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Transaction processing systems**

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Osaka Flower Coffee Shop: Transaction Processing Systems¹

The time to make decision is now. However, I am still not sure if I should implement TPS into our business; would it successfully put a stop to the problem I have? Or would it just be a waste of money?

In June 2012, Duy Tran, the owner of Osaka Flower Coffee shop, had to make a decision on an information system that hopefully would help him in managing the shop more efficiently, preventing the cashier from stealing money and the staff from slacking off and causing serious deficits. Unless Duy found a solution to this once and for all, the Osaka Flower Coffee shop would have to suffer losses or even close down in the future.

Making the decision was easier said than done. The plan had short-term and long-term issues to be considered. Duy had to decide on specific transaction processing system (TPS) software to be implemented into the business along with any required hardware. In short term, this could help Duy expand his business online and give him a clearer picture of business sales, as well as the average number of transactions and customers per day. In long term it would help Duy put a stop permanently to staff theft because this system would show exactly how many transactions had occurred and store all sales data in a database. In the case of hardware or software failure, completed transactions would be stored while unfinished ones would be rolled back, waiting for the system to come online again.

Over the long-term, there was the question how Osaka Flower Coffee shop should grow the business once the system had been implemented—and how Duy should implement the system in order to maximize its benefits. It might be easy to implement the standard software in order to deal with the current problems, but in the long run the software would need to be flexible enough to adapt to whatever business patterns might arise when Duy decided to change the way he did business. The software was too expensive if it was limited to solving some small problems; it has to, at the same time, support the business in whatever direction it would be heading.

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Transaction Processing Systems

A transaction process system (TPS) is an information processing system that handles business transactions involving the collection, modification, and retrieval of all transaction data. TPS is also known as transaction processing or real-time processing. A more complete definition is as follows:

A transaction process system and transaction processing are often contrasted with a batch process system and batch processing, where many requests are executed all at one time. The former requires the interaction of a user whereas batch processing does not require a user to be present. Also, in batch processing the results of each transaction are not immediately available. And, there is a delay while the many requests are being organized, stored and eventually executed. In transaction processing there is no delay and the results of each transaction are immediately available. During the delay time for batch processing, errors can occur. By contrast, and although errors can occur in transaction processing, they are infrequent and tolerated, but do not warrant shutting down the entire system. (Janssen, 2012)

Transaction Processing System Capabilities

The biggest benefit (and also the biggest weakness) of a TPS is its ability to process several thousand transactions at once. The system holds all the necessary information in its database—which can include sensitive information such as customers' private bank numbers and addresses—as well as process the order and print the materials, such as labels and receipts, necessary to ship an order out to the customers. Such systems are very powerful, but due to their extensive capabilities, it can be difficult for small companies or businesses to utilize the system's full functionality. Where a company is able to utilize the broad set of TPS capabilities, it can serve to automate nearly all the company's transaction records.

Because a TPS often holds a large amount of private information in its database, it is a tempting target for security breaches. Companies that want to implement such systems need to invest in security at the same time.

A TPS may support a web-based front end that can be accessed by potential and existing customers. Such a system can open up a brand new market for a business; it allows people from around the world to purchase the business's goods or services.

TPS Suites and Vendors

A TPS could come in many forms, with many different options, prices, and vendors. For example, some run on normal operation systems, such as MS-Windows or Mac OSX. Others are integrated with a cash register. There is also the very large gap in price between different TPS alternatives. That makes it very confusing and challenging to choose a suitable one that both matches business needs and comes with a reasonable price-tag. This is particularly the case when the purchaser is not an IT expert.

A number of factors need to be considered when choosing a TPS. These include:

- The price
- The main infrastructure that the TPS is built upon, ranging from small special purpose machines (such as cash registers) to IBM z series mainframes
- The operating system that the TPS requires, ranging from mainframe systems such as OS/360, DOS/360, VAX/VMS, PDP-10, and TOPS-10 systems to simple PC systems.
- Their working capacity, in metrics such as maximum transaction rate
- Their flexibility. For example, could they be customized when installed in a particular business?

The Coffee Industry in Vietnam

The coffee industry is one of the biggest industries in the world, with an estimated export volume of 20 billion dollars. The estimated value of the coffee industry worldwide is approximately 100 billion dollar, only second to crude oil, making it the second most sought after product in the world, topping gold, natural gas, sugar and corn (Goldschien, 2011). This global demand had catapulted the coffee shop to the top of restaurant business in term of growth rate, approximately 7% per year (Coffee-statistic.com, 2012).

