Innovation Management in a Digital Age

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➢ Topic Idea

This assessment will brief discuss about the Innovation idea taken into consideration and technology enabling it and worked upon with 3 different personas in healthcare industry with potential JTBD. Also, at the end would work deeply through journey map and assumption made for the best possible solutions.

➢ Detail about the Industry and project assessment.

I would be doing this assignment using secondary research in the healthcare industry specifically into medical equipment new innovation technology for cancer detection.

- My topic: Early Breast Cancer detection in the women
- Target customer:
  1) Brest feeding women (married who has a child)
  2) Married or unmarried women above age of 50 years.
  3) Women who are working in radiotherapy centres or nuclear plants who are more exposed to radiation.
- Problem faced by customer: Not able to detect the breast cancer in early stage.
- Innovation Product: Wearable Bra or Breast strap.

➢ Introduction

In the US, Europe, and Asia, breast cancer affects more women than any other type of cancer. Although the number of breast cancer deaths has steadied over time, it is still the second most common cancer among all women and the most common among Hispanic women. Women 50 years of age or older are the ones most likely to develop breast cancer. Even if a woman is unaware of any other risk factors, she may still develop breast cancer. Breast cancerous cells typically develop a tumor that is frequently detectable via mammography, ultrasound, or physical palpation as a lump. Men can also develop breast cancer, but women are more likely to do so. Other body regions can also host the growth of breast cancer cells after they have spread. This process of cancer cells spreading is known as metastasis. Thus, this device will be more likely to help women show any abnormality in the body cells near their breasts to identify any heat level, texture, or colour of the mammary tissue, which is then analysed by specialized algorithms to understand breast cancer.

Primary Research

This assessment is about a new innovation idea in the healthcare industry to research and invent a wearable breast cancer-detection bra or bra strip for women and transwomen under different categories. This is a disruptive innovation because it employs a painless, non-invasive process based on regular ultrasound monitoring. This technology emits ultrasonic waves, similar to those used in high-intensity focused ultrasound and moderately intense pulsed ultrasound, to do echography scans for possibly malignant cells. This is in contrast to current cancer-detection equipment, which employs radiation. Piezoelectric sensors, which are pieces of equipment that run on energy produced when force is applied to a piezoelectric substance, are used to generate the ultrasonic waves. This technology enables us to miniaturize the smart bra's detecting mechanism, making it almost unnoticeable and easy to wear. In order for the user to make a scheduled visit with a specialist, the system will notify her if it discovers a suspicious mass of cells.

This innovation is offered under smart clothing technology (a medical device) and may result in a totally novel method of cancer prevention. It might also be a better option than traditional therapies, which are expensive and have serious side effects that have a big influence on patients' quality of life. This gadget has the potential to do more than only identify cancer because it uses a periodic scan pattern to look for lumps or cancerous cells in and around women's breasts rather than emitting practically continuous, low-dose ultrasound waves in a regulated manner to trigger apoptosis in the cancerous mass.

I have chosen this innovative approach because, after more than 629,000 new cases were diagnosed in the year 2021, breast cancer continued to be the most prevalent type of cancer among women in the USA, Europe, and some parts of Asia. According to the World Health Organization (WHO), only around half of women in this country survive for over five years after being diagnosed, with late detection being a significant contributing factor.

To enable daily condition monitoring, the Smart Bra will initially be offered to women who have previously received a cancer diagnosis. The target market will thereafter be widened to include females with a genetic propensity for cancer. All ladies will eventually receive marketing for the smart bra. It is hoped to alter the breast cancer screening procedure and create a more relaxing, easy, routine, and at-home screening option. Additionally, reoccurring breast cancers could be identified using this technique and treated early, increasing the likelihood of a favourable outcome.

After the product is introduced in the market, we can conduct further research under (sustaining) incremental innovation, so that we can do modular transformation that would happen gradually over time. Additionally, it would enable the product's and its market's progressive development over time if proper feedback or a positive response were obtained from customers.

