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SMART LOCK SYSTEM

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2. Kami mengakui bahawa *SMART LOCK SYSTEM* dan harta intelek yang ada di dalamnya adalah hasil karya/ reka cipta asli kami tanpa mengambil atau meniru mana-mana harta intelek daripada pihak-pihak lain.

3. Kami bersetuju melepaskan pemilikan harta intelek *SMART LOCK SYSTEM* kepada Politeknik Sultan Salahuddin Abdul Aziz Shah bagi memenuhi keperluan untuk penanugerahan Diploma Kejuruteraan Mekanikal kepada kami.

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ABSTRACT

This final report outlines the implementation of an Smart Lock System (SLS). The project was undertaken as a senior Mechanical Engineering project. SSLS is an exciting technology that could have the potential to revolutionize convenience and security for consumers worldwide. This project served primarily as a means of investigating this potential, with a particular emphasis placed on controlling overall system cost while offering security. The importance of this consideration are the uses for houses , offices, businesses and universities. It is the position of the team undertaking this project that a system with convenient features of a professional solution could be built for a small fraction of the cost.The inexpensive system attempts to maximize the available features without sacrificing the low price point. The lock in the system is independently Internet enabled to eliminate the need for a dedicated connection to a central network controller device. Instead, the lock is permitted to communicate directly over the Internet. This server is maintained by a door administrator who is able to use the web interface to manage user access profiles, remotely disable lost RFID cards, view door access logs and suspicious activity, and easily send messages to other administrators within the system. The web interface for the door administrator allows for advanced system control without the need for expensive proprietary software, advanced knowledge of the system's architecture, or the high installation and maintenance costs associated with dedicated communication wiring. Security is also an important consideration that was addressed in this project. The database sends a positive authentication message to the lock system in order to open the door.

ABSTRAK

Laporan akhir ini menggariskan pelaksanaan Smart Lock System (SLS). Projek ini dilaksanakan sebagai projek program kejuruteraan mekanikal. SLS adalah teknologi menarik yang berpotensi merevolusikan kemudahan dan keselamatan bagi pengguna di seluruh dunia. Projek ini berfungsi sebagai kaedah menyelidiki potensi smart lock dengan memberikan penekanan tertentu terhadap mengawal kos keseluruhan sistem sambil menawarkan keselamatan. Projek ini adalah untuk kegunaan rumah, pejabat, perniagaan dan universiti.Projek ini akan memberikan penyelesaian profesional dengan sebagian kecil dari kos anggaran. Sistem ini murah untuk difungsi untuk memaksimumkan ciri yang ada tanpa mengorbankan harga jualan yang rendah. Kunci dalam sistem secara bebas internet diaktifkan untuk menghapuskan keperluan untuk sambungan khusus ke rangkaian pusat alat pengawal. Sebaliknya, kunci itu dibenarkan untuk berkomunikasi secara langsung melalui Internet. Pelayan ini dikendalikan oleh pemilik tempat terdebut menggunakan antara muka web untuk menguruskan profil akses pengguna, mematikan kad RFID yang hilang dari jarak jauh, melihat log akses pintu dan aktiviti yang mencurigakan, dan boleh menghantar mesej kepada penguna lain dalam sistem. Antara muka web untuk pemilik tempat tersebut membolehkan kawalan sistem canggih tanpa memerlukan perisian proprietari yang mahal, membolehkan pengetahuan lanjutan mengenai seni bina sistem, atau kos pemasangan dan penyelenggaraan tinggi yang berkaitan dengan pendawaian komunikasi khusus. Keselamatan juga merupakan pertimbangan penting yang ditangani dalam projek ini. Pangkalan data menghantar mesej pengesahan positif ke sistem kunci untuk membuka pintu.

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BAB 1

PENGENALAN

1.1 INTRODUCTION

In an increasingly interconnected digital world, the traditional metal lock-and-key method of security is becoming more outdated and inconvenient compared to the flexibility,enhanced security, and reduced long-term cost that modern access control solutions have to offer. The trend is to be smarter, faster, lighter, more secure and more integrated than before.With this in mind, the concept of carrying a heavy and bulky keyring around everywhere to potentially access dozens of doors is a century-old solution that is being applied to the current pace and various needs of our modern society today. In addition, metal keys can be easily lost or stolen which means that the conventional response to this costly mistake is to change the locks on all the doors to which that key or those keys can access and to reissue new, updated keys to all of the people whose access rights were affected due to the installation of a new lock.Several solutions for door authentication that take advantage of modern technologies include magnetic stripe cards and integrated cell phone applications. However, none of them are capable of providing a comprehensive solution that is convenient, secure and economic.

While magnetic stripe cards are inexpensive and used widely throughout the world, the private information encoded in the magnetic stripe card is exposed to physical damage and is more likely to cause unsuccessful reading of the information contained (after having taken the time to properly orient the card in the mag-stripe reader, of course).Cell phone applications can also be used to control door locks and are often very difficult to be hacked into. In our research we presented a part of smart home technology which using applications in a mobile device, so it will more easy and efficient to use. It also based on Android and Arduino platform both of which are free open source software. In this paper, a system called smart security lock system using phone application is proposed and prototyped. First the hardware design and software development are described, then the design of a wifi-based Smartphone application for unlock the door are presented. The hardware design for door-lock system is the combination of smart phone as the task master, wifi as command agent, Arduino microcontroller as controller center / data processing center, and solenoid as door lock output. All of the tests indicate that all goes according to the initial design of this research.

