

STUDENT'S DECLARATION

Name: LIM SENG CHEE

Matric No: SCOM 005308

School: Computer Science

Thesis Title: Intelligent Air Conditioner System: User Acceptance Level of ICONS and Cost Saving Analysis

I hereby declare that this thesis in which I have submitted to School of Computer Science on 23th Nov 2009 is my own work. I have stated all references used for the completion of my thesis.

I agree to prepare electronic copies of the said thesis to the external examiner or internal examiner for the determination of amount of words used or to check on plagiarism should a request be made.

I make this declaration with the believe that what is stated in this declaration is true and the thesis as forwarded is free from plagiarism as provided under Rule 6 of the Universities and University Colleges (Amendment) Act 2008, University Science Malaysia Rules (Student Discipline) 1999.

I conscientiously believe and agree that the University can take disciplinary actions against me under Rule 48 of the Act should my thesis be found to be the work or ideas of other persons.

Students Signature: Date: 23th Nov 2009

Acknowledgement of receipt by: _____ Date: _____

ACKNOWLEDGEMENTS

First and foremost I would like to offer my sincerest gratitude to my supervisor, Pn Faten , who has supported me throughout my thesis with her patience and knowledge whilst allowing me the room to work in my own way. I attribute the level of my Master degree to her encouragement and effort and without her, this thesis would not have been completed or written. One simply could not wish for a better or friendlier supervisor.

Secondly, I would like to say a big thank you to Pn Nasuha Lee, my cyber-marketing lecturer and Pn Norlia, my E-business lecturer, who guided me in writing the thesis on to a correct path. Besides that, I would like to thank Dr Nasriah who advise me on my research methodology and Dr Suhaimi, who has explained the correlation, line regression and statistic method to me.

I would like to thank both my course mates, Lau Teng Lye and Ching Yee Khim. We always discuss about our product ICONS box from various aspect like the technology, product design, target market, financial forecast etc. Without them it is hard to create a superb product to the consumers. Besides that, I would like to thank my classmate, Wong Si-Maan who has guided me on Statistical Package for the Social Science (S.P.S.S). tool to process the data and Lee Yean Hooi, who has briefed me on the Technology Acceptance Model (T.A.M).

I also would like to express my thanks to my aunt, Beh Soo Hau who helps me on checking and correcting my grammar mistake, and some of my classmates who have passed their dissertation, and share their opinions and experience.

Last but not least, the Universiti Sains Malaysia Hamzah Sedut Library1 and Library2 both have provided the support and equipment which I need to produce and complete my thesis.

Finally, I would like to thank my parents for supporting me throughout all my studies at University Science Malaysia, and for providing a sweet home in which to complete my writing .

TABLE OF CONTENTS

STUDENT’S DECLARATION	ii
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	v
LIST OF TABLES	viii
LIST OF FIGURES	x
LIST OF APPENDICES	xi
ABSTRAK	xii
ABSTRACT	xiii
SECTION 1.0 EXECUTIVE SUMMARY	1
SECTION 2.0 INTRODUCTION TO THE COMPANY	3
2.1 Company Background	3
2.2 Business Intent	3
2.2.1 User Pain and Solution.....	4
2.3 Growth Strategy	5
2.3.1 Financial Strategy	5
2.3.2 Technology and Product Development Strategy	6
2.3.3 Marketing Strategy to increase market of mind set.....	6
2.4 Target Markets	12
2.5 Revenue Model	13
2.6 Operational Setup	13
2.7 Long Term Goals of Company	14
2.8 Market & Competitor Information	15
2.9 Strength & Weakness or S.W.O.T	17
2.9.1 Strength	17
2.9.2 Weakness.....	18
2.9.3 Opportunity	19

2.9.4	Threat	19
SECTION 3.0	EMPLOYMENT OF KNOWLEDGE WORKERS	21
3.1	Management Team	21
3.2	Organizational Chart	22
3.3	Human Resource Plan	23
SECTION 4.0	PRODUCT OR SERVICE DEVELOPMENT.....	25
4.1	Technology Overview.....	25
4.1.1	SIRIM.....	27
4.1.2	Product Insurance.....	27
4.2	Research and Development (R & D) of ICONS and layout setting.....	28
4.3	Benefit & Customer Value	30
SECTION 5.0	MARKETING PROGRAM.....	35
5.1	Marketing Overview	35
5.1.1	Introduction.....	35
5.1.2	Brief Information of Technology Acceptance Model.....	36
5.1.3	Research Hypotheses	37
5.1.4	Methodology.....	39
5.1.5	Analysis, Result and Findings.....	39
5.1.6	Discussion and Conclusion.....	49
5.2	Additional Information.....	50
5.3	Marketing Programs	71

