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Foodini Marketing Plan

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Foodini Marketing Plan

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Executive Summary

This plan provides the strategic direction for the rollout and marketing of the Foodini 2.0, the newest product from the Foodini division of Natural Machines. The Foodini 2.0 is the second 3D Food Printer produced by Natural Machines. The Foodini 1.0 was marketed exclusively to high end restaurants, with a small number released. The Foodini 2.0 builds on the Foodini 1.0 platform by adding an integrated oven and IoT functionality. With the Foodini 2.0, we will introduce subscription access to the new Foodini Design Library, as well as an option for customers to purchase individual designs. The Foodini 2.0 is designed for technology innovators, enabling them to print with their own ingredients and designs, and explore a new frontier of culinary creativity. The product will launch at CES, Maker Faire, 3D printing hackathons and other user groups in 2020.

Funding for the Foodini 2.0 product is approximately $1.8 million[1]. The product will be launching into a nascently competitive market with only a few similar products. Unique amongst the competition, our product employs fused deposition modelling (FDM), includes an oven, and has IoT functionality. It also inherits proven functionality from the Foodini 1.0.

The SOM or share of market the division is aiming for with this product is approximately $10.15 million, the world-wide 3D printing food market is estimated at $425 million[2] and is experiencing an estimated 57.6% growth rate[3]. 3D printed food is estimated at 6.9% of the entire $6.12 billion[4] edible crafts market, leaving room for robust growth.

Our customer analysis revealed that Tech Hobbyists would provide a good onramp into the home consumer 3D food printer market. We found that Tech Hobbyists were enthusiastic about trying new technology, were willing to pay more than other potential customers, and were willing to pay for a monthly subscription for access to food designs and patterns. This marketing strategy is built around targeting the Tech Hobbyist market.

Our SWOT analysis finds that the company and product are well positioned, with unique features, competitive pricing and recognized leadership heading up the project. Raising awareness of 3D food printing in general, and the Foodini specifically will be a challenge that must be addressed. Taking advantage of opportunities like partnering with cooking shows, expansion into overseas markets and marketing to institutions will provide growth potential going forward. In the near term, the company should remain aware of the potential for volatility in our single market, the United States, and be on the lookout for competing products from tech giants like Amazon.

Foodini's elegant and refined industrial design along with excellent customer service will set us up for a solid launch. In our first year, we are targeting 1,600 unit sales at $2,500 each. We'll grow our sales through promotional activities at Maker Faires, Hackathons, Meetups and Trade Shows. By year three, the Foodini division is expected to become profitable. Our

objective is to meet or exceed the projected 57% growth rate of the 3D printing industry. By year 5, we will look to serve adjacent markets in the home and institutional segments.

Foodini will be presented and promoted at trade shows, such as CES and the Maker Faire. To gain a foothold deep in the Tech Hobbyists market, we will sponsor hackathons and user groups and monitor and participate in 3D printer user groups. To reach Tech Hobbyists where they shop, Foodini will be available through well regarded high-tech online stores, NewEgg and TigerDirect. We will also offer direct purchasing through our website. Once our sales reach a critical volume, we'll look to expand our distribution network to include Amazon.

Protecting and building the Foodini brand is an important aspect of this plan. In addition to trademarking our logos and symbols, we will create internal design guidelines and ensure that sales and support are trained to use them properly and consistently. Our product's premium materials and design, coupled with excellent customer service, will ensure that our brand retains a positive and strong image. The product will be showcased at Maker Faires, Hackathons, and Trade Shows and communication with distribution partners and other members of the cross-functional team will help keep sales on target.

The communication strategy in the initial phase of 5 year plan will focus on brand building and inspiring Tech Hobbyists who currently have a 3D printer to become Foodini 2.0's early adopters. Our target customers' core values; time saving in the kitchen, impressing colleagues and family with gourmet edible art and feeling pride in making enjoyable creations will be reflected in our communications. This will will serve to strengthen their emotional bond with our product. Our promotional efforts will include participation in tech user forums; showcasing the product at Trade shows, such as CES and Maker Faire; sponsoring Hackathons and 3D printing user groups; and running a targeted ad campaign on the internet

Ensuring that this marketing plan is followed and applied as written is crucial to our success. A detailed implementation schedule will be followed to ensure that we remain on schedule to meet the goals of this plan. In addition, a detailed control plan will ensure that our goals are tracked and measured and that key operational functions occur in a timely manner.

1. Introduction

The purpose of this marketing plan is to create a marketing strategy for the Foodini 2.0, a 3D food printer produced by Natural Machines. This plan will analyze the product, market and market segments, the company, its potential customers, and competitors. It will then make recommendations for marketing objectives and goals, marketing strategy, promotions, and price. And finally explain our vision for product and brand management, pricing management, distribution management, communications management, and implementation and controls.

Through this analysis and explanation we will show that 3D food printing is not just a small burgeoning niche market; but a market on the rise with significant expected customer adaptation and market expansion. We believe the Foodini 2.0 will capture this market and become a leading brand that our customers will buy and come back for seconds.

2. Company Analysis

2.2. Company Background

Natural Machines is a 3D food printer company headquartered in Barcelona Spain, with a second office in New York City, USA. Natural Machines currently has 18 employees.

Company's Vision: Healthy food, one freshly printed meal and snack at a time.
Company's Mission: Combine food, tech and design in order to help people eat healthier

2.3. Founder Background

Company founders, Emilio Sepulveda and Lynette Kucsma, combined their passions for technology and healthy food, forming Natural Machines in 2012 with a mission to create a machine that can be used to create healthy foods using ingredients chosen by the user. Sepulveda holds an MBA from ESADE Business School. After a lengthy career at Telefonica Global systems, Sepulveda has transitioned into the entrepreneurial world.[5] Kucsma, holds an MBA from Fairleigh Dickinson University, is a former employee of Microsoft[6] and was named by CNN as one of 7 Tech Superheroes to Watch.[7]

2.4. Funding

After an initial failed Kickstarter campaign, the founders of Natural Machines bootstrapped the first $800K of funding. Since then, they have obtained an additional $1M in funding and have raised $3.1K through grants and Venture Capital funding.[8]

2.5. Industry Background

The 3D food appliance industry is still in the early stages of formation but is expected to reach $525.6 million by 2023. Several competitors exist, including ChocEdge, Print2Taste and biFlow. Unlike Natural Foods, these competitors products have limited ingredient capacity.[9] These competitors will be discussed in depth Section 4, Competitor Analysis.

2.7. Product Description

The Foodini 2.0 is a 3D food printing appliance, internet enabled, capable of holding up to 5 capsules of food ingredients, which are switched automatically during food creation to

construct a food design to exact specifications. Users of the Foodini prepare their own ingredients, load the necessary food capsules, and then print the creation of their choice.

The Foodini 2.0 is the second generation of the Foodini appliance. With this generation, full IoT functionality and a built-in oven are added features.

The Foodini 2.0 appliance:

- Is an enclosed appliance, measuring 16.9 x 18 x 16.9. The enclosure is designed to fit in any home kitchen and meet food safety requirements by enclosing all electronic parts and isolating them from food contact.
- Uses Fused Deposition Modeling (FDM) technology, to print using any flowable food
- Can print food sizes up to 50 x 165 x 120mm
- Food assembly chamber can be used to bake the assembled product.
- Has an onboard Android based interface with internet connectivity and Foodini Creator software.
- Is IoT enabled, allowing for software updates, download of designs, and access to the subscription based Foodini Design Library.
- Comes with 5 food nozzles, capsules, holders and tags; 4 capsule presses; 1 silicone matt, test capsule, dish and tray.

3. Market Definition Potential and Demand

3.1. Market Definition

3D food printing is a relatively new technology that grew out of the greater craft market's edible arts segment. While the original product targeted commercial industries, the 2.0 aims to penetrate into the home market. Its target market will be residential consumers ages 18-54 who make at least $75,000 a year and identify as Tech Hobbyists.

TAM

The craft market is estimated to be worth $36B[10]. Edible arts make up 17% of the crafting market and is valued at $6.12B[11]. For the purpose of this Foodini 2.0 marketing plan we're setting the boundary of the total available market to the Edible Arts - 3D Food Printing segment valued at $425M[12].

SAM

The United States makes up approximately 60% ($255M)[13] of the world wide 3D Food Printing market and our research suggests its residential consumers account for 35% of the market ($89.25M). This will be the Foodini's served available market.

SOM

The target share of the available market will focus on Tech Hobbyists which are estimated at 22.7% of the available market and are valued at $20.3M of the $425M 3D Food Printing market. From there we'll be target the top half from the median income,

those making at least $75K per year which brings our SOM down to approximately $10M, as shown in Figure 1.
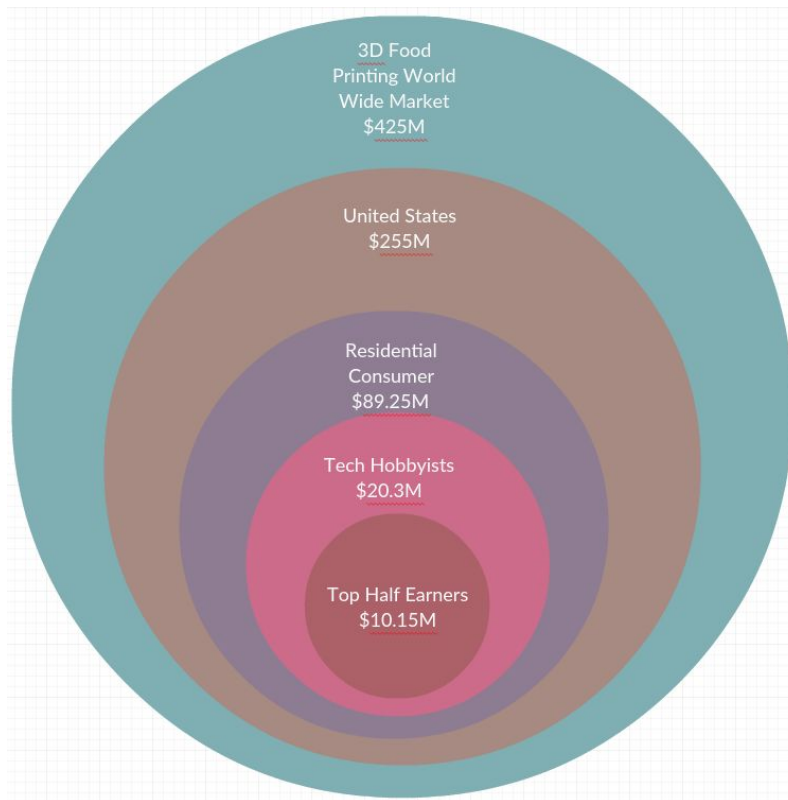
Figure 1: Estimation of Total Available Market

Needs

The Foodini 2.0 will find a home with those Tech Hobbyists who have a desire to comfortably explore their own creative expression with confidence and it will enable them to craft professional edible art that will impress their friends.