1.2 RESEARCH BACKGROUND

The current situation about nowdays security system is okay , but not great or mind-blowingly insane. It is just a padlock which opens when people use a key. If we lost the key , people are totally screwed. They should be buying a new padlock instead. Other than that if the owner is not having the key itself or lost it somewhere the houses , offices and shoplots are totally unlockable in a proper manner .

Nowdays , in news all of the people know that robbery is a very common thing happening all over the world and Malaysia is not an exception for that, we have far more robbery cases than we might ever imagine or we came to know through news. This makes people to be soo scared of their belongings and the place itself . Some are even stuck in house without going anywhere out for vacation or outings just out of being worried about their place and belonging to be stolen by an stranger anytime in the future.

It makes the life of people very dependent on their own presence all the time . This makes their lives very hard at times if we add up those times individually overtime.

1.3 PROBLEM STATEMENT

Our problem statement for this project will be thre main things. First of all , the house lockpads commonly suffer from plysical flaws. These flaws include were the lockpads get rust overtime , lockpad het mechanical failure , or even internally broken components make it significant flaws,

Other than that , many people lose their keys and they are having hard time where , they couldn’t pass through their own places , This makes even more harder when people send someone else to do some sort of work for them in the respectable places, This will create shear frustration to all at last.

Lastly, workers as hostel warden and house securities are very busy with their own daily routine jobs. If they should watch each and every lots or houses every now and then , they will be out of their other routine jobs to attend . They are also intended to work mostly in the enterance where they will suspect and allow only outhorised personal in the rea as the main job. If security systems are too weak it takes a lot more securities to maintain all day security

1.4 OBJECTIVE OF PROJECT

Our objective for this project is to make sure a security system should be developed to make sure there is no malfunction to happen in the possible future.

The second objective is to provide grater alternative to enter through security system if the appropriate keycard is lost.

And for the final objective , there should be a situation with a security system where there is no need for a working security to protect our houses , offices or shoplots.

1.5 RESEARCH QUESTIONS

1.5.1 How does smart lock system is going to reduce burden in people's life?

1.5.2 Does using smart lock system really going to improve security overall?

1.5.3 What prototype is going to be build in order to make the transfer seamsless?

1.6 PROJECT SCOPE

Our scope for this project is all over Malaysia. This is because our project is soo versatile , reliable and anti theft protected with 2 years of warranty which is also given for free. We didn't include overseas countries because of their power source differences and their hacking technologies are far more advanced which might in return be a threat to our ;product.

After that , we are targeting on specific customers town our product for their maximum usage efficiency and can get the most out of our intended project. These people include all those who own houses , all shoplot owners and all office workers.

1.7 IMPORTANCE OF RESEARCH

The necessity of security has increased during thse days of increasing crime rates.The prototype The smart lock system will be able to meet the high requirement for improved security system. In addition, due to the current economic instability,everyone is expecting a cheaper system for better commercial value.. Therefore, the prototype will be able to help reduce cost and provide more for what customers pay for.

Next, the lock systems that will be created can be owned by all local community. Indirectly it will increase the sales of the product and increase the profit that will be earned. The prototype is user friendly because of its uncomplicated use and even easy to learn. In addition, the system an environmentally friendly that does not cause any harm to environment.

1.8 CONCEPT /THEORY

Operating smart lock system

1.)The smart lock system should be powered by powerbank , usb cable or straight out from power input current

2.) Then connect the system to moble data or wife

3.) While setting up the mobile hotspot change the hotspot namee as ‘smartlock’ and set the password as ‘12345678’.

4.)the system will automatically detect the wifi signal and connect itself to the source.

5.)Then, download a play store app called ‘BLYNK’

6.)Login using username “freddychai200000@gmail.com

7.)use the password ‘Freddy200@’

8.)now the system is functioning

9.) If u use the given real access card , the system will show up green led light and open the servo motor.

10.)If any other cards are being used in the system , the system will detect and give out red light and a very loud sound to give an alert.

11.)This time , the motor wont open , and this false card will trigger the system and will send a notification to the app installed called BLYNK

1.9 CHAPTER SUMMARY

In this chapter, there are some information about the statement of project problems and the purpose of this project is held. In addition, the objective to carry out the project is clear to help the security system in general , especially security systems to be more effective, and very reliable.

BAB 2 RESEARCH LITERATURE

2.1 CHAPTER INTODUCTION

In the Malaysian market at present, there are many tradisional key lock system. But most of them are are not that secure. It is also focused on the physical aspect of the system.This will ignore other important elements. All over the worls the key lock system have not been updated since.

Among the weaknesses in the key lock system is that are on the market are not absolutely best way to secure ur place or property. Also, not going to last long and it has physical failure rate attached to it.. Next, is that , if the key is lost , it becomes impossible to get in your property.

