AELIOS TECHNOLOGY

Optimizing Energy, Saving Lives

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Executive Summary

Electricity is the backbone for efficient functioning of the healthcare system across the globe. Electrical issues within the system can lead to degradation in quality of healthcare, inaccessible healthcare to patients and even loss of lives. Hospitals in rural India are crippled by erratic and shortage of power from the grid, thereby, leading to massive dependence on power backup supplies like battery inverter systems and diesel generators (DGs).

Aelios Technology is a start up with the vision of transforming the electricity infrastructure in the health care sector in India through their Intelligent Plug for Devices, IPlugD (pronounced as 'I Plugged'). Our product, IPlugD, helps hospitals extend the duration of services from power backup supplies by redirecting at least 30% power from the non-critical devices to the critical ones. This is enabled by wireless and autonomous switching-off of the unimportant devices or 'non-critical' devices. Such an extension would enable hospitals to attend to more patients as well as perform essential surgeries even during power outages without altering the existing infrastructure of backup supplies.

The target market is the healthcare enterprise in India, which comprises both the public and private sector. In the public sector, we focus on the low tier hospitals, where, at the bottom we have a health Sub Center (150,000) for a group of villages, above which there is the Primary Health Center (28,000) at the district sub division level and the Community Health Center (5,000) at the district level. The private sector hospitals, both for-profit as well as charitable ones will be our beachhead market. The addressable revenue from this market is estimated to be about $ 50 million.

The business model is comprised of revenue by direct sale of a basic and a premium version of IPlugD as well as an annual service fee. Aelios Technology is exploring partnerships with Original Equipment Manufacturers (OEMs) of power backup supplies to integrate IPlugD with their frontline products for the healthcare market.

Our potential competitors are focused on the Smart Home market and are not equipped to serve the healthcare sector. Ours is the only wireless technology, which prioritizes the critical devices and *can function even without internet*. We enjoy the first mover advantage in the healthcare market. The main risks associated with the business are changes in government regulations as well as massive upgradation in the electrical infrastructure in rural India.

We have completed a 'proof-of-concept' analysis of the IPlugD by rigorous testing under controlled laboratory conditions at the Department of Electrical Engineering, University of Minnesota. Following this analysis, we have performed a field and feasibility test of IPlugD at the 'Nirmiti Skin and Laser Centre' in Sangli, Maharashtra, India in January 2018. By incorporating the lessons learnt from the January test, the next pilot project of Aelios Technology, is to perform a full-scale test of IPlugD at two hospitals in Sangli and one in Satara, Maharashtra, India. The test is to be undertaken in Summer of 2018. The pilot will enable us to evaluate the actual impact of our technology not just in terms of number of hours of extension of services from power backup supplies but also in terms of number of additional patients attended, increase in earnings for the hospitals and the number of surgeries enabled that would otherwise have been hampered due to deficient backups. We also intend to better understand the customer, which will help us evolve our product in terms of user experience as well as develop a feasible pricing strategy.

Background

Conventionally, the health system infrastructure has focused on the availability of physical spaces, essential equipment and skilled personnel for delivery of healthcare services [1]. According to a World Health Organization (WHO) study [2], the availability of electricity is imperative for the functioning of a health facility and is an important factor for effective delivery of essential health services. For instance, vaccine storage and night time deliveries are all dependent on the availability of reliable power. Moreover, another recent publication by the WHO and the World Bank maintains that besides improving the direct functionality of health facilities, access to electricity is equally instrumental in attracting and retaining skilled health workers, especially in rural areas [2].

Often in rural India, the electricity supply for health care facilities is erratic as well as scarce. A survey of doctors and health care administrators in Sangli, Maharashtra by our team reported unavailability of power from the grid every Tuesday, apart from other unscheduled cuts during the week. Chattisgarh, a coal surplus state in Central India, has on an average about 20 hours of electricity availability in a day for its Primary Health Centers (PHC) [3]. These power cuts often happen during 9 am to 4 pm, the peak operating time for the health care facilities [3]. Moreover, there are unscheduled power cuts during the evening hours, crippling the delivery of healthcare services during off peak hours. According to Indian Public Healthcare System(IPHS) guidelines [4], all public health care facilities should provide services 24x7, but, the infrastructural issues are barring it from doing so.

