

# LYU1301 MOBILE APPLICATION USING NFC

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2013-2014

Term 1

Final Year Project  
Presentation



# AGENDA

- Introduction to NFC
- Our research on NFC
- Our application of NFC
- Q&A

# INTRODUCTION TO NFC

# WHAT IS NFC?



# WHAT IS NFC?



# RESEARCH ON NFC

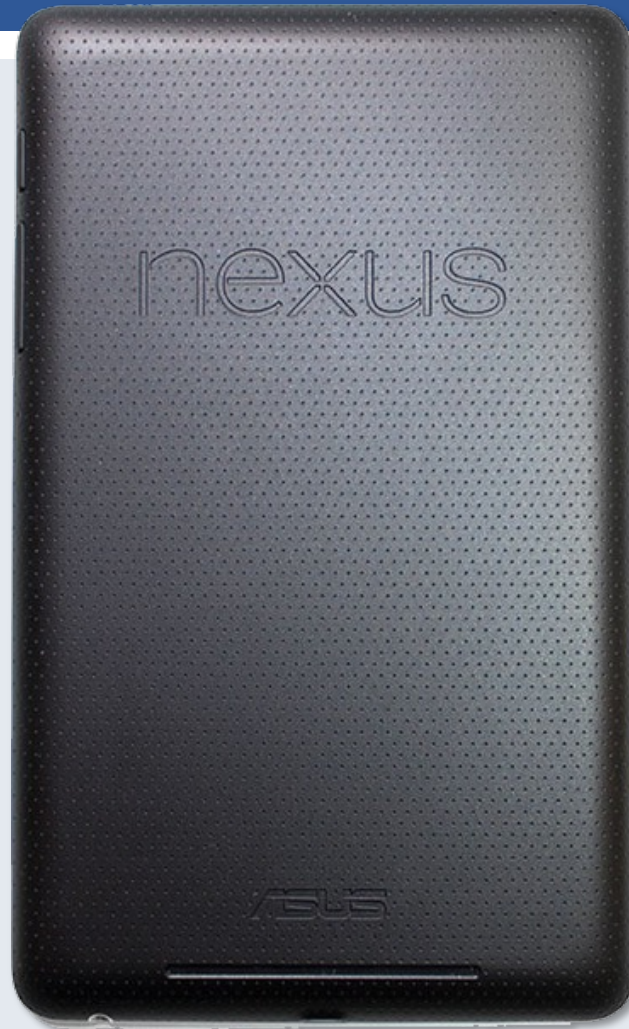
# WHY?

- Understand the usage of NFC
- Understand the limitation of NFC

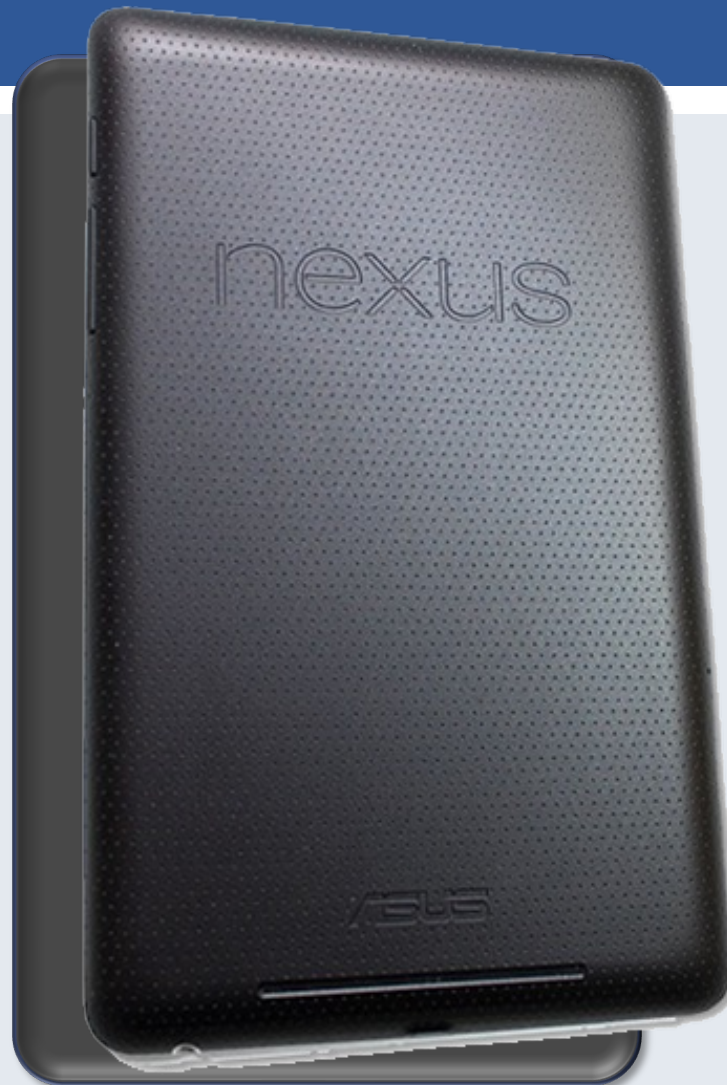
# WHAT IS INSIDE THE PHONE?



# NFC CONTACTLESS FRONT END (CLF)



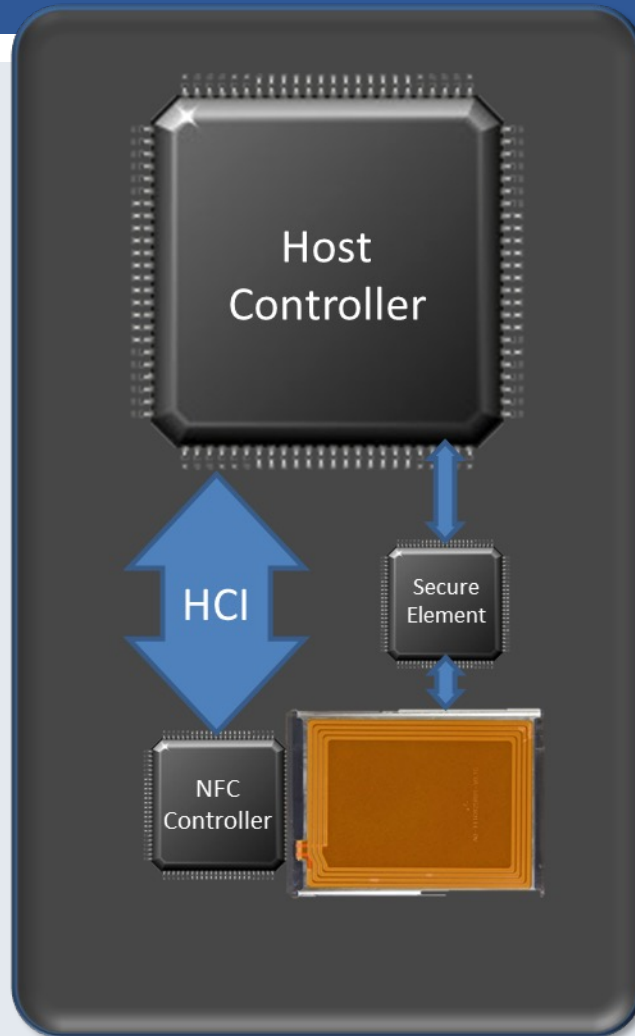
# NFC CONTACTLESS FRONT END (CLF)



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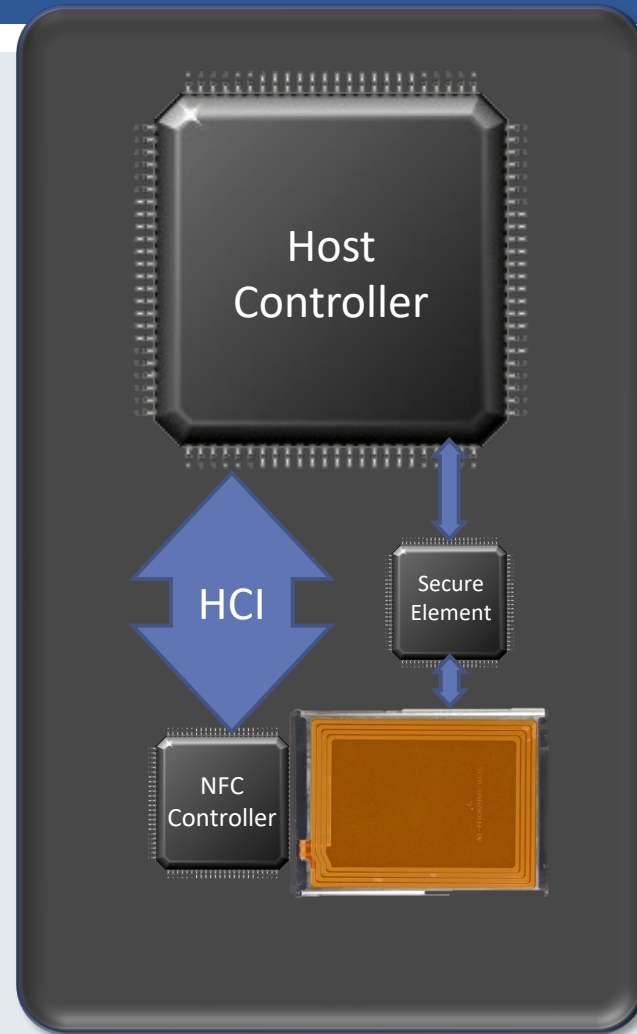


