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**ASSIGNMENT 3: NEW PRODUCT DEVELOPMENT**

for

**LASER PROPERTY MEASUREMENT TOOLS (LPMT)**

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## **EXECUTIVE SUMMARY**

In this report, a new product is presented, the Laser Property Measurement Device, a new innovative gadget that offers a convenient, speedy, and precise property measuring solution for valuation professionals, construction professionals, and property owners. The gadget came into existence to solve some of the normal difficulties, including measuring errors, lengthy site valuations, and inaccuracy in measurements that were associated with measuring tapes. The product came into existence due to some of the normal difficulties involved in property valuation and site valuation, whereby measuring tapes always resulted in errors and increased working hours. Based on the NABC framework, the report shows a clear need in the market, the technological approach adopted for making the product, unique benefits, and alternatives that already exist in the market. By applying the steps in New Product Development-Idea Generation, Screening, Product Design, Prototyping, and test marketing step by step, this project illustrates how the Laser Property Measurement Tool can help increase work effectiveness, reduce human error, and satisfy the rising demand for precise measuring technology in the property and construction industry.

## **1.0 INTRODUCTION**

The demands for speed, accuracy, and professional documentation have been increasing in the industry of property industry, especially within valuation, inspection, sales transactions, preparation of tenancy, renovation planning, and architectural reporting. Despite the rapid digitalization of the real estate sector, many of today's practitioners still depend on traditional tools such as manual measuring tapes, bulky survey equipment, or outdated laser meters that merely record basic readings. Measurement errors due to conventional techniques mean that inspection processes may be more time-consuming, data recording may not be consistent, and further site revisits may always be necessary, generally reducing productivity and increasing the operational costs of the property professionals.

Realizing the problem exists, the team has come up with the Smart Laser Property Measurement Tool, an innovative technology that aims to improve efficiency and accuracy with regards to property measurement works. This innovative technology came out because the team realized the occurrence of the problem every time real estate agents or property valuers went on property inspections, especially on larger units such as industrial warehouses, high-rise condominiums, and commercial shop lots. Many real estate agents and property valuers were expressing their desire for a tool which could make the tasks easier by automatically storing the data for the creation of digital floor plans without the need for sketching manually.

These online surveys were employed in the preliminary data gathering phase among real estate agents, valuers, contractors, interior designers, and property managers in Malaysia to refine our product design idea. Based on this, it was revealed that there was significant demand for a tool that could integrate the effectiveness of a laser sensor with the capability of being connected by mobile devices, enabling measurements to be saved and organized in real time. The restraining factors identified include the absence of Bluetooth connectivity, the unmet need of digital plan generation, and a need for smaller design concepts that could facilitate portability during property inspections.

The method developed for the LPMT takes into consideration the New Product Development method, which includes the processes of identification of the need, idea generation, screening, design development, concept testing, prototyping, and test marketing. All these were conducted in an organized way to make sure that the product is capable of addressing the market demands and incorporates the required technologies. Through this introduction, the purpose of designing the Smart Laser Property Measurement Tool have been proved in property industry.

## 2.0 NABC APPROACH

To ensure that the solution developed is truly in line with the needs of the real estate industry, the NABC approach is used. NABC helps identify the Need, Approach, Benefit, and Competition for the Smart Laser Property Measurement Tool combined with a 3D Scanner. With this approach, the practical value, innovation elements, and advantages of the product over existing tools can be more clearly demonstrated.

Table 2.1 NABC: Need

NEED	<ul style="list-style-type: none"><li>● Fast measurement</li><li>● Accurate measurement (distance, area, height)</li><li>● Digital documentation available</li><li>● Used for evaluation, inspection, rental, renovation, and reporting</li><li>● Old tools are slow &amp; error-prone</li><li>● Professionals want portable tools, automatic data storage, digital plans</li><li>● Need modern &amp; practical tools</li></ul>
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In today's real estate industry, fast, accurate, and consistent measurements are essential. Professionals such as property appraisers, agents, contractors, and interior designers need to ensure that every measurement of distance, area, and height of a space is accurate. A small mistake can affect valuation reports, rental plans, renovation plans, and project documentation. The problem is many are still using old tools such as tape measures or regular laser meters. These tools are time-consuming, prone to errors, and cannot store data digitally or produce 3D visuals. That's why you sometimes have to repeat site visits, waste time, and the risk of making the wrong decision is high. Now, professionals need a tool that is easy to carry, can automatically store data, directly produce digital plans on-site, and ensure that measurements are always consistent. With all of this, work on-site becomes smoother, saves time, and is less stressful. It is clear that the industry needs a Smart Laser Property Measurement Tool that is not only fast and accurate but also practical for daily use, while helping professionals make smarter decisions because all the complete and reliable data is right in front of their eyes.

Table 2.2 NABC: Approach

<p>APPROACH</p>	<ul style="list-style-type: none"> <li>● Combine Smart Laser Measurement Tools and 3D Scanner.</li> <li>● Measure distance, area, ceiling height, and room dimensions.</li> <li>● 3D visual</li> <li>● Features: Bluetooth, saving data, real-time export, and automatic plan</li> <li>● Reduce manual drawing and save time</li> <li>● Developed according to New Product Development.</li> </ul>
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To solve this problem, the approach taken is to combine two main technologies, namely laser property measurement tools and 3D laser scanners, into a portable hybrid tool. In this way, users can accurately measure distances, areas, ceiling heights, and room dimensions while getting 3D visuals to understand the space more clearly. This tool has many important features that make work easier, such as Bluetooth to connect with a phone or computer, automatic data saving, real-time export, and automatic digital plan creation. All of this makes work faster, reduces manual drawings, and simplifies documentation. This approach is developed according to the principles of New Product Development; each function is tested through prototypes, questionnaires, and market feedback so that this tool is practical and suitable for use by all professionals in the real estate industry, including during site inspections, valuations, project documentation, or asset monitoring. All of this makes work faster, reduces manual drawings, and simplifies documentation. This approach is developed according to the principles of New Product Development; each function is tested through prototypes, questionnaires, and market feedback so that this tool is practical and suitable for use by all professionals in the real estate industry, including during site inspections, valuations, project documentation, or asset monitoring.

Table 2.3 NABC: Benefit

BENEFIT	<ul style="list-style-type: none"> <li>● Fast and consistent inspections</li> <li>● Reduce repeat site visits</li> <li>● Professional digital documentation</li> <li>● Lightweight and user-friendly</li> <li>● Real-time exportable data</li> <li>● Help with decision-making</li> <li>● Increase productivity and save costs.</li> </ul>
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Using the Smart Laser Property Measurement Tools has many advantages for people working in the real estate and property industry, including surveyors, valuers, architects, developers, and anyone involved in valuation, inspection, buying and selling, renting, or planning renovations. First, inspections are much faster and more consistent, so there is no need to repeat site visits many times, saving time, energy, and costs. All documentation is also digital, easy to create, and looks professional and can be used directly for valuation reports, rental plans, or renovation plans without doing any extra work. The 3D visuals produced also provide a clear and realistic picture of the shape, size, and layout of the space, making it easy to understand the property and make decisions more accurately and confidently. All these functions are in one tool, eliminating the need to carry multiple tools or remeasure many times, making work on-site more efficient and less stressful. The stored digital data can also be exported in real time and shared with clients, colleagues, or management, making it easier to collaborate and keep records. In addition, this tool is lightweight and easy to use, suitable for large spaces, complex layouts, or high-rise buildings without feeling tired or fatigued. Overall, this tool helps increase productivity, save operating costs, and simplify workflow, while supporting all professionals in the property industry to make smarter and more accurate decisions because all the important data and complete visuals are in just one device.