The Local Coffee Industry

Vietnam had been introduced to the coffee industry in the late 19th Century by French colonists and had, since then, become a major global producer and exporter of coffee, second only to Brazil (Scofield, n.d.). Inexpensive robusta coffee was the best known of Vietnam's coffee outputs. It had been noted, however, that the country frequently paid more attention to quantity than to quality. Thus, Vietnam had frequently been blamed for flooding the world market with low-quality products (Vietnamnet, 2013; Scofield, n.d.). The government had responded by encouraging higher quality Arabica beans. In addition, Weasel Coffee (Ca phe chon) was a unique domestic offering that was expected to help rebuild the image of Vietnamese coffee with its authenticity and genuine flavor, despite being highly priced (The Economist, 2012).

At the time of the case, the world's major coffee retailers were Gloria Jeans, Starbucks, Dunkin' Donuts, Caribou, Coffee Beans and Tea Leafs, NYDC, with Starbucks leading the competition. In Vietnam, however, the major players were local, with Trung Nguyen coffee and Highlands coffee ranking 1st and 2nd in the market respectively. Some other local producers included Hung Phat Company, Vietcoffee, and Vinacafe. In addition to being Vietnam's biggest coffee house, Trung Nguyen was one of the country's biggest independent exporters of rosbuta beans (Reuters, 2012). The Trung Nguyen Coffee name was literally ubiquitous in Vietnam, with each coffee house having its own style reflective of the local preference, as the brand has established itself as a mass market brand (Dobson, Modi, Perez & Phan, 2007). Trung Nguyen also had made attempts to acquire new markets, specifically the United States (Bloomberg, 2013). That move appeared to be a response to the challenge posed by Starbucks, who entered the Vietnam market in February 2013, gaining enormous press and public attention (CNN Travel, 2013). With the rising living standards and competition from foreign powerhouses such as Starbucks, Vietnamese coffee retailers such as Osaka Flower needed to be strategic in acquiring new customers and making them return.

Market and Customers Behavior

Vietnam was one of the biggest per-capita coffee markets in the world, with the amount of coffee consumed increasing by 65% from 2008 to 2011 (BBC News, 2012). Coffee shops had sprung up on almost every street corner of Ho Chi Minh City and this proliferation of shops was considered a unique feature of Vietnam. The French inspired the country's coffee industry, with 2 local brands dominating the market along with small coffee shops owned mostly by the local families (Ives, 2013). The 2 local brands that have the biggest market shares were Highland coffee and Trung Nguyen coffee. Trung Nguyen coffee had virtually defined the coffee market in Vietnam; they were the biggest chain of coffee houses in the country (Reuters, 2012).

Duy Tran

Duy Tran, whose full name was Tran Phuc Duy, was born on October 10th, 1980. At the age of 17, he had opened his own business and had a shop that imported and sold motorbike spare parts. After a year of business, he chose to close it down in order to focus on his studies, graduating from Foreign Trade University. After graduation, Duy began his career as a research assistant for IPSOS, a French company. Duy could not hide his ambition to open his own business, however, slowly preparing himself with everything that he needed.

Osaka Flower Coffee Shop

An artist and architect named Hai first opened the Osaka Flower Coffee shop, located in Ho Chi Minh City, in 2009. It was originally named Song Me. It began as a prosperous business, making considerable profit, but after 2 years of operations, business began to decline largely due to the inattention of the owner. To compound the problem, the owner became addicted to gambling during the same time period. Ultimately, he was forced to sell the operation in order to pay his debts. Before the transaction, the business made a profit of approximately \$2500 to \$3500 VND per month. The shop's main customers were mostly young couples, drawn in by the manner in which the former owner decorated the place and the romantic theme that he had picked. Another large customer segment consisted of families who came, mostly on weekend mornings, to have breakfast together. One group of customers that Mr. Hai had never targeted was the office workers of the companies surrounding the area. Sensing an opportunity, Duy bought the coffee shop in late 2011, renovated it, and changed its name to Osaka Flower Coffee.

Ho Chi Minh city is divided into 24 districts, with the center containing districts 1, 3, 4, 5, 6, 7, 8, 10, and Binh Thanh; the rest are consider suburban area. The shop was located in the heart of District 10 in a crowded neighborhood, near one of the busiest streets in District 10. However, it was hard to find one's way to the shop since it was located in a crowded neighborhood. For the people not from around the area, it could easily be overlooked without detailed instruction.

