Section 3

Team 8

Fall 2023

Business Plan

Business Name: WakeRing

Business Idea: Biometric Monitoring Ring

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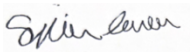
Sophia LaManna		Lamannsr@dukes.jmu.edu
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Executive Summary

WakeRing
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Management: Managing Director, Marketing and Sales Manager, Operations Manager

Industry: Consumer Electronics

Number of Employees: 22

Amount of Financing Sought: $2,686,195 (74%) total long-term debt, $950,000 (26%) common stock

Investment Sources: $350,000 (37%) founders' contribution, $600,000 (63%) angel investors

Use of Funds: Machinery purchases, renovation costs, and operating expenses / overhead

Product/service selling price: $80 (indirect) and $92 (direct)

Business Description: We are manufacturing a ring that monitors biometric data of the user and reports back to your phone to keep you awake and alert.

Products/Services: Our variable cost for each ring will be roughly $15.60 and sold at prices of $80 (indirect) and $92 (direct). Estimated first year sales are 35,409 units bringing in an estimated $3,002,683 of revenue. Many direct sales will be completed through Amazon.

Competitive Advantage: With there being many technological devices that track bodily functions, there is a possibility that something (such as the design or specific aspect) is already patented, but our product's application is different enough to not conflict with existing patents. When it comes to barriers to entry and why our product is hard to copy, our product is all about value and getting the most for every dollar. It is difficult to incorporate heartrate and blood oxygen sensors as well as a battery and Bluetooth chip into a single ring and keep costs low and prices affordable for consumers.

Markets: Our target market segment is commuters that drive alone, more than 30 minutes, and utilize wearable technology. Within this segment, there are different age ranges that will have to be reached in different ways (such as through social media vs. television). The current market size is 12.21 million and is estimated to be growing at 6% annually. By taking up 1% of the market in year one, this would lead us to have a revenue of $3,002,683.

Distribution Channels: Our main distribution channel will be through Amazon and our own website and will be approximately 40% of our total sales. The other 60% will be through other retail locations where they will sell either online or physically in their stores. With our target market being tech-savvy, Amazon and other popular retail locations will be the best locations to sell our product.

Competition: As for current competition, the main products would be Cipia and Alertme. Both of these are aimed at preventing drowsy driving, but Alertme is a low-cost and inefficient product while Cipia is much higher in price compared to the WakeRing. With our product being located in the middle pricewise and having the best value, with the correct marketing our product will be the most appealing to this type of target market.

Financial Projections (Unaudited):

	2024	2025	2026	2027	2028
Revenue: (dollars in thousands)	3002.7	3817.4	5036.9	6079.5	7205.9
EBIT:	(1348.0)	(609.8)	(214.4)	759.0	1354.5

Have you ever felt so tired you thought you might crash your car? This is a real fear, 800 people die every year from falling asleep behind the wheel (National Highway Traffic Safety Administration, 2023). With drowsy driving at an all-time high, it's hard to feel safe on the road. Using WakeRing that's a fear of the past. It's a ring that leverages effective biometric data to keep you alert while you're driving.

The WakeRing is a standard-sized ring that monitors biometric data (blood oxygen, heart rate, and heart rate variability) to detect if you are falling asleep. When the device senses drowsiness, it notices a drop-in heart rate along with blood oxygen levels and sends a signal to the user's phone via Bluetooth that activates loud alarms (*N. Akula, A. G. Bourgeois, M. Kleinsasser, R. Sunderraman, H. Tirumani, and B. Tharpe, 2022).*

When it comes to our competitive advantage, our product focuses on technology that is reliable and effective, yet affordable. With this being a rare combination in the current market, being that other products like AlertMe are cheap yet ineffective and Cipia is at a much higher price point, our product will appeal to a large market segment who is looking for a more balanced product.

We have identified several consumer segments who are especially likely to be interested in the product, including Americans who commute to work and those who use wearable technology which has been steadily growing on average at 19.7% (Beckman, 2023). This makes our product even more prevalent to the modern consumer and a promising investment given the associated risks of any start-up company.

Our innovative ring brings to the market cutting-edge technology by implementing a differentiation strategy. Utilizing biometrics and data from the sensors in our ring, our product monitors key indicators of drowsiness (Heart rate, blood oxygen, and heart rate variability). Unlike traditional approaches to keeping drivers awake such as caffeinated