Trends

Gartner announced its top 10 key trends and technologies for the internet of things from 2019 to 2023[14]. IoT User Experiences are one of the newest trends that could have significant impact across all kinds of technologies. The Foodini 2.0 will capitalize on this trend by allowing its users to truly create unique combinations of shapes and flavors that have never been done before. They can then share their work with their friends and family on social media or upload their designs for others to experience.

Growth

According to Data Bridge Market Research the 3D food printing market is itself growing at a CAGR of 57.6%[15] during the forecast period of 2017 to 2024. Its major market drivers include increased demand for customized cakes and bakery items, increasing market need for mass customization, and increasing consumer preference for convenience food products [16]. The edible arts market is currently valued at $6.12B with 3D food printing only making up 6.9% of the market. Mass customization could be the driver that lets the Foodini 2.0 push much further into edible arts market.

Buyer behavior

Buyers of the Foodini 2.0 will exhibit the limited decision making type of behavior. They will likely be unfamiliar with the brand and class but because there is relatively low personal, social, and economic risk the only information seeking they'll express is product feature comparison.

Customer segments

Our research indicates the major residential customer segments are Tech Hobbyists, Home Bakers, and Parents.

Competition

The following are 3D food printer companies and their products that will directly compete with Natural Machines Foodini 2.0

- ChocEdge Choc Creator V2 Plus
- Print2Taste Procusini 3.0
- byFlow Focus

It is likely that the Foodini 2.0 will disrupt in some fashion and thus compete indirectly with gourmet restaurants and kitchen service retainers whose tasks include skilled and artistic labor.

Collaborators

Natural Machines will collaborate with a number of businesses for distribution, advertising, and branding. More details on this will be given in section 9, Marketing Strategy.

Macroeconomic forces

Given the political state of the world, macroeconomic forces could impact any business. Manufacturing and importing the machines could be impacted by tariffs. The level of education in a given workforce needs to be sufficient to create the machines but not so high that they drive costs up. Finally, any recession in world economy could slow the growth of the industry and impact the business if people can't afford to purchase the Foodini 2.0.

4. Competitor Analysis

The 3D food printing market is narrow, with few competing products. Currently, 3D food printing is almost exclusively used in the professional culinary market. The consumer market for 3D food printed food and 3D food printing hardware is in a nascent stage. Several companies are now beginning to move towards the consumer market. Our focus will be on the companies who are marketing consumer focused 3D printing hardware.

4.1. ChocEdge

4.1.1. Company Profile

The 3D chocolate printing technology used by Choc Edge was initially developed by university students at the University of Exeter in the UK. They aimed to produce a 3D printer that could produce objects in a material that had not been used before. The Choc Edge company was founded in 2012 by Dr. Liang Hao, a Lecturer at the School of Engineering, Computer sciences and Mathematics.[17] Headquartered at Exeter University's Innovation Centre and ChocEdge has between 11 - 50 employees.[18]

4.1.2. Product

The Choc Creator V2.0 Plus utilizes Additive Layer Manufacturing (ALM) technology to produce chocolate based food products. The ChocPrint Slicing program, included with the product, is used to create designs.

4.2. Print2Taste

4.2.2. Company Profile

Print2Taste was founded in 2014 and is based in Freising Germany. After running a successful Kickstarter campaign that raised €40,581, they produced their first 3D food printer model, the Brocusini. Print2Taste currently has 4 employees and is operating with venture capital funding. Their current product, the Procusini 3.0, holds a single cartridge, and can use any flowable type of food. Design tools are available through the Procusini Club website. Procusini Club membership is included with the printer.

4.2.3. Product
The Procusini 3.0 uses Fused Deposition Modeling (FDM) technology, to print using any flowable food from a single cartridge. The printer has an open air, portable form factor. The Procusini can print using any food that is pureed to the proper consistency.

4.3. byFlow

4.3.1. Company Profile
byFlow was founded in 2014 by Floris Hoff, an industrial product designer with more than 4 years experience in 3D Printing. byFlow is headquartered in the Netherlands. byFlow has obtained seed funding in the amount of €30K[19].

4.3.2. Product
The byFlow Focus uses Fused Deposition Modeling (FDM) technology to print using any flowable food from a single cartridge. The byFlow form factor is open air and foldable. Each printer comes with a 3 year license for byFlow Studio, an online 3D design platform that is used to create and upload patterns to the printer.

4.4. Competitor Overview

The Foodini is differentiated from the competition by it's enclosed form factor, greater food capsule capacity, a built-in oven and IoT functionality. Table 1 provides a detailed feature comparison.

Printer	Company	Prints	Print Volume (mm)	#Capsules Onboard	Fillable Capsules	# Capsules included	# nozzles included	# Nozzle sizes	WiFi Enabled	IoT	App	Portable	Oven Equipped	Price
Natural Machines Foodini	Natural Machines	Anything formable	50 x 165 x 120	5	Y	5	5	3	Y	Y	Foodini Creator	N	Y	$2,500
ChocEdge Choc Creator	Choc Edge	Chocolate	180 x 180 x 40	1	Y	1	2	1	N	N	Chocodraw	N	N	$3,399
Print2Taste Procusini	Print2Taste	Thick pastes	250 x 150 x 100	1	Y		?	?	Y	N	Browser Based	Y	N	$2,275
byFlow Focus	byFlow	Thick pastes	208 x 228 x 150	1	Y	10	4	2	Y	N	Browser Based	Y	N	$4,599

Table 1: Overview of Competitor Products

5. 5.Customer Analysis

Customer Analysis - Tech Hobbyists

Survey Data

An initial survey was sent out across a wide range of social media platforms to determine what sort of customers exist for a 3D food printer and associated IoT services. The survey was completed primarily by residential consumers. They self identified into three primary market segments: Tech Hobbyists, Parents, and Home Bakers. From this data we found that those who identified as Tech Hobbyists responded with the most affirmative interest in purchasing a 3D food printer and paying for a subscription service and individual designs (Figure 2). From there we selected those that also made $75,000 or more gross annual income.

Customer Analysis

Tech Hobbyists: 22.7%

- High Income

- Very likely to use IoT

- Spend more on subscription

- Spend more on individual design purchases

Home B̶̶̶̶rs: 27.3%

- High Income

- Likely to use IoT

- Less likely to subscribe

- Spend less on individual design purchases

Parent̶ 2.7%

- Lower Income

- Somewhat likely to use IoT

- Spend less on subscription

- Spend less on individual design purchases

Figure 2: Customer Analysis

The Survey helped to verify and quantify our customers' interest in the development of secondary IoT service options. Google Forms and IBM Cognos Analytics were used to find the following results of our survey.

- 60% have IoT devices in their homes
- 78% yes or maybe would use IoT devices to schedule meals
- 73% yes or maybe would download designs from the internet
- Willing to pay the following for subscriptions: ~$30, ~$100, ~$400 / month

Those who responded "yes" or "maybe" to purchasing a 3D food printer would pay the following prices for individual Gourmet Designs.

- Under $10:   100%
- $10-20:   68%
- $30:   48%
- $50-$100:   45%
- $101-200:   26%
- More than $200:   10%

Interview Data

We went on to further interview some of these customers to get a better idea of what they wanted from a 3D food printer.

Perceptions

Many of them had relatively few pre formed perceptions as most had not been aware that 3D food printing technology had been made available for consumers until they did our survey. Without knowing the details of the Foodini 2.0, many customers showed concerns over the quality of the food being printed and worried that the cartridges would cause a negative environmental impact similar to that of Keurig pods (K-cups). When these came up we assured them that the extruder technology of the Foodini 2.0 allows for you to fill your own dishwasher safe canisters with the fresh food you have in your home. However, this tells us that customers have a desire to be environmentally conscious when considering the purchase of a 3D Food Printer.

Values

An analysis of our customers helped us understand what values they get from our product. Functionally, people want to not just save time in the kitchen with the Foodini 2.0, but they want to be able to create the shapes and designs that they can imagine with impressive professional looking results. Emotionally, the Foodini 2.0 enables Tech Hobbyists to feel safe exploring their creative expression using a medium (food) that many of them felt insecure of with their skills unassisted. Now with our product they can not only not be ashamed of the food they prepare in the kitchen, but can rather be proud of it. Socially, the Foodini 2.0 will impress friends

and colleagues when they are inspired by the high quality and professional production of our customers gourmet art.