2.2 CONCEPT / THEORY

Our project works better than all existing products. Our project basically having a system which opens the lock when an authorised card is scanned on the system . if the card is lost , another random card can be used to scan the the system , this will basically send notification to the owners cell phones.

This will give allow the owner to allow or block the attempt on that entry to their places. If the owner or someone the owner recognising is intending to go in , the owner always has the control over it .

This also makes sure that the owner hets al the suspicious attempt on entering to their houses, which in return mskes them cautious and to take further actions.

2.2.1 COMPONENTS IN SMART LOCK SYSTEM

Good design can be produced by studying each material used. To produce a good design, a study of the key components of smart lock system is done. The purpose of the study was to obtain information and learn more about the main components of the smart lock system. The components are as follows:

Diagram 2.2.1.1 Power supply sources- battery , usb cable , battery cable

-power supply source are used to supply power to our system

Diagram 2.2.1.2 Access card- the key to access the smart lock system

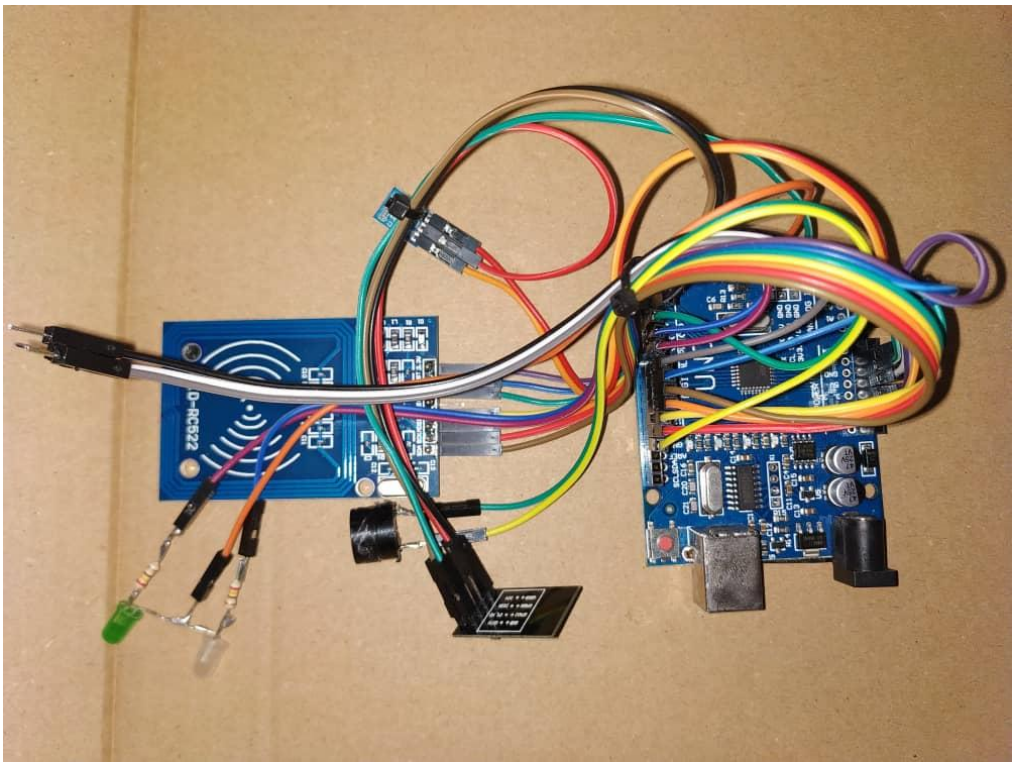

Diagram 2.2.1.3 Cuircuit board- motherboard which controls all the function

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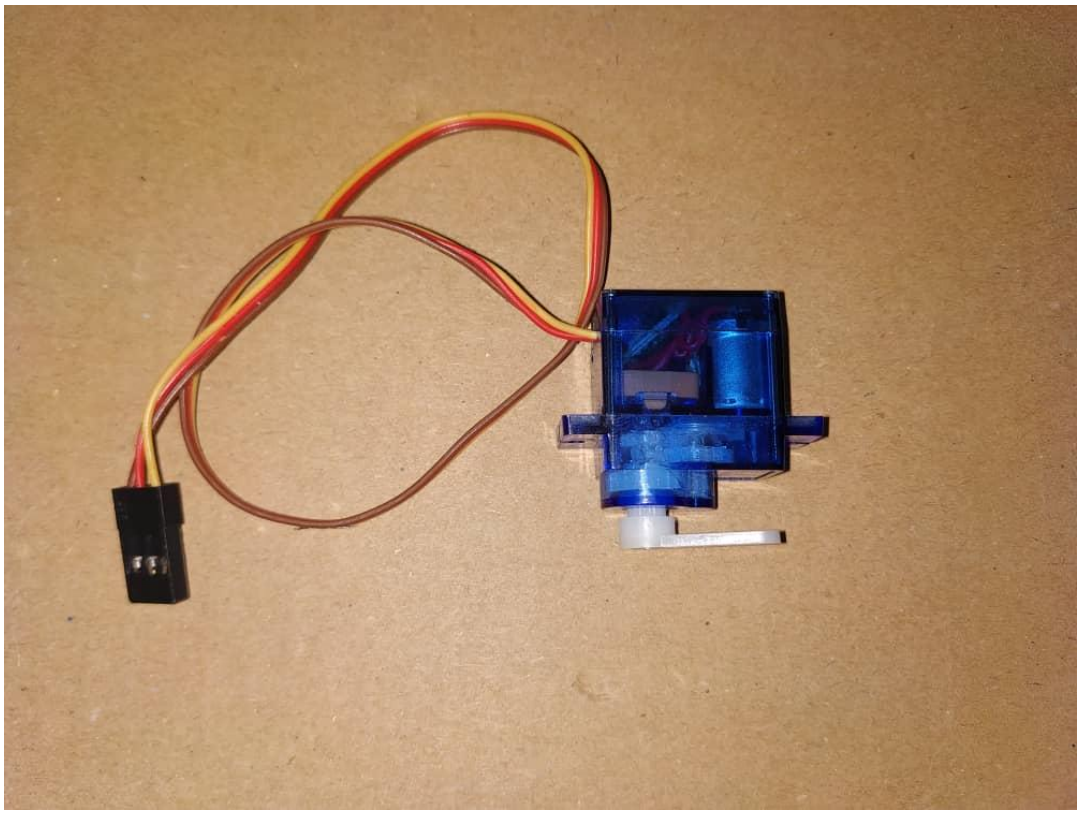


