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Executive summary:

This document outlines the process used for the selection of a new product concept to be developed by STP. STP's motivations for developing a new product are discussed. A thorough evaluation process is then employed to select a suitable product area. Following consideration of all respective strengths and weaknesses, the product area of 'location-aware apps and associated hardware' is selected. Six product concepts are then presented from this product area, each with a brief description and schematic. Ten criteria are presented for the comparison of these product concepts, including budget compliance, innovation/novelty, easy of market entry, ease of IP protection and customer demand. The concept was selected using a weighted concept selection matrix. The result is that the 'smart sunglasses' concept (A) was selected since it scored highest in the matrix.

Document Changes Log:

Issue	**Reason/Main changes**	**Date issued**
-01	First issue	28/01/24
-02	Revision to the selection criteria and selection matrix	02/02/24
-03	Addition of the six product concept schematics	25/04/24

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Concept Selection Documentation

Due to recent breakthroughs in artificial intelligence (AI), augmented reality (AR) and virtual reality (VR), it is necessary to develop new innovative products that incorporate these features for society. This will enable STP to keep up with the evolving technological landscape. As customer needs are always evolving, the development of new products is essential for product portfolio renewal and customer retention. There has been a strong indication that our most recent product, AuraPay, has reached the maturity stage of its product life cycle. STP recognises the need to keep its product pipeline flowing to maintain cash flow. As such, it has been decided that now is an opportune time to develop a new product.

1. Product Area Selection

The product areas of highest potential were identified as washing machine related products, location-aware apps with an associated proprietary hardware, dental products, and mobility-assistive devices. The feasibility and potential of each of these 4 product areas was analysed whilst considering various organisational and project constraints, shown in Table 1.

Table 1: Different product areas with their respective advantages and disadvantages

Product Area	Advantages	Disadvantages
Washing machine related products	- High demand and stable market. - Potential for eco-friendly features. - Longer than average product life, less influenced by rapid technological changes.	- Well-established competitors such as Beko and Samsung. - Difficult to break into the market due to abundance of existing client-supplier partnerships. - Strict and changing regional regulations. - Higher customer-support expectation due to its longer lifecycle. -Greater potential for process innovation rather than product innovation, since the market is mature; this doesn't suit STP, given the domination of larger competitors.
Location-aware app and associated hardware	- Potential for innovation, updates, and variants. - Easier to scale globally. - Less influenced by economic climate or environmental regulations.	- More privacy concerns to consider. - Larger number of competitors who can frequently and easily enter the market.
Dental products	- Growing market due to growing interest in oral health. - Consistently high product demand. - An essential product all over the world.	- Requires dental specialists and scientists. - Strict regulations from health and welfare bodies such as FDA, GMP and HTA. - Research is time-consuming and requires volunteers, along with ethical concerns. - Rapid technology advances can easily make products outdated.
Mobility-assistive device	- Widespread funding and support. - More essential to associated demographics. - Less volatile to sudden economic climate changes.	- A more limited market. - Requires approval from health regulators, taking longer to reach market. - Lower customer expectation due to the limited functional requirements of the product. - Faulty products can cause injury lawsuits, so more focus required on Consumer Protection Act 1987.

For the location-aware app and associated bespoke hardware, its strengths clearly outweigh its disadvantages. STP's dedicated data protection team is well-equipped to manage the associated privacy concerns for this product area, given that many previous products have had similar concerns due to the tracking of user data. The presence of numerous competitors is also of less significance, given STP's status as a medium-sized, established brand with a significant budget and prior experience. Dental products are less feasible due to a lack of specialist knowledge in the field. Hiring these experts is an avoidable addition to the project cost. Mobility-assistive devices and washing machine related products have less potential for success, both due to saturated markets and not integrating well with our existing catalogue, which decreases the likelihood of these products succeeding with our previous customers. Considering these, it became apparent that the location-aware app and associated hardware project area was most appropriate.

2. Concepts

Table 2 shows the concepts generated by each member of the group.

