloading platforms. The classification of the APPs is instead different in each downloading platform. Some common classifications of the APPs include transaction, communication, information tool, entertainment, and learning (Hsu, 2013).

The APP usage has increased a lot in the recent years. The total number of downloads from 2008 to 2011 is ten billion (Yang, 2009; Chen, 2012). The large amount of downloads signifies that the APP has been accepted and is used by many people (Yang, 2009). In fact, most of the time people spend on their smart phones involves the use of APPs, very little time is spent on Internet or other phone related things. This phenomenon shows that people can get information and service without using a browser, but with an APP. It also shows the people Internet habits have been affected by the APP and the importance of the APP has also gradually increased.

Reengineering approaches
Hammer & Champy (2006) argues that Business Process Reengineering (BPR) is a customer demand-oriented method to transform an organization in order to maintain flexibility and to gain competitiveness. The objective is to improve the cost of quality, service and operating speed by updating the entire working process and using approaches such as brainstorming to think and change continuously (Hammer & Champy, 2006). According to King & Teo (1996), organizational resources and IT technical support are needed to transform business processes.
<table>
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<th>Approach</th>
<th>Explanation from food ordering perspective</th>
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<td>Combine</td>
<td>Merge different works into one and deal with it simultaneously</td>
<td>Cheng et al. (2000)</td>
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<td>Isolate</td>
<td>Isolate the work, which has a specific working process in order to deal with it more quickly</td>
<td>Cheng et al. (2000)</td>
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<tr>
<td>Strengthen connections</td>
<td>Strengthen the connection between customers and restaurant managers</td>
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<td>Integrated activities</td>
<td>Share and combine each database to provide customers with information in a short time</td>
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<td>Benchmark targeting method</td>
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<td>Rearrange the activities in original ordering process to develop a new and more efficient ordering process</td>
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Several reengineering approaches (or methods) have been proposed in the literature. Cheng et al. (2000) describe a Japanese accounting firm that used three methods (“combine”, “isolate”, and “strengthen connections”) to transform the traditional business processes. Geng et al. (2009) describe seven methods for improving the process of public service organizations. One of the seven methods, relevant in this study, is “integrated activities”. The method “integrated activities” is a platform based on information sharing. Information sharing represents a revolutionary change for traditional business processes and concerns customers and suppliers as well as the internal business processes. The method implies that data is collected and stored in a database to allow continuous information to be shared with key customers and suppliers and between business processes. Klein (1993) describes the so-called benchmark targeting method. This method implies that the company compares itself with the best companies engaged in the same activities and tries to find solutions on how to improve the weak point of the process. Cheng et al. (2009) applied business process reengineering to develop a new method of transforming the management in a company. This new method is called the benchmark targeting method. For example, one of the involved companies chose the best company in its industry, which had implemented the same activities, compared and learned the better parts of their process and used this knowledge to improve their own process. Furthermore, Gao et al. (2007) show that if we take the parts of the original process in an organization and rearrange them, we can enhance efficiency. Table 1 provides a summary of the six reengineering approaches discussed above. It is also explained in what way they are relevant in the current study.

**THE APP ORDERING PROCESS**

This section describes a general APP ordering process used in Taiwanese fast food restaurant chains. The process has been formed, by using the APP ordering systems provided by various fast food restaurant chains in Taiwan (such as KFC and MOS). The investigation showed that the APP ordering system in these fast food restaurant chains usually included four functions: Order, Information, Record, and Other sites information. The customer accesses the four functions on the APP ordering system’s front page. To make an order, the customer selects the order function, and enters information about what dishes to have, where to have the meal, how to have the meal, when to have the meal, as well as name and phone number. After that, the customer can come to the selected restaurant site at the specified time to have the meal. In general, the APP ordering process can be divided into four steps, which are described in more detail below.
Step 1: Enter the APP front page, member register, and login.
When the customer enters the APP ordering system’s front page, the available core functions (usually order, information, record, and other sites information) can be accessed. Some APP ordering systems will request the customer to register and login, in order to be able to make an order. The order function provides the customer with the ordering service and information about the menu (dishes with picture and price), locations to have the meal, and ways to have the meal (pick up at drive-thru window or dine at the restaurant). The information function provides the customer with the latest news about the fast food restaurant chain, for example, news about product listing, promotion, and advertisements. The record function shows all the meal orders, which the customer has made in the past, and all the meal orders with processing status. The other sites information function provides the customer with a map to show the location of other restaurant sites in the chain.

Step 2: Make an order
After the customer has studied the menu and decided what dishes to order, the customer continues by pushing on the order button. The system will request the customer to choose what dishes to have and quantity, where to have the meal (restaurant site), how to have the meal (pick up at drive-thru window or dine at the restaurant), when to have the meal (time), and how to pay for the meal (e.g., gift, cash, or points).

