Hult International Business School

Master's in Business Analytics

Future Mindset & Challenge – BCH-7809

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Executive Summary

Water leaks alone cause a lot of water damage and large costs. Water leakage from homes in the United States can amount to more than 1 trillion gallons of water per year. That's the same amount of water used annually by Los Angeles, Chicago, and Miami combined! Individual leaks can appear insignificant at first, but they may quickly accumulate and cause significant damage to a home.

Our solution includes a water flow sensor and mobile application. The sensor collects data on water flow and works with our machine learning models to monitor water usage and provide predictive maintenance recommendations to decrease the risk of water damage and minimize maintenance costs. The insights are then created in a user-friendly way through the app, where users can monitor usage, check status, and receive alerts. The app would be integrated with virtual assistants to offer a smooth customer experience.

The global flowmeter market is currently valued at $8.29 billion (2020). Our scope is the US ultrasonic flowmeter, which is currently valued at $136.2 million (2020) and is expected to hold 7.5% of the US flowmeter market share. Key players in this market are based in Europe, North America, and Asia, but focus on commercial solutions. However, our focus is on residential solutions. A direct company is called BlueBot that produces a similar product and app. They provide a reactive maintenance solution, but we provide a predictive maintenance solution, which is our competitive advantage. Our ideal customer is a tech-savvy homeowner who aspires to have a connected life via having a smart home system. They should be a millennial, have a higher education, and earn higher than a median income. This amounts to up to 18.7 million homeowners or 6% of the US population.

The development of the sensor, algorithm and app is targeted to last one year, in the meantime, we will be looking for possible investors and once we are ready to launch, we will use Amazon as our B2C strategy. We are predicting to break even at the middle of year two following a purchase with a subscription model for our solution.

In the next 5 years, the business environment of WB will be mainly shaped by 2 factors: the smart home trend and the market penetration strategy of the big tech companies. Depending on this, the company may pivot to the B2B market if it seems more feasible. In the future, WB can partner with home insurance companies to help them reduce the risk of water damage.

Introduction

Water damage to a home is considered a year-round possibility, rupturing household water pipes releasing hundreds of gallons per hour into homes. In fact, every year in the United States, flood loss costs over $13 billion in damage and removal costs, including over 14,000 water damage emergencies per day and an annual home insurance claim of $10,234 (Bluebot, 2020). Not to mention that roughly 14,000 Americans experience water damage emergencies every day. Water leaks are said to be undetected in 10% of American homes, wasting 90 gallons of water each day (Bluebot, 2020). Estimating the volume of water leaks from homes in the country would total inasmuch as 1 trillion gallons. This is the same amount of water as Los Angeles, Chicago, and Miami consumes in a single year (King, 2019).

Water pipe leakage can be almost as damaging as other types of pipe leaks; water can physically impair a building's structure which can put you in an expensive situation. As a homeowner, you are more than likely to be attentive in addressing the periodic duties of property maintenance because you do not want to find out about it the hard way. While this type of case is covered by the homeowner's policy, certain policies would still dismiss damage to your home that occurred rapidly and will have it evaluated based on what could have reasonably mitigated the leak.

Insurance executives have cautioned that homeowners who ignore a slow leak for months before the critical damage could get into a coverage dispute. It was recently reported by the Insurance Information Institute, about one of every 50 homeowners file water damage or freezing claims per year, accounting for about 24% of all homeowner's insurance claims and costing on an average $10,900 per claim (Metz, 2021). Moreover, only 36% of homeowners have fewer than $500 – or none at all – to set aside for an emergency home repair.

Despite this, however, it also appears that there are several aspects causing the costs to rise such as aging homes with possible plumbing failures, luxurious homes with valuables that are susceptible to water damage, and more homeowners wanting their laundry room on a higher floor (Adriano, 2019). Given that the majority of U.S. households today as mentioned in a blog last 2019, Smart Home Technology Hits 69% Penetration in the U.S. (Martin, 2019) that translates to 83 million households, with 18% of those, or 22 million homes, own more than one smart home device, according to Consumer Technology Association (CTA). On top of that, it is expected to have 2.7 billion installed smart home devices in the United States by 2023 (Statista, 2021).

Problem

The implementation of connected and smart systems is gradually disrupting every nook of homes, from comfort to security, connectivity, and most recently, energy efficiency too. Automatization, standardization, and access control are allowing houses to become increasingly smart and governable by user interfaces and virtual assistants (Ahuja & Patel, 2017). However, the research appears to highlight an untapped gap among all the innovations that are driving this market trend, which is found to be the development of innovative maintenance solutions.

As the majority of useful connected products have been primarily developed for innovation in terms of customer-facing features (remote access, voice-commands, etc.) it would be worthwhile if the technologies surrounding these connected devices, as well as the data collected from them, could be used to allow maintenance strategies for homes. This way, problems that arise from unseen parts of the home will not manifest at the worst possible moment and could also be avoided.

Maintenance

Traditionally, we've been conditioned to think about maintenance as primarily a reactive service but if read through the market patterns on the industry, the rise of the industrial Internet of Things (IoT), organizations now use intelligent maintenance tools to gather data and interact with the connected devices to improve production efficiency and that is catered by the maintenance strategies that work best for different scenarios (Ratcliff, 2020). This can be attested by the recent study of Schneider Electric where 90% of the facility experts believe that connecting systems to the Internet would result in smart, efficient, and profitable operations (Schneider Electric USA, 2020). The type of maintenance strategies includes—Reactive Maintenance, Preventive Maintenance, and Predictive Maintenance.

