

# RFID and Restaurant

## **SEEM3490 – Group 3**

LAM KA HO LOUIS	1155018465
MA SO SUM SHARON	1155028805
WONG CHOR MAN LEAH	1155018466
WONG HONG FAT BILLY	1155028806

# Prolog

## Background

### Introduction to RFID

- What is RFID?
- Overview of RFID technology
- How does RFID work?
- How can RFID help restaurants?
- Further Discussion

### Introduction to Mobile POS system

- What is Mobile POS?
- How does Mobile POS work?
- How can Mobile POS help restaurants?
- Pros and Cons of using Mobile POS in restaurants

### Introduction to Internet Technology

- How can Social Media help restaurants?
- How can App-based marketing help restaurants?
- Pros and Cons of using Internet Technology in restaurants

### Suggestions on using other Information Technology to help restaurants

### Conclusion and Vision

# Background

*In the good old days.....*

- people seldom dine out
- restaurants :
  - made good use of the manpower
  - use pen + paper to jot down orders
  - ✘ use computers
  - ✓ use human's brains



# Background

*XX years later.....*

- technology is evolving
- people earn more + are willing to dine out
- diners look for better restaurants
  - ✓ efficient
  - ✓ comfortable dining environment



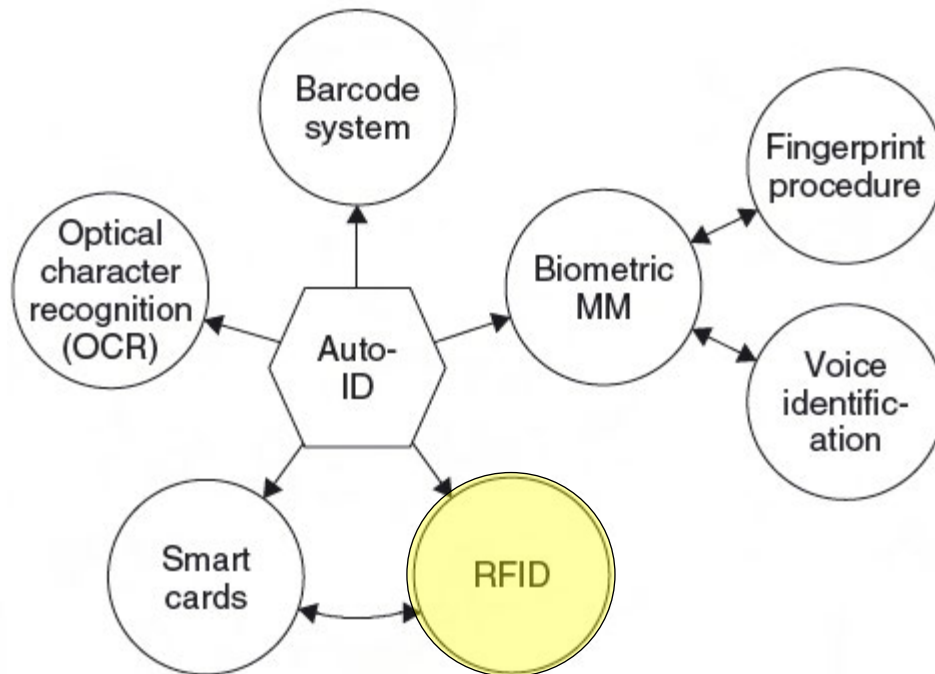
# What is RFID?

- **R**adio **F**requency **I**Dentification
- a wireless communication technology
- ✓ transmits the identity (in the form of a unique serial number) of an object or person using radio waves



# What is RFID?

- a kind of automatic information technologies (AITs)
  - associated with *automatic data capture (ADC)* in various applications



Overview of the most important auto-ID procedures

# What is RFID?

- a kind of automatic information technologies (AITs)
  - associated with *automatic data capture (ADC)* in various applications
    1. Fast
    2. ✘ Require physical sight or contact between reader / scanner and the tagged item
    3. Use low cost components
    4. Attempt to provide unique identification and backend integration

# Overview of RFID technology



## 3 basic components

- Tags (or transponder)
  - Composed of :
    1. A semi-conductor chip
    2. An antenna
    3. A battery (sometimes)

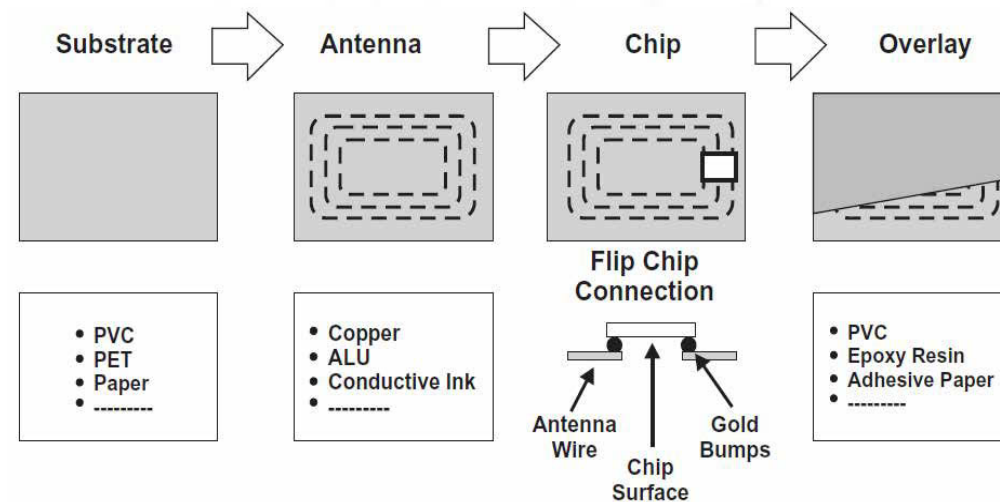


# Overview of RFID technology



## 3 basic components

- Tags (or transponder)



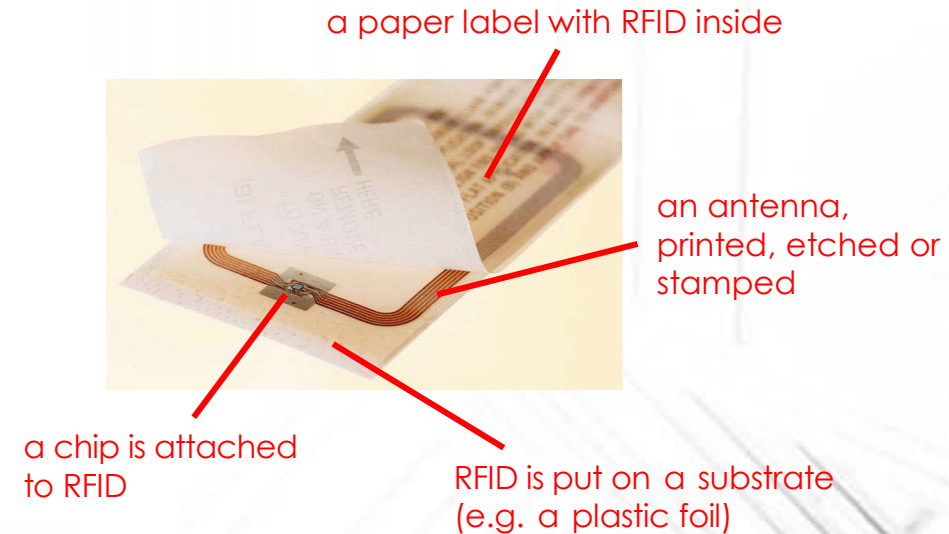
RFID Tag Components

# Overview of RFID technology



## 3 basic components

- Tags (or transponder)
  - Attached to almost everything (e.g. cases, vehicles)