Nearby there were a lot of companies, meaning a correspondingly large number of office workers. These companies and organizations were both private and governmental and included Yan TV Ltd., The People Committee of Ward 12, and the biggest prison in the city.

Product

The main products of Osaka Flower Coffee shop were coffee, beverages, soft drinks, cocktails, food, and office lunches—with the office lunches only being available from Monday to Friday, the working days of most of the organizations and companies in the area.

According to a research conducted by Duy in his coffee shop, the average time a customer spent in there was approximately 1 hour and 40 minutes. Normally, the customers would go to the coffee shop in groups, and they would just sit there and talking, catching up on things with their friends. Customers like this usually spent 2-3 hours in the coffee shops. In other cases, the customers would come alone, usually with their laptop so they could do their work. It's critical for any coffee shop in Vietnam to have Wi-Fi. Coffee shops had become a way of life in Vietnam. Most of the time, Vietnamese prefer to meet at a coffee shop than any other place. Statically, an average Vietnamese drank 0.7 kg of coffee per year (General Statistic Office, 2011).

Operations

Originally, the staff were organized into 2 big shifts and one half shift. The 2 big shifts were from 7 a.m. until 3 p.m.; the other was the night shift from 3 p.m. until 11 p.m. The half shift was from 6 p.m. until 11 p.m. The employees that work the half shift were mostly students who have to study or work somewhere else before they get there. The purpose of the half shift was to reinforce the night shift because the number of customers at night was larger than in the morning. Except for the cashiers who were paid by the hour, the waiter, cook, and bartender are paid by the day. The cashiers work a different shift than the waiter and the bartender, because they are also the shift leader. They have to arrive 1 hour before the normal shift to get everything ready as well as check the time other employees get in. The cashiers get paid 60 cents an hour. The waiters get paid \$4 a day, the same as the bartenders. There are 3 cashiers, 8 long shift waiters, and 2 half shift waiters along with 4 bartenders: 2 for the morning shift and 2 for the night shift.

Competition

There were a large number of competitors for the Osaka Flower Coffee shop in the area. In fact, there were approximately 30 coffee shops in the area, and 2 of them were considered the main competitors of Osaka Flower. Trung Nguyen coffee had 2 locations near Osaka Flower. Highland coffee did not have any shops in the area.

Current Situation

Duy reported that since he took over the coffee shop, he experienced 4-5 months with profit ranging from 10 million VND (roughly \$480 USD) to a maximum of 47 million VND (roughly \$2250 USD). Since the beginning of May in 2012, however, the coffee shop had experienced a sharp decline in profit. At first, Duy thought that it was due to the new staff he had just hired; the original staff that had worked for him since he opened the shop having been fired due to a disagreement regarding working time and wages. Eventually, he ended up replacing his entire new staff with the exception of the cook, the cashiers, and the bartenders. The new hires included a total of 8 waiters for the morning shift, 8 waiters for the night shift, and 4 waiters working only from noon.

Based upon his assumption that the new staff was inexperienced, he had trained them. After the training—which included how to serve customers, how to take orders, the process of recording an order and delivering the order to the proper place—Duy still experienced decline in profits and, upon deeper investigation, was surprised to find out that the volume of customers had not declined at all. Duy therefore suspected that one or both of the cashiers were stealing money because, aside from him, they were the only staff who could access the register. Unfortunately, Duy did not have any hard evidence to implicate either of them and waiting for such proof would be too dangerous for the business. As shown in Exhibit 2, profits were declining precipitously.

Competitive Problems

There were also problems with the competitors, particularly the two Trung Nguyen coffee shops in the vicinity and the coffee shop belonging to the Mien Dong Thao coffee chain. In the past they had not been a big concern but currently, for a number of reasons, they become serious competitors, taking away a significant number of Osaka Flower's customers. This led to Osaka Flower's showing losses for 3 continuous months in 2012.

Customer Problems

Osaka Flower Coffee has several problems with its customers. According to Duy, customers often complained about the booking service. Apparently, the current system couldn't record customers' reservations accurately. There were also cases where wrong orders were delivered to the cashier and kitchen. This added to customers' dissatisfaction, which was quite high.