To detail: (1) Reactive Maintenance refers to the replacement of components only after the asset has broken down or reached the point of failure; (2) Preventive Maintenance entails performing maintenance procedures when the equipment is in use to prevent accidental breakdowns and the costs that come with them; and (3) Predictive Maintenance tracks asset efficiency in real-time during routing operations in order to detect and forecast faults (Prometheus Group, 2020). When it comes to maintenance control, these methods have all been pitted against each other.

Although, predictive maintenance has recently piqued people's interest as a significant opportunity for individual homeowners, service providers, and communities overall by driving economic development and improving the quality of life. From a technical point of view, it facilitates mass data collection from homes, along with the advancement of machine learning techniques that enables the detection, analysis, and surfacing of insights hidden within the data collected, albeit inaccessible.

While it is believed that predictive maintenance has the potential to change the way people live and this is the best time to make that happen, however, homeowners find that the companies that are connecting devices in their homes are not yet delivering predictive maintenance. To put this type of maintenance in action, operators must deploy IoT sensors and develop powerful analytics utilizing machine learning and other techniques, applying predictive maintenance technology to single-family homes. This uses data from machine sensors and smart technology to notify the user when a piece of equipment is at risk of failing. From here, actions will be taken offline, inspected, and repaired accordingly. Predictive maintenance of homes is one, if not the most, important urban growth initiative that can be implemented in the United States for the sole reason of promoting social justice and shifts to a more prosperous economy (Shipshape, 2021).

Solution

The process of gaining relevant experience in the field has started from a Data Driven competition, our team has come up with a Machine Learning algorithm capable of predicting, with remarkable accuracy, the status of water pumps installed in the African region of Tanzania. The functionality of our software has led to a pivoting strategy, consisting in the application of predictive maintenance as an integrated smart-home system for similar water appliances. Feeding data of different nature and switching a small portion of parameters, this technology can suggest problematics that are occurring or are likely to arise in the near future for a wide range of water structures, as they all rely on comparable mechanisms.

From here the idea behind our business solution has developed, Water Benders wants to provide an all-inclusive solution to prevent water damages in residential units and deliver a complete overview of the water system status. The predictive algorithm will be employed by a set of water-meter sensors offered to monitor water flow and alert users of any abnormal activity or potentially problematic outcomes with a user-friendly phone application.

Prototype

Sensor

The sensors provided are easy to apply, small and with a robust PVC hard-shell, and connected to the internet through the house's wi-fi. A practical clamp allows to manually attach the sensor to water pipes of any size and material (Figure 1), also recording the specific diameter to gain insights on the expected water flow inside the pipe.

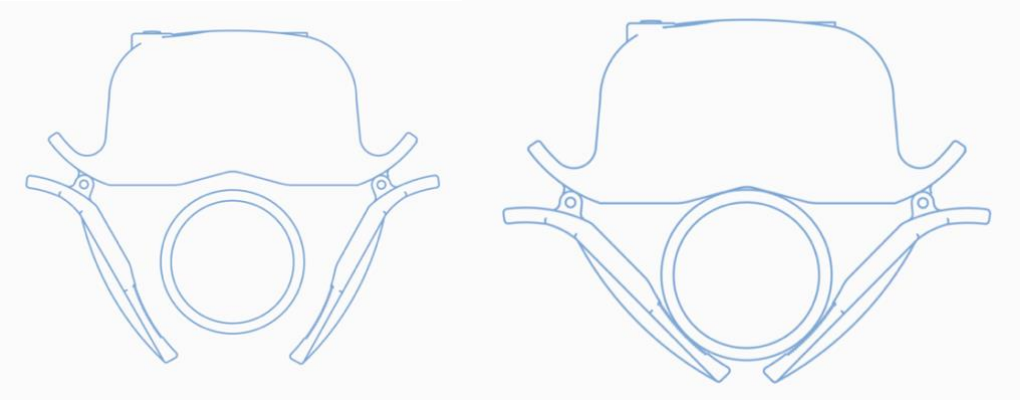

Figure 1

The sensor includes two embedded technologies to gather data and assist the algorithm to react or predict accordingly. Firstly, ultrasound is emitted to assess the water-flow quality within the pipe (Figure 2), a change in the data might indicate leakage or obstruction of different nature, and the likelihood of what anomaly is occurring would be specified on the application.

Comparing the data with historical values over time, the sensor can also identify smaller leakages, while by checking the volume of water in use, the app is also capable of providing insights on utility spending. Moreover, a thermometer keeps track of the pipe's temperature, which is matched with weather forecasts collected by the app to predict possible water freezing.