RFID tag – Smart label

# Overview of RFID technology



## 3 basic components

- Tags (or transponder)
  - Store data + transmit data  
→ interrogator
  - Active tags
  - Passive tags
  - Semi-passive tags



Common RFID tag

# Overview of RFID technology



## 3 basic components

- Interrogator (alt. reader or read/write device)
  - Composed of :
    1. An antenna
    2. An RF electronics module
    3. A controller electronics module



# Overview of RFID technology



## 3 basic components

- Interrogator (alt. reader or read/write device)
  - Read the data contents of an RFID tag
  - Write data to the tag (in the case of smart tags)
  - Relay data to and from the controller
  - Power the tag (in the case of passive tags)



# Overview of RFID technology



## 3 basic components

- Controller (or Host)
  - takes the form of a PC / a workstation running database and control software

# Overview of RFID technology



## 3 basic components

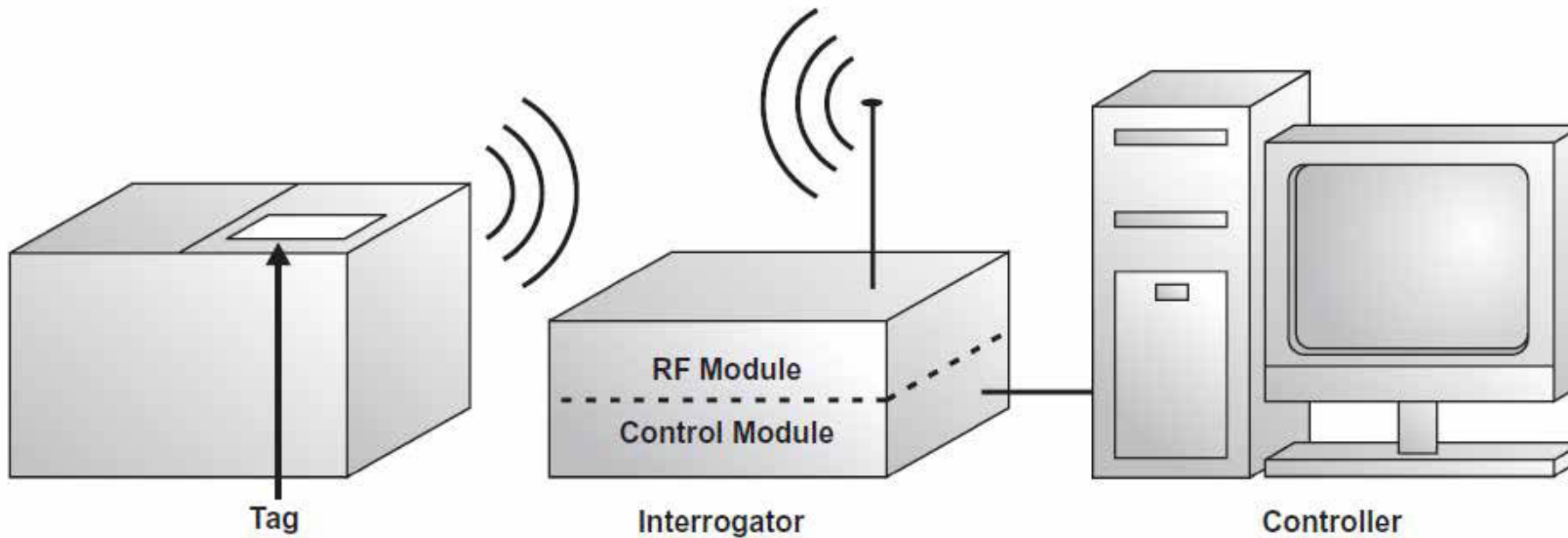
- Controller

Network multiple RFID interrogators together  
+  
Centrally process information



1. Keep inventory + alert suppliers when new inventory is needed
2. Track the movement of objects throughout a system + redirect them
3. Verify identity + grant authorization
4. Debit an account