Table 2.4 NABC: Competition

<p>COMPETITION</p>	<ul style="list-style-type: none"> <li>● Competitors: Laser meter, Mileseeey R1500 Rangefinder, Leica Disto X6, Phone apps, Leica Disto D2, Bosch 3D Scanner.</li> <li>● Computer limitations: data not saved, slow, easy to make mistakes, heavy, and software problems.</li> <li>● Smart Laser Property Measurement Tools product: precise laser + 3D + automatic data saving + bluetooth + real-time export + easy reporting</li> <li>● More efficient and practical.</li> </ul>
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Now on the market there are many popular tools for real estate professionals to use, such as the traditional laser meter, Mileseeey R1500 or Myosil Arc 1500, Leica Disto X6 and D2, phone measurement apps, and Bosch 3D Scanner. But all these tools have their own limitations. Traditional laser meters can only measure distance; there is no 3D function, and there is no automatic data saving, so if there are many measuring points, you must write manually, which is slow and easy to make mistakes. The Mileseeey R1500 or Myosil Arc 1500 is correct for distance and width, but there is no real 3D function, limited data storage, and manual export, so it is less efficient for large projects. Leica Disto X6 and D2 are a bit more advanced; X6 has a tilt sensor and some simple 3D functions, but still not enough for full 3D mapping. Data can be saved and exported, but if there are many measurement points, the work is still slow. Phone measurement apps are easy and portable but less accurate, there is no full 3D function, and data is easily lost. The Bosch 3D Scanner can provide 3D visuals, but it is heavy and not user-friendly, and the software sometimes hangs if there is a lot of data. Unlike all these tools, Smart Laser Property Management Tools combines all the important functions in one tool, accurately measuring distances and areas, have complete 3D visuals, save data automatically, connect via Bluetooth, export in real time, and directly produce digital plans. With this combination, measurement and 3D mapping can be done directly in one tool, making fieldwork faster and smoother and more systematic, and professionals can make more confident decisions because all the data and complete visuals are right in front of their eyes.

### **3.0 NEW PRODUCT DEVELOPMENT**

New Product Development (NPD) is the process of developing a new product from idea to market-ready. This is important because it helps ensure that the product not only works well but is also practical, useful, and meets the needs of the user. Through NPD, each function of the product can be tested and improved based on feedback so that the result is usable and truly provides value.

#### **3.1 Definition**

This new product can be understood as any innovation that makes a product better, whether in terms of functionality, additional features, or new value compared to products that are already on the market. The development of this new product is not done simply because it wants to look modern or follow trends, but more importantly, it is born from the needs of users who need more accurate, fast, and efficient solutions to make their work easier. In the real estate industry, this need exists because professionals face many challenges every day, for example, issues of measurement accuracy, the need for complete documentation, and the pressure to complete reports in a short period of time. So, the meaning of the new product in this project is built based on advantages that can really solve real problems that users face in their daily work.

The new product developed for this project is the smart laser property measurement tool, which is a combination of a laser property measurement tool and a 3D laser scanner combined in one portable device. The device is designed to be compact in size, easy to carry to the site, and practical to use in real-world situations. It can replace the use of traditional tools such as manual tape measures or basic lasers that often require manual recording and are prone to errors. The smart laser property measurement tool is a modern solution that not only makes work more accurate and efficient but also, at the same time, helps real estate professionals continue to survive and thrive in an increasingly competitive industry.

In terms of functionality, this device combines three main components. First, it can make distance measurements with a high level of accuracy using professional laser technology. Second, it is able to scan the entire space in 3D to produce accurate and complete visuals. Third, all collected data can be transferred directly to a mobile application via Bluetooth or WiFi connection, so users can save data and review or generate digital floor plans without having to draw manually. In this way, the risk of errors can be reduced, repeated site visits can be avoided, and the entire documentation process becomes more organized and manageable.

From a business continuity perspective, this tool plays an important role as the real estate industry is increasingly technology-dependent and the level of competition is also increasing. Professionals who still use traditional measurement methods risk making measurement errors, taking a long time to prepare reports, and ultimately losing customers to competitors who use more sophisticated technology. With this smart laser property measurement tool, users can gain advantages in terms of higher accuracy, more organized documentation, and faster work processes, thus helping them remain relevant and competitive in the market.

Apart from that, from a growth strategy perspective, this smart laser property measurement tool can also help users expand their services and market potential. With 3D scanning features and digital data integration, professionals can offer additional services such as digital floor plans, 3D models, or technical reports that look more polished and professional. This can not only add value to the services offered but also allow them to attract more customers, charge higher fees, and enter new markets such as digital property marketing or 3D visual development. Indirectly, this tool does open up wider growth opportunities for individuals and organizations.

Overall, this laser-based smart real estate tool can be considered a major innovation in the real estate industry, as it combines accuracy, efficiency, and digital visuals in one device. It is not only an improvement over traditional measurement tools but also helps users survive in a competitive industry while supporting their career and business development. With a combination of modern technology and practical functions, this tool is truly a complete solution to improve the productivity and quality of work of today's real estate professionals.

### **3.2 Classification of New Product Development**

The Laser Property Measurement Tool combined with a 3D laser scanner can be categorized as an improvement to existing products because it improves the functions of equipment that has long been used in the market, such as a regular laser measurement tool and a basic 3D scanner. Previously, these two tools were used separately, but through this innovation, both functions are combined in one smaller, compact, and easy-to-carry device. This combination makes its use more practical, more organized, and more timesaving, especially for professional use in the real estate field. This classification is appropriate because this product does not directly remove or eliminate the use of traditional tools but rather adds value by improving the original function and solving real problems that always occur when doing property inspection work. In addition, this product can also be considered an addition to the existing product line because it expands the capabilities of conventional laser measurement tools through the combination of 3D scanning technology in a more complete and better version. This improvement can indirectly reduce manual work, minimize measurement errors, and speed up the inspection process with more accurate and consistent data.

In terms of the type of innovation, this product can be considered a synthesis innovation, which is the combination of two different tools that create a solution with higher value. Conventional laser measurement tools previously only measured distances, and users had to manually record readings, while 3D scanners provided visuals of spaces but often required additional software and separate equipment. When these two technologies were combined in one device, users could take measurements, record 3D visuals, and produce digital floor plans in the same workflow without having to switch tools. This combination makes the workflow more streamlined and consistent because all data is collected in one interconnected system. This synthesis innovation also helps reduce errors that usually occur when data from different tools has to be manually combined. So, this product does not just combine functions but improves the way property inspections work so that they are easier, more organized, and more efficient.

From a product development perspective, this innovation can be categorized as a new product in the market because it offers features and capabilities that traditional tools cannot provide separately. Although laser measurement tools and 3D scanners have existed and been used for a long time, both still function as separate devices with limited capabilities. This product combines measurement accuracy, 3D mapping, automatic adjustment, and real-time digital integration in a system that is specifically designed for property inspection purposes. This innovation not only makes work more efficient but also helps reduce human error, shorten inspection time, and provide more complete data for professional evaluation and

documentation purposes. Therefore, this product can be considered to introduce a new way of use with much better performance than existing tools.

In addition, when viewed from the product dimension aspect, the most important dimensions for this device are features, technology, and quality specifications because all of these directly affect the performance during actual inspection work. In terms of features, this device has functions such as integrated distance measurement, 3D scanning, automatic adjustment, error detection, and digital floor plan generation, which make the data collection process more organized and systematic. In terms of technology, this product uses a high-precision laser system, real-time 3D mapping, and integration with mobile applications so that data transfer is smoother and faster. In terms of quality specifications, emphasis is placed on consistent accuracy, system stability, and data reliability, which are very important for appraisers and surveyors in preparing professional reports and making accurate decisions.

