

INNOVATOR
INTELLIGENT AIR CONDITIONER SYSTEM
(ICONS)
DETERMINE THE TEMPERATURE AND
OCCUPANT RANGE FOR DEVELOPMENT OF
ICONS

LAU TENG LYE

Dissertation submitted as partial fulfilment of the
requirements for the degree of Master of Science
(Information Technology Technopreneurship)

November 2009

Student's Declaration

Name: LAU TENG LYE

Matric No: SCOM005008

School: School Of Computer Science

Thesis Title: Determine The Temperature And Occupant Range For Development Of ICONS

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ACKNOWLEDGEMENTS

I would like to express my indebtedness to all those who have give me the possibility to complete this dissertation.

I am deeply indebted to my supervisor and my dissertation panel Puan Faten Damanhoori, Puan Norlia Mustafa and Puan Rosnah Idrus from the Universiti Sains Malaysia whose help, stimulating suggestions and encouragement helped me in all the time of my research works and writing of this dissertation.

I would like to thank all the interviewees and respondents of the research survey. To my team members of this dissertation, I wish to thank Mr. Lim Seng Chee and Mr. Ching Yee Khim, for all the help, and support they gave in preparing this dissertation.

I would especially, like to give my special thanks to my wife Tan Yoke Lin whose patient and love enabled me to complete this dissertation.

Last but not least, I would like to thank my family members continuously supports me during my difficult times.

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LISTS OF ABBREVIATIONS

		Page
ICONS	Intelligent Air Conditioner System	1
°C	Degree Celsius	1
°F	Fahrenheit	1
MDEC	Multimedia Development Corporation	2
SWOT	Strength Weakness Opportunity Threat	3
Mr.	Mister	4
UUM	Universiti Utara Malaysia	4
A.I.	Artificial Intelligent	4
SNP	Supply Network Planning	4
USM	Universiti Sains Malaysia	4
CRDO	Chief of Research and Development Officer	8
Co. Ltd	Corporate Limited	8
PIR	Pyroelectric Infrared	8
RMK9	Rancangan Malaysia Ke-9	9
ICT	Information Communication Technology	9
(M)	Malaysia	10
IPO	Initial Public Offering	11
CMO	Chief Of Marketing Officer	14
PCT	Patent Cooperation Treaty	14
Tel	Telephone	14
SIRIM	Standards and Industrial Research Institute of Malaysia	15
CDU	Condensing Unit	16

FCU	Fan Coil Unit	16
B2C	Business To Consumer	18
SOHO	Small Office Home Office	20
GB	Giga Bytes	20
FTP	File Transfer Protocol	20
CIO	Chief Information Officer	20
CEO	Chief Executive Officer	20
CFO	Chief Of Financial Officer	20
CTO	Chief Of Technology Officer	21
VMI	Vendor Managed Inventory	21
hp	Horse Power	21
R&D	Research and Development	27
sq ft	Square Feet	31
m ²	Meter Square	31
mV	Milli Volts	35
USD	United States Dollar	35
RM	Ringgit Malaysia	35
MCU	Master Control Unit	38
EAC	Enhanced Air Conditioning	38
IPOC	Input Process Output Chart	43
FAM	Functional Attributes Map	44
COG	Center Of Gravity	48
Tcv	Temperature Confident Value	50
Pcv	People Confident Value	50

MIN	minimum	50
VB6	Visual Basic 6	54
Q	Question	64
SPSS	Statistical Package for the Social Sciences	73
PhD	Doctor of Philosophy	75
b/f	brought forward	96
c/f	carried forward	96
NA	Not Available	99

ABSTRAK

Pelan perniagaan ini bertujuan membangunkan suatu sistem penyaman udara kepintaran buatan (ICONS). Produk ICONS akan dimiliki oleh Innovator. Produk ICONS mempunyai dua bahagian iaitu bahagian perisian dan bahagian perkakasan. Perisian produk ICONS akan dibangunkan dengan menggunakan algoritma Logik Kabur. Bahagian perkakasan mengandungi penderia suhu, penderia penggerakkan dan pengawal suhu. Penyelidikan bagi pelan perniagaan ini akan membangunkan suatu enjin perisian yang akan berfungsi secara automatik untuk mengawal suhu penyaman udara berasaskan jumlah orang yang masuk ke dalam sesebuah bilik. Teknik temuduga dan teknik soalselidik digunakan untuk mengumpulkan julat suhu dan bilangan orang untuk membangunkan perisian produk ICONS. Keputusan soalselidik adalah seperti berikut: suhu sejuk adalah 18°C (64°F), suhu biasa adalah 22-26°C (72-79°F), suhu panas adalah 30°C (86°F), kategori sedikit penghuni adalah tiga orang, banyak penghuni adalah tujuh hingga sembilan orang dan terlalu banyak penghuni adalah tiga-belas orang. Pelanggan sasaran bagi produk ICONS adalah pengguna rumah dan pejabat pengguna yang menggunakan penyaman udara berjenis unit berasingan dan mempunyai komputer. Strategi pemasaran pelan perniagaan ini adalah bekerjasama dengan pembekal alat penyaman udara untuk mendapatkan kebolehpercayaan atau kesedaran produk di kalangan pengguna, mencipta jenama melalui pengiklanan dan mempromosi produk ICONS melalui peralatan rangkaian Internet, bengkel teknologi dan pameran perdagangan. Innovator akan memohon dana permulaan perniagaan sebanyak RM150,000 daripada Multimedia Development Corporation (MDEC).

