

Revolutionizing Neonatal Care: The Role of Embrace Innovations in Addressing Infant Mortality in Resource-Constrained Settings

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Abstract- This paper explores the innovative business model of Embrace Innovations, a social enterprise committed to tackling the critical issue of infant mortality in resource-constrained settings, especially in India. Founded with the mission of offering affordable and effective infant care solutions, Embrace has developed the Embrace Infant Warmer as a cost-effective alternative to traditional incubators. In analysing the operational strategies, market dynamics, and impact of Embrace's products on neonatal health outcomes, the study uses a mixed-method approach through applying qualitative and quantitative research methods. Conducting in-depth interviews and surveys with relevant stakeholders which lead to important discoveries about how Embrace was able to effectively penetrate these markets through its unique value proposition: affordability, portability, and user-friendliness. The paper discusses the challenges of the organization, such as high maintenance costs and regulatory compliance issues. Ultimately, this research would highlight the potential for Embrace Innovations to transform infant healthcare through continuous innovation and strategic partnerships, thereby contributing significantly to reducing infant mortality rates globally.

Index Terms- Embrace Innovations, infant mortality, business model, healthcare solutions, mixed-methods research, neonatal care, social entrepreneurship.

I. INTRODUCTION

Embrace was formed with a motive in serving the needy people in areas where latest technology warmers were not present and one of the most affected countries was India, as it entered in market, with proper strategy and quantified measures made itself a formidable business unit generating handsome revenue.



Figure 1: Baby Warmer

The company was co-founded by Ashish Pattnaik where he worked on mortality rate of infants and how to reduce it with latest research and innovation. The machine was warmer, where infants received adequate heat to survive and an environment where they can nurture themselves. A story started with an initiative from protecting the infants to run a successful business across the world and writing a success story.

II. LITERATURE REVIEW

1. Overview of Embrace Innovations

Founded in a mission to address an alarming cause of infant mortality worldwide and primarily in India, it found Embrace Innovations which became a company that addressed low-cost alternatives to using an incubator to provide warmth essential for the vulnerable infants. Different research studies have shown such innovations effective in improving neonatal health results in low-income environments.

2. Qualitative Input from Stakeholders

Research by Pattnaik and colleagues in 2023 highlights qualitative data obtained through interviews with providers and users of the Embrace Infant Warmer. This was found to be

pertinent in highlighting how the user-friendliness and portability of the product enhance its adoption in rural healthcare settings. Notably, stakeholders pointed out the fact that the warmer allows skin-to-skin contact essential for breastfeeding and infant bonding.

3. Industry Context

The Indian infant healthcare market is expected to grow up to \$2.5 billion by 2025 with drivers like urbanization, a rising population, and increased awareness in health care. According to NASSCOM's report of 2017, the social enterprises like Embrace play a vital role in this growth curve as they bring in disruptive innovations for the underserved population. The study reflects on the competitive landscape within which Embrace operates and discusses opportunities and challenges to scale its impact across various regions.

4. Implementation Challenges

Embrace faces various operational challenges such as high maintenance costs and regulatory compliance issues. A qualitative analysis conducted by Standard (2024) elaborates on how such challenges may limit the scaling of innovative healthcare solutions in India. Logistical challenges, including transport and electricity supply, still pose considerable barriers to deeper penetration in the market.

5. Comparison with Traditional Solutions

Comparative studies have revealed that although traditional incubators are effective, their high cost and complicated use make them not accessible in rural areas. According to research, Embrace has managed to reduce the cost of the incubator while at the same time simplifying its use for the healthcare worker with little training.

Many health organizations and institutions have acknowledged Embrace's innovative approach. The case studies reveal how Embrace Infant Warmer has become the only tool that has been responsible for saving lives and showing the efficiency of such equipment, in qualitative outcomes reported by health workers. Embracing social responsibility and partnering with NGOs boosts the credibility and influence of Embrace within the industry.

6. Future Directions

Long-term follow-up studies must be conducted in order to check long-term health outcomes in infants for using Embrace products. Cultural adaptations to the design of products are another area, which may enhance the user acceptance rate in various regional areas.

Through these areas of focus, Embrace will be able to perfect its business model along with retaining its mission statement: saving the lives of babies everywhere(Incubators / Accelerators Driving Growth of Indian Start-up Ecosystem - 2017 | nasscom, 2017)

III. RESEARCH METHODOLOGY

Type: Descriptive and exploratory research.

Approach: Mixed-methods (qualitative and quantitative) to provide a comprehensive analysis.

Data Collection Methods:

Primary Data

Interviews: Conducted in-depth interviews with stakeholders, e.g., manufacturers, distributors, and policymakers to understand operational and strategic factors.

Field Observations: Studied the use of Embrace products in rural and urban healthcare centres.

Secondary Data

Literature Review: Conducted a review of literature studies, reports, and case studies on infant healthcare devices and Embrace's business model.

Market Reports: Used industry reports to examine market trends and competition.

Sampling Method: Purposive sampling for qualitative data and stratified random sampling for quantitative data.

Sample Size: Determined by the scope of the study and geographical coverage.