# Overview of RFID technology

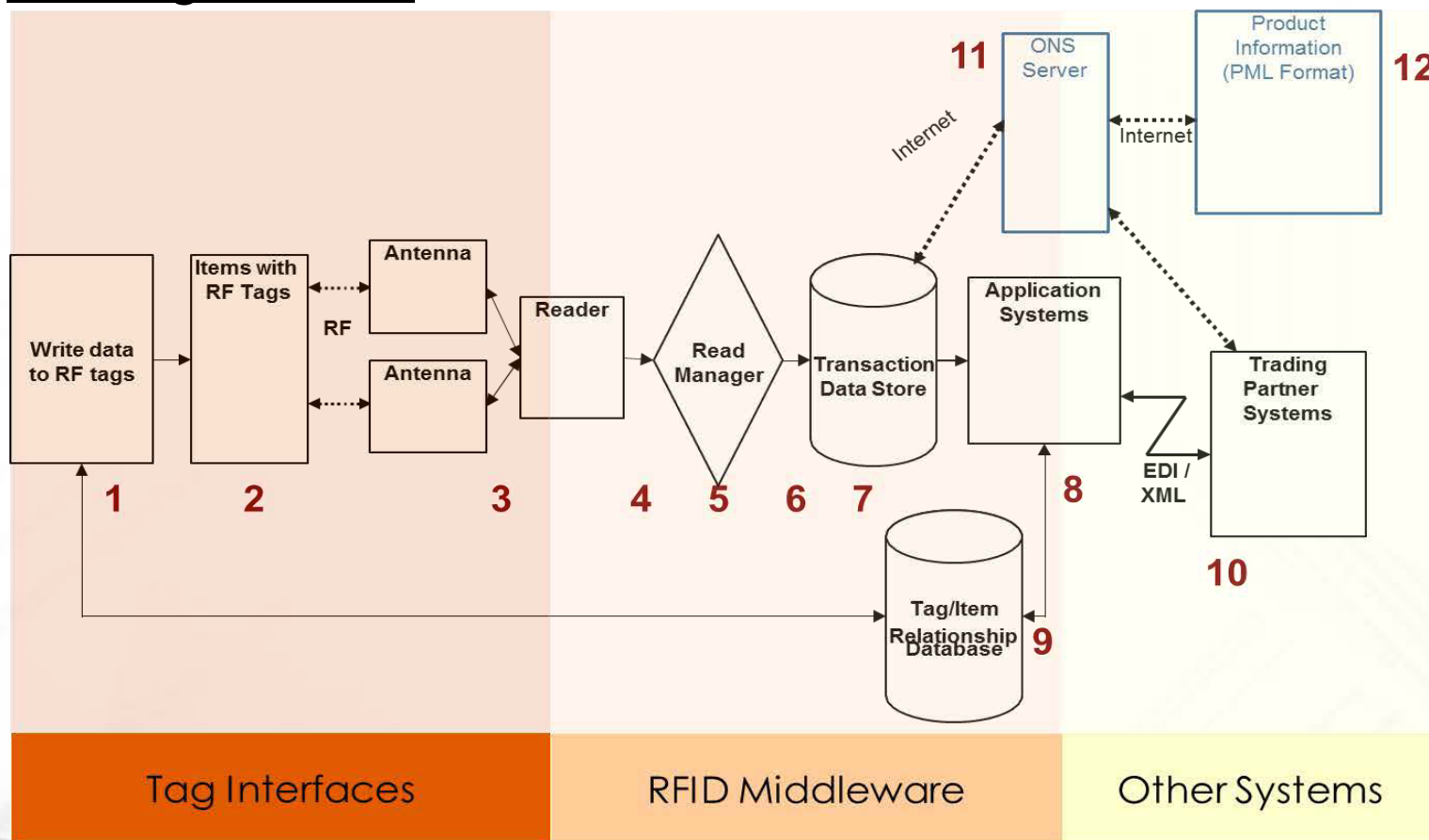


The Basic Building Blocks of an RFID System



# Overview of RFID technology

## RFID logical view



# Overview of RFID technology



Basic RFID system components

# How RFID works?

**EXAMPLE**



# How RFID can help restaurants?

## Table Tracker

- a RFID-based system
- high-frequency (HF) RFID tags attached to the underside of each dining table and table trackers
- ✓ identify where its customers have seated themselves
- ✓ measure how long it takes for an order to be served



Each Starter or Clearing Unit contains its own passive RFID tag

# How RFID can help restaurants?

## Table Tracker



Wireless Table Tracker

No More Name Shouting or  
Number Cards

- read the table tags
- detect where the guest is sitting

# How RFID can help restaurants?

## Table Tracker

Provide You Options

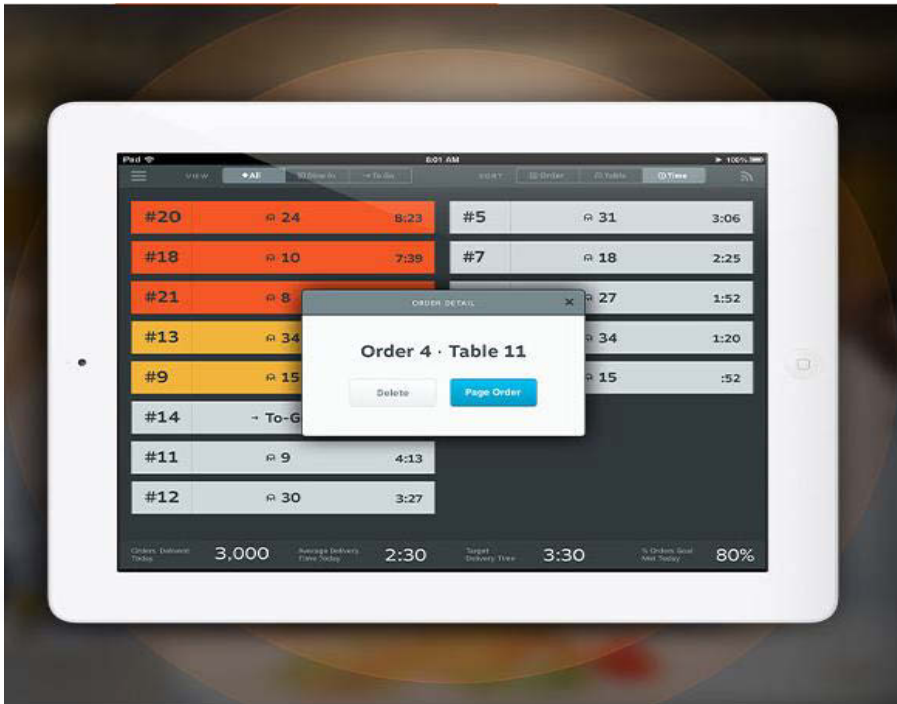
- can choose how to tag restaurant tables



Table Tags

# How RFID can help restaurants?

## Table Tracker



Order Display

## Immediately Locate Guests

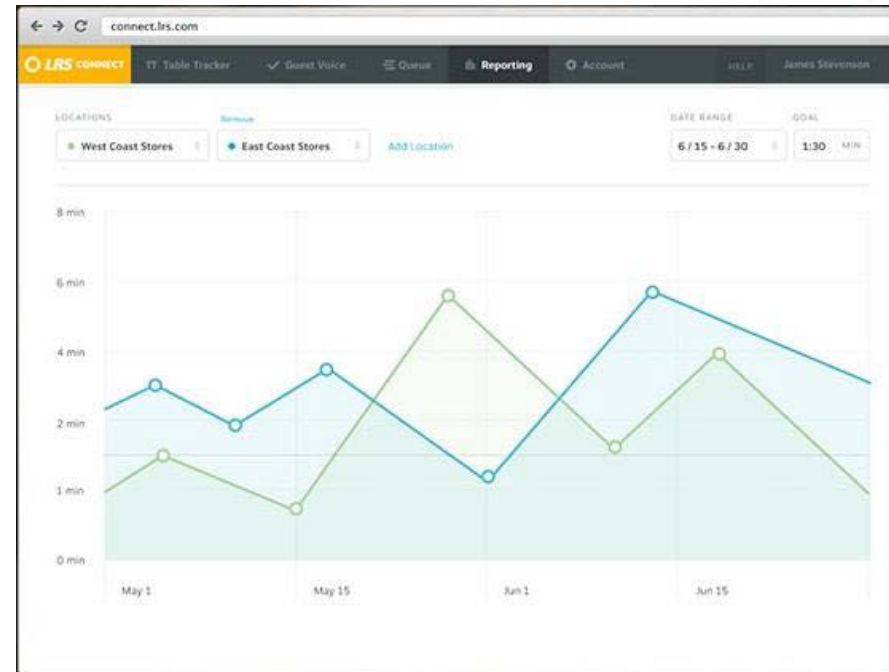
- Color indicators show which orders are late

# How RFID can help restaurants?

## Table Tracker

### Gain Important Insights

- ✓ collects important data for restaurant management purposes



### Advanced Reporting Tools



# How RFID can help restaurants?

## Table Tracker



# How RFID can help restaurants?

## Table Tracker

- restaurants using it :



“We shaved a **full minute** off ticket times. Table Tracker has given us the ability to prioritize orders and deliver food faster.”

Michael Johnson,  
Regional Manager  
Jason's Deli

# How RFID can help restaurants?

## Table Tracker

- restaurants using it :



“Table Tracker tells you where to go like a light beam to the table.”

“It’s the best investment I’ve made this year.”