SECTION 6.0	FINANCIAL PROJECTION.....	74
6.1	Financial Overview	74
6.1.1	Profit and Loss	77
6.1.2	Balance Sheet	78
6.1.3	Cash Flow Statement	80
6.2	Financial Qs to consider	81
SECTION 7.0	FUTURE PLAN	82
7.1	Summary of key point.....	82
7.2	Future Work.....	84
REFERENCES.....		86
APPENDICES.....		94

LIST OF TABLE

	Page	
Table 2.3.3.3	Types of segmentation	12
Table 2.8.1	Comparison on service types of competitors	15
Table 2.8.2	Comparison on featured product of competitors	17
Table 2.9	S.W.O.T Analysis	20
Table 3.3.1	Human Resource Plan	23
Table 3.3.2	Training Program	24
Table 4.2.3	System requirement for ICONS	29
Table 5.1.5.1	Respondents demographics data	40
Table 5.1.5.2	Respondents' Air conditioner usage and user behavior	42
Table 5.1.5.3	Respondents' awareness about A.I and software	43
Table 5.1.5.4	Matrix of Correlations	44
Table 5.1.5.5	Hypotheses testing – Regression Analysis	45
Table 5.1.5.6	Summary of testing result for hypotheses	48
Table 5.2.1	Survey one: Customer Acceptance on new innovative products	51

Table 5.2.7	Survey Two: Customer behavior on air conditioner usage	61
Table 5.2.8	Tenaga National Berhad electricity Domestic Tariff	63
Table 5.2.9	Household electronic energy consumption	64
Table 5.2.10	Household electronic energy consumption	65
Table 5.2.11	Comparison Air Conditioner Mode	66
Table 5.2.12	Comparison Night Time Air Conditioner	67
Table 5.2.13	Comparison Day Time Air Conditioner	68
Table 5.2.14	Comparison Night Time Air Conditioner (Inverter Technology)	69
Table 5.2.15	Comparison Day Time Air Conditioner (Inverter Technology)	70

LIST OF FIGURES

	Page
Figure 2.3.3.1 4-P model	8
Figure 2.3.3.2 4-C model	10
Figure 3.2.1 Company management team	22
Figure 4.1.1 Basic idea how the idea works	25
Figure 4.1.2 ICONS in box connection with devices	25
Figure 4.1.3 Temperature intersect diagram	26
Figure 4.2.1 Physical layout of ICONS box	28
Figure 4.2.2 Physical Room Layout setting	29
Figure 5.1.2.1 Basic form of Technolgy Acceptance Model(T.A.M)	37
Figure 5.2.2 Respondents' understanding about AI Technology	57
Figure 5.2.3 Respondents' heard about software	58
Figure 5.2.4 Respondents believe that A.I. perform better then Inverter	59
Figure 5.2.5 Respondents desire to save the bill for electricity usage	59
Figure 5.2.6 Respondents' acceptance per unit price range for product	60

LIST OF APPENDICES

		Page
APPENDIX A	ENERGY CONSUMPTION TABLE FOR VARIOUS TYPE OF APPLIANCES	94
APPENDIX B	ENERGY CONSUMPTION AND COST CALCULATION	96
APPENDIX C	SURVEY QUESTIONNAIRES	106
APPENDIX D	ONLINE ADDITIONAL SURVEY	109
APPENDIX E	PRODUCT POLICY FORM & PRODUCT CERTIFICATION FORM	115

ABSTRAK

Innovator telah ditubuhkan oleh tiga orang pelajar Universiti Sains Malaysia (USM). Innovator menawarkan sebuah produk yang dikenali sebagai “Intelligent Air Conditioner System (ICONS)”. ICONS perlu dihubungkan kepada penyaman udara dan komputer untuk mengubahsuai suhu sesuatu bilik secara automatik. ICONS akan memasang suis penyaman udara apabila seseorang memasuki sebuah bilik dan akan menutup suis apabila tiada orang dikesan dalam bilik itu. ICONS mempunyai dua bahagian iaitu kotak pengawal yang berhubung dengan alat penyaman udara dan satu lagi perisian diaturcarakan dengan algorithma logik kabur yang telah dipasang ke dalam satu komputer. Penjimatan kos merupakan satu strategi pemasaran untuk mempromosi produk ICONS kepada orang ramai. Innovator mempromosi produknya melalui, emel, Internet, laman web, dan pameran. Kos penjualan ICONS telah ditetapkan kepada harga RM350.00 seunit. Jangkaan untuk penjualan pada tahun pertama, kedua dan ketiga adalah RM420,000, RM840,000 dan RM1,680,000. Kelebihan ICONS, ialah ia dapat mengoptima tenaga elektrik. Satu analisis dijalankan bagi pengiraan kos untuk kegunaan tenaga elektrik ke atas alat elektrik telah menghasilkan keputusan yang alat penyaman udara yang berhubung dengan ICONS dapat menjimatkan 15% atau lebih daripada bil elektrik. Satu kajian penerimaan teknologi ke atas ICONS telah dijalankan melalui satu soal selidik dengan saiz sampel sebanyak 100 responden. Kajian ini menggunakan satu analisis korelasi dan regresi untuk menentukan penerimaan pengguna terhadap ICONS. Dari segi analisis regresi, semua hipotesis nol ditolak. Sebagai kesimpulan, pengguna menerima ICONS sebagai suatu produk yang dapat digunakan di dalam rumah mereka.

