Bistro Breakfast Improvement Project

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Scenario

5W1H

What: A freshly cooked breakfast meal that includes both Chinese and western food suitable for everyone.

Who: Anyone who comes to campus, but mainly students and teachers.

When: Mostly before morning classes, or for breakfast, but as it is open for most the day it can be at anytime you feel hungry and wish to eat breakfast food. Any big school events or large groups who wish to make large quantity reservations can also contact the bistro.

Where: The NTHU students' restaurant.

Why: 1. To reduce the process time required to buy breakfast including the queuing time, waiting time.
2. Sharing of information: letting customers know about the latest product information that include offers or sales, or if there are any sold out products etc.
3. To be able to offer a ordering experience that doesn't require queuing, waiting time and the need of bringing money on you.
4. During peak hours, the lack of enough employees can affect the quality of the meals.

How: 1. Create and provide an online ordering system.
2. Focus and place the resources and employees mainly in the kitchen, in order to improve the production process and quality of our products.
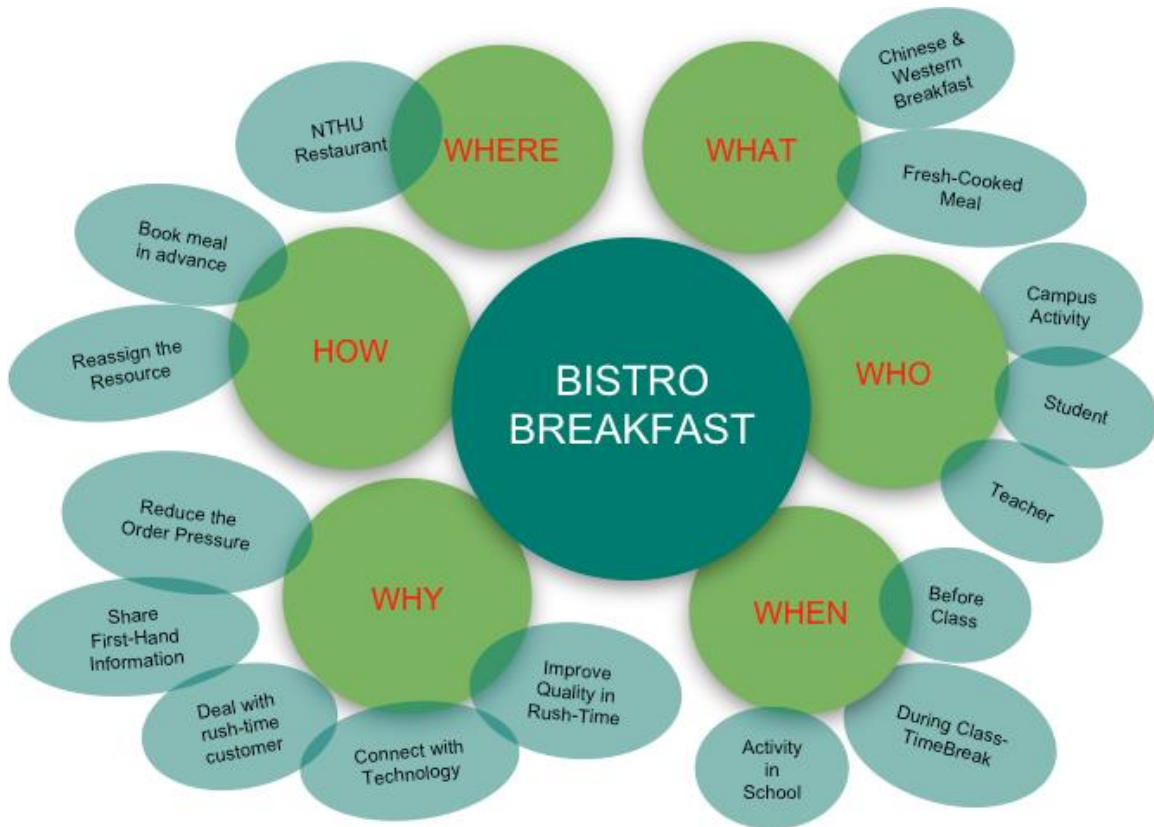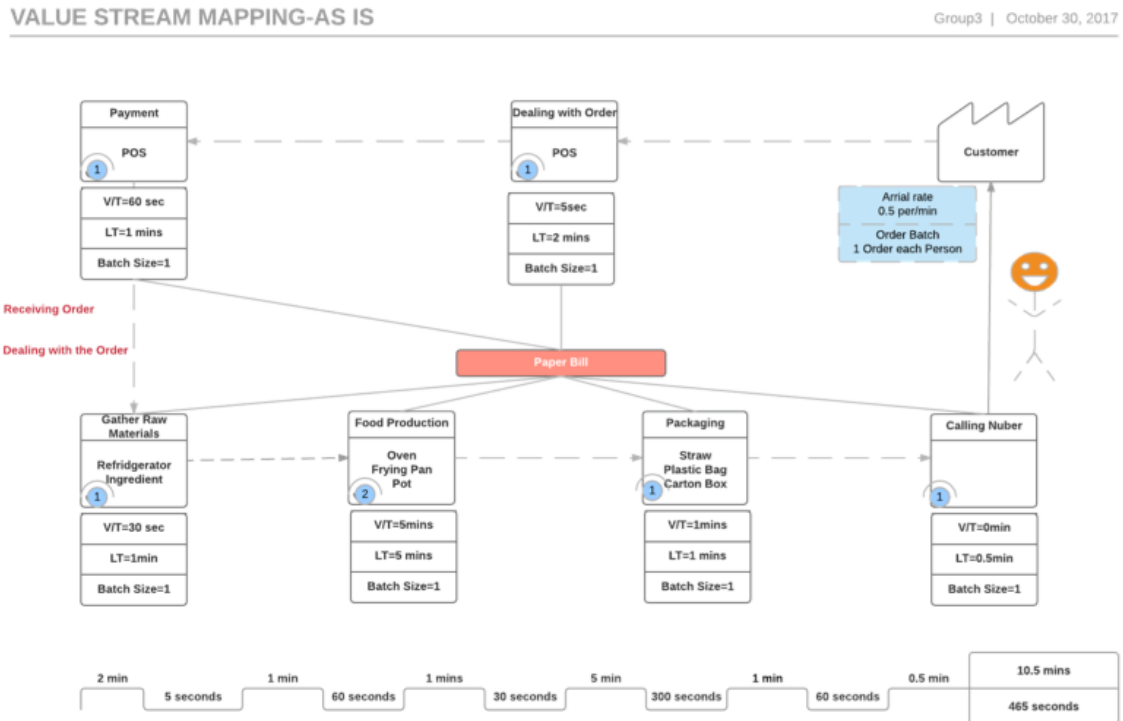
Assumptions