**Johnny Carrabba,**  
Owner & Founder of the Original  
Carrabba’s & Mia’s

# How RFID can help restaurants?

## Freshness dishes tracking system

- RFID magnetic tags embedded beneath each plate
- A centralized system + robotic arm  
→ remove “expired plates”
  - raw food is cleared after an hour ;  
cooked food is cleared after two hours



- restaurant using it :



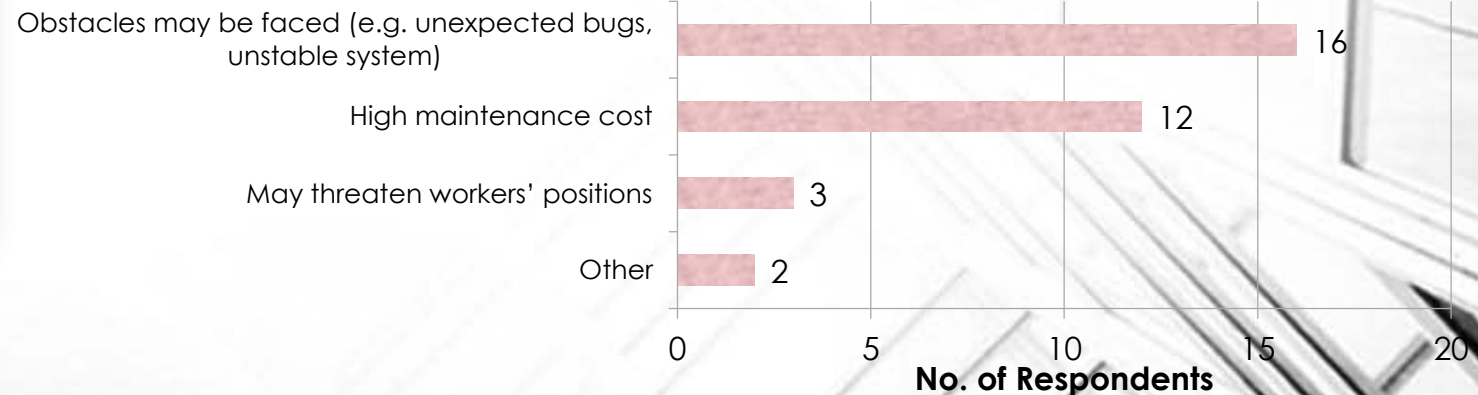
# Further Discussion towards RFID

- Surveys conducted

## Q : How can RFID help a restaurant in your mind?



## Q: What are the possible worries that you are having towards using RFID in restaurants?



### Survey on the Influence of IT and RFID on Restaurants

The purpose of conducting this questionnaire is to investigate the influence of RFID and information technology on restaurants. The following questionnaire contains questions about the familiarity with RFID and information technology that are using in restaurants, and the opinions on using RFID in restaurants from the views of both the diners and staff of restaurants in terms of its feasibility and the corresponding vision. The findings gathered from this survey will be incorporated into a research project. We would like to invite you to spend about 5 minutes on our questionnaire. All data collected will only be used for research and analysis purposes and will be kept strictly confidential. Thank you for your time!

\* Required

#### Part A Familiarity with Information Technology currently using in restaurants

1. Do you know what is Radio Frequency Identification(RFID) technology and it's underlying techniques used? \*

- No idea
- Had heard about the name "RFID" only
- Just know what the abbreviation RFID stands for but don't know what it is actually
- Have clear understanding on what RFID is and how it

2. Do you have any working experience in restaurants? \*

- Yes
- No

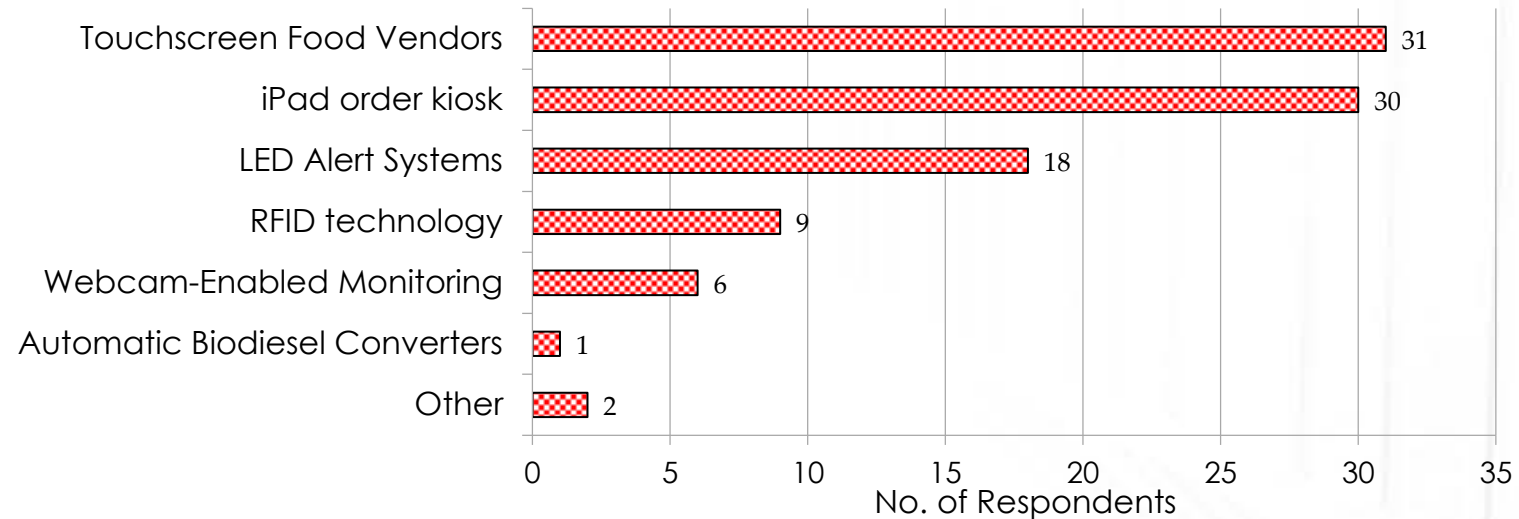
## Further Discussion towards RFID

Pros of using RFID in restaurants	Cons of using RFID in restaurants
✓ improve efficiency and effectiveness	may have obstacles while using RFID technology (unexpected bugs, unstable system)
✓ easier to manage restaurants	high maintenance cost
✓ share workload of staff	may threaten workers' positions
✓ earn more profits	old workers may not know how to use it

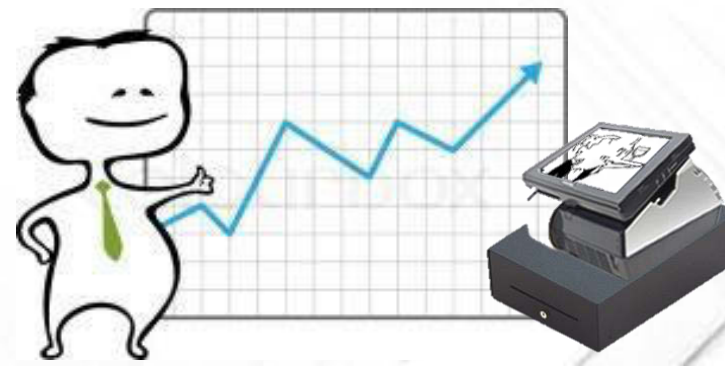
# What's more?

According to surveys conducted.....