# NFC CONTACTLESS FRONT END (CLF)



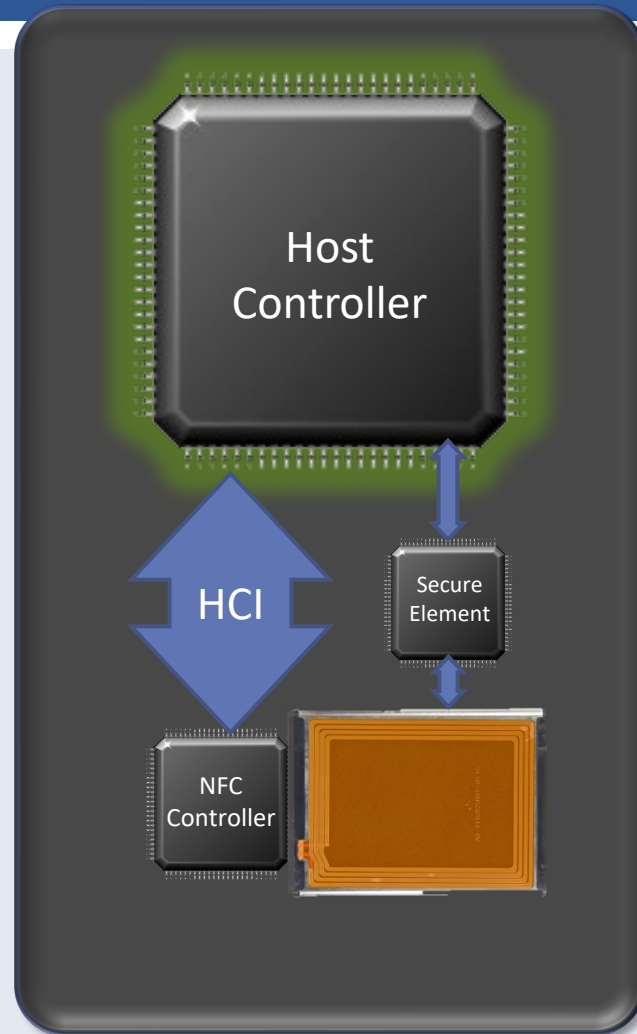
# NFC CONTACTLESS FRONT END (CLF)

- Host Controller
- NFC Controller
- HCI
- Secure Element



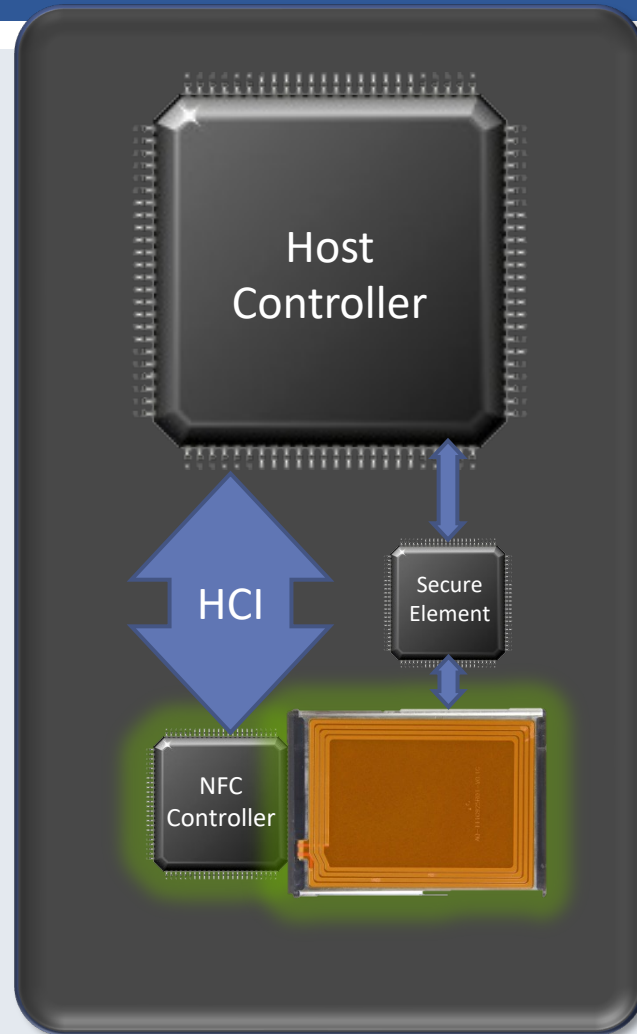
# NFC CONTACTLESS FRONT END (CLF)

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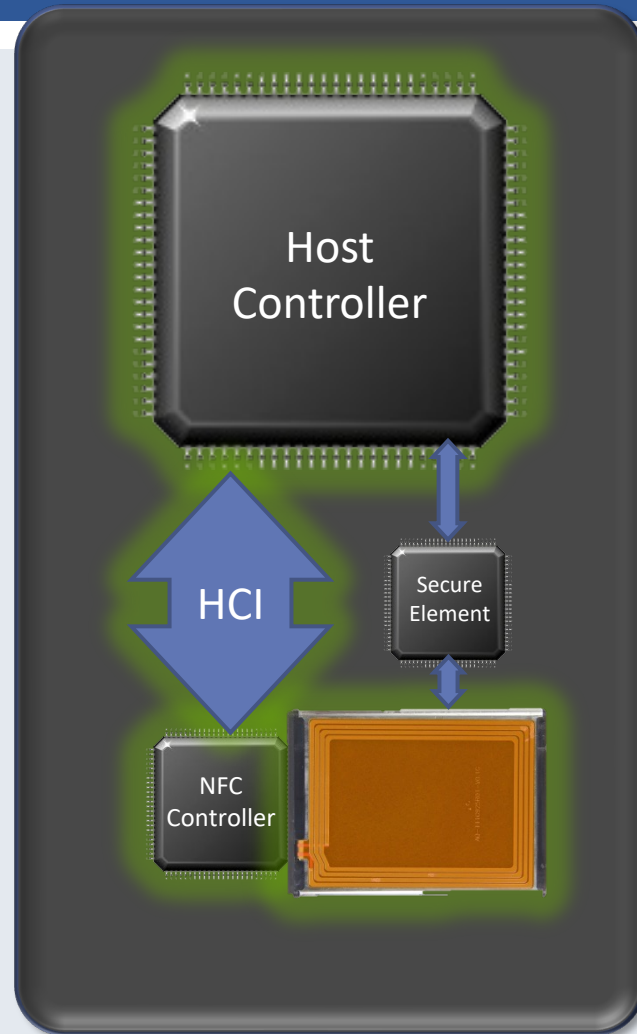
# NFC CONTACTLESS FRONT END (CLF)

- Host Controller
- NFC Controller
- HCI
- Secure Element



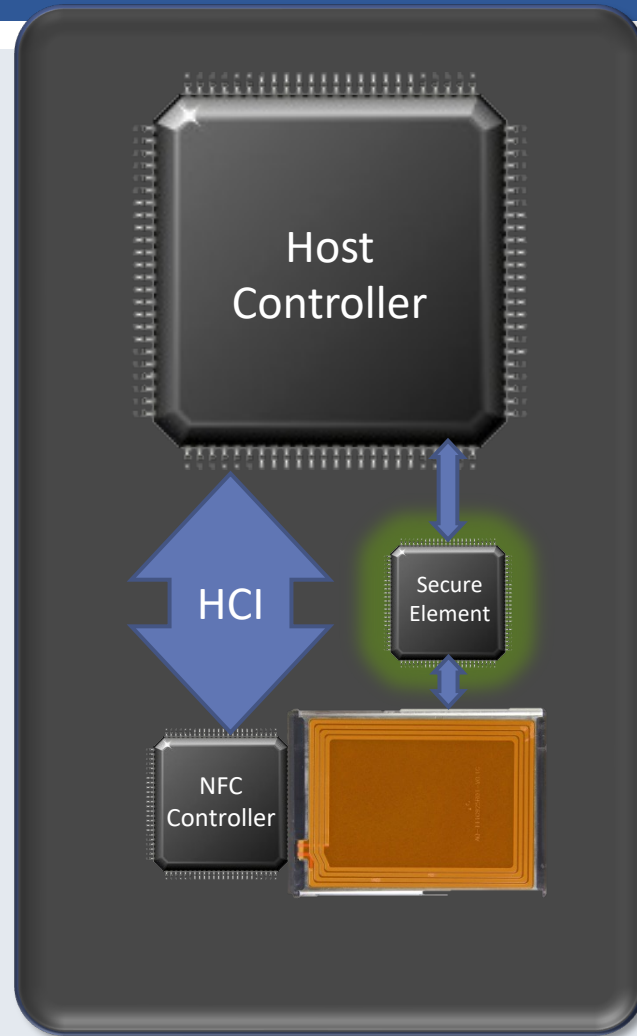
# NFC CONTACTLESS FRONT END (CLF)