The Tech Hobbyist Persona

The Tech Hobbyist persona in Figure 3 will be used to test and refine our marketing assumptions as we create and roll out new marketing materials.
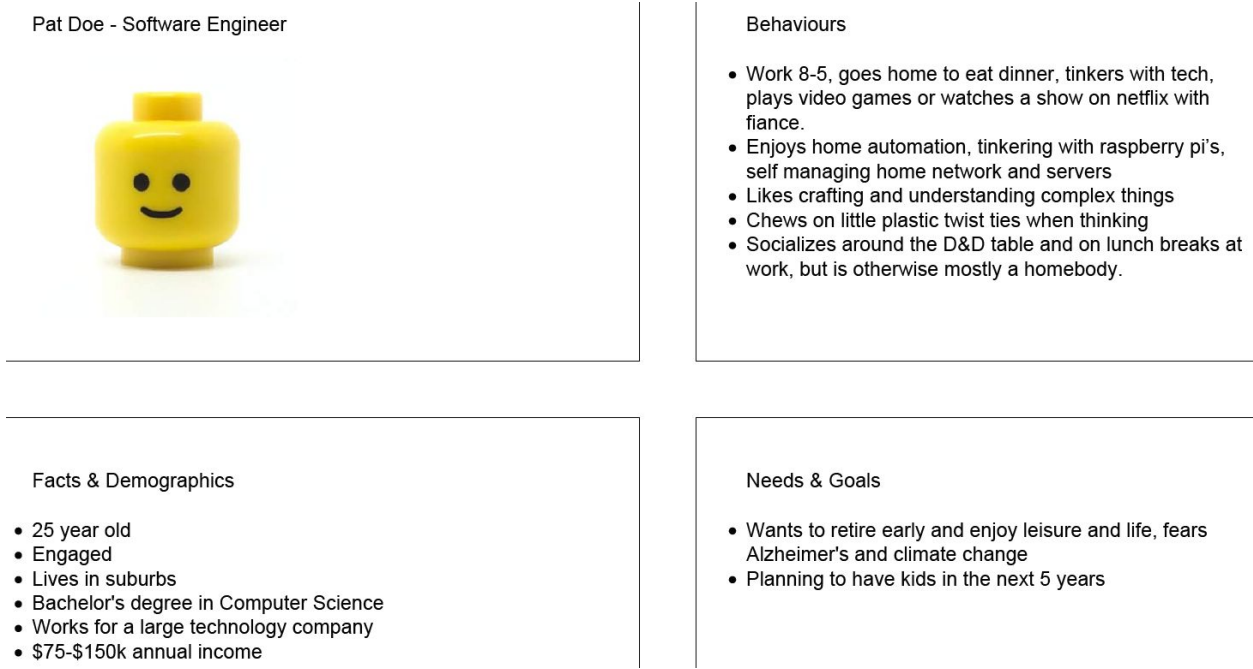
Persona

Figure 3: Tech Hobbyist Persona

6. SWOT Analysis

The SWOT analysis is a technique to help understand the Strengths, Weaknesses, Opportunities and Threats against the company, product and technology. The Strengths and weaknesses are focused on internal aspects, while Opportunities and Threats are focused on factors that are external. Figure 4 shows the strengths, weaknesses, opportunities and threats we identified.

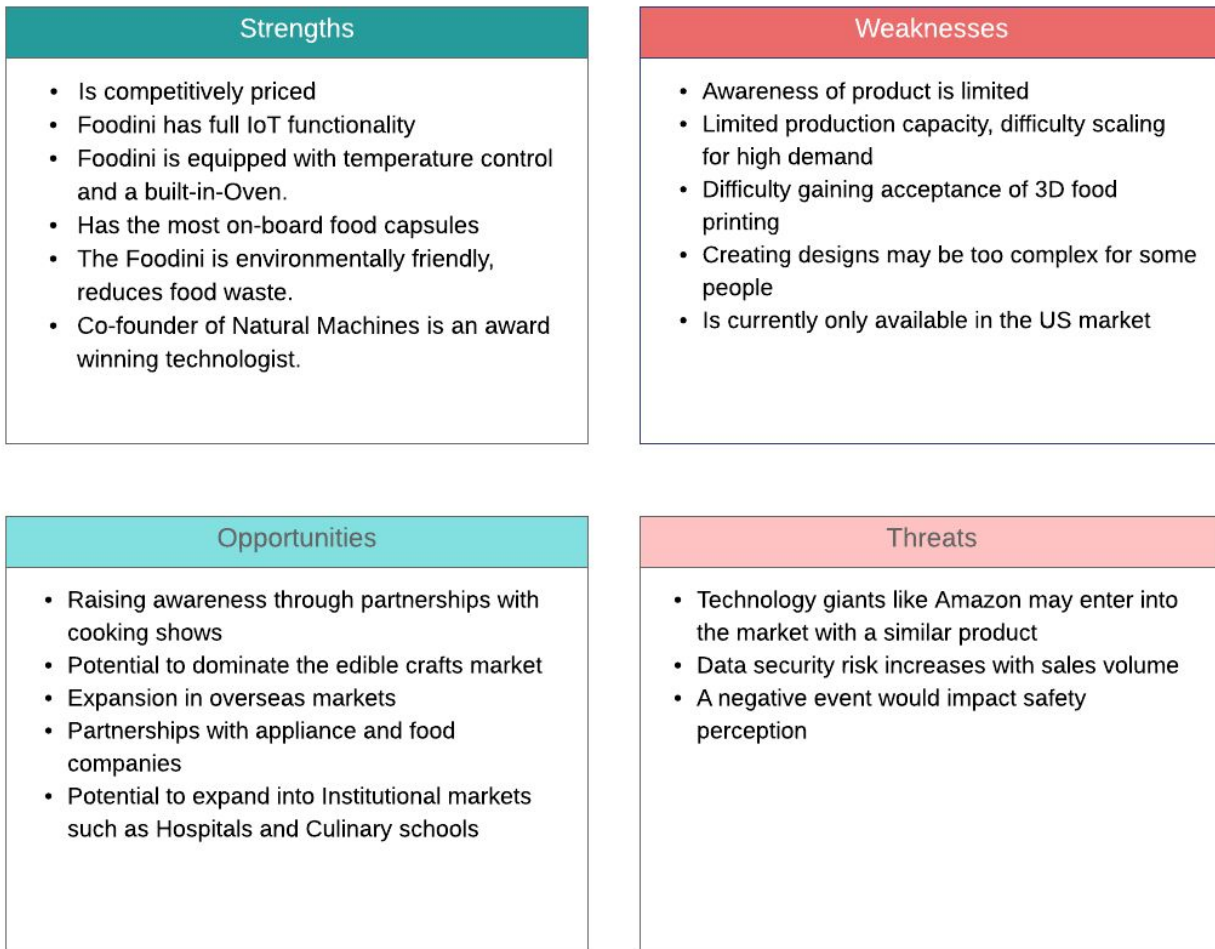| Strengths	Weaknesses
• Is competitively priced • Foodini has full IoT functionality • Foodini is equipped with temperature control and a built-in-Oven. • Has the most on-board food capsules • The Foodini is environmentally friendly, reduces food waste. • Co-founder of Natural Machines is an award winning technologist.	• Awareness of product is limited • Limited production capacity, difficulty scaling for high demand • Difficulty gaining acceptance of 3D food printing • Creating designs may be too complex for some people • Is currently only available in the US market
Opportunities	**Threats**
• Raising awareness through partnerships with cooking shows • Potential to dominate the edible crafts market • Expansion in overseas markets • Partnerships with appliance and food companies • Potential to expand into Institutional markets such as Hospitals and Culinary schools	• Technology giants like Amazon may enter into the market with a similar product • Data security risk increases with sales volume • A negative event would impact safety perception

Figure 4: SWOT Analysis

6.2. Strengths

The strength analysis helps us understand our advantages and positives. The Foodini 2.0 is affordable, with a price that places it mid-range among the competition. With five food capsules onboard, the Foodini provides the greatest ingredient flexibility on the market. Foodini's user interface is designed to provide a nimble and smooth experience for the user. Our product is the only product on the market with full IoT functionality, which allows users to upload recipes and control the device remotely. Foodini's temperature controlled food capsules and built-in oven allow the user to complete their 3D food creation in one step. Foodini's flexible food options make it environmentally friendly, allowing use of food which would otherwise be discarded, which reduces food waste. Finally, the experience of Natural Foods co-founder Lynette Kucsma, named as one of CNN's 'tech superheroes' to watch[7], provides a leadership edge over the competition.

6.3. Weaknesses

Because 3D food printing is a new concept, consumer awareness and acceptance is a major hurdle for any product in this market. A lack of awareness of 3D food printing in general, and our product specifically is a major weakness we must address. Any time a new food concept is introduced, gaining acceptance is a challenge. Our surveys showed that for some people, there is an "ick" factor when it comes to 3D printed food. Gaining trust and acceptance of 3D printed food is a must if our product is going to succeed. Our current production capacity is limited. For some users, operating a technical product is a challenge. Though we provide access to pre-made patterns through the Foodini Design Library, users will want to make their own creations. The complexity of creating a 3D design may be a barrier for some users, and as such is a weakness we must seek to address. As the demand for our product ramps up, scaling up our manufacturing will be a challenge. Finally, our choice to market exclusively in the United States exposes us to the risk of a volatile economy entering into recession, which will impact our sales.

6.4. Opportunities

One of our greatest weakness, a lack of awareness of 3D printed food, provides us with an opportunity. Showcasing this new food creation technique and our product on cooking shows, such as Master Chef, Top Chef or Cut Throat Kitchen, will create buzz and win over new customers. The edible crafts market is ripe for innovation and 3D food printing can be the next frontier. Because our product is uniquely designed to integrate into the home kitchen, we can gain a foothold in the home market and dominate the edible crafts market. As we gain a foothold in the home market, there is an opportunity to partner with a major appliance manufacturer, which will give us more name recognition and exposure, bringing us into consideration any time a consumer shops for new kitchen appliances. A logical step as we increase our sales and revenue will be a move into overseas markets, which will greatly increase our potential market. Finally, expansion into institutional markets, such as hospitals and culinary schools, will both increase awareness and expand our customer base.

6.5. Threats

Our success could be our downfall if greater acceptance and adoption of 3D food printing attracts the attention of other technology giants. A company like Amazon could create a similar product and challenge our position in the market using their already dominant marketing power. Equipping our product with IoT functionality provides undeniable benefits to consumers, however hosting the services necessary for IoT functionality puts us in the business of data storage, and IoT makes the Foodini appliance itself a potential hacking target. A breach of data security, or IoT based attack, could erode or even destroy consumer confidence in our product. Finally, any company that deals with food must consider food borne illness as a serious threat. One negative event related to the Foodini, or to 3D food printing, could destroy any confidence we've gained from our consumers.