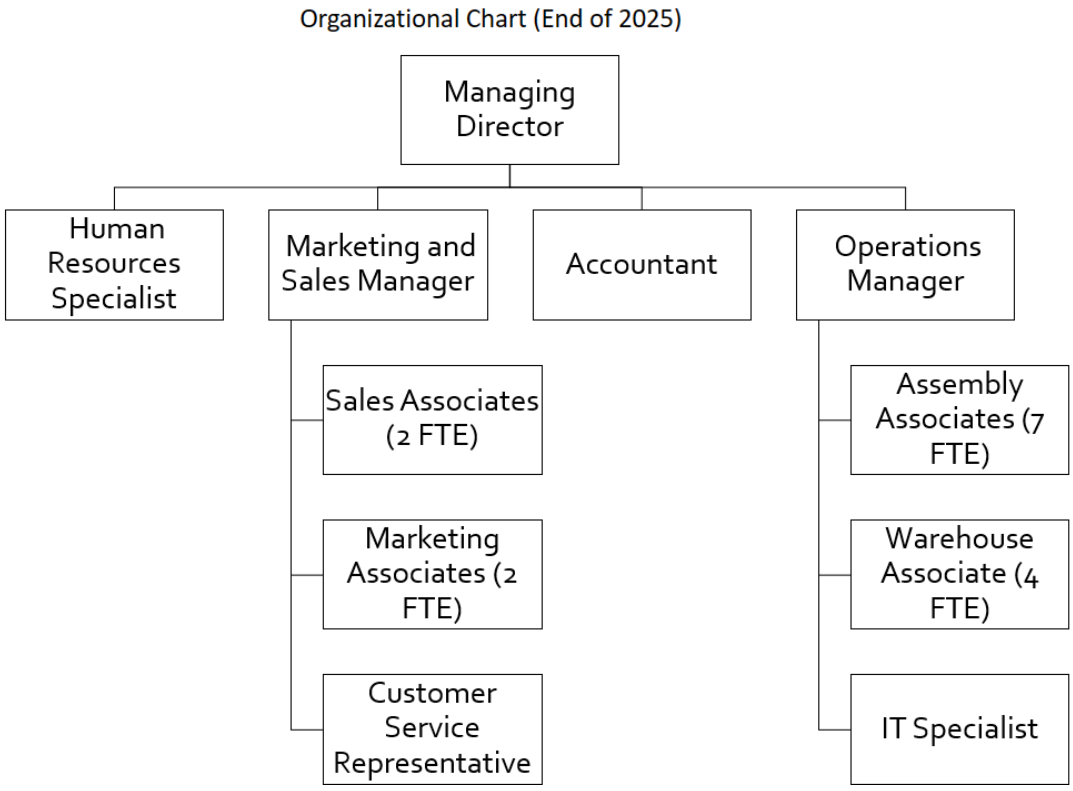
drinks (which were reported by our survey to be the most popular), our product proactively monitors the user for constant assurance.

Our facility will be in York County, Pennsylvania. This location is close to several major material supply hubs including New York City, Philadelphia, Washington DC, and Baltimore. These hubs will provide access to products, the closest port being The Port of Philadelphia. We are outsourcing most of our products from international suppliers which will come in through the port in New York City. Proximity to these markets will also provide access to an experienced talent pool from which to recruit employees. We anticipate distributing through Amazon, which has a new distribution site in York County. We anticipate these distributions will drive a significant portion of product demand.

In the production process of WakeRing, we decided that we were going to outsource our aluminum shell, heart rate monitor, blood oximeter, battery, and Bluetooth chip. Outsourcing these materials allows our company to save money on the salaries, machinery, and time that would be required to produce these components on-site. Any maintenance needed for the machines we use will be done through outside contractors. For the setup of our business, we will outsource the production of our website and our app, as well as any maintenance needed. After the initial website and app are set up, there will be no need for a website and app developer in the office. Outsourcing these functions keeps our expenses lower in total without compromising the quality of the product.

Overall, our business is projected to perform well financially through the first five years. Our current forecast assumes that the business will break even in year four. We are using a mix of long-term debt and stockholders' equity to finance our company. We will not need to take out any more loans after the end of year three, meaning we can focus on paying off our existing loans, and we will be able to pay out dividends to our stockholders at the end of year five.

Exhibit 1: Organizational Chart



Changes to staffing each year:

We do not anticipate any change in staffing in the first five years. We prepared for changes in salaries along with commissions for each year. After the first five years, we will evaluate progress and efficiency and add as needed.

Exhibit 2: Pay, mandatory deductions, benefits, knowledge, skills, abilities, and motivation table (Year Two)

Compensation						Mandatory Payroll Deductions					Benefits					
Position (Salary/Wage - W) (Full-time Assumed, Part-time - PT %)	Salary or Wage for position)	Bonus or Commission	# for position	Projected End of Year 2 Salary or Wage **including** bonus/comm. Each	End of Year 2 Salary or Wage **including** bonus/comm. all positions	FICA	FUTA*	SUTA	WC	Mandatory Deductions - Total	Benefits - Health Cost	Benefits - Retirement Cost	Benefits - Any other Benefit Cost	Benefits - Total	Total Cost per Employee	Total Cost for All Employees
Managing Director	161000	48300	1	209300	209300	16011	42	376	1256	17685	13500	6440	0	19940	246925	**247000**
Operations manager	91000	10010	1	101010	101010	7727	42	376	606	8751	13500	3640	0	17140	126901	**127000**
Marketing and Sales Manager	115000	12650	1	127650	127650	9765	42	376	766	10949	13500	4600	0	18100	156699	**157000**
Accountant	68000	6120	1	74120	74120	5670	42	376	445	6533	13500	2720	0	16220	96873	**96000**
Human Resource Specialist	62000	5580	1	67580	67580	5170	42	376	372	5960	13500	2480	0	15980	89520	**90000**
IT Specialist	50000	4500	1	54500	54500	4169	42	376	300	4887	13500	2000	0	15500	74887	**75000**
Wearhouse Associate	47000	3290	4	50290	201160	15389	168	1504	2820	19881	54000	1880	0	55880	69230	**277000**
Assembly Associate	44000	3080	7	47080	329560	25211	294	2632	4620	32757	94500	1760	0	96260	65511	**458000**
Sales Associate	48000	24000	2	72000	144000	11016	84	752	576	12428	27000	1920	0	28920	92674	**185000**
Marketing Associate	60000	5400	2	65400	130800	10006	84	752	720	11562	27000	2400	0	29400	85881	**172000**
Customer Service Representative	40000	3600	1	43600	43600	3335	42	376	240	3993	13500	7440	0	20940	68533	**69000**
Totals			**22**		**1483280**	**113471**	**924**	**8272**	**12720**	**135387**	**297000**	**37280**	**0**	**334280**	**1173635**	**1953000**

Vacation Policy and time off: 21 paid vacation days and 10 days sick leave

*Bonuses: Position(s):Managing Director 30%, Operations Manager 10%, Marketing and Sales Administrator 10%, all other employees= 5.6%. Commissions: All sales employees= 25% per employee.