ABSTRACT

Innovator was formed by three students of Universiti Sains Malaysia (USM). The company proposed a device, the Intelligent Air Conditioner System (ICONS) which is connected to the air conditioner and a personal computer. ICONS will automatically adjust the temperature of the room. It will also automatically switched on the air conditioner when a person enters the room and switched off the air conditioner when there is nobody in the room. ICONS, consists of two parts, the controller box connected to the air conditioner and the software, programmed using the Fuzzy logic algorithm installed on a personal computer. Cost saving features is one of the marketing strategy used to promote the product to the public. Innovator promotes the product via internet, email, website, social network, the Internet and exhibitions. The unit cost of ICONS is sold at RM350.00 per unit. Sales projection for year one, two and three are RM420,000, RM840,000 and RM1,680,000 respectively. The uniqueness of ICONS, is its ability to optimize the electrical usage. An analysis of the cost and energy consumption of appliances results show that air conditioner connected to the ICONS box and the computer would save more than 15% of the total electric bill. A technology acceptance research on ICONS has been carried out through a survey with a sample size of 100 respondents. This research applied the correlation and regression analysis to study the user acceptance of ICONS. The correlation analysis showed that all variables are positively correlated. For the regression analysis, all the null hypotheses are rejected. Finally it can be concluded that users accept the use of ICONS into their household.

1.0 EXECUTIVE SUMMARY

Innovator, an innovative technology team were formed by three partners. Lau Teng Lye is the Chief Executive Officer and heads the R&D division. Ching Yee Kim is Chief Marketing Officer and Chief Finance Officer in charge of entire the company marketing and finance division. Lim Seng Chee is Chief Technology Officer, in charge of the whole Technology division. The mission of the team is to invent and market a mini case controller for the air conditioner. This device will help reduce the wastage of energy, cut cost and optimize the usage of the air conditioner. The product which is named Intelligent Air Conditioner System (ICONS), consists of two parts. The first part is the software called the ICONS program which is developed using the Fuzzy logic algorithm is installed into a personal computer. The second part is the ICONS box which is an external unit connected to the air conditioner. The ICONS box consist of two motion sensors, one temperature sensor and a controller. ICONS is fully automated to adjust air temperature inside the room. When a person enters into a room the motion sensor will be triggered, this will set a communication with the ICONS program. The ICONS program will send a signal to the controller to switch on the device. On the other hand, when there is nobody inside the room, the ICONS program will switch off the device. ICONS's temperature sensor will adjust and maintain the temperature in the room automatically to suit the number of people in the room. This feature of ICONS helps save the consumption of electricity. Innovator's startup fund is RM 150,000. Each respective family members of the partners provide a startup fund of RM50,000. Besides, Innovator also planned to participate in the Multimedia Development Coperation business plan competition to get the pre-seed fund of RM 150,000. The market size of air conditioning usage in Malaysia, has increased from 13251 units since year 1970 to

253 399 units in year 1991, and it will be predicted the number of air conditioner usage will be attain 1 511 276 units in the year 2020. (Nasution, Wan Hassan, 2005). Since Innovator is new to the market, therefore Innovator focus on niche market, which is targeted to the home users and office users. Innovator would like to apply e-marketing program like website, email, social network to promote the ICONS to the market. The sales projection for the first year is targeted at 1200 units, the Business to Consumer (B2C) sales will reach RM 420,000 (RM350.00 x 1,200 unit). In the second year, Innovator planned to double up the volume to 2400 units which the sales revenue is RM840,000. In the third year, the targeted sale is 4800 units, sales revenue is RM1,680,000. Innovator plan to setup its office in Penang for the first two years. In the third year, the company will expand its market to the whole of Malaysia. In the next three years, innovator plan to expand to the whole ASEAN region. A cost saving and energy consumption analysis of the of appliances using the Tenaga Nasional Berhad tariff was done. The results showed that air conditioner connected to the ICONS box and the computer would save more than 15% of the total electric bill. Another research was carried out to investigate the user acceptance of ICONS. A survey of 20 questions was send out to 100 respondents. This research using the Technology Acceptance Model (Davis, 1989) applied the correlation analysis on user affinity with air conditioner, the perceived ease of use of ICONS, the perceived usefulness of ICONS, the user behavioral intention of using ICONS and the purchase intention to buy ICONS. The result of the correlation analysis showed that all the above variables are positively correlated. The result from the regression analysis rejected all the null hypotheses. Therefore, it can be concluded that users accept the use of ICONS into their household.