The following table are some of the assumptions made for Bistro breakfast before any improvement was made.

Assumption Item	
Order Receive Rate	0.5 order/ min
Order Profit	$40 / order
Salary	$135 / hr (worker)、$150 /hr (high-level)
Execution Cost	$2 / process

Business Reengineering Processes

VSM

The following diagram is the VSM diagram for the As-Is process

As we can see from the diagram we can identify the following problems:

1. There are many people buying breakfast at peak times, so they usually need to line up.
2. The clerk needs to spend a lot of time keying customer order information.
3. The clerk needs to spend a lot of time exchanging money, and it may lead to a human error.
4. Paper bills are not easy to read because it is easy to mess up and miss the order particularly when you are forced to work quickly and it can not be tracked.
5. Manual processing like Keying order, Exchanging money and Reading bill may lead to the human error.
6. Due to the lack of order integration, the store can only deal with an order at a time, resulting in capacity loss.
7. The clerk needs to call the customer and wait them to pick up their food.
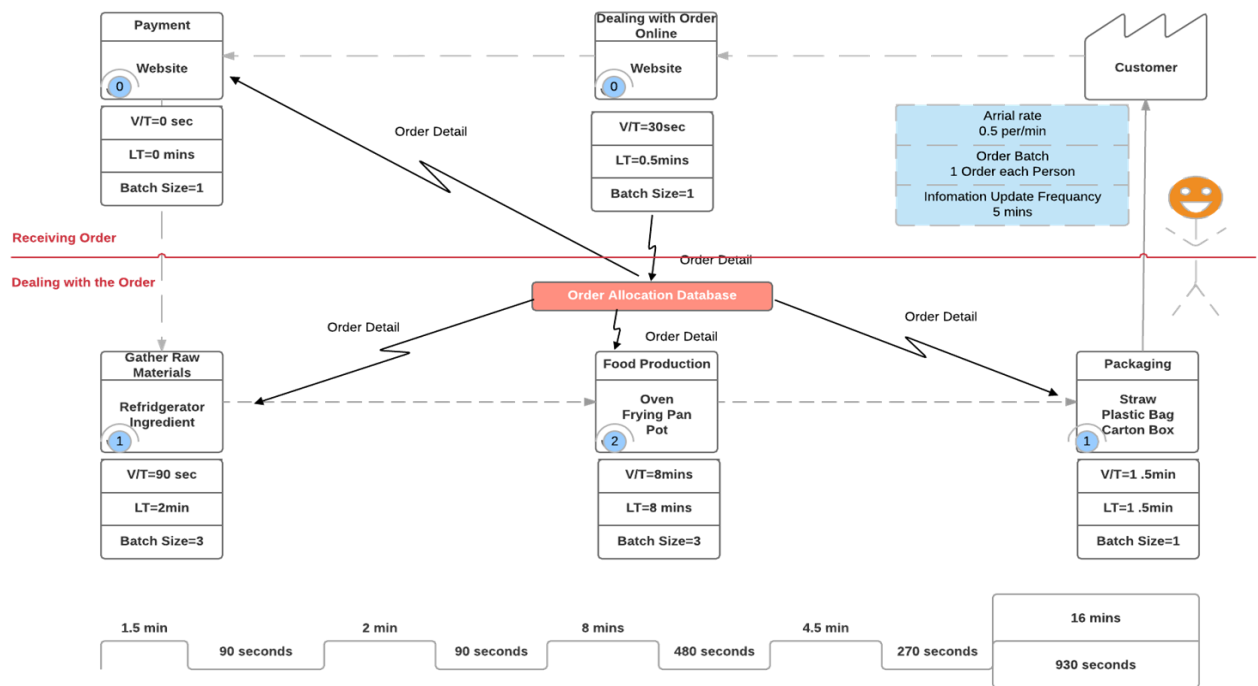8. Low activity ratio.

Activity Ratio Only 72.2%

Total Lead Time	10.5 mins
Total Value Added Time	455 seconds

Possible solutions to the problems found:

Problem number	VSM block	Target	Possible Solution
1	1	Decrease waiting time about 50%.	Hire more clerks, Pre-order on the Website
2	1	Decrease key in time about 50%.	A more user friendly POS, Pre-key in on the Website
3	2	Avoid error and faster calculation.	A cashing machine, Pre-paid on the Website
4	1,2,3,4,6	Storage and pass information on time.	A data base for order information
5	all	Reduce manual processing .	Put human resource into meal-making
6	3,4,5,6	Avoid capacity loss	Integrate orders to do batch processing.
7	6	Remove this action.	Pick meal on their own
8	all	Increase activity ratio about 10%.	Reduce Non-Value added actions

To-Be VSM diagram:

Payment	
Website	0
V/T=0 sec	
LT=0 mins	
Batch Size=1	

Dealing with Order Online	
Website	0
V/T=30sec	
LT=0.5mins	
Batch Size=1	

Customer

Arrial rate
0.5 per/min

Order Batch
1 Order each Person

Infomation Update Frequancy
5 mins

Order Detail

Receiving Order

Order Detail

Dealing with the Order

Order Allocation Database

Order Detail   Order Detail   Order Detail

Gather Raw Materials	
Refridgerator Ingredient	1
V/T=90 sec	
LT=2min	
Batch Size=3	

Food Production	
Oven Frying Pan Pot	2
V/T=8mins	
LT=8 mins	
Batch Size=3	

Packaging	
Straw Plastic Bag Carton Box	1
V/T=1 .5min	
LT=1 .5min	
Batch Size=1	

1.5 min	2 min	8 mins	4.5 min	16 mins
90 seconds	90 seconds	480 seconds	270 seconds	930 seconds

As-Is and To-Be comparison:

Difference	As Is	To Be
Lead Time	10.5 mins	16 mins
Value Added Time	7.6 mins	15.5 mins
Time of Dealing an Order	10.5 mins	5.4 mins
Statistics Analysis	x	v
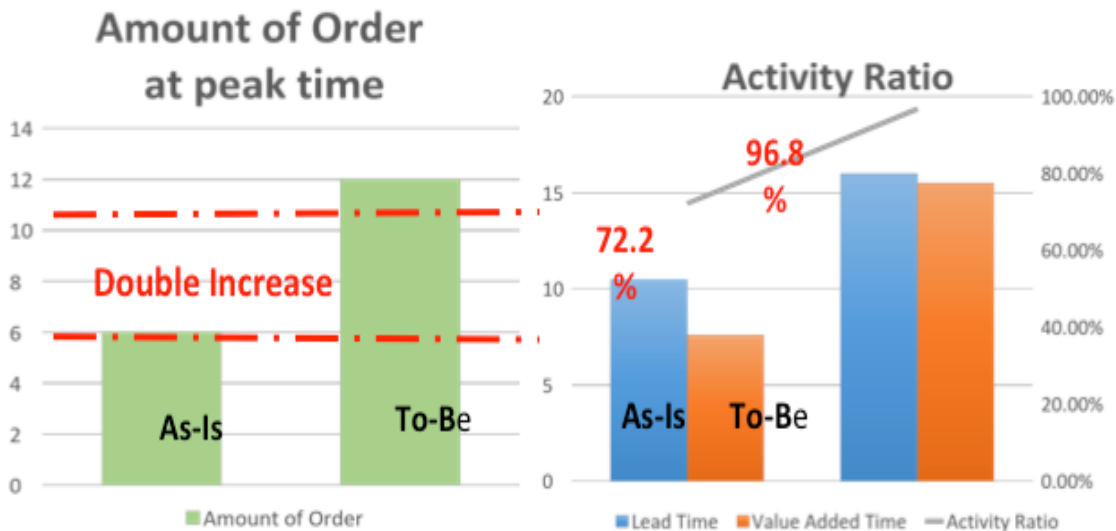
To compare the difference As-Is and To-Be. We can use value added time and lead time to get the activity ratio. We can also use the lead time to calculate time of dealing with an order, because To-be model deals with three orders at once. Therefore, sixteen-minutes has to be divided by three, then we can get 5.4 minutes for one order. In other words, when as is model deal with one order the to be model can deal with two order. Then , we assume the margin profit of order is 15$, and the peak time is 7 to10 o'clock, after calculating, we prove that to be model can gain extra profit about 270$.

Another benefit of to-be model is that it can use data to analyze the sales performance like the most popular product . If we can get the information, we can prepare the ingredient efficiently, even more, we can make the meal first and provide to someone who is in rush.
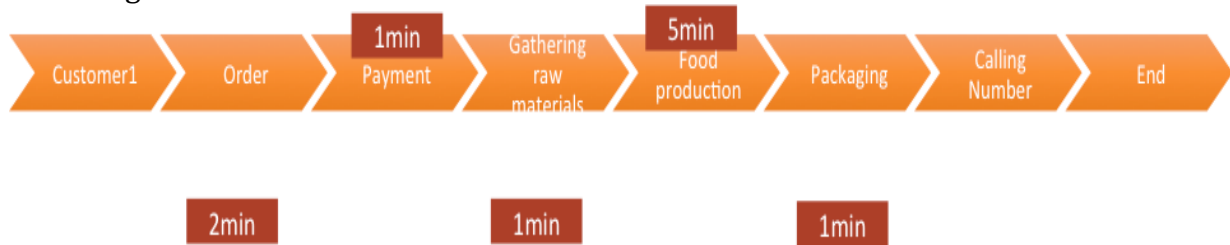
Goal of VSM:

Increase Resource Utilization → Value Added Promote

Increase Amount of Order → Profit increase

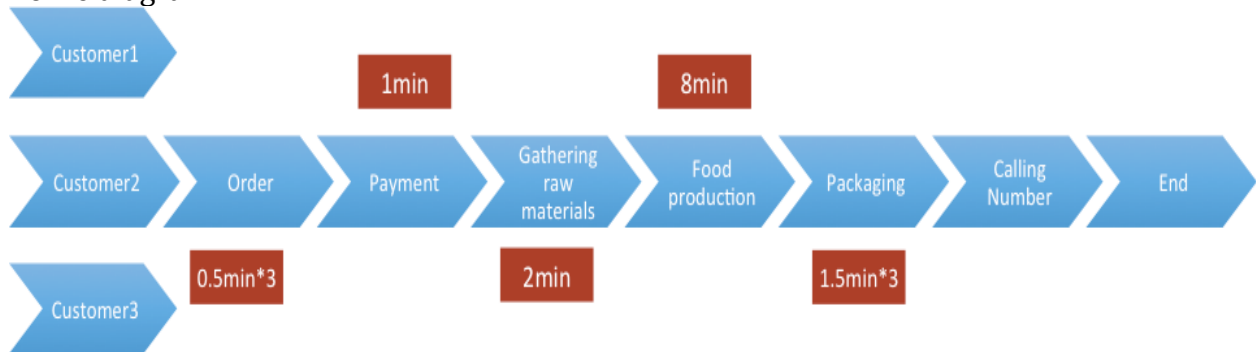Collect and Analyze Data → Do right business strategy