Diagram 2.2.1.4 Servo motor-lock that opens and closes according to the access cards used

Diagram 2.2.1.5 Screws- to tight the cover to set it in place

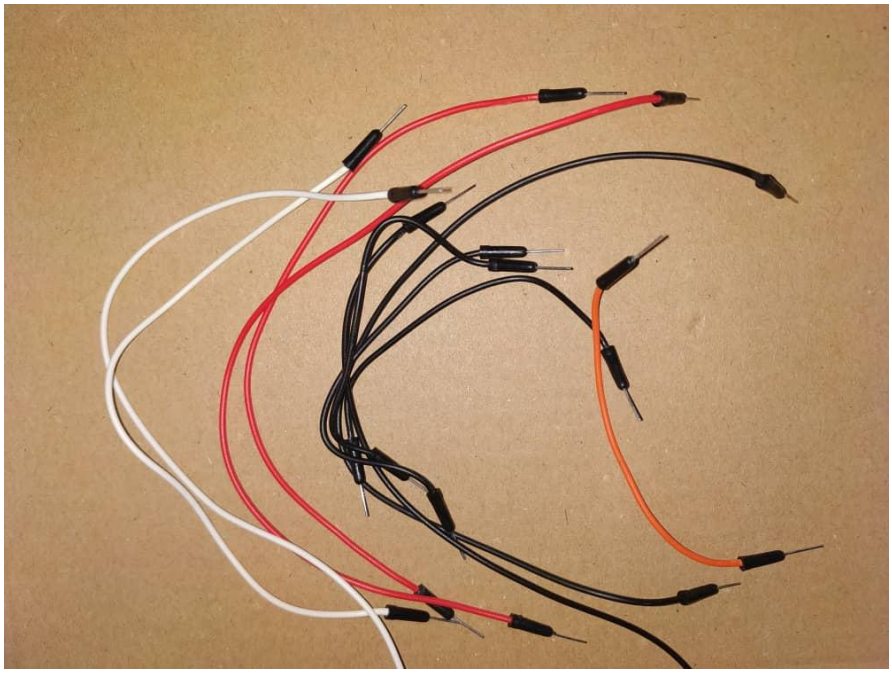


Diagram 2.2.1.6 Connectingwires

2.22 **SCIENTIFIC STUDY**

In this era of globalization, almost everyone still using traditional lock and key system. Based on observations and studies that have been made in several places, most users use manual method. Apart from that, a very little number of people are changing to electronic system. In this observation as well, there are many negative effects obtained in the use of the manual method which is lock and key system.

The effect of the use of this old manual method, it can be concluded that there are too many weaknesses and disadvantages of their own, Among the weaknesses found in the use of this manual or old method is in terms of time. For example if using a key to unlock a padlock , people will be needing more time to find which key fits the specific padlock and he process is a little time saving if taken into account for long term comfort.

This causes more effort too, very hard to use , difficulty when the physical aspect of the padlock or key had an issue.This makes the system to be unreliable. As the physical aspects degrade overtime , the owners need to buy a new key and padlock which is a expense.

The features found in The smart lock system are much better than the use of the old manual method. This is because, The smart lock system can have a positive impact on consumers in terms of price, security and time. Furthermore, the risk of injury while operating this machine is very low if the user uses and follows the correct usage method. The use of manpower is at a minimum.