Data Analysis Techniques

Quantitative Data: Used statistical tools in analysing both survey results and sales data.

Qualitative Data: Conducted thematic analysis of interview transcripts and field notes to reveal patterns or insights.

IV. EMBRACE BUSINESS MODEL

The launch year in India was 2011 with a prototype and later we worked on the warmer and revised prices on given years have been mentioned below.

Table 1: Warmer Price YOY

Year	Price
2011	200
2014	300
2015	300
2018	400
2021	500
2024	650
2027	700
2030	750
Price in Dollars	\$\$\$\$\$

(A portable warmer comes to the rescue of premature babies - BusinessToday2013)

V. WORLD WIDE SALES YEAR WISE

We worked on prices of each unit from growing demand. Even after rise we maintained our market reach. As compared with other players, we were still cheap with quality service and after sales service. This can be concluded by above line graph.

Table 2: Worldwide Sales

Year	Sales
2011	70000
2015	200000
2020	400000
2024	700000
2027	1300000
2030	1800000



Figure 2: Worldwide Sales Chart

Above sales represents management and mission achievement. A well-versed business model and meeting consumer demands with optimum cost and hi-tech technology which includes Warm Pak, a time bound material with a melting point of 98F. A time bound material gives off latent heat at a constant temperature when transitioning between liquid to solid and vice-versa.

After being heated by Acetimeter for 30 minutes, the Warmer maintains 98F for up to 8 hours straight. Easy to use as it can be reheated repeatedly and placed in baby-wrap.

Market Size and Growth

Indian infant healthcare market is projected to reach astonishing \$2.5 billion by 2025, with given factors such as a growing population, increasing industrialization and rising urbanisation. The market for incubators, a critical component of neonatal care, is expected to grow significantly, particularly

in rural areas with lower access. Embrace aim is to reach 1000000 or 1 million by sales at the end. (Home, 2023)

Embrace's Unique Solution

Our plan is to offer bio-degradable material to the existing warmer. Along with material, we will offer customisation to the consumers.

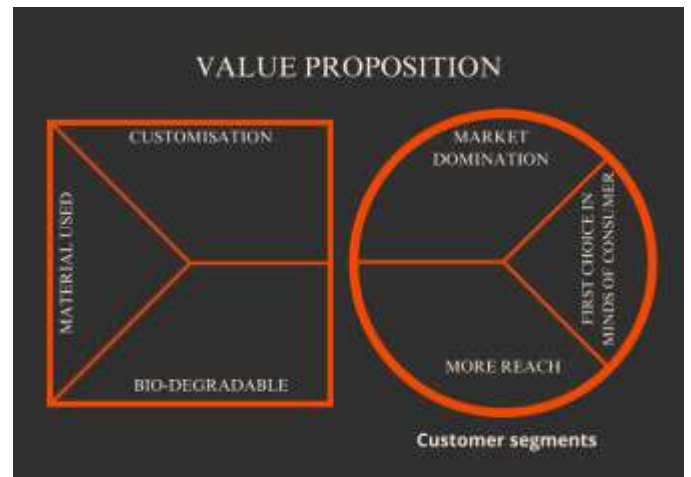


Figure 3: Unique Value Proposition

Material: Organic cotton, organic cotton is bio-degradable and sensitive for skin of babies. It will further lessen our raw material costs, will bring in sustainability and provide different colours and styles to consumers, as promised customisation. (Value Proposition - Definition, Importance, How to Create, 2023)

Embrace Outsourcing the Product

Product- Warmer can be outsourced with the given business model. A wide range of services more can be added, like wireless charging, Automatic time setting etc.

Strategy- The part which can be outsourced is electric transmitter which looks after the heat and optimum temperature for the baby inside.

Costs Incurred- Warmer being cheapest, company can invest in importing parts for better customisation and quality product for the consumers.

End Service to Consumers- They need to aware the consumers regarding latest technology developments, and how the warmer will be more advanced and meeting even small demands.



Figure 4: Outsourcing Plan

Future Scope of Study

- **Cost Versus Benefit:** Conduct comparative studies based on price competitiveness of the Embrace solutions compared to other alternative solutions within different markets.
- **Impact Analysis:** Carry out longitudinal studies on infant health outcomes with Embrace products.
- **Cultural and Regional Adaptation:** Examine the influence of customization options like colours, designs, etc, on acceptance in different regions.
- **Scalability Challenges:** Analyse the operational challenges that arise while scaling up globally, including logistics and compliance.
- **Customer Feedback:** Assess user experience and satisfaction to help guide product development.

VI. CONCLUSION

Embrace presents a competitive solution to crucial healthcare challenge, offers unique combination of innovation, affordability, and accessibility. Company's dedication to social responsibility is evident in its collaboration with NGOs, participation in CSR initiatives, and efforts to address infant mortality rates in rural areas and villages where basic amenities are scarce is imminent. The potential to transform the landscape of infant care through strategic partnerships, continuous developments, and a customer-centric approach, enables company to well-positioned itself and make long lasting image in the minds of customers worldwide and beyond. (Drama, disruption and daring to look ahead - IBM Blog, 2022)

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