Customer Questionnaire form

- **How often will women use the medical bra and breast strip?**
  - Daily basis
  - few days in a week.
  - few weeks in the month
- **Whether women will monitor the health record data, periodically track the same, and communicate with the health expert or doctor or not?**
  - Yes, on a periodic basis.
  - Yes, some time
  - No, it will not track
- **How convenient is it for women in terms of using the wearable bra or breast strip?**
  - Yes, it is highly comfortable.
  - No, I can't use it for a long time.
  - Maybe; it depends on the weather, time, and place of usage.
- **How reliable is the product in terms of cost, durability, and storage?**
  - It's expensive, durable, and easy to store.
  - It's not very expensive, not that durable, and not easy to store.
  - Its price is average, but durability and storage depend on the situation.
- **Are you satisfied with customer service or not?**
  - Yes; fully satisfied
  - No; not yet satisfied
  - Average rating (neither satisfied nor unsatisfied)
- **How easy is the product to use and connect to external devices like mobile apps or smart watches?**
  - Not so easy to connect, but can be connected using the guidance manual.
  - It requires external guidance to support or connect
  - It is very easy to connect and get connected to devices quickly; no external effort is required.
- **Weather product was helpful in the detection of abnormalities in any form before 1st breast cancer and after progressive cancer was identified?**
  - Yes, it could help me diagnose cancer at an early stage before the cells progress.
  - The product was not at all reliable.
  - I'm not sure, and I have not yet found any final outcome; I'm still using it periodically or sometimes.
- **How often do you want to replace your regular bra with this medical smart bra that helps you in the early stages of cancer detection?**
  - Yes, mostly I want to replace it with a regular bra.
  - No, I don't at all want to be replaced.
  - I'm not sure I am ok with using both bras often interchangeably.

Secondary Research

Under this innovative model, different researchers are working on a bra that might be able to detect cancer. Thanks to the cutting-edge technology that has helped me to inspire. Thus, I have found my customer personas based on the information published by WHO over many years about which categories of women are more likely to develop breast cancer. Thus, I have chosen married women, older women above 50 years of age, and women who are exposed to more radiation on a daily basis in their work culture.

After reading for many years about people and breast cancer stories in and around different women, this has created a necessity for me to analyse and identify what can be done to help the women in different aspects to prevent or early detection of breast cancer so that they can live their lives fully at a better livelihood.

It has happened to me to go through the interview with Martina Adorni and see how she has gone through painful times during and after her pregnancy, when she was diagnosed with stage two breast cancer. She explained her pain and the various extreme precautions she took during the breast-feeding stage to prevent her baby from passing such a disease heridatorically. Whereas Radhika Thakkar, a second persona, was a famous nuclear scientist who worked across many public and private institutions to help build better nuclear-based technologies in electricity production and the medical field. Every time there was a risk of being diagnosed with cancer, as she was exposed to radioactive substances, despite the proper precautions used for prevention before working in research labs, later she was diagnosed with stage one breast cancer as a hard lump node was detected around her breast. On the other side, global research and WHO data provide that women over 50 years of age are more susceptible to various diseases as their immune systems weaken, especially breast cancer, if they have a previous medical condition or a family history of such diseases, or if exceptional circumstances are provided.

As I thought about this innovative idea, I also noticed that there are various institutes and university students who are working on it, but till now no one has made it perfectly to release their product in the market as no further progress could be made in this technology. The famous company named Spark Grants is from CCS and its partners, the Canadian Institutes of Health Research and Brain Canada, Dr. Kemisola Bolarinwa in Africa, and Icosa Med. These are three competitors who are working intensively in various countries to research and develop this innovative idea into practice. Some of them have put this innovation on hold due to a shortage of funds, which may be due to their failure to obtain permission from the respective authorities in their respective countries.

Customer Personas

Name: Martina Adorni

Title: Housewife & Brest feeding women (Married)

Attitudes and background

- Martina Adorni is a married woman who has a child of 1 year.
- She is a housewife who breastfeeds her infant daughter.
- She is a non-working woman and just takes care of her kids and house.

JTBD:

- Safety in breast-feeding: if the mother has undetected abnormal cell growth, there might be chances to pass on this hereditary trait to her children.
- Every time wearing a cancer detector bra or breast strap to detect any abnormality around the breast after pregnancy or after the birth of a new baby.

What she says: After marriage, when women are in the breast-feeding stage, they have to take a lot of precautions if they have any abnormalities in their bodies with respect to cancer cells. Cancer is a slow-killing disease; it grows silently; sometimes people don't even know until it reaches the 3rd stage; thus, it will be riskier to pass on such an abnormal condition to her new-born child.

Name: Radhika Thakkar

Title: Nuclear Safety Specialist at the NEA

Attitudes and background

- She is a well-known nuclear specialist who is exposed to nuclear-active radiation every time she works in a nuclear power plant.
- She is a non-married 35-year-old working woman.

JTBD:

- Able to wear a bra comfortably every time, unlike a regular bra, especially while exposed to reactive plants in the nuclear testing center.
- A person who is more exposed to radioactive substances has more chances of abnormal cell growth causing cancer. This bra would act as an alternative to keeping track of the health of the breast, unlike smart watches.

What she says: As a nuclear scientist, she is more exposed to cancer-causing substances. So, she has to be more careful, do her regular breast check, and use a breast strip or cancer detector bra, even despite using safe equipment in the workplace.