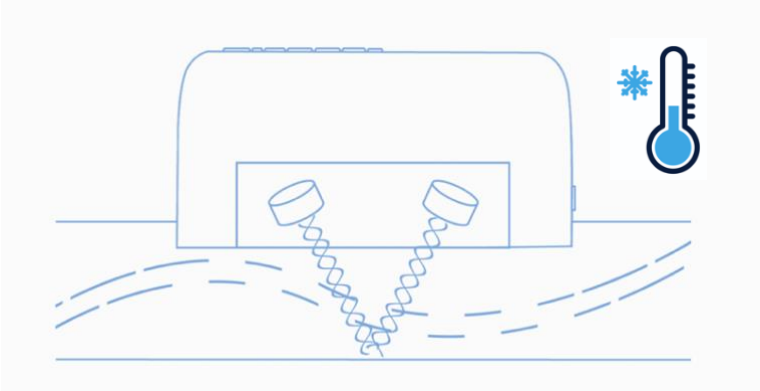

Figure 2

The combination of reactive and predictive maintenance techniques of the algorithm allows the sensors, to provide an all-round monitoring of the household water consumption and highlight any problematic that might arise from it.

Mobile App

The free-to-download mobile App will be available on the three major App Stores (Amazon, Apple and Google). This represents the way consumers interact with the analytical results and it is created to be simple and practical.

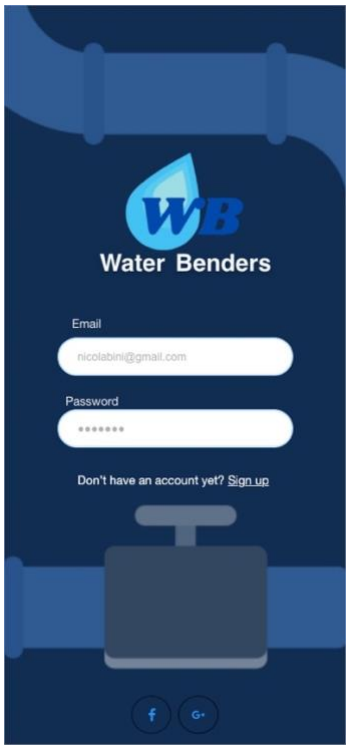

Figure 3

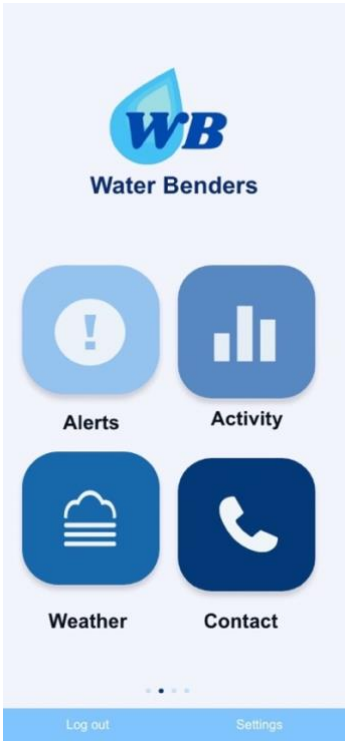

Figure 4

Logging in and Menu

To get started, the app will prompt the user to a log-in screen, including a sign-up link for creation of account, along with the enrolment of the sensors (Figure 3). From the home/menu/menu screen, you can view and click on different options to explore by category (Figure 4).

Alert Status

On this screen, the user will be able to see the monitoring dashboard, focusing on the actual water leakage condition and water freezing exposure to risk that are updated real-time. (Figure 5). An example of alert notification can be seen in Figure 6, where a pre-programmed alert message that is time sensitive, letting the user know on which equipment the leak has been detected and what action needs to be done. For ease of emergency use, contact information of their personal plumbers are also linked.

Consumption Activity

This screen allows the user to watch and analyze the historic trend of the performance of the water flow, pinpointing specific water events. It gives the user the option to view it daily, weekly and yearly as desired. Apart from this, the user can also see the consumption of each equipment where sensors are applied, displayed in per-minute and per-unit (Figure 7). This dashboard could also show options available in terms of spending and efficiency of the water pipes.

Weather Activity

Finally, the weather screen helps the user to look at the days when freezing will be most likely to happen, allowing the user to anticipate freezing situations and take necessary actions on how to respond to any alerts (Figure 8).

