

Arm
Tech

觸控上身



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Our Team

Our Concept

數位生活中 人們需要 遙控器



Our Concept

遙控器 不是萬能 也並非隨手可得



Our Concept



用身體當遙控器

Body as Remote

Our Concept

Microsoft Kinect



Asus Xtion



PrimeSense



但...

體感偵測器 卻不便於

隨身攜帶

Our Concept

What we do is...

使體感偵測器能 隨身攜帶



What we do

使

觸控
上身

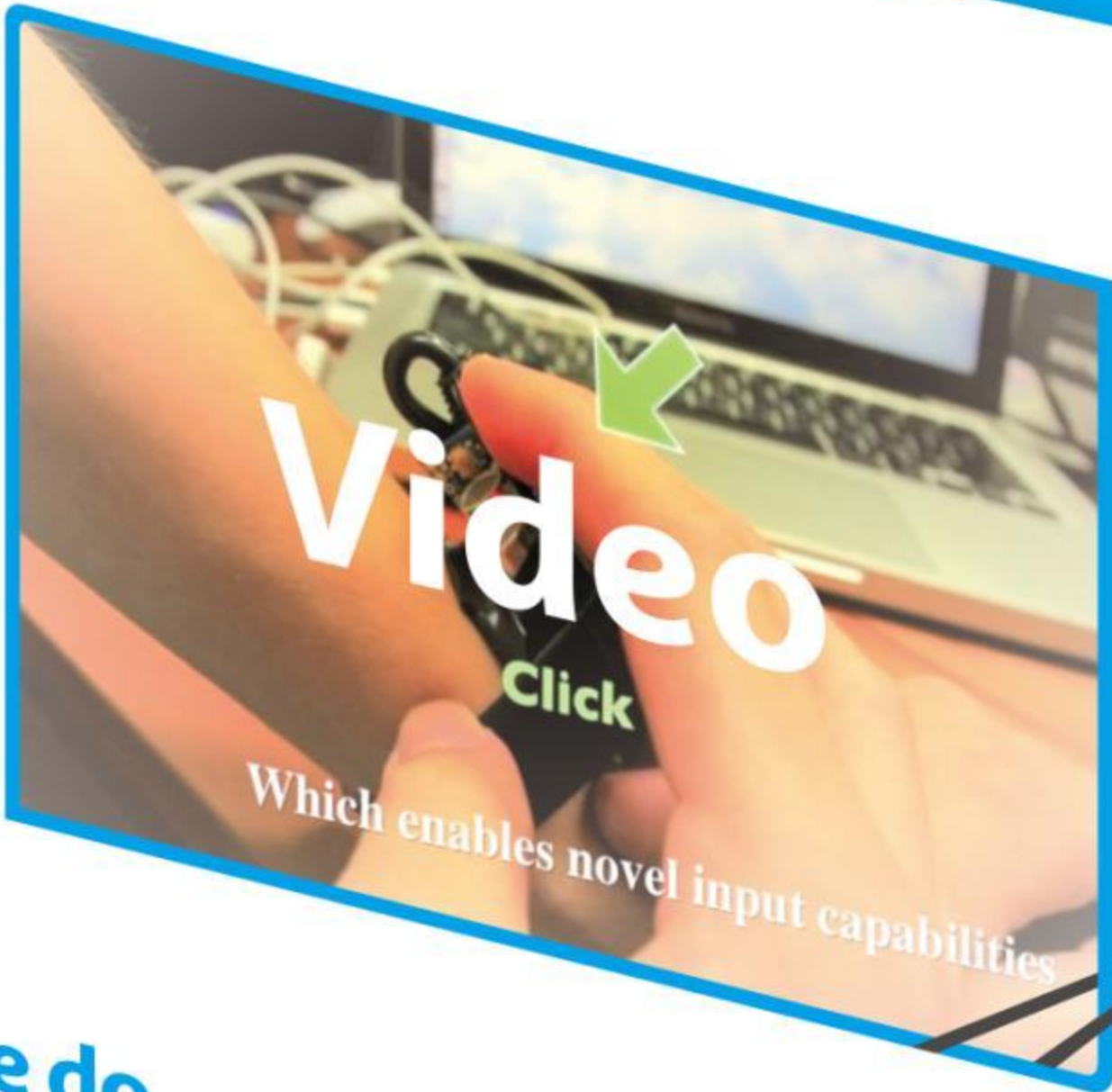


What we do

**You are the
interface!**

What we do

**Arm
Tech**

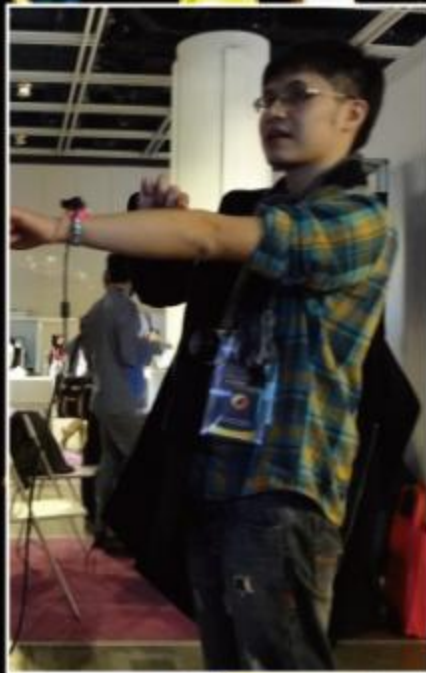
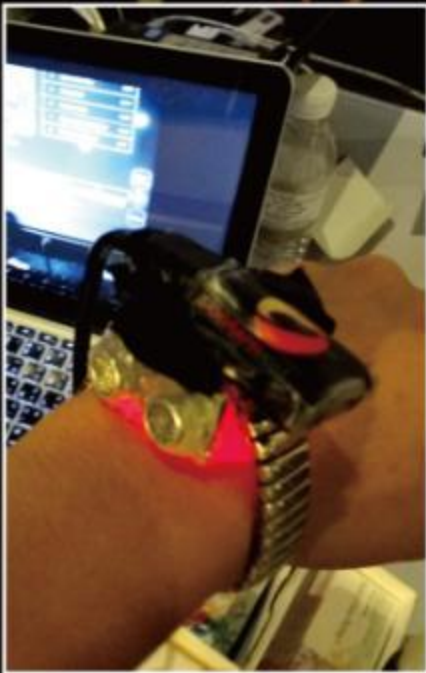


What we do



SIGGRAPH ASIA 2011
HONG KONG

ACM SIGGRAPH Asia Emerging Technologies HongKong, Dec. 2011



UIST 2011 (ACM Symposium on User Interface Software and Technology)

PUB - Point Upon Body: Exploring Eyes-Free Interaction and Methods on an Arm

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ABSTRACT

This paper presents a novel interaction system, PUB (Point Upon Body), to explore eyes-free interaction in a personal space by allowing users to tap on their own body to be provided with haptic feedback from their arms. Two user studies illustrate how users can interact privately with their business card from their business cards operating in their own space. According to these results, several user interface design issues of eyes-free gestures between their bodies and others, both invisible gestures, demonstrated results due to their body feedback. Based on the design principles from the observations, an interaction system, PUB, is designed to demonstrate how interaction design benefits from these studies. The scenarios, users' behavior, current and future design issues, are discussed according to the findings of this study.

ACM Classification: H12 (Education and Instruction) and H12.2 (User Interfaces) - Graphical user interfaces.

General Terms: Design, Human Factors, Experimentation.

Keywords: Eye-free interfaces, eyes-free interaction, user interface, haptics.

INTRODUCTION

Several approaches have been developed to utilize a user's forearm as a device [1] or as a device [2] to explore the interaction through the user's own motion. Instead of the possibility of user expressions, the human factors that influence how users interact with their business cards represent. Therefore, we conducted a series of user studies to explore the design space for the interaction with the forearm.

The results of the user studies explore the following principles for designing an eyes-free system on an arm. The haptic feedback from a user's own body before to improve the accuracy of the input gestures. The other points to detect the movement of the hand area from the shoulder joint to the wrist joint. The haptic feedback from the second user can



Figure 1: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

result in a user's gesture between the other joints to the wrist joint. Some users use their shoulders to point. However, the distance of the input gestures differ from user to user. Therefore, a calibration procedure is required to learn how to interact with the device. Experimental results indicate that the input area between the other joints and the wrist joint has a larger volume than the wrist joint point. The input gestures also require from one to two. While tapping on the device position, before continuing, the attempt to handle with both fingers to the user the input gestures. Hence, the tapping area for hand calibration is required.

