Surgitrack

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Surgitrack is a device that goes in operating rooms to track and display analytics for wasted equipment during surgeries, providing hospitals with much needed data to cut down on unnecessary spending.

Surgitrack currently has a total available market of 100,000 operation rooms in the United States alone, in an estimated 6,000 different hospitals across the country. There is also possibility for multiple Surgitrack items in each surgical room, determined by the demand seen from the 250,000 registered surgical nurses, as well as global expansion of the product to countries with a large number of hospitals, such as China.
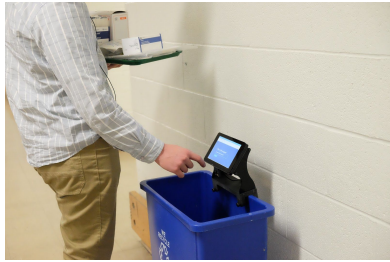
In the product development process, we spoke with surgeons, nurses, and acquisition managers at University of California, San Francisco, one of the largest hospitals in California. These customer segments were able to share with us the pain points they experience through the surgery process itself, giving us insight into functions our product could incorporate to simplify their lives. Specifically, they stated a need for a solution to assist them in cutting down waste during surgery to save operating costs.

The early adopters we are targeting are surgical nurses at large hospitals that have the capital to test new technology. Many large academic hospital departments in California, including UCSF, have an innovation department that looks to implement new technologies into the hospital structure. Because these hospitals have over 50+ surgery rooms, it is a good place for us to see if our product is well fit for their needs. If this adoption within a single state proves to be successful, we will have the support of large, respected hospitals as references for new customers.

Currently, Surgitrack is estimated to cost $600.00 through purchasing directly from the company. Surgitrack is being sold through direct sales because of the infrastructure set-up of the analytics page that is unique to each hospital, and this will allow a reduction in price since this method avoids dealing with wholesalers. This number is derived from our cost of goods being approximately $130.00, which is due to the expensive prototyping equipment used in the original build of the product. As the product moves to mass manufacturing, the cost of goods is likely to decrease significantly, increasing the profit margin of the product.

How It Works

Surgitrack is a hospital waste analytics device that is installed into the waste bin in operation rooms. The product itself is a touch-screen display module that is capable of connecting onto the internet, inside an enclosure that can be modified to attach to any wastebin. The display displays the accompanying web, which allows nurses to select specific surgeons and surgeries before scanning in the items that are wasted in that surgery. The scanning process involves holding the item in front of the built-in camera and pressing a button on the web application when ready. The end screen provides a summary of the unused items and their dollar value, as well as how the value compares to previous surgeries of the same type. This web-app is also available on any other platform to view analytics and review progress, all stored on a hospital-specific server to protect privacy. A visual walkthrough of the product usage can be found below:

1. After a surgery, bring waste over to waste basket and start up device. Select appropriate surgery/surgeon	2. Scan items in through capturing an image of the label before the item is thrown in the waste basket. Watch the item list update as scans are processed.	3. Review analytics of scanned items for the surgery on device immediately, or on any internet-connected platform afterwards

Target Market

Our target market are nurses who work in operating rooms at hospitals. The devices themselves would be stored in operating rooms, and nurses will be the ones to interact with the devices after each surgery, as shown above. The analytics will be available to anyone with a valid hospital login, allowing the data to be available to both the surgeons themselves as well as hospital administrators that are concerned about costs in the hospital. The target market of surgical nurses actually approached the team with its pain points, allowing the team to hear firsthand what the user though were problems in the existing system. The team was also able to visit nurses and surgeons at the University of California, San Francisco Medical Center, where the pain points were observed in person. A combination of information learned from speaking with the nurses, as well as details noted by the team during the visit, allowed for the creation of a suitable list of functions on the product that would address the pain points of the user.

Market Analysis

A thorough analysis was conducted to analyze the size of the market Surgitrack can impact. The first conclusion was that technology that contains the same functionality as Surgitrack does not exist at a large scale in any hospital system worldwide. This means that we would be able to present high-impact novel technology without immediately having to deal with competitors or to remove existing products. After speaking with nurses and surgeons in various hospitals in the United States, it can also be concluded that wasted surgical supplies is a pain point seen in every one of them, and not just a pain point exclusive to large hospitals or academic hospitals.