ABSTRACT

This business plan is to develop an Intelligent Air Conditioner System (ICONS) product. The ICONS product will be owned by Innovator. The ICONS product consists of a software and a hardware components. The software engine of ICONS will be developed using the Fuzzy Logic algorithm. The hardware components consist of a temperature sensor, two motion sensors and a temperature controller. The research of this business plan is to develop a software engine that will automatically adjust the air-conditioner temperature based on number of people entering into a room. The interview and questionnaire techniques are used to collect the temperature and occupant range values to develop the software of ICONS product. Results of the questionnaire are as follows: cold temperature is 18°C (64°F), normal temperature is 22-26°C (72-79°F), warm temperature is 30°C (86°F), few occupant categories are three people, many occupant categories are seven to nine people and too many occupant categories are thirteen people. The target customers of ICONS product are home and small offices user that using the split unit air conditioner and computer. The business plan market strategies are, to collaborate with air conditioner service providers to build credibility and product awareness among the consumers, to create brand awareness via advertise and promote this product via the Internet, techno seminars and trade shows. The Innovator will apply for the pre seed fund of RM150,000 from MDEC to startup the business.

Section 1.0 Introduction

1.1 Executive Summary

The purpose of this business plan is to raise RM150,000 for the development of an intelligent air conditioner system (ICONS) while showcasing the expected financial and operations over the next three years. The Innovator (“the Company”) is going to be a Malaysia based company that will provide the ICONS hardware and software to customers in its targeted market. Based on this research, the statistical data showed that, most of the office or home users suffer a situation where the room temperature is sometimes too hot and sometime is too cold. The conventional air conditioner only has the auto cut off function. This auto cut off feature works when the air conditioner temperature reached a threshold value set by the user. For example, the user sets the room temperature at 18°C (64°F), when the room temperature reached 18°C the air conditioner will stop the supply of cool air in the room. It will turn back on when the room temperature exceeds 18°C. If there are two persons in the room, the room temperature might be very cold. In this case, the users will have to switch off and on that is manually adjusting the temperature of the air conditioner in order to be comfortable. This is not an effective solution for the users. ICONS aims to solve this situation. ICONS consists of two parts, the software part and hardware part (known as the ICONS-box). The ICONS-box consists of a temperature sensor, two motion sensors and a temperature controller. The software was developed using the Fuzzy Logic Technology algorithm. The product details will be described in fourth section of this business plan. The software is to be installed into a host computer and the hardware is to be attached with to the host computer and air conditioner unit. The auto temperature adjustment will function when the ICONS program runs with the ICONS-box connected to the air

conditioner. Innovator comprises of a technical team member, a marketing & financial team member and a technology team member. The technical team member will be in-charge of the software and the hardware design for the ICONS. The marketing & financial team member will be in-charge of how to promote, to brand the ICONS, to plan the budget and to manage cash flow of Innovator. The technology team member will be in-charge of ICONS product related to the technology issues. Innovator will raise its initial funding through a pre-seed funding of RM150,000 from Multimedia Development Corporation (MDEC) via the business plan competition for the start up of the business. Innovator will then raise the funds via personal loan from the commercial banks. In order to expand its business, Innovator will increase its financial fund via shareholders' investments and venture capital funding in future. In order to create awareness and promote the ICONS product, the market strategies are as follows: collaborate with air conditioner service providers to build the credibility and product awareness among the consumers, to advertise and promote this product via the Internet, techno seminars, blogs and trade shows. The details of the marketing programs are discussed in the fifth section of this business plan. Based on the current standards, Innovator will generate RM173 for the ICONS product cost; this includes all the hardware and software costs. The selling price for the ICONS is RM350. For the first year Innovator forecast sales units of ICONS product is 1,200 units, the second year forecast sales units is 2,400 units and the third year forecast sales is 4,800 units. For the year three (2012), Innovator will target 20% of its sales by export to ASEAN countries. The details are discussed in the sixth section of this business plan. In the future, Innovator will implement the ICONS algorithm into other types of electrical appliances such as refrigerator and heater. These future plans will allow Innovator to continue

sustain and to be more competitive in the industry. Using the Five Forces Model and Strength Weakness Opportunity Threats (SWOT) the risks of the business are suppliers bargain power; customers bargain power, threat of potential entrants, threat of substitutes and competition with competitors. The details are discussed in the fifth section of this business plan.