2.0 INTRODUCTION TO THE COMPANY

2.1 Company Background

Innovator, were formed by three partners. Lau Teng Lye is the Chief Executive Officer heading the R&D division. Ching Yee Kim is the Chief Marketing and Chief Finance Officer in charge of entire the company's marketing and finance division. Lim Seng Chee is the Chief Technology Officer, in charge of the whole Technology division.

2.2 Business Intent

The company main intention is to provide a smart solution to the home owners and office users by introducing to the market a mini case controller for the air conditioner. This device will help to reduce the wastage of energy, cut cost and optimize the usage of the air conditioner. It will also provide a convenience to the users by adjusting the temperature automatically. The company also would like to collaborate with other manufacturers to improve the product quality or invent new product in the future. The company will try to sustain the business in the first two years to gain the necessary experience and make profit for future developments.

2.2.1 User Pain and Solutions

Most of the Asian countries especially South East Asia have hot and humid climate (eg: Malaysia, 27°C ~ 32°C) all year round. Due to hot and wet climate, people are willing to spend their money to purchase air conditioner to resolve their physical discomfort and improve their quality of life. Especially for those people who are working inside office in the situation where the room temperature in the condition either too cold or too hot for them, as a result they are unable to concentrate on their task. This is due to the air conditioner does not have the self-adjusted features, therefore users need to adjust the temperature to resolve their physical pains. Currently the economic recession has caused a rise in price of almost all products and services. It has caused high cost to electricity bill especially for those who rely heavily on electronic devices. The raise of electricity tariff is one of the factors that cause customer to pay high cost.

ICONS box attached to night time air conditioner (conventional type) saved 15.51%, day time air conditioner (conventional type) saved 36.61%, night time air conditioner (inverter type) saved 22.19%, and day time air conditioner (inverter type) saved 14.6%. An average bill electricity saving is 22.23% ($14.6\% + 22.19\% + 36.61\% + 15.51\% / 4 = 22.23\%$). Based on the above calculation, it helps to save more than 15% of electricity bill. Hence, ICONS enable customer to sustain their life style activities and reduce the energy wastage.

2.3 Growth Strategies

Innovator needs to analyze on its own position in the market and make a decision either to change the market strategy to expand the market. Innovator used Ansoff Matrix model (Ansoff, 1957), to help Innovator identify the product's position. Since Innovator is new to the market, diversification is the growth strategy that is used by Innovator to sell a new innovative product to new markets. Although the risk is a high, Innovator believes that there is a high profit return. In order to cope with the risk factors, Innovator needs to increase sales volume and maintain Innovator's image all the time by recruiting staffs with good communication skills. Through conversation with the customers, they are able to study and understand Innovator's business nature and products. In future, when the business grow, a few methods can be used to increase sales and business. First of all, Innovator will deploy the business to multiple locations, so that customers can get access to the products and services easily. When the business become consistent, Innovator would expand the customer base, and offer business to business (B2B) service, or reseller of the products. In order to sell the product to other geographical area, Innovator would also set up online business, so that the businesses can grow, sales increase and gain market credibility.

2.3.1 Financial Strategies

The ideal startup fund for a company is RM300,000. Innovator is a newly setup company, the company startup fund is only RM 150,000. The fund comes from their family support, each respective family members provide the startup fund of RM50,000.

Other business investors also provide some capital. Besides that, Innovator also participates in the MDEC business plan program, hoping to gain the pre-seed fund of RM 150,000 from the competition. More over, Innovator also proposed the business plan to government agencies like SMIDEC to seek financial support from the agencies.

2.3.2 Technology and Product Development Strategies

In order to protect the benefit of both parties i.e Innovator and business partner , the product development and source code is never exposed to any business partner, besides that, Innovator also plan to patent the developed algorithm of the software. It helps us to gain more financial support from manufacturing business partner and business investors.

2.3.3 Marketing Strategies to increase market or change the mind set

In analyzing the market behavior and competition, Innovator applies the segment and targeting strategies. Each of the process (segmentation, targeting and positioning) is interrelated. The activities of segmenting and targeting are used to analyze the market behavior and verify competitor. After analyzing the market and competitor, Innovator finds that the concept “positioning” always capture consumers’ mind. Each of the activities is dependant on previous action.

Segmentation –The process of aggregating individual or business along similar characteristics that pertain to the use, consumption, or benefits of a product or services.

(Strauss, J., et al., 2006)

Targeting –The process of selection the market segments that are most attractive to the firm and selecting an appropriate segment coverage strategy. (Strauss, J., et al., 2006)

Positioning –A tactic used by marketers to create an image or identity in the minds of their target market for its product, brand, or organization

The process to reach position and the positioning statement is created, ones can enter into the market mix. First the process must go through the segmentation, follow by targeting customers, next is positioning the product into the market.

