

BUSINESS DESCRIPTION

CASI is a wearable patch designed to (a) quantify the amount of stress in a person's periodic stress cycle, (b) advise them in managing and (c) provide measures to mitigate any serious covert ailment like a cardiac arrest.

Our product indubitably belongs to the healthcare sector. Given the sheer variety of businesses within the healthcare sector, we deduced that analysis of the entire sector would be rather ineffectual. Consequently, we analysed the **medical equipment industry** to comprehensively understand the market we were going to enter, in order to define our practices accordingly. We employed Porter's Five Forces model for the strategic analysis of the industry:

Threat of New Entrants: Low

Due to regulatory policies, research and development expenditure, and legal restrictions, barriers to entry in this industry are typically high. However, if CASI establishes a strong brand identity in the industry, the likelihood for the hospitals to choose other companies might be less.

Threat of Substitutes: Moderate

The strict guidelines of government agencies for substitute medical equipment products reduce the threat of substitutes that could pose a direct challenge to CASI and its future operations. Further, for viable substitutes that serve the same purpose, would have to face the same barriers of entry, which make the substitutes evolve at a gradual rate.

Bargaining Power of Buyers: Moderate

Buying power is becoming more consolidated with the emergence of more Group Purchasing Organisations(GPOs), and medical reimbursement policies are developing. On the other hand, certain medical health equipment, in the absence of substitutes, are indispensable.

Bargaining Power of Suppliers: Low

Suppliers to this industry include manufacturers from various sectors. Due to low customisation, the contract manufacturers do not have a lot of bargaining power. Further, since the switching costs are low, medical device companies deal with various suppliers to handle speed-to-market and cost pressure by closing plants requiring high fixed costs.

Competitive Rivalry: High

Litigation regarding patents, low switching cost of the hospitals, new reimbursement policies are some of the reasons due to which there is high rivalry among existing firms in the industry. Product recall can also cost a lot and competition can sometimes play in courts.

Based on this analysis, we concluded that while the industry has more future potential to grow, at present there is **high competition** between existing firms. Further, various companies from other industries within the health sector, including pharmaceuticals and

biotechnology, are entering the medical device market. In such a market condition, the success of our product relies on the fact that our product, whose consumer base is divided into two, has no direct substitutes. In that, most of the other products providing services similar to ours, do not have a **singular focus** on cardiac stress detection, with virtually none depending on the use of sweat as the indicators, which bestows uniqueness and, relative accuracy of our product, making it significantly **less expensive**.

*Our product's Unique Selling Proposition (Refer-Competitive Analysis) further discusses the features that distinguish us from other competitors in the industry.

MARKET ANALYSIS

Marketing Model

- Based on the afore-mentioned Porter's Analysis (Refer to Business Description) and the nature of our product, we found it suitable to use a combination of **commercial selling** and **licensing** of our product to other companies, in areas we are not well-versed with. This would facilitate the **scalability** of our product, due to the existing network of manufacturers and marketers, and provide appropriate shelf space. In order to prevent the internal strife for the sale of our product, we plan to clearly demarcate the regions where it would be sold commercially and where it would be licensed.
- We will adopt the **omni-channel** marketing. To meet the paradigm shift in the current market, we aim to operate online, along with the in-store approach. We will offer monthly subscription models.
- We plan to hire 5-7 individuals at the initial stage, as a part of a **Business Strategy Department**, who will be responsible for establishing deals with hospitals and other institutions, and help us to expand. This department will be responsible for finding the right distributor for our product, keeping in mind the market conditions and switching costs among the distributors.

Consumer Base

We can broadly divide our potential buyers into two categories, that is, our direct consumer or company client.

The α -CASI's will be for the direct consumers whereas the β -CASIs will be for the company clients.

Both the rim or the permanent attachment and temporary daily disposal patches would be different in each kind of set.