- Host Controller
- NFC Controller
- HCI
- Secure Element



# NFC CONTACTLESS FRONT END (CLF)

- Host Controller
- NFC Controller
- HCI
- Secure Element (Optional)



# NFC OPERATING MODES

- Reader/Writer Mode
- Peer-to-peer Mode
- Card Emulation Mode

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# RECENT APPLICATION

- Shopping
- Card Emulation
- Phone Setting
- S-Beam

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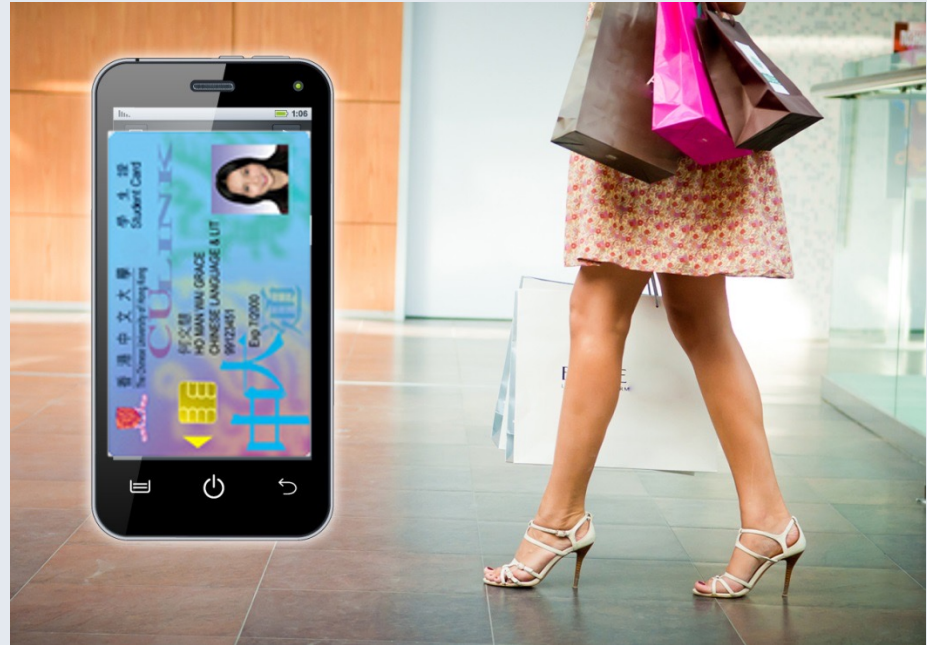
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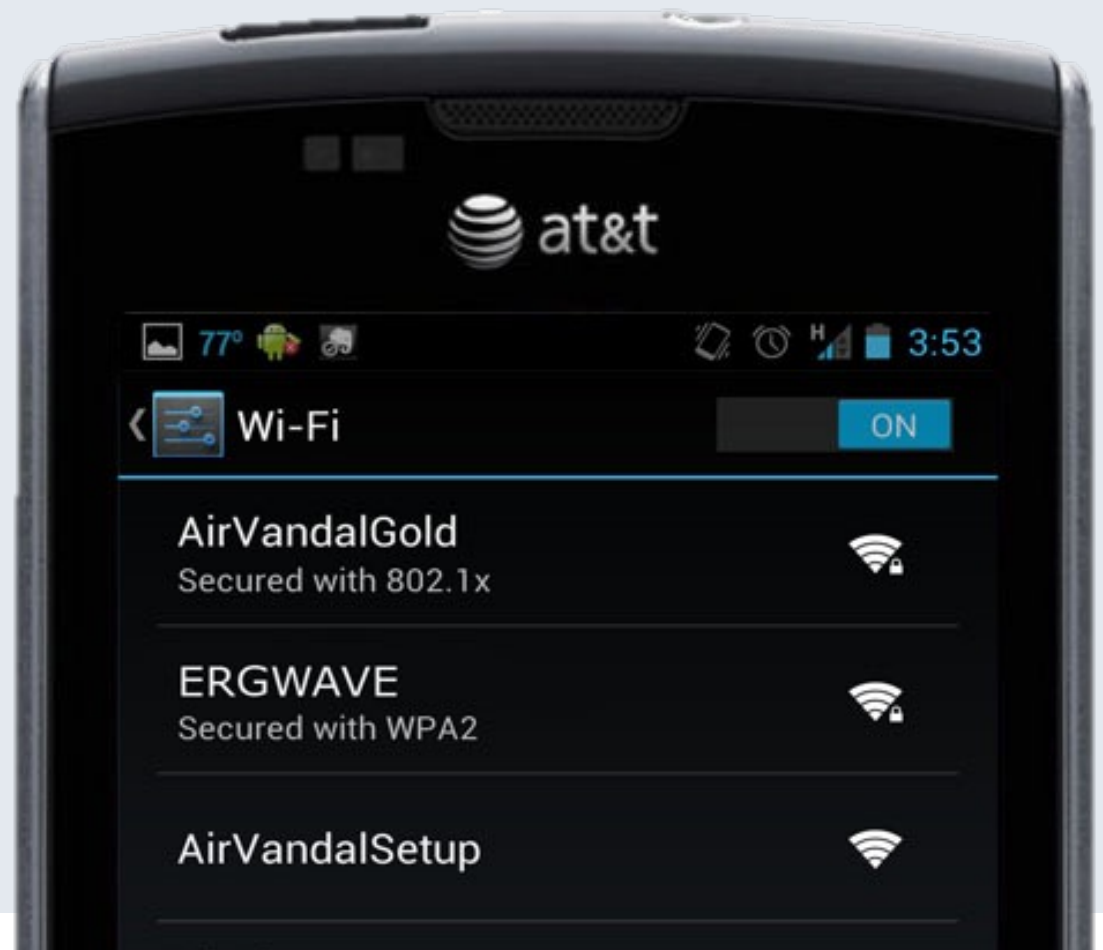