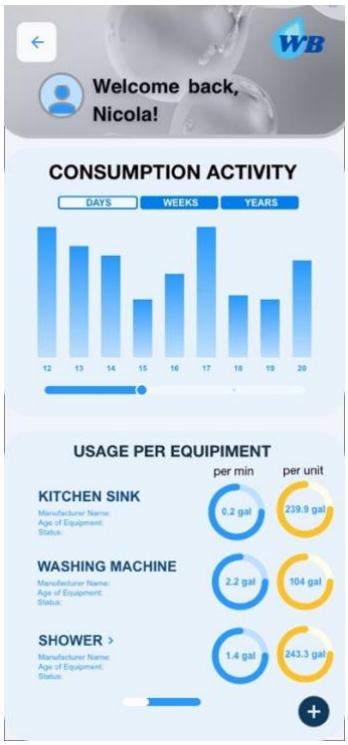

Figure 5

Figure 6

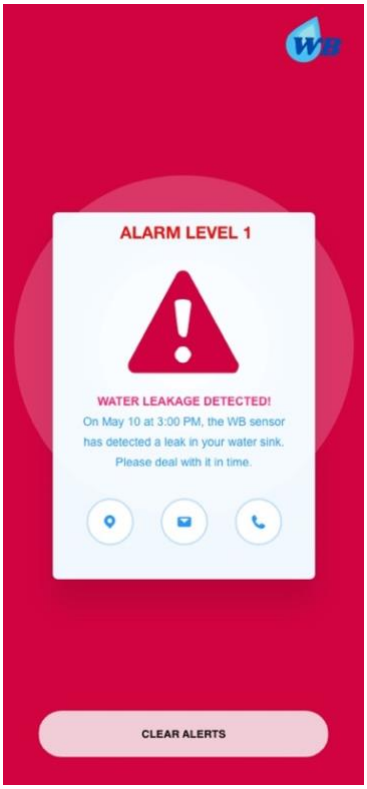

Figure 7

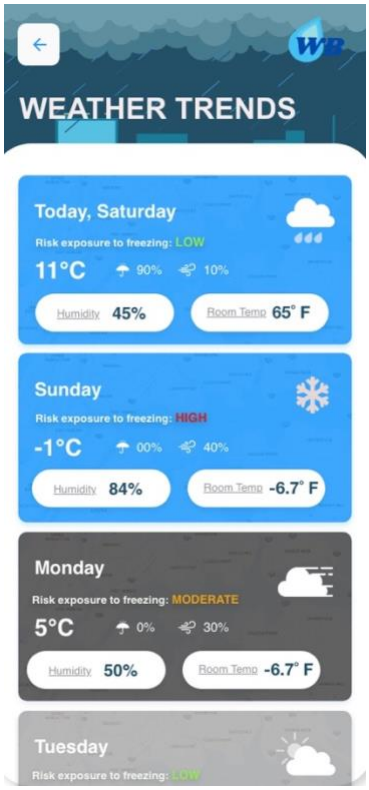

Figure 8

Stage of development

Currently, Water Benders is in the initial stage of development in terms of hardware. The priority is to find inexpensive suppliers to manufacture the sensors, in order to integrate our algorithm. Once tests have been run to ensure the functioning of our system, the following step would be to patent our product before making it enter the market. The future plans are modeled in detail on our Rollout Plan.

Market

In order to understand which market the focus will be set to, it is important to understand the Total Addressable Market (TAM), Serviceable Available Market (SAM), and Serviceable Obtainable Market (SOM). The TAM is the value of the entire market or the total possible demand for the product/service. The SAM is the portion of the TAM that can actually reach the product/service. Finally, the SOM is the portion of SAM that is actually obtainable by the product.

In terms of our TAM, we will be focusing on the flowmeter market. According to Grand View Research, the global flow market size was valued at $8.29 billion in 2020. It is expected to expand at a compound annual growth rate (CAGR) of 5.7% from 2021 to 2028, making the market value at around $13 billion in 2028 (Grand View Research, 2021). Although the increasing demand for flow measurement technologies in oil and gas management applications is expected to drive global market growth, the adoption of these technologies would also gain traction in other sections such as water and wastewater. In 2020, the water & wastewater market share has the second-highest global flow meter market share at 24%, while power generation topped the list with 28%. In the next few years, the water and wastewater industry is yet to take over because of rapid urbanization and industrial development in countries in the Asia Pacific region.

Although Europe dominated the flowmeter market and accounted for over 35% of the global revenue share in 2020, North America comes second at 27%. This is due to Europe having companies that are market leaders with the latest technologies, whereas the United States is still open to market penetration of cutting-edge innovations. According to the same research report, the market size of flow meters in North America was around $2.27 billion and is expected to reach $3.51 billion by 2028. This can be considered our SAM because it targets the same geographic area as where we are planning to launch our product.

The flowmeter market comprises many different products. The magnetic flowmeters segment held the largest revenue share of approximately 24% of the total market share in 2020. Ultrasonic and Coriolis segments are anticipated to increase to around 7.5% each from 2021 to 2028. These flowmeters feature the integration of IoT, leading to smart flow rate measurement solutions - exactly what we are trying to do with Water Benders. Our SOM would be the ultrasonic segment because that is the technology we are currently going for. At the moment, it comprises around 6% of the market share - this would be $136.2 million in 2020 and is expected to go up to $263.3 million by 2028, at the 7.5% expected market share.

Competitors

Indirect

Key industry participants in the global flowmeter market are ABB Ltd., Emerson Electric Corporation, General Electric, Krohne Messtehnik Gmbh, HÖNTZSCH GMBH & CO. KG, Hitachi High-Tech Corporation, and Siemens, according to Grand View Research (2021). These companies would be considered indirect competitors because they are mainly focused on commercial solutions that are traditional, hard-to-install, and expensive.

Direct

Our niche in the market is to focus on residential solutions that are innovative, easy-to-install, and affordable. Although these key players have all of the current market share, we plan to disrupt the residential industry and do it one household at a time. A direct competitor would be a startup called Bluebot™ who has come up with its own ultrasonic flowmeter that tracks water flow and provides insights. It is a similar concept to ours although it lacks a lot of features including our innovative predictive machine learning algorithm - which is essential to predict a frozen pipe during the winter.

Bluebot™ serves as more of a reactive monitoring system, contrasting to our reactive monitoring system. Some of our competitive advantages are 1) predictive and customizable alerts, 2) emergency contact notification, 3) away-mode and 4) virtual assistant compatibility.