Set 1:(CASI-β)Hospitals and Research Facilities: Business to Business(B2B)

Along with the permanent attachment, β-CASIs will contain NASA's patented microfluidic tubules separation structure which will separate the two kinds of sweat(apocrine and eccrine). This set will have the ability to store sweat over a longer period of time; hospitals can use this to conduct further tests, like Cystic Fibrosis Sweat Test, etc. Since the collected sweat would be concentrated, it would aid in increasing the accuracy of these tests.

This set will, simultaneously, also execute the basic detection function that the product is designed to perform. The relatively higher cost, due to the intricate separation structure, would be more affordable for institutions, than for the general public. Thus, the additional separation feature is designed by keeping in mind the target consumer base.

Set 2: (CASI-α)General Public: Business to Customer services(B2C)

This set pairs a relatively less complex mechanism with the permanent attachment, as it only aims to perform the stress detection function based on a change in pH and density of the solution. As a result, it would be relatively cheaper, making it more affordable to, and accessible for, individuals more prone to high-stress levels.

Other Services

- We will also provide the facility for a healthcare service, so that any inconvenience faced by the customers, regarding the patch or the application, can be mitigated by our customer care services, which will remain operational 24X7.

COMPETITIVE ANALYSIS

UNIQUE SELLING PROPOSITION

Our product is differentiated from its competitors based on a multitude of features present in a user-friendly patch:

1. **First-Mover Advantage:** No other product currently combines the task of real-time stress analysis and collection of sweat for further testing functions at such a cheap price. It has a singular focus on stress-detection function and aims to preemptively detect cardiac arrest.
2. **Application Features:** The application, which would work in conjunction with the patch, would assess the user's normal body functioning, and accordingly set a threshold limit. Suggestions would appear as notifications, in case the stress levels cross this limit. For the subscribers of the app, a pack of 30 patches would be delivered monthly.
3. **User-Friendly:** As opposed to other hefty products providing similar services, our product is relatively comfortable and does not hinder basic movement and

functioning. It is easy to wear and does not require the help of experts for any kind of installment. One can easily keep track of, and read, the stress levels, as opposed to complex data, accessible only to physicians.

4. **Diverse Consumer Base:** We simultaneously target hospitals, research institutions, etc, while directly serving the general public. The features and price considerations of CASI- α and CASI- β have been designed by taking into account the targeted buyer.
5. **Affordable:** It is significantly less priced, as compared to other similar products in the industry, making it accessible to a wider public.

COMPETITOR ANALYSIS

This analysis was primarily conducted by understanding the product and business model of various competitors in the market. Some of the factors considered during this process include provisions of stress analysis, sweat storage, real-time cardiac detection/analysis, and ease of handling. Target consumer base and cost were also considered. The following are the products which provide services similar to CASI:

Neumitra Bandu

Product Description: It is a wearable patch that intermittently measures the autonomic nervous system to analyze and track stress levels.

Analysis: Priced at a staggering \$1,500, while Neumitra monitors stress levels, it does not detect the possibility of cardiac arrest as it doesn't study the constitution of sweat. Further, sweat level can be affected by various demanding/startling tasks, as it works on skin conductance. It does not give the option of sweat storage for further testing. As a result, it does not function as a direct substitute for CASI.

Muse Headband

Product Description: It is a wearable headband that measures brain activity via ECG signals, which are converted into audio feedback.

Analysis: Approved as a wellness device rather than a medical one, it only provides real-time feedback on brain activity, heart rate and body movements, but does not aim at detecting the possibility of cardiac arrest. It also faces various technical issues, discussed in further sections. It does not function as a substitute for CASI.

Roger's Patch

Product Description: It is a wearable sweat sensor that analyses the stress hormone cortisol in the subject's sweat.

Analysis: Marketed primarily to assess the health condition of athletes, it does not detect the possible threat of cardiac arrest. It is highly-priced, and does not give the provision of analytical sharing of data to the users or their doctors.

*For a comprehensive analysis of similar products, refer to the competitive analysis table in the attachments.