Holidays off: New Years Day, Martin Luther King Jr. Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Columbus Day, Thanksgiving, Christmas Eve, Christmas Day.

Other Benefits: None

* Costs for employees split up into cost of goods sold and salaries and wages in the income statement.

Knowledge, Skills, and Abilities

Key Service or Product manufacturing positions	Knowledge, Skills, and/or Abilities Needed	How are you going to secure these KSAs and verify employee qualifications?
Operations Manager	Forecasting, capacity planning, managing inventories, process selection, scheduling, and motivating employees.	Provide models of how operations should be managed and utilize performance metrics used for analysis and corrective measures. This manager must have a related degree and previous related experience.
Assembly Associates	Understanding the process of our operations and design of our product. Capable of being efficient and effective.	Set guidelines for timelines, quality assurance, and production. Also have controlling measures overviewed by operations manager to to ensure effective process execution. This position will have previous experience in a related industry.
Warehouse Associates	Keeping up with inventories such as receiving shipments, organizing inventories, and managing outgoing shipments.	Having operations manager overview quality of work and provide corrective actions based on efficiency. This position will have previous experience in a related industry.

Motivating Employees

Annual Percentage Pay Increases of 3% and bonuses up to 10% for operations manager and up to 5.6% for assembly and warehouse employees. Listening to employee concerns to remove obstacles they face to ensure smooth operations. We also want to ensure employment security to display confidence in our employees. Employees will also have more paid vacation days than the national average, allowing them to refresh and recharge.

Exhibit 3: Market Segmentation Analysis/ Target Market Selection

Segment Name	Segment size (e.g. # of Households in Segment)	Growth Projection of Segment	Segment Description	Priority level for targeting	Justification for Targeting
Segment #1 Solo Driving Work Commuters who use wearable technology & drive over 30 minutes	12.2 million people	6% annual growth	This segment consists of Americans who commute alone by car to work at least one day per week, use wearable technology, and drive 30 minutes or more each way. This group has a majority of white males, but is fairly representative of the overall demographics of the United States (Flynn, 2023) (US Census Bureau, 2021). This group lives in urban and suburban areas, are ages 16 and above, and has a median income of above the U.S. average of $31,000. This segment follows current events, uses social media such as Snapchat, Facebook, Twitter, and Instagram and is fairly tech-savy. Within this segment theres are sub-segments such as commuters age 55-64. This segment drives to work alone at higher rates than any other age segment and we will be targeting this group at a higher rate (National Institute on Aging, 2020).	1	We chose this as our number one segment specifically because of the overall size and diversity of those who make it up. With commuters who drive to work alone being so large (US Census Bureau, 2021) and our product being ideal for individuals driving alone, we rank this group as a high target segment who could seriously benefit from our product. This group would also be responsive to products that increase safety and reduce injury or fatalities and to build on this, highly educated individuals are more likely to commute longer distances and would therefore be more inclined to use our product (Trendle and Siu, 2007). According to information provided by Statista, a third of consumers who use wearable technologies use the technology to monitor health information such as heart rate and blood oxygen levels (Laricchia, 2022). With such a substantial size, it is a key reason why our product would appeal to this segment.
Segment #2 Truck / Delivery Drivers who use wearable technology	1.08 million	6% annual growth	This segment consists of truck / delivery drivers that use wearable technology. This segment is over 90% male, and average age is over 40. About 60% are white and 15% African American. They have an average annual salary of about $60,000 in the US ("Truck Driver Demographics", 2023). The State with the largest amount of truck drivers is Texas with over 172,000 drivers living there. Due to higher age of the drivers, over 80% use facebook and we estimated that 72% watch football. This segment creates a advertising channel and potential location for us to pursue (St. Bonaventure/Siena Research survey, 2023).	2	We chose this segment because many truck drivers are operating heavy and dangerous vehicles and can be on the road for extended periods of time. Although this is similar to our segment number one, it is listed below because of the smaller market size. It might also be more difficult to sell to this segment because there are safeguards in place already to keep drivers from falling asleep, so there would be competitors in this space. Despite the safeguards in place, truck drivers are still at risk for drowsy driving or falling asleep. Two-thirds of truck drivers admit to driving while tired on at least half of the trips they make, and 13% admitted to falling asleep while driving (Federal Motor Carrier Safety Administration, 2015) . This makes us believe our product would appeal to truck drivers because you can never be too safe.
Segment #3 Night Shift Workers (aged 25-34) who use wearable technology	4.5 million	7.2% growth per year	This segment consists of night shift workers who utilize wearable technology. The majority of these workers include, but are not limited to, provision of essential services such as public safety (water/gas/light), postal service, health care, transport, security, power plants ("A Demographic Profile", 2008). 8.7% of the total work force is between the ages of 25-54 and work the night shift, 44% of which are female (U.S. Bureau of Labor Statistics, 2019). The media habits of this segment are already a mix of our previous two segments.	3	Although this is not our top priority for targeting, this could be an essential group to market towards. People naturally aim to fall asleep at night and with night-shift workers, there is a natural urge to fall asleep (Suni and Singh, 2023). Many of these workers could benefit from our product and their employers would also find it useful for increasing productivity. There are also few alternatives outside of supplements, such as five hour energy, to our product within this segment, all the more reason to use resources to target them.

How Did We Arrive at Growth Rate and Segment Size

Segment 1: We arrived at roughly 12.2 million person segment size by finding the number of adults in the United States and multiplying that with the percentage of people who use wearable technology, conservatively 30% (National Heart, Lung, and Blood Institute, 2023). Furthermore, we multiplied the percentage of commuters over 30 minutes, 22% by the # of people that use wearable technology (55.5m x 0.22) to arrive at 12.2m people. We arrived at the growth rate for commuters using wearable technology and drive over 30 minutes based off the growth rate of wearable technology at 6% from 2019-2022 as reported by Statista (Laricchia, 2023).