Customer Segment

Our customer segment is medium-high income homeowners in the US. To start, we are planning to launch on the east coast, specifically Boston, MA, since the city's low winter temperatures are placing the pipes at risk. Boston and its nearby areas are subjected to cutting-edge technology from top colleges like MIT and Harvard, allowing residents to become more comfortable with emerging innovations.

Our ideal customer would aspire to have an integrated smart home either now or in the future. They desire to keep their homes in good order and prevent costly breakdown repairs (repairing once failures occur). This may also be a safe way for homeowners to keep their property in good working order while keeping live control of the place. In addition to that, it would be also particularly valuable for house owners who own vacation properties and need to monitor their condition during the off-season.

According to Pretty (2018), there are five types of smart homeowners, 1) “The Tech Innovator”, 2) “The Security Seeker”, 3) “Home Controllers”, 4) “The Environmentalist”, and 5) “The Frugal Homeowner”. Water Benders conveniently falls under all categories because it is a sustainable tech product that connects to the smart home ecosystem and provides control and security to the users via a mobile application as well as is compatible with virtual assistants.

Customer Persona

The background of our ideal customer would be either a new or established homeowner who is a millennial (aged between 25 and 40), is a mid-senior level employee at a medium-large corporation, earns more than the median income in the neighborhood and is tech-savvy, sustainable, pro-privacy, likes to be in control, independent, and cares about the maintenance of their personal assets, including home(s) and car(s). The product is not only intended for consumers that have top performing houses and want to implement innovative solutions to create an all-round smart eco-system, but also to owners of residences that perhaps rent their properties and need insights on usage and maintenance.

According to the American Housing Survey via Brookings, there are around 36 million new and established homeowners in the United States. Among those, 67% are millennials, 38% have a BA-level education or higher, and 50% are above the median income level (Schuetz, 2017). These percentages would average to 52% so we can assume that is the percentage of the market we can obtain nationally. This would be 18.7 million homeowners, which is around 6% of the US population.

Business Model

Water Benders (WB) is a start-up that uses predictive maintenance as a service to streamline revenue by offering sensors via service subscriptions. These smart meters are digitized through an app that is free of use and is empowered by AI and Machine Learning algorithms. Ideally, this app is designed to monitor property maintenance, primarily leakage alarms, and frozen pipe risk updates, and it can be used continuously before a withdrawal request is made. To detail the pricing plan, A regular subscription for $7.99/month will include additional functionality such as pipe health status, predictive maintenance warnings, and alerts to emergency contacts. As for a premium subscription of $12.99/month, the user can get discounts on sensor purchases and customize updates, as well as all of the other features listed so far.

Additionally, the servers can also communicate with smart speakers from major companies such as Alexa, Siri, and Google Home via their APIs. This allows the users to request any desired information from their virtual assistant regarding the status of the pipes and the possibility of frozen pipes that may occur in the coming days. Even though some details will be accessible via smart speakers, our sensors will only connect with the Water Benders App, locking in consumers who purchased one or more sensors to use our app.

The value of our solution consists, first of all, reducing the cost of maintenance; maintenance operations when there are no failures yet, are less expensive than repairing the failure and the damage that it has caused.
Second, being able to certify and prove the water system status of a property can increase its value, and its ease of sale, because the seller can show and prove to the buyer that its property does not have hidden problems.

Predictive maintenance recommendations are provided by a machine learning model trained with data collected from multiple control and test scenarios. The idea is to introduce variation after the pipe's optimal setting so the model is able to detect even the smallest leak. Once in production, customers' data will be collected by the sensors they installed at their property and sent to Water Benders' servers.

Most of the operating costs of the business are divided into three departments:

Software Development and Server Maintenance

The service provided relies on analyzing data the sensors collect and provide information on their status and failure risk of water pipes. To provide it, Water Benders needs servers where the data is stored and analyzed, and where the users' phones connect through an app to retrieve information on their water systems.

The servers need to be maintained by IT experts, the app needs to be constantly updated to increase its functionalities and keep up with new OS versions, and machine learning models need to be improved and expanded as more types of data and sensors come in. For this, Water Benders needs respectively an IT Team and a Data Scientist Team.

Sensors Manufacturing and Shipping

Water Benders will outsource the production of its sensors to a specialized company. However, all its products will always maintain their brand and they will be sponsored as its own products.

The shipping will be made to the final customer directly from the manufacturing company to which the production is outsourced to. In the future, to decrease delivery time Water Benders will buy a supply depot in the US to reduce shipping time.

Marketing and Sales

Being a startup that wants to sell a service and products and aims to be considered a reliable and serious enterprise, it will take an effective and sustained marketing campaign that must continue to promote the company's brand and boost sales.

For this, we plan to start our first selling campaign on Amazon, by advertising the Water Benders sensors on the Smart Home section. Through Amazon and social media platforms, we will drive traffic to our website where we will convey the value proposition to potential customers.

To increase engagement and customer satisfaction Water Benders will create a "Water Benders Community" Facebook group where customers can post pictures of their setup and share their experience with the product.