COST

The following is the estimated **annual cost breakdown** for the **first year**:

1. **Manufacturing: \$106,900** : \$78,200(α)+\$28,700(β)
 - Material Cost*
 - CASI- α (Pack of 30): \$8.5 * 6800 units
 - CASI- β (Pack of 7) : \$22 * 700 units
 - Assembly and Packaging Cost: \$2
 - Manufacturer's Commission: about 8% of the manufacturing cost: **\$1(α), \$2(β)**
2. **Customer Acquisition Costs** **
 - Marketing Cost: **\$17,000**
 - Advertisement Cost: **\$23,000**
 - Per-user acquisition cost ~ \$50
3. **Other Operating Costs**
 - a. **Additional Operating Expenses**
 - Annual Salaries *** (Technical and Business Department): **\$48,000-\$60,000**
 - Non-capitalised Research and Development and Expansion: **\$10,000**
 - b. **Additional Cost of Goods Sold** (Annual Change in Percentage, based on industrial average)
 - Maintenance and Repair Costs: **5%**
 - Sales Promotion: 10%
 - Annual Tax Rate: **11.3%**
 - Annual Inflation Rate: **~2%**
4. **Miscellaneous Costs: \$20,000**

*1. For a comprehensive breakdown of material costs, refer to the table in attachments.

2. We would commission the production to a manufacturer, in order to outsource overhead manufacturing costs and direct labor cost. We would be aiming at Special Economic Zones(SEZ) to reduce transport and miscellaneous costs.

** Customer Acquisition Cost= (Marketing + Advertisement costs)/Customers acquired

***Salaries are based on the average annual income in India. That is, our skilled workers would be hired Indians, due to cheap labor costs.

Based on the industry averages (with special emphasis on our competitors), and thereby adjusting it according to factors like material cost, targeted consumer base, etc, we derived the annual total variable and total fixed costs. This yielded the final estimated annual total cost at **\$226,900** for the initial years.

REVENUE MODEL

OPERATIONAL ACTIVITIES

- I. **Commercial Selling:** Initially we'll keep a margin of 12% on the units that are sold by our distributors. CASI- α would be sold at **\$20**, and CASI- β would be sold at **\$52**.
- II. **Royalties:** An important element of our licensing agreement would be royalties on sale. To ensure a greater guarantee of compensation, we'll rely on sale-based royalties, rather than profit-based. Based on the industrial figures, we'll charge a royalty of 8% on the sales.

ADDITIONAL ACTIVITIES

- I. **Google AdMob:** This will be one of our main sources of income in the first year. Advertisements on our application will include the general pop-up ads as well as the promotional offers given by the companies. An average android app with 1000 live users generates revenue of around \$100-\$200 daily.

PROJECTED REVENUE AND OPERATING PROFITS

Projected revenues, over the years, grow from \$244,300 in the first year to \$803,000 in the fifth year, based on our *expansion* and the expected *growth of the industry* that ranges between 4% to 5% for the next few years. The **operating profit** (a) over the years will be as follows:

Year 1: \$17,400

Year 2: \$53,900

Year 3: \$162,000

Year 4: \$405,000

Year 5: \$613,000

Proposed team budget:

1. Airfare: 85,000 INR (\$1,214/ per person)
2. 4 nights stay in Holiday Inn, Titusville: 70,000 INR. (\$1,000)
3. Visa: 11,200 INR (\$160/per person)
4. Other Expenses: 30,000 INR (\$430/per person)

- a. Food
 - b. Insurance
 - c. Transport
 - d. Miscellaneous
5. Therefore, the total team budget (including chaperones) comes out to be around **827,200 INR (\$11,817)**.