In conclusion, this classification shows that this product is a technology-based innovation that has been enhanced by combining existing functions into a modern device that is more accurate, efficient, and easy to use. This combination makes this product more suitable for use in real-world inspection situations that require speed, accuracy, and organized digital documentation. The product also reflects how improvements to existing tools can provide new value without completely changing the basic concept of measurement. In addition, this classification shows the suitability of the product with the needs of today's real estate industry, which is increasingly dependent on digital technology in the assessment and reporting process. By emphasizing work efficiency, error reduction, and data reliability, the product is in line with current professional practices and the needs of real users in the field.

### 3.3 New Product Development Process

A company or entrepreneur who wants to start a business needs to do research on current developments, especially on demand, competitors, and technology. They will move on to the next step after deciding which ideas to propose. It can be concluded that this product development process is in stages and requires a specific timeframe depending on what product is being focused on.

#### 3.3.1 Research and Development

A company or entrepreneur will conduct research and development (RND) before a product is released on the market. This aims to ensure that the product is of high quality, satisfies customers' expectations and desires. This research and development (RND) will be used in the production of new products or improvements to existing products through research into existing problems (Holstein, 2025).

##### a. Idea Generation

Throughout the idea generation process with research and development (RND), the ideas generated were based on the real estate sector. This sector is a huge contributor to the Malaysian economy and is always relevant throughout the ages. Therefore, this idea generation was made by identifying the problems that are often faced and the main needs of users in this profession. As a result, there are three types of products that have potential in the real estate market. The types of products are as follows:



Figure 1.0 Multi-function Drone

Nowadays, there are many types of drones produced by technology companies to facilitate users in their work such as in the real estate sector, agriculture, mapping, and others. In the context of real estate, most developers will rely on the use of drones to inspect buildings that cannot be accessed. Problems will arise when the building that needs to be inspected is a large, multi-storey and aging building.

The first problem that developers often face during inspection is measuring the building size. When the building is too large like an apartment or bungalow, measuring work using manual digital tape is not the most efficient method. The reason is the significant distance separating the walls and there is a possibility of human error. Measuring the height of the building will be difficult because of the limitation of tape length.

The second problem is the lack of lighting. When an inspection is carried out in a large, abandoned building, there is no lighting from an electricity supply and only relies entirely on natural lighting from open areas. This will make it difficult for the developer to make measurements of the building. In addition, the developer will also have difficulty in observing the measurements and will make mistakes in recording the measurement values.

The third problem is in detecting the building defect. In some buildings that are strictly not accessible to see the condition of the building, it is very risky for the developer. This is because the developer cannot detect the defect in the building in the first place. As a result, the developer is unable to predict the kind of harm and the anticipated cost of fixing the flaw. For example, cracking walls, leakage, peeling paint and others.

The last problem is in communication for information updates. For large and multi-storey buildings, developers will often divide their workers to measure the building for each different part or according to each different floor. When each worker is in a different part, it will be difficult for them to communicate and ask for information. Furthermore, if the area does not have a stable connection to make phone calls.

To counter that problem, we are thinking of a new innovative drone which is a multi-function drone. The new feature implemented in this product is it comes with built-in audio function, can attach firmly to walls for detailed inspection, tripod mode for steady capturing, laser tool for accurate measurement, defect detection sensor included, 360° panoramic camera and lastly LED light for dark or indoor areas. This feature is adapted from existing products such as laser distance meter, defects detector, walkie talkie and 360 cameras.

This innovation of product also known as synthesis which is combination existing concepts or factors into a new formulation or use. This multi-function drone led to improved inspection efficiency such as enhanced safety, provides accurate measurement, detects building defects early, delivers full visual coverage, improves visibility in dark areas and enables communication during operation.

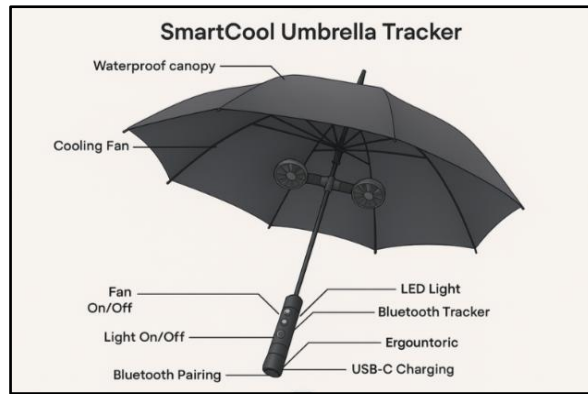


Figure 2.0 Smartcool Umbrella Tracker

Real estate professionals that work as valuer, estate agent, or property manager are typically exposed to outdoor activities during inspection. Their work primarily takes place outside, unlike office jobs that involve working at a computer. The weather in Malaysia can be unpredictable, shifting between rainy spells and hot weather. Therefore, the use of an umbrella is very important for individuals who venture into this field.

Usage of umbrellas sometimes can lead to another problem for some people like misplacement and lack of convenience during outdoor use. Therefore, Smartcool umbrella tracker can counter that problem with new features such as a tracking system, cooling fan system and other innovations like lighting systems with eco-friendly materials, water resistant electronics, and detachable battery unit.

The first benefit from the innovation feature is it can prevent loss. The existing tracking system that attaches to the body of the umbrella can trace the location of that umbrella as long as it is connected with the handphone. With a certain distance, the user could search for their umbrella if he forgot where he put it. It is very helpful during the emergency time and reduces the time needed to look for it.

Secondly, the tracking system can ensure the safety of the user. Other persons who are linked to the umbrella can locate it by using their handphone if the user of the umbrella vanishes without a trace while carrying it outside. The impact of it is that criminal cases can be avoided, and users will feel safe when going out. If the real estate professionals conduct an inspection at the wilderness area, they will be more confident for their safety.

Lastly are convenience and comfort. Users will be more comfortable especially in hot weather with the advanced utilization of lighting and cooling fans. Users may cool off by using the fan at the top of the umbrella. Next, lighting applications can facilitate users' nighttime wandering in the dark.



Figure 3.0 Laser Property Measurement Tool (LPMT)

The development of structures in Malaysia or abroad will certainly use measurement tools to measure the size of the building for installation and others. However, using manual methods will create constraints in terms of accuracy, time and safety on site. Therefore, with the existence of the Laser Property Measurement Tool (LPMT), this is a technological innovation to increase efficiency and reduce errors.

There are various problems that often arise during measurement process, including the need for a long physical distance between workers and the structure, the difficulty of measuring inaccessible building permission, the need for a large workforce to carry out measurements, the time it takes to measure large buildings, and the risk of measurement errors due to weather factors and site conditions.

Therefore, with the existence of this Laser Property Measurement Tool (LPMT), users such as estate management firms can measure in 3D more accurately without having to record manually, this 3D display makes it easier for users to see the building structure visually, can collect data on a large scale, store data in a cloud system which will make it easier for management to review and has GPS tagging which can track the exact location of the site. Apart from its lightweight and portable physical form, there are many advantages to this Laser Property Measurement Tool (LPMT). These include the application of digital systems, reducing costs for a long period of time, time saving, reducing the number of workers and increasing operational efficiency.

b. Idea Screening

Following an investigation among the three products mentioned earlier, namely the multi-function drone, smartcool umbrella tracker, and laser property measurement tools (LPMT), (LPMT) was chosen as the product to develop. This is due to the factor state below:

The first selection factor is continually relevant. If there is development and having a property in this country, that shows that these measurement tools are needed. The nation's

development is increasingly progressing towards technological advancement. Therefore, Laser Property Measurement Tool (LPMT) really meets the current needs and desires of users. These days, a lot of individuals choose products that facilitate their job and save time by eliminating the need to carry many goods at once. The target market is increasingly diverse in its categories. This is due to the production of these measurement tools was initially for individuals in professions such as real estate. However, nowadays many members of society prefer to make structural reforms on their own. In addition, young generation students in specialized fields also prefer advancement measure tools like Laser Property Measurement Tool (LPMT) rather than manual measuring tape.