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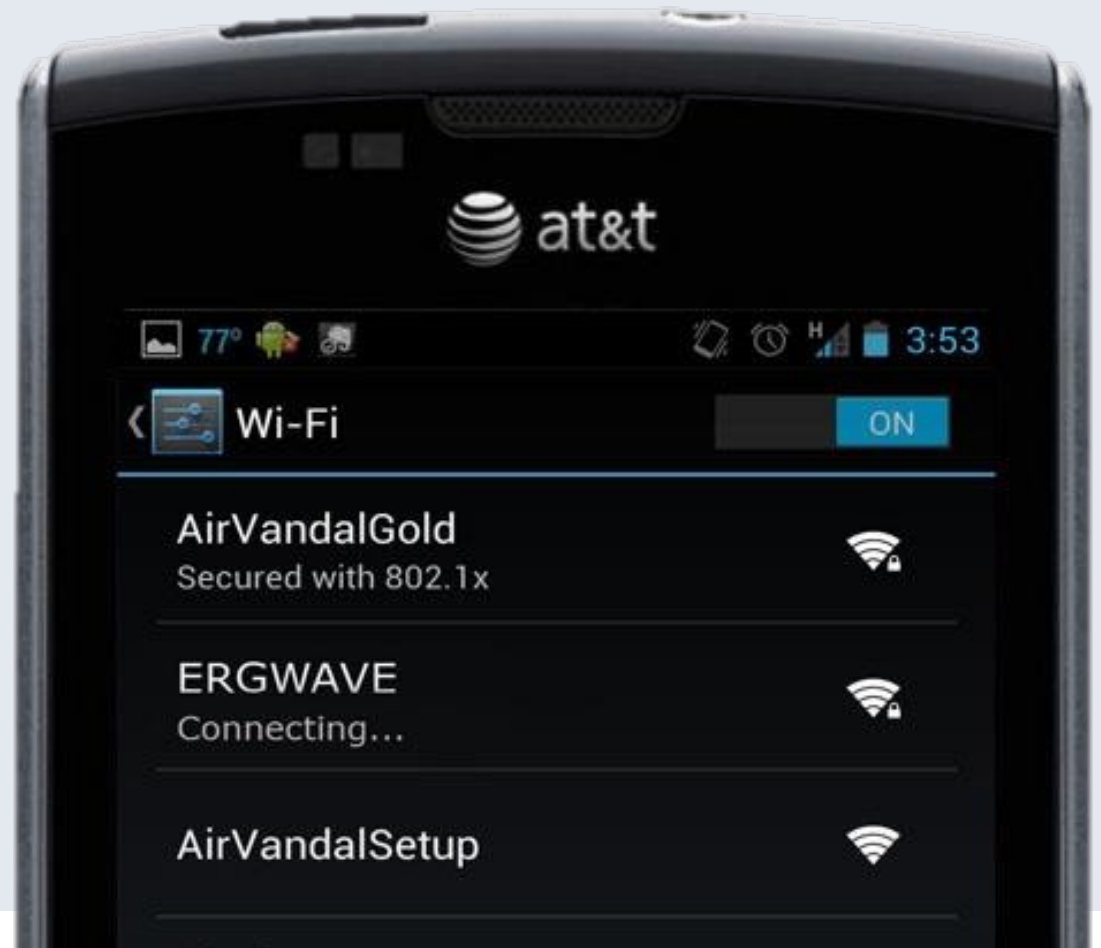
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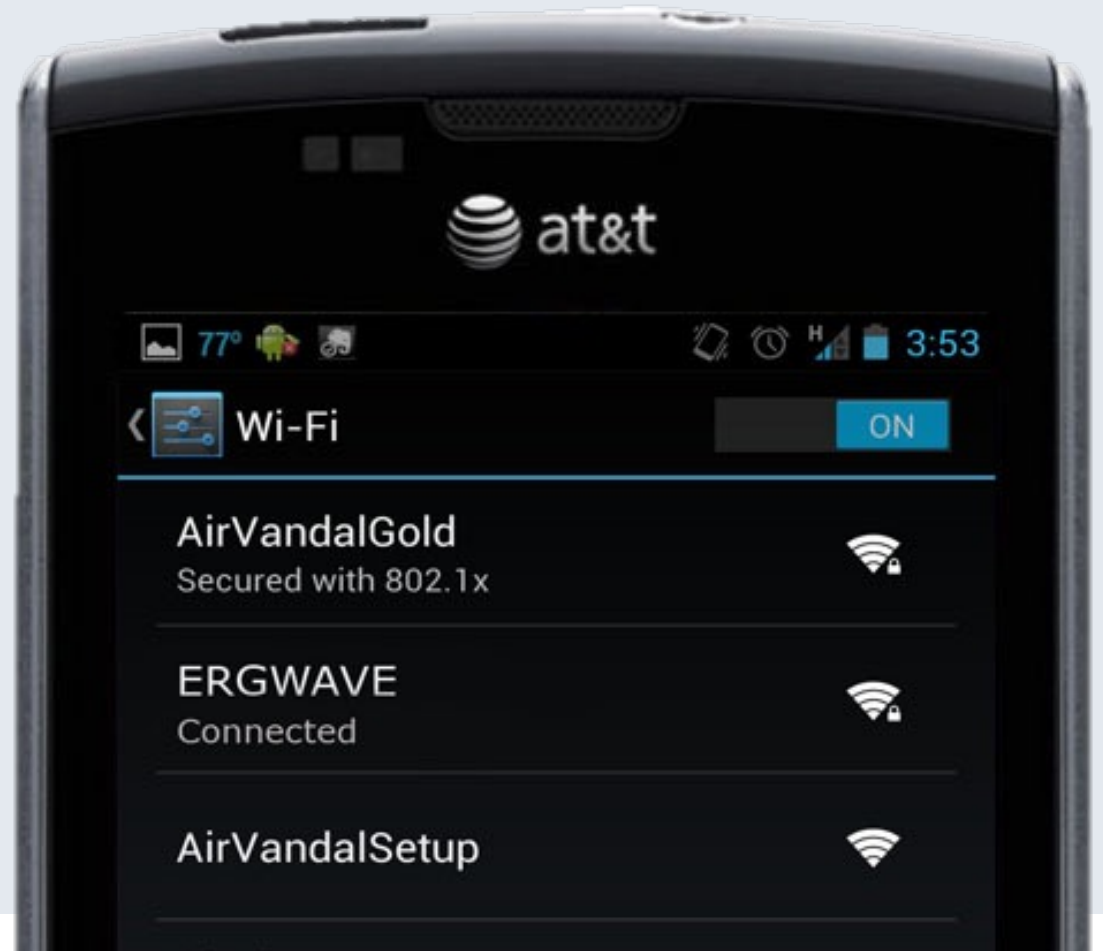
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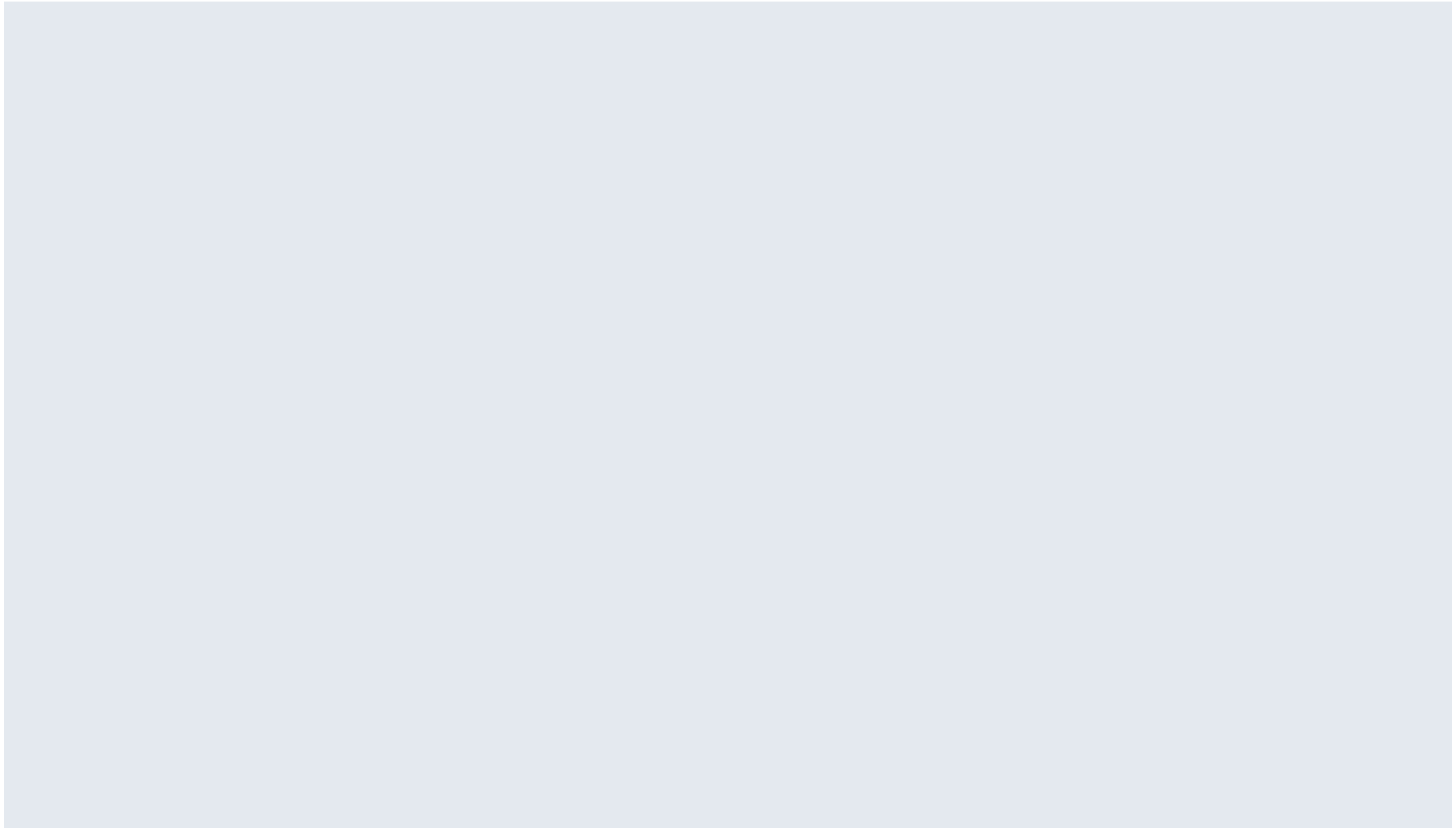
# RECENT APPLICATION

- Shopping
- Card Emulation
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# WE HAVE LEARNT

- The possibility usage of NFC
- The security level of NFC
- The communication limitation of NFC
  - E.g. P2P Half-duplex mode