7. Marketing Objectives and Goals

Our core objective is to create a long-term competitive advantage for the Foodini division, so that it can continue indefinitely to create value for its customers. The 'Prospector' strategy archetype most closely fits our approach for our Tech Hobbyist customers. There is a higher initial development cost however we believe this is necessary, in light of the need to keep-up with the rapidly growing 3D printer market.

In the near-term we will launch an elegant product with a refined industrial design, and invest in excellent customer service. In the first year our objective is to sell 1,600 units at $2,500 each. We will foster the user community through design library subscriptions and promotional activities, including Maker Faires, Hackathons, Meetups, and Trade Shows. We'll show off the product at these events. This will foster a forum for early adopters to be creative, learn from one another, and provide valuable feedback to our internal engineering team.

Longer term, beyond year 3, the Foodini division is projected to have paid down its debt burden and be profitable. The objective is to continue design innovation, and benefit from the experience curve in manufacturing to improve both quality and the profit margin. Our objective is to meet or exceed the projected 57% growth rate of 3D printing as an industry.

Revenue					
	2020	**2021**	**2022**	**2023**	**2024**
Units	1,600	2,512	3,944	6,192	9,721
Price	$2,500.00	$2,500.00	$2,500.00	$2,500.00	$2,500.00
From Sales	$4,000,000.00	$6,280,000.00	$9,859,600.00	$15,479,572.00	$24,302,928.04
Designs Subscription	$288,000.00	$452,160.00	$709,891.20	$1,114,529.18	$1,749,810.82
Costs					
Manufacturing	$3,500,000.00	$4,640,000.00	$6,429,800.00	$9,239,786.00	$13,651,464.02
Personnel	$1,500,000.00	$1,650,000.00	$1,815,000.00	$1,996,500.00	$2,196,150.00
Advertising	$800,000.00	$628,000.00	$985,960.00	$1,547,957.20	$2,430,292.80
Finance Charges	$98,280.00	$116,747.80	$37,318.88	0	0
Profit					
	-$1,512,000.00	-$185,840.00	$1,338,731.20	$3,235,721.38	$7,774,832.03

Table 2: Five Year Projected Budget and Revenue

With a Positive return on investment after the initial 5 year period, looking beyond the Foodini division, Natural Machines will be in a position to service adjacent market segments

such as Home Bakers, and institutions such as Hospitals. The division will also have enough momentum to offer the product to overseas markets including Europe, Australia, and Asia.

8. Marketing Strategy

The Marketing strategy for Foodini 2.0 will be calibrated towards getting it to our target customer and increasing our customer base over time. Our target market for Foodini 2.0 is the Tech Hobbyist. Interview feedback from our target customers was used to define and set these marketing objectives. These strategic objectives will be centered around the product itself, the channels of distribution, pricing, and promotions.

Product

Foodini 2.0 is a market driven 3D food printer. Based on feedback from Tech Hobbyists, the Foodini R&D team identified and developed several new features. Foodini 2.0 is updated to include full IoT functionality, a more friendly digital interface, and a built in oven. Add-on purchase options now include subscription based access to the Foodini Design Library and individual design purchases. These add-on services will enable the Tech Hobbyist to quickly be successful using the Foodini. To encourage reluctant purchasers and increase confidence in the product, Foodini 2.0 will have a 60 day, no questions asked return policy, in conjunction with a 2 year warranty.

Price

Foodini 2.0 will be priced in the mid range, relative to our competitors. The Tech Hobbyists we interviewed indicated that they are willing to pay $1,500 to $3,500 for this technology. Our competitors products are priced from $2,200 - $4,500. By pricing the Foodini 2.0 at $2,500 we will attract value conscious consumers while also maintaining profitability. The Tech Hobbyists we interviewed indicated that they are willing to pay for access to designs. To meet this need, we will be offering a subscription for access to the Foodini Design Library for $9.99 per month. We will also offer individual design purchases, priced at $9.99 each. These design purchase options are strategically priced to encourage movement into a subscription option after the purchase of an individual design.

Promotion/ Customer Acquisition

To create awareness of the Foodini 2.0 and attract our target market, we have selected a variety of platforms for initial promotion of the Foodini 2.0. These platforms were chosen as the best channels for reaching our target consumer, the Tech Hobbyist.
- Booths at trade shows such as CES will showcase the Foodini 2.0
- We will monitor and participate in online tech forums

- Booth at the Maker Faire will demonstrate the capabilities of Foodini
- Sponsor Hackathons and 3D Printer User Groups to build name recognition
- The Natural Machines website will highlight the Foodini 2.0

Place

Based on our interviews with Tech Hobbyists, we have strategically identified the distribution partners for Foodini 2.0. In addition to distributing the Foodini 2.0 through through our website, we will partner with Newegg and TigerDirect, which were named by Tech Hobbyists as places they shop. When our sales through these partners reaches a sufficient volume, we will look to add Amazon as an additional distribution partner.

9. Target Market and Positioning

Positioning

The 3D food printing industry is in the early stages, with competition ramping up. As detailed in section 4, Competitor Analysis, we will be positioning Foodini 2.0 against products with similar functionality; ChocEdge, Procusini and byFlow. The Foodini is well positioned against the competition, having a combination of more versatility and an affordable price. Foodini 2.0 is currently the only 3D food printer with IoT functionality. With a no questions asked return policy and 2 year warranty, Foodini stands out amongst the competition as a trustworthy product. We believe that IoT and the Foodini Design Library will make Tech Hobbyist connect emotionally to Foodini 2.0. The vast collection of designs accessible in the Foodini Design Library will enable the Tech Hobbyist to create fun food creations that they can be proud of.

Figure 5: Product Positioning Map

Target market

As detailed in section 3, Market Definition, we will be focusing primarily on the US residential consumer market with an even more specific focus on the Tech Hobbyist. These are people who love technology and are willing to spend the most to acquire and use a new

technological innovation. This target population will be between the age of 18-54 years and they earn between $75-$150k.

10. Product and Brand Management

10.1. Brand Management

The Foodini is a unique product that is pre-chasm in its market acceptance. It is being marketed to Tech Hobbyists, as innovators. The objective is to build brand equity, across all customer interactions or 'touch points'. The logos and symbols will be trademarked globally to defend the brand, and internal design guidelines and sales and support training will be used to create a consistent brand look-and-feel. Brands are owned by the customers, and the Foodini 2.0 is part of an innovation cycle within the division that will help keep the promise of Natural Machines and the Foodini division.

The use of premium materials in the products' construction will help build brand image. Responsive customer service will win early-adopter loyalty and influence the influencers.

The Foodini Design Library will require upfront investment and collaboration with chefs to build and maintain a robust offering that will continually delight our subscribers.

10.2. Product Management

The product management role will interface with both development and sales to ensure a successful launch. The product will be showcased at Maker Faires, Hackathons, and Trade Shows to generate enthusiasm. Regular communication with distribution partners and other members of the cross-functional team will help keep sales on target.

From the perspective of Porter's Five Forces, the first few years for the product could be volatile. There could be supply chain disruptions related to Brexit, the China - US trade dispute or competitive factors. The threat of substitution is somewhat high, if competitors imitate the Foodini's unique characteristics. Similarly the threat of new entrants servicing the Asian or other unserved markets could become a headache down the road. In fact all 5 forces could become headwinds for the Foodini and that is why it is important to launch successfully, and be reactive to changing market conditions.

A dashboard with customer value driver inspired KPI's will be used to drive process improvement, unit sales, and customer satisfaction and delight.

11. Pricing Management

Value-based pricing with a skimming approach will maximize key customer value drivers, while maintaining a tolerable price point. We are aiming for the Enthusiast 3D printer range, in terms of pricing, as described by the publication 3D Insider [20] and thus it is imperative that the division has enough revenue and budget to deliver a solid product.

From a 3 C's perspective we are priced competitively within the Enthusiast segment[21] at $2,500. Despite high unit one costs of $1.5M, our profit margin for subsequent units will be healthy. Further gains in the profit margin will be achieved through improvements in the manufacturing process that will be gained as we climb the experience curve.

12. Distribution Management

Initially, Foodini 1.0 targeted the commercial market with high end restaurants as the prime focus. Foodini 2.0 targets the residential market, with Tech Hobbyists as our focal point. Since we are entering a new market, a revamp of the Foodini 1.0 distribution management system is necessary. In the new strategy, we are aiming at tech enthusiasts home users, especially those who have a 3D printer and would be interested in exploring a 3D food printer.

Our product, Foodini 2.0, will utilize our existing distribution system, direct sales from the Natural Machines website as one sales channel. In addition, we will distribute through well regarded high-tech online stores, Newegg and TigerDirect. When we reach a critical volume, we will expand our distribution network to include Amazon.

The tech forums mentioned above are some of the most visited places by tech enthusiasts who are exploring new technologies. In monitoring and participating in these forums, we can better understand our early adopters and use this data to inform future marketing and product redesigns.

13. Communications Management

The Communication strategy for Foodini 2.0 aims to rapidly increase sales and build a strong brand. The targets for the communication plan are the segments identified in the marketing plan: technology hobbyists, including those who will serve as potential partners in co-developing the technology to improve it further.

13.1. Communications Strategy

The communication strategy in the initial phase of 5 year plan will focus on brand building. It is important for a product to build its Brand Equity. Our goal is to inspire Tech Hobbyists who currently have a 3D printer to become Foodini 2.0's early adopters. These target early adopters can help co-develop, upload new patterns on the Foodini forum, and can build a strong array of positive word of mouth through their personal blogs and other communication platforms.

This will enable us to capitalize on all three aspects of our customer's core values:
1. Functional: Saving time in kitchen and enabling creation of unique shapes and designs.
2. Social: Impressing colleagues and family at home and at social events with gourmet edible art.
3. Emotional: Feeling pride in making enjoyable creations with the latest technology.

13.2. Advertising and Promotion

Our promotional efforts will include participation in tech user forums; showcasing the product at trade shows, such as CES and Maker Faire; sponsoring Hackathons and 3D printing user groups; and running a targeted ad campaign on the internet. Since we are only targeting the early phase of the technology life cycle, the communication strategy will be periodically reviewed and will be completely revamped after the 5 year initial base expansion plan is complete.