Step 3: Confirm the order and submit
After the customer has entered all the order information, the next step is to confirm the order. The customer can see pictures and explanation of all selected dishes and control the order visually. In addition, the customer can choose other services based on personal preferences. For instance, customers can get a discount if they prepare their own cups, choose different sauces, and replace the meals ingredients. After the customer has finished the conformation, the customer continues by pushing on the submit button.

Step 4: Enter personal information and take the meals
After the customer has submitted the order, the APP ordering system will request the customer to enter personal information like name and phone number, in order to ensure that the customer can receive the dishes accurately. The system will give the customer an order number and information concerning how long the customer can have the meal. In addition, the APP ordering system asks whether the customer would like to save this order in the record. In case, the customer would like to order the same combination of dishes another time without completing all the steps again.

IMPROVEMENTS OF THE APP ORDERING PROCESS
This section describes improvements of the general APP ordering process used in Taiwanese fast food restaurant chains. The improvements have been identified through applying the reengineering approaches found in the literature review on the APP ordering process. The analysis resulted in four suggested improvements, which are described in more detail below.

1. Add quick order process
Sometimes the customer is in a hurry and needs to be able to order quickly. This could be taken care of by adding a quick order process. Two functions could be added in the APP ordering system to provide two alternative quick order processes. The first function is an a la carte menu with the main dishes. The a la carte menu should only show the main meals (e.g.,
a hamburger without the drink and french fries) and exclude catering and special meals with discounts. This will decrease the total ordering time for the customer. The second function is combo meals. The combo meals represent fixed combinations of meals that the customer can choose. This will also decrease the total ordering time for the customer.

2. Add dishes waiting/preparing time
When the customer decides what to order it could be helpful to know the individual waiting time of the different dishes. This could be taken care of by adding different colors to dishes (i.e., picture or symbols) in the APP ordering system. For example, dishes with green symbols can be prepared soon, dishes with orange symbols will take some time to prepare, and dishes with red symbols will take a long time to prepare. In this way, the customers will know how long time they need to wait before it is possible to have the meal and may choose dishes based on this information.

3. Add meal suggestion function
Many customers have special demands when it comes to food. This could be taken care of by adding a function in the APP ordering system, which recommends different dishes, based on the customer’s individual requirements. For example, customers that want to control their health or are dieting could be recommended dishes with fewer calories. In addition customers with allergies could be recommended dishes without certain ingredients.

4. Add map based location selection
The APP ordering system in fast food restaurants in Taiwan first allow the customer to select a restaurant site based on written information about the location. After a restaurant site has been selected, the location is shown on the map. The customer has to make an order on one page and view the map on another page. The APP ordering system from an enterprise in Japan instead shows the customer’s relative position to restaurant sites on a map. The customer can also select a restaurant site directly on the map. This allows the customers to know the best restaurant location, even if they have no knowledge of available restaurant sites. The APP ordering system in Taiwan is less convenient and could be improved by adding the functions of seeing all restaurant sites on a map and the customer’s relative position to them and the function of selecting restaurant site directly on the map. The customer should also be able to work on a single page. This will also decrease the total ordering time for the customer.

CONCLUSION
This paper describes a general APP ordering process used in Taiwanese fast food restaurant chains. The process has been developed, by using the APP ordering systems provided by different fast food restaurant chains in Taiwan. In addition, this paper describes four ways to improve the APP ordering process. The improvements have been identified through applying reengineering approaches found in the literature on the APP ordering process. The suggested improvements include: (1) Add quick order process, (2), Add dishes waiting/preparing time, (3) Add meal suggestion function, and (4) Add map based restaurant location selection.

The customer will sometimes forget to pick-up the ordered meal due to some events. In order to avoid these situations, the APP ordering system can provide a reminder function (e.g., the customer’s cellphone could ring, shake, blink, or receive a message from the APP ordering system) to remind the customer to pick-up the ordered meal. If the customer activate the reminder function, the APP ordering system will remind the customer in any of the above-
mentioned manners, when the meal order is ready. This implies that the customer will have control of the status of the meal order, without regularly opening the cellphone and checking the APP ordering system. This provides a lot of convenience for the customer.

In general, the APP ordering system is quite new and not fully developed. Thus, opportunities to improve the APP ordering system should be very interesting for the fast food restaurants currently using this system. The food restaurants that are not using the APP ordering system should instead be interested in how the system could be used in their business and what gains would be created. It is not an easy task to implement an APP ordering system. The restaurant must consider the normal organization, processes, and operation concurrently. For instance, the meal orders probably will increase if the APP ordering system is provided. Thus, it is important to consider if the kitchen will we able to deliver on time or if each ordering process should have an own production process. This shows that the food industry needs to think comprehensively when they provide new services in order to enhance competitiveness.

REFERENCES