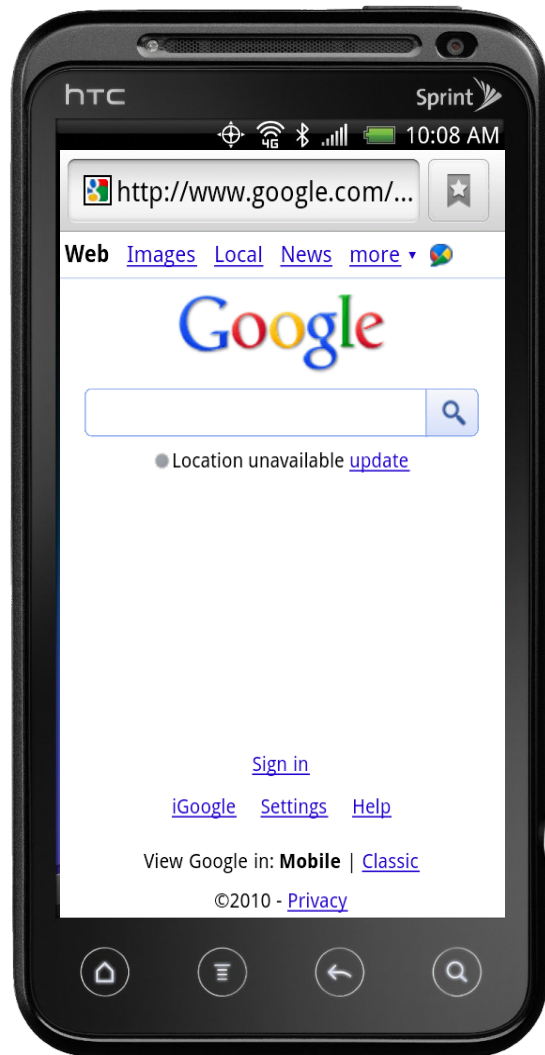




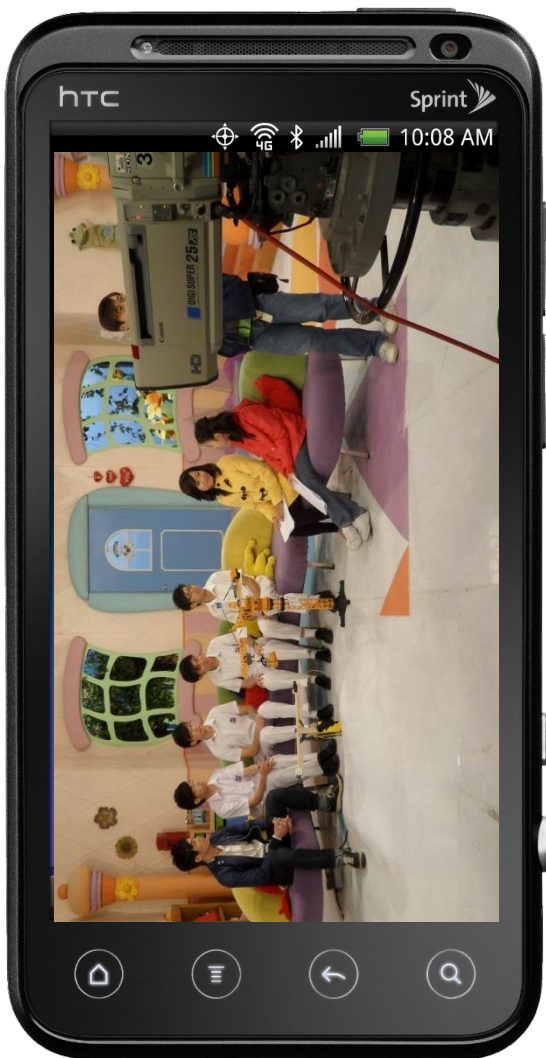










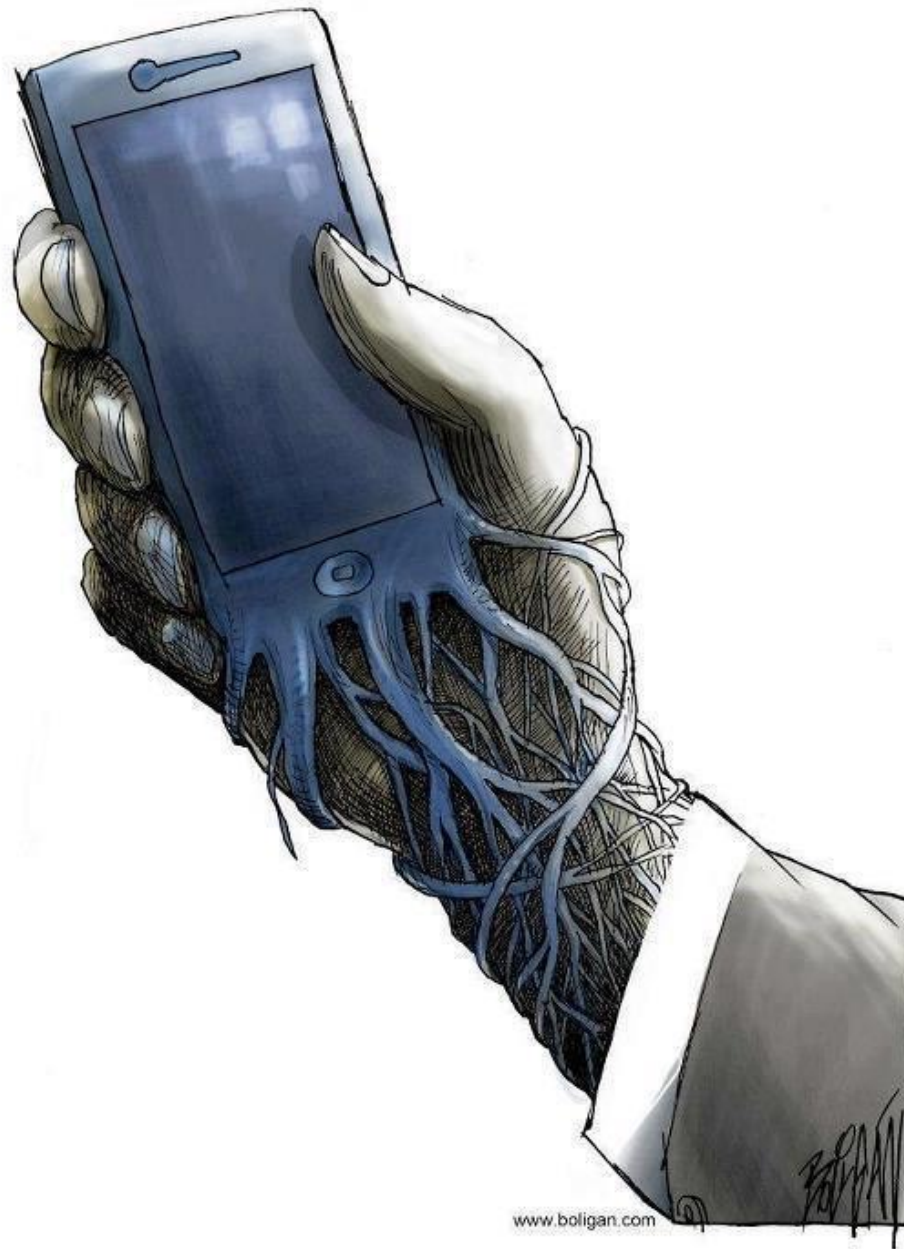















ADDICTED TO  
OUR i-PHONES?  
THEY'RE HAVIN'  
A LAUGH

OMG - YEAH -  
LOL - GOTTA GO  
- GOTTA CHECK  
WHO'S **TWEETED**  
ABOUT IT







錢一  
穆九  
先生零  
論年  
天人九  
合一十六  
歲

(一)

中國文化過去最偉  
大的貢獻，在於對天  
人關係的研究。中國人  
喜歡把天與人配合着講  
。我曾說天人合一論。  
是中國文化對人類最大  
的貢獻。從來世界人類最初  
碰到的困難問題，便是  
有關天的問題。我曾讀  
過幾本西方歐洲古人所



# REALITY

Worst game ever.