Rollout Plan

The first stage of the rollout is to create a sensor to start feeding the information into the algorithm, but in order to do that, we need to make sure that the sensors are picking the correct information of the pipes. In order to achieve this, we will simulate different scenarios under a controlled environment so we can correctly label the information. Once the sensor is ready, we can start looking for suppliers that can meet the requirements of the product we need, and at the same time, we can start developing and training of the algorithm.

After we are comfortable with the algorithm and we have reduced the number of possible suppliers to a handful, we can start developing the app to have it ready for testing with a study group. This will give us feedback to enhance our User Interface, packaging and product installation before we start the lookout of investors.

Once we secure more funds, we can continue the research on improved materials for the final product, packaging and finishing the UX for the App. The last step is to test the final product, check compatibility and try to "break" the process to make sure it is ready for launch. Our chosen method to launch the product is to add it to the Amazon platform, in the prime section, have it featured under the Smart Home section, and include it on Apple's Homekit devices selection in their dedicated website.

Our go-to-market strategy will start with a B2C to enable rapid expansion and market adoption. As mentioned before our main distribution platform is going to be Amazon.com because of the large user base that they already have, efforts to promote our products will be taken in order to attract more users. The strategy is to build a customer network in the Massachusetts area and later expand to the rest of the United States. Water Benders chose Massachusetts because the population has a higher household income than other states, there are a lot of start-ups in the area and at the same time, there is a high density of schools. This is important because the people in Massachusetts can adopt products faster and there are lots of students looking for internships. We can enable the experience while they help us develop our business.

In the future, water benders can look into partnerships with insurance companies to offer our products to the costumes via a B2B2C, this will enable insurance companies to track the health of their customers' pipes, offer discounted prices and help them reach faster claims decisions.

Opportunities

After stocks, real estate is America's favorite long-term investment (Royal, 2020). Stocks have the advantage over real estate for their high liquidity, and by being fungible when compared to other stocks from the same company. On the contrary, when buying a real estate property, the investor has to gather a lot of information about each individual property he is considering buying. Being non-fungible, 2 houses of the same size, with the same amenities and in the same city, or even the same neighborhood or street, are never the same; The buyer has to assess the underlying conditions of the house's multiple infrastructures (water system, heating system, roof conditions, house covering, and so on).

This process of acquiring information is time-consuming and risky. The investor can never assess with perfect accuracy the state of the systems in the house. Waterbenders service helps to compare different houses with quantifiable metrics, as the conditions of pipes also affect humidity and the status of other hidden parts of the house.

Additionally, there is a strong ongoing trend in smart houses that focus on giving households more control over their house by connecting their smartphones and smart speakers to their lighting system, electric curtains, surveillance, heating, air conditioning, and more. According to a Voicebot survey (2020), almost 90 million Americans owned a smart speaker. Our system will integrate perfectly in an already penetrated service and add functionalities to it in a smooth way.

Furthermore, there are further business opportunities to partner with home insurance companies. Generally, water damage resulting from an unexpected event is covered, while damages resulting from gradual damage, or damage caused by negligence or lack of maintenance are not covered (Metz, 2021). Whenever an accident occurs, insured customers need to fill a claim illustrating the damage and the causes of that damage. Then the insurance company has to assess whether or not the damage has happened as the customer described and decide to approve or deny the claim. Partnering with home insurance companies would allow Water Benders's customers to share their sensors' data with their insurance provider, in exchange for a reduced insurance fee and an increase of their claim approval rate.

Risks

The main risk for Water Bender's project will be that the fast growth of the smart-home and integrated predictive maintenance market will attract big enterprises into the segment. The possibility that the margins surrounding this type of technology will grow in the following years is high. With this comes the danger of powerful players such as Google and Amazon decided to enter the environment by developing their own technology, instead of keep supporting collaboration with us.

The capabilities of such companies would make the existence of Water Benders unsustainable in the market. However, if the business has the opportunity to mature organically over a reasonable time frame, the chance of being acquired by larger players can also represent a rewarding scenario.

Scenario Analysis

In order to cope with the risk of the larger players entering the market and the opportunity of said market to grow much larger, a simple scenario analysis is laid out (Figure 9). As these two are found to be the major drivers influencing the opportunity to grow of Water Benders, different strategies will have to be applied for each scenario.