14. Implementation and Control

14.1. Implementation

The Foodini Marketing strategy will be performed on a schedule. Table 3 details the major steps needed to perform this marketing plan.

Implementation Schedule

Activity	Date(s)/Frequency
Form cross-functional team between development and sales	March 2019
Create Brand Standards and trademark logos and symbols	March 2019
Create design library	April 2019, ongoing
Sales and Support Training	April 2019

Online targeted ad campaign	May 1, 2019 - Dec 31, 2019
Hackathon Sponsor	May 2019, Monthly
Host 3D Printing User Group	July 2019, Monthly
Maker Faire Booth, NY	9/21/2019 - 9/22/2019
CES Las Vegas, Eureka Park Marketplace Booth	01/07/2020 - 1/10/2019

Table 3: Implementation Schedule

14.2. Control

Table 4 details the control activities that will be performed to ensure that our marketing targets are being achieved and objectives obtained.

Table 2 Control Activity

Activity	Performed By	Date/Frequency
Track Budget	Accounting	Daily
Reconcile Cash Flow	Accounting	Monthly
Monitor KPI Dashboard	Management	Weekly
Communicate with distribution partners	Logistics	Weekly or as needed
Monitor Communication Effectiveness	Marketing	Quarterly
Monitor Customer Feedback	Support	Monthly
Track Target Market Sales	Marketing	Monthly
Track Market Milestone achievement	Marketing	Quarterly

Table 4: Control Activity

15. Conclusion

We believe that Foodini 2.0 can become the 3D Food Printer of choice for Tech Hobbyists if we follow this marketing strategy. The ultimate goal of this company is to expand its market rapidly and establish itself as a leader in the food and technology industry. As a startup, we believe that launching the product in the residential market, targeting Tech Hobbyists will position us to make a lateral move into adjacent markets in future. For any high tech product, 5 years is a enough time for substantial market shifts to occur. At 5 years, we will review and revamp our marketing plan, taking into account the inevitable changes that will have taken place in the market. As the market grows, it is likely that larger tech players will step in and influence this industry. We plan to do a review of our marketing strategy periodically and adjusting in response to these challenges. After 5 years, we will explore the potential to collaborate with a major appliance company as our product becomes a standard feature in home kitchens.

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[3] "Global 3D Food Printing Market - Data Bridge Market Research." https://databridgemarketresearch.com/reports/global-3d-food-printing-market/. Accessed 17 Mar. 2019.

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[9] "Global 3D Food Printing Market - Analysis and Forecasts - 2018-2023." https://bisresearch.com/industry-report/global-3d-food-printing-market-2023.html. Accessed 24 Feb. 2019.

[10] https://qz.com/928235/the-business-of-creativity-is-worth-44-billion/ Accessed 22 Feb 2019.

[11] "Millennials Are Ready For Crafting, But Is The $36B Crafting Industry ...." https://www.forbes.com/sites/pamdanziger/2018/07/08/millennials-are-ready-for-crafting-but-is-the-36b-crafting-industry-ready-for-them/#2380837b3a2c Accessed 22 Feb 2019

[12] " 3D Food Printing Market : Global Demand Analysis & Opportunity Outlook 2024" - Research Nester https://www.researchnester.com/reports/3d-food-printing-market-global-demand-analysis-opportunity-outlook-2024/272 Accessed 22 Feb 2019

[13] " 3D food printing market expected to grow at a CAGR of 54.75% between 2018 and 2025" - Newswire - go.galegroup.com http://go.galegroup.com.proxy.lib.pdx.edu/ps/i.do?id=GALE%7CA491254244&v=2.1&u=s1185784&it=r&p=PPCM&sw=w Accessed 22 Feb 2019

[14] Gartner's top 10 IoT trends for 2019 and beyond - Network World from IDG https://www.networkworld.com/article/3322517/internet-of-things/a-critical-look-at-gartners-top-10-iot-trends.html Accessed 22 Feb 2019.

[15] "Global 3D Food Printing Market – Industry Trends and Forecast to 2024" - DataBridge Research Center https://databridgemarketresearch.com/reports/global-3d-food-printing-market/ Accessed 22 Feb 2019.

[16] Global 3D Food Printing Market – Industry Analysis, Size, Share, Growth, Trends and Forecast by 2024 - Market Talk News

https://markettalknews.com/global-3d-food-printing-market-industry-analysis-size-share-growth-trends-and-forecast-by-2024/ Accessed 22 Feb 2019

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http://empslocal.ex.ac.uk/people/staff/lh244/. Accessed 24 Feb. 2019.

[18] "Choc Edge | LinkedIn." https://www.linkedin.com/company/choc-edge. Accessed 24 Feb. 2019.

[19] "3D By Flow | Crunchbase." https://www.crunchbase.com/organization/3d-by-flow. Accessed 15 Mar. 2019.

[20] "3D Printer Price: How Much Does a 3D Printer Cost? - 3D Insider." https://3dinsider.com/cost-of-3d-printer/. Accessed 17 Mar. 2019.

[21] "Marketing Theories - Porter's Five Forces - Professional Academy." https://www.professionalacademy.com/blogs-and-advice/marketing-theories---explaining-porters-five-forces. Accessed 16 Mar. 2019.

17. Appendix: Market Research Log

17.1. Initial Value Propositions
We initially began this marketing plan by considering the following products.
Amazon 3D All Food Printer (Home Market):
> **The Product:** Choose from an array of recipes including your favorites from leading brands and famous chefs.
> Adjust sweetness or savory levels for your tastes, or design something entirely new and sell it on our digital menu.
> Save your favorites for quick reference.
> You can schedule a meal in advance, or eat whenever you feel hungry.
> It integrates seamlessly with Alexa voice operation commands and can be configured to automatically purchase more supplies so you never have to worry about dinner again.
>
> **Value Proposition:** At the touch of a button, Amazon Home Services brings you gourmet catered meals crafted in your home for up to 6 people at once from their revolutionary "3D All Food Printer".

Foodini 3D Food Printer by Natural Machines (Restaurant/Bakery/Food Service/Home Market?):

> The Product:
> Foodini is a 3D food printing appliance, designed to be clean, simple to use, and flexible.
>
> Foodini includes 5 food cartridges that can be filled with any food that lends itself to 3 dimensional construction. The 5 cartridge design allows for multiple ingredients to be used in a single creation, with cartridges switching automatically as needed. 5 food nozzles in 3 different sizes accommodate a variety of food textures and food design features. The included Foodini Creator software is used to design unique food shapes. Foodini creator can be used on a laptop, tablet, or directly on the Foodini's touchscreen. Foodini Creator includes shape libraries to start designs and recipes, or users can create them from scratch.
>
> Value Proposition:
> From meats to sweets, Foodini helps you create exquisite food that will wow your customers and keep them coming back for more.
>
> Questions for Class:

Would you consider a 3D food printer for home use?
Would uniquely shaped food items, sweet or savory, impress you at a restaurant?

Fluoride Ion Battery (EV Industrial Market):

The Product :
Fluoride ion battery or FIB is a new form of battery technology that operates on liquid electrolytes. A new type of fluoride-ion battery that works at room temperature. Fluoride-ion battery technology usually operates at high temperatures in solid state, roughly 150 degrees Celsius or more. But with new technology, battery chemistry with a liquid fluoride-ion solution based on "dry tetraalkylammonium fluoride salts in ether solvents", and a copper–lanthanum trifluoride cathode has been successfully experimented to charge and discharge at room temperature.

With an edge, fluoride-ion batteries have around 10 times more energy density than lithium-based units. Unlike lithium-ion batteries, FIBs do not pose a safety risk due to overheating, and obtaining the source materials for FIBs creates considerably less environmental impact than the extraction process for lithium and cobalt,

Value Proposition:
Do you want a reliable energy source that is eco-friendly? Durable? And cost effective? FIB gives you long lasting power you always wanted. Honda - Start something special!

17.1.1. Developments:

After some evaluation and discussion with the professor we determined that it would be better to focus on a 3D food printer which didn't claim to create savory items as well as sweet. This was largely due to much of the early feedback rejecting the idea outright that the technology existed and that it was capable of producing worthwhile food. Research would later show that our assumptions and the feedback we initially got was misplaced. We ended up circling back around to including savory items as well as including the cooking capability of the print plate including an oven.

17.2. Research Notes
Jan 8: Reviewed an article regarding Fluoride Ion Battery (BV)
Honda, NASA, & Caltech Claim Fluoride Battery Breakthrough -
https://cleantechnica.com/2018/12/08/honda-nasa-caltech-claim-fluoride-battery-breakthrough/

Jan 11: Reviewed journals on Honda's influence on Fluoride ion battery (BV)
Honda presents new battery chemistry that could succeed lithium-ion:
https://www.greencarreports.com/news/1120563_honda-presents-new-battery-chemistry-that-could-succeed-lithium-ion

The Electrochemical Society
Advancing solid state & electrochemical science & technology
Honda's Battery Breakthrough :
https://www.electrochem.org/redcat-blog/hondas-battery-breakthrough/

Jan 15: Reviewed few another journals regarding Fluoride ion battery (BV)
Fluoride-ion battery runs at room temperature
New liquid electrolyte nudges high-energy-density device toward application : by mitch jacoby
Dec-10-2018,
https://cen.acs.org/materials/energy-storage/Flouride-ion-battery-runs-room/96/web/2018/12

Jan 25 : Interview with Cloudforest chocolatier on Start st. (OA)

Jan 28 : Literature Review on Fluoride Ion Battery (BV)
Room-temperature cycling of metal fluoride electrodes: Liquid electrolytes for high-energy
fluoride ion cells, Davis V.K., Bates C.M., Omichi K., Savoie B.M., Momcilovic N., Xu Q., Wolf
W.J., (...), Jones S.C.
(2018) *Science*, 362 (6419) , pp. 1144-1148.
http://science.sciencemag.org/content/362/6419/1144

Feb 3: Compiled list of comparable printers, created comparison matrix (RS)
https://docs.google.com/spreadsheets/d/1JZKOULNLH508Nn6ITQpMDGFKNA0Dj35_LtqQO0A
tti8/edit#gid=0
Started narrowing down potential competitors. Very new players in the market had little to no
information available and weren't realistically competitive with the Foodini. Decided to focus on
ChocEdge, Print2Taste (Procusini) and ByFlow as competitors.