Segment 2: We arrived at a segment size of 1.08 million people because the statistic was stated by the American Trucking Association of number of truckers anually at 3.6m (American Trucking Association, 2023), later multiplied by the percentage of Americans that use wearable technology (0.3) (National Heart, Lung, and Blood institute, 2023). We arrived at the growth rate for truck drivers using wearable technology based off the growth rate of wearable technology at 6% from 2019-2022 as reported by Statista (Laricchia, 2023).

Segment 3: We arrived at segment size through published numbers of night shift workers in 2019 (we do know that it is pre-covid numbers but we found that employment numbers have returned to pre-covid rates). We then used the Bureau of Labor Statistics realese of information to access the numbers of non-daytime and irregular hour workers at roughly 15 million people (U.S. Bureau Of Labor Statistics, n.d.)(Population Reference Bureau, 2008) and 4.5 million of those utilize wearable technology(15m x .3%)(National Heart, Lung, and Blood Institute, 2023). We came to the growth rate by comparing the same numbers from a 2004-2014 study from the Bureau of Labor Statistics and assumed a consistent growth rate of the market and then combined this growth rate with the growth of wearable technology users to arrive at 7.2% per year (U.S. Bureau of Labor Statistics, 2018).

Exhibit 4: Market Quantification

Year	Total Market Potential (No. of Customers)*	Market Share**	Annual purchase frequency ***	Total Annual Unit Sales	Indirect Channel Price	Direct Channel (Retail) Price	Annual $ Revenue
2024	12.210 million	1.00%	0.29	35,409	$80.00	$92.00	$ 3,002,683
2025	12.936 million	1.20%	0.29	45,017	$80.00	$92.00	$ 3,817,441
2026	13.728 million	1.50%	0.29	59,716	$80.00	$92.00	$ 5,063,916
2027	14.542 million	1.70%	0.29	71,692	$80.00	$92.00	$ 6,079,481
2028	15.422 million	1.90%	0.29	84,975	$80.00	$92.00	$ 7,205,880

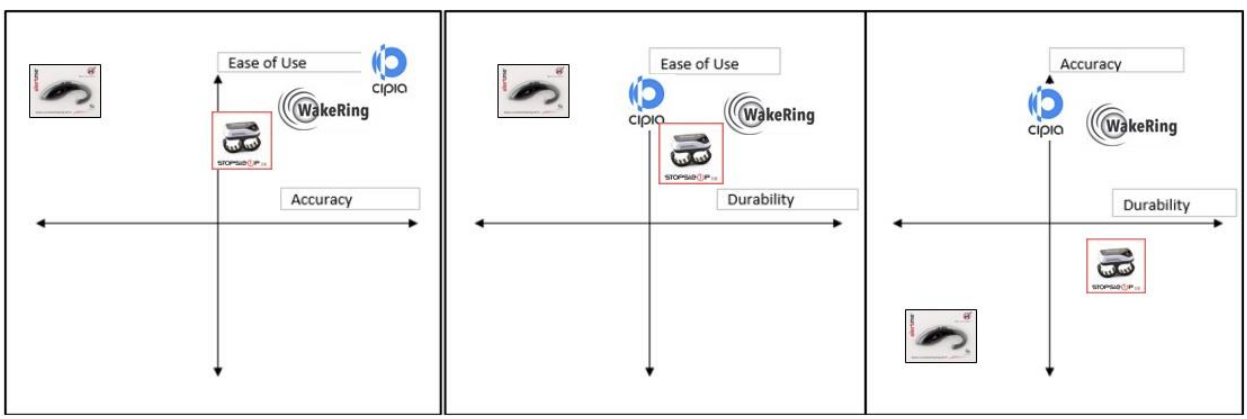
To determine the initial year's potential market population (2024), we took into account that truck / delivery drivers as well as night shift workers also overlap in the segment of solo work commuters who drive more than 30 minutes and utilize wearable technology, so we decided to concentrate our market calculations within this one segment as to not double count anyone. The initial year's potential market population would then be 185 million (solo commuters) x 0.3 (percentage who use wearable technology ("Study Reveals Wearable", 2023)) x 0.22 (percentage of commuters who drive 30 or more more minutes (Flynn, 2023)). This gives us our starting year's value of 12.21 million and then we determined that the annual growth rate of wearable technology users to be 6% (Laricchia, 2023) which leads us to each year being calculated by multiplying the following year by 1.06. Growth rates for solo drivers over 30 minutes was negligible so it was not taken into account when it came to segment growth rate.

To determine our first year (2024) market share, we utilized all three methods and used a weighted average to determine our final number of 1.5%. When it came to a proxy firm, we determined that Fitbit was a good fit with them having a similar product in our general market. In Fitbit's first year (2010), they sold 58k units at a price of roughly $100 ("Business of Apps", 2023) and when compared to the total market of wearable technology at that time of roughly 1.9 billion dollars, they came in as 0.03% of the market their first year. Secondly, our survey results indicated that about 1 in 10 people would purchase our product at retail price and that they would switch from whatever technology they were currently using, indicating a 10% share in the wearable technology market for preventing drowsy driving. Lastly, we based our first-year sales at 58k units (the same as Fitbit's first-year unit sales) and at a price of $92, which would produce a revenue of roughly 5.3 million dollars. With the current market of wearable technology at a value of 68 billion dollars (Laricchia, 2023), this would give us a market share of roughly 0.008%. Now, because our estimated market size is smaller because our product is specialized for drowsy driving, our industry market share for that market will be bigger. There are approximately 20 companies (Chaitanya, 2023) that specialize in preventing drowsy driving, which would give us an equal share of 4.35% and to be conservative, we lowered that to roughly 2.5%. These three estimated market shares of 10%, 0.03%, and 2.5% are quite spread out, so we decided to do a weighted average, emphasizing the proxy firm the most, industry analysis second, and our survey the least for a final estimated market share of 1.0%. To determine our yearly growth within the market, we modeled Fitbit's average yearly increase within the market their first 5 years at an increase of roughly 0.07% per year, but with our more specialized market, we increased that number to a yearly increase of 0.2%.