An initial calculation shows a total of of 100,000 operating rooms the United States, is one of the ten countries with the largest number of hospitals. The other nine are China, India, Vietnam, Nigeria, Russia, Japan, Egypt, Brazil, and South Korea. Assuming a total of approximately 200,000 hospitals worldwide, with a conservative estimate of 2 operating rooms per hospital, that leaves at least 400,000 operating rooms worldwide that can be positively impacted by Surgitrack. With the increase standard of living, the need for operating rooms is constantly increasing to meet the needs of the population. Based on this analysis, there is no fear that Surgitrack would run out of customers at any point, giving us confidence that Surgitrack has a valid and growing total available market.

Early Adopters

Given the large total available market, we need to pinpoint a group that will be the first to adopt our technology. Based on our analysis of the different types of personnel and hospitals in the country, it can be concluded that the most suitable early adopters of Surgitrack are surgical nurses that work in operating rooms in large hospitals in the United States. These surgical nurses tend to work in hospitals that have larger budgets for new equipment testing, which will be necessary since despite Surgitrack's large return on investment, it is still not a "cheap" product. Additionally, many of these establishments are academic hospitals that have deep connections with innovation and new technology development, so they would be the most open to trying out new equipment in their own hospital rooms.

This group has been selected as early adopters for Surgitrack because their need for tracking spending in hospital rooms has risen to the top of their priority list, as stated to the team by nurses at UCSF. Because of the status of these hospitals as large healthcare and research organizations, they want to be able to find the solution to properly stocking medical carts, data for which can be generated by Surgitrack. Additionally, hospitals of this caliber have the manpower and budget to focus on solutions to large medical problems, such as surgical waste, unlike smaller hospitals in the country who tend to be understaffed.

Current Costs

The current cost of the prototyping process amounts to a total of ~$48,000, spent throughout the last three months. The large majority of the cost is due to personnel costs and workspace costs, with a marginal amount of money spent on the prototyping process due to use of cheaper materials. An exact breakdown of the costs is shown below:

- **Electronic Materials Total: $192**
    - Raspberry Pi 3: $40
    - Raspberry Pi Display: $72
    - Raspberry Pi Camera: $40 x 2 = $80

- **Mechanical Materials Total: $51**
    - M2 Screw Kit: $15
    - Acrylic Sheets: $8 x 2 = $16
    - UPrint Material: $12
    - TangoBlack/VeroBlack: $8

- **Personnel Costs Total: $45,000**
    - $45,000 annually (for 15 Hrs/Week)
    - $11,250 for 3 months of work
    - $11,250 x 4 members = $45,000

- **Workspace Cost Total: $2500**
    - 1000 sq ft @ 2.50/sq ft = $2500

- **IT Cost Total: $135**
    - Internet: 3 month @ $40/month = $120
    - Web Service: 3 month @ $5/month = $15

    Total Cost: $47,743 for 4 people in 3 months of operation

This initial cost will grow as Surgitrack scales in production, but with our early revenue stream, we will hit profit by the third year. The calculation of this can be found in our five year profit model, shown below. A detailed Bill of Materials can be found below as well.

Surgitrack stands to be a good investment because of its large target market, as well as its profitability. Currently, the product is on track to become profitable within the next two years, with a net profit of almost $10 million in the first five years. This number is achieved with only hitting 20% of the target market, which is attainable through adoption by hospitals on the west coast alone.. This large profit margin is due to the low cost of creating the device, and the high cost it can sell for because of the money it can save by producing analytics. Using the device can help save on average $650 per surgery, which means the device, currently priced at $600, pays for itself within one surgery.

The target market we are accounting for in initial calculations includes only US markets, though this device and technology have the ability to be spread globally. This item is very scalable since the target market, nurses in operating rooms, exist in every hospital in every country. One particularly large market that we plan to target next in China, since Chinese hospitals share the same problems with wasted goods, and because of this, much of the unused but contaminated surgical base materials get recycled back into everyday items, increasing the chance of contamination. With our device, hospitals can reduce cost and waste, and prevent unnecessary spread of diseases. China has approximately 70,000 hospitals, and about half of them have the capital to invest in new technology. These hospitals will be our introductory step into the Chinese/Asian markets.

Our first access for funding will be through the National Institute of Health's Small Business Innovation Research (SBIR) grant, which can award up to $300,000 in the next two years. This initial funding will allow us to further develop our backend and analytics pages, as well as solidify our manufacturing process. In this time frame, we will also begin a pilot test with the University of California, San Francisco, having a few different operating rooms installed with our technology. This trial will help us monitor the usage of the devices, and speak with the nurses and surgeons on its impact on their daily workflow. Luckily, Surgitrack, as a medical device, does not need any FDA approval, so the development timeline is much shorter than average hospital equipment.