Internal Problems

At the time of the case, Osaka Flower Coffee was suffering from a net loss of 20 million VND per month. In addition to previously mentioned external factors, this could likely be explained by its weak internal control. Duy stated that he knew the morning-shift cashier had stolen cash from the store for 5 months, but there were no documents, records, or receipts that could be used as evidence to substantiate this accusation. This allowed the cashier to continue his theft, damaging Osaka Flower's profit significantly.

Also as a consequence of weak internal control, its employees were not working efficiently. "They'd been slacking off, not just the employees, but also the supervisor," said Duy. He reported that there were cases where the employees didn't come to work on time, or didn't come to work at all, asking other employees

to clock in for them so that they would still receive full pay at the end of each month. This situation also had a material negative impact on the shop's profits, stated Duy.

Theft

Apparently, Duy encountered problems answering these questions using the current system:

- When did the employees clock in?
- Who really took an order?
- Were customer reward cards being double punched?

With the new software, Duy thought that he could easily solve those problems. He would be able to track who is doing what and when, so he would have more control over the business.

Under the new system, Osaka Flower's employees would clock in using a secure employee time keeping system. Each employee would be able to use a code, swipe card or fingerprint recognition device to clock in and out. This would allow Duy to know when his employees were actually "on the clock" and help eliminate the casual time theft and buddy punching that may have occur with the existing time keeping systems.

With the new system, Duy would also have the advantage of a complete and comprehensive suite of tools for identifying and stopping abuses, giving him peace of mind (hopefully) by eliminating shrinkage and tracking everything. The new system would allow employees to be assigned to cash drawers, allowing them to be held accountable for shortages. It would also enable Duy to track voids for each employee by showing him reports on who was doing what and when, how many discounts had been given, and so forth. With that information, he could better determine if employees were incompetent or stealing. The new system would also provide Duy with inventory control to prevent waste and make accurate orders.

Reducing Routine Time Demands

With the software, Duy expected that he might be able to spend less time on paperwork and more time on managing the store. The point of sale will system would allow him to see reports quickly and accurately, so he could make better decisions. By monitoring and recording all transactions and records and storing them to a database, the system also offered considerable protection in the event of non-human failures such as natural disasters.

After researching a TPS, Duy concluded that TPS software that could aid him in managing Osaka Flower Coffee's operation in a number of ways. For example:

- Reduce pricing mistakes and wrong orders to customers, since the point of sale system sets all pricing. That should insure that the staff quotes an accurate price and that the shop collects on any up sells (additions made to the order after it has originally been taken) that actually take place.
- Reduce problems such as employees stumbling over foods and drinks listed on the menu, incorrectly calling out drinks or food, or just plain goofing-up an order. Since employees could easily see exactly what was in every drink or food order, this would reduce the number of wrong orders and also increase waiter as well as cashier knowledge about the products the shop has. This improve efficiently in ordering would create happier customers as well, since they would now get a consistent message and, more importantly, price.
- Having drink and food orders printed or displayed on a monitor would eliminate handwriting errors and increase order accuracy.

Of course, these capabilities came at a high price. And that was what made the decision so challenging.

The Decision

Despite all of the benefits this new system could bring to the store, Duy was still considering whether to implement the system. The system that best fit his needs would cost \$5370. That sum represented nearly a year's profits (assuming the \$500/month that had originally been Osaka Flower's minimum monthly profit). Naturally, if higher profit levels were assumed, the system seemed like much better deal. But could software alone really solve the problems that he had encountered? Or was the fundamental problem one of increasing local competition. And, if so, would technology really be central to the solution?

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Exhibit 1: Summaries of Major Vendors

| Vendors | Features | Comments |
|---------------------------------------|---|---|
| <u>POSqx</u> | POS restaurant Client and Internet access Cloud Computing infrastructure | Suitable for Osaka Flower coffee since its main targeted customers were small and mid-size restaurant. POSqx was cheap and had a cash register to go along with the software. |
| IBM z/Transaction Processing Facility | Built on TPF 4.1 and run on OS/360 | One of the earliest TPS on the market, it focused on providing high performance and was able to process a large quantity of transactions. |
| IBM Information Management System | Built to run on OS/360 and successors have joint hierarchical database to process extensive transaction | This TPS was highly flexible because it could run on a large number of OS, and the joint database feature had proved to be very important for international businesses |

Source: Compiled from vendor company websites and demonstration evaluations by the case writers.

Exhibit 2: Osaka Flower Coffee Shop Profit Margin in 2012



Source: Osaka Flower, December 2012