To determine the annual purchase frequency, we compared our product to the Oura ring, a similar product that users also wear. Although serving a different purpose, the battery technology that will be used in our product will be similar to the Oura ring's battery. Based off of online reviews, most people ended up replacing or not using their Oura ring because the battery began to experience issues such as not holding a charge. The average person ended up replacing their ring after about 3.5 years ie. an annual purchase frequency of roughly 0.29 ("Plasticlab Client Reviews", 2023).

We determined that our pricing would be based on the value method of pricing. With our variable costs of our product coming out to roughly $15.60, we decided on an indirect channel price of $80 which represents the value created by our product and allows us to cover more of our fixed expenses. This may sound high, but we want our product to look effective and trustworthy due to the nature of it saving lives and we feel that this price accomplishes this while still being affordable. We are planning for a portion of our sales to be through Amazon (40%, which is similar to Fitbit's Amazon sales) (Hagen, 2015), where there is a referral fee for consumer electronics of 8% ("How Much Does it Cost to Sell on Amazon, 2023). We wanted to mark our product slightly higher to instill a mental image of a more reliable product, so this would mean that roughly 40% of our product would be sold on Amazon and our own website for $92 and the rest would be sold to other retail locations for $80 where they would mark it up themselves.

Exhibit 5: Positioning/ Competitive Analysis



Positioning Statement
Striving to enhance road safety and combat driver drowsiness, WakeRing is dedicated to pioneering cutting-edge, yet cost-effective technology, to elevate safety standards on the road.

We chose Ease of Use, Accuracy, and Durability as our attributes. Accuracy is the most important attribute of the 3, from all of the reviews that we have read, as well as from the point of view of a lifesaving device. From what we have seen many people complain about the accuracy and false positive problems that plague our competitors ("Verified Amazon Customer", 2019). Durability is also important as when a consumer makes a purchase of a more expensive product they expect it to last, at the same time this is being marketed as a lifesaving device, so the thought of it breaking in the middle of your cross-country road trip could be detrimental. When thinking about ease of use, you have to remember that people are possibly already drowsy when using our product, so we need to make it as user-friendly as possible.

(SWOT) A strength of bringing this product to life comes from the reliability and accuracy of the metrics and data collected from our product's components like our blood oximeter. The current competitors and indicators used in their product are inconsistent with metrics that provide reliable information to alert drivers, such as electrodermal activity. A weakness that our product could fall short of would be the reliance on suppliers to produce our parts in comparison to keeping production and manufacturing in-house. An opportunity presented in our external environment would be the amount of accidents due to drowsy driving. Our product will be able to reduce the number of accidents per year that fall in the hands of drowsy drivers. As of a 2017 report from the National Highway Traffic Safety Administration (NHTSA), they estimate about 91,000 accidents were due to drowsy driving Drowsy driving ("National Highway Traffic Safety Administration", 2021). The threat of this product could be an external concern with the development of self-driving vehicles and driver assist systems currently being implemented into more modern vehicles.

We used Alertme because it is a product that works to keep you from sleeping at the wheel, which is similar to what WakeRing does. Based on reviews, we found that it is very inaccurate because even if you aren't falling asleep, if you look down a certain amount such as looking for your drink, it rings ("Verified Amazon Customer, 2023). They come at a low price so this comes as no surprise that it has a high rate of false positives and positioned on the map as such. We used Stopsleep because it is a ring-shaped product that monitors your body to see if you are asleep, and wakes you up if needed, which is very similar to our product. While it operates similarly to our product in terms of ease of use, the inaccuracy provided by electrodermal activity and its reviews provides reasoning as to why they rank lower than our product on our position map. We used Cipia because it is a soon-to-come product that uses AI to track your face and eye movements to determine if you are asleep or not, which does similar things to WakeRing. Due to accessibility, all of the setup with technology, and its inability to alert, its accuracy is ineffective as competition and ranked as such on our positioning map.

Exhibit 6: Marketing Mix

Exhibit 6: Marketing Mix

Product/Service Branding

For our brand name, we wanted a self-explanatory name that conveyed our product's purpose and when it came to our logo, we went with a sleek design for simplicity and colors that are associated with advanced technologies. The circular shape in the background also emphasizes our product's design. The overall design of our product will be a sleek, grey-scale colored ring that feels "heavy," as in it feels expensive and not cheap or fragile. This ring will be tracking heart rate and blood oxygen content as well as connecting to Blutooth devices, so we want consumers to feel that it is reliable and well-made. Our product will be packaged in a small black cardboard box (roughly 6 inches by 6 inches by 3 inches) that has our products logo on the top and some information about our company, like our mission statement, on the sides.