TOC

As-is diagram:

		1min		**5min**			
Customer1	Order	Payment	Gathering raw materials	Food production	Packaging	Calling Number	End

2min   **1min**   **1min**

- As we can see from our behaviour model our process is a linear one, so it has to be repeated every time a customer arrives.
- The two main constraints from our process are the ordering process, and the food production process, which take 2 minutes and 5 minutes respectively.
- So we feel the need to improve the ordering process, which will in turn improve the food production process to reduce the time constraints.

To-Be diagram:

Customer1

		1min		**8min**			
Customer2	Order	Payment	Gathering raw materials	Food production	Packaging	Calling Number	End

0.5min*3   **2min**   **1.5min*3**

Customer3

- In order to reduce the time constraints we mentioned in the As-Is model, we created an online website for our customers to be able to make an order online, as well as being able to come and order at the shop.
- Ordering online, allows more than one payment and order to be processed at a time, therefore reducing the ordering time.
- Furthermore, the kitchen can start gathering raw materials and preparing food for more than one order at a time, as he might receive more than one order.
- The new constraint we will have to consider in this new model will be that of the packaging.
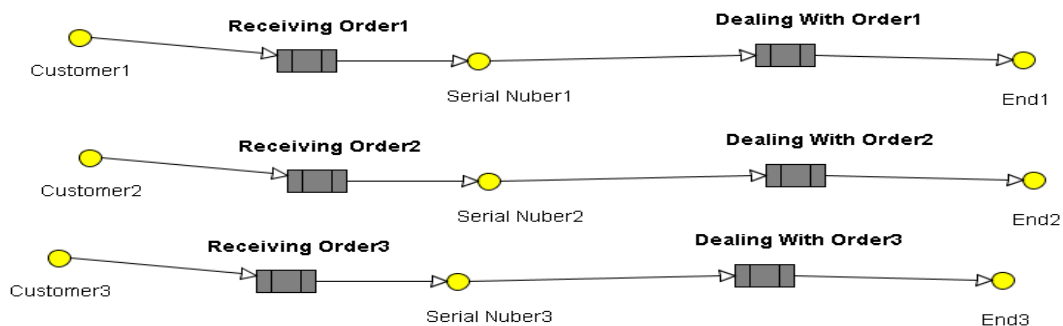
As-Is and To-Be comparison:

Process	Before(min)	After(min)
Ordering	2*3	0.5*3
Payment	1*3	1
Gathering raw material	1*3	2
Food Production	5*3	8
Packaging	1*3	1.5*3
Calling Number	0.5*3	0
Total	31.5	17

- As we can see from this comparison we managed to reduce the total process time by nearly a half.
- The key is being able to accept and process more than one order at a time.
- Another factor is the calling of the number, as customers who order online, will know when to pick up their order and will know their order ID before hand.
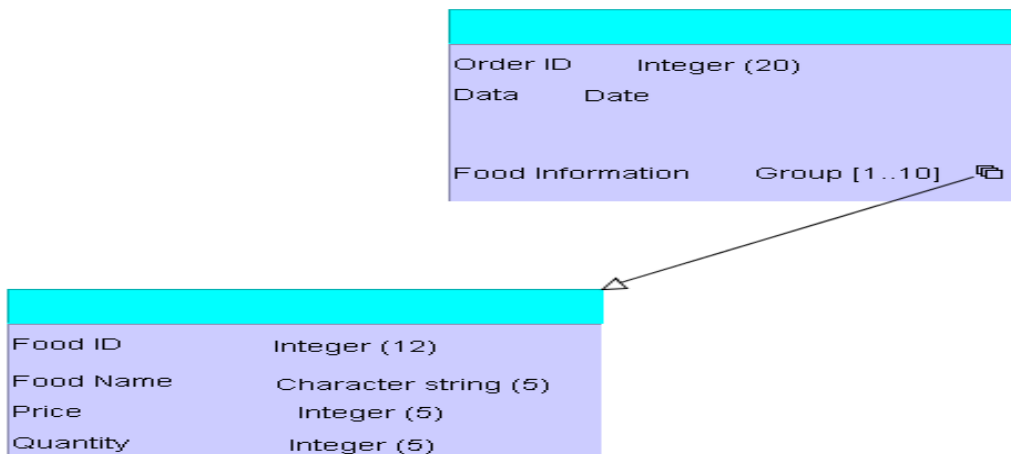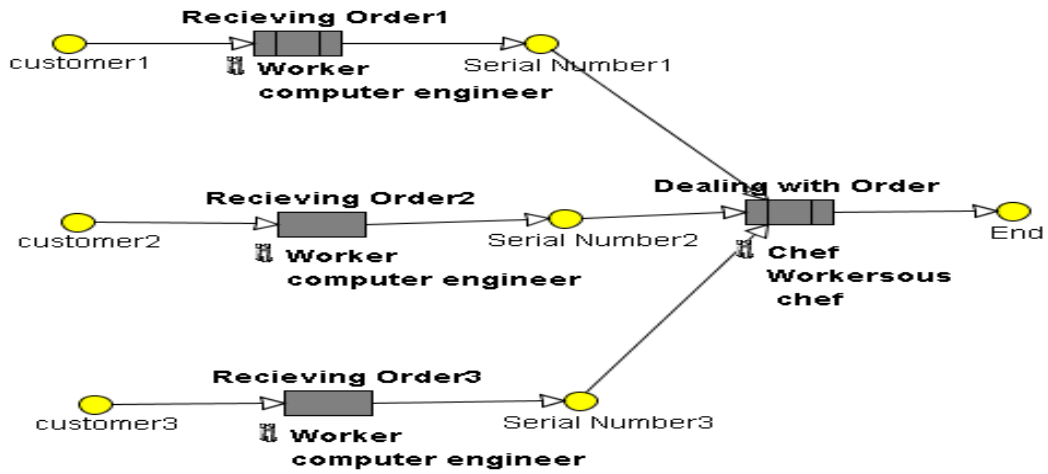
Income