Table 2: Concepts

Concept name	Description
Concept A: Smart sunglasses (by Aung)	The smart sunglasses have microphone, camera, and speaker. The features on the sunglasses can be controlled by voice-recognition. Location and visual data are used to provide augmented reality overlays, which can aid users with everyday activities and travelling. Data from location and camera are analysed by AI to give live audio-guide for the visually impaired to navigate. The camera and microphone can detect a medical or safety emergency and send alert and location to a nominated phone number.
Concept B: Location-aware language translation wearable (by Daniel)	This mobile product enables real-time, two-way translation. The hardware includes a microphone, earpiece speaker, external speaker, and location tracker. Location data is used to make the app aware of local languages, dialects, and accents in the area, and to provide context and knowledge of regional vocabulary. The app implements AI to complement this, with speech pattern recognition improving future use. The product is ideal for travellers, migrants and use in global organisations or governments.
Concept C: Tourism location aware app (by Vic)	The product is a software-integrated location-aware touchscreen device, ideal for tourists travelling to a new location. It shows popular landmarks, local tour guides, local events, restaurants, accommodation, and transportation, ranked by environmental impact. Another feature is an in-app currency for purchasing tickets. Local language selection and real-time location-precise weather are also available. A dedicated button on the device allows the transfer of location information to relevant emergency services.
Concept D: Path tracking AI device (by Abdullah)	The product is a small location tracking device, which pairs with an associated app to track location in real time. Using AI-integrated software, the app tracks location and reports sudden deviation from recognised usual paths to the user. The product is primarily aimed at young children and the elderly, who usually commute alone. The main selling point is that it is cheaper than Air Tag, its main competitor. Since it blends in with common accessories, it's less likely to be identified as a location tracking device, so in case of criminal activity it is less likely to be removed.
Concept E: Scavenger-hunt app (by Ein)	The product is an immersive scavenger hunt app and corresponding handheld portable gaming device. Within the app, clues and challenges can be tied to specific real-world locations, accessible to anyone within the vicinity. Multiple tasks must be completed, with clues and completion points able to be positioned in other geographical locations, including other countries requiring participants to collaborate. This encourages exploration and interaction between users from different countries. The product features machine learning models to automate appropriate placement and frequency of task points.
Concept F: Location-Based Fitness and Wellness App (by Kabeer)	The product is a fitness oriented smart watch with an associated app. It provides guidance based on the user's real-time location and environmental context. It offers personalized fitness plans based on the user's location, incorporating outdoor features for a dynamic workout. It also contains information on nearby restaurants/cafes with suitable dietary compatibility.

3. Concept Selection

For objective concept selection, it was necessary to specify the most important selection criteria. Complying with the budget is most important when deciding on the product, because companies fail due to lack of cash rather than lack of profit. Another important criterion is innovativeness and novelty, which allows our product to keep up with changing customer needs. The product must easily enter the market to ensure growing sales in the appropriate timeframe. There must be clear evidence of customer demand. There must be an ease of IP protection to prevent competitors from exploiting our IP. Other less significant criteria were also considered in the selection process. The concepts were assessed systematically through a weighted concept selection matrix, and this is summarised in Table 3.

Table 3: Concept Selection Matrix

Criteria	Weight	Concept A	Concept B	Concept C	Concept D	Concept E	Concept F
Innovation/Novelty	4	4	3	2	1	1	2
Specific Demographic	3	3	3	3	4	2	3
Ease of Market Entry	4	3	3	3	1	2	3
Political factors	1	2	3	3	2	3	4

Updateability	3	4	3	4	2	4	5
Market Expansion Potential	2	4	4	2	2	1	3
Budget Compliance	5	3	3	3	5	4	3
Ease of IP protection	4	3	3	1	1	1	2
Customer Demand	4	3	3	3	5	2	4
Economic climate adaptability	3	3	3	2	4	2	2
TOTAL		**107**	101	85	93	73	99

Concept A and B have high innovation as almost no other similar products exist. They target a relatively large variety of users and can easily enter the market. Additionally, their product designs are protectable with patents. Despite this, the products are more luxuries rather than necessities, which means they are less likely to excel in changing economic climates.

Concept C lacks innovation since successful location-aware apps to assist tourism already exist. Although there is a market of tourists and travelers, most users will prefer to just download apps onto their existing smartphones rather than buy this device. The software of our device can be frequently updated but there is limited potential for add-ons. Developing a touchscreen device will be expensive and the code inside cannot be protected as an intellectual property.

Concept D has very low novelty due to the existing AirTag by Apple, which increases difficulty of market entry. It is essential to a wide variety of users who may be vulnerable. Its high customer demand is robust against a changing economic climate. Its limited functions and basic hardware limit its ability to adapt the changing customer needs or to expand its market.

Concept E is not novel as many location-aware games already exist. The product only targets specific gaming and entertainment markets in which many successful competitors exist. Customers are less inclined to invest during recession since gaming is not a necessity. Additionally, the gaming program cannot be protected as intellectual property.

Concept F is somewhat innovative, but the targeted market of fitness enthusiasts is relatively small. Customers may stop using the product during a recession as the features are not a necessity. The IP protection for the software is limited.

As shown in the final row of Table 3, Concept A (Smart sunglasses) has the greatest total score of following the scoring process. Consequently, this concept was taken forward for further consideration by STP's product development team. Closely following this concept were Concepts B and F (Translation wearable and Fitness + wellness app respectively). Given the versatility of Concept A, it was kept in mind by the product development team that there remains potential to integrate some of the features of B and F into the smart sunglasses.