In order to enter the market, Innovator had focus more on one of the 4-“P” model, which are Product, Price, Promotion and Place, one of which is promotion. The 4-“P” model classification concept was developed by consultant and marketing educator E. Jerome McCarthy in 1960 and it is widely accepted by public. Nowadays, some of the marketers add on his own “P” to enhance the 4-“P” model, such as Personnel, physical evidence, packaging.

The 4-“P” technique is used to relate to market mix where it categorizes an item by branding, pricing, place, quality etc.



Figure 2.3.3.1: 4-P model

“Product: All the elements of each individual product or services that is to be sold include branding, product features, packaging, installation, services and warranties.” (Napier, H. A., et al., 2005)

Since Innovator is new to the market, Innovator emphasizes on the benefit of ICONS box, which will make the customer feel convenient, when customer enter their home or room, the air conditioner will be on automatically, there is no need for a remote control to switch on and adjust the room temperature. The only thing a customer needs to do is either buy the ICONS box or get accessories as replacement parts to ICONS box.

“Place: Activities pertaining to how the product or services is distributed to the customer, including distribution channel and intermediaries, warehousing, order fulfillment and shipping.” (Napier, H. A., et al., 2005)

Since Innovator temporary set their home as home office, therefore the product can be

accessed at their home office, besides that customer can access the product information and services via the website. More over, Innovator also used direct marketing techniques to retain, recruit, and extend the products and services to customers.

“Price: The cost of the product or service to the customer.” (Napier, H. A., et al., 2005)

The product is set at affordable price based on a package of air conditioner plus ICONS box. If customer would like to buy on the replacement part of the devices, they can get it at affordable price. However, the package price would be cheaper then buying separate unit of ICONS box.

“Promotion: Activities pertaining to how information about products and services is communicated to customers, including, advertising, public relations, promotion and customer education.” (Napier, H. A., et al., 2005)

The product, ICONS box is a new product therefore Innovator has to put in a lot of effort to promote the product to new market. Due to Innovator’s limited budget, Innovator would advertise through flyers and newspapers, so that it will capture local attention, besides that Innovator would also organize some road shows, so that customers will know more about the business, with a series of roads show and exhibitions, it helps to build viral market for the product.

From business market perspective point of view the 4-P model is an “inside-out” (from business to customer). Another model is “outside-in”, in another word (from customer

view)

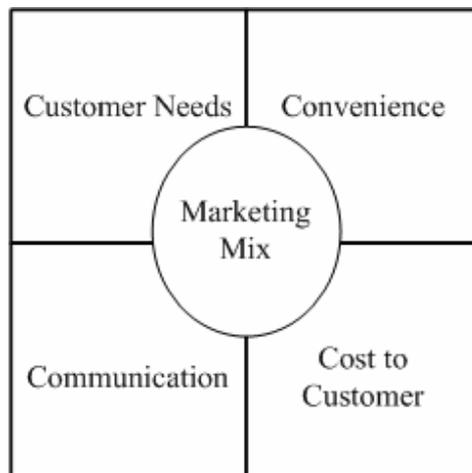


Figure 2.3.3.2: 4-C model

“Customer: Need and wants: product variables are redefined in term of what the customer needs and wants.” (Napier, H. A., et al., 2005)

Innovator set the target customers with mid income group (eg: more then RM 1500), they can afford to buy the products. Besides that Innovator believe that customer with higher education background can understand the concept of artificial intelligent technology and accept the product.

“Convenience: product distribution variable broadened to include all the elements involved in obtaining and using a product or services.” (Napier, H. A., et al., 2005)

Innovator will set up service center at various locations, to enable customer to get the feedback or service immediately. If they face any difficulty on the product, they can

email to the helpdesk support, Innovator will send services crews to their location immediately.

“Communication: promotion variable are broadened to include all communication with customers design to increase sales.” (Napier, H. A., et al., 2005)

Communication is a very important factor to determine the success of a company. Good after sales services will build a good public image for Innovator. When Innovator organize or participate in exhibition, Innovator would provide customer service, via communication with consumer, so they are able to understand the product and services, good communication indirectly help to build up good image for Innovator. If customers have any inquires, they can also send an email to the Innovator’s mailbox or through company official helpdesk system.

“Cost to customer: price variables changes to be the total cost to the customer of consuming a product or services.” (Napier, H. A., et al., 2005)

When sales volume increased, Innovator will lower down the cost of average production, so that customer will feel that the product is worthwhile.

In order to get into the market, the market segment strategy is a very important factor to identify Innovator position and the product category. Innovator can classify the customers based on their characteristics and behaviors. There are four types of segmentation categories, which are geographic segmentation, demographic segmentation,

psychographic segmentation and behavioral segmentation.