Pricing

	Year 1	Year 2	Year 3	Year 4	Year 5
Alertme Price (competitor)	11	11	11	11	11
Your Channel Price:	80	80	80	80	80
Your Retail/Customer Price:	92	92	92	92	92

We determined that our pricing would be based on the value method of pricing. With our variable costs of our product coming out to roughly $15.60, we decided on an indirect channel price of $80 which represents the value created by our product and allows us to cover more of our fixed expenses. This may sound high, but we want our product to look effective and trustworthy due to the nature of it saving lives and we feel that this price accomplishes this while still being affordable. We are planning for a portion of our sales to be through Amazon (roughly 40%, which is similar to Fitbit's Amazon sales) (Hagen, 2015), where there is a referral fee for consumer electronics of 8% ("How Much Does it Cost to Sell on Amazon, 2023). We utilized a pricelining tactic in determining our retail price when compared to our competitors. Alertme had the lowest quality, but the lowest price and Cipia was the most accurate and highest price competitor. We aim to provide the best value between these companies while still ensuring reliability and value in our price. With this strategy in mind, 40% of our product would be sold on Amazon and our website for $92 and the rest would be sold to other retail locations for $80, where they would mark it up themselves. Our post five year plan we will be changing our percentage mix between Amazon, our website, and other retail locations to focus more on our website where we will see more profit per sale now that consumers are more aware of our product.

Distribution/Location Strategy

We chose utilizing Amazon as our main retailer, foregoing the need for wholesaling, as the most cost-effective way of delivering our product to our customers. After a cost-benefit analysis of individually shipping products through UPS or having to use Costco's markup percentage model, Amazon's "professional" selling plan emerged as the most economically viable choice. As well as being the most cost-effective, they also provide value logistically and an increased value for customers. Amazon offers logistical benefits by providing storage facilities and transportation for our products, streamlining our process of getting product(s) to consumers as well as minimizing planning and resource allocation. The increase in value for consumers provided by Amazon would be in terms of accessibility and convenience. The platform itself is a marketplace and avenue for consumers to be reached on as well as it's convenience. Their efficient order fulfillment process minimizes time between purchase and product delivery and lessens the burden on our operations management. If we were to use a wholesaler (which we are currently not), we believe that Costco would be an ideal relailer/wholesaler to promote and sell our product because of their reputation and accessibility. It is also possible to have sales representatives in-store where our product is located to help explain how WakeRing works and therefore increase the liklihood they buy our product.

Promotional Strategy (in thousands of $)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total IMC Budget (roughly):	900k	763k	759k	911k	1.08m
Advertising Exp:	750k	400k	400k	650k	650k
Sales Promo Exp:	50k	100k	50k	100k	150k
PR Exp:	100k	163k	159k	100k	180k
Other Promo Exp:	0k	100k	150k	61k	100k

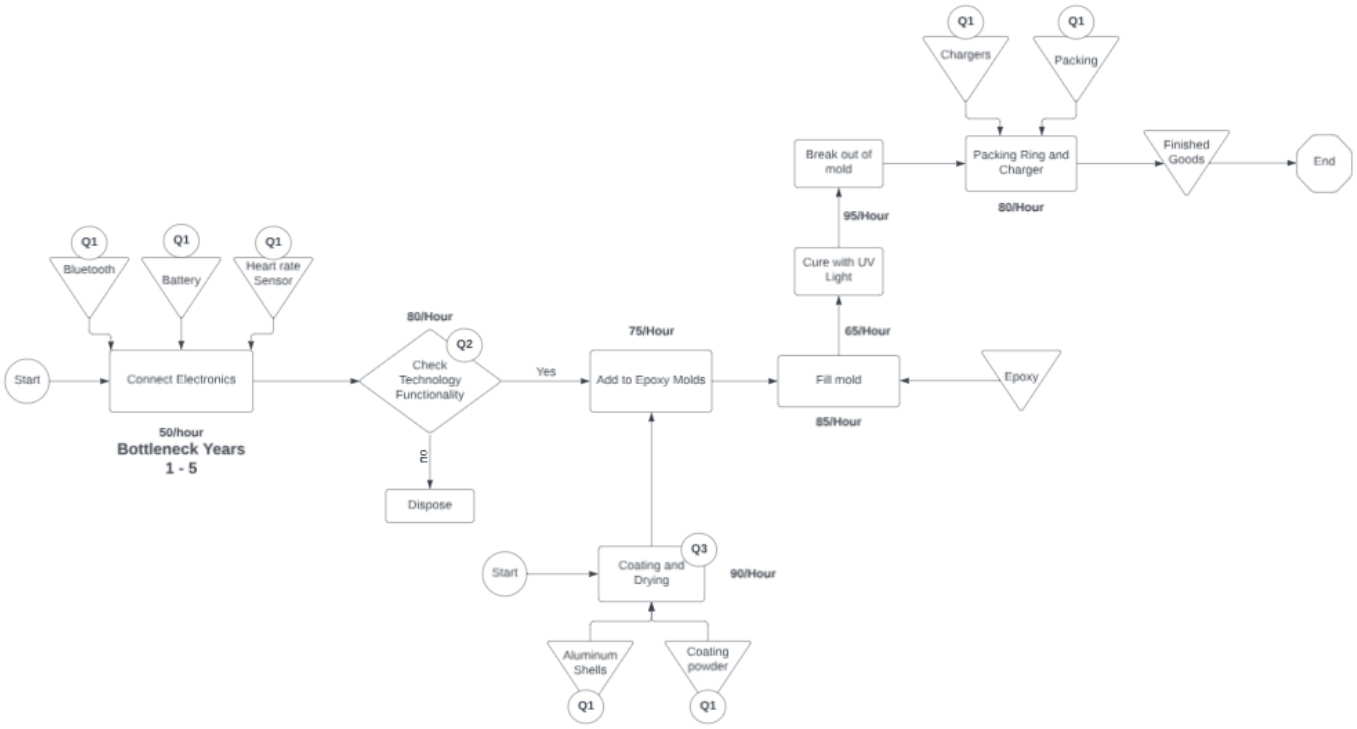
When it comes to our budget for our promotional strategy, it will come out of our marketing budget which is a percentage of our revenue (30% year one, 20% year two, and 15% following). Out of our promotional program, our initial goal is to make consumers aware of our product and explain the benefits to our target market. We will allocate much of our initial budget to advertising to get the word out about our product and then this number will be toned down later on when our goal shifts to motivating people to purchase our newer products. Another main promotional tool will be PR campaigns where we are planning on using social media influencers as well as our own campaigns such as PR stunts and events. The key message of the majority of our marketing will be that "there's always a chance..." you could be affected by drowsy driving and that our product is the optimal value solution. This ties back to our positioning because we are trying to be the most reliable product for the price point we are located at. For specific prices in advertising, we will be using morning talk shows and popular podcasts (both of which our number one segment listens to often) as our main expenditure. The price for a product mention or promotion varies greatly, but we estimate that it costs about $18 per 1,000 listeners for a 30-second ad (Molenaar,2021). We will be aiming for podcasts that have roughly 500,000 repeat listeners which costs about $9,000 per ad, meaning that we could potentially do up to 83 total advertisements. To target various segments of our main target market, we will be dividing our advertisements across multiple channels and podcasts to reach as many people as possible. As for PR stunts and campaigns, there is no accurate way to measure the costs, but it will be divided up so that the entire budget is spent roughly equally between the two.