## Q. Can you select the technologies you saw in restaurants?

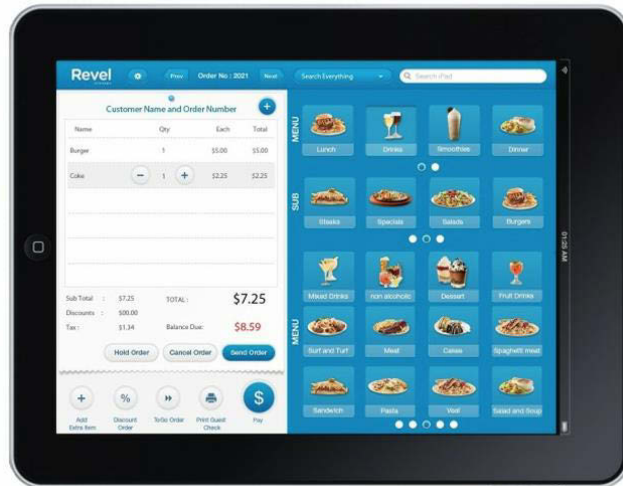


- Mobile POS ⇒ helps restaurants !



# Mobile POS

- Two types of POS:
  1. Traditional POS
  2. Modern POS





# What is Traditional POS?

- POS stands for “Point of sale” initially
- A system
- Purposes
  - Calculate the amount of goods
  - Customers ✓ easily make payments



# What is Traditional POS?

- Equipment needed:
  1. Computers that have connected to center server
  2. Barcode scanners
- Widely used in supermarkets



# What is Modern POS?

- Modern POS = “Point of Service”
- NOT only for checkout
- NOT only can be touched by cashiers
- Customers ✓ use it directly

## EXAMPLE

1. ✓ store patient's data for doctors
2. ✓ display menu or act as an ordering system for restaurants

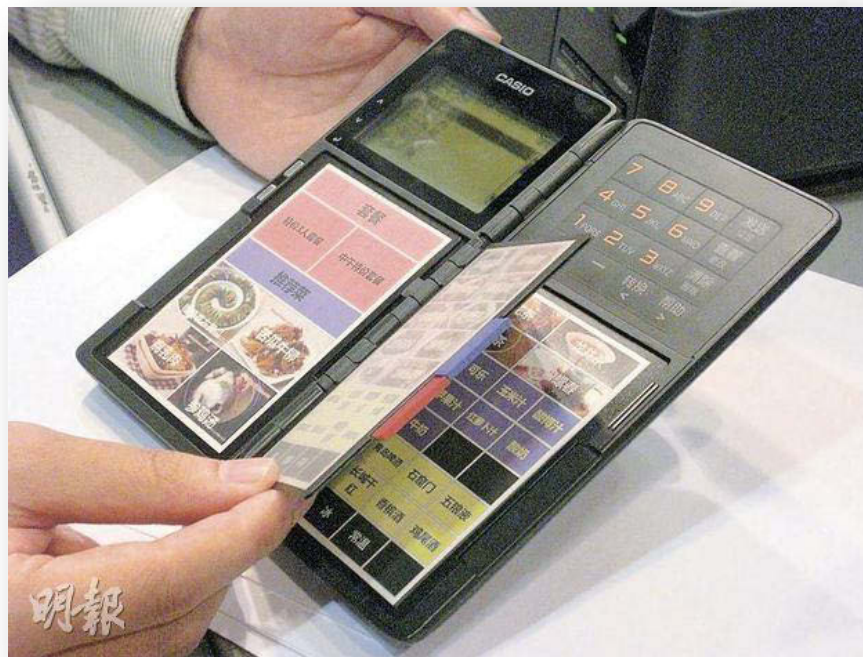
# What is Mobile POS?

- Mobile POS
  - = Mobile “Point of Service”
  - = a food ordering system
- Functions for restaurants' usage:
  - order food
  - transmit orders to the kitchen
  - prepare bills for each of the tables that has consumed
  - show financial statistics (e.g. daily reports)



# Mobile POS (in the past)

- Mobile POS has been used for years, but...
  - ✘ user-friendly
  - Expensive



# Mobile POS (nowadays)



After smartphones were commonly used.....

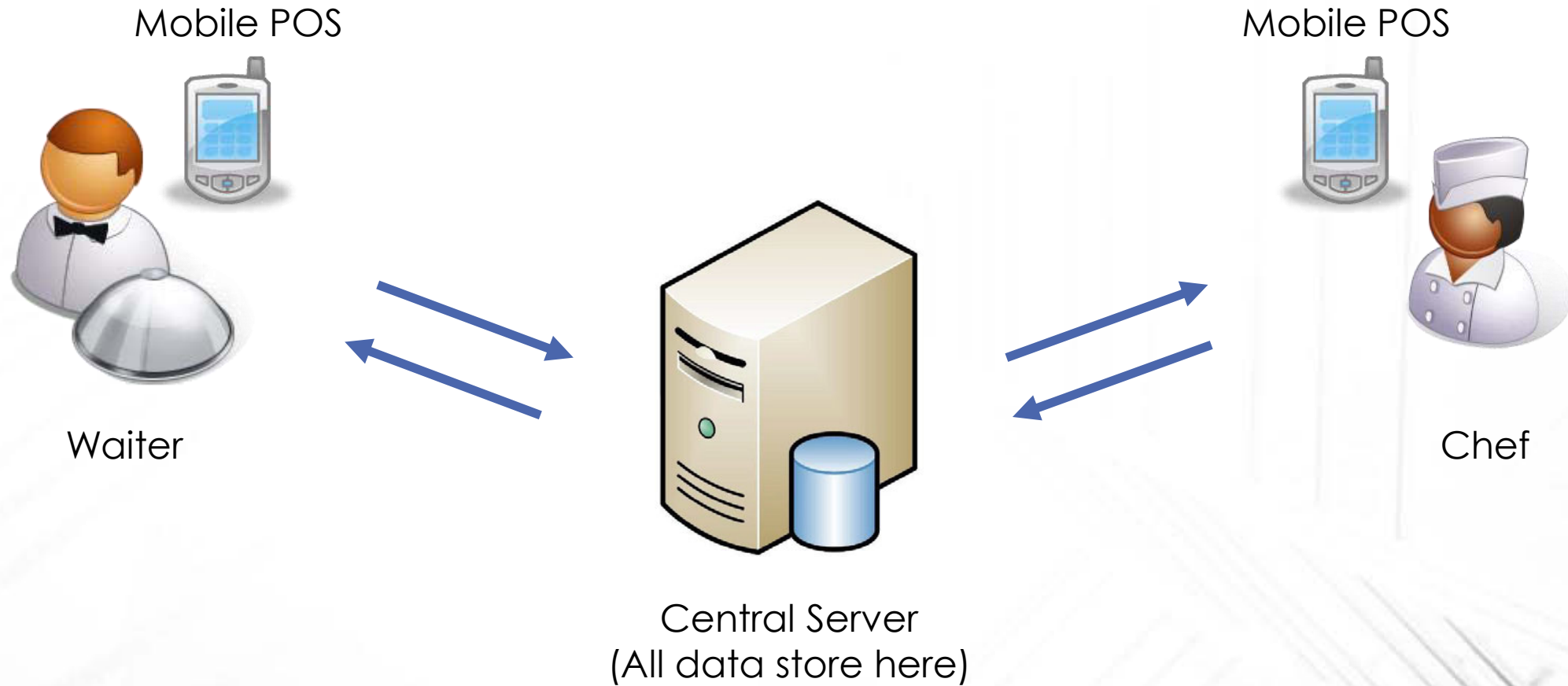
- Mobile POS just likes an App
- No extra devices is needed
- ✓ User friendly