Section 2.0 Introduction To The Team

2.1 Team Background

The planned company name for the ICONS product is Innovator. Innovator consists of three team members, who are Mr. Lau Teng Lye, Mr. Ching Yee Khim and Mr. Lim Seng Chee. Mr. Lau Teng Lye was assigned to be in charge of the development of the ICONS product; Mr. Ching Yee Khim was assigned to be in charge of the marketing & sales and pricing issues of the ICONS product and Mr. Lim Seng Chee was assigned to be in charge of the technology issues regarding the ICONS product. Below is the table of summary of the team member's qualification background.

Table 2.1: Team Members Academic Qualification And Working Experiences.

Name	Academic Qualification	Working Experiences
Lau Teng Lye	Bachelor of Information Technology (Artificial Intelligent, A.I.), 2005, Universiti Utara Malaysia (UUM)/ Kedah.	1. INTI International College Penang, Lecturer, 2 years. 2. ESSP Sdn. Bhd, Systems Engineer, 1 and half years.
Lim Seng Chee	Bachelor of Information Technology (Software Engineering), Multimedia University/ Malacca	1. Comdev Software Sdn Bhd, Application Support & Programmer, 1 year. 2. Exabytes Network Sdn Bhd, Systems Engineer, 4 months
Ching Yee Khim	Bachelor of Biological Sciences (Botany), Universiti Sains Malaysia (USM)/ Penang	1. Dell Asia Pacific Sdn., SNP Brand Marketing Specialist, 6 years. 2. CG Computers Sdn Bhd, Sales Executive, 1 year

2.2 Business Intent

This business plan intent is to add a brand new feature (artificial intelligent) with affordable price in air conditioner industry. ICONS will provide a convenient feature and costs saving for the air conditioning to the customers as the values of proposition.

An air conditioner is a device designed for cooling in buildings or homes.

Typically, most air conditioner use the refrigeration cycle concept, to perform the cooling task. Air conditioner can be categorized to the various types, the portable unit, the window or wall unit, the split unit and the centralize unit air conditioner. ICONS product can only work with the split unit type of air conditioner. This type of air conditioner will be used in the small commercial premises and home premises.

The split unit air conditioner consists of Condensing Unit (outdoor unit) and Fan Coil Unit (indoor unit). ICONS product will be used in the split unit air conditioner type.

Based on these reasons, the ICONS product was invented to solve the users' pains in term of cost and feature.

2.2.1 User Pain

Most of the office users suffer a situation where the room temperature is sometime too hot and sometime too cold. Therefore the users have to switch off and on or manually adjust the temperature of the air conditioner to keep them comfortable. This is not an effective solution for the users in the premises. The above condition will cause an extra work to the users in the office premises as well as to the home users. They may lose concentration during their working time. Moreover, the above problem also may cause the users to get tired easily if the room temperature is too hot. Besides, the hot temperature may cause damage to electronic devices. On the other hand, if the room temperature is too cold, it might cause users to go to the washroom more frequently. According to the survey data analysis in the fourth section showed that, about 69% of the respondents suffer from the room temperature being too cold or too warm.

Air conditioner is commonly used in office or homes. However intelligent air conditioner is a new trend to the air conditioner industry. As the technology grow, human tend to integrate intelligence into appliances, to improve the quality of their life style. Conventional air conditioner does not resolve the user pain, so ICONS is the solution for resolving the above user pain. The conventional air conditioner referred here has the following specifications: no energy saving feature, no inverter technology, no ionize feature and with a remote temperature panel controller.

2.2.2 User Pain Solution

ICONS integrated the human knowledge into the air-conditioner, to help the user to adjust the temperature automatically; so that the user can get a comfortable room temperature which in turn will improve the quality of the human life. ICONS is able to configure all the air conditioner setting by itself.