Due to the shortage and erratic nature of power supply from the grid, the health care facilities are forced to rely on their power backup supplies like battery inverter systems and diesel generators. The duration of services from these backup supplies is limited and can last for a few hours. A healthcare facility with no power from the grid and exhausted backup supplies is doomed, the consequences of which are faced by the patients. For example, the doctors surveyed by our team in Sangli, do not perform a surgery on Tuesday, causing massive inconvenience to patients as well as loss of revenue and customers for the hospitals.

Problem

Within this overarching problem of poor electricity infrastructure for healthcare facilities in rural India, we address a more specific issue:

Given the limited power backup resources, how should the healthcare facilities optimize their power consumption in order to maximize the duration of services from backup supplies.

Value Proposition

Our product, IPlugD, enables hospitals to extend the services from backup supplies during power outages by directing power from the non-critical devices to the critical ones. It directs additional power to the critical devices by turning off the non-critical devices.

According to a study by the Bureau of Energy Efficiency, Government of India, around 30% of power is used in lights, fans etc [5]. Our technology would direct the power from such devices to the essential devices.

IPlugD alleviates the key customer's pain of inability to attend to the patients due to scarcity of power, thus increasing social and economic value of the customer. Moreover, IPlugD provides the customer with flexibility in choosing the set of critical devices, enabling doctors to make informed decisions and plans during power outages. It seamlessly retrofits into the existing

infrastructure in a hospital, comes with a user-friendly software interface and is a scalable technology as the hospital grows in size.

Product Description

IPlugD enables extension of services from backup supplies by switching off the non-critical devices autonomously using a local WiFi network. It is an interface between the backup supply and the devices (Figure 1). Each device is connected to one IPlugD, which connects it to the backup supply. The doctor/healthcare administrator provides a list of critical and non-critical devices, where in Figure 1, the patient monitoring system is the critical one while the light is the non-critical one. When available power from the backup supply starts diminishing, the IPlugDs communicate amongst each other using an ad hoc WiFi network and switch off the non-critical devices as shown in Figure 1(b). It is important to note that, IPlugD requires only a local area network to function and is not dependent on internet. Here is a list of additional features of IPlugD:

1. IPlugDs come with a user-friendly software interface, which enables the user to rank the set of connected devices in a preferred order of priority. Furthermore, the software interface also provides information on the time to exhaustion of the backup supply based on the chosen order of priority of devices.
2. IPlugD is compatible with any type of backup supply; battery inverter system, diesel generator or solar based.
3. IPlugDs are equipped with state of the art sensors, which enable them to 'learn' power profile of devices, usage patterns, provide energy consumption analytics as well as intelligent recommendations to the customers.

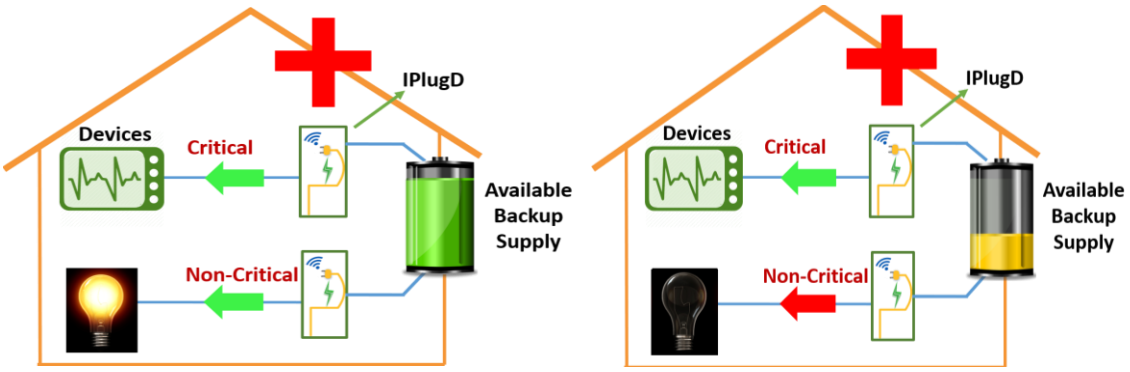

Figure 1: *IPlugD is seen in action with the hospital running on power backup supply. The critical device is the patient monitoring system, and the light is the non-critical device as specified by the health administrator. Both the critical and non-critical device are ON in (a) when the available power from the backup supply is sufficient, while only the critical device is ON in (b), when the power availability from the backup has reduced significantly.*