# How can Mobile POS help restaurants?

- Itacho Sushi (板長壽司) uses iPad mini as the Mobile POS



# How does Mobile POS work?





# How can Mobile POS help restaurants?

## Pros of using POS in restaurants

- Accuracy of food names and amounts ✓ guaranteed

## Cons of using papers + pens in restaurants



- Waiter/waitress always writes strange words
- Write prices of the dishes wrongly
- Difficult for the chefs to understand the wordings wrote



# How can Mobile POS help restaurants?

## Pros of using POS in restaurants



- ↓ chances to miss diners' food orders

## Cons of using papers + pens in restaurants



- Easy to lose the papers of orders



# How can Mobile POS help restaurants?

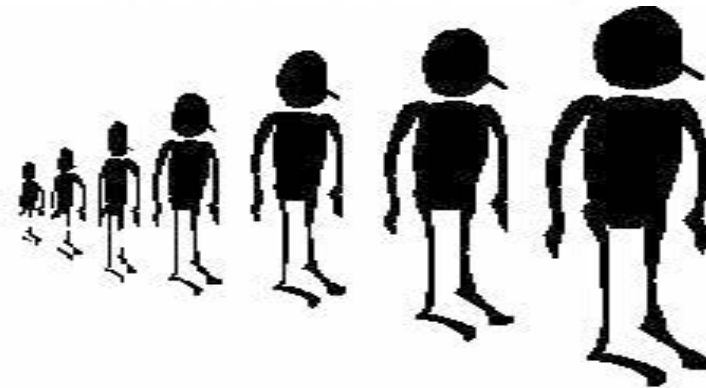
- Generate statistics
  - daily financial reports
  - total revenue
- Through data analysis.....
  - know which dishes are more attractive to diners



# Pros of using Mobile POS over POS



- Customers do NOT need to line up



# Cons of using Mobile POS in restaurants

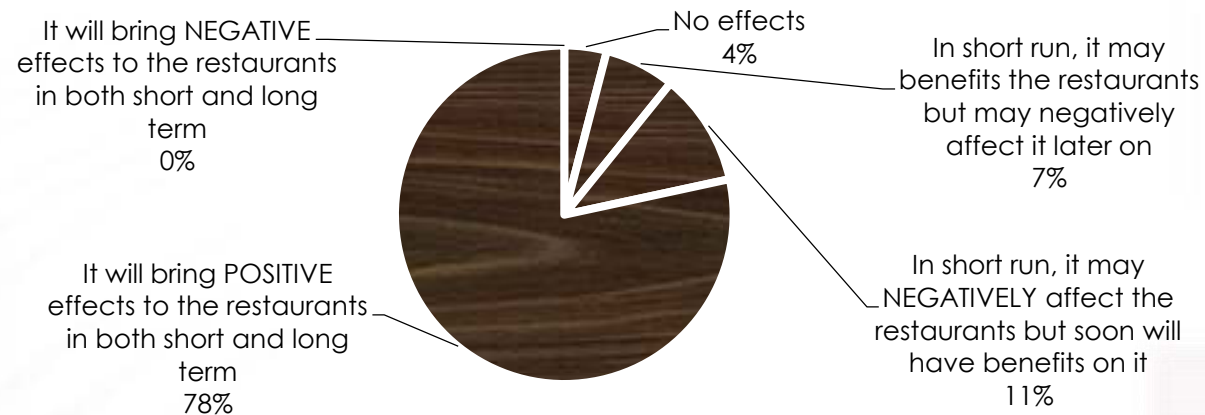
- need IT supporting team to maintain the system
- ✘ existing POS can perfectly fit a specific restaurant
  - further development is needed
- ↑ cost for maintenance + sustainable development  
⇒ not suitable for small scale restaurants



# What's more?

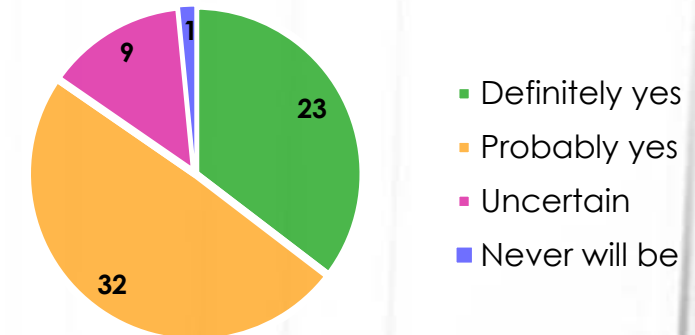
According to surveys conducted.....

**Q : What do you think about the influence of using these kind(s) of Information Technology in restaurants?**



- Internet Technology ⇒ helps restaurants !

**Q : From your view, will it be the market trend to use information technology in restaurants?**



# Social Media

- A group of websites, that built on the foundations of Web 2.0, not just only provide you information but can also interact with you
  - ✓ freedom of speech (allowed to give comments on anything)
  - ✓ freedom of voting
  - ✓ recommend articles based on user's interests freely



# Common Social Media Services

- Social Networking websites



- Photos and Videos Sharing websites



- Blogs



- Coupon sites



- Customer review sites



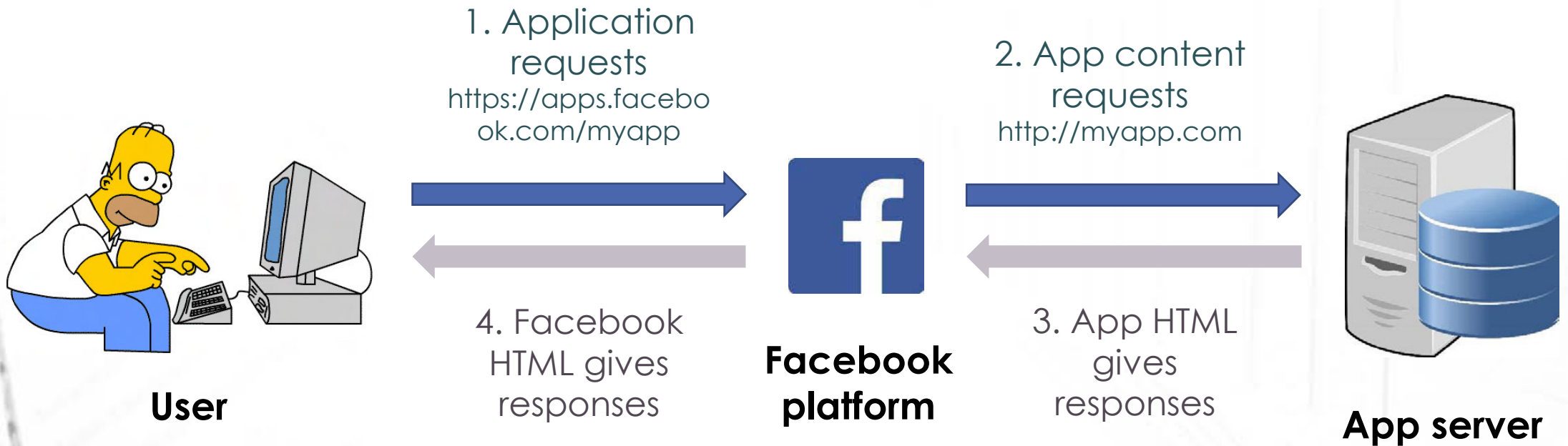


# What do Social Media Marketing Programs do?



- Create content that attracts attention  
↓  
encourages readers to share it across their social networks
- Any statements consumers share via Internet about an event, product, service, brand or company is called **electronic word of mouth (eWoM)**
- underlying messages spread from a trusted third-party source + ✓ resonates  
↓  
results in earned media