Feb 3: Reviewed academic literature about 3D Food printing
"I can't get past the fact that it is printed": consumer attitudes to 3D printed food
Packaged food eyeing 3D printing but progress uneven - analysis
Consumer Food Trends: Tapping into Personalized Foods
3D Food Printing May Provide Way To Feed The World
A Review of 3D Food Printing Technology
3d printing technologies applied for food design: Status and prospects
Extrusion-based food printing for digitalized food design and nutrition control

Research used to inform some of our initial survey and interview questions. Research showed
consumer hesitation to embrace 3D printing food, so we explored this further with our questions.

Feb 8: Interview with a Professional Chef, a culinary pass out from Miami Culinary Institute (BV)

Feb 22: (DS)
   - **Research on US Creativity Market**
     https://qz.com/928235/the-business-of-creativity-is-worth-44-billion/

- **Edible Crafts Market:**
  https://www.forbes.com/sites/pamdanziger/2018/07/08/millennials-are-ready-for-crafting-but-is-the-36b-crafting-industry-ready-for-them/#2380837b3a2c
- **Market Research Reports and Forecasts on 3D Food Printing:**
  Mordor Intelligence
  https://www.mordorintelligence.com/industry-reports/food-3d-printing-market
  DataBridge Market Research
  https://databridgemarketresearch.com/reports/global-3d-food-printing-market/
  Grand View Research
  https://www.grandviewresearch.com/industry-analysis/3d-printing-industry-analysis
  BIS Research
  https://bisresearch.com/industry-report/global-3d-food-printing-market-2023.html
  Research Nester
  https://www.researchnester.com/reports/3d-food-printing-market-global-demand-analysis-opportunity-outlook-2024/272
  Research and Markets
  https://www.researchandmarkets.com/research/j3kmz7/global_525?w=4
- **3D Food Printing market growth rate:**
  http://go.galegroup.com.proxy.lib.pdx.edu/ps/i.do?id=GALE%7CA491254244&v=2.1&u=s1185784&it=r&p=PPCM&sw=w
- **Market Trends:**
  Gartner Research
  https://www.networkworld.com/article/3322517/internet-of-things/a-critical-look-at-gartners-top-10-iot-trends.html
- **Market Drivers:**
  https://markettalknews.com/global-3d-food-printing-market-industry-analysis-size-share-growth-trends-and-forecast-by-2024/
- **Market Share Index:** http://www.rogerjbest.com/nav.cfm?A=N&C=3&P=1#
- **Competitive Landscapes:**
  http://go.galegroup.com.proxy.lib.pdx.edu/ps/i.do?&id=GALE|A552882712&v=2.1&u=s1185784&it=r&p=PPCM&sw=w
- **Academic Papers:**
  Extrusion Speed vs Print Speed: Fused Deposition Modeling expected to hold more than 43% share of the total 3D Food, this is good as the Foodini uses Fused Deposition Modeling (extrusion).
  https://www-sciencedirect-com.proxy.lib.pdx.edu/science/article/pii/S0924224417300821
  3D Food Printing Market shows trend towards partnerships and collaborations to introduce new technologies or further enrich the existing product portfolio.
  http://go.galegroup.com.proxy.lib.pdx.edu/ps/i.do?&id=GALE|A544603254&v=2.1&u=s1185784&it=r&p=PPCM&sw=w
  Sustainability and Food Waste Reduction from 3D Printed Foods is significant and could lead to much less food waste and much more people fed.
  https://core.ac.uk/download/pdf/41817540.pdf

Economic model for the evaluation of 3D Food Printing (Also impacts to economics, social perspectives, sustainability, and supply chains).
https://ill.lib.pdx.edu/PDF/477500.pdf
- **Customers:**
Explores how 3D food printing would be useful in a wide range of customer areas including rehabilitative industries like hospitals.
- https://www.forbes.com/sites/tjmccue/2018/10/30/3d-food-printing-may-provide-way-to-feed-the-world/#4ae854d55817

Feb 23(OA): Spoke with interviewee again about recommended retailers. Interviewed prospective customers.
https://sharaevans.com/3d-food-printers-a-next-generation-kitchen-appliance/

Feb 24: Obtained company background from NaturalMachines website (RS)
https://www.naturalmachines.com/about-us
Solidified Natural Machines as the company we wanted to be. Company is at a level of maturity that makes it a realistic player in the 3D food printer market.

Feb 23: Obtain company financials and other info from Crunchbase and other sources (RS)
https://www.crunchbase.com/organization/natural-machines
https://www.kickstarter.com/projects/456763017/designed-for-healthy-eating-foodini-a-3d-food-prin?ref=discovery
http://fortune.com/2015/02/26/3d-food-printing/
Searching for holistic financial data about Natural Machines. No single source revealed the entire picture. Crunchbase looked promising, but further research reveals that the company had self funding and a large VC investment, plus a failed kickstarter project that was not reflected in the Crunchbase data.

Feb 24: Researched NaturalFoods founders (RS)
https://www.linkedin.com/in/emilio-sepulveda-42145b/
https://www.linkedin.com/in/lynettekucsma/
https://www.cnn.com/2015/01/20/business/7-tech-superheroes-watch-2015/index.html
Used founder data to inform company background.

Feb 24: Researched Choc Edge (RS)
https://www.crunchbase.com/organization/choc-edge#section-overview
Researching ChocEdge financials and any other data. ChocEdge is unique among the competitors in that it was born out of a University and is still headed by a professor who kept his day job.

Feb 24: Research Choc Edge founder (RS)
http://empslocal.ex.ac.uk/people/staff/lh244/
Finding data about professor who founded ChocEdge.

Feb 24 - (OA) Weaknesses of 3d food printer -
https://www.3dprinteros.com/3d-printed-food-just-good-real-deal/

Feb 24 (OA)- 3D Printed Sprouting Dishes (Chia-food) -
https://www.eater.com/2015/3/7/8167791/watch-3d-printed-crackers-sprout-into-a-miniature-salad

Feb 24 (OA)- Foodini interview with Marketing Manager -
https://sharaevans.com/3d-food-printers-a-next-generation-kitchen-appliance/

Feb 24 (BV) Interviewed a couple Tech Hobbyists (Senior Tech. Support Engineers) from Microsoft Corporation.

Feb 25 (RS) - Obtained sample 3D food printer industry report
https://bisresearch.com/industry-report/global-3d-food-printing-market-2023.html
Report sample provided a larger picture of the 3D food printer market. Unfortunately, all of the statistical data was redacted since this is a sample, but the foundational narrative helps inform our direction for competitor analysis and SWOT.

Feb 26 (OA) -
https://www.nytimes.com/2019/02/21/t-magazine/3d-printed-food-dessert.html?action=click&module=Features&pgtype=Homepage

March 3 (RS)
Find closest comparable for food or meal based subscription
https://www.blueapron.com/pages/pricing
Looking at what a food capsule subscription plan might look like. Assemble it yourself at home plans like Blue Apron are the closest thing in the market that exist.

March 3 (RS)
Mission or value statements from competitors
https://www.3dbyflow.com/company
http://chocedge.com/faq.html
https://www.procusini.com/unser-unternehmen/
Using this information for competitor profiles.

March 4(OA) :
http://foodink.io/
https://www.youtube.com/watch?v=UWOVvSfSjCM
3D printed restaurant

March 4(RS):

Interview with Tech Hobbyist
In person interview with Tech Hobbyist who currently has a 3D food printer. At this point, we're pretty far along but the interview helps solidify the emotional aspects of our target customer, in particular pride in creating things with technology.

March 5(OA) :
Positioning analysis with Choc Edge and ByFlow
https://www.3dbyflow.com/home-en

March 5, 2019 (BV)
6 challenges of 3D Food printing -
https://www.fabbaloo.com/blog/2014/1/8/the-six-challenges-of-3d-food-printing.html

March 5, 2019 (BV)
3D Printers for Food technology and Applications
https://turbofuture.com/consumer-electronics/3D-Printers-For-Food-Technology-and-Applications

March 5, 2019 (BV)
3D food printer by college of Food Technology
https://www.slideshare.net/RohanDeshpande3/3-d-food-printing

March 5, 2019 (BV)
10 Disadvantages of 3D Printing Technology -
https://3dinsider.com/3d-printing-disadvantages/

March 5, 2019 (BV)
A guide to 3D Printed Food – revolution in the kitchen?
https://www.3dnatives.com/en/3d-printing-food-a-new-revolution-in-cooking/

March 5, 2019 (BV)
3D Printing - Risks and Opportunities
https://www.oeko.de/oekodoc/1888/2013-532-en.pdf

March 5, 2019 (BV)
Limits of 3D Printing
https://hbr.org/2015/06/the-limits-of-3d-printing

March 5, 2019 (BV)
3D Opportunity serves it up
https://www2.deloitte.com/insights/us/en/focus/3d-opportunity/3d-printing-in-the-food-industry.hzml

March 5, 2019(MO)
3D Printer guid 2018
https://all3dp.com/1/best-3d-food-printer/

March 5, 2019 (MO)
Foodinni Business Model
https://www.slideshare.net/funk97/foodini-business-model

March 5, 2019(MO)
Natural Machine
https://www.foodnavigator-usa.com/Article/2015/10/30/Natural-Machines-co-founder-explains-merits-of-the-Foodini-3D-printer#

March 5, 2019 (MO)
3D Printer in a commercial Kitchen
https://www.nytimes.com/2016/10/24/business/commercial-kitchens-getting-a-taste-of-3-d-printed-food.html

March 5, 2019(MO)
3D Printer Companies
https://en.wikipedia.org/wiki/List_of_3D_printer_manufacturers

March 7, 2019 (OA)
Use of tech
https://www.thelocal.se/20190305/sweden-to-test-3d-printed-food-in-elderly-care-homes?fbclid=IwAR0Mw8npqwrgTkRy2GeoScD-w9vbGcpiq48WU4RtcUdV97UN-TtEn__mbQk

March 8, 2019 (OA)
How to approach competitive analysis :
https://medium.com/pminsider/real-competitive-analysis-is-about-learning-to-love-your-competitor-15e45b9ef10a
Adoption curves
http://earlywarn.blogspot.com/2010/06/technology-adoption-in-hard-times.html

17.3. Meeting Notes

ETM 555
Technology Research Group Meeting Agenda
3/3/2019
Attending: Rita, Bharat, Dave, Oneshin, Michael

Review and Practice Presentation

Subscription Details from [Use case doc](#)
- Individual Design Purchases, Subscriptions for full access to design library, Subscription to Premium (Professional) Design Library, Subscription for prefilled ingredient canisters.