# Objective

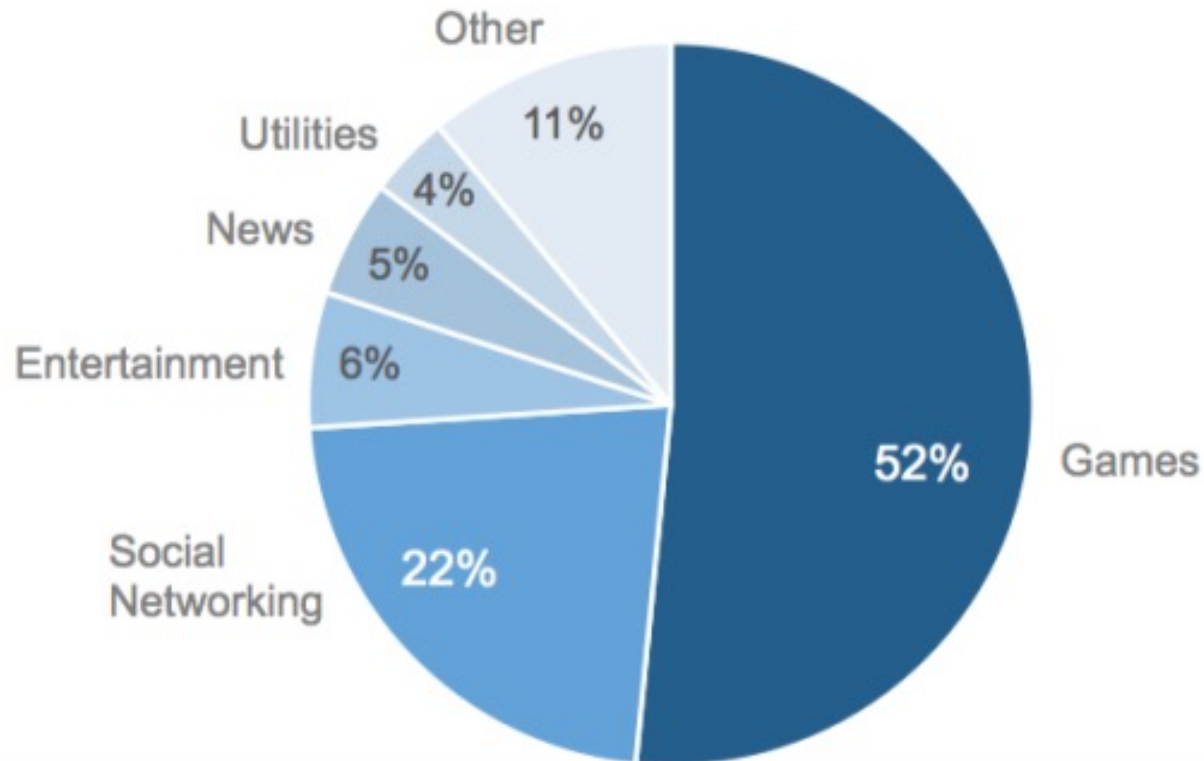
- To build an attractive application using NFC
- To enhance interaction between people and reality

# Objective

attractive ?

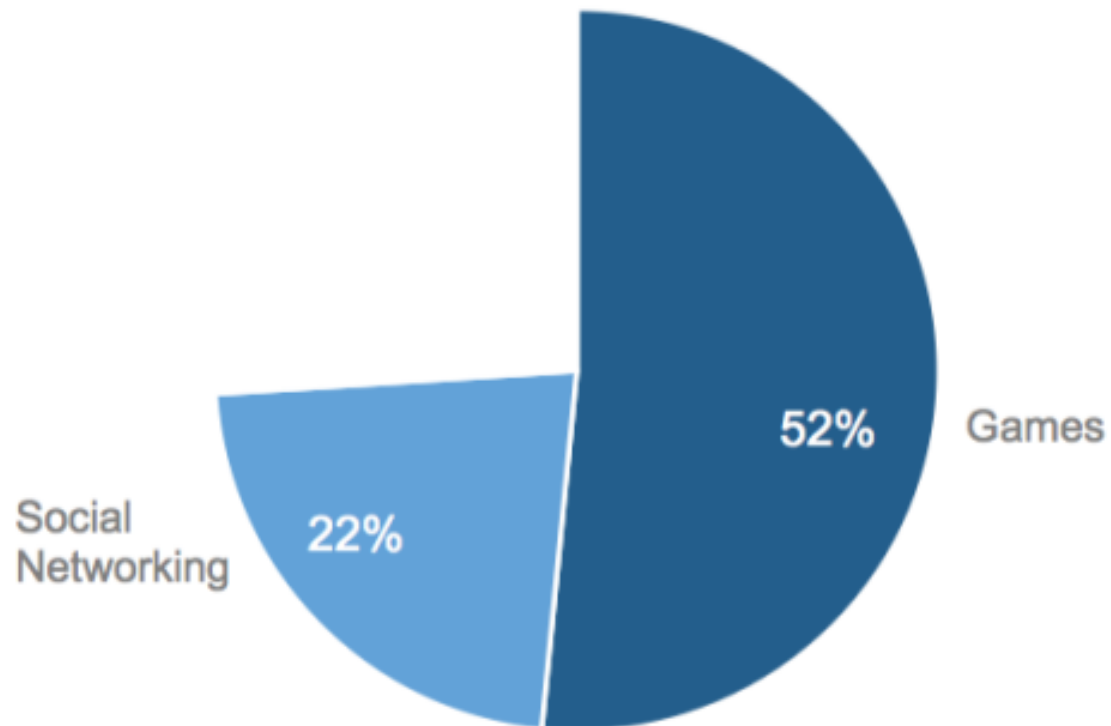
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## Worldwide Sessions per Category



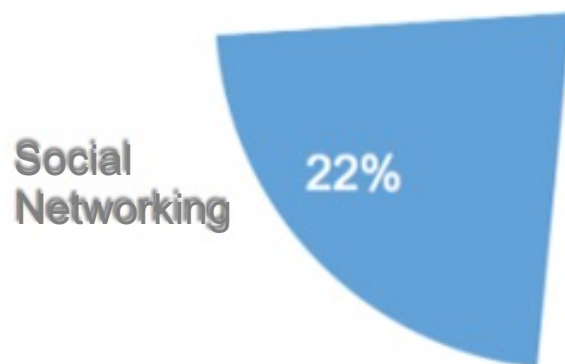
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## Worldwide Sessions per Category



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## Worldwide Sessions per Category



Social  
Networking



What Not To Buy? Pet Store Puppies!



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Top comments ▾

# facebook



Facebook shared a link.

August 21



Today, we're announcing Internet.org, a global partnership between technology leaders, nonprofits, local communities and experts who are working together to bring the internet to the two thirds of the world's population that doesn't have it.

#ConnectTheWorld



**Internet.org**

[www.internet.org](http://www.internet.org)

Every one of us. Everywhere. Connected.



Show more

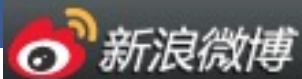
ALL COMMENTS (2,080)



Share your thoughts

Top comments

# facebook



Facebook shared a link.

August 21

#玩转微博#达人专属信用卡有哪些专属优势？  
1、个性域名—你的微博你的卡；2、专属特惠—千家商户优惠全年享；3、达人加速—刷卡消费达人积分同步累积；4、每月首笔取现免手续费；5、达人等级每升一级，获赠招行信用卡积分，等级越高赠送越多  
更多优势→<http://t.cn/8DDLA2m>。



### 玩转微博

微博是种生活，通过微博我们更好地了解世界，如何玩转微博？你知道

话题详情

369

11月30日 14:10 来自皮皮时光机 / one of us. Everywhere. Connected.



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mongkok brother

發表於 2009-8-27 06:00 PM [只看該作者](#) [繁](#) [簡](#)



香討旺

系統管理員



帖子 14974

積分 1608

金幣 8

註冊時間 2003-2-22



系統管理員



發短消息

加為好友

簡介

為了帶給會員更多功能,

我們在暑假完結前,

將率先推出 討論區交易系統,

幫助會員, 在討論區內更簡便地進行交易買賣。

[http://www.discuss.com.hk/ts.php?item=ts\\_guide](http://www.discuss.com.hk/ts.php?item=ts_guide)

實用相關搜尋: [交易](#)



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ALL COMMENTS (2,080)



Share your thoughts

Top comments ▼



只看該作者 繁 簡



簡介

為了帶給會員更多功能,

No.2  
美肌食品



Share on Facebook

## CUPAL Beauty

CUPAL Beauty 瑞士膠原蛋白美肌精華 (桃味)



詳情



容量/價格

清淡蜜桃味(14天份量) 內含14包獨立包裝, 方便攜帶, 能令妳隨時隨地都可以為肌膚注入美肌精華。

清淡的蜜桃味, 更易入口, 讓妳輕鬆打造緊緻彈力肌。

使用方法: 每日一包, 加入1/3 杯(100毫升)暖水飲用或其他飲品飲用, 並加以攪拌。

發短消息

加為好友



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ALL COMMENTS (2,080)



Share your thoughts

Top comments ▼



## 范克廉樓學生膳堂 Benjamin Franklin Centre Student Canteen



🏠 沙田香港中文大學范克廉樓地下 [地圖](#)

☎ 2994 3412

🍽 港式

🕒 星期一至五: 11:00-21:00; 星期日: 08:30-21:00  
星期六休息

💰 \$40以下



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Beacon

范



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ALL COMMENTS (2,080)



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Top comments ▾

## Beacon of Harmony



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ALL COMMENTS (2,080)



