UNIVERSITI TEKNIKAL MALAYSIA MELAKA

DEVELOPMENT OF TEMPERATURE CONTROLLER SYSTEM FOR QUAIL COOP APPLICATION

This report is submitted in accordance with requirement of the Universiti Teknikal Malaysia Melaka (UTeM) for the Bachelor of Computer Engineering Technology (Computer Systems) with Honours

by

MUHAMMAD ASHWADIE BIN ZULKIPLI
B071310020
880729-03-5207

FACULTY OF ENGINEERING TECHNOLOGY
2016

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

BORANG PENGESAHAN STATUS LAPORAN PROJEK SARJANA MUDA

TAJUK: **DEVELOPMENT OF TEMPERATURE CONTROLLER SYSTEM FOR QUAIL COOP APPLICATION**

SESI PENGAJIAN: **2016/17 Semester 1**

Saya **MUHAMMAD ASHWADIE BIN ZULKIPLI**

mengaku membenarkan Laporan PSM ini disimpan di Perpustakaan Universiti Teknikal Malaysia Melaka (UTeM) dengan syarat-syarat kegunaan seperti berikut:

1. Laporan PSM adalah hak milik Universiti Teknikal Malaysia Melaka dan penulis.
2. Perpustakaan Universiti Teknikal Malaysia Melaka dibenarkan membuat salinan untuk tujuan pengajian sahaja dengan izin penulis.
3. Perpustakaan dibenarkan membuat salinan laporan PSM ini sebagai bahan pertukaran antara institusi pengajian tinggi.
4. **Sila tandakan (✔)

☐ SULIT (Mengandungi maklumat TERHAD yang telah ditentukan oleh organisasi/badan di mana penyelidikan dijalankan)

☐ TERHAD (Mengandungi maklumat yang berdarjah keselamatan atau kepentingan Malaysia sebagaimana yang termaktub dalam AKTA RAHSIA RASMI 1972)

☐ TIDAK TERHAD

Disahkan oleh:

_____(TANDATANGAN PENULIS)_____   _____(TANDATANGAN PENYELIA)_____

Alamat Tetap:

Lot 1910, KEDAI KG. TAWANG,   Cop Rasmi:

JALAN TAWANG – WKF. AIK,

16320 BACHOK, KELANTAN.

** Jika Laporan PSM ini SULIT atau TERHAD, sila lampirkan surat daripada pihak berkuasa/organisasi berkenaan dengan menyatakan sekali sebab dan tempoh laporan PSM ini perlu dikelaskan sebagai SULIT atau TERHAD.

DECLARATION

I hereby, declared this report entitled "Development Of Temperature Controller System For Quail Coop Application" is the results of my own research except as cited in references.

Signature   : ………………………

Name   : ………………………

Date   : ………………………

APPROVAL

This report is submitted to the Faculty of Engineering Technology of UTeM as a partial fulfillment of the requirements for the degree Bachelor of Computer Engineering Technology (Computer Systems) with Honours. The member of the supervisory is as follow:

………………………………….
(Project Supervisor)

ABSTRACT

Automatic temperature control system is one of the factors that can reduce the mortality rate of livestock such as quail because the weather is unpredictable. The project emphasizes on the efficiency of temperature control in maintaining to fixid value despite changes in the weather occur. The sensor ia also used to control the temperature of the system if temperature rise more than the set temperature, the fan blower will receive instructions from the board arduino to control air circulation and thus lowers the temperature and this will be one of the reasons domestic animals such as quail will be safe and comfortable. The wind heat is trapped inside the closed house will be removed and the heat can be reduced by using an automatic temperature control system. The project can also help breeders of quail in the village because the system is easy to use.

ABSTRACT

Sistem kawalan suhu automatik adalah salah satu faktor yang boleh mengurangkan kadar kematian ternakan seperti puyuh kerana keadaan cuaca yang tidak menentu. Projek ini menekankan kepada kecekapan kawalan suhu dalam mengekalkan nilai tetap walaupun perubahan cuaca berlaku. Sensor ini juga digunakan untuk mengawal suhu sistem jika suhu meningkat lebih daripada suhu yang ditetapkan, kapas akan menerima arahan daripada arduino papan pengawal peredaran udara dan dengan itu merendahkan suhu dan ini akan menjadi salah satu daripada sebab haiwan domestik seperti puyuh akan selamat dan selesa lantas dapat mengurangkan kadar kematian haiwan domestik tersebut. Angin panas yang terperangkap didalam reban tertutup akan dikeluarkan dan kadar haba dapat dikurangkan dengan menggunakan automatik sistem kawalan suhu. Projek ini juga boleh membantu penternak puyuh di kampung kerana sistem ini mesra pengguna dan mudah untuk disesuaikan dengan keadaan.