The main concept of ICONS is to make the human life easier. This product wishes to create a convenience for the user, by automatically control the room temperature setting with the artificial intelligent technology. A.I. technology makes machine “think” or “act” or “reason” accordingly like a human being. Sensor technology, however, makes machine “act” without “thinking” or “reasoning” (Nageswara, 1998). Sensor technology is less costly, because it involved mostly hardware and less software configuration. However, A.I. technology is more costly because the programmer will use softwares to train or make a device to reasoning and learn like a human being. The customers do not see the value, they tend to choose sensor technology product (Guestrin C., 2008) because it’s cheaper than the A.I product. According to Guestrin, the future trend of system development will move toward the A.I direction. ICONS is a machine that can “think” and “reason” and “act” like a human being. For example ICONS can set the room temperature base on numbers of people entering into the room. When there are less people in the room, the ICONS will adjust the temperature to the comfortable range of temperature.

2.2.3 How To Market ICONS Product

The ICONS product will be market via the marketing programs such as collaborate with air conditioner service providers to build the credibility and create product awareness among the consumers. This is important marketing plan of Innovator, due to Innovator is a new company that joins into the air conditioner industry, so Innovator needs to collaborate with the current air conditioner service providers for creating product awareness among the customers. Besides, to create awareness of the product, Innovator will advertise and promote this product via “Internet-ad”, techno seminars, forums, blogs and trade shows. Blogs and forums are very useful Internet tools that will provide Innovator with feedback from the customers. Based on the feedback, Innovator can plan for the new marketing strategies and at the same time resolve customers’ problems. Nevertheless, with the interaction Innovator can build a good customer relationship and loyalty to enlarge the customers based.

2.2.4 ICONS Production And Future Plan

Innovator will buy the hardware such as temperature sensor, motion sensor, sensor wire and temperature controller from china electronic suppliers. Innovator gets the K-type temperature sensor quotation from Yongkang Shenwei Electric Co. Ltd. Weihai Reweal Optoelectronic Technology Co. Ltd. will supply Innovator with the PIR motion sensor and sensor wire. Zhejiang Chog Electric Co. Ltd. will supply Innovator with the XMT-D temperature controller. This hardware will be assembled by the CRDO of Innovator, the assembly hardware unit which is the ICONS-box. The hardware layout will be displayed in appendice. Innovator will sell the ICONS product to the customers as ICONS-box and ICONS software engine. In the future, Innovator plans to create and manufacture its own

hardware unit, so that Innovator will not rely fully on the suppliers. This will reduce the cost of the product and improve the quality of the ICONS product in the long term.

2.3 Growth Strategies

2.3.1 Financial Strategies

Innovator will raise funds via three means, which are pre-funding, personal loan or microfinance and venture capital. The project financial strategies are as follows; firstly this project will apply the pre-seed funding from the MDEC via the business plan competition as the stepping stone (initial stage) to get the financial funding for this project. The amount of the pre-funding provides by MDEC is RM150,000. Besides, this project has won the consolation price during the Business Plan Completion 2008, which organized by Universiti Sains Malaysia on December 2008.

The MDEC pre-seed fund was initiated by the Rancangan Malaysia Ke-9 (RMK9) of the Malaysia government development plan in which, to help local technopreneurs in Information Communication Technology (ICT) industry. This pre-seed fund is only eligible to local individual technopreneur that would like to start up their ICT business. This fund is not eligible for existing companies in the industry. The pre-seed fund provided by MDEC is RM150,000. In this pre-seed fund program, the technopreneur not only received the funding, but also get technical and non-technical support services such as development monitoring services, access to the share lab facilities, business angle and venture capital funding to help the fresh technopreneurs to succeed. The application form to apply the pre-seed fund can be found in this website (<http://www.technopreneurdevelopment.net.my/cms/AllProduct.asp?CatID=122>). The filled application form should be submitted to this e-mail link

techpreseed@mdec.com.my. Innovator will utilize this mean to raise the pre-seed fund to kick off the ICONS project.

Moreover, Innovator team members plan to apply for the personal loan or micro-finance from the commercial banks to increase company project funds for backup company financial purposes. Micro-finance is a type of loan service with the aim of giving loan service to those individuals and small entrepreneurs' who do not have qualifications for existing commercial bank products due to the lack of a good guarantor or other terms and conditions required by the banks (Beatriz Armendariz de A. et al., 2005).

The micro finance is Innovator's best alternative choice to raise the funds for the company due to the Innovator business nature. In order to apply for the micro-finance, Innovator needs some of the following documents and information for the commercial bank to approve. For example, Ambank (M) Berhad provides the micro-finance service called AmMikro. The application form can be downloaded at (http://www.ambg.com.my/business.asp?sc=business_loans&pg=bloans_ammikro). The micro-finance offers financing from RM50,000 up to RM100,000 and the repayment period up to 5 years.