After this initial development and testing period with the SBIR grant is over, we will be look for Venture Capital and Angel funding through many VCs and Angels that focus on the healthcare community, leveraging our relationship with UCSF as proof of credibility with these investors. The goal is to raise a total of $3 million of seed funding within six months, and use that funding to start our expansion into hospitals on the west coast. This will take approximately another year or two, before we begin our Series A round, and the money will be used to focus on national expansion.

Surgitrack stands to be an unbeatable investment opportunity due to the innovative technology, as well as the product's scalability. Please contact us with any questions about our business model or about investment opportunities.

Surgitrack Hypothetical Profit Model

	Year 1	Year 2	Year 3	Year 4	Year 5
A. Sales Price		$600.00	$600.00	$600.00	$550.00
B. Number of Units Sold		500	2000	7500	15000
C. Net Sales [=AB]		$300,000.00	$1,200,000.00	$4,500,000.00	$8,250,000.00
D. Cummulative Net Sales [=SUM C(j)]		$300,000.00	$1,500,000.00	$6,000,000.00	$14,250,000.00
E. Unit Cost (Target)		$150.00	$150.00	$125.00	$125.00
F. Cost of Product Sold [=BE]		$75,000.00	$300,000.00	$937,500.00	$1,875,000.00
G. Gross Margin [=C-F]		$225,000.00	$900,000.00	$3,562,500.00	$6,375,000.00
H. % Gross Margin [=100G/C]		75.0	75.0	79.2	77.3
I. Development Cost	$50,000.00	$75,000.00	$100,000.00	$300,000.00	$500,000.00
J. Marketing [=0.13C]	$6,500.00	$9,750.00	$13,000.00	$39,000.00	$65,000.00
K. Other [=0.08C]	$4,000.00	$6,000.00	$8,000.00	$24,000.00	$40,000.00
L. Total Operating Expense [=I+J+K]	$60,500.00	$90,750.00	$121,000.00	$363,000.00	$605,000.00
M. Pretax Profit [=G-L]	-$60,500.00	$134,250.00	$779,000.00	$3,199,500.00	$5,770,000.00
N. % Profit [=100M/C]		44.8	64.9	71.1	69.9
O. Cummulative Profit [=SUM M(j)]	-$60,500.00	$73,750.00	$852,750.00	$4,052,250.00	$9,822,250.00

Quantity [1]	Part Number [2]	Part Name [3]	Description [4]	Manufacturer [5]	MPN [6]	Procurement Method [7]	Lead Time (wk) [8]	MOQ [9]	Fixed Cost (USD) [10]	Unit Cost (USD) [11]	Ext. Cost (USD) [12]	Notes [13]
1		Power Cable	Male A/B 1 meter orange insulated jacket			Generic			$0.000	$0.350	$0.350	
8		Screws	M2 x 8 Socket Head Cap Screw			Generic			$0.000	$0.010	$0.080	
4		Screws	M2 x 4 Socket Head Cap Screw			Generic			$0.000	$0.010	$0.040	
1		Raspberry Pi 3b		Raspberry Pi Foundation		Generic			$0.000	$8.000	$8.000	
1		Raspberry Pi Cam		Raspberry Pi Foundation		Generic			$0.000	$8.000	$8.000	
1		Raspberry Touchscreen		Raspberry Pi Foundation		Generic			$0.000	$14.400	$14.400	
12		Screws	6-32 x 1 Socket Head Cap Screw			Generic			$0.000	$0.010	$0.120	
2		Screws	3/8-16 x 1 Socket Head Cap Screw			Generic			$0.000	$0.010	$0.020	
									Total:		$31.010	

The Business Model Canvas

Key Partners 🔗

-Electronic component manufacturers

-Cloud storage for collected data

Key Activities ✓

-Producing hardware

-Problem solving wasted materials/money through provided analytics

Key Resources 🏭

-Software/hardware engineers to scale

-Funding

-Lab space for prototpying

Value Propositions 🎁

-Reduce wasted equipment by $300 per surgery

-Easily adapted into current workflow; does not require training

-Provides surgery analytics that can decrease equipment decision making processes by 50%

Customer Relationships ♥

Acquisition:
- -Trade shows
- -Content Marketing

Retention:
- -Constant support system
- -Free updates

Channels 🚚

-Hospital to hospital relationships

-Large hospital equipment wholeseller

Customer Segments

-Nurses at large hospitals

-Equipment acquisition managers at hopsitals

Cost Structure 🏷

-Economies of scale: parts decrease in cost as units increase

-Manufacturing costs, personnel costs (engineers, marketing, sales)

Revenue Streams 💰

-Asset sale of hardware device

-Annual subscription to analytics software and data

Strategyzer

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