# Cover Page

# Background Information

Today, the need of increasing quality of life through automation is a huge market

## Concept

## Verification + Identification of needs, wants, and opportunities

# Project proposal

## Design Proposal

Many new innovations come out today and revolutionise the way lives work in the world for most of the population. But what about that other bit of the population, the elderly? My design proposes to give the elder demographic a higher quality of life, by meeting a few crucial needs of the target market. These needs are:

* Missing alerts due to being hearing impaired
* Struggling to turn off lights due to aching pains
* Forgetting to turn off lights when going out
* Concerned about high costing electricity bills each month
* Light is too bright for comfort
* Light is not the right colour to concentrate

All of the needs will be fulfilled with my design, of the Light++.

## Preliminary Research

I have already completed preliminary research on all of the needs, to ensure they are real needs and not just charlatan needs.

* Missing alerts due to being hearing impaired: In 1993, the Asutralian Bereua of Statistics compiled the number of those with a disability, which was 18.1% of the population. Of this number, 31.5% had a hearing impairment. This equates to 5.7% of Australias population having a disability. This justifies the need for a visual stimulus rather than an auditory stimulus to be produced when an alert is activated.
* Struggling to turn off lights due to aching pains

## Analysis of Research

## Justification of Need

After establishing that there is indeed a market for this product, I have to evaluate my findings and ask myself why am I doing this product. A good criteria to evaluate the justification of a need is to have a rational scenario, mimicking scenario, regulations scenario, and a standards scenario.

* Rational Scenario: This is the action of looking at hard facts and numbers to see if they need can be justified through logic. Rational scenarios do not take into account ethics or legalities, but nor does it exclude them. It is simply the logic behind the need. In my case, the logic is sound and is justified by my statistic in my preliminary research. The data shows that there is definitely a target market for my product and on
* Mimicking Scenario: This is more colloquially known as the “if they did it, we can do it” scenario. The mimicking scenario is the research of other products on the market and looking at how they became a success, and drawing inspiration from that. In my research I have thouroughly gone through the design process and marketing process of the Domus - RGB LED Downlight Flare. From this product I have drawn inspiration from such features as the aesthetic ‘satin white alimium frame’ and the functional wireless communication method. Although the mimicking scenario is a good method to success, if you mimic a product too much, your own product might look like knockoff or not become successful as the exact same product is already out there on the market.
* Regulation Scenario: In this scenario you look closely at the rules and regulations in place that you must work with to create your product. An initial need I had in mind was for an easy instllation of my product by the user. This would allow the average human to buy my product off the shelf and install it themselves with ease when they get home. Unfortunetately, due to reugalations and laws this need could not be fulfilled by my product, and thus will shape the design process of my product as it will no longer target that particular aspect.
* Standards Scenario: While regulations provide an explicit measure to justify change, standards expectations provide implicit reasons for change. When you use the standards scenario to justify your agenda, you are not proposing that the product needs something as much as you are suggesting that if the product doesn’t need that something, it will be of a disadvantage. Through this scenario, I can justify the use of the mobile phone as a controller for my product as not having it used in this product, in today’s era of technology, will be of a great disadvantage.

## MDP Parameters

When creating my MDP there will be many parameters I must abide to. Many of these parameters would not be as strict if this project was created professionally, but since I am a Year 12 student the parameters are very closed in. Some parameters to consider are time, skills, finance, resources, and personal limitations.

* Time: Time is a major consideration when designing the product as you cannot go over the deadline, nor do you want to finish with too much time spare. Finishing over the deadline will result in a penalty to the success of the product. In this case the penalty is major and result in a complete failure of the product. If I finish with too much time to spare, than my product may not be the best it can possibly be.  
  In total, I have about 200 days to complete this product.
* Skills: This parameter can be split into 2 different categoires pre-learned skills, and intra-learned skills.
  + Pre-learned skills are skills that I already have acquired. Here is a table of them:

|  |  |
| --- | --- |
| 1 | ***Fundamental Awareness*** (basic knowledge) |
| 2 | ***Novice*** (limited experience) |
| 3 | ***Intermediate*** (practical application) |
| 4 | ***Advanced*** (applied theory) |
| 5 | ***Expert*** (recognized authority) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Skill | Proficentcy Level | Where I learnt it | Where I am possibly going to use it | Needed proficentcy Level |
| * + Soldering | * + Advanced | * + Self taught at home though a hobby for repairing old circuits. | * + I will be using this skill throughout my project to solder compnents together | * + Intermediate |
| * + Programming C | * + Fundamental Awareness | * + Reading other peoples code | * + To program the behaviour of integrated circuits such as the common ‘arduino’ chip the Atmega328PU | * + Intermediate |
| * + Programming Python | * + Intermediate | * + Self taught through the Board of Studies Software Design and development course | * + To program the main control system that will dispense commands to the light systems | * + Advanced |
| * + Circuit Building | * + Novice | * + Through YouTube tutorials | * + To build the senders and recievers of the lights | * + Intermediate |
| * + Network Infrastructures | * + Advanced | * + Year 10 work experience, and ongoing applied theory for my own homes infrastructure | * + To allow the user to interface with the lights | * + Novice |

* + intra-learned skills are skills that need to be learnt in order to complete a stage of development in either the planning process or design process. For this project I will need to learn many skills to a high proficiency level. Here is a list:
    - Digital 3D modelling
    - 3D printing and preparing the print
    - Basic woodwork
    - Basic painting
* Personal Limitations: this

## Design Brief

# Project management

## Identification and exploration of the need

* For the elderly, hearing impaired doorbell.
* Timer for medicine
* Visual smoke alarm
* General better quality of life through automation, ie email alerts

## Areas of investigation

## Criteria to evaluate success

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Priority | Explanation | Method of Evaluation | Page No. |
| Function | | | | |
| Easy implementation / install | High | In order to be successful, the  product needs to be easy to implement. This includes how easy it is to install, and connect it to the various sensors. | Timed tests of the time it takes to install a normal light, and the light++. It should not take more than twice as long to install the light++ then the normal light. |  |
| Consumer Use | High | To be considered a success this product must get a positive response from the target market. | I will conduct a demonstration in front of the target market (the elderly) and record their opinions through a survey. |  |
| All in one solution | High | To be a success the product must be able to work without any use of additional competing products. | Through an evaluation of an electrician when the product is replacing the existing system. |  |
| Intuitive | High | The product must be able to function correctly when used by a beginner with no previous knowledge. | The target market (elderly) will be given a test of the product and a survey will record whether or not they could use it. |  |
| Improves on existing competing product | Medium | Must contain all features out there that similar products use, plus more additional features. | <to fill> |  |
| Aesthetics | | | | |
| Shape and Form | Low |  |  |  |
| Luminosity | High |  |  |  |
| Interface for Communication | High |  |  |  |

## Action, time and finance plans

## Selection and use of resources

# Project development and realisation

## Design theory and practice

## Creativity

## Research

## Development and evaluation of ideas

## Study of practices in industrial and commercial settings as they relate to the major design project

## Production techniques

## Communication

## Safe working practices

# Project evaluation

## Criteria for evaluation

## Analysis of evaluation

## Impact of the major design project on the individual, society and the environment.