# of Salespeople:	2	2	2	2	2

Compensation Method: Salary: 48k Commission: 25% of their own sales

We will be using two sales representatives for the forseeable future and this will be enough to accomplish our sales based goals. Both of these reps will be employees of the company and their main purpose is to foster relations with other retail stores (like Walmart and BestBuy). Although we plan on the majority of our sales to be through Amazon, we will certainly need to expand to other stores to maximize our sales. Each representative will be targeting different stores and they will be incentivized by a fairly large commission for whatever sales they make to stores. This inscentive should motivate some of the top sales individuals to persue jobs at our company, making our product even more likely to be bought. Another main priority of our sales representatives will be attending trade shows and expositions to make the public and other companies even more aware of our product.

Exhibit 7: Flow Chart



For each major quality step:

Quality Step	What is measured?	How often?	How will you ensure quality?
Q1	Quality of outsourced materials	Once for every unit of outsourced materials	Check to see if all outsourced materials are working properly
Q2	Combined technology functionality	Once per unit	Check to make sure that all tech components are working properly after they have been attached together
Q3	Coating and drying	Once for every aluminum shell	Check to see if all shells are coated properly

For each critical resource:

Critical Resource	Brief Description	Unit Cost (in appropriate unit)	How many?
Aluminum shell	Outer shell of the ring	$0.56	1 per ring
Heart rate and sp02 sensor	Biometric sensors to detect drowsiness	$3.80	1 per ring
Bluetooth chip	Chip to send data to your phone	$5.70	1 per ring
Battery	Power source for the ring	$4.00	1 per ring
Charger	Used to charge the ring	$0.80	1 per ring

Briefly describe your main facility - provide information about layout and dimensions.

30,639 square foot warehouse, assembly, and office space located in York, Pennsylvania.

Exhibit 8: Quality

Indicate the Dimensions of Quality on which you will focus.	**Why is this dimension important, given your industry & target market?**	**Identify the Quality Step(s) on the Process Flowchart / Service Blueprint to which this corresponds.**
Reliability	Given that we are creating a product that is meant to save lives, we want our product to be reliable whenever in use by the consumer.	Q1 and Q2 for connecting the electronics
Perceived Quality	Given that we are creating a product that is meant to save lives, we want our consumers to feel that the quality of the ring is high enough that they are satisfied that it will work.	Q1 and Q3 for coating and drying
Special Features	The big selling point for our ring is the biometrics that are used to detect if you're getting drowsy, so we need to make sure that those features are working properly.	Q1 and Q2 for connecting the electronics

Use the space below to describe any additional Proactive Quality Assurance Plans that are not connected to a specific activity on your Process Flowchart / Service Blueprint.
We will perform regular maintenance on our machines, provide training for our employees to ensure that our products are to company standards, and perform regularly scheduled product tests that involve checking the reliability of the finished product.
Describe any reactive quality assurance plans. Include a recovery plan should a customer receive poor-quality goods and/or services.
In terms of reactive quality assurance to satisfy customers, if a faulty product is delivered and is realized by the customer, their purchase will be refunded, a new ring will be delivered, and a 25% discount will be applied to their next order of our product (maximum of 4 items).

If you will utilize a quality/process improvement methodology, indicate which:
☐ NA ☐ TQM ☒ Six Sigma ☐ ISO ☐ Benchmarking ☐ Other (specify what): ***Note: You will not use all of them; only those with highest relevance.***
Provide a specific explanation of how your chosen quality methodology relates to your business and how it will be applied:
We will utilize the Six Sigma methodology because we are making our product using an assembly line, so we need to make sure that all our products are identical in both look and performance when delivered to customers.