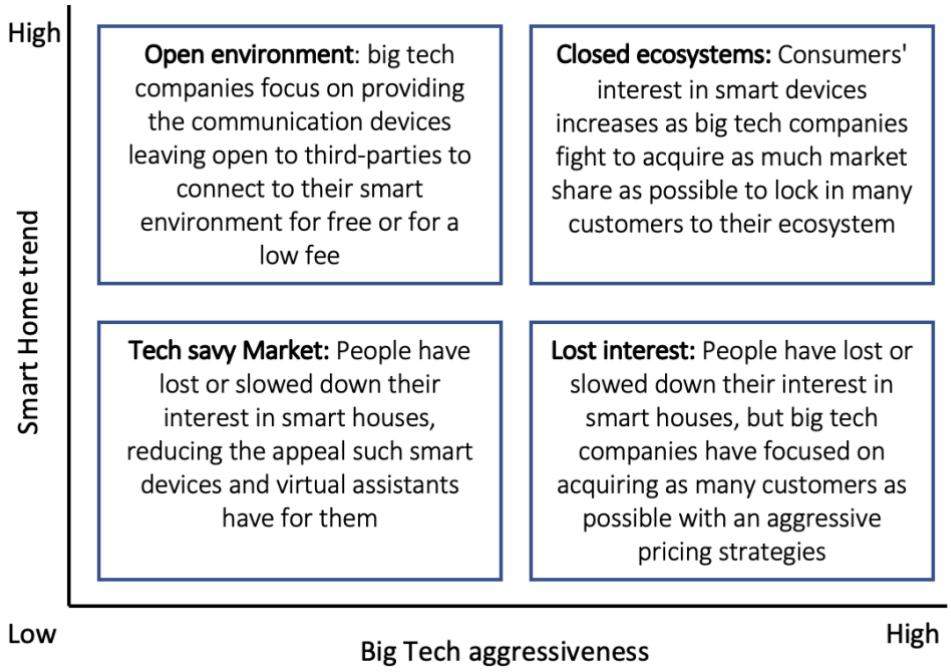

Figure 9

Open environment

When the smart home trend is high and big tech aggressiveness is low, big tech companies focus on providing communication devices leaving them open to third parties to connect to their smart environment for free or for a low fee. This is the most favorable scenario for Water Benders because it can keep selling its sensors and continue to integrate them as much as possible with all the ecosystems (Google Home, Alexa, Siri) on the market.

Tech-savvy Market

When the smart home trend is low and big tech aggressiveness is low, People have lost or slowed down their interest in smart houses, reducing the appeal such smart devices and virtual assistants have for them. Following this trend, big tech companies did not pursue aggressive pricing strategies. In this scenario, Water Benders will have to demonstrate to a less enthusiastic customer base the value of its

solution, maybe targeting customers through tech content creators on youtube, to attract consumers that are not currently looking for any water solution but would benefit from it.

Closed ecosystems

When the smart home trend is high and big tech aggressiveness is high, Consumers' interest in smart devices increases as big tech companies fights to acquire as much market share as possible to lock in many customers to their ecosystem. Water Benders should focus on entering one of the popular smart home ecosystems to benefit to target the customers that have already chosen that particular ecosystem.

Lost interest

When the smart home trend is low and big tech aggressiveness is high, People have lost or slowed down their interest in smart houses, but big tech companies have focused on acquiring as many customers as possible with aggressive pricing strategies. In this scenario, Being a small company that relies on selling products to consumers in a highly competitive and slow-growing market, Water Benders will pivot to a B2B approach, focusing on the niche of facility management of big properties.

Financial Analysis

Given that we need to develop the sensors from scratch, we are giving a whole year for the development of the sensors, the app, and the training of the algorithm. The base team will be composed of the 5 founding members that will distribute the roles to investigate and develop the sensor, contact suppliers and build the business model, and one data scientist that will be building the predictive modeling and algorithm.

Revenue streams will come from sales of the sensors, first-time subscriptions and returning customers, we are assuming that the company will retain 25% of the existing customers, meaning that they are the ones that will renew the subscription.

For the costs, we are going to do the home office for the first two years and once we are profitable we are going to move into an office. We are going to need one server every two years to keep up with the increasing number of users. There are subscription costs related to developer accounts for iOS and Android as well as a service fee for selling on Amazon, this has been taken into consideration. The last cost is the cost of goods sold. We calculated 48% of the price to be allocated because the product is technologically complex and needs to be built with the best materials for durability.

In the scenario projection, we aimed to break even at year 2 and start having profits at the start of year 3, but after crunching all the numbers, we end up with profits in year 2.

Retail Price	$99.99
Membership per Month	$ 6.99
Membership per Year	$83.88

Year	One	Two	Three	Four	Five
Gross Sales	**$ 67,113**	**$ 1,014,342**	**$ 2,130,101**	**$ 3,614,430**	**$ 4,809,719**
Revenue of Sales	**$36,496.35**	**$547,445.25**	**$1,094,890.50**	**$1,824,817.50**	**$2,372,262.75**
Revenue of Subscription (First Time)	**$30,616.20**	**$459,243.00**	**$ 918,486.00**	**$1,530,810.00**	**$1,990,053.00**
Revenue of Customer Retention		**$ 7,654**	**$ 116,724**	**$ 258,803**	**$ 447,403**
Sensors Sold per day	**1**	**15**	**30**	**50**	**65**
Sensors Sold per year	365	5,475	10,950	18,250	23,725
Customer Retention %	25%	25%	25%	25%	25%
Retention Customers		91	1,392	3,085	5,334
Rent	$ -	$ -	$ 50,000	$ 50,000	$ 50,000
Servers	$ -	$ 5,000	$ -	$ 10,000	$ -
Labor	$ 520,000	$ 610,000	$ 730,000	$ 820,000	$ 1,110,000
App Publishing Rights (iOS and Android)	$ 124	$ 99	$ 99	$ 99	$ 99
COGS (48% of Gross Sales)	$ 17,519	$ 262,788	$ 525,577	$ 875,961	$ 1,138,749
Amazon Fees	$ 98.39	$ 915.99	$ 1,791.99	$ 2,959.99	$ 3,835.99
Cost Per Unit	$ 1,473.26	$ 160.51	$ 119.40	$ 96.38	$ 97.06
Total Cost	**$ 537,742**	**$ 878,803**	**$ 1,307,468**	**$ 1,759,020**	**$ 2,302,684**
Net Income	**$ (470,629)**	**$ 135,539**	**$ 822,633**	**$ 1,855,410**	**$ 2,507,034**
Margin	**-701%**	**13%**	**39%**	**51%**	**52%**
Estimated Growth		1411%	110%	70%	33%