Evolution of creation of this system

Diagram 2.2.2.1 shows padlock that hammered to unlock

Diagram 2.2.2.2 shows padlock is being opened by spanners

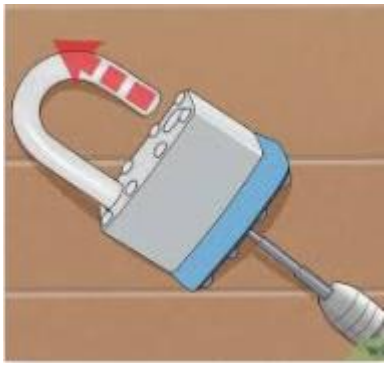


Diagram 2.2.2.3 shows a padlock being opened using a sharp object

Diagram 2.2.2.4 shows greese being applied to a padlock

2.3 SYSTEM AND WAYS USED

Today, there are still many who use the manual method. This is because, the production of new technology will make it very expensive. There are many disadvantages using this old manual method. Among the disadvantages of this method is that it can be exposed to a very high risk of accidents because it does not have any safety factors. In addition, this method takes a long time and the use of manpower at the maximum level.

2.3.1 Perbandingan Kriteria

Diagram 2.3.1COMPARISON OF CRITERIA BETWEEN MACHINE AND OLD MANUAL METHOD

Tradisional lock and key system	Physical failure More time consuming Harder to operate Less reliable More energy consuming
Smart lock system	More secure Access from anywhere Very reliable for unlimited time period Very convinient

2.4 Chapter summary

After conducting a literature review, a lot of information can be gathered about security systems. This information provides a reference to the design, specifications and technology that are in the market. This information is also very useful as a guide to help facilitate the design process and also develop the prototype our smart lock system.