DEDICATIONS

Alhamdulillah, praise to the Almighty Allah S.W.T

This project is dedicated to:

My parents,

My beloved family,

My beloved wife

My Supervisor,

My lecturers,

And all my friends

Thanks for their encouragement and never end support.

ACKNOWLEDGMENTS

First of all, thanks to ALLAH S.W.T for his mercy and guidance in giving me full strength to complete this report and prototype. Even facing with some difficulties in completing this task, I still managed to complete it. A lot of thanks to my supervisor, Mr. Shamsul Fakhar for all of his support and guidance in helping me to finish my task that really tested my abilities mentally, physically and softskill.

Special appreciation and thanks goes to my parents and beloved wife Nurul Huda because too much support me mentally and physically and financially not only the current project but also during the rest of my studies. In addition, recognition thanks to all my friends who never gave up in giving their support to me in the all aspects of learning, namely Abang Ngah, Izazul, Hafiz, Ahmadee, Sharul and also Hisham and classmates. Thank you very much all, I will never forget all of your kindness.

Table of Contents

LIST OF FIGURE

LIST OF FIGURE

CHAPTER 1

INTRODUCTION

1.0   INTRODUCTION

Closed house for quail farming is very important because it can prevent infections such as cockroaches and rodents from entering the house and reduce deaths due to the heat factor. This project is related to the temperature control in the house where it will be able to reduce the temperature readings in close coop. This project is also a model for real projects taken from the reading and research. The project has several components. LCD display for measurement of temperature and humidity can see where they exceed a set level, the fan will run output. Arduino is used as the processor and software, the code can be used for component output. Temperature and humidity sensors that we use is from DHT22 temperature sensor can change the temperature value to the value in electical voltage. DHT22 also has a 4 foot pin at which the input voltage applied to pin1 positive (+), in addition to data pin2, pin3 is pin4 NC and the input voltage is negative / GND (-). The system will run when the temperature sensor provides an input to output and for temperature fan fan will rotate in a predetermined speed. To record the data taken from DHT22, SDCard module used and this will allow a user to view data weekly or monthly.

1.1 BACKGROUND

As the temperature conditions are extremely important in the breeding of this quail, a system called automatic temperature control system has been established and it is one of the factors that can reduce the mortality rate of livestock such as quail as the weather is unpredictable. to apply the concept of automatic temperature control system, the coop must use closed type. This project focuses on the efficiency of the temperature control to maintain a constant value even if the weather changes occur. The sensor is also used to control the temperature of the system if temperatures rise more than the set temperature, the fan will receive instructions from the board arduino to control air circulation and thus lowers the temperature and this will be one of the reasons domestic animals such as quail will be safe and comfortable. In addition, security is also guaranteed because the quail house system that no rat hole or animals that can lead to infection.

1.2 PROBLEM STATEMENT

1. The idea of this project came into existence after the livestock barn in the village and do some research in reading where he conceptualized an enclosed area such as quail coop where the main challenge for rearing quail in the coop is to produce quail meat and for sale either while still alive or already processed. Interestingly, quail eggs are very high demand from customers.
2. Livestock quail require stable temperature for comfort, temperature control technology can help to create the most stable temperature where the animal died from high temperatures and airflow that is inappropriate.
3. If using an opened, there are problems in livestock such as infection such as rats and cockroaches. To apply this technology temperature control, closed coop needed.
4. Close coop concept can also avoid the problem of bad odors surrounding environment where the smell of the will decrease and does not interfere with the surrounding community.

5. If a high chicken mortality rate will cause losses to the sales system operators but will deteriorate due to the death of livestock.