As-Is Behaviour diagram:

(drill down)

Making Order — **Payment**

Customer1 — Order1 — Serial Nuber1

Gather Raw Materials — **Food Production** — **Packaging** — **Calling Number**

Serial Nuber1 — Raw Materials — Food — Final Product — End1

As-Is organization model:

CEO

Daenary Targary
CEO

Management

Jon snow
Shop Manager

Counter

Alexdar
Worker
Danny wang
Worker

Kitchen

Mrs.white
Chepurple
sous chef

As-Is Object model:

Order ID	Integer (20)
Data	Date
Food Information	Group [1..10]

Food ID	Integer (12)
Food Name	Character string (5)
Price	Integer (5)
Quantity	Integer (5)

To-Be behavior diagram:

Recieving Order1

customer1 — Worker computer engineer — Serial Number1

Recieving Order2

customer2 — Worker computer engineer — Serial Number2

Dealing with Order

Chef Workersous chef — End

Recieving Order3

customer3 — Worker computer engineer — Serial Number3

(drill down)

Making Order

Customer1 — Order1

Payment

Order1 — Serial Nuber1

Serial Number1
Serial Number2
Serial Number3

Gathering Raw Material

Raw Material

Production

Food

Packaging

Final Product

Calling the number

End

To-be organization model:

CEO
Daenarys Targaryan
CEO

Management
Jon Snow
Shop Manager

Server Maintainence
Cersei Lannister
computer engineer

Counter
Night King
Worker

Kitchen
Tyrion Lannister
Chef
Arya Stark
sous chef

To-be object model:

Order Data

Order ID	Integer (20)
Data	Date
Buyer Information	Aggregation ☐
Food Information	Group [1..10]

Food Information

Food ID	Integer (12)
Food Name	Character string (5)
Price	Integer (5)
Quantity	Integer (5)

Buyer Information

Buyer ID Integer (12)	
Telephone	Integer (12)

As-Is and To-Be comparison:
1. Simulation

To_Be: Overview | To_Be: Chart | Resources | Resources Chart
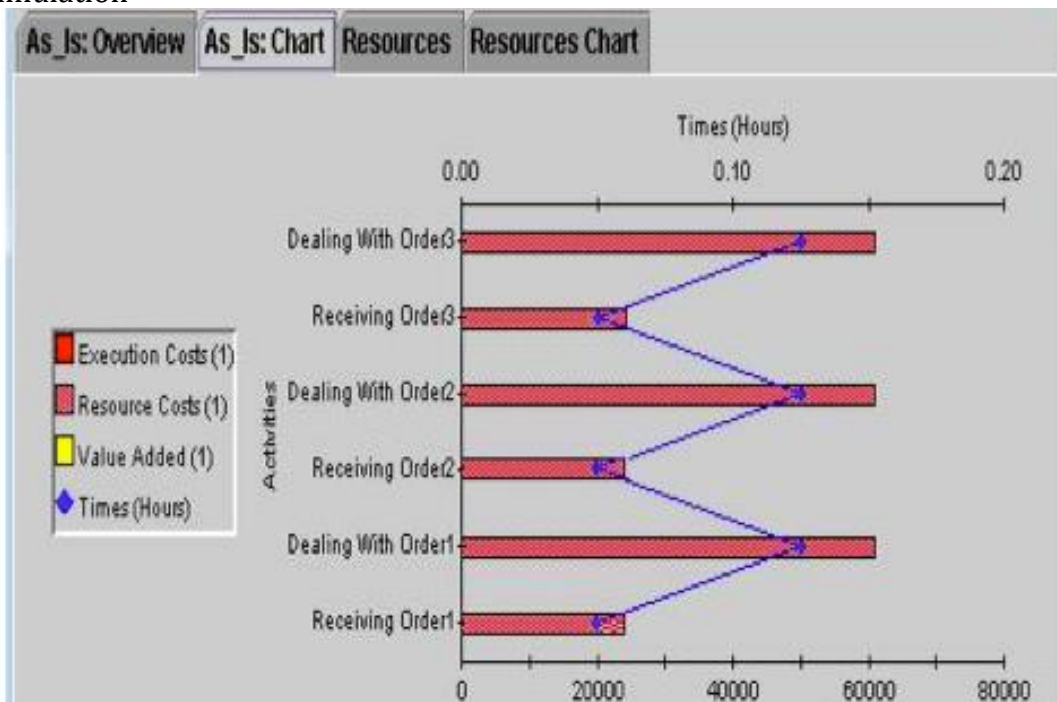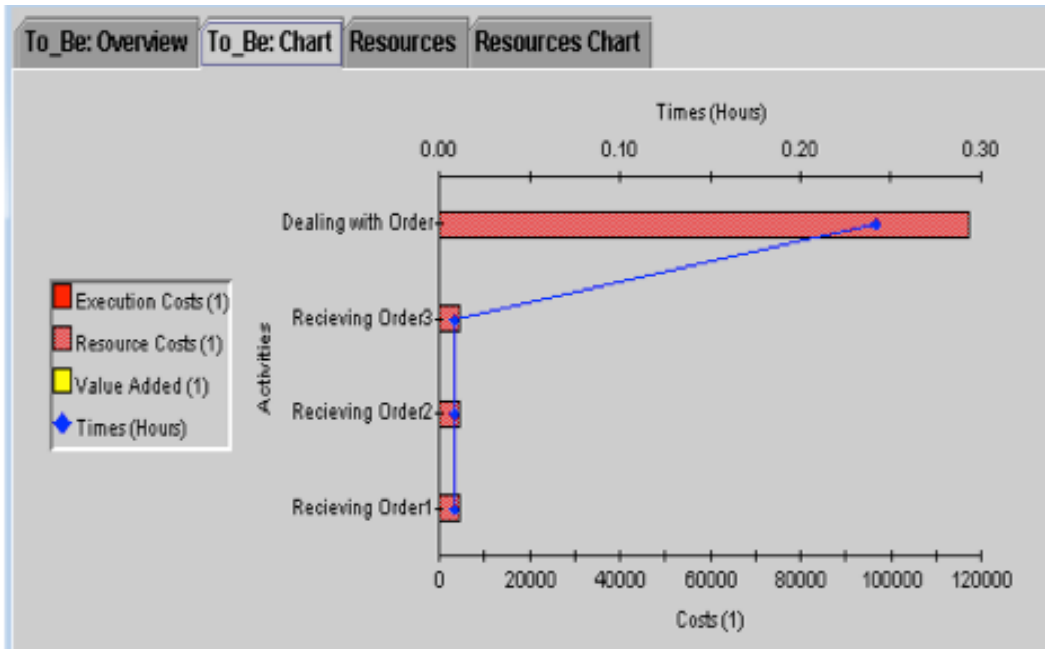
Activities	Count	Execution Costs ...	Resource Cos...	Value Added (1)	Times (Hours)
Recieving Order1	1	35	4,501.125	50	0.008
Recieving Order2	1	35	4,501.125	50	0.008
Recieving Order3	1	35	4,501.125	50	0.008
Dealing with Order	1	4.5	117,515.25	0	0.242
Sum	4	109.5	131,018.625	150	0.267