Sangli Sojourn: Field Tests and Customer Interaction

A lab scale prototype was developed and tested in the Department of Electrical Engineering, University of Minnesota. After successful 'proof-of-concept' testing under controlled laboratory conditions, we decided to test the workability of IPlugD in medical facilities in India. This was done to investigate and understand the possible changes needed to adapt the technology to (i) assimilate with medical equipment in India, (ii) test the ease with which the device can adapt to

the electrical settings in India, (iii) secure a field and feasibility testing for the plug as well as (iv) interact with healthcare professionals in India who would be the end customer for our product. The endeavor also provided an opportunity for us to learn about the needs on the ground and thereby, adapt our product (both in terms of cost as well as features) to meet the needs.

In November 2017, our team initiated contact with medical professionals in India in order to secure a testing site for a field test of IPlugD. We received favorable response from a private clinic named 'Nirmiti Skin and Laser Centre', located in Sangli, Maharashtra India, run by Dr. Mayuri Patil. She is a cosmetologist by training and runs an Out-Patient Department (OPD), where she consults about 50-100 patients a day.

The operating room (OR) of the hospital was chosen to perform the field and feasibility testing, with a battery supply already installed and connected to all of the available devices in the OR. For the experiment, three devices in the OR were chosen and assigned an order of priority. The devices chosen were (1) Cauterizing Machine (2) Suction Pump (3) Heating Lamp, as shown in Figure 2 with power ratings at 225W, 761W and 160W respectively. For the first experiment, devices (1) and (3) were connected to respective IPlugDs and assigned priorities, where (1) was given a higher priority than (3). Following this, the mains supply was temporarily disconnected and the supply from the battery backups was enabled.

In the absence of an IPlugD, as the available supply would have dwindled to below 385W (which is the minimum requirement for devices (1) and (3) to run at full capacity) both would have been forced to run on a diminished capacity. This would most certainly affect the performance of the devices as well as simultaneously reduced the operating time of both the devices. However, when equipped with the IPlugDs (as the capacity dropped below 385W) the low priority device (3) was automatically and wirelessly switched off to allow for the functioning of device (1) at full capacity and for a longer duration.

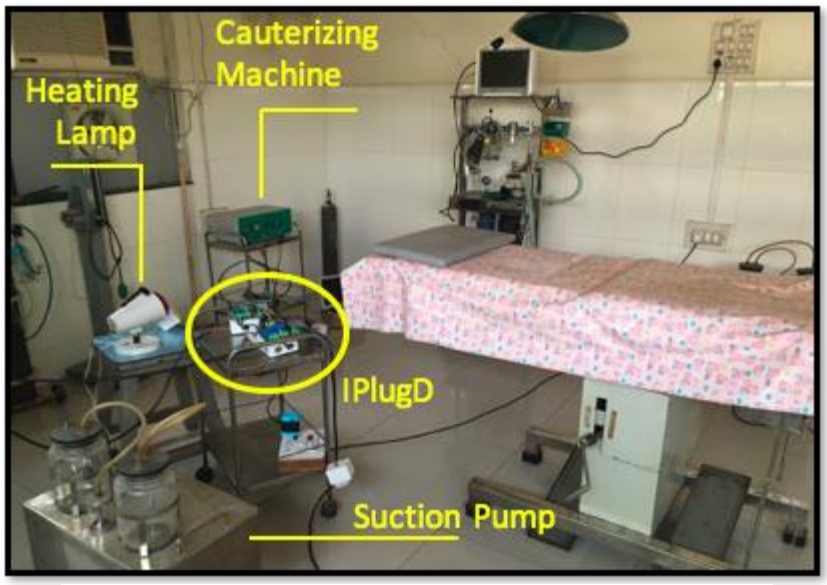

Figure 2. IplugD setup at Sangli, Maharashtra, India.

We successfully repeated the experiment for a second time by operating devices (2) and (3), with (2) being assigned a higher priority than (3). This has allowed us to converge upon a design for a minimum viable product that is ready to be deployed in the Indian market. Furthermore, the field experiments in Sangli have enabled us to reach to a TRL (Technology Readiness Level) 6.

Based on the experiment and subsequent feedback from Dr. Mayuri, a few key points to be noted are as follows:

1. During the experiment, there was a loss of internet connectivity for about 8 hours during the day. However, this did not affect the nature or the outcome of the experiment. The team realized that is a crucial for our solution to function without internet.
2. There is a need for a user interface that can easily connect with the IPlugDs deployed in the facility.