1.3 PROJECT OBJECTIVE

The objective of this project are:

1. To study and get optimum temperature in the quail coop closed to ensure maximum productivity.
2. To apply in closed environments that quail coop.
3. To analyse impact of the designed system on the quail coop environment.
4. To develop storage temperature and humidity data safely
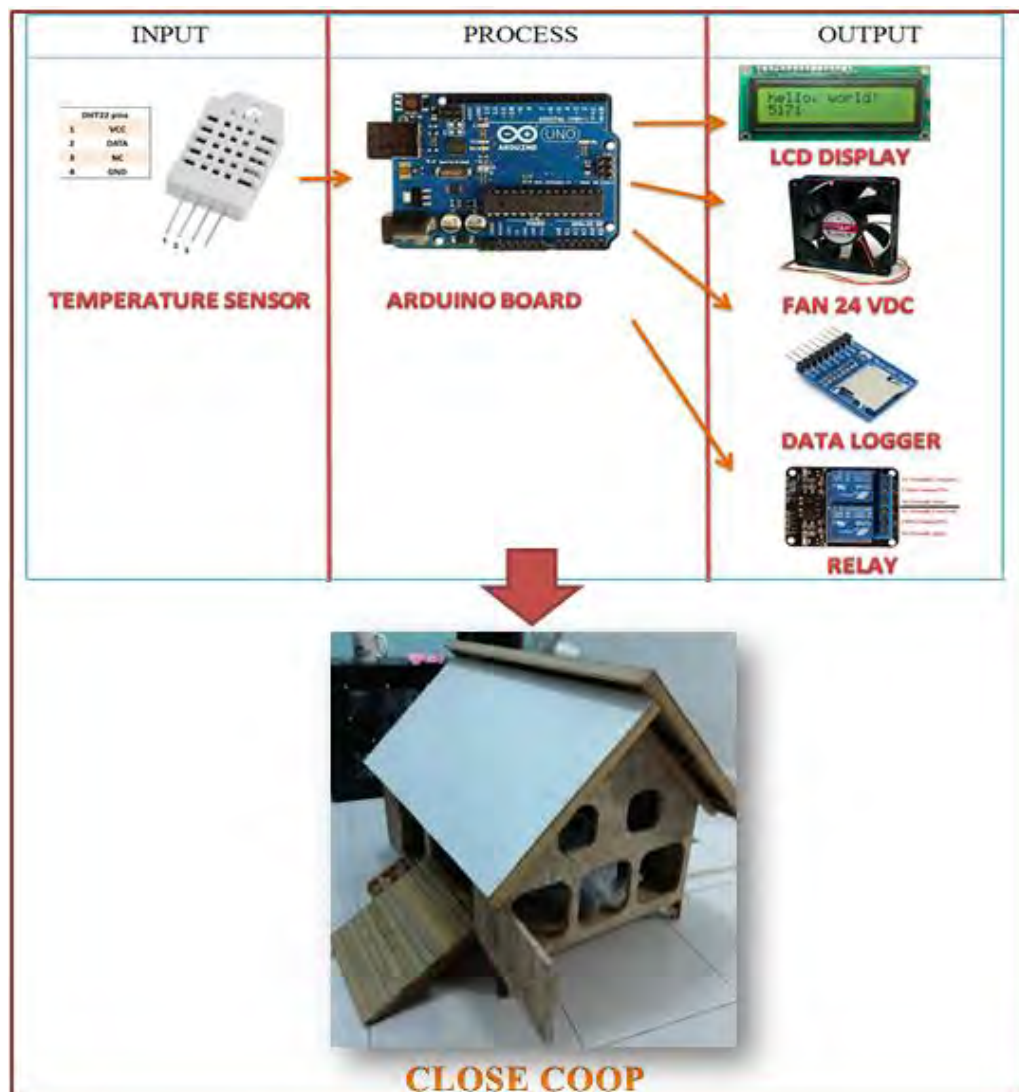
Figure 1.1 : The components will be used and examples of the coop closed.

1.4   WORK SCOPE

1. The scope of this project is related to the use of temperature control in the coop that works to get a good temperature setting for livestock.

2. The project uses five blower where warm temperatures and humidity will be reduced until the temperature stabilizes. Good for livestock, temperature is the main thing that should be considered. microcontroller will control the reaction temperature and the recorded temperature using SDCard module.