Name: Julia Bradbury

Title: TV presenter above age of 51 years

Attitudes and background

- She is a married 51-year-old working woman.
- She is a famous TV presenter, and her age is above 51 years. She works for famous US and Canadian TV channels.

JTBD:

- Women are more likely to develop breast cancer after the age of 50. As the immune system becomes weak, abnormal activity and an unhealthy lifestyle cause rapid sickness in old age.
- Maintain better breast health so that older women are not more likely to develop breast cancer.

What she says: After the age of 50, more than 48% of women are likely to have a chance of developing breast cancer. Early detection would help old women live a longer, healthier life. Therefore, regular usage of a cancer detector bra on a daily basis and regular breast check-ups would keep women safe in old age.

Customer Journey map

Foothold Customer

Name: Martina Adorni

Title: Housewife and Brest feeding women (Married)

Why did you choose "Martina" as foothold Customer?

Martina Adorni is a married woman, and she is in the breast-feeding stage. As per the secondary research information, those women who are in the breast-feeding stage or lactating a new-born baby have a higher chance of infecting the baby if the mother has suppressive breast cancer undetectable at an early stage. Therefore, breastfeeding women have to be more careful after a pregnancy of almost 2.5 years.

	Step – 1	Step – 2	Step – 3	Step – 4	Step – 5	Step – 6	Step - 7
STEPS	After pregnancy, meeting with a doctor, taking advice on breast feeding, and keeping track of abnormalities in the breast	Buying a cancer-detectable bra or bra strip from a doctor, cancer institute, or company-specific outlet	Getting trained about its usage and knowledge of wearing and maintaining it.	Using a bra on a daily basis and wearing it comfortably even during breast-feeding time	Keeping track of its health record generated via a mobile or remote device & communicating the same to the doctor	Post-service of the bra or bra strip, as it is medical equipment from the service center.	Issue in regularly cleaning, maintaining, and disposing of it.
Pain Points or Challenges	1) Challenges in taking the appointment with doctors. 2) On a daily basis, maintaining the good health of the breast and keeping track of abnormalities in the breast	Cancer-detection bras are not easily available everywhere; they are specifically sold by company outlets, my cancer institute, or hospitals.	As it is a medical device, it requires little technical knowledge for its usage.	Size issues may be a concern, and as it is an electronic device, it is not advisable to wear it every time, even at night.	As it is a medical device, it functions exactly like a smart watch. We need to see that it is always connected to a gadget like a mobile, which is really a headache.	Due to malfunctions or regular maintenance, we need to visit the service center (SC) or make an appointment for a home visit if traveling to SC is not possible.	As it is, medical equipment seems to be quite expensive, so it would be difficult to buy again. There might also be complexity in cleaning it daily.

JOB TO BE DONE

- ✓ When women are in the breast-feeding stage with their new-born baby for 1.5 years, there are chances that if the mother has unidentified breast cancer, there might be chances that she may pass on that virus or cell causing cancer to her baby.
- ✓ As doing cancer tests every time is not possible as it could be a lengthy and expensive process, a breast cancer-detectable bra or breast strip can be helpful in helping breast-feeding women keep themselves safe and help them identify any abnormalities as per the record provided by medical equipment. This is more suggestive for those women who have a past medical history of any illness.

POTENTIAL SOLUTIONS

1. Wearing a cancer-detection bra on a regular basis for at least 1.5 years, especially during breast feeding, would help JTBD. Women might utilize the product to safely inspect their breasts frequently from the convenience of their homes.
2. A breast strip (sticked to a breast) has minute biosensors that could potentially help identify the heat level, texture, and colour of the mammary tissue, which is then analysed by specialized algorithms to understand breast cancer.
3. During any stage of abnormality noticed in the connected device, like a mobile or other gadget, further suggestions from a doctor or further analysis via MRI or body scan can be done to determine whether any abnormality exists or not.

Business Solution Chosen

- Exchange and replacement facilities are available within 25 days of purchase.
- Different sizes of bras and different patterns are available on the market for more comfortability.
- Online order options are also available with different payment methods.
- A technician's home visit and multiple service centres are available if any problem arises, with an 8-year warranty and a 6-year free service provided.
- Easy mobile apps and special smart watches are available in combo or in isolation in order to connect to the cancer bracelet detector device easily.

ASSUMPTIONS	UNCERTAINITY	IMPORTANCE
The cancer-detection bra (called Smart Bra) or breast strip will be convenient and easy to use for all the users of the product.	Medium	Low
Pregnant or breast-feeding women will mandatorily use the device on a daily basis so as to protect their new-born child.	High	High
A periodic track of health data is maintained, monitored, and systemically communicated to doctors on a periodic basis upon exception for health issues.	Medium	Low

Business Model Chosen

- ✓ The business model will include continued innovation in the product in terms of size and comfortability so that all women of all ages can use it on a daily basis.
- ✓ Special modifications are made based on the request or requirement of women with any abnormality or transwomen.
- ✓ making it easier to wear and use it and more reliable in connecting to mobile devices and other smart watches so that medical data can be provided on a continuous basis.