BAB 3

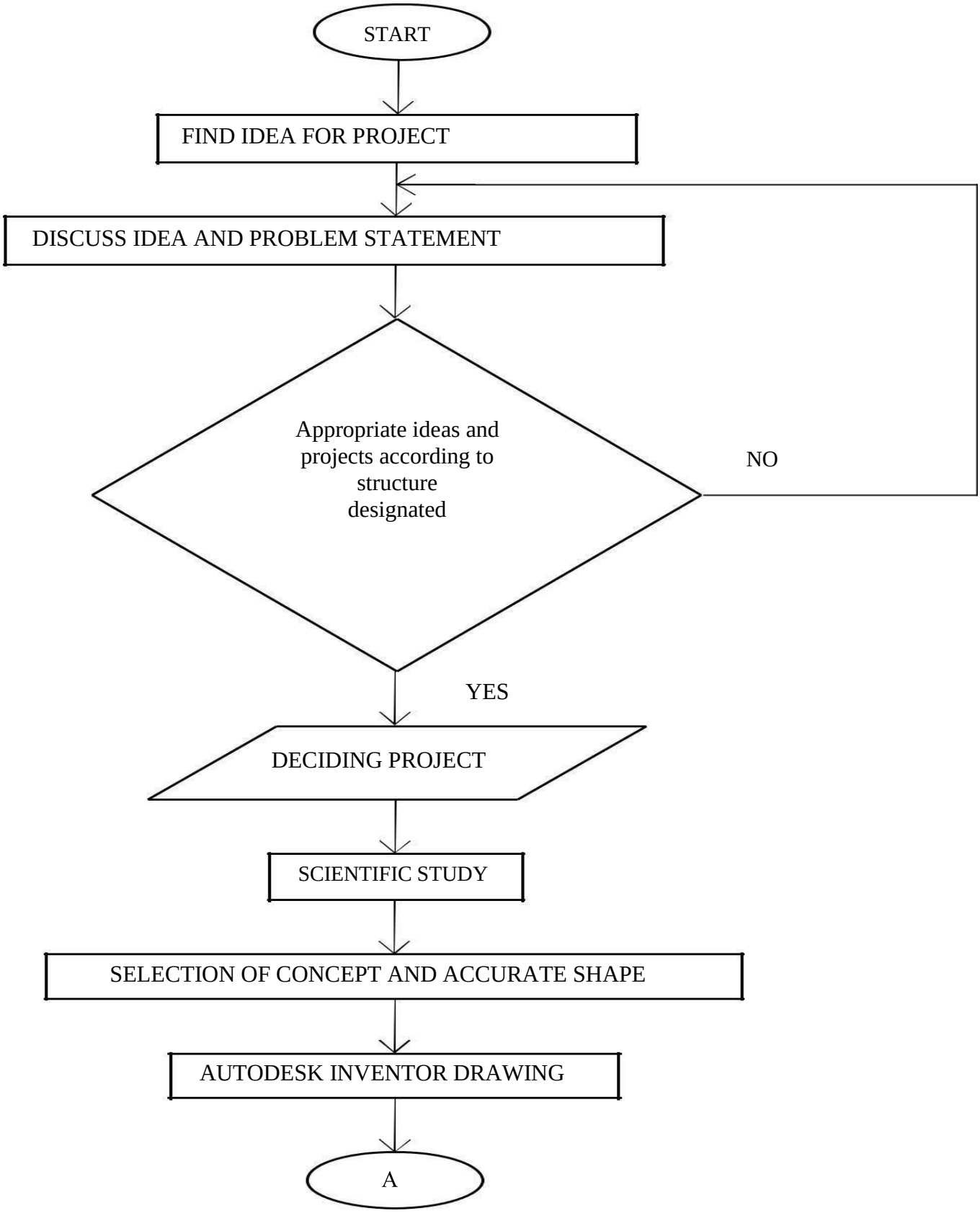
RESEARCH METHODOLOGY

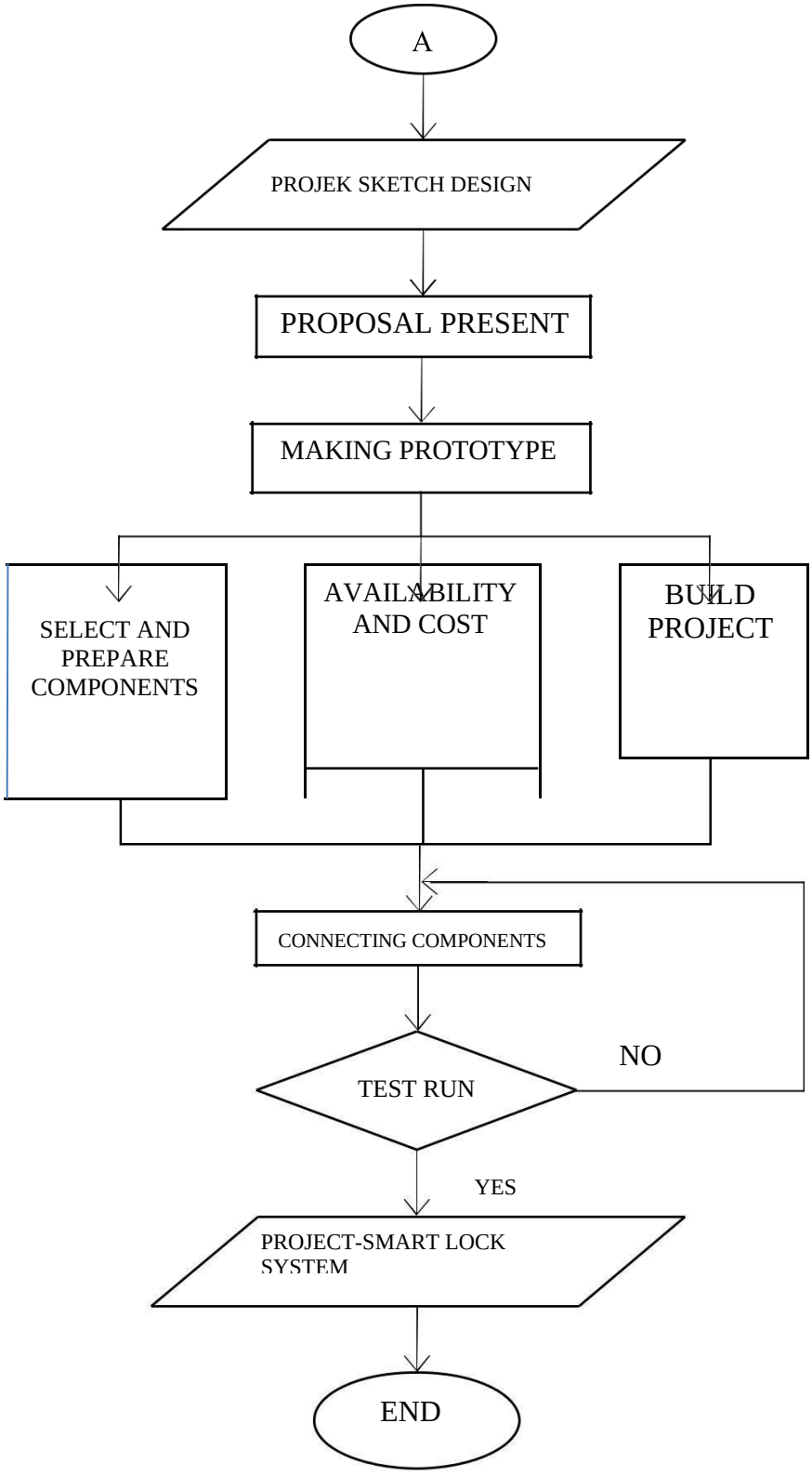
3.1 INTRODUCTION OF TOPIC

Research methodology is a method and technique of designing, collecting and analyzing data in order to produce a complete design study. Methodology describes the method of a problem being studied and the reason why a particular method and technique is used. The purpose of the methodology is to help understand more broadly or in more detail the application of the method by making a description of the research process.

According to the Fourth Edition Hall Dictionary methodology means a system that includes methods and principles used in a particular force or discipline. Other meanings of methodology are methods, methods, style techniques, styles, beats, patterns and systems. Methodology also carries the meaning of knowledge about the methods or disciplines used that are used when conducting a particular study to achieve a specific goal. Research methodology refers to the most appropriate method to conduct research and determine effective procedures for answering research problems.

3.1.1 Carta metadologi





Rajah 3.1.1.1: methodology flow chart

3.2 RESEARCH SHAPE

3.2.1 IMPROVEMENT ON THE SYSTEM

Our project was added a wifi access which made it to be used from anyplace.