Second factor of choosing Laser Property Measurement Tool (LPMT) is because reasonable and affordable selling price. The selling price can be guaranteed by many people, even a student. This is because it is not fully depending of a physical component, while focusing on system setup in that tool. In the perspective of the buyer, that will be a more money saver in the long term because it is a combination of a few items and becoming one item. When the Laser Property Measurement Tool (LPMT) can be sold at an affordable price, this allows many new users to own it because their investment risk is lower. In addition, Laser Property Measurement Tool (LPMT) can satisfy customers because they can have a high technology product without the burdensome cost.

c. Description of product technology

The first technology applied is 3D scanning. This technology allows buildings to be measured and provides a realistic 3D image of the building's measurements. This provides a clear picture of the building's structure. Measurement of length, width and height will be accurate because the result will show the shape of that structure. If the user's measurement method is incorrect, the 3D rendering of the house will not be perfect.

The second technology applied is GPS tagging. This technology is to remark the actual location of the site. Each location marked on the Laser Property Measurement Tool (LPMT) will be given the actual geographical coordinates to ensure that the user does not need to mark and draw the location manually on paper. This can save time and facilitate their work.

Lastly, technology applied is cloud integration. This technology is to allow users to store and share data with others such as management for review purposes. All data in the Laser Property Measurement Tool (LPMT) such as 3D images and GPS coordinates will be stored simultaneously in the cloud securely. Other interested parties can access the data simultaneously. The advantage of this cloud is that data is safe from loss in contrast to manual storage.

### 3.3.2 Product Design/Features & Technology Description

This part introduces the product design, functionality and technology supporting the proposed laser property measurement instrument. For functionality, accuracy and usability, the product design combines efficiency with beauty. The discussion has revolved around the essential technologies that offer accurate measurement, reliability and flexibility in different environmental conditions. It also has functions that offer professional performance despite simplified functions. This section highlights how simple design can be combined with advanced technology in producing competitive product measurement technology.

#### a. Product Design

In the design of the Laser Property Measurement Tool, there is a focus on the fact that modern automation users should have very minimal adjustments in the process of using it. This includes automatic calibration which eliminates the need for the user of the device to do any fine tuning. Once it is turned on, the sensors in the product can make the necessary adjustments for distance, angle and other environmental factors.



Figure 4.0 Laser Property Measurement Tool (LPMT) Design

In terms of physical appearance, the product focuses on a small body design, made from hardened ABS materials with silicone-infused edges for added ruggedness. The main front features a large backlit LCD display that can adjust brightness accordingly to suit its functionality either outdoors or indoors where lighting may be welcoming to measurements. Vibration-reduction support features are incorporated to offer stability in laser beam projection, especially when placed on a tabletop or carried along for handheld measurements.

In terms of aesthetic design, the product is characterized by the adoption of minimalist styles entailing clean-cut designs, rounded edges, and a modern industrial aesthetic. The designer has managed to incorporate a minimalist user interface with fewer push buttons strategically positioned. The use of display smartphones helps in the swift operation of the

product while also boosting aesthetic appeal. This is a general aesthetic common in products that exude professionalism, accuracy, and advanced technology.

Its internal design aims at allowing for faster processing speed even when it has a stable structure. The optical sensor, processor, and cooling systems are ordered in a manner that even during long scanning ranges, the device remains stable. This results in a highly accurate result each time and does not lead to overheating, a highly common issue with old or less expensive laser range finders.

Finally, the design also includes USB-C ports, a cloud synchronization module, and wireless communication antennae, which will cater to modern data processing. This has been done in such a way that it doesn't occupy much space but still retains functionality. This integrated design of the product will meet the expectations of the market in terms of ruggedness, mobility, automatization, and connectivity, which are greatly required in today's professionals.

#### b. Product Features

The Laser Property Measurement Tool offers customers a cutting-edge package of advanced automated functionalities, which improves productivity and accuracy in property measurements such as automatic calibration, whereby the device is adjusted automatically, which eliminates human error, and which optimizes and shortens the inspection process, especially during time-sensitive property inspections and property construction. The tool uses stabilisation algorithms that provide stable and highly accurate results, even under difficult environment conditions. The device automatically compensates for a slight shaking motion of the human hand or even some vibrations in the environment, providing highly accurate results. Using this tool will make an important impact on creating a wall-to-wall scan, ceiling height analysis, or a digital floor plan.

The new user interface has greatly improved and become simpler and more user-friendly. The menus are optimized, and the icons are larger in order to reach all objects in a saving manner. The display automatically adjusts the brightness based on the prevailing conditions. Moreover, the system also identifies the variations in temperature for the beam in order to maintain its precision. This device is also incorporated with high-speed scanning technology that efficiently records information at a higher rate compared to other laser distance devices. This indicates that users will be able to carry out their work at a much faster rate since it encompasses room measurements, scanning an entire space in 3D, as well as other rapid

scanning applications. This is further reinforced by noise cancellation software that prevents interference that may hinder accuracy.

In terms of data management, it allows export options in different formats such as CAD, BIM, PDF, JPEG, and Measurement values. Apart from that, it has cloud sync and auto-backup features. This allows all the collected data to be safely stored in the cloud even in cases whereby the device gets lost or damaged. These functionalities of this software provide a direct response to professional markets in terms of precision, efficiency, and integration.

c. Technology Used

The technology that powers the Laser Property Measurement Tool is based on a cutting-edge auto-calibration technology that relies on internal environmental sensors monitoring temperature, distance, and reflectivity. All these happen Automatically whenever this device is ON, therefore ensuring that all readings are accurate. The fact that there is no need to adjust and that it can be applied by different users across different areas means that this device takes a significantly shorter time to set up. These features are realized through a blend of optical noise reduction functions and vibration compensation technology. The optical sensor eliminates unwanted reflections or noise, while on the other hand, the vibration component smooths out values even when the user is holding the sensor and their hand isn't completely steady.

There is a high-speed microprocessor powering the software behind this device. Thus, it allows for quick calculations, scanning, and menu navigation. Up-to-date system architecture reduces the occurrence of crashes that may be witnessed during continuous scans or while big data is concerned. This means workflow can be continuous in high-demand tasks such as generating detailed property measurements or conducting building inspections. Another significant constituent is environmental adaptation technology. The integrated smart sensors automatically adjust laser strength, screen brightness, and processing parameters for any change in lighting, temperature, or vibration. That means the device can operate at optimum accuracy in bright outdoors, hot construction areas, or dimmed indoor areas.

It incorporates the latest communication technologies like BLE for fast wireless data transfer and cloud synchronization modules for automatic backups. Conversion software is also incorporated into the tool, which enables the tool to handle export formats like CAD, BIM, PDF, and others, thus again ensuring compatibility with all major applications and giving the tool added value as the latest technological solution for real estate professionals, architects, engineers, and land surveyors.

### 3.3.3 Concept Testing

Concept testing refers to the process of evaluating a product idea before it is fully developed and commercialised. For this entrepreneurship project, concept testing was carried out to assess the acceptance and feasibility of the Measurement Scanner product. This process helps determine whether the product concept meets customer needs and has potential demand in the market.