The requirements of the applications are: age must range is from 18 to 60 years old, Malaysian nationality, the applicant must be an entrepreneur, photocopy of applicants' identity card, saving or current account (6 months statement), business registration, business permit or license, management account, audited account, income tax forms such as EA or B form. All the completed documents are sent via post to the nearest branch of the commercial bank.

For the next expansion stage, Innovator plan to raise its funding through venture capital funding. The venture capitalists expected to get the return at least 20% until 25% of the venture capital that they invested in Innovator. Advantages of collaborating with these venture capitalists are to oversee and provide marketing strategies, operational and financial advices to Innovator. Besides these advantages, venture capitalists can provide alliances such as introducing Innovator to its existing network companies locally or internationally. The other advantages are facilitating exit by preparing Innovator to go for an Initial Public Offering (IPO). Moreover, the venture capitalists can help Innovator to facilitate an overseas trade sales and stock exchange.

2.3.1.1 Funds Required

At this moment Innovator required RM114,200 of pre seed fund for the business start up. Innovator will apply this pre seed fund via MDEC Technopreneur application. This fund will be used by Innovator to spend on the business operational cost and activities such as pay the staff salary, buy vehicle and equipment for business use and other operational cost. The startup fund does not include the ICONS product hardware cost. The following table shows the breakdown items of the funds will be used.

Table 2.2: Innovator Start Up Funds.

Business Start Up Year	2010
ICONS Product Start Up Cost	RM
Sales & Marketing Budget	11,950
Insurance & Rental	7,800
Miscellaneous Expenses	5,100
Salary of Administrator	18,000
Salary of Consultant	30,000
Fixtures & Fittings	10,000
Office Equipment	15,000
Vehicles	16,200
Total Start Up Cost	114,050

2.3.2 Technology And Product Development Strategies

2.3.2.1 ICONS Software Technology

ICONS software engine is built using the Fuzzy Logic approach in Artificial Intelligent Technology. Fuzzy Logic (Zadeh L.A, 1975) can manipulate data that deal with “degree of certainty” (percentage) rather than the Boolean logic “true and false” (logic 1 or logic 0) in programming language. Innovator choose Fuzzy Logic algorithm in development of the ICONS software engine because of its special characteristic which, Fuzzy Logic can solve problem involved grey areas of measurement for example the temperature range.

2.3.2.2 ICONS Software Engine Development Strategies

Innovator using the rapid prototyping approach of System Development Life Cycle to develop the prototype of the ICONS software engine. The reason Innovator choose the rapid prototyping approach is because Innovator can reuse some of the good algorithm that have been carried out by Fuzzy Logic researchers. The ICONS software engine can work with ICONS-box to auto-set the air conditioner temperature based on the numbers

of people enter into the room and the room temperature. The whole system will work as follows: firstly the temperature sensor and motion sensor in ICONS-box will detect the current room temperature and numbers of people are entering into the room respectively. Secondly these inputs will pass it to ICONS software engine to manipulate an appropriate or comfortable temperature. Thirdly this temperature value will be set by the temperature controller in ICONS-box to the air conditioner.

Innovator will buy all the hardware of the ICONS-box from the suppliers, assembled it as the ICONS-box before delivered to customer with the ICONS software. Innovator gets the K-type temperature sensor quotation from Yongkang Shenwei Electric Co. Ltd. Weihai Reweal Optoelectronic Technology Co. Ltd. will supply Innovator with the PIR motion sensor and sensor wire. Zhejiang Chog Electric Co. Ltd. will supply Innovator with the XMT-D temperature controller.

2.3.2.3 Paten ICONS Software Work

Innovator planned to have patent application for the ICONS product; this is to protect the team members' intellectual investment. Innovator can get more funding via licensing the product to other air conditioner service providers. The ICONS patent application form can be get via the following website link (<http://www.myipo.gov.my/>). A patent is a right given to an invention, it can be a product or a process that provides a new approach of doing something, or offers new features in technical solution to a problem. Any individual or a company may make an application for a patent either alone or jointly with another individual. An applicant must apply a patent with the Intellectual Property Corporation of Malaysia under the Patents Act 1983. ICONS patent or protection gives Innovator the exclusive right to stop others or competitors from

manufacturing, using or selling the Innovator's invention in Malaysia without the Innovator's consent or permission. A patent is protected 20 years from the date of filing subject to use. The total cost of the patent application is RM1050. Innovator will consider to patent the ICONS product in other country via the Patent Cooperation Treaty (PCT). The following is the intellectual property company in Malaysia. The Registrar The Patent Registration Office Intellectual Property Corporation of Malaysia, 32nd Floor, Menara Dayabumi Jalan Sultan Hishamuddin, 50623 Kuala Lumpur, Tel: 603-2263 2100, Fax: 603-2274 1332.