3.2.2 TECHNICAL DRAWING

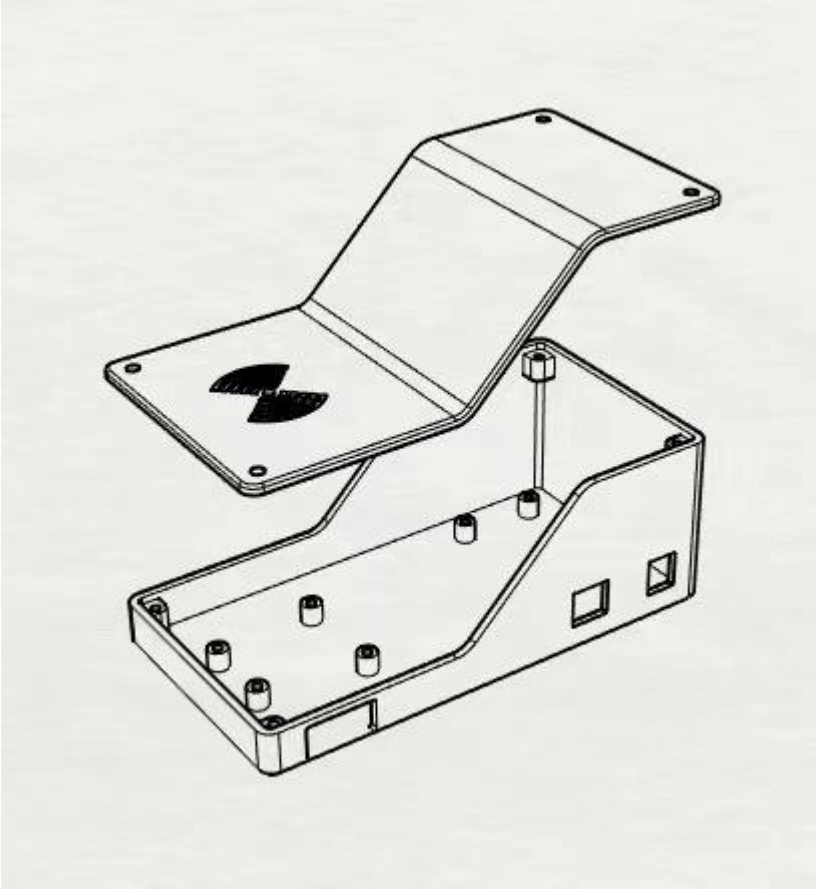


Diagram 3.2.2.1 tecnical drawing of the project

3.2.3 ERGONOMIC ANALYSIS

Ergonomic analysis is done to ensure that the prototype, process and system used are in accordance with the needs of customers.The prototype dimensions of The Climb Junkies are 7 meters high and 16.5 meters long. This height is very much in line with people's liking.In addition, the smart lock system is also comfortable to use. Rough and hard plastic is used as a medium to make the cover so that the system will be more durable .

3.3 RESEARCH INSTRUMENTS

Among the research instruments used are conducting questionnaires to the public, especially household owners.This method can help solve the problems faced by all people and can even improve the system that have been created before. This observation is to look at the problems around the security system and do something towards goodness to solve the problems faced such as seeing the rate of robbery increasing day to day. With the 2 instruments of this study, we can add knowledge and can solve the problems faced by society at this time. Questionnaires and respondents from general people are as in the appendix.

3.4 ANALYSIS OF DATA

Referring to question 1 in the questionnaire completed by the respondents, almost 92% of saying old key and lock system is not relevant anymore.

In addition, 90% of respondents agreed that the method ,sensors and access card (smart lock system) can be replaced to make people's live better while 10% of respondents disagreed. Respondents who agreed wanted to find other alternative methods to facilitate their daily work.

In addition, 95% of respondents agreed that keyless entry method with just sensors and access cards improve the level of security. Most of the 95% of the following respondents use traditional methods.

Therefore, as many as 94% of respondents strongly agree that smart lock system is a more reliable option than the traditional lock and key system. While the other 6% do not agree because they are comfortable using the existing traditional methods. Then, as many as 95% of respondents agreed that smart lock system is the future of technology for security system. Finally, 92% agreed to support and recommend the innovation of this technology for commercial uses.

3.5 CHAPTER SUMMARY

After researching the research methodology, a lot of information can be gathered about The smart lock system.s. This information provides a reference to the design concepts, dimensions and cost estimates that will be used in the production of the project. This information is also very useful as a guide to help facilitate the design process and also develop the prototype The smart lock system..

BAB 4

FINDING

4.1 WORKING PROCESS

All the materials needed to build The smart lock system were obtained in advance. Then arduiono was learned in order to assemble all the komponents ,alot of sources and books did help on the process on connecting components.After months of learning and trial and errors , finally the projek was been functional.

4.2 RESULTS

After the project manufacturing process is complete, it is done that our final project manufacturing process on The smart lock system does not require as planned. This is due to a number of changes in terms of components and the use of appropriate and quality materials to ensure product value.

4.3 PROJECT RESULTS

i) The LED light worked perfectly as for access given or declined.

ii) The battery we bought was out of juice after 6 months , so we bought a new one to replace that one.

iii) The system always requires strong internet connectivity.

4.4 PROJECT TESTING RESULTS

Once the project is ready to be developed, tests have been done to see how the smart lock system to see if it can operate. After testing, we found that it takes 1 to 3 secs to setect the access card depending on the wifi signal.