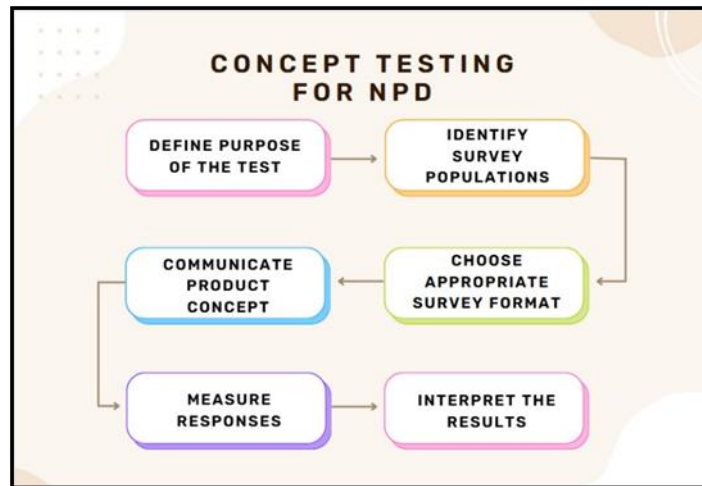


Figure 5.0 Concept Testing for NPD Flow Chart

The purpose of concept testing is to reduce business risk by gathering early feedback from potential customers. In this project, concept testing was conducted to:

- Identify customer interest in the Measurement Scanner product
- Evaluate whether the product concept is clear and understandable
- Determine the perceived usefulness of the product
- Support decision-making before moving to the next development stage

#### **Concept Testing Method**

The concept testing method used was a simple customer feedback approach by using a Google Form. Potential users were introduced to the Measurement Scanner concept, including its basic function, features, and intended use. Respondents were then asked to provide their opinions based on their understanding of the product. Feedback was collected using short questions through Google Form, by focusing on usefulness, practicality, and willingness to use the product. This method is suitable for early-stage product ideas and aligns with the purpose of concept testing as outlined in the subject syllabus.

a. Sketch Concept

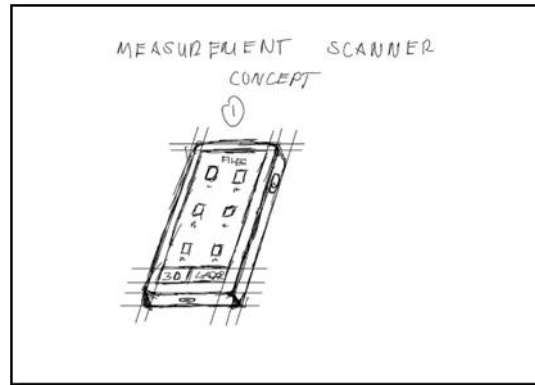


Figure 6.0 First concept

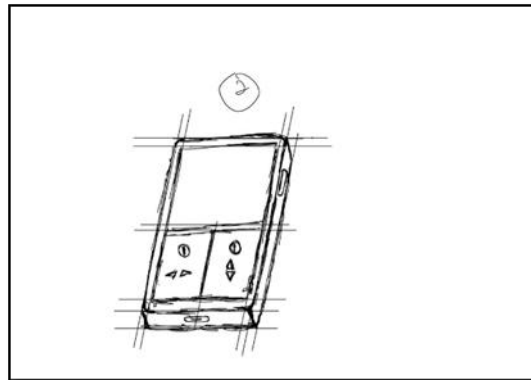


Figure 7.0 Second concept

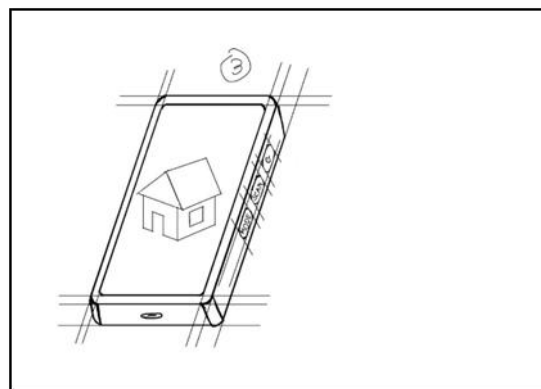


Figure 8.0 Third concept

The first concept relies heavily on the combination of the chosen mode button for either a 3D scanner or a laser scanner. It is also equipped with type-C connectivity and charging port, pointy square edges, a high-definition touch screen panel, and an on and off button on the side. Moreover, for the second concept, it is also equipped with a high-definition screen, but it is not a touch screen and is highly dependent on the buttons to control the measurement.

Not just that, it also has the on and off button on the side, pointy square edges, and is equipped with Type-C connectivity and charging port. Finally, the chosen concept, the third concept, comes with a full high-definition touch screen with soft, round edges. Moreover, it is also equipped with a mode and scan button on the right side of the device that can make it easier for the user to change modes and to start using the scanner. In addition, it also has the power button on the right side and is equipped with Type-C charging and connectivity port to improve the reliability.

b. Rendering of Chosen Concept



Figure 9.0 Third concept rendering image

The third concept is chosen because it follows every criterion that we set for our measurement scanner product, with a high-definition touch screen panel design, a good quality laser sensor for the scanner, easy to use, and convenient to bring along, even during extended site or field inspection.

**Results of Concept Testing**

The concept testing results show that most respondents responded positively to the Measurement Scanner product. In accordance with the graph below, most respondents agreed that the product could help to ease on-field measurement issues and is a very essential device to have during inspection compared to other manual methods. The concept was generally easy to understand and considered relevant for both personal and small business use.

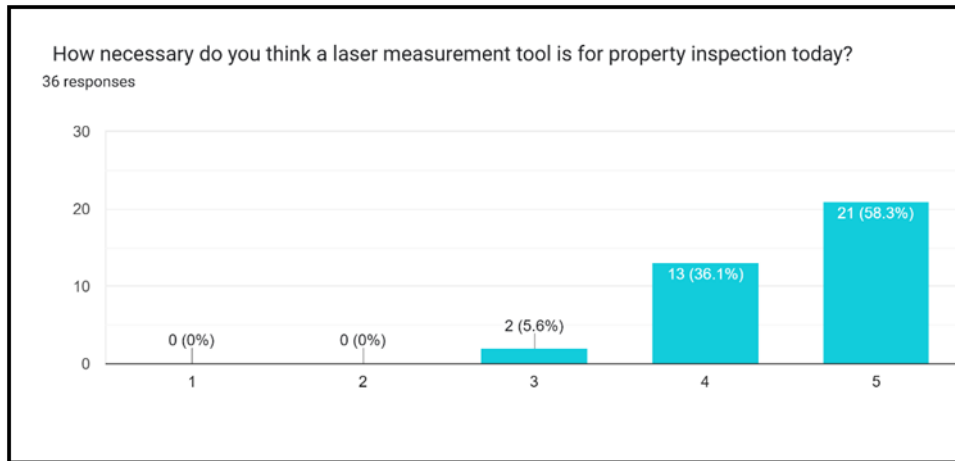


Figure 10.0 Necessity of a measurement tool for an inspection chart

However, some respondents highlighted concerns such as product cost, battery life, durability, software stability, and measurement accuracy. These responses indicate areas that require improvement before the product is introduced to the market.

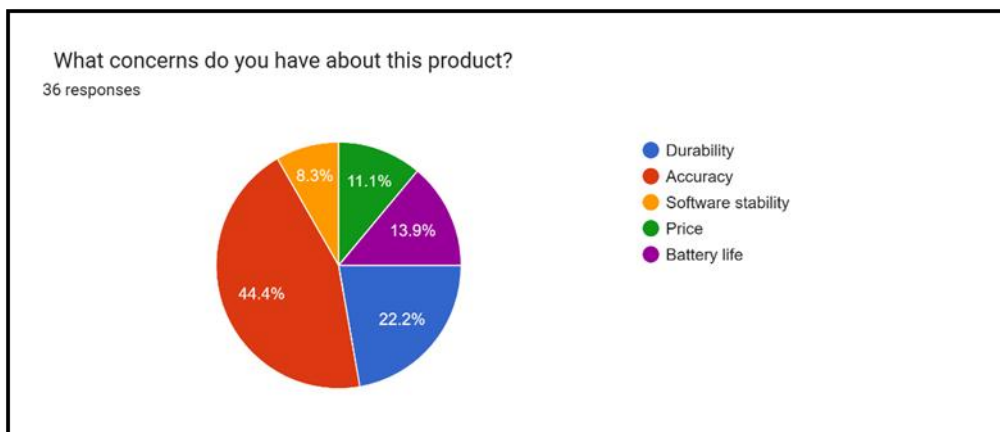


Figure 11.0 Product's concerns chart

Concept testing is important as it allows the business to understand customer needs at an early stage. For the Measurement Scanner product, concept testing helps our team to identify strengths and weaknesses of the product concept at an earlier stage so that it can be fixed and improvable. Thus, from the feedback and supportive information from the consumers, it can be used to refine the product, improve customer satisfaction, and increase the chances of market success. In conclusion, concept testing has shown that the Measurement Scanner product has potential market acceptance. The positive feedback supports the viability of the product concept, while the constructive feedback guides improvement. Conducting concept testing at this stage helps minimise risk and supports better business planning before product launch.