Table 2.3.3.3: Types of segmentation (Strauss, J., et al., 2006)

Bases	Geographics	Demographics	Psychographics	Behavior
Identifying	City, County,	Age, Income,	Activities,	Benefits
Profiling	State, Region,	Gender,	Interests,	sought, Usage
Variable	Country	Education,	Opinions,	level, Brand
Examples		Ethnicity	Personality, Value	loyalty, User status

In order to introduce ICONS box to the market, Innovator apply geographical segmentation as well as behavioral segmentation to potential customers. People who live in city might have similar problems, which they face everyday, so it will affect the others characteristic and form a pattern. For example, hot temperature will cause tenant inside condominium to switch on air conditioner, similarly, other tenants will also switch on their air conditioner. This action helps to resolve their physical pain but it also increase their living expenses.

2.4 Target Markets

Innovator's business model is based on Business to consumer (B2C) concept. Therefore, Innovator's main target is consumer. When the business keeps on growing then Innovator will change the business model to hybrid model, which is a combination of Business to Business (B2B) and Business to Consumer (B2C) like government agencies,

private sector and industries. At the next steps, Innovator plans to target Panasonic manufacturer, so that Innovator can collaborate with them and share the largest market. Besides that through partnership with difference air conditioner manufacturer, Innovator get their design application protocols and integrate with the software, it will make Innovator's customer base grows rapidly.

2.5 Revenue Model

Since Innovator is a newly setup company, Innovator's revenue is based on selling the product & services with installation of air conditioner device to the customers.

Revenue = services + ICONS box.

2.6 Operational Setup

Location

The Operational setup will be in a small home based office (S.O.H.O). The team members work at home and will continue for a short moment, after that Innovator plan to move to commercial building to perform the business.

Customer support

Customer support unit is also based in their home office. If customers have any query, they can phone, email or creates a helpdesk ticket to the customer support for further assistance. Innovator will be pleased to answer their questions regarding technical problem, sales inquiries, product information etc. There is no extra charge or time limit

for the support.

Service plan

Innovator will update customer information monthly, so that they can verify their status from time to time, or after they have renewed their guarantee. After a customer has renewed his guarantee status, Innovator aim to provide their best services, Innovator also provide after sales services support, so that Innovator can always keep in contact with the customers.

Distribution

Although Innovator just enter the local market; later on Innovator plan to target on international market. The program will be given to the customer when they had purchased a model of air conditioner. Besides that, Innovator will setup a website that will allow customers to download the application via the internet; they can download the application any time, 24 hours per day without any time limit, as long as their computer is connected online through the internet.

2.7 Long Term Goals of company

Innovator's first goal is to expand this product to the global market within 5 years. The second goal is to integrate the AI technology into other types of electronic appliances such as heater, refrigerator. Innovator's next plan is to implement smart home, and equip the A.I knowledge into the devices in the house or office, which can operate all the routine tasks by themselves. Besides that, Innovator would also collaborate with

electronic manufacturers, for instance: LG, Samsung, Panasonic etc. to implement the system into their products so that Innovator can earn royalty from them and become the technology pioneer in this field. Innovator is expecting a 30% profit margin from the market per annum.

2.8 Market & Competitors Information

In the air conditioner market, there are a few leading companies in the current market, these companies have established their respective credibility, providing their respective products and services. In order to get into the market, Innovator needs to conduct some market research and situation analysis, so that Innovator can enter to the market without any resistance from the competitors.

Innovator encounters two type of competitors in the industries, which provide the service and solution like installation, maintenance etc. to the big scale industries. The second type of competitors provided the new featured air conditioners to the home users and commercial.

Table 2.8.1: Comparison on service types of competitors.

Company Name	Year Establish	Services and Specialize
Yin Lee Air Conditioner Engineering	October, 1999	Northern Region of Peninsular Malaysia specialized in installation and maintenance of all types of

		industrial and commercial air-conditioning and refrigerators.
World Air-Conditioning Engineering (M) Sdn Bhd	1997	Centre Region of Peninsular Malaysia specialized in indoor air purifying, energy saving, cooling efficiency of commercial and factory air conditioner system
Kejuruteraan Jaya Tech Sdn Bhd	1994	The company focuses their business primarily on corporate customers, the company undertakes small and medium scale project and upgrading work for air-conditioning.
Klasse Airconditioning Sales & Services	1st August 2000	The company operation in the Centre Region of Peninsular Malaysia specialized in precision air conditioning or close control air conditioning for industrial sectors.
T-Technic Engineering Sdn Bhd	1998	Specialized in design, supply, install, service & maintenance, repair, overhauling and retrofitting of all range of chillers, air-conditioning & refrigeration, mechanical & electrical products and systems.

Table 2.8.2: Comparison on featured product of competitors.