As_Is: Overview | As_Is: Chart | Resources | Resources Chart

Activities	Count	Execution Costs (1)	Resource Costs ...	Value Added (1)	Times (Hours)
Receiving Order1	1	35	6.75	50	0.05
Dealing With Order1	1	4.5	60,783.75	0	0.125
Receiving Order2	1	35	6.75	50	0.05
Dealing With Order2	1	4.5	60,783.75	0	0.125
Receiving Order3	1	35	24,300	50	0.05
Dealing With Order3	1	4.5	60,783.75	0	0.125
Sum	6	118.5	206,664.75	150	0.525

- A total of 3 orders were processed in both As-Is and To-Be simulations.
- The To-Be model allows more than one order to be processed at a time.
- This in turn reduces the total amount of time needed to deal with an order.
- As we can see from the results of the simulation:
    - Execution costs were lowered in To-Be.
    - More than one order was allowed to be processed at a time.
    - This reduced the resource cost, and the amount of time needed to complete the whole process.
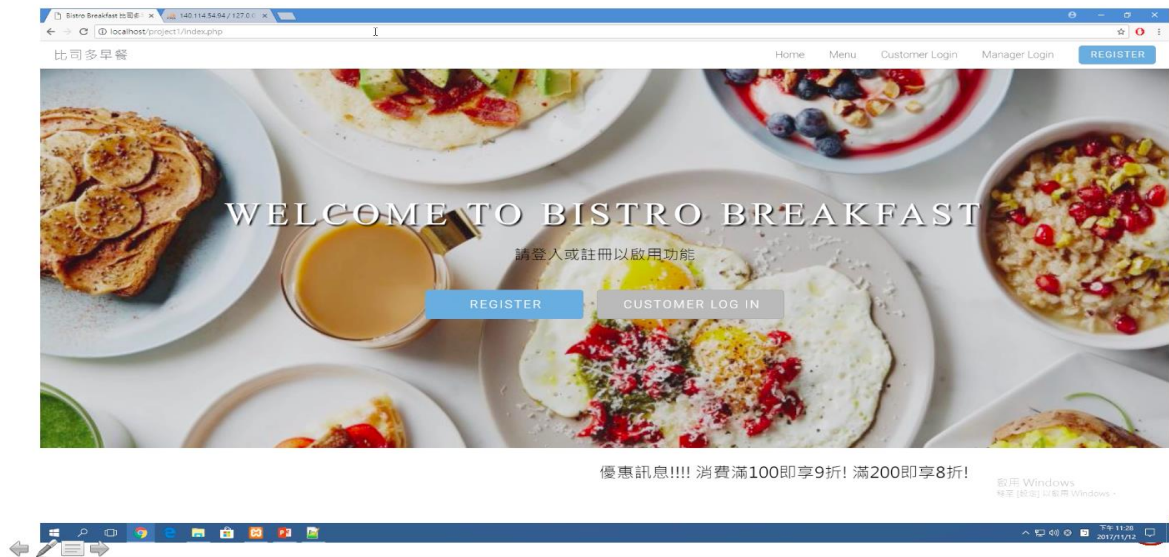
2. Cost analysis

	Assumptions	As-Is Model	To-Be Model
Cost	Worker	135*2	135
	Chef	135	135
	Sous-Chef	135	135
	Computer engineer	N/A	150
	Execution costs	2*6*30	2*4*30
	Total	900	795
Profit	Value added	50*30	50*30
	Net profit/Order	40*30	40*30
	Total	2700	2700
	Hourly Net Profit (order net profit + value added/hour - (total cost/hour))	1800	1905

(1. Hourly cost= all workers pay+execution costs per order*30(one order every 2 mins) 2. 1 order every 2 mins)

As we can see our to-be model is more effective not only due to our increase in hourly net profit, but we have also lowered our costs and increases the amount of orders we can deal with at the same time.