### **3.3.4 Build Prototype (2D/3D)**

This is only a conceptual, non-functioning prototype developed to represent the 3D scanning laser measurement tools. This is intended to be used for the classroom and showcase the physical appearance, arrangement of the internal components, and the overall system layout of the product.

The external or physical appearance of the product is made to be minimalistic and compact casing design for handheld devices to have an easier time carrying and using the product. There is a colour coded buttons interface on the side of the device that is for the power, mode, and scan buttons. The built-in display is positioned on the front, allowing for enhanced user interaction, basic measurement feedback, scan status, distance value, battery level, and connection indicator. This is to help visualize the three-dimensional form, detailed analysis, and rotate the form.

The optical sensors and laser emitter are positioned at the top of the device for better direct line-of-sight scanning. Wireless antennas are positioned close to the top for facilitation of a stable connection. The environmental sensors help with sensing the temperature and ambient light.

At the centre of the internal components, the microprocessor is suited for stabilisation, scanning, automatic calibration, optical noise reduction algorithms, a cloud synchronisation system, and Bluetooth Low Energy (BLE). There are three buttons on the interface printed circuit boards for the power, mode, and scan buttons. To improve the stability and accuracy of the measurement, there is environmental adaptation technology, anti-vibration support, and cooling components for effective thermal management.

The lower section of the device has components, like a power management circuit, a rechargeable battery, and a USB-C connector for power and data transfer. This arrangement shows the usefulness of combining the components into a compact handheld casing that is user-friendly.

Below are the three-dimensional (3D) generated models of the product prototype, including the labelled components and features in the small casing body. This prototype helps show the usefulness, compact sizing, and viability of the product.

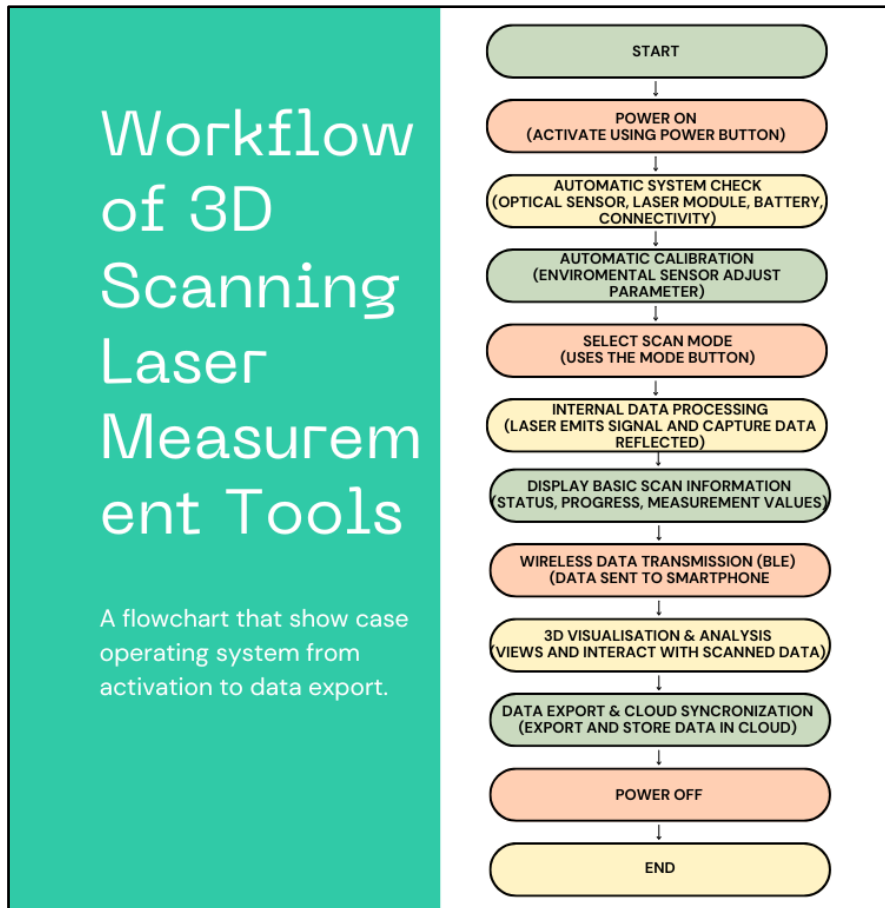


Figure 12.0 Workflow of 3D Scanning Laser Measurement Tools



Figure 13.0 Prototype Model

The prototype shown is a model of the concept and not a fully functioning one, only to help showcase the architecture and design of the portable 3D laser scanning measurement tools. This focus on integrating all the parts required to create the product that have been designed into a chassis that is similar to a smartphone. This prototype has a workflow that shows the operating system from activation to data output. The steps include the internal processing, capturing data using a laser, initiating a scan, and transmitting data wirelessly to mobile applications for storage and viewing. This prototype lacks certain features and only represents conceptually, like the software algorithm, miniaturizing the hardware, and a complete calibration system. This is only to evaluate the design, function, demonstration and validate the product idea.

### 3.3.5 Test Marketing

For a week, a survey has been conducted through a questionnaire using the Google Form platform. The test market is where we evaluate the feasibility of the product before launching it into the market. This is used to test the market survey among the surrounding people, especially focusing on the students and working people in the real estate industry. The Google Form survey was shared on various social media platforms to reach a wide range of respondents, including WhatsApp, Instagram, and Facebook. The main goal of this survey is to determine how satisfied respondents are with the product we are going to launch. A total of 38 people participated in this survey.

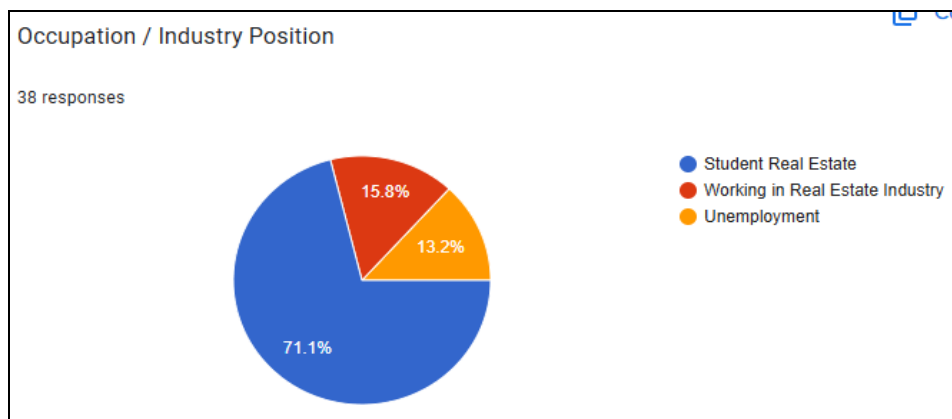


Figure 14.0 Occupation / Industry Position

Most respondents were students in the real estate field, which is 71.1%. This shows that most of the feedback was obtained from students who are still in their studies. In addition, 15.8% of respondents were individuals working in the industry, while 13.2% were unemployed respondents. Overall, these findings show that the study respondents were more dominated by students than professionals in the industry.