Besides that, in the next five years Innovator planned to collaborate with more air conditioner service providers, so that the process of research and development can improve the product quality and users satisfaction in the future.

2.3.3 Marketing Strategies To Increase Market Or Mind Share

Based on the Innovator CMO the marketing ongoing strategies can be divided into three main phases, which includes 1) collaborate with air conditioner service providers to create product awareness among the customers, 2) promote the ICONS product via the Internet environment and 3) promote the ICONS product via conventional way. Based on these strategies will help Innovator to increase market and brand the ICONS into potential customer mindset.

In order to increase the market locally and globally; the first market strategies is to collaborate together with the existing well known brand air conditioner to build the credibility and product awareness among the consumers. This strategy is crucial to Innovator because Innovator is a small company with no credibility among the air

conditioner market. Besides that, Innovator does not have any customers base in air conditioner industry, thus it is very difficult for Innovator to gain customers.

Second strategy is using the Internet facilities to advertise, promote via the social networks such as Facebook, Friendster, Twitter and etc. Besides that, the blog and forum also can help Innovator to get the latest information about the customers and plan for the next marketing strategies to reposition ICONS product. Blog also acts as a tool for Innovator to interact with the customers or potential customers, the customers can post any comments and recommend the ICONS product to their friends. This approach is very efficient and cost effective with nowadays Internet technology.

The third strategy is conventional approach, which promote ICONS product via techno seminars, trade show, participate events or exhibition launch by government agencies, techno magazines and brand positioning.

Besides that, Innovator will buy insurance for ICONS product. This liability insurance is important to protect Innovator and the customers of Innovator. Innovator will buy the product liability insurance from Tokio Marine Insurans Malaysia.

Moreover Innovator will apply SIRIM certification for ICONS product. This certification is allowed Innovator to take care of the ICONS product quality. Besides that, this certification allows ICONS product to have better position in customer mindset.

2.4 Target Markets

The ICONS product consists of hardware (ICONS-box) and ICONS software engine (Fuzzy Logic algorithm). The ICONS product will resolve the user pain of manually adjust the air conditioner temperature, whenever the occupants in the room entering and

leaving the room. The potential consumers of ICONS product are air conditioner consumers for small commercial premises or office and home consumers. The potential customers must have their own set of computer to run the ICONS software. The air conditioner type, which using the ICONS has to use the split unit type (with control panel). The split unit type of air conditioner consists of two major components, which are Condensing Unit (CDU) and Fan Coil Unit (FCU). The CDU will be installed at the outdoor of the premise and the FCU will be installed at the indoor of the premise. Generally the CDU will absorb the heat from indoor and the FCU will release the heat to the outdoor (Carrier, 2008). Currently, this project target market can be divided into two phases; first phase is local market and second phase will expand to global market with other types of air conditioner such centralized multi system.

The following table shows summary of the air conditioner service providers with their product features. This information was gathered from the interview conducted by Mr. Lau Teng Lye.

Table 2.3: Split Unit Type Air Conditioner Features.

Brand Features	LG	Carrier	Samsung	Toshiba	Panasonic
Inverter	Yes	Yes	Yes	Yes	Yes
Ionizer	Yes	Yes	Yes	Yes	Yes
ICONS-Fuzzy Logic (Auto Temperature Adjustment)	No	No	No	No	No

Based on the above information, most of the local brand air conditioners have the ionizer features to purify the air and some of the brands have the inverter technology and none of these air conditioner service providers have integrate the AI technology (Fuzzy Logic)

into their air conditioner system. This scenario will get the Innovator an advantage to promote the new feature of ICONS product to these air conditioner service providers' customers. The ICONS product can work with all brands of split unit type air conditioner.

2.4.1 Industry Analysis

Based on the previous researcher (Tang C.K., 2005) dataset, air conditioner approximately increase 41,929 (1,004,478 units/ 30 years) units per year in Malaysia. Innovator financial year will start from year 2010. Therefore, air conditioner sales units, during year 2010 are about 41,929 units X 10 years = 419,290 units. According to the Tang C.K. (2005), the dataset shown that only 28% of the household (income level above RM3500) in Malaysia own the air conditioner. Therefore, the targeted air conditioner units in Malaysia are about 117,402 units (419,290 X 28%) by the year 2010. According to Innovator CMO, the total computer usage for small office and home user are 148,461 units and 373,949 units in the year 2010 respectively. Hence, total forecast computer usage by the year 2010 is 522,410 units. Based on Innovator CMO data analysis showed the comparison ratio for computer versus air conditioner in year 2010 is 1:1.6. Therefore, the total targeted market size for ICONS product in year 2010 is about 522,410 units.