Comma.ai group feedback considerations

2/24/2019
Attending:Rita, Bharat, Dave, Michael, Oneshin

Recap from last meeting and feedback from Prof on 2/19/19

Workshop Dress Rehearsal Presentation Slides:
https://docs.google.com/presentation/d/1GjxDNkjDPWECPDi1_0BWJVjSzA3qg5IT268S-zVlRZc/edit#slide=id.p

Any questions or group decisions for paper?
SWOT Analysis (should aim for 3 or more per section):
    Strength (Internal):
- Foodini is known by 33% of those who were asked to name a Food Printer brand.
- Fused Deposition Modeling expected to hold more than 43% share of the total 3D Food Printing Market
- Significant impact from sustainable packaging
- Reduce food waste in homes

    Weaknesses (Internal):
- ~~Power consumption:~~ can be behind the curtain.
- Small company: 18 employees, may have difficulty meeting expanding requests
- $800K bootstrapped by founders at potential financial risk
- Knee Jerk Reactions (See slack/Company FAQ on Taste)

    Opportunities (External):
- Only 6% of people could name a 3D Food Printer brand means the market is open for a Natural Machines to establish themselves as the leader and primary innovator.
- Combining 3D printing technology with other tech like IOT, and possibly heating and cooling presents new 'cool' creative options for innovative cooks

    Threats (External):

- Competitors developing partnerships and collaborations with potentially key partners
- Copy-cats

2/17/2019
Attending: Rita, Dave, Bharat, Michael

Understanding Feedback from Professor:
- Review Step 5b: Jobs to be done
  - Understand emotional context
  - Understand what the customer really wants to do
  - What do they want to get done?
- Create customer archtypes from this workshop, interview, to create personas.

- What is your market?
  - Did she mean TAM/SAM/SOM - dsherman

- Use case step 6 (Optional)
  - Workshop

Interview questions:
https://docs.google.com/document/d/1LAdXidiUQRvtDHYEoeM9xuLXagbKB7Yb6cAyrwPrKPY/edit

Workshop more?

Project Deliverables:
Marketing Plan Outline - see for assignments

Make sure to track decisions and considerations in the Market Research Log

2/10/2019
Attending: Micheal, Rita, Bharat, Oneshin, Dave

Potential value driver questions:
https://docs.google.com/document/d/1jtwV6SzyaFSJyJGmhAqUPAi69cFUqiWr5EYP4DB4_KI/edit

Interviews:

Presentation Deliverables:
Technology adoption curve - Bharat
Market and Segments - Michael

Customers - Oneshin
Value Drivers - Rita
Interview Data - Bharat
Survey Data - Dave

01/27/2019
Attending: Dave, Rita, Bharat, Oneshin, Micheal

Decisions
    Product: 3D Food Printer

    Company (startup or existing): Natural Machines: Foodini

    Markets: Home (Meal replacement, Home Baking, Parents), Commercial (Restaurant, Bakers), Toys (Educational - Computer Literacy, Non-education)

Group Workshoping
    Product:
        Characterize product (initial description)
            Have a close look at the product you want to research and brainstorm answers to the following questions:

            - What does the product do in principle?
                3D prints food products
            - What conditions need to exist for the product to function in principle (e.g. do users need particular skills or resources, complementary products, etc.)?
                SMART Home Capable, reliable electricity, internet access, interest in cooking/baking

            - What are the intended performance level of the product and what value would it deliver (e.g. is it faster, cheaper, better integrated, prettier, ...)?
                Unique shapes, automated/scheduled prep, simpler UX, better integrated (IoT), fun, wider palette, cheaper, temp controlled section, better memory chip.

            Prepare a short description of the product (in general terms), based on your team's discussion. Target length is ca. 1 page, including pictures. (This will NOT be the final description of the product - as you learn more about customer needs, you will add or subtract features later. You will also think about what it takes to create a so-called "whole" product).

Company:

Characterize Company:

Characterize the start up company or the unit in the company (e.g GE's medical imaging, Daimler's Truck Business) that you imagine to be a part of. You are writing the marketing plan for this company/unit.

https://www.kickstarter.com/projects/456763017/designed-for-healthy-eating-foodini-a-3d-food-prin?ref=discovery

https://www.crunchbase.com/organization/natural-machines#section-overview

- What is its role/mission/reason to exist?

To empower creativity and collaboration in the kitchen.

- What needs does it fulfill or benefits does it provide? (Don't be overly specific (e.g. "we sell milking machinery") or too generic (e.g. "we are in the engineering business"))

It creates novelty and excitement in food making.

- What are the distinct competencies of the unit? (Don't list anything that applies to any competitor, that's not distinct)

IoT, Faster, Cheaper, wider palette, refrigerated cartridge section, better memory chip/ cloud, different range of foodini with different functionalities to serve different market segments (from one print head to multiple), cheapest model with disposable cartridges and expensive model comes with self cleaning cartridges.

- Looking at the future - what things would you give serious consideration (e.g. moving into a new segment)?
(These pointers are based on Malcolm McDonald: Marketing Plans, 6th edition).

Moving into the toy market, being integrated into other kitchen appliance producers (ovens),

- Do online research. Discuss the answers to these questions as a team. Agree on assumptions you have to make. Agree on characterization.

Document it in up to one page (not longer, a mission statement needs to be concise).

    - Assumptions

        Engineering is behind the curtain (Cheaper, faster)

        Wider Palette

        IoT figured out - works perfectly

    - Characterization (See above)

Markets:

Brainstorm a wide array of opportunities (i.e. groups of people who would benefit from using your product). Try to list at least 5 and up to 10 opportunities. For each opportunity, list the specific end user and the application (what they use the product for). In your team, discuss the following questions:

    - What do you know about each segment/group of potential customer?

        Home (Meal replacement, Home Baking, Parents, Students)

        Commercial (Restaurant, Bakers),

        Toys (Educational - Computer Literacy, Non-education)

    - Are these target customers well-funded?

        Home Affluent:

- Meal Replacement
    - Engineers: Yes
    - Hobbyists: Yes
- Home Baking: Yes
- Parents: Some
- Students: Some

        Commercial:

- Restaurants: Yes
- Bakers: Yes

        Toys:

- Educational: Yes
- Non-educational: No

    - Could your reach these customers with your company's sales force? Or would this require a new channel?

        The company is small - would need to hire sales team in major cities and/or open a channel with Amazon/Google to utilize their targeted ads.

    - Do they have a compelling reason to buy a new type of product?

        Yes - to differentiate from competitors and create unique food designs.

- Is the product a complete solution for the customers that works more or less as a standalone? Or would you have to partner with other companies? How much of the total solution do you provide vs. other partners?

> Yes, it works mostly as a stand alone. Partner opportunities exist.

- Are there many alternative solutions to the customer problem? How fierce is the competition? Could the competition block you?

> https://all3dp.com/1/best-3d-food-printer/ - research assignment

- If you win the customer segment, can you leverage it to enter additional segments? Or is this a dead end?

> Yes, it is a potentially mass-market technology.
> If we target the commercial market we can then target the home market. If we target the affluent home market, it can expand into mass market.

- Based on these discussions: cross segments off your list that do not appear promising.

> We believe our segments are all promising

Initially, it is OK to do this based on a quick online search, your discussion and your intuition as a team. For the 2-3 remaining segments, however, you will have to repeat this process based on actual research. The next sections will guide you through this process.

Interviewing:

Interview **multiple** end users in each potential segment and take detailed notes (if possible, have an **interviewer** and a **note-taker)**.To prepare, think about how you can clearly explain the essence of what your proposed solution might look like (i.e. the product) and how you want to organize the information you want to collect. You might find it useful to organize everything in a table: columns are different segments, rows are notes on:

- End Users (Who would actually be using the product?)

- Chef / Baker / Chocolatier
- Hobbyists / Engineers
- Parents / Kids

- Applications (What does the enduser do with the product? What jobs does she get done with the product?)

  - Note what types of food they volunteer
- Would you use IoT devices that can schedule meals?
- That can download designs from the internet?
- That can upload your designs to others?

- Benefits (What valued would the enduser gain from using your solution, such as time savings, hassle reduction, lower costs, creativity, etc.)

- How would you want a 3D food printer will benefit you?

- Influential customers (Who do people in this segment look to for thought leadership and adoption of new technology? Who is respected because they are considered innovative, smart, prudent?)

Who do you look to for cooking advice, ideas or inspiration?

(ie. Cooking shows, celebrity chefs, parenting magazines)

- Market characteristics (What would help or hinder the adoption of new technology in this market)

- What would encourage or discourage you from purchasing this product?

(ie. Food safety. Healthy ingredients.)

- Partners/Players (Which companies would you have to work with so that your solution fully integrates into the users' workflow?)

  - Do you have any smart devices in your home?
  - What brands or devices do you use in your kitchen?

- Market Size / Total Available Market (How many potential customers exist for your and all competing solutions?)

  - Do you think this is something you or others like you would buy?
  - How long do you wait before buying a new piece of technology?
  - What do you look for before buying a new piece of technology?

- Competition (Who, according to the endusers, offers similar solutions?)
(This framework is based on Bill Aulet: Disciplined Entrepreneurship)
- What other 3D food printer brands are you aware of?