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Top comments ▼

CUCOM

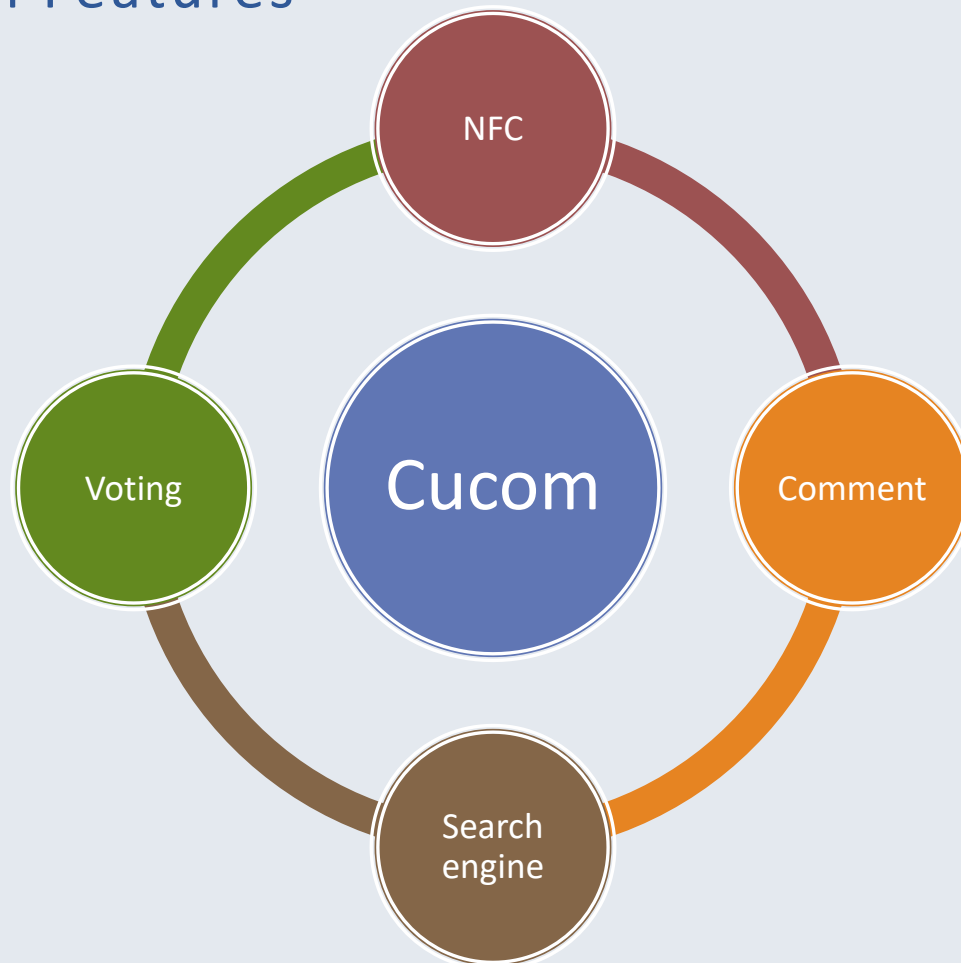
# OUR APPLICATION

- Cucom= Chinese University Communication
- Social App
  - To comment on physical environment in CUHK



# CUCOM

## ■ Four Main Features



# NFC



- CTag = Cucom's NFC Tag
- Located in different places (canteens, lectures theatres etc.)

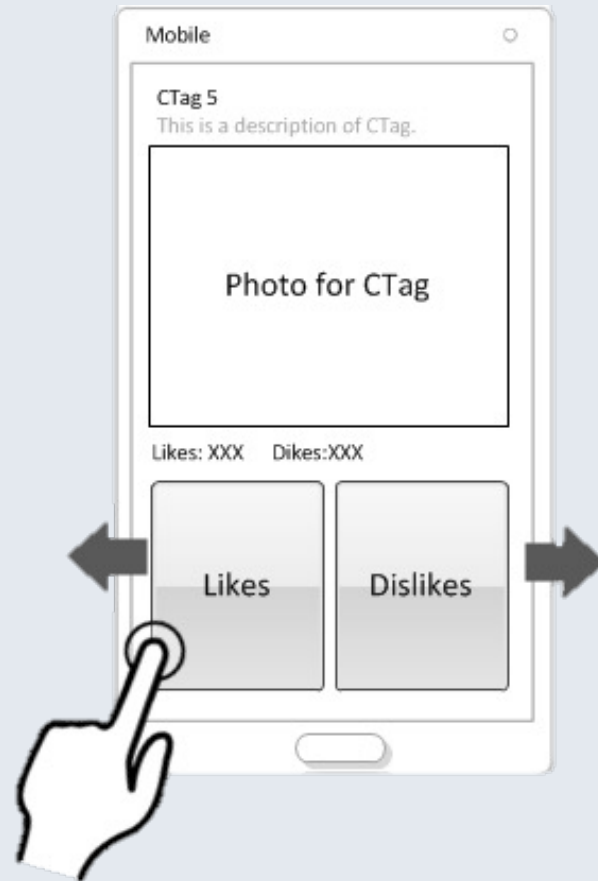
# NFC

- Network not required
  - Benefit for people who have no network
- List the information
  - Name
  - Description
  - Likes
  - Dislikes
  - Comments



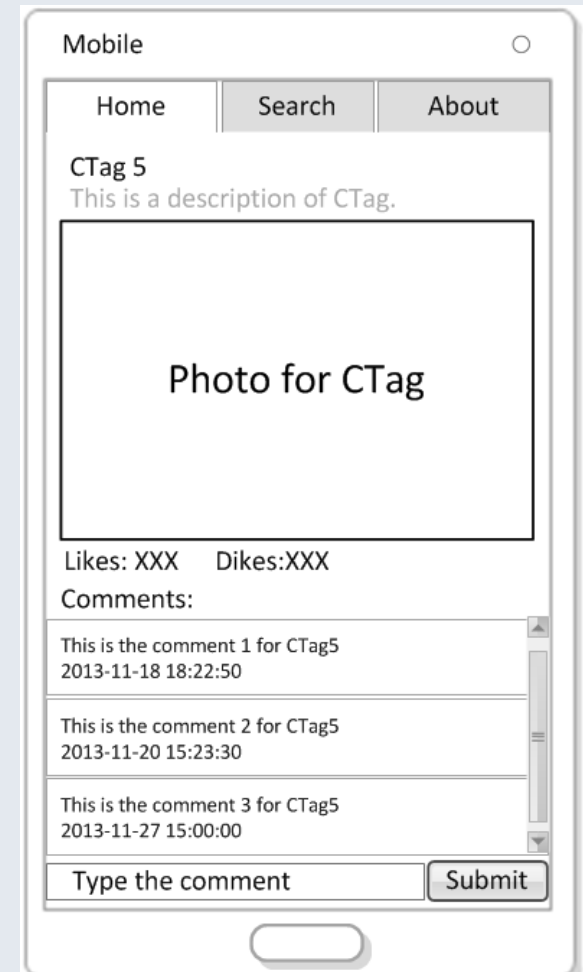
# VOTING

- Two choices
  - Likes
  - Dislikes
- Vote for once a month
  - Lower the biasness
  - Users can change their options
- Update when having network
- Required users to go to the location
  - Interact with real world
  - Reflect popularity