Break-up:

$85,000 + 30,000 + 11,200 = 126,200 \text{ INR } (\$1,640)$

$1,26,200 \times 6 = 757,200 \text{ INR } (\$10,810)$

$7,57,200 + 70,000 = 827,200 \text{ INR } (\$11,817)$

** Prices in accordance with Indian standards.*

FUNDING SOURCES

The following are some sources for funding our product, in order of preference:

1. Fund of Funds for Startups (FFS)- Government of India

- An initiative under the Department of Promotion of Industry and Internal Trade (DPIIT), FFS would be the ideal source for funding.
- Under this programme, the startups are exempted from the income tax for three years under the section 80-IAC of the Income Act, 1961, and from taxation of a capital gain on the sale of shares.
- The startups even get repayment of up to 80% on filing an application for a patent.
- In the past, the scheme has evidently approved various startups related to healthcare technologies. We meet the eligibility criteria for the scheme.

2. Incubators/Accelerator

Our rationale for choosing such sources was the fact that in addition to funding, they provide support in terms of infrastructure and networking:

- Initially, incubators can provide a platform to work in conjunction with other startups, which can offer networking opportunities, along with other technical support.
- At a later stage, accelerators can help refine the business model, and provide access to customers of the established firms. Consequently, they might boost the likelihood of attracting investment further down the line.

3. Angel Investors

- Since angel investors look for personal opportunities, along with investments, most of them understand business and take a long-term view.
- Angel investing is a viable option as it poses much less risk than debt financing, whereby capital invested doesn't have to be returned.
- We would be providing investors with an equity stake at a fair valuation. Tentatively, a 10% stake in the company would be offered in exchange for \$200,000.

4. Crowdfunding- Healthcare events

- Crowdfunding, particularly at healthcare events, can serve as an additional source of revenue. Studies have revealed that more than 80% of the donations made in India are in the healthcare sector,
- Such an activity can also increase the credibility of our company in the market environment.

*While considering the option of pursuing investments from venture capital firms, we recognised a tradeoff between monetary gain and executive control. Given the inclination of VC firms towards high-risk/high-return profiles over other models, it would be difficult to secure their investments. This would render putting resources into pursuing them rather inefficient, and ultimately not worth the cost of additional board seats in their favor. Since the other listed sources could potentially provide similar funding with less caveats, we decided not to pursue VC firms for this purpose.

Funding for the trip to Kennedy Space Center, Florida, USA

The team will first look for corporate sponsors and travel grants, and any gaps or shortcomings in funding would be provided for by the members' families. In all possible cases, the team will not miss the opportunity to attend the innovation summit.

FUNDING EVALUATION

Given the existence of multiple independent stages in the process of obtaining funds, it was decided that our funding evaluation metric has to account for the effectivity of each step. This is exemplified in the RED evaluation process:

I. Initial Broadcast: REACH

A. *Metric*- Number of replies to each wave of funding proposals sent out.

- B. Low measures would signal potential missteps in two departments- source targeting and funding proposal design, with the latter being affected by either poor presentation/ design or undesirable financial prospects.
- C. A focus group, followed by a team-wide evaluation, determines the root cause of
- D. poor yield out of those stated above, which would be then addressed by a graphical redesign or a re-analysis of market conditions and funding sources.

II. Digital Interaction Retention: ENGAGEMENT

- A. *Metric*- Number of in-person meetings secured after digital interaction via email or calls.
- B. The inability to retain investors after digital interaction would signal either ineffective communication over the chosen medium or an inability to schedule meetings, the causes for which range from the non-availability of members to that of transport.
- C. Communication logs would be reviewed to determine prevalent sources of error. If no major lapses would be found, additional factors, such as member workloads or transport would be examined and appropriately addressed.

III. Final Sponsorships: DECISION

- A. *Metric*- Quality and number of positive responses obtained after meeting company representatives.
- B. Pitches are easier to analyze, given the direct presence of team members, and undesirable outcomes after this stage often boil down to an ineffective or unrehearsed verbal pitch or not being able to negotiate impromptu conditions.
- C. The sponsorship presentation would be reviewed, remade (when necessary), and rehearsed. Backup conditions would be prepared to present from our side when otherwise unexpected terms would be suggested by potential sponsors.