	TEST – 1	TEST - 2
Hypothesis	More than 98% of pregnant or breast-feeding women will use the medical bra periodic basis.	More than 80% of women will see the benefit of using this device (Smart Bra) especially pregnant women.
Experiment	A survey was conducted for 1000 women to know whether they wear or use it on a daily basis or not. Even while traveling.	The total number of sales by supplier will help to know the number of bras used by women in different categories.
Target Metric	At least 680 women should use it on a daily basis out of total Target metric.	70% of the total product sold by the manufacturer out of the total 100% production.
Actual Results	Based on the survey conducted for doctors and the radiology institute to know whether there is early detection & fall in breast cancer MRI tests & CTS scans for the breast-feeding women.	Fall in the total number of breast cancer patient's data provided by state or country breast cancer institutes and research institutes.
Decision	Final decision based on the outcome of the survey conducted. If the target metric is met, we can go ahead with further research and investment in the project.	Final decision based on the final data provided by the Cancer Institute about the fall in the number of breast cancer patients.

Note that breast-feeding bras are of a different pattern than regular bras; they have a separate section created for feeding milk to babies.

Change Management Approach

Under the change management approach, we wanted to create urgency for a healthcare product for the customer, especially pregnant women and women who had a past medical history, because with the growing percentage of breast cancer across the globe, people are more health conscious to spend in terms of better health than other expenditures. Therefore, I wanted to bring about a change in the lives of people by offering a more relaxing, easy, routine, and at-home screening option rather than going to a lab for expensive testing periodically. In order to form a powerful coalition, the research team decided to form a partnership with an external ancillary support team and bring in a better leader to guide the team forward to the innovation approach; thus, emotion, commitment, and team building would play crucial roles in the change coalition towards the new innovation of this product.

During this process of innovation, the vision for change was kept in mind, the product was developed, values were identified, strategies were created, and the future and goals of the organization and customer were kept in mind. Often called "vision and mission statements," they are important to developing the best customer-driven healthcare product. Also, at all points in time, the vision and mission were communicated to all the employees who were working towards developing innovation; they were deeply embedded in everyone's mind as the ethics, policies, and guiding principles of the organization's mission and vision to create products on an ethical side.

Working towards removing obstacles was quite challenging and curtailed the scenario. The senior management took the initiative to quickly remove barriers, identify people causing issues, and also make sure that the company’s structure is in accordance with vision, job detail, performance, and compensation systems. Multiple short-term goals were made rather than just one long-term one. No important targets were given; those are expense-causing in nature. Targets were also deeply analysed after considering their advantages and disadvantages, and people working towards product development were fairly rewarded.

Kotter theory was mostly based on the best change management approach, which most organizations adopt. At all points in time, the change management was continuously monitored and implemented periodically. New ideas were implemented along with changes in corporate culture policy. Along with rapid implementation of policies within the work culture.

When all the above steps are identified, systematically adopted, and implemented, organizations will feel systemic growth and success in introducing new innovative products to the market.

➢ Conclusion

My innovation is product-based innovation under the disruptive innovation method. It requires huge investment and various stages of research. Also, after a product is introduced, it has to be kept sustaining, so incremental or sustaining innovation would be carried out. Also, I feel my innovation and product are unique, would play a crucial role in influencing the lives of various cancer patients, and would bring new change to the healthcare industry. The foundation of this cutting-edge technology is the distinction between breast tumours and healthy breast tissue. The wearer's daily activities may be monitored by the smart bra, which could also measure differences and look for minor tumours. As opposed to breast cancer screening in a medical lab, doing it at home would be more comfortable, convenient, simple, and regular. Thus, this product could be the best profit-generating business opportunity while also impacting the livelihood of millions of cancer patients.

➢ Level of uncertainty in Innovation

There is a high level of uncertainty involved in this innovative project. Also, at the same time, it requires a huge amount of funding at the innovative stage. Unfortunately, if any assumption happened to be uncertain and any hypothesis test failed, there might be a huge amount of loss. Also, the customer survey form is going to play a very major role in determining the assumptions. Thus, the criticality of the test for each assumption is very crucial, which may lead to a high level of uncertainty in the innovative model. It is also very important to understand the exact requirements of the target customer along with their individual expectations at a large level. Also, as it is a medical product, obtaining the license, various approvals, and a human trial would require a lot of permission from various authorities.

Competitor may also cause an issue in this business model and may eat up our customer base if this new innovative model happens to be brought to the public before our product is launched.

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