We also developed a novel gesture system, PUB (Point Upon Body), to demonstrate the applicability of the design principles. These concepts based on the proposed Chameleon device are possible. One is for controlling a mouse pointer on a remote device (Figure 1), and the other is for using a horizontal graphical user interface (GUI) system on a remote display (Figure 2). Through these three scenarios, design and interaction issues were explored from the user study to explore people's arm as a device input device.

The rest of this paper is organized as follows. The user studies were conducted to explore the design space about the arm that interacted on a user's arm. The BACKGROUND, the PUB GUI system describe the user studies, procedures, results and subsequently derived design principles. Based on these principles, the PUB DESIGN system presents the design of the prototype system, PUB, to demonstrate the possible scenarios. Next, the DESIGN, the DESIGN, and the DESIGN are illustrated and their generalizations. Conclusions are



Figure 2: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

BACKGROUND

Figure 1 shows the user study of PUB. The user study was conducted to explore the design space about the arm that interacted on a user's arm. The user study was conducted to explore the design space about the arm that interacted on a user's arm. The user study was conducted to explore the design space about the arm that interacted on a user's arm.

CONCLUSIONS

The user study was conducted to explore the design space about the arm that interacted on a user's arm. The user study was conducted to explore the design space about the arm that interacted on a user's arm. The user study was conducted to explore the design space about the arm that interacted on a user's arm.



Figure 3: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

REFERENCES

1. [1] ...
2. [2] ...



Figure 4: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

REFERENCES

1. [1] ...
2. [2] ...



Figure 5: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

REFERENCES

1. [1] ...
2. [2] ...

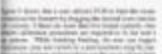


Figure 6: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

REFERENCES

1. [1] ...
2. [2] ...



Figure 7: A user operated the Chameleon device to interact with a horizontal GUI system on a system display through the designed gesture system, PUB.

REFERENCES

1. [1] ...
2. [2] ...

TOP HCI Research Conference

What we do

About Product

手錶 輕量外型 可隨身配戴



About Product

低成本



About Product

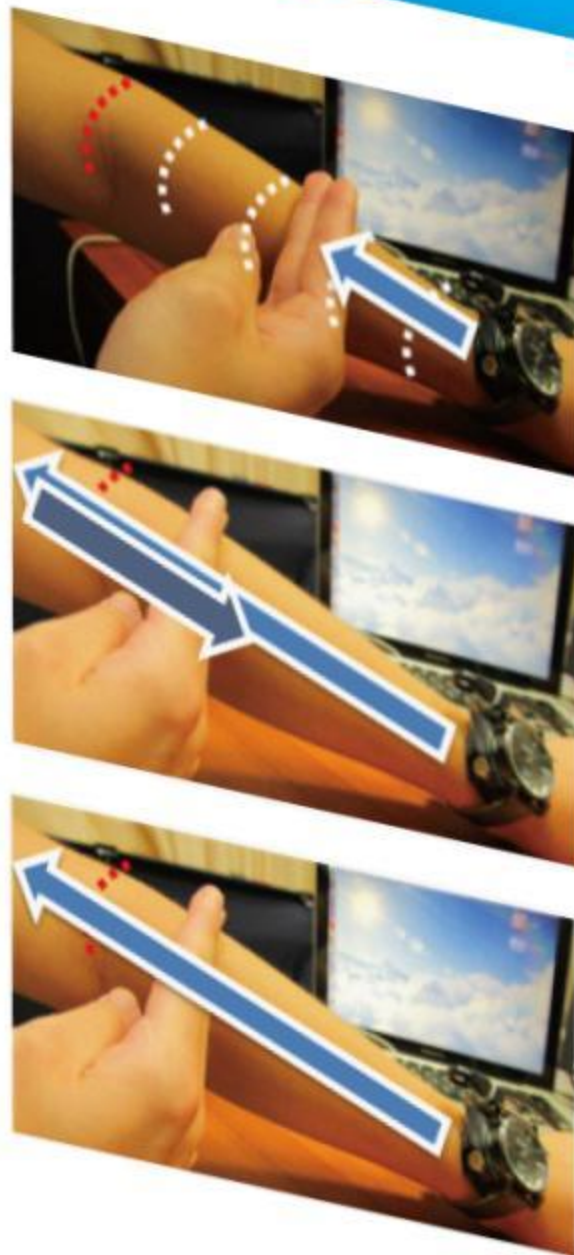
元件	成本單價 (新台幣)
超音波測距模組	< \$1,000
藍芽單晶片 微處理器	\$200
電池	\$100
電路主板 (以百組計)	\$100
總計	< \$1,500