Web design

Homepage

Menu (before logging in):
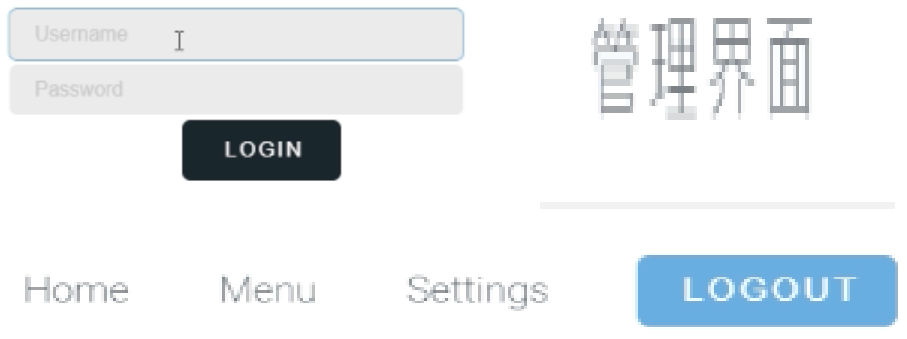
Manager Functions:

We will give a set of username and password to whoever buys our webpage

The top left of our web will display"管理介面" if a manager has logged in.

After the manager has logged in the top right will include settings.

MANAGER LOGIN
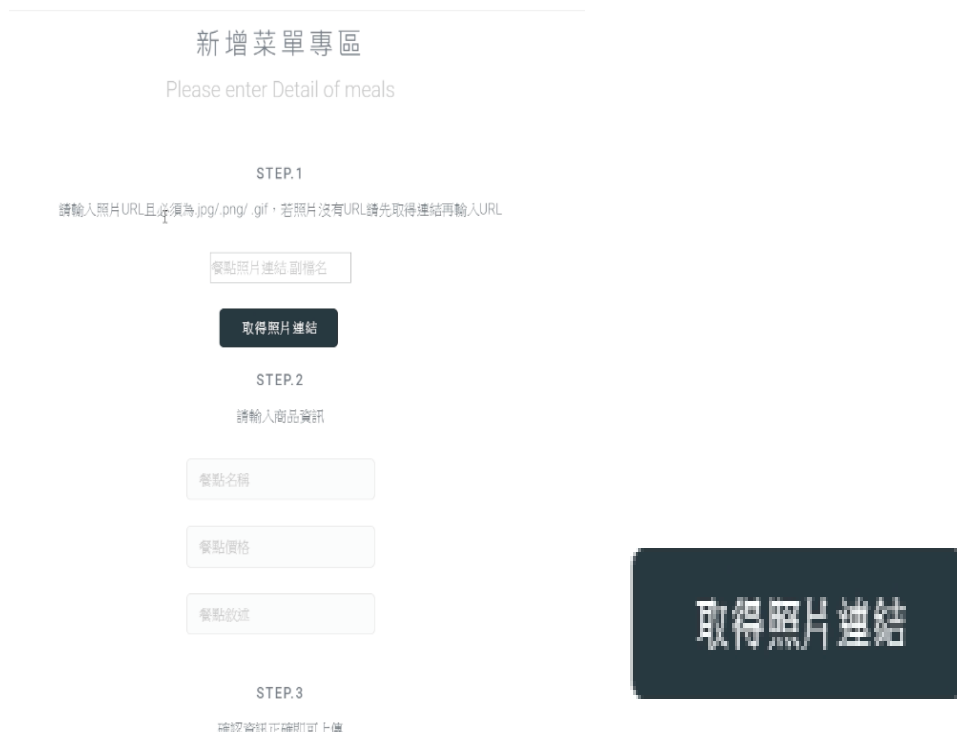
Username

Password

LOGIN

管理界面

Home   Menu   Settings   LOGOUT

Display for settings: Includes uploading a new meal with pictures, name, price and description.

Also includes a delete function to delete any existing things on the menu.

To obtain a URL for your picture you can upload to imgur that we provide a link for.

If your upload was successful it will tell you.

新 增 菜 單 專 區

Please enter Detail of meals

STEP.1

請輸入照片URL且必須為.jpg/.png/ .gif，若照片沒有URL請先取得連結再輸入URL

餐點照片連結 副檔名

取得照片連結

STEP.2

請輸入商品資訊

餐點名稱

餐點價格

餐點敘述

取得照片連結

STEP.3

確認資訊正確即可上傳

X

Browse   or drag images here.

Paste Image or URL

Meme Gen   Video to Gif   Browse my Imgur Uploads

By creating a post, you agree to Imgur's **Terms of Service** and **Privacy Policy**
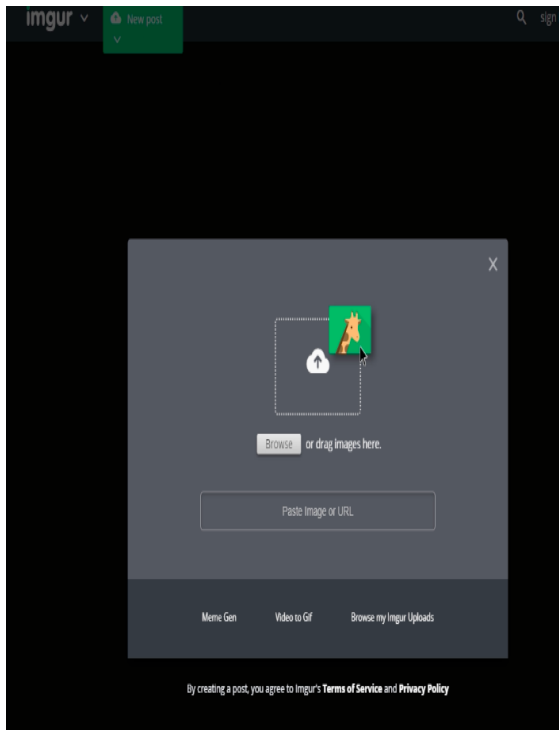
Smile Set

135

Enjoy. Be happy.