3. The project will be issued as a model because it is a project based on the study and knowledge in reading.

4. The project is also one of the study related to changes in temperature following a closed house.

CHAPTER 2
LITERATURE REVIEW

2.1   GENERAL OVERVIEW

Have you ever wondered whether a closed house and whether the system is used to control the flow of air in enclosed livestock quail remain stable? Why the need for a closed house? The answer necessarily referring to one word sure that's call controlling temperature close coop. This is because the chicken coop or hutch quail often associated with harsh environments and has an unpleasant odor to the local community. Flies will easily breed so it can disturb public order with the environmental conditions that are met by flies (Jimat kos dengan teknologi windflex, 1997). Here is the number of poultry farms that use a closed coop in 2004 where a total of 30 chicken farms that use closed house system. But with the rapidly developing technology, this problem can be overcome by creating a closed house system that has a temperature control to stabilize cultured in a closed house follows (Jimat kos dengan teknologi windflex, 1997). This proves the closed coop system control temperature has been transmitted and received for the poultry industry or quail and chicken most of the equipment is the same with the quail farming equipment (MELAYU and BERHAD, 1997).

Jurusan	Bilangan Ladang	Bilangan Ladang Tertutup	Populasi	Peratus Ladang Tertutup
Penelur	31	5	1,297,000	16
Daging	366	58	3,523,600	15
Kampung	5	0	0	0
Baka Daging	7	7	931,000	100
Baka Kampung	1	0	0	0
Baka Telur	1	1	70,000	100
JUMLAH	**411**	**71**	**5,821,600**	

Figure 2.1 : The number of farms using closed house (Unimap portal30).

2.2   CLOSE COOP CHICKEN

Closed coop where it means the whole coop sealed except at the top of the flow of air in and out. Ventilation in the house will be controlled by a temperature control system that will stabilize the situation in the livestock barn. Closed coop needed because it provides a comfortable environment in coop to livestock. Using control ventilation and a comfortable and productive livestock optimized (afzainizam and profile, 2011). Figure 2.4 below is close coop used by the livestock industry, where it uses the tunnel ventilation system with air conditioning evaporated (Tunnel Ventilation With Evaporative Cooling System) (Inc, 2016) . Most of the poultry equipment to a closed house is similar to quail farming equipment [5]. Figure 2.2 of the blower fan is used to close the coop is very important that the height should be installed in accordance with the position of the chicken, if too are low will cause discomfort chicken and fan blower must also be installed at a height of 8-12 inches from the floor level (nu'man and profile, 2012).

Figure 2.2 : Fan blower close coop (nu'man and profile, 2012).

Figure 2.3 : Closed coop used for poultry (afzainizam and profile, 2011) .

There are three (3) types of chicken coop covered the type of ventilation tunnel (tunnel ventilation), ventilation tunnels and humidifying air (use a cooling pad / humidifier), ventilation tunnels and water spray (mist / fogging) along the inside of the longitudinal axis coop (Unimap portal). Figure below refers to the type of chicken coop closed as described the kind of tunnel ventilation, tunnel ventilation and air humidification and tunnel ventilation and water spray (mist / fogging).
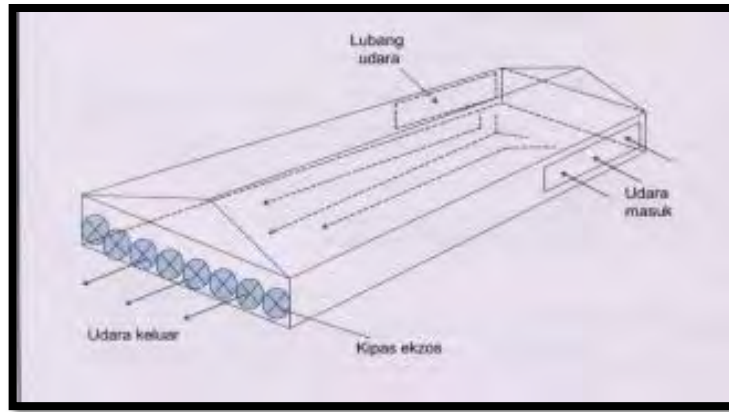
7