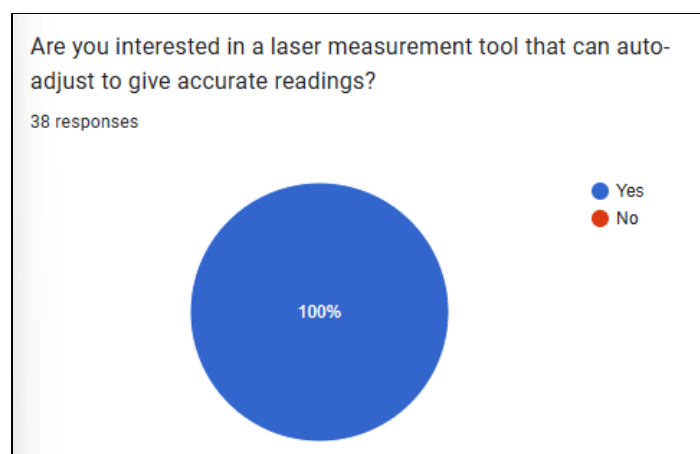


Figure 15.0 Interested Percentage Using a Laser Measurement Tool

Based on the figure above, all respondents (100%) expressed interest in using a laser measuring tool that has an auto-adjust function to provide accurate readings. This finding shows a very high level of acceptance and interest in the feature, thus proving that the auto-adjust function is important and relevant to users.

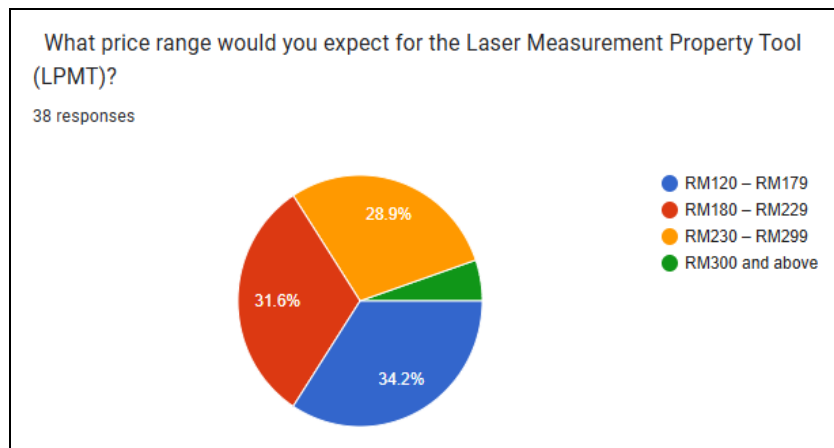


Figure 16.0 Price Range Expected for the Laser Measurement Property Tool (LPMT)

Based on the diagram above, most respondents expected the price of the Laser Measurement Property Tool (LPMT) to be in the range of RM120–RM179, which is 34.2%. This was followed by the range of RM180–RM229, which is 31.6%, and RM230–RM299, which is 28.9%, indicating that most respondents were more inclined towards the moderate price. Only a small number of respondents expected the price to be RM300 and above, indicating a relatively high price sensitivity among consumers.

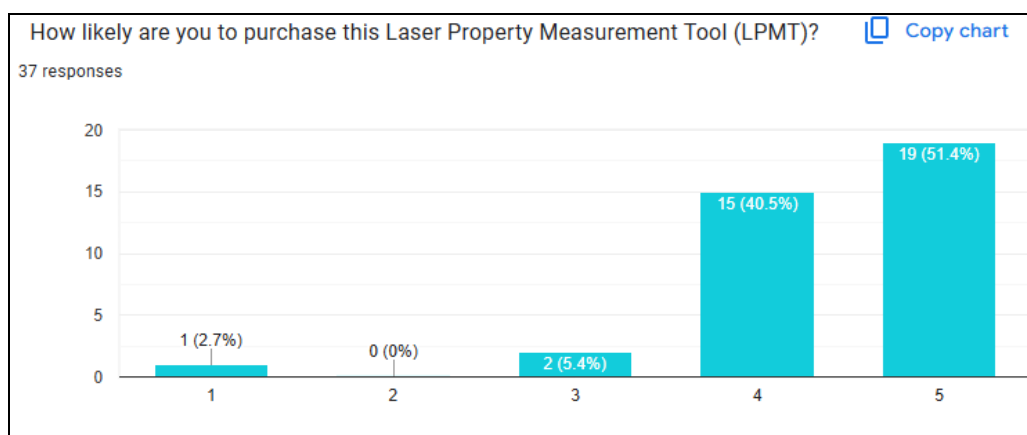


Figure 17.0 Percentage on How to Purchase the Laser Property Measurement Tool (LPMT)?

Based on Figure 5, the majority of respondents showed a high tendency to purchase the Laser Property Measurement Tool (LPMT). A total of 51.4% of respondents chose scale 5, while 40.5% chose scale 4, indicating a very positive purchasing interest. Only a small number

of respondents chose the low scale, namely 2.7% on scale 1 and 5.4% on scale 3, while no respondents chose scale 2. Overall, these findings indicate a strong market potential for LPMT.

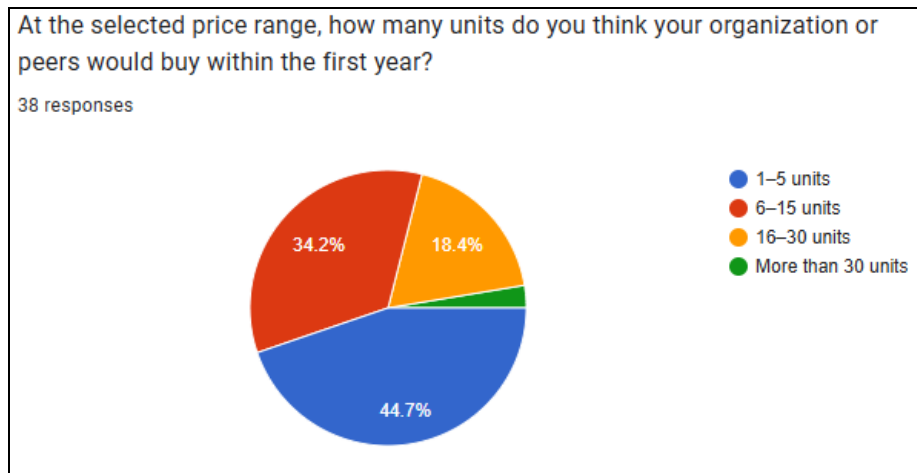


Figure 18.0 Units of LPMT that Peers would buy within the First Year

Based on the diagram above, the majority of respondents expect to purchase 1–5 units within the first year, which is 44.7%. This is followed by 34.2% of respondents who expect to purchase between 6–15 units, while 18.4% expect to purchase 16–30 units. Only a small number of respondents expect to purchase more than 30 units. Overall, these findings indicate that initial demand is expected to start on a small to medium scale.