支援多種手勢

Discrete



About Product

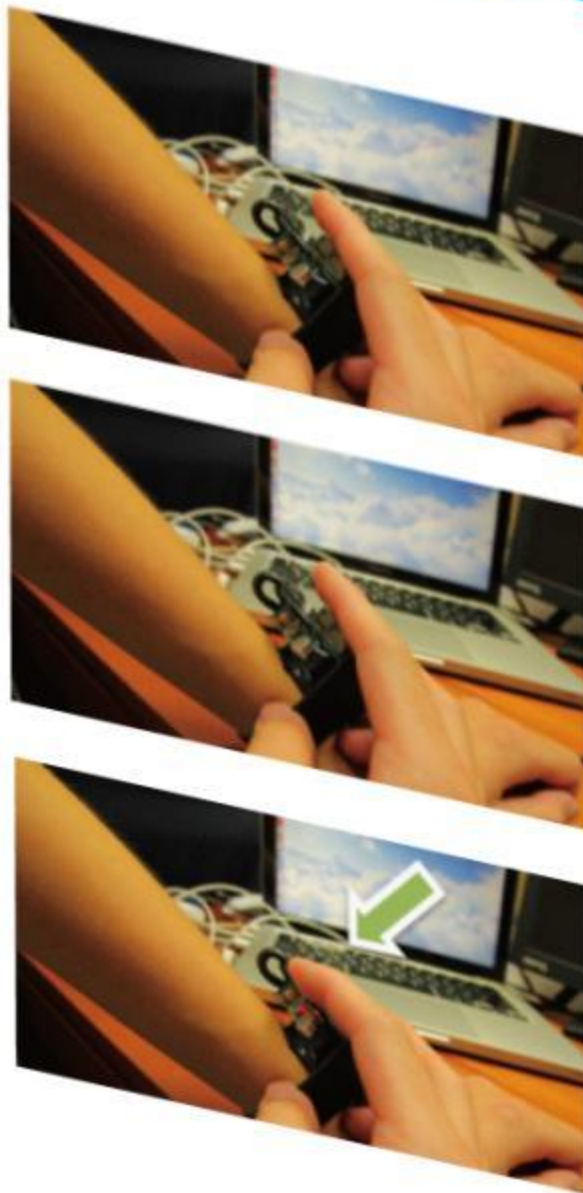


支援多種手勢

Continuous



About Product



結合多種應用

Smart Phone



About Product

結合多種應用

Smart Watch



About Product

結合多種應用

Smart TV



About Product

亦可搭配第三方裝置

如 Google Glass 等





6-DOF Motion sensors

About **Product**



本產品與Kinect比較

產品	重量	安裝	精準度	範圍	速度	反應時間	優勢	劣勢
 Kinect	460g	放置於 1.5m外	3~30 (mm)	60~ 1000cm	30 fps	0.5~2秒 (在動作完成後)	全身偵測	無法在陽光下使用 無法偵測碰觸身體
 SonarWatch	60g	手錶 型態	20 (mm)	設定為 0~30cm 上限為 600cm	100 fps	<1秒 (在動作完成後)	精準的 手臂偵測	只限於手臂