# COMMENT

- Express the opinions
- Not required users to go to the corresponding location



# SEARCH ENGINE

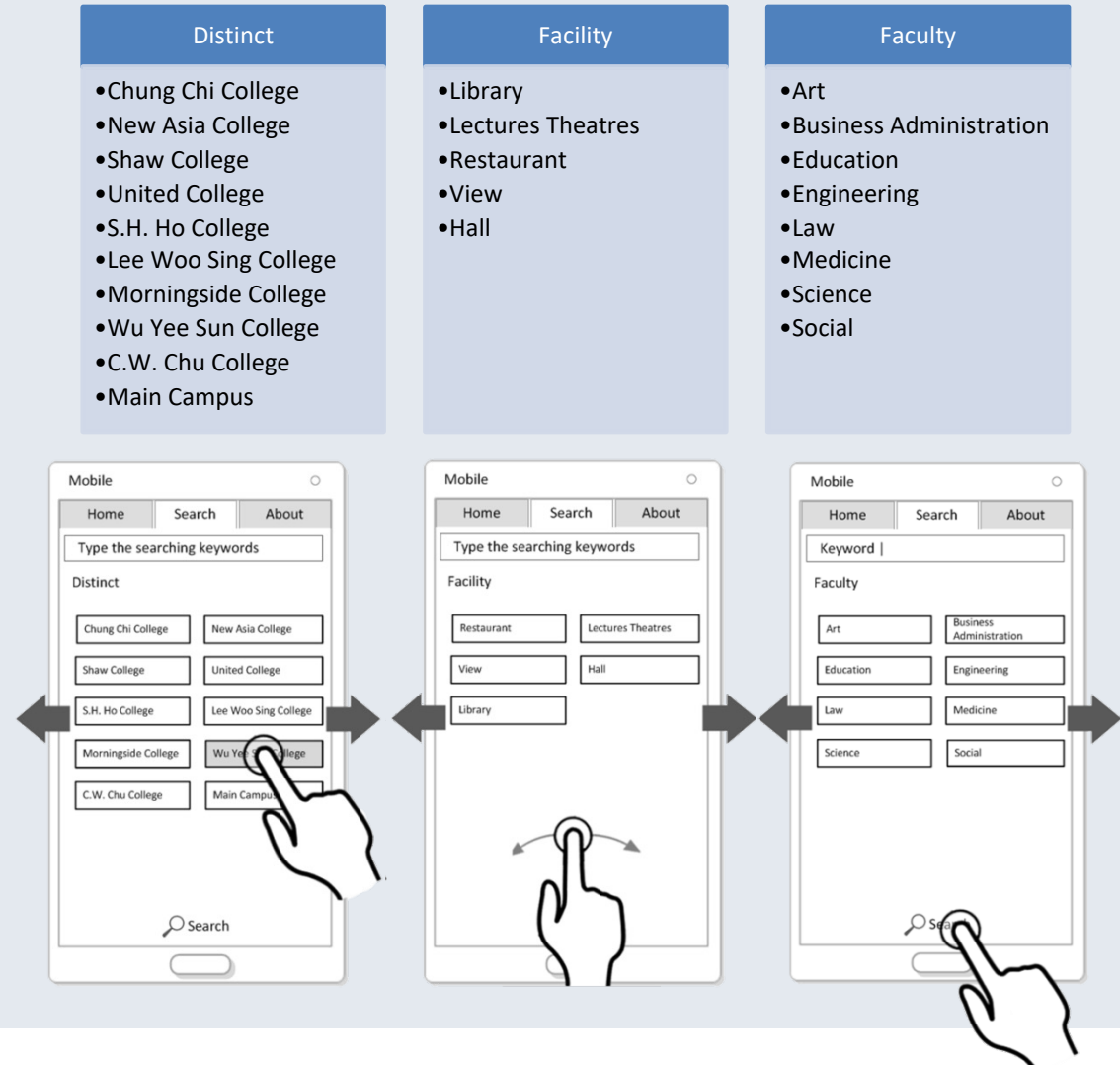
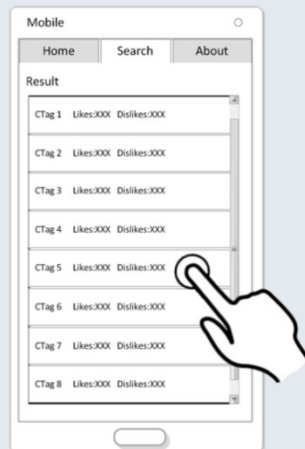
## ■ Category

For filtering

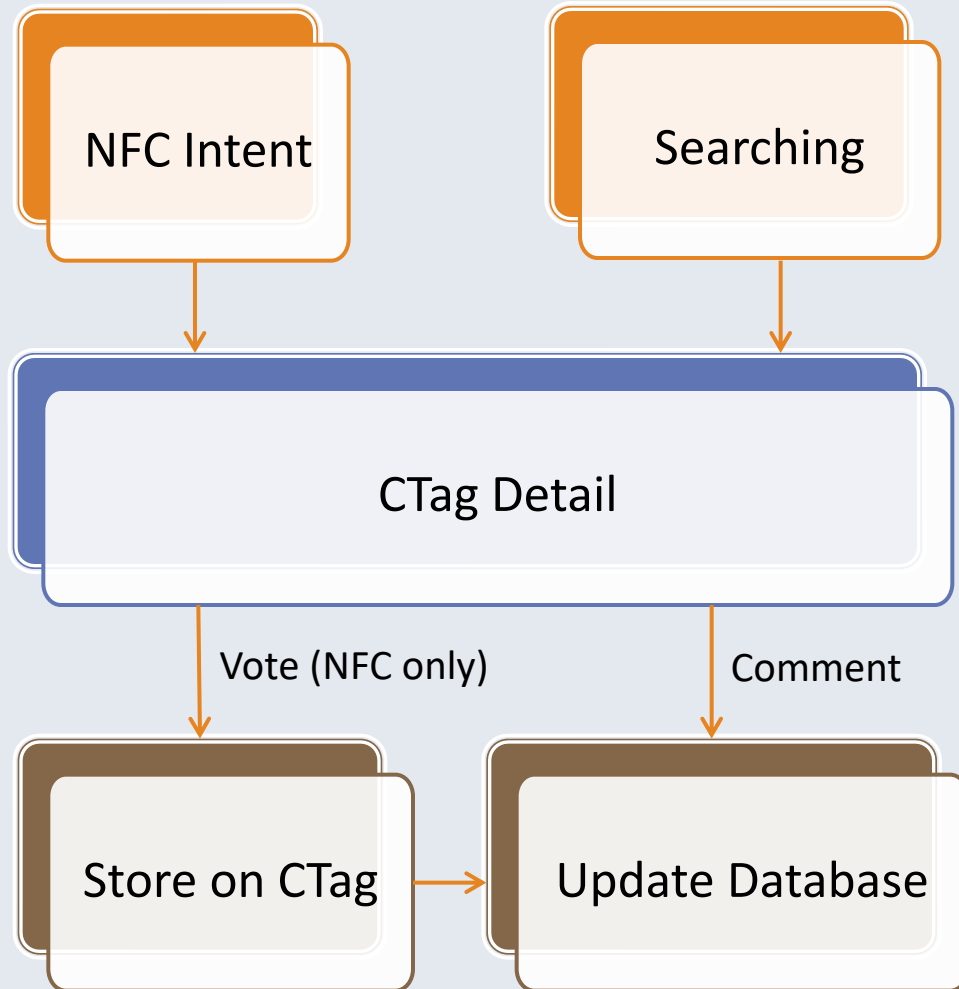
- Distinct
- Facility
- Faculty

## ■ Keyword

For searching



# COMPONENTS



# EXTRA

- Upload to server if possible
- Atomicity of writing action
- User Experience
  - Simple
  - Swiping
  - Searching

# LIMITATIONS AND DIFFICULTIES

## ■ NFC Tag Security

- Requires user to read and write data
- Limitation: complete datasheet on suitable tag type is not easily available

## ■ NFC Tag Lifetime

- The more popular the CTag, the lesser the lifetime

Popularity (Write/day)	Mifare Ultralight Lifetime (days)	Mifare Classic (days)
5	2,000	20,000
10	1,000	10,000
25	400	4,000
50	200	2,000
100	100	1,000
150	67	667
200	50	500
500	20	200

# FUTURE WORK OF CUCOM

## ■ **Comment in Offline**

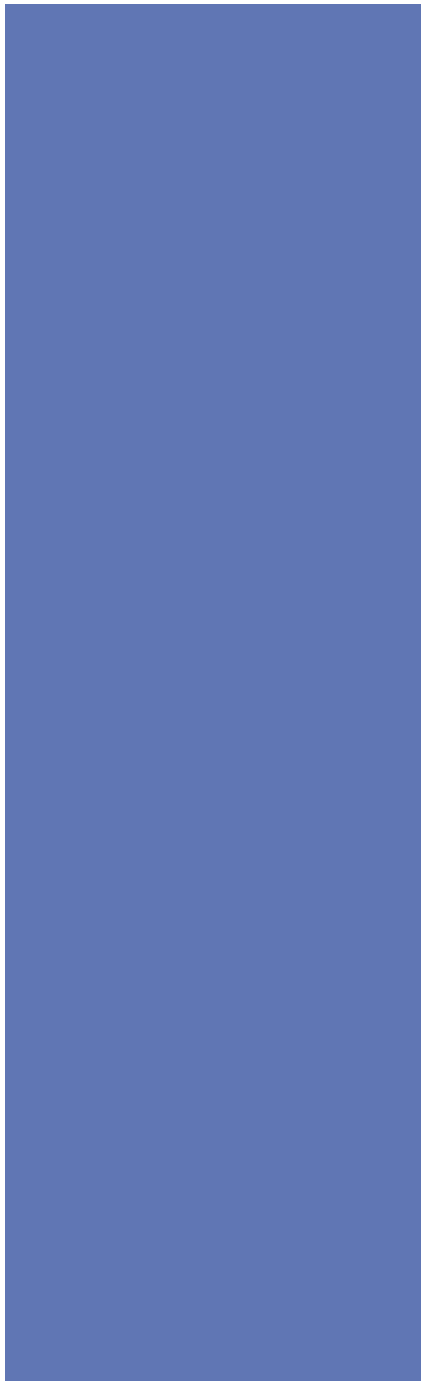
- Create buffer on remaining space in CTag

## ■ **Customizable Features**

- E.g. booking classroom, treasure hunt

## ■ **Enhance User Interface & Personalize**

- User account
- Add set of themes and characters
- Motion gesture



Q&A