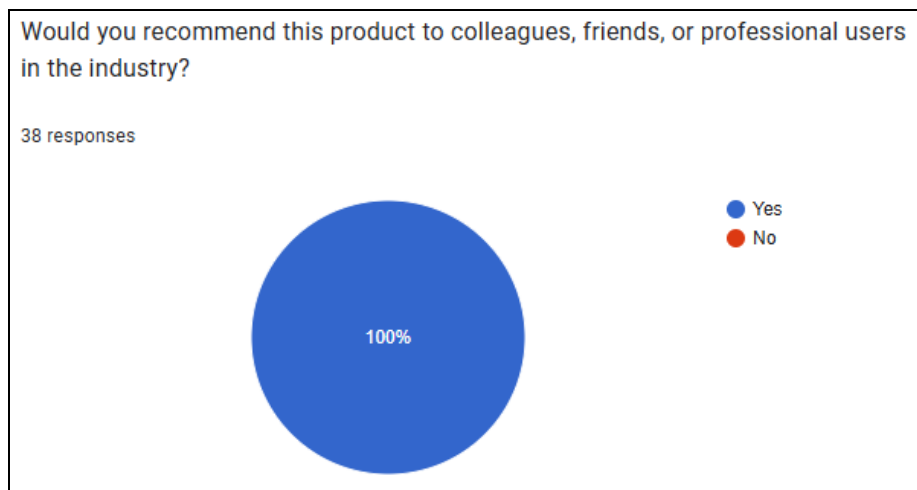


Figure 19.0 Recommended Product to Colleagues, Friends, or Professional Users

From the result above, we can conclude that 100% of the respondents want to recommend this product to their colleagues, friends, or professional users in the real estate industry.

## 4.0 CONCLUSION

The LPMT has shown through the comprehensive evaluation carried out during the NPD process that, within the property and construction sectors, it has a high feasibility, high market demand, and is commercially viable. It solves major issues that concern measurement accuracy, long inspection times, and protracted manual documentation among practitioners in the real estate profession, such as valuers, agents, surveyors, architects, and contractors.

Concept testing and market surveys confirm that property practitioners, nowadays, are more receptive than ever to embracing digital tools to help improve workflow and productivity. The integration of laser measurement technology, Bluetooth connectivity, and an intelligent mobile application positions the LPMT as a competitive, up-to-date solution. Its ability to auto-save measurements, create floor plan sketches, and export reports in various formats hugely cuts down on human error and enables faster decision-making. These features make the LPMT different from some basic laser devices currently available in the market, while remaining affordable compared to high-end professional surveying equipment.

NPD analysis also confirms that LPMT follows technological trends, especially in light of the shift towards digital transformation, mobile-based solutions, and smart working tools. With proper branding, targeted marketing, and strategic partnerships with real estate agencies, valuation firms, and construction companies, the LPMT has great potential for market entry into Malaysia and further expansion to neighbouring countries. Possible improvements in the future might include further development of 3D mapping, voice-activated controls, or incorporation with architectural software to make the user experience even easier.

The Smart Laser Property Measurement Tool is, in conclusion, not only practical and innovative but highly relevant to the needs of the contemporary property industry. Advanced features, an easy-to-navigate interface, and high acceptance by the market all point to the fact that the product can be successfully commercialised and contribute much to the standards of measurement and operational efficiency of the built environment.

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## 6.0 APPENDICES



### LASER MEASUREMENT PROPERTY TOOLS (LMPT)

Hi and Good day!

We are final year students of Bachelor In Real Estate Management with Honors from College of Built Environment (CBE), currently conducting a New Product Development (NPD) project for our Technology Entrepreneurship (ENT600) subject. We are conducting a survey to collect data for our new product invention which is an Laser Measurement Property Tool (LMPT). Kindly be noted that this survey consists of 5 sections to be completed.

**Problem Statement:**  
In the real estate sector, valuers, students, and property firms need a laser measurement tool that is accurate, stable, and easy to use for site inspections. However, many existing tools do not fully meet industry requirements due to inconsistent readings, limited durability, and unstable firmware performance. These problems can result in inaccurate measurements, interruptions during inspections, and difficulties in producing reliable valuation or inspection reports.

In addition, most current devices do not have automatic adjustment features to adapt to environmental conditions such as lighting or vibration. As a result, users must manually recalibrate the tool, which is time-consuming and may lead to errors. Therefore, there is a need for a modern, lightweight, and ergonomic Laser Property Measurement Tool (LPMT) that can improve accuracy, consistency, and professionalism in property inspection work.

**Objectives:**

1. To develop a durable, accurate, and easy-to-use Laser Property Measurement Tool (LPMT) that improves efficiency and accuracy during site inspections in the real estate industry.
2. To assess the market acceptance and potential demand for the Laser Property Measurement Tool (LPMT) among interns, valuers, and real estate practitioners.

We assure you that all the information collected by the respondents will be kept strictly confidential. Thank you in advance for your time and attention.

[Sign in to Google](#) to save your progress. [Learn more](#)

\* Indicates required question

Figure 20.0 Google Form Survey Questionnaire

**PART A: DEMOGRAPHIC DATA**  
*In this part, we would like to collect the general information of the respondents background.*

**Gender \***

Male

Female

**AGE \***

18-21

22-25

26-30

30 and above

**Occupation / Industry Position \***

Student Real Estate

Working in Real Estate Industry

Unemployment

[Next](#) [Clear form](#)

Figure 21.0 Part A of Google Form Survey Questionnaire

**PART B: PERSONAL LIFESTYLE**

*In this part, we would like to know your lifestyle and tool usage during property inspection activities.*

Which measuring equipment do you normally bring during inspection? \*

- Laser measurement
- Measuring tape
- Smartphone/Camera

Do you use a laser measurement tool during site inspection? \*

- Yes
- No

If yes, how frequently do you use a laser measurement tool? \*

- Every site inspection
- Only for specific property inspections
- Rarely


What problems do you face when carrying or using measuring tools during inspection? \*  
(Select up to two)

- Tools are heavy/bulky
- Difficult to access quickly
- Easily misplaced
- Need protection from rain/damage
- Lack of proper storage space

[Back](#) [Next](#) [Clear form](#)

Figure 22.0 Part B of Google Form Survey Questionnaire

The product design of our new product development:



Are you interested in a laser measurement tool that can auto-adjust to give accurate readings? \*

Yes

No

Would a small and easy-to-hold tool help you during site inspection? \*

Yes

No

Is durability (water resistance, dustproof, impact-proof) important for a site inspection tool? \*

Yes

No

[Back](#) [Next](#) [Clear form](#)

Figure 23.0 Part C of Google Form Survey Questionnaire

**PART D: PURCHASE INTENSE**

*In this part, we would like to know whether the respondents are interested in buying our product.*

How likely are you to purchase this Laser Property Measurement Tool (LPMT)?

1    2    3    4    5

Definitely would not buy                        Definitely would buy

Which factor is the most influences your purchase decision ? \*

- Price
- Product durability
- Product Design
- Accuracy and performance

Would you recommend this product to colleagues, friends, or professional users in the industry? \*

- Yes
- No

[Back](#)    [Next](#)    [Clear form](#)

Figure 24.0 Part D of Google Form Survey Questionnaire

**PART E: FEEDBACK**

*In this part, we would like to know the feedback of the respondents regarding this product.*

How necessary do you think a laser measurement tool is for property inspection today? \*

1      2      3      4      5

Not necessary                                    Extremely necessary

What price range would you expect for the Laser Measurement Property Tool (LPMT)? \*

RM120 – RM179

RM180 – RM229

RM230 – RM299

RM300 and above

Do you think this estimated price range is reasonable based on its features? \*

Yes

No

At the selected price range, how many units do you think your organization or peers would buy within the first year? \*

1–5 units

6–15 units

16–30 units

More than 30 units

Figure 25.0 Part E of Google Form Survey Questionnaire

At the selected price range, how many units do you think your organization or peers would buy within the first year? \*

- 1-5 units
- 6-15 units
- 16-30 units
- More than 30 units

What concerns do you have about this product? \*

- Durability
- Accuracy
- Software stability
- Price
- Battery life

Please provide suggestions to improve the LPMT product concept (if any) \*

Your answer \_\_\_\_\_

[Back](#) [Submit](#) [Clear form](#)

Figure 26.0 Part E of Google Form Survey Questionnaire