※雖然理論上精準度較高，但kinect無法偵測碰觸身體的動作 ※反應時間決定於演算法與使用者，比較基準不同。

About Product

Business Model



SMART TV

Smart TV Alliance

SAMSUNG

Google TV

SONY
From. believe

LG Smart TV

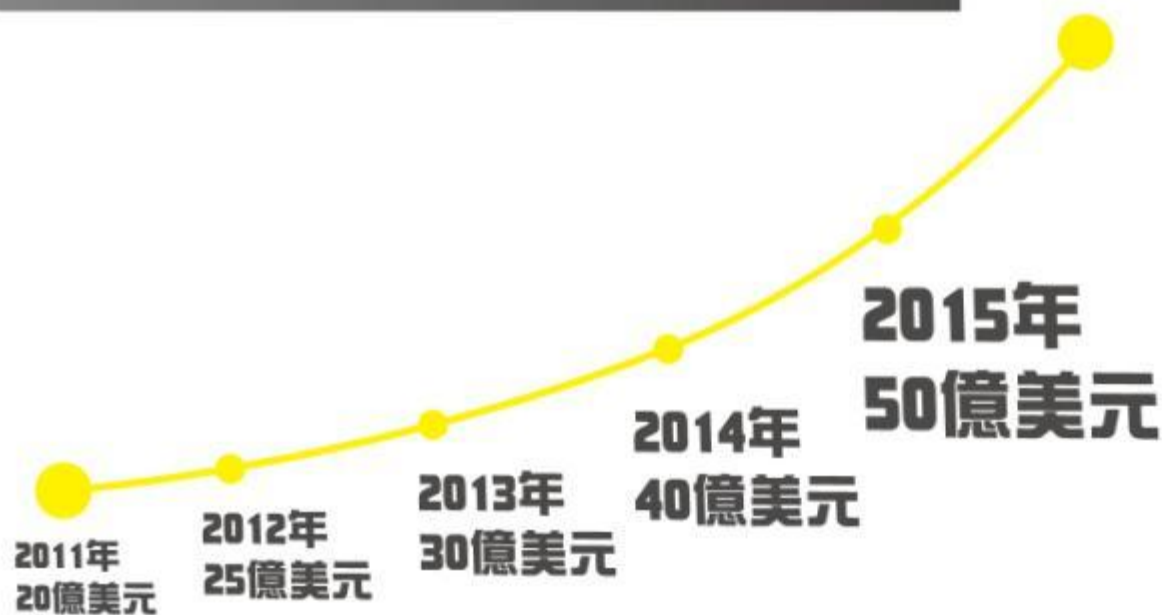
TOSHIBA

SMART TV VIETNAM

市場發展

根據 IMS Research 預測，
全球可穿戴技術市場營收。

**2016年
60億美元**



Business Model

營運模式

核心技術

可攜式身體觸控介面

美國、台灣專利申請

營利模式

1

販賣產品

開發自有品牌實體商品販售

2

技術授權

收取授權費並提供開發環境

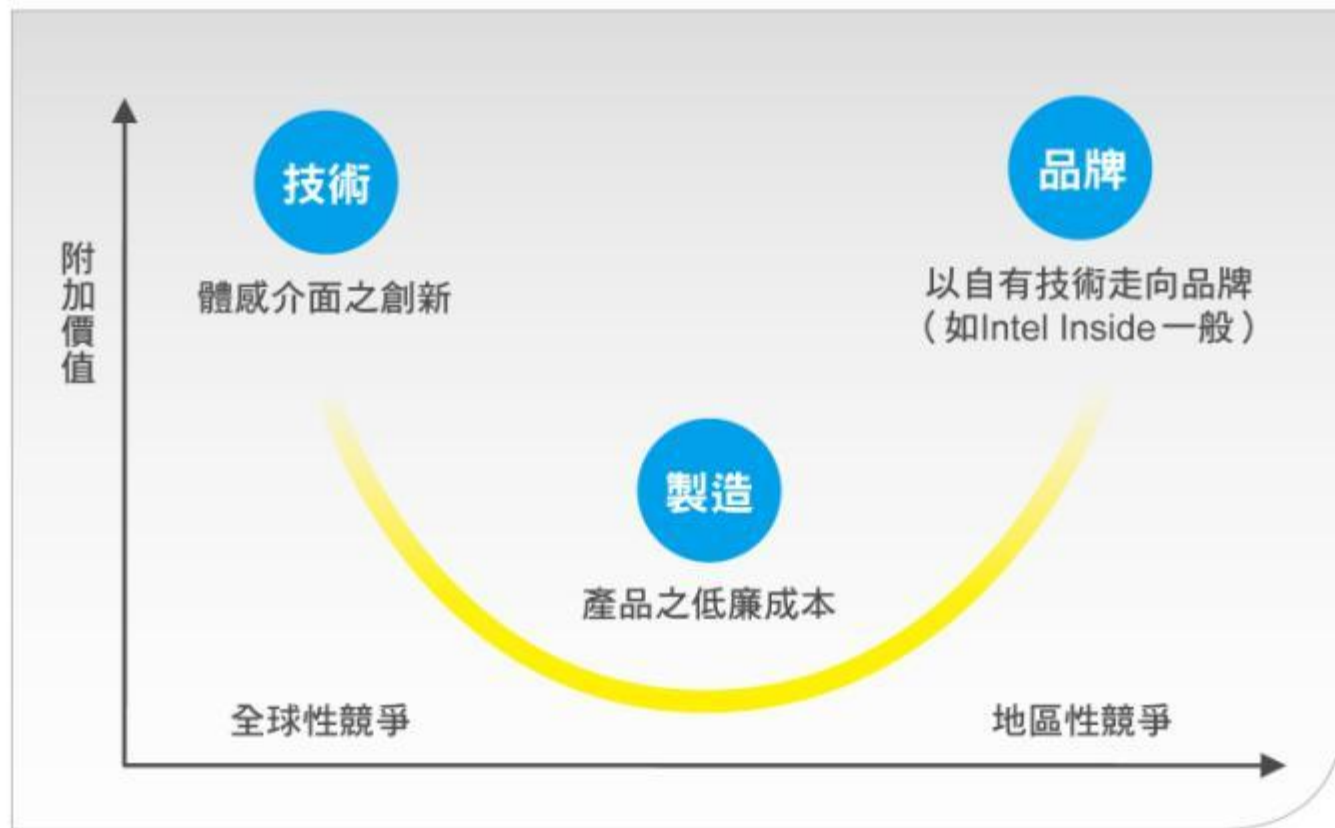
3

委外開發

第三方公司委外開發及整合型服務

Business Model

微笑曲線



Business Model

Arm Tech inside



Business Model



**You are the
interface!**



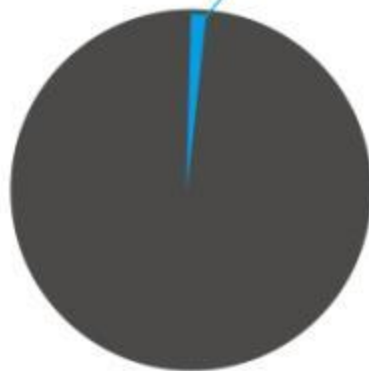
市佔率預期

市佔**1%**: 180 萬支
營收**3.6** 億 ($180*2000$)



Kinect

市佔**1%**: 500 萬支
營收**10** 億 ($500*2000$)



SmartTV

Business Model

市場佈局



Business Model

SWOT

Strengths

可攜帶：輕巧可以隨身攜帶

易結合：可與隨身配件結合