The time record is the fastest to overcome all existing methods. In addition, energy consumption using The smart lock system is minimal. This is because most of the work been done electrically. Users of The smart lock system only need to use card to scan which is very convinient. Furthermore, the risk of injury is low. Various safety devices have been ftaken into care.The level of maintenance is also low because this system does not require any maintenance.

BAB 5

DISCUSSION , CONCLUSION

AND SUGGESTION

5.1 CONCLUSION

In conclusion, this project is accepted by public. Although at the beginning of the project there were some problems such as difficult use and lack of value, the project was eventually able to be improved and generally accepted. Such a project will take a long time to meet the set criteria. With the cooperation provided by each team member guided by the project supervisor, this project can be completed successfully.

After various studies and experiments that have been done on this project, we can prove that the use of smart lock system has succeeded in helping coconut plantation operators as well as giving a positive impact to people

Overall, our project has met the criteria or objectives of the project because it can facilitate and can help people live a secure life. The system used is well received because it is easy to operate. Comparison with other methods further strengthens the usefulness of this project.

5.2 SUGGESTION

With this project in the market, we believe that the demand for better security in the market can be met. Therefore, we believe and hope that this project will be further expanded.

In this regard, we hope that with the creation of this innovation can attract more interest and anyone who wants to create or improve tools to help anyone. This innovation can not only meet our needs but also ease the burden.

With this, it can not only help farmers but also encourage young people to continue to think creatively. Perhaps new ideas can give this innovation even greater and can be widely used not only on coconut trees but also all types of trees.

In addition, we also hope that in the future the machine can accommodate more weight and have smoother movement.

5.3 CHAPTER SUMMARY

Each project developed has its own importance and objectives, as does our project smart lock system. Although there were shortcomings in the beginning, we managed to achieve its objectives. Based on the conclusion, we can see that this project can be well received by everyone. This is because, we have met the needs and even eased their burden. Therefore, we hope that this project can be continued so that it can be accepted by everyone and can be widely commercialized. With this, let us all help to develop the Malaysian economy by producing more innovative innovations.

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ATTACHMENT

LAMPIRAN A **Feedback form**

LAMPIRAN B **Gantt Chart 1**

LAMPIRAN C **Gantt Chart 2**

FEEDBACK FORM

Is traditional key and padlock system for security still a recommended option nowdays? *

- ◯ Yes
- ◯ No

Do you think sensors and access card (smart lock system) can be replaced to make people's live better ? *

- ◯ Yes
- ◯ No

Does keyless entry method with just sensors and access cards improve the level of security? *

- ◯ Yes
- ◯ No

Do you think smart lock system is a more reliable option than the traditional lock and key system? *

- ◯ Yes
- ◯ No

Do you believe that smart lock system is the future of technology for security systems? *

- ◯ Yes
- ◯ No

Would you support and recommend the innovation of this technology for commercial uses? *

- ◯ Yes
- ◯ No

GANTT CHART 1

Minggu	Status	M 1	M2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M10	M11	M12	M13	M14	M1 5
Aktiviti Projek																
Membina kumpulan projek	R(10-12)															
	L(11-12)															
Discusi tentang konsep	R(17-12)															
	L(18-12)															
Buat kajian	R(31-1)															
	L(1-1)															
Peta minda terhadap idea-idea	R(7-1)															
	L(8-1)															
Pertimbangan Idea-idea kreatif	R(14-1)															
	L(15-1)															
Anggaran keupayaan kumpulan terhadap projek	R(21-1)															
	L(22-1)															
Bincangan terhadap nilai komersial projek	R(28-1)															
	L(29-1)															
Persetujuan cadangan	R(4-2)															
	L(5-2)															
Memuktamatkan projek	R(11-2)															
	L(12-2)															
Penamaan projek	R(18-2)															
	L(19-2)															
Anggaran bajet	R(25-2)															
	L(26-2)															
Penyediaan pembinaan	R(4-3)															
	L(5-3)															
Pengekodan lengkap	R(11-3)															
	L(12-3)															
Bina projek	R(18-3)															
	L(19-3)															
Membuat penutup dan siapkan projek akhir	R(25-3)															
	L(26-3)															

GANTT CHART 2

Minggu	Status	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	
Aktiviti Projek																
Perjumpaan bermuka	R(12/8)															
	L(13/8)															
Buat abstract	R(18/8)															
	L(19/8)															
Pembetulan Journal	R925/8)															
	L(26/8)															
Membuat casing	R(2/9)															
	L(3/9)															
Survey Casing	R(10/9)															
	L(11/9)															
Cari kedai 3-D Priting	R(16/9)															
	L(17/9)															
Reka Bentuk Casing	R(23/9)															
	L(24/9)															
Pilih Casing	R(7/10)															
	L(8/10)															
Casing disiapkan	R(13/10)															
	L(14/10)															
Isi Borang Pertandingan	R(21/10)															
	L(22/10)															
Sedia maklumat utk pertandingan	R(27/10)															
	L(28/10)															
Pembaiki FYP	R(3/11)															
	L(4/11)															
Semak Keadaan FYP	R(9/11)															
	L(10/11)															
pemeriksaan kecekapan	R(17/11)															
	L(18/11)															
Tetap Harga Jual	R(25/11)															
	L(26/11)															

Petunjuk

	perancangan
	perlaksanaan