# Overview of Facebook Application Technology



# How can Facebook Applications help restaurants?

- Data can be collected includes :
  - Users' profiles
  - Educational background of users
  - Events participated
  - Groups joined
  - Users' corresponding interests
  - Posts / groups / comments users "Liked"
- Things can be done by restaurants :
  - Writing posts

應用程式 ▶ 你今天會被雷劈到的機率是多少? ▶ 權限

The screenshot shows the 'Configure your permissions' interface for a Facebook application. The title is '你今天在雷劈到的機率是多少?' (What is the probability of you being struck by lightning today?). The interface includes a 'Default Activity Privacy' dropdown set to '公開' (Public), a 'User & Friend Permissions' section with a search box containing 'u', and a list of permissions. The 'user\_education\_history' permission is highlighted by a mouse cursor. Other permissions listed include user\_about\_me, user\_activities, user\_birthday, user\_groups, user\_hometown, user\_interests, user\_likes, user\_location, and user\_questions. There are also fields for 'Extended Permissions' and 'Auth Token Parameter'.

# How can Social Media help restaurants?

- Offering discounts to diners
- Promote new and special dishes
- A platform for recruitment

**Pacific Coffee 咖啡素椰香蕉朱古力鮮奶咖啡飲品 買一送一優惠券**

商戶: Pacific Coffee  
類別: 飲食  
地址: [途線分店](#)  
信用卡: --  
優惠期: 2014-10-10 至 2014-10-14 (優惠 只剩4天)

**內容**  
內容: Pacific Coffee 咖啡素椰香蕉朱古力鮮奶咖啡飲品買一送一優惠券(至14年10月14日)  
條款及細則: --  
圖片:

咖啡素椰香蕉朱古力鮮奶咖啡/香蕉朱古力  
**買一送一 電子優惠券**

特別優惠細則:  
• 只適用於咖啡及奶茶類產品  
• 適用於全港Pacific Coffee (部分門市除外)  
• 此優惠券由2014年10月10日起生效  
• 憑此優惠券可獲贈送指定飲品一份  
• 此優惠券不可與其他優惠券同時使用  
• 每位顧客最多可獲贈送一份  
• 此優惠券只限在指定門市使用  
• Pacific Coffee Co. Ltd. 保留最終決定之權利

★ 延伸閱讀/ 相關著數 ★

**Oliver's Super Sandwiches**

Fresh Attitude. Your Way.

**Oliver's Super Sandwiches**  
食肆及餐廳

用戶: 8,105 個讚好, 6,690 個簽到次

Katie Leung、Sara D. Sung 和 Chor Man 都對此讚好。

Oliver's 誠邀您加入我們的大家庭! 歡迎對餐飲業有興趣人士將履歷電郵至 [recruit@olivers-supersandwiches.com](mailto:recruit@olivers-supersandwiches.com) 或向 Facebook inbox 查詢。我們等您加入呀!

Oliver's is now recruiting new members to join our team! Interested parties please send us an email at [recruit@olivers-supersandwiches.com](mailto:recruit@olivers-supersandwiches.com) or leave an inbox message for more details! We are waiting for you to join us!

Hong Kong  
2601 7574

**香港吉野家 Yoshinoya Hong Kong**

牛肉飯專門店 食物/飲品

117,598 個讚好, 109 個簽到次

Tung YC、Chor Man 和其他 23 人都對此讚好。

關於:  
• 分店地址 / 營業時間  
<http://www.yoshinoya.com.hk/location.php>  
• 外賣服務  
<http://www.yoshinoya.com.hk/purchase.php>  
• 營業時間  
<http://www.yoshinoya.com.hk/comment.php>  
• <http://www.yoshinoya.com.hk/>

香港吉野家玩盡 哈囉嘢雙倍全日祭! 參加左嘅朋友仔記住去 WeChat 香港吉野家喇! 睇吓下有無中獎喇!

推廣期內, 於早餐/下午茶時段惠顧滿\$40, 或午市/晚市時段惠顧滿\$70, 將即日收據相片傳到 WeChat「香港吉野家」帳號:  
- 每日第66、166、266、366位參加者可贏取海洋公園門票2張  
— 查看更多

# How can Social Media help restaurants?

- Raise the public awareness by organizing different contests to make it more fun



# How can Social Media help restaurants?

- get feedback from customers for improvement
- provide solutions to problems + resolve complaints
- keep living up to its good reputation



# Pros of using Social Media Marketing



- either free or at low price
- fast
- can promote globally
- Two-way communication  
→ improve customer services
- enhance the network connections with both customers and raw materials suppliers
- collaboration of knowledge sharing

# Cons of using Social Media Marketing

- may reveal unwanted negative comments to users + raise criticism
- may face problems like spam, copyright & privacy related issues
- may have risks of being hacked  
→ shared incorrect information





# How can App-based Marketing help restaurants?

- ✓ e-Menu
- Use GPS to search for restaurants around you



## How can App-based Marketing help restaurants?



- Loyalty Program
  - ✓ view membership details
  - ✓ save / accumulate points for future use
  - ✓ reserve table

## How can App-based Marketing help restaurants?

- order pick up / food delivery
- offer coupons and discounts
- spread the latest news of new dishes
- ✓ embed with In-app game



# Food Ordering Real Example



1. Online ordering



3. Food delivery

2. Delivery details



# Pros of using App-based Marketing

- ✓ send notifications to customers
- convenient to prepare marketing materials
- ✓ interact with customers directly
- ✓ keep track on users' responses
- allow e-payment

# Cons of using App-based Marketing

From views of restaurants...

- Difficult to build a version that is suitable for all different existing mobile platforms
  - different screen sizes, OS, browsers

From views of diners...

- Limited navigation for handheld gadgets

# Suggestions

How can we make use of the existing **Information Technology** to run a restaurant other than those are using now?