Company	Year Establish	Services and Specialize
Daikin Industries, Ltd	1924	The company experts in air conditioning system with inverter and energy saving features for home, commercial and factories.
Intelligent Life form in 2008 by Advantage Air group	2008	The company expert in high technology and innovation design in new generation of temperature control system in air conditioning.

2.9 Strength & Weaknesses or S.W.O.T.

Before Innovator enter this software and air conditioner industries, Innovator has analyzed the market trends and consumers' behaviors, so that Innovator can get the key aspect of overall market, market size, market segment, competitor, individual product feature or services and current trend of technology.

2.9.1 Strength

There are a few significant strength of the algorithm design of the product:

1. The algorithm (Fuzzy Logic) enables the air conditioning devices to work

effectively and efficiency.

2. There is no remote control to send signal to control or adjust the temperature of the define area, when customer enter, the program will detect the environment and switch on the device, vice versa, when the customer leaving the defined area (eg: room), then it will turn off automatically.
3. When the algorithm detect the temperature of the defined area is optimum, it will reduce motor workload, this will result in energy saving and not create any side effect to the environment.
4. The software program is offered free of charge with the air conditioner model they purchased.
5. The team members either possess complementary A.I (Artificial Intelligent) skill and technical skill to develop the core of the program (Software), or marketing tactics to promote the product to the market.

2.9.2 Weakness

Since ICONS is new to the market, the current potential limitations are as below:

1. On rainy day or when the weather is cold, customers do not wish to turn on air conditioner, therefore the program is unable to function.
2. The initial cost of developing the program might be costly.
3. The external devices connect to the air conditioner might cause problem to the technical phobia person.
4. The team still lack professional management team member like quality control, devices tester, and management staff.

5. Due to lack of professional members such as engineer, developer and programmer, therefore more time and cost are consumed to develop the program.

2.9.3 Opportunity

1. Air conditioner has become a necessity for every family, offices, government agencies and manufacturing plants.
2. Human behaviors who always forget to switch off the air conditioner is a cause for high electricity bill.
3. In order to reduce the electricity bill, customers are willing to pay for additional features to customize on the program, such as remote control, centralize control on air conditioner.
4. SME (Small Medium Enterprise) industries and government agencies will be target.
5. After gaining local market credibility within 3 years' period, Innovator will have high potential to go into international market.

2.9.4 Threat

1. The competitors can easily copy the idea and concept.
2. The current market is full of products with partial implementation of Artificial Intelligent technology.
3. The competitors offer similar product with lower price.
4. The competitors have superior distribution channel to promote their product to the

market, for instance, they can get the customers information lists from their business partners.

Table 2.9: S.W.O.T Analysis

<p>Strength</p> <ul style="list-style-type: none"> ● The algorithm (Fuzzy Logic) enables devices to work effectively and efficiency. ● No remote control to send signal to control or adjust the temperature ● Energy saving and not create any side effect to the environment. ● Program is offered free of charge ● The team members either possess complementary A.I (Artificial Intelligent) skill. 	<p>Weakness</p> <ul style="list-style-type: none"> ● On rain day or when the weather is cold, customers do not wish to turn on air conditioner, therefore the program is unable to function. ● The external devices connect to the air conditioner might cause problem to the technical phobia person ● Initial cost of developing the program might be costly ● The team still lack professional management team member like quality control, devices tester, and management staff. ● More time and cost are consumed to develop the program
<p>Opportunity</p> <ul style="list-style-type: none"> ● Air conditioner has become a necessity. ● Human behaviors that forget to switch off the air conditioner. ● Customers are willing to pay for additional features to customize. ● SME industries and government agencies will be target. ● Gaining local market credibility within 3 years' period, go international. 	<p>Threat</p> <ul style="list-style-type: none"> ● The competitors can easily copy the idea and concept. ● The current market is full of products with partial implementation of Artificial Intelligent technology. ● The competitors offer similar product with lower price. ● The competitors have superior distribution channel to promote.

3.0 EMPLOYMENT OF KNOWLEDGEABLE WORKERS

3.1 Management Team

Lau Teng Lye, graduated from Universiti Utara Malaysia and possesses Bachelor degree in Information Technology major in Artificial Intelligent. He has 2 years working experience as a lecturer at INTI College. He is involved in developing the A.I software, at the mean time, he is the Chief Executive Officer at Innovator, besides that he also manages and monitors the entire ICONS application's progress.

Ching Yee Khim, graduated from Universiti Sains Malaysia and possess Bachelor degree in Biologi major in Botani (Biology Science major in Botany), with 6 years working experience as SNP Brand Marketing Specialist in marketing field. With his experience in sales and marketing field, he is positioned as Chief Finance Officer cum Chief Market Officer, and takes care of the financial projection and price analysis for Innovator and monitoring market from time to time.