Following the field testing at the 'Nirmiti Skin and Laser Centre', the team performed an initial customer survey by interacting with 10 doctors who own and operate their private clinics in and around Sangli, Maharashtra, India. Following summarizes the discussion on various relevant topics with the doctors.

1. Problem of electricity scarcity faced by regional hospitals

The amount of scarcity varies with the time of the year, typically increasing during the summer time. In the summer months, we face power cuts for 6-8 hrs every Tuesday and 3-4 hours of power cuts for 2-3 days/week (excluding Tuesday). In winter, the number drops to 4-5 hrs every Tuesday and 2-3 hours of power cuts for 1-2 days/week (excluding Tuesday)

2. Cost of using backup supplies, including maintenance and repair

In general, the batteries and diesel generators (DG's) are the preferred sources of backup supplies. For an average 20 bed private hospital, batteries require a onetime investment of about $500 while DG require a onetime investment of about $1167. Maintenance and repair happens once every 6 months on average, costing about $83 each.

3. Major impact of power shortage in hospitals

Due to large scale and scheduled power cuts on Tuesdays, we do not schedule any surgical procedures on Tuesdays. Apart from Tuesdays, the unscheduled power cuts affect us about 2-3 times a month. We deal with those by turning our backup supplies on even if the electricity from the grid is available, just to ensure a power cut does not hit during the middle of an ongoing surgery. If long duration power cuts happen at night, OPD services are affected where we are able to consult patients only till the backups last (for e.g. batteries typically last for 2.5 hours).

4. Any existing solutions to deal with diminishing battery power

If we see that the battery or DG will not survive in case of a long-term power cut, we have to manually turn off the unnecessary loads and keep ensuring that it remains off.

5. Fatalities in the past year due to power outage

Thankfully, there was no such incidence. Currently we do not schedule critical surgeries at all on Tuesdays, which prevents such events. But we do have to transfer 2-3 critical patients every month to a larger public hospital as a precautionary measure, where the backup availability is better.

6. IPlugD - as a solution

Any device that can help us get more time for operating medical equipment from existing backup supplies would be a great addition. In addition, a well quantified estimate of the time to exhaustion of the backup supply based on the chosen list of priority would be extremely beneficial for planning and decision making during power outages. Also, since important medical equipment is connected through the IPlugD, it should not impede the functioning of the

equipment. Moreover, we do not want a new employee just to operate this new technology. It should be user friendly, such that any doctor/ health administrator can be easily trained to use it.

7. Capacity to invest

Based on our discussion, doctors believe that larger hospitals with higher capacity to treat patients would be more willing to invest. As a rough estimate, any hospitals with monthly electricity bills of about $417 and above would be willing to do a onetime investment of about $167 in the IPlugDs. For an average 20 bed hospital, monthly electricity bill is about $250 and initial investment of about $83 is feasible.

There were numerous main takeaways from the customer interactions, that the team either has or intends to incorporate into the product:

1. Customers would like to have easy hassle-free interaction with IPlugDs
2. Customers would like to know, in real time, the duration of services left from the back up supply for a chosen order of priority
3. There should be fail-safe options in place to tackle instances when the IPlugD device malfunctioned and cannot perform accordingly, when connected to critical loads

Market Analysis

Our target market is the healthcare market in India, the organizational structure is as shown in Figure 3. and comprises both the public and private sector. In the public sector, we are targeting the low tier hospitals in the rural areas. At the bottom we have the health Sub Center(SC), which caters to about 5000 people and has the capability of only doing deliveries with some basic medical tests. There are about 150,000 SCs in India. At the district sub division level, we have the Primary Health Center(PHC), the first referral unit for the SCs. A PHC addresses to the needs of about 20,000 people and is a 5-10 bedded hospital with outpatient, inpatient as well as emergency services. At a district level, Community Health Center(CHC) is the advanced healthcare facility, which is a 20-30 bed hospital and catering to about 100,000 people. The data presented is obtained from a Government of India website [4]. The private sector, comprising of both for-profit as well as charitable health care facilities, is our beachhead market. These facilities are of varying sizes ranging from a small specialty clinic to large multi-specialty hospitals. There are more than 20,000 such facilities spread across the country [5]. The annual growth rate of the healthcare facilities is about 10% in India. The net addressable revenue from the healthcare market is $50 million.