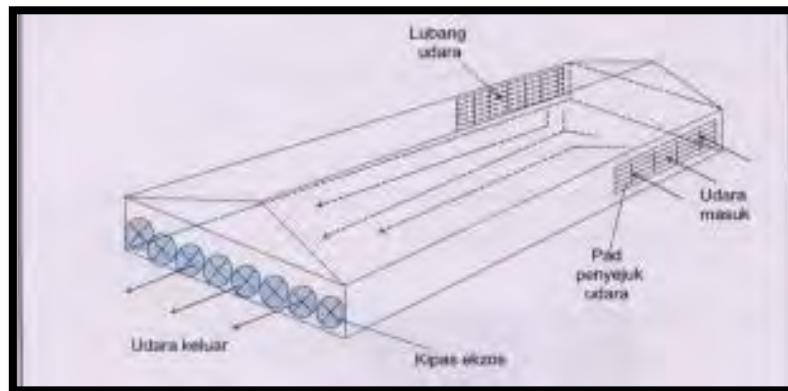Figure 2.4 : Tunnel ventilation (Unimap portal30).

Figure 2.5 : Tunnel ventilation and humidifying air (Unimap portal30).

Ventilation type tunnel (tunnel ventilation) is a type that does not use the pad / air humidifier and air also under the roof before moving into the house. This will cause air movement will be efficient with optimum speed of 300 to 450 ft / min and it is particularly suitable for use in the highlands (Unimap portal30). For that kind of tunnel ventilation and humidifying the air intake, the air goes through the process of humidifying after passing through the obstacles are hollow and wet / moist like cooling pad (Unimap portal30). The moist air will produce cool effects dandingin and turned out better. Additional cooling system is only required when the chickens grew and "warm" after reaching the age of 24 days. For tunnel ventilation and water spray (mist / fogging), it is dedicated to pens that do not use a cooling pad / moisturizer which "fogging nozzle" arranged horizontally from the coop for each 30 to 50 feet. Normally control is done manually when the chicken heat (Unimap portal30). Normally, water is sprayed onto the curtain of fine mesh using a nozzle that were ready (Unimap portal30). The purpose of this tunnel ventilation actually

8

works to remove heat from the house and reduce excess moisture. This will mngakibatkan Abatement of dust and odors and prevents the accumulation of gas accumulation ammonia and carbon dioxide in addition to a good supply of oxygen for respiration (Unimap portal30). Using temperature control technology is also closed house, chicken mortality rate can be reduced from two to three per cent compared with an opened or conventional systems (Jimat kos dengan teknologi windflex, 1997).

2.2.1   CURRENT APPLICATION

Closed coop would use a system called temperature control for livestock which are in the house. The main components used in a closed coop is like a sealed coop and coop buildings are developed must be enclosed with the outgoing and incoming air and exhaust fans to control the ventilation system in the house where he serves as the air exchange and air out and the air in the coop. Air conditioning is also an important component of which is to ensure improved cold temperature inside the coop. Three phase supply of used and available standby generator if the power goes off. Moisture temperature sensor type used as well as the alarm system to sound an emergency alarm if there is equipment that is damaged or does not work. Automatic feeding equipment is used also to facilitate the scheduling system foragers such as pan feeder, auger feeders, feeder chain. The figure below shows the automatic feed equipment used in the livestock industry closed house.

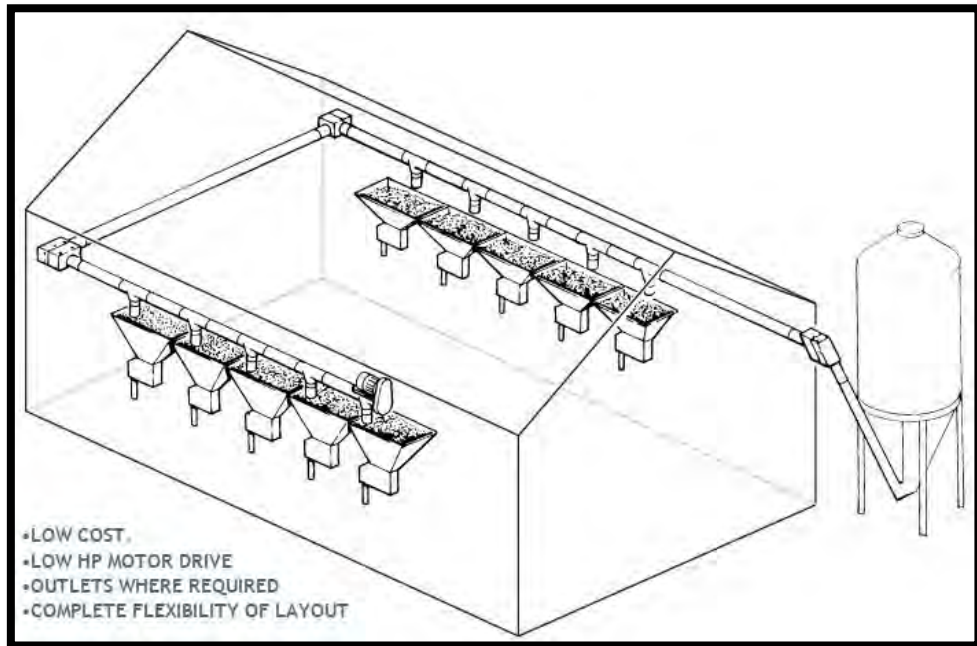Figure 2.6 : Pan feeder (Pan feeder, no date).