可擴展：易與其他裝置溝通

易量產：使用現有成熟技術

Weaknesses

**開發細節與原理已發表於國際會議，
為避免技術可能被有心業者複製，
已順利申請專利通過！
案號為101115396**

Opportunities

除結合**體感**與**觸控**兩大現有趨勢外
裝置本身更**便於攜帶**。

SWOT

Threats

所屬技術為現今學界熱門研究議題。

競爭對手產品的製程提昇。

體感裝置與智慧電視的整合。

4P

Product

與國際知名品牌合作，
並與其產品結合（如智慧型電視），
為其創造銷售賣點，達成同Intel inside之

ArmTech inside 效益



4P / Product

Price

NTD\$ 2,499 -> 1,999
台灣定價 國際定價

4P / Price

Place

硬體

短期 > 搭配知名廠商的產品出售

長期 > 銷售自有品牌產品

軟體

在App Market與App Store上販售

4P / Place

Promotion

參展

藉由當場實機體驗來推廣產品。

與知名品牌搭配出售並主打

”小小ArmTech，大大體驗”

4P / Promotion

Marketing Strategy

商業策略

短期

ArmTech as a Technology - B2B

中期

ArmTech as a Product - B2C

長期

*ArmTech as an ADK
- Accessory Development Kit*

Marketing
Strategy

**Arm
Tech**

Live Demo

The working prototype



Arm
Tech
觸控上身



*Thanks
for
your listening*

Arm
Tech

Design Concept