Business Model

Aelios Technology will offer two versions of the product, a basic version, named IPlugD and a premium version IPlugD^{+}. The price of IPlugD is $20 per unit while that of IPlugD^{+} is $30 per unit. The distinguishing feature between the basic and premium version is the accompanying software, whereas in the premium version, the accompanying software comes with the following benefits:

- Device level energy analytics access
- Intelligent recommendations for critical and non-critical devices
- Time to exhaustion of the backup supply

There will be an annual service charge from our customers, which will vary based on the size of the hospital. On an average the annual service fee would be $25 per customer and will provide the following facilities in return:

- Fault prediction of the IPlugDs
- On site replacement
- Software upgrades

We are also exploring business partnerships with power backup OEMs for integration of our technology with their frontline products in the healthcare market. Our team is also in discussion with vendors and distributors in Mumbai for outsourcing production, assembly, testing and distribution. The key risks associated with our business plan include changes in government regulation which do not permit use of devices like IPlugD in hospitals and massive upgradation in electricity infrastructure that eliminates the need of backup supplies. Going forward in future, after our third year, we intend to enter the residential market for enabling transformation of existing homes into smart ones.

Go-To Market Strategy

Our point of entry into the market is through the private sector. The health administrators and doctors will be the agents of trust in the technology and will help Aelios Technology build a credibility in the healthcare market. In our first year, we will focus in the state of Maharashtra. By year 3, we would like to spread ourselves in the region around Delhi as well as in Andhra Pradesh. After our 5th year, we would also like to enter the western region of India. At the end of year 5, we would have strategically spread ourselves in the states where about 50% of the healthcare facilities in the country are concentrated, as shown by the green region in Figure 4.

Figure 4. Go-To Market strategy

Competition

We face competition from an American company Bert, a British company Smart Home Energy and an Indian company Oakter. All our competitors are focused in the Smart Home market. Our technology is the only one which prioritizes critical devices and can function even without internet. As seen in the Table *II* in Appendix, our technology outperforms our potential competitors in the relevant metrics of interest and is priced competitively. Moreover, we enjoy the first mover advantage in the healthcare market in India.

Financial Projections

The financial analysis is based on the assumption of five IPlugDs for an SC, 15 for a PHC, 45 for CHC and 30 for a private clinic. This enables us to target segments of hospitals based on their sizes of operation. In year one of commercial operations, we are conservative in our approach and targeting only 10% of the healthcare facilities in Maharashtra. By year 5, we plan to capture 70% of the market of the state of Maharashtra, entire Delhi, 55% market in Andhra Pradesh, 25% market in Uttar Pradesh, 15% market in Rajasthan and 5% market in Gujarat. We are assuming that CHCs and private hospitals would be more interested in IPlugD^{+}, while smaller hospitals like SC and PHC would be interested in basic IplugD.

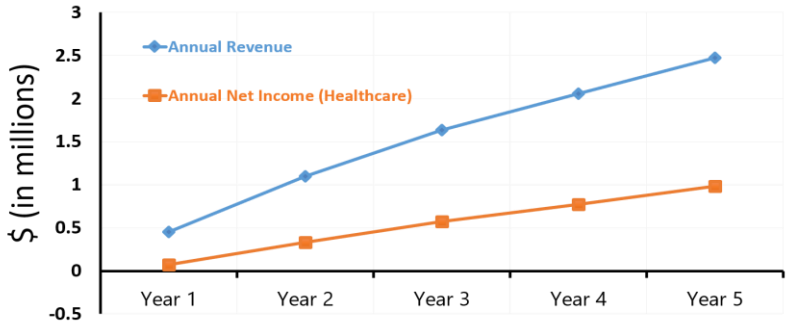

Figure 5. Aelios Technology Financial projections for five years

The cost of materials, staff salaries, inventory costs etc are assumed based on consultation with vendors in Mumbai. A detailed financial projection for 5 years based on the above-mentioned assumptions is provided in Table *III* in the Appendix, a summary of which is shown in Figure 5. By the end of year 5, Aelios Technology will be a business with an annual revenue of $2.5 million, with an annual profit of about a $1 million.