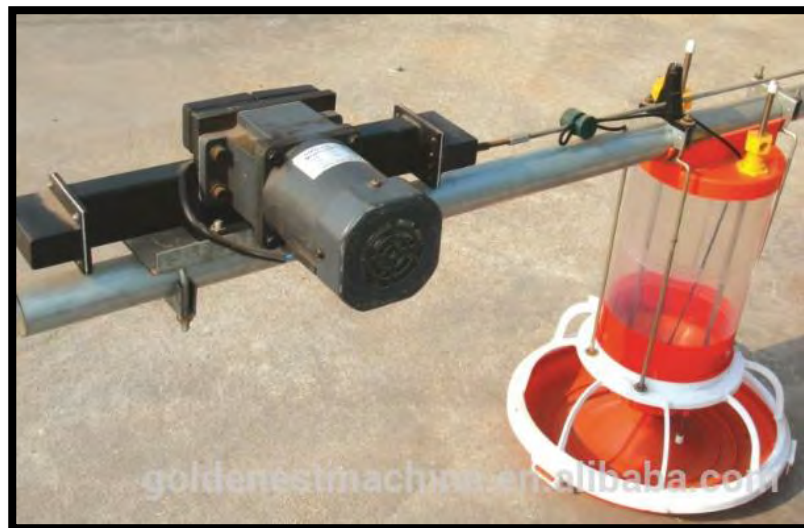Figure 2.7 : Auger feeder (Auger feeder, no date).

Figure 2.8 : Chain feeder (Alibaba, 1999).

Closed coop system has also been widely used in Malaysia. For example, a closed coop is used for the whole poultry is almost the same equipment with a closed coop for quail (MELAYU and BERHAD, 1997).

2.2.3   ADVANTAGES AND DISADVANTAGES

Malaysia has many industries that use this closed house concept. Benefits can be found by using the enclosed chicken coop is in terms of ventilation where air inside the coop can flow in and out well. This means that the temperature inside the house much lower than the temperature outside the house. Environment in the coop also give comfort to the chickens because these animals are less susceptible to interference and pressure from outside factors such as wild birds and rodents that certainly it could lead to livestock diseases and can be controlled from entering the coop. Changes obtained by using closed coop system temperature control allows the minimum and maximum temperature in a closed coop is 4 ° C (24-28 ° C) compared to 10 ° C (25> 35 ° C) for an open coop system. More chicken coop can be loaded into a closed type because of floor space for every chicken can be reduced by one third compared to the open coop. Manure from livestock can also cause persistent stench and flies breed, but with a closed coop, the stool will be dry and can easily reduce stench and flies in the environment. Closed coop can also raise chickens to excel at the same size of pens and mortality of livestock and damage is less than opened. If the pain and the death rate is less, of course, medical costs can be reduced while breeders mengungtungkan. it is more favorable to livestock farmers when market opportunities for exporting wide open and better, because of the control factor and the disease is at a minimum and guaranteed quality (afzainizam and profile, 2011).

Every kindness certainly embedded disadvantages, as well as the concept of temperature control closed house available where weaknesses on the cost of providing the infrastructure which is the cost to develop a farm closed and requires entrepreneurs who are highly committed and knowledgeable in the management and maintenance of ventilation systems gibberish closed and exposure to tools used. Costs for electricity and water for maintenance operations will also be higher than usual coop (afzainizam and profile, 2011).

11