2.4.2 Potential Customer Profile

Based on the dataset, Innovator has developed an extensive demographic profile that will use in regards to its target market. These demographics include:

- Home users (with split unit control panel air conditioner) with income level above RM3500 per month.
- Small office or premise with split unit air conditioner.
- User must have computer.

2.4.3 Well Known Air Conditioner Service Providers

The following table shows the top five well known air conditioner service providers operated in Malaysia and internationally (Asia region).

Table 2.4: Well Known Air Conditioner Service Providers.

Air Conditioner Service Provider	Malaysia	International/ Asia region
Panasonic	√	√
Toshiba	√	√
Samsung	√	Asia
Carrier	√	√
LG	√	Asia

2.5 Revenue Model

Innovator revenue model include the answer for this fundamental question: How will Innovator profit from ICONS product? Innovator will buy the hardware from the suppliers. Innovator will assemble and install the hardware and software to the customers as end product (ICONS product). Innovator revenue model is selling the ICONS software and hardware attaches part (ICONS-box) installation to the customers. The software license agreement will be used to protect our ICONS software product from being duplicate, modify and distribute illegally. Innovator business model is Business To Consumer (B2C) model. Innovator will generate RM173 for the ICONS

product cost; which included all the hardware (ICONS-box), packaging cost, delivery and installation cost. The hardware of ICONS-box includes the temperature sensor, motion sensor and temperature controller. Mr. Ching Innovator CMO has proposal the selling price of RM350 for ICONS product and the break even sales are 1,093 units. For 1st year Innovator forecast sales to sell 1,200 units, 2nd year forecast sales to sell 2,400 units and 3rd year forecast sales to sell 4,800 units of ICONS product.

Table 2.5: Innovator Revenue.

Items	1 st Year	2 nd Year	3 rd Year
Sales units	1,200	2,400	4,800
Selling price	RM350	RM350	RM350
Cost price	RM173	RM173	RM173
	RM'000	RM'000	RM'000
Gross Sales (sales units X selling price)	420	840	1,680
Cost of Goods Sold (sales units X cost price)	207.6	415.2	830.4
Gross Profit	212.4	424.8	849.6
Operating Expenses			
Consultant Fee	24	24	24
Product Liability Insurance	8	14	25
Company Insurance	3.6	0.5	0.5
Medical Fee	0.5	7.2	10.2
Rental of Premises	7.8	7.8	7.8
Admin. Salaries & Allowances	84	272.4	422.5
Upkeep of Office	1	1.5	2
R&D Expenses	0	24	26
Advertisement	10	15	20
Printing & Stationery	0.5	0.5	0.5
Salesman Salaries & Commissions	0	24	41
Travelling Expenses	1	3	5
Upkeep of Vehicle	0.45	0.54	0.6
less Total Operating Expenses	140.85	394.44	585.1
Profit Before Interest & Depreciation	71.55	30.36	264.5
less Interest	12	12	8
less Amortization of R&D	9.179	10.631	11.599
less Depreciation	12.74	25.84	32.84
Net Profit	37.631	(18.111)	212.061

2.6 Operational Setup

2.6.1 Innovator Office and Services

In order to utilize or minimize the operation costs, this project operational setup is a small scale SOHO (Small Office Home Office) based. Innovator will rent a office space (700–800 square feet) with annual rental RM7,800 at Penang Island. Innovator needs a reliable and affordable web hosting services for the marketing programs via Internet. Joomla web hosting company offered \$5.95 per month for web hosting fees with 20GB (Giga Bytes) web space, 200GB bandwidth per traffic, 3 domains hosted, 10 MySQL v.5 database, 5 FTP (File Transfer Protocol) accounts and 200 e-mail boxes. Besides that, Innovator will create a merchant account that can accept multiple payment methods such as PayPal, credit card, debit card and etc.

2.6.2 Innovator Man Power

The three team members will carry out most of the technical works and research works for first year. Innovator will hire one administrative (Executive Secretary salary RM18,000 per annual) to handle all the administration works such handing the invoice, purchase order, inventory and etc. Innovator also will hire a Chief Information Officer (CIO salary RM36,000 per annual) to handle website management work. Moreover, Innovator will need a consultant (salary RM24,000 per annual) to handle some of the air conditioner technical knowledge issues. Innovator will get a recommended consultant from MDEC or USM to help Innovator in the management, technical and legal issues.