Social and Economic Impact

Our solution has significant potential to bolster the capacity of hospitals to provide extended healthcare to patients in need. We judged the efficacy of our product based on the impact of increasing the medical services by one more hour, while being powered by backup supplies. Table *I.* summarizes the average number of patients, doctors of varying specialization attend in an hour. The impact is measured by (1) additional number of patients that can be consulted by extending services by one hour and (2) additional income gain to the hospital/ doctor. Based on the customer interactions, extending services by one hour enables doctors to consult an additional 10 patients. Moreover, it adds an income of $33 per hour back to the customer.

No.	**Name of physician**	**Specialization**	**Avg. no. of patients consulted/ hr**	**Net income gain to customer/hr (USD)**
1	Dr. Mohan Patil	Dermatology	12	50
2	Dr. Rohan Patil	Dermatology	12	50
3	Dr. Sunita Patil	General Practitioner	6	15
4	Dr. Mamta Parmar	Dental Consultation	6	10
5	Dr. Mamta Parmar	Dental Surgery	1	16.66
6	Dr. Dinesh Bhaban	General Practitioner	20	33.33
7	Dr. Neeraj Bhaban	Plastic Surgery	5	25
8	Dr. Mayuri Patil	Cosmetology	10	41.66
9	Dr. Rohit Khot	Gynecology	12	40
10	Dr. Swati Khot	Pediatrician	15	50

Table I. Socio-economic impact of doctors

Under a conservative assumption of extending medical services by 30 minutes every day, our IPlugDs add about 15 hours of additional service time monthly, amounting to 150 more patients that can be consulted every month. In a village or small town where there are limited medical facilities, enabling 150 more patient consultations per month is a significant improvement. Note that this improvement has come without any added infrastructure investment such as adding more battery or DG supplies or changing the wiring of the building. Even if one of these 150 extra consultations (that would likely not have happened in the absence of IPlugDs) leads to a lifesaving diagnosis, the impact is immeasurable. Customer interactions with surgeons informed us that if a power cut happens in the middle of a critical surgery, an extension enabled by our plugs could lead to a successful completion of surgery. Such an event is essentially one life saved, the value and impact of which is incalculable.

For the customer, it is more than likely that a positive word of mouth would benefit his/her clinic, in terms of increased consultations. Moreover, for an average 20 bed private hospital, an initial investment of 20 IPlugDs can be recovered in just under 4 months based on the extra revenue generated. So, it can be safely said that one summer term is enough to recover the costs of investment in IPlugDs.

The Path Ahead: Proposed Pilot, Timelines and Future Plans

Pilot: Our MVP test in Sangli during January 2018, was showcased to doctors and healthcare administrators from various private hospitals in Sangli with the objective of generating interest for a full-scale system test. In February 2018, the team communicated with three private clinics and obtained permission to perform a full-scale system test in the following facilities in Sangli and Satara:

1. Nirmiti Skin and Laser Centre (Sangil)
2. Khot Hospital and Maternity Clinic (Sangli)
3. Dr. Patil Skin, Laser and Dental Centre (Satara)

The pilot would involve installation of about 30-40 IPlugDs in each of the above facilities and would allow the doctors/ healthcare administrators to rank the connected devices in order of priority through our user interface. The following are the key measurable outcomes that we are mainly interested in:

1. Additional hours of service enabled by IplugDs during summer months (May-Aug).
2. How many additional patients received healthcare due to IPlugD?
3. What is the added economic value to the hospital due to IPlugD?
4. What level of customization is needed from one facility to the next?
5. How much is a hospital facility willing to spend on IPlugD?

This pilot will help us validate the following set of assumptions:

1. Coverage of the entire facility through the wireless network of IPlugDs
2. Direct about 30% additional power toward critical devices
3. Enables more people to receive healthcare services
4. Return on Investment analysis
5. User friendliness of our user interface to set priorities and monitor the connected devices

Budget: Table *IV* in Appendix summarizes the estimated budget for the pilot project. The estimated budget for the pilot is $7400.

Apart from the above three facilities for a pilot project, we will do an extensive customer evaluation to better understand the pains and gains of our customer. We will also use this pilot as

a platform to market our technology in the state of Maharashtra. This pilot project, if successful, will help build credibility for Aelios Technology and will be our first step in entering the healthcare market. Our planned timeline for the upcoming months is presented in the Appendix.