# Suggestions

1. How can IT help **facilitating the seating of guests** in restaurants?

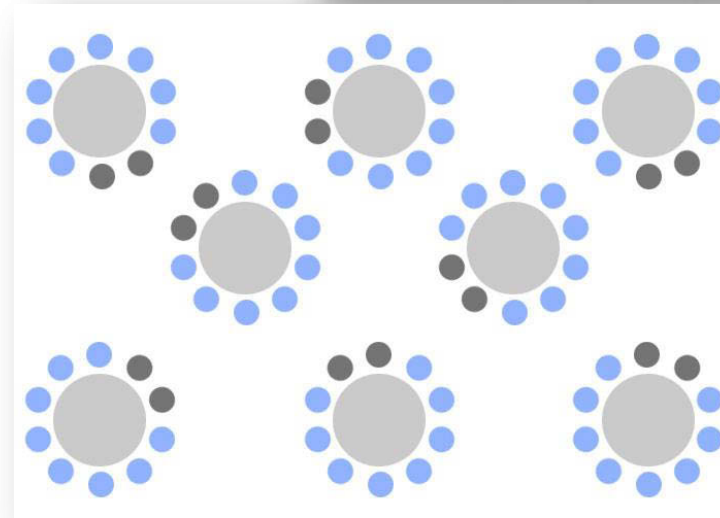


Hosts use NFC technology instead of keeping sheets for reservation

Better table management

Provide the best plan for utilizing all tables to serve diners in every turn

✓ more accurate quoting of wait times





# Suggestions

2. How can IT help **improving food ordering process** in restaurants?
  - Touch screen dining tables  
→ shows all food related information



# Suggestions

## 2. How can IT help **improving food ordering process** in restaurants?

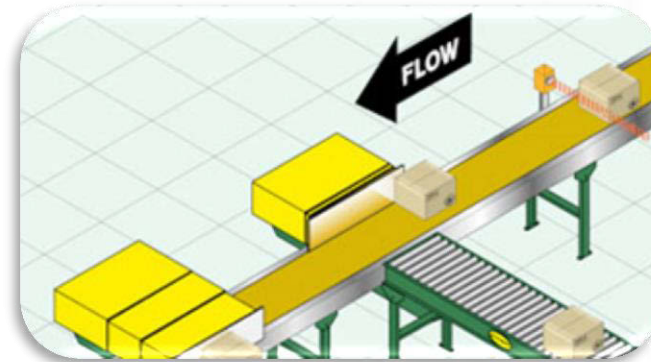
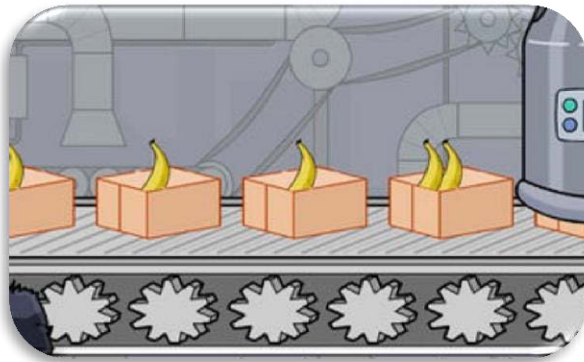
For restaurants that have low budgets :

- Using QR code menu (EACH dish will have its' own unique QR code)
  - ↓ cost
  - ↑ efficiency
  - less room for mistakes in ordering food
  - ✓ offer instant discounts



# Suggestions

3. How can IT help **food production procedures in kitchens of restaurants?**



# Suggestions

4. How can IT help **retaining traditional style in Chinese restaurants?**
  - Things that only Chinese traditional restaurants have :
    - “Dim Sum” Cart
    - Pantry helpers



# Suggestions

4. How can IT help **retaining traditional style in Chinese restaurants?**
- Using smart “Dim Sum” carts + smart tables
    - Unmanned carts using beacons
    - NFC embedded tables + dishes



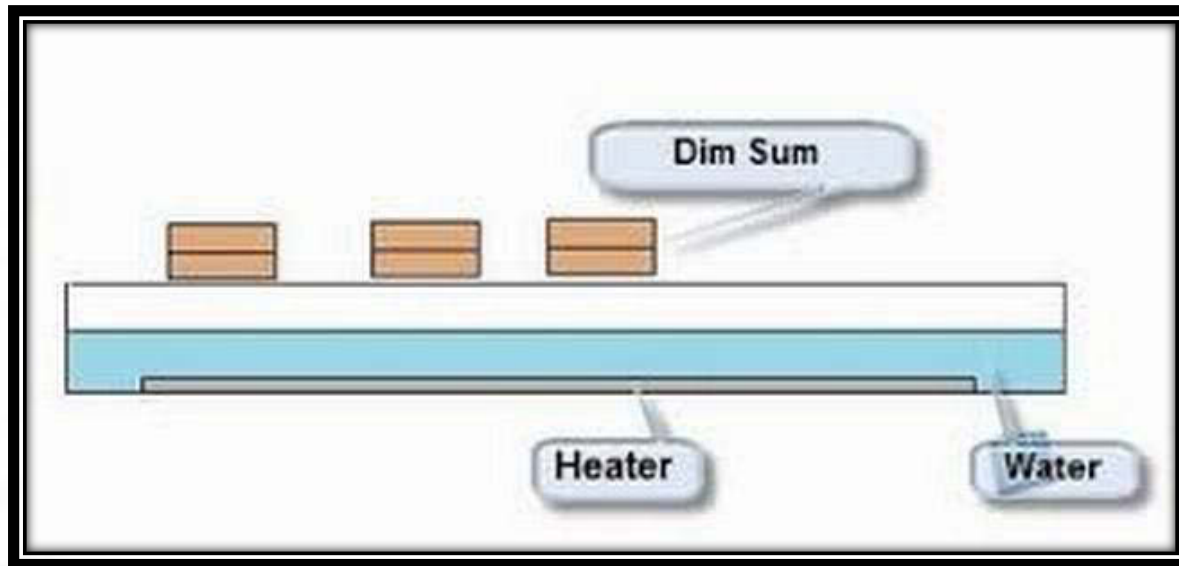
# Suggestions

4. How can IT help **retaining traditional style in Chinese restaurants?**



# Suggestions

4. How can IT help **retaining traditional style in Chinese restaurants?**



# Suggestions

## 5. How can IT help **improving services in VIP rooms** in restaurants?



- Everything can be made without the use of manpower  
⇒ enhance privacy within the VIP rooms
- Unmanned services include :
  1. Tea type selection for Chinese restaurants
  2. Water refilling services
  3. Computerized menu for food ordering
  4. Hidden and secure convey belt to deliver food
  5. e-Payment for the bill



# Suggestions

5. How can IT help **improving services in VIP rooms** in restaurants?
  - Using advanced dining tables, like the automatic “mah-jong” tables



# Suggestions

5. How can IT help **improving services in VIP rooms** in restaurants?
  - Using advanced dining tables, like the automatic “mah-jong” tables



# Suggestions

## 6. How can IT help **improving takeout services** in restaurants?

- Make use of QR code technology to select food from menu
- NFC technology ⇒ food takeaway



# Conclusion

By using .....

RFID technology

- Improve restaurants' management of materials flow

Mobile POS

- Operation cost of restaurants

Social Media

- Help making profits for restaurants



# Vision

In future, with the help of information technology in restaurants.....

- Restaurants may be able to earn more profits
- Manpower no longer accounts for the most of the cost
  - Lots of processes can be finished by using technology
  - Many tasks can be done in unmanned ways
- Efficiency can be raised
  - Avoid careless mistakes made by lazy waiters/waitresses
- Still 10% service charges ?

**The End**