STEP. 3

確認資訊正確即可上傳

開始上傳

刪除菜單專區

Please enter Detail of meals
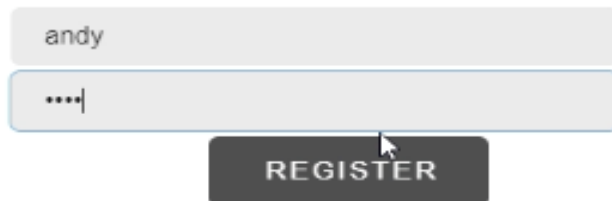
STEP. 1

請輸入餐點名稱名稱

Smile Set

STEP. 2

確認資訊正確即可刪除

刪除資料

上傳成功

Register function: if it was successful the following message will show.

REGISTER

andy

••••

REGISTER

註冊成功，稍後重新為您導回登入頁面

Customer login: Our customer passwords in the database are encrypted so there are privacy invasion issues. The top left of our website interface changes to "顧客介面"once you login. The top right of our interface also adds a shopping cart.

CUSTOMER LOGIN

andy

••••

LOGIN

☐ ✏編輯 ♦ 複製 ⊖ 刪除   4   andy $2y$10$U/xphFrPlmUt50Q|QK/4M.9KUXAyoZ0.HoFCNYueDtn…

顧客界面

Shopping cart function:
You can check your shopping cart anytime and it gives you the final price, you can also keep adding products, you can also clear you shopping cart. Once you confirm your purchase, you will be directed to the payment page where you will need to fill in credit card details, once you confirm you will be given a number so you can go get your meal.

購物車

請確認餐點

產品:	數量:	價格小計:

您一共購買0元

繼續購物   確認結帳   清除購物車

購物車內已無商品

您一共購買0元

繼續購物

恭喜您獲得滿200元打8折的優惠

產品:	數量:	價格小計:
Milk Tea	6	180
PUDDING	3	60

您一共購買192元

繼續購物　確認結帳　清除購物車

您一共消費144 元

請線上完成支付

信用卡	請輸入卡號
	末三碼

確認付款　返回購物車

取餐編號19

感謝您的購買，稍後重新為您導回首頁

Menu(After logging in as customer):

MENU
請選擇餐點

BURGER $40
DELICIOUS MEAT AND TOMATO.
0

MILK TEA $30
YUMMY MILK TEA.
2

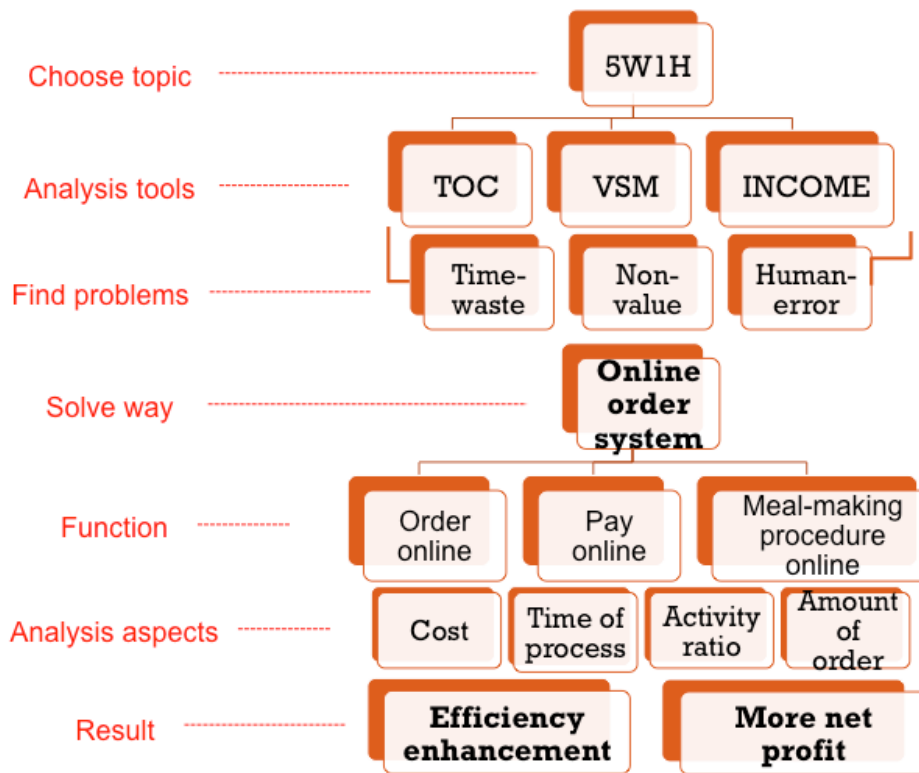PUDDING $20
GOOD
3

加入購物車

Discussion/ Conclusion

First we used 5w1h to choose the Bistro as our topic, then we applied the BPR processes and tools TOC, VSM, INCOME to analyze as-is and find the problems. In order to solve some time-waste/non-value/Human-error problems, we established an online ordering system. Customers can order online pay online and can even see the meal-making procedure online.

The Final step was that we use these three tools again to analyze the to-be model. We compared as-is and to-be model from four aspects –Cost, Time of process, Activity Ratio/ Order quantity

Our results show that the online ordering system and our to be models truly enhances the efficiency and helps the bistro gain more orders and profit.