Funding: The MVP testing was done with the support of ARPA-E (NODES). Presently, the team is actively seeking funding opportunities through venture competitions. We have plans to apply for the NSF iCorp program later this year. During the pilot phase, we will get in touch with startup investors in India. We are also open to business investors in the US and would be pitching to them after our pilot ends. The successful completion of the proposed pilot is very important for Aelios Technology to draw in investments into the business plan.

Aelios Technology as a venture aligns directly with the individual career goals of our team members with regards to developing technology and businesses with social impact for the energy market. Mr. Bhaban and Mr. Talukdar, who plan on graduating this year with PhD in Electrical and Mechanical Engineering respectively, will lead the venture after graduation.

TEAM

Mr. Sourav Patel is a PhD student in Electrical Engineering at the UMN since Fall 2016. He specializes in power electronics and control. He has three years work experience as a Field Engineer at NTPC Ltd., India.

Mr. Saurav Talukdar is a PhD candidate in Mechanical Engineering, UMN since Fall 2013. He is a visiting research student with LANL, USA and specializes in machine learning and control. He obtained his BS degree from IIT Bombay.

Mr. Shreyas Bhaban is a PhD candidate in Electrical Engineering, UMN since Fall 2012. He is 2017-18 recipient of the Doctoral Dissertation Fellowship at UMN. He is an expert in Controls and has in-depth understanding of healthcare market

Mr. Atul Fotedar is a MBA student at Carlson School, UMN since Fall 2017. He is responsible for the Business Development and Operations. Prior to business school, he was the operations manager for Asia Pacific at Whirlpool Corporation.

The team is a finalist in the 2018 National Level DOE Cleantech University Prize contest and the first runner up in the DOE Cleantech University Prize contest for the Midwest region (21 applications from 12 universities).

Appendix

Acknowledgement

Prof. Murti V. Salapaka
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Prof. Carla Pavone
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University of Minnesota

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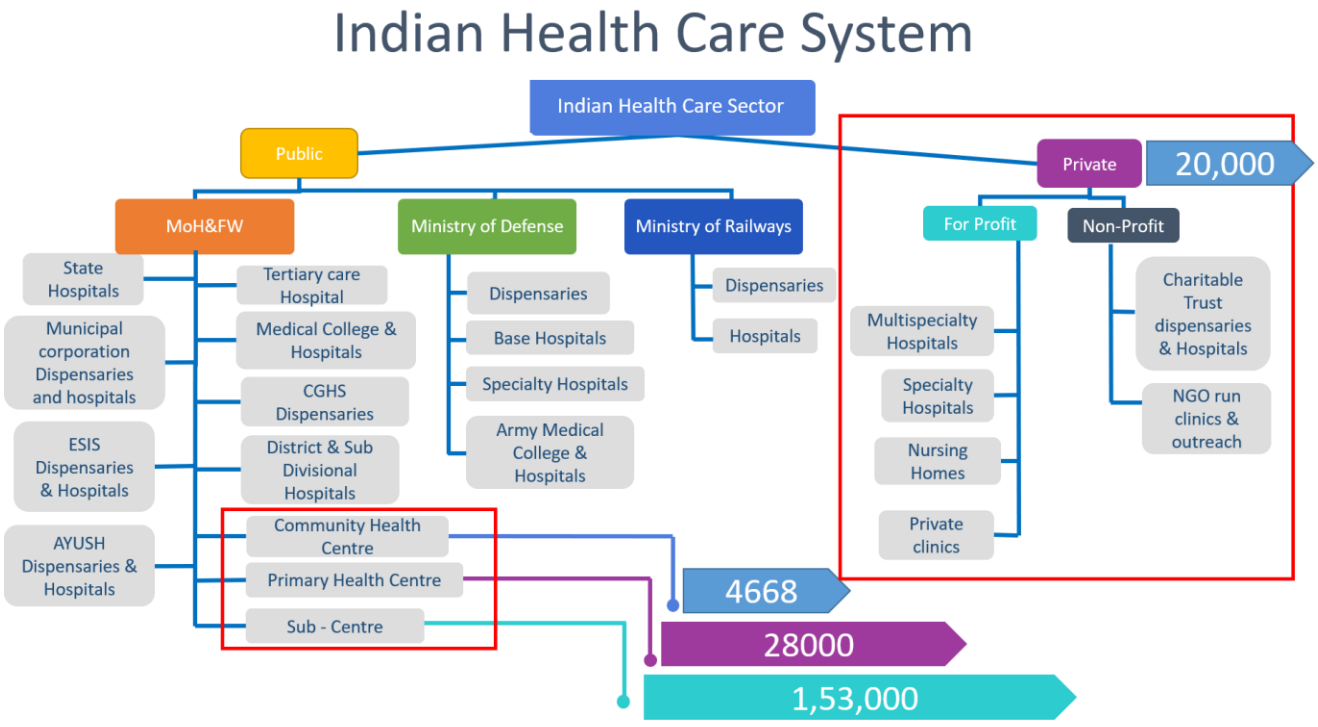