Mr. Lau Teng Lye will hold the position of CEO and in charge of the ICONS product research, ICONS-box assembly, installation and development works. Mr. Ching Yee Khim will hold position of CMO and CFO. Mr. Ching will in charge to create the

marketing strategies plan as well as to promote and market the ICONS product. Moreover, Mr. Ching will need to take care of the financial issues such as to determine the selling price of the ICONS product, monetary issues and the marketing activities. Mr. Lim Seng Chee will hold the position of CTO and in charge of ICONS product technology planning and ICONS-box installation and customer service works. Besides that, Innovator will utilize the Vendor Managed Inventory (VMI) features to handle the supply chain processes to cut down the costs such as warehouse cost, shipping costs, and etc.

2.6.3 Innovator Office Equipments

Innovator will need a desktop computer, laser printer, scanner, Internet access, telephone lines, 2 units of 1.5hp air conditioners split unit type, office furniture in the office. A low end specification desktop computer system will be used by the executive secretary. Three members of the Innovator will use their own notebook computers. One low end laser printer and low end scanner will be shared among the staff in Innovator Company. Innovator will get the Internet access from Telekom Bhd. Innovator will subscript the Business Broadband SOHO package with monthly fees of RM318 per month. With this package, Innovator allows to have unlimited access of Internet and free 1Giga Byte e-storage, free wireless modem and free 1 e-mail (<http://streamyx.com/promotions/promotions.php?id=wifioffice>, visited on 2nd September 2009). Innovator will need a simple set of office furniture, one office desk and one office chair for each Innovator staff. Innovator needs one eight feet meeting table with eight chairs for meeting the clients' purposes. Two air conditioners of 1.5hp required in Innovator office, one air conditioner will be installed in the meeting room and the other one will be installed at

the working areas of the Innovator staff. Besides that, Innovator needs a vehicle for delivery the ICONS product to the customer and also some installation tools. These assets needed by the Innovator, in order to run the business efficiently and effectively.

2.7 Long Term Goals

2.7.1 Long Term Goals For ICONS Product

The first long-term goal for this project is to expand this product to global market within five years. The second main goal is to embed the AI technology (Fuzzy Logic) into other types of household electronic appliances such as heater and refrigerator. The future plan of this project is to build an intelligent home, means that all the equipment in the house or office can operate all the routine tasks by Fuzzy Logic. Besides that, collaborate with more electronic manufacturers to implement Fuzzy Logic system into their products and to be technology pioneer at this field.

2.7.2 Long Term Goal For Innovator

The long term goal for Innovator is to go for an Initial Public Offering (IPO), and then becomes a public listing company. Innovator planned to work closely with the venture capitalists that recommended by MDEC to achieve this long term goal. Innovator will utilize the services that provided by MDEC to excel in this industry. At the same time, Innovator needs to maintain good and healthy financial records of the business in order to achieve this goal.

2.8 Competitors Information

Innovator faces two types of competitors in the air conditioning industry. First type of the competitor is companies that provide air conditioning solutions services such as installation and maintenance services in big scale industrial sectors. This type of competitors will compete with Innovator by providing new air conditioning solutions for the customers. The air conditioning services that provided by those competitors are energy saving features, air purifying solution, cooling efficiency and etc.

Second types of competitor are companies that provide new features in air conditioning system for home users and commercial sectors. Generally, these types of competitors are providing new features of air conditioner such as mobile access or Internet access control of air conditioner from the premises. Innovator has identified some of the competitors in this industry based on the Google search engine located that in Super Pages database (<http://superpages.com.my>, visited on 15th August 2009). There are approximately 120 companies that will compete with Innovator. The top seven major competitors based on the Google search engine (15th August 2009) are:

- Yin Lee Air Conditioner Engineering founded on October, 1999 as a sole proprietorship. Its business operations in the 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 founded on 1997. Its business operations in the 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 was established in 1994. Specialized in Focusing primarily on corporate customers, the company undertakes small and medium scale project and upgrading work for air conditioning.
- Klasse Air Conditioning Sales & Services was founded on 1st August 2000. Its business operations 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 founded on 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.
- Daikin Industries, Ltd founded on 1924 and incorporated on 1934. Specialized in air conditioning system with inverter and energy saving features for home, commercial and factories.
- Intelligent Life form in 2008 by Advantage Air group, with the expertise of Rylex Australia. Specialized in high technology and innovation design in new generation of temperature control system in air conditioning.
- Chill Technology from Daikin specialists in Northland and cater for all the refrigeration, heat pump or air conditioning, ventilation and under floor heating needs. Chill Technology owned and operated by Julie and Richard Crum, Chill Technology opened for business in 1997. Chill Technology specialized in designing, installing and providing solutions for domestic and commercial projects.