Figure 10

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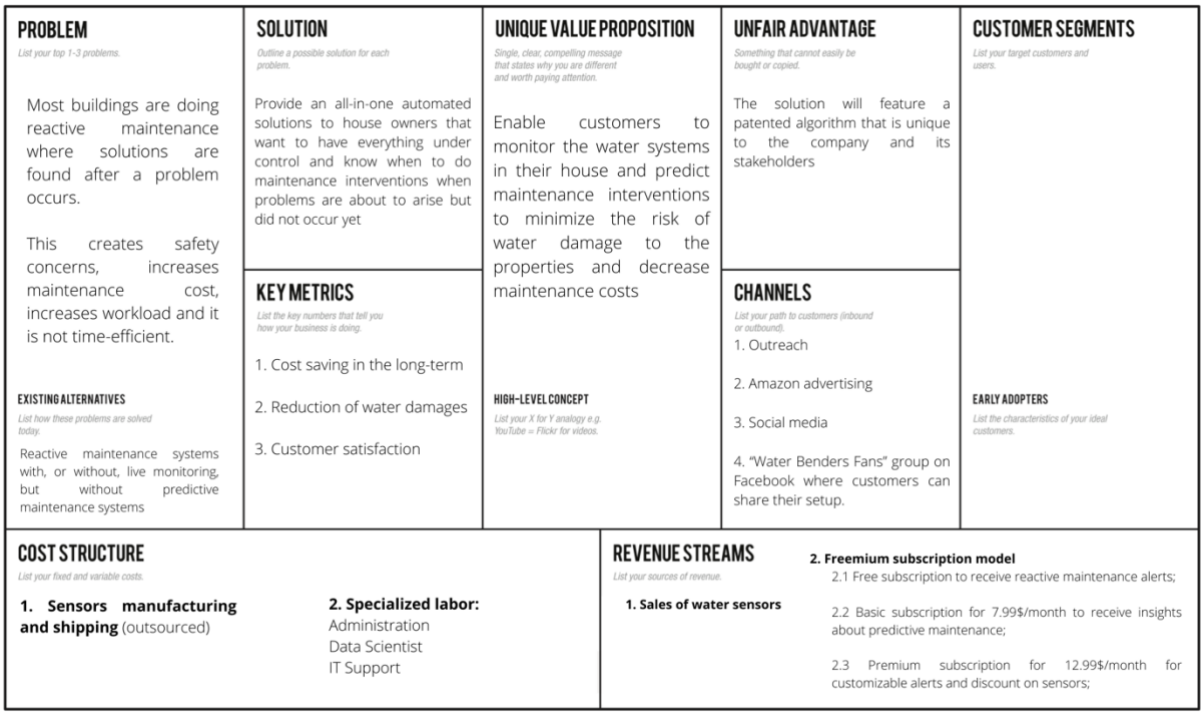
Appendices

Appendix 1:



PROBLEM

List your top 1-3 problems.

Most buildings are doing reactive maintenance where solutions are found after a problem occurs.

This creates safety concerns, increases maintenance cost, increases workload and it is not time-efficient.

EXISTING ALTERNATIVES

List how these problems are solved today.

Reactive maintenance systems with, or without, live monitoring, but without predictive maintenance systems

SOLUTION

Outline a possible solution for each problem.

Provide an all-in-one automated solutions to house owners that want to have everything under control and know when to do maintenance interventions when problems are about to arise but did not occur yet

KEY METRICS

List the key numbers that tell you how your business is doing.

1. Cost saving in the long-term
2. Reduction of water damages
3. Customer satisfaction

UNIQUE VALUE PROPOSITION

Single, clear, compelling message that states why you are different and worth paying attention.

Enable customers to monitor the water systems in their house and predict maintenance interventions to minimize the risk of water damage to the properties and decrease maintenance costs

HIGH-LEVEL CONCEPT

List your X for Y analogy e.g. YouTube = Flickr for videos.

UNFAIR ADVANTAGE

Something that cannot easily be bought or copied.

The solution will feature a patented algorithm that is unique to the company and its stakeholders

CHANNELS

List your path to customers (inbound or outbound).

1. Outreach
2. Amazon advertising
3. Social media
4. "Water Benders Fans" group on Facebook where customers can share their setup.

CUSTOMER SEGMENTS

List your target customers and users.

EARLY ADOPTERS

List the characteristics of your ideal customers.

COST STRUCTURE

List your fixed and variable costs.

1. **Sensors manufacturing and shipping** (outsourced)

2. Specialized labor:
Administration
Data Scientist
IT Support

REVENUE STREAMS

List your sources of revenue.

1. Sales of water sensors

2. Freemium subscription model

2.1 Free subscription to receive reactive maintenance alerts;

2.2 Basic subscription for 7.99$/month to receive insights about predictive maintenance;

2.3 Premium subscription for 12.99$/month for customizable alerts and discount on sensors;