During the interview, keep a very open mind - you want to inquire and learn, not advocate for or sell your technology. Get people to talk and engage. Ask open-ended questions, go with the flow of the conversation, do not over-prepare, and do not be rigid in how you characterize your solution.

Research Deliverable Assignments

Home (Kitchen):
Market Segments: Home Bakers, Parents, Consumers
Value Drivers:
Position on Technology Adaptation Life Cycle Curve:
Initial Customer Interviews:

Commercial:
Market Segments: Professional Restaurants, Bakeries, Chocolatiers
Value Drivers:
Position on Technology Adaptation Life Cycle Curve:
Initial Customer Interviews:

Experimental (Lab / Garage):
Market Segments: Hobbyists, Engineers, Universities (Culinary Schools)
Value Drivers:
Position on Technology Adaptation Life Cycle Curve:
Initial Customer Interviews:

17.4. Workshops

17.5. Use Case:

https://d2l.pdx.edu/d2l/le/content/734107/viewContent/3895301/View

The prior steps have helped you identify who your customers are and what jobs they need to get done. But how does this connect to your product? Have you thought about everything required for the product to be a "whole" product? Do you really understand how the customers (your persona) will interact with the product and what they will experience?

If not, you can use a full-life cycle use case to help you understand. It is a visualization that covers all phases of major interactions between the customer and the product. This includes

how the persona finds out about the product, acquires it, uses it, gets value from it, pays for it, tells others about it, and buys it again. The process of mapping this out as a team highlights what you already know, what you still need to research, and what decisions to take. It also helps you communicate effectively with target customers - they understand what the product does and what they sign up for. As such, it is the process and not the documented process result that matters.

However, if you want to include a use case in your marketing plan, you have multiple options. Some people use images (stick figures are fine), similar to a cartoon or storyboard: each frame shows an important phase in the customers journey with the product. Others create a slide with different columns, each representing a phase in the customer process, such as "becoming aware of a need", "choosing product", "buying product", "setting up product" etc. Each column contains bullet points, describing what is happening (e.g. "customer connects product to home Wifi and activates account, using the printed license key provided in the box").

Discovers the product:
- Advertise it on shows, magazines, show off designs at company potlucks (word of mouth at a social event), social media - Pinterest

Acquires it:
- Order it from website, Amazon, high end kitchen appliance stores (Williams-Sonoma)

Uses it:
- Making cool designs in their kitchen
- Access new designs via IoT

Gets value from it:

- Functional: What will the product, or the service help me to do?
    - Accurately write proportions with precision quickly.
    - Give professional looking, impressive results
    - Can create what you can imagine
- Emotional: How will the product or the service make me feel?
    - Proud of the results
    - Not ashamed to show people
    - Comfort in exploring creative expression
- Social: How will the product or service make me be seen by others?
    - Others are going to be impressed
    - Others will really appreciate the high quality production
    - Others will see professionalism

Pays for it:
- Credit Card, Cash, etc

Tells others about it:
- Showing off creations on social media (youtube, twitter, facebook, pinterest), word of mouth.

Buys it again:
- Individual Design Purchases, Subscriptions for full access to design library, Subscription to Premium (Professional) Design Library, Subscription for prefilled ingredient canisters.

17.6. Jobs to be done

JTBD is a framework for customer-centered thinking that can be used to

- identify growth opportunities and develop strategy
- to create and market innovative products
- to develop or improve user experiences.

It aims to carefully chart the "jobs" a customer wants to get done when she "hires" (i.e. buys or rents) a product or service. Generally, any job has three dimensions:

- Functional: What will the product, or the service help me to do?
    - Accurately write proportions with precision quickly.
    - Give professional looking, impressive results
    - Can create what you can imagine
- Emotional: How will the product or the service make me feel?
    - Proud of the results
    - Not ashamed to show people
    - Comfort in exploring creative expression
- Social: How will the product or service make me be seen by others?
    - Others are going to be impressed
    - Others will really appreciate the high quality production
    - Others will see professionalism

JTBD focuses on the job context and its outcome, rather than on the people who want to get the job done or the product that does the job. Accordingly, jobs are documented in a template like this

Example: When I am hungry after work, I want a quick and healthy dinner so that I feel satisfied and good about myself.

Our Product: When I want to make an interesting or unique dessert, shapes come to life, I need the ability to create interesting designs beyond my own capabilities in the kitchen.

Jobs are different from solutions because there are frequently different products or services that do the same job. Also, the same product may serve to achieve different jobs in different contexts. Understanding JBTB can thus help differentiate customer segments.

After the job is initially identified a job map (or job structure) helps to understand it in depth. It assumes that any job has eight sub-steps:

1. Defining: What aspects of getting the job done must the customer define up front in order to proceed? This includes planning, identifying available and needed resources, selecting resources, etc. (E.g. buying and storing healthy and ready-made dinners to choose from)
> Hire a professional, costing time, ingredients, and hundreds of dollars an hour. If I do it myself
- Have to decide to attempt it myself or, it might not be well done.

2. Locate: What inputs or items must the customer locate to do the job? (E.g. frozen dinner in freezer, microwave)
- Locate a professional/a means of doing it, time.
- Buy decorative products from the store, i.e tube of frosting, candy decorative elements.

3. Prepare: How must the customer prepare the inputs and environment to do the job? (E.g. open box, remove foil, set the microwave)
- Open the tube of frosting, open the candy decorations, apply to the cake

4. Confirm: Once preparation is complete, what does the customer need to verify before proceeding with the job to ensure its successful execution? (E.g. power level and time)
- Accuracy of the intended design

5. Execute: What must customers do to execute the job successfully? (E.g. turn product, stir after 2 minutes, eat)
- Carefully apply frosting and candy decorations.

6. Monitor: What does the customer need to monitor to ensure that the job is successfully executed? (e.g. safe internal temperature)
- Decorations not falling off

7. Modify: What might the customer need to alter for the job to be completed successfully? (e.g. adjust timing for different microwaves)

- Remove errors, Re-apply decorations

8. Conclude: What must the customer do to finish the job? (e.g. clean and recycle)
   - Clean and recycle

Companies can create better products by simplifying steps that are complicated: for example, a subscription service for healthy meals can make sure that there are always meals to choose from in step 1, while a color changing box in step 6 might tell people when the food is ready.

To make sure that you are mapping job steps (what the customer is trying to accomplish) rather than process solutions (what is currently being done), ask yourself the following validating questions:

- As defined, does the step specify what the customer is trying to accomplish, or is it only being done to accomplish a more fundamental goal?
- Does the step apply universally for any customer executing the job, or does it depend on how a particular customer does the job?

17.7. Marketing plan decisions
1. Executive Summary - Oneshin
2. Introduction - Dave - This section was not initially assigned until after the presentation had been completed because it was not necessary until the report was due.
3. Company Analysis - Rita
4. Market Definition, Potential, & Demand - Dave
   a. Market Demographics
   b. Market Needs
   c. Market Trends
   d. Market Growth
   e. Buyer behavior
   f. Customer segments
   g. Competition
   h. Collaborators
   i. Macroeconomic forces
5. Competitor Analysis - Rita
   a. ChocEdge Choc Creator V2 Plus
   b. Print2Taste Procusini 3.0
   c. byFlow Focus
6. Customer Analysis - Dave
   a. ~~Culinary School~~
   b. Tech Hobbyists
      i. Survey Data
      ii. Interview Data

- c. ~~Home Bakers~~
7. SWOT Analysis - Bharat
8. Marketing Objectives and Goals - Oneshin
   a. Financial
      i. Revenues
      ii. Margins
      iii. Growth Rate
   b. Nonfinancial
      i. Customer satisfaction
      ii. Perceived quality
      iii. Loyalty
      iv. % of sales from new products
9. Marketing Strategy - Michael
   a. Positioning
   b. Product and/or service attributes
      i. Foodini 2.0 machine
      ii. Subscriptions for full access to basic design library or Premium Subscription to Premium (Professional) Design Library.
         1. Subscription includes prefilled ingredient canisters. (Pricing example: https://www.blueapron.com/pages/pricing)
            a. 3 Plans for different amounts of food per week see Blue Apron
      iii. Individual Design Purchases

   c. Distribution
      i. High end cooking stores (Fry's, Best Buy)
      ii. Online: Amazon, NewEgg, ~~Direct from us~~
   d. Promotion
      i. Advertising Strategies
         1. Cooking shows, cooking magazines, ads on cooking themed websites
      ii. Sales promotion strategies
         1. 30 day money back guarantee
      iii. Public Relations - Press releases,
      iv. Personal Selling/Trade Shows
   e. Price: what to charge for products, features, or services and well as discount structures or payment plans.
      i. Individual Design Purchases, Subscriptions for full access to design library, Subscription to Premium (Professional) Design Library, Subscription for prefilled ingredient canisters.
   f. People: marketing specialists to execute strategy, system for recruiting, motivating and retaining them.
10. Target Market and Positioning - Michael

        a. Target Market

        b. Functional, emotional and/or self expressive benefits

        c. Price

11. Product and Brand Management - Oneshin
12. Pricing Management - Oneshin
13. Distribution Management - Bharat
14. Communications Management - Bharat
15. Implementation and Control - Rita
16. Conclusion - Bharat

17.8. Process and overall evaluation:

Our team conducted Interviews, administered online surveys, reviewed academic papers and business literature reviews.

The process was messy at first. For many areas of the project we knew what pieces were needed but didn't know how to get or produce them. Further independent research on structures of marketing plans and online examples gave us an understanding of how to find and present the information we found. It came together in the end with a project we believe to be reasonably viable. If we had full access to professional marketing reports and financials from competitors we believe the data would show our project is even more viable than the conservative estimates we used in our report.

Once we settled on the Foodini, a few major milestones for the project, were perhaps our midterm presentation and associated feedback which showed us that we needed more in-depth qualitative interviews with Tech Hobbyists. These interviews helped refine our offering and supplemented the survey results. Another realization was that we were not making it across the chasm just yet -- at least until the Foodini 2.0 captures the consumer Tech Hobbyist market. The financial plan exercise also reinforced this with the low unit sales volume in year 1, and what this would mean for a traditional bricks-and-mortar retailer.