Figure 3. Industry analysis of Indian Healthcare Sector.[6]

Table II. Comparative analysis of competitors

Features	Bert	SMART HOME ENERGY	Oakter SMART HOME	AELIOS TECHNOLOGY
Retro-fit	✓	✗	✓	✓
Functions without internet	✗	✗	✗	✓
Integrates generation data	✗	✓	✗	✓
Optimize for Power scarcity	✗	✗	✗	✓
Intelligent Recommendations	✗	✗	✗	✓
Target Market in Healthcare center	✗	✗	✗	✓
Unit Price	$60	$60	$30	$20-30

Table III. Financial Projection for five years

	Dollar Figures				
	Yr 1	Yr 2	Yr 3	Yr4	Yr5
Revenue	16390	37652	52580	61944	67082
Sales	452,610	1,098,575	1,634,561	2,055,706	2,472,144
Licensing					
Total Revenue	**452,610**	**1,098,575**	**1,634,561**	**2,055,706**	**2,472,144**
Expenses					
Cost of Goods Sold					
Materials	73,918	178,301	261,443	308,705	351,027
Labor	40,000	137,500	211,750	254,100	300,000
Licensing	20,000	0	0	0	0
Other	9,014	20,708	28,919	32,520	35,218
	142,932	**336,509**	**502,112**	**595,325**	**686,245**
Gross Profit	309,678	762,066	1,132,449	1,460,381	1,785,899
Gross margin	*68%*	*69%*	*69%*	*71%*	*72%*
Operating Expenses					
General & Administrative					
Salaries	145,000	253,000	326,700	422,955	503,730
Selling & Marketing	50,000	60,000	70,000	70,000	70,000
Office / Rent	30,000	90,000	120,000	150,000	180,000
Professional Fees	0	0	0	0	0
Other G&A	0	0	0	0	0
	225,000	403,000	516,700	642,955	753,730
Research & Development	10,000	26,400	43,560	45,000	49,500
Total operating expenses	377,932	765,909	1,062,372	1,283,280	1,489,475
Net Income Estimate (excl. deprec	74,678	332,666	572,189	772,426	982,669
NI growth rate	*0%*	*345%*	*72%*	*35%*	*27%*

Table IV. Budget estimate for pilot project

Description	Numbers	Amount (in $)
Travel to India and return	2	2500
IPlugD	100	1500
Electrician	1	600
Software Intern	1	400
Electronics Lab Access Fee	1	500
Rent	2	400
Living Expenses	2	400
Local Travel	1	500
Other expenses	2	600
Total		**7400**

Business Timeline

Jan

- MVP tested in Sangli
- Initial customer study done

Feb

- Three hospitals identified for pilot project in summer
- Design modification initiated
- Finalist in the national level DOE Cleantech UP

Mar

- User interface design begins
- Understanding the pilot facility in terms of electrical loads initiated
- Develop impact assessment approach

Apr

- 100 IPlugDs procured, developed and tested for pilot
- Hire intern, electrician
- Contact local college for access to Electronics Lab

May

- Two team members travel to Sangli
- Pilot starts
- Initiate contact with vendors, distributors and investors in India

Jun

- Explore the legal aspects for starting a business
- Data analysis
- Initiate contact with new customers
- Team returns to Minneapolis

Jul

- Pilot plants monitored through the intern
- Impact assessment of IPlugD
- Pilot ends

Aug

- Compile a report on the pilot project
- Final product design iteration
- Identify potential business investor

Sep

- Establish contracts with vendors and distributors
- Approach new customers in private sector for orders
- Product design finalized

Oct

- Large scale production plan in place
- Talent acquisition initiated

AELIOS TECHNOLOGY

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