Lim Seng Chee, graduated from Multimedia University (Malacca Campus) and possesses Bachelor degree in Information Technology major in Software Engineering. He has 2 years working experience as application support cum programmer in Information Technology at Comdevweb Software Sdn Bhd. He is the Chief Technology Officer of Innovator, monitoring the latest technology in the market and improves the quality of the products through various Research and Development.

3.2 Organizational Chart

Below is the organization chart of Innovator, each member in Innovator is assigned with respective position, to perform daily routine to maintain and sustain the business operation.

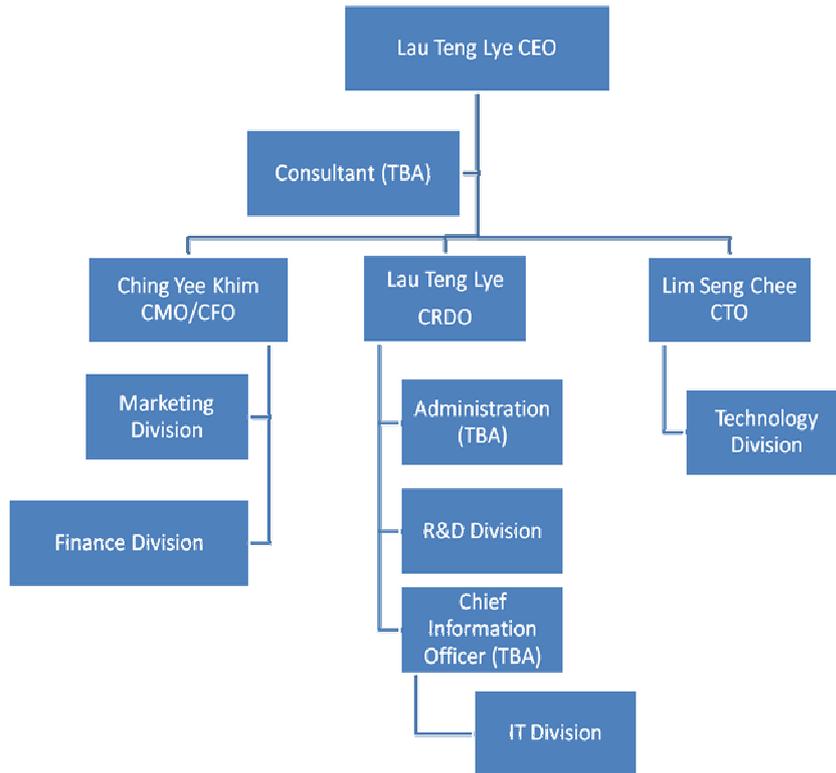


Figure 3.2.1: Company management team

Hiring the right key personal for a company is very important, it determine the success of a company. Innovator, is supervised by Pn Faten Damanhoori, who is an experienced lecturer in University Sains Malaysia (U.S.M). Innovator is a newly setup company, with three key personals, that is Lau Teng Lye as the Chief Executive Office, Ching Yee Khim as the Chief Financial Officer, and Lim Seng Chee perform as the Chief Information Technology Officer. The C.E.O, Lau manages the product development of

the ICONS box and heads the Research and Development Division. Ching, the C.F.O position at Innovator and supervise the Finance Division. Lim as the C.T.O position at Innovator, and manages IT division.

3.3 Human Resource Plan

Innovator is new to the market, therefore to hire the right key personal for a team is very important, in order to run Innovator for the 1st and 2nd year, the management team members will recruit some staffs to develop and maintained the quality of the product and manage to handle the necessary works. For the 3rd year, the management team might need some new employees to assist operation of Innovator.

Table 3.3.1: Human Resource Plan

Position/Role	Year 1	Year 2	Year 3
<u>CEO</u>			
CEO and Chief of R&D	1	1	1
Technical Advisor		1	1
Executive Secretary	1	1	1
Position/Role	Year 1	Year 2	Year 3
<u>R&D Department</u>			
R&D Engineer		1	1
<u>Technology Department</u>			
CTO	1	1	1
Technical Development Director		1	1
Technical Engineer		1	2

<u>Marketing/Finance</u>			
<u>Department</u>			
CMO/CFO	1	1	1
Business Development Manager	1	1	1
Account Executive		1	2
Financial Manager		1	1
Dispatch & Office Assistant		1	2
<u>IT Department</u>			
CIO/IT Director	1	1	1
Web Designer		1	1
Total No. Of Worker	6	14	17
Total Knowledge Workers	5	12	14
Total Foreign Knowledge Workers	0	0	0
% Of Knowledge workers	83%	86%	82%

Table 3.3.2: Training Program

Training	Year 1	Year 2	Year 3
External Conference	√	√	√
Trade Show		√	√
ISO certification		√	√
Courses		√	√

In the third year, Innovator will come out with a plan as the table above that will benefit the employee in term of incentive and technical knowledge skills.