Exhibit 9: Inventory, Suppliers and Distribution

RAW MATERIAL INVENTORY & SUPPLIER SELECTION ***If your organization does not have raw material inventory, please check this box***: ☐NA

Item(s)	**Supplier Name & Location (City, State, Country)**	**Reason for selecting this supplier**	**Supplier lead time (in days)**	**Frequency of replenishment (in days)**	**System of Management**	**Mode(s) of Transportation**
Epoxy (Liquid)	West System / Harrisburg, PA, USA	Locational Excellence, Variety	10	21	Fixed Order Interval	☒ Highway ☐ Rail ☐ Waterway ☐ Air
Aluminum Shell (in the shape of the ring)	PlasticLab / Den Haag, Netherlands	Cost Efficient, Ratings	21	30	Fixed Order Interval	☒ Highway ☐ Rail ☒ Waterway ☐Air
Battery	Grepow/ Livermore, CA, USA	Specific Need, Niche	14	30	Fixed Order Interval	☒ Highway ☐ Rail ☐ Waterway ☐ Air
Bluetooth Connection	AITRIP, Shenzen, China	Specific Need, Cost Efficient	21	30	Fixed Order Interval	☒ Highway ☐ Rail ☒ Waterway ☐Air
HR Sp02 Sensor	RichardsonRFPD / Horsham, PA	Specific Need, Cost Efficient	10	21	Fixed Order Interval	☒ Highway ☐ Rail ☐ Waterway ☐ Air
Packaging	Uline 12575 Uline Drive Pleasant Prairie, WI 53158	Specific Need, Cost Efficient	14	21	Fixed Order Interval	☒ Highway ☒ Rail ☐ Waterway ☐ Air

FINISHED GOODS INVENTORY ***If your organization does not have finished goods inventory, please check this box***: ☐NA

	Finished goods produced (per hour)	**Frequency of shipping finished goods**	**Average level of Finished goods inventory on site**	**Amount of safety stock on site**
At the end of Year 1	18	Weekly	((18*8) *5)/2 = 360	2950
At the end of Year 2	22	Weekly	440	3750
At the end of Year 3	29	Weekly	580	4976
At the end of Year 4	35	Weekly	700	5974
At the end of Year 5	41	Weekly	820	7081

What is the lifespan of your finished goods inventory?	☐NA	3-5 Years based on battery life.
How will you manage the perishability of Finished Goods Inventory?	☒NA	

DISTRIBUTION **If your organization does not require distribution, please check this box**: ☐NA

Name of transportation provider/carrier	**Reason(s) for selecting this provider/carrier**	**Frequency of Pick Up / Drop off**
UPS	The location of the distribution center is nearby, low costs, and efficient turnaround of delivery.	weekly

Exhibit 10: Capacity and Resources

	Demand (per hour)	Capacity (per hour)	Utilization (%)	Hours of Operation	Bottleneck name and description	How will you manage /adjust the bottleneck to ensure you can appropriately serve or supply your customers?
At the end of Year 1	**18**	**50**	**36%**	**8**	**Connect electronics**	**N/A**
At the end of Year 2	**22**	**50**	**44%**	**8**	**Connect electronics**	**N/A**
At the end of Year 3	**29**	**50**	**58%**	**8**	**Connect electronics**	**N/A**
At the end of Year 4	**35**	**50**	**70%**	**8**	**Connect electronics**	**N/A**
At the end of Year 5	**41**	**50**	**82%**	**8**	**Connect electronics**	**Add 1 worker to connect electronics**

Show your calculations for the following parameters at the end of Year 1.

Hours of operation/month	Demand/month	Demand/hour	Capacity/month	Capacity/hour	Utilization
(260*8)/12=174	**35,409/12=2,951**	**(35,409/260)/8 =18**	**((50*8) *260)/12=8,667**	**50**	**18/50=36%**

Additional resources (beyond your bottleneck) must be allocated appropriately to support operations. Identify which resources have a significant impact on capacity at start up and describe why these are appropriate amounts of resources at start up.
Although our operations rely heavily on tools and machines, there is still a human component that can determine the quality and speed our product is produced at. We will provide proper training for the employees before we start production to maintain a high quality and throughput rate.
Describe adjustments you will make as resource requirements vary with time. Be specific regarding which key resources (beyond your bottleneck) will be adjusted, when, and how. If you make multiple adjustments, explain each.
At the end of year five we will add another worker to the connect electronics station because we want to keep at least a 15% capacity cushion. This will make the cure epoxy with UV light the new bottleneck with a throughput rate of 65 per hour.

How will you manage seasonality? *If your organization does not have seasonal demand, please check this box*: ☒ NA

Exhibit 11. WakeRing Income Statement

	Fiscal year				
	2024	**2025**	**2026**	**2027**	**2028**
Sales Revenue	$3,002,683	$3,817,441	$5,036,916	$6,079,481	$7,205,885
COGS	$1,59,634	$1,778,591	$2,041,319	$2,262,341	$2,504,876
Gross Profit	$1,406,049	$2,038,850	$2,041,319	$3,817,140	$4,701,009
General and Administrative Expenses					
Salaries and wages	$1,119,049	$1,153,720	$1,188,332	$1,223,982	$1,260,701
Payroll Tax Expenses	$99,551	$102,630	$105,709	$108,880	$112,147
Employee Benefits and Retirement	$230,879	$238,020	$245,161	$252,515	$260,091
Commissions Expense	$46,560	$48,000	$49,440	$50,923	$52,451
General Insurance Expense	$60,054	$76,349	$100,738	$121,590	$144,118
Depreciation Expense	$43,847	$43,847	$43,847	$43,847	$43,847
Rent Expense	$83,951	$86,889	$89,930	$93,078	$96,336
Travel, Meals, and Entertainment	$30,000	$31,050	$32,137	$33,262	$34,426
Website Expense	$25,000	$6,000	$6,210	$6,427	$6,652
Advertising and Promotion Expense	$900,805	$763,488	$759,587	$911,922	$1,080,822
Taxes and Licenses	$45,040	$45,040	$45,040	$45,040	$45,040
Utilities	$19,600	$23,520	$28,224	$33,869	$40,643
Outbound Shipping	$15,934	$20,258	$26,872	$32,261	$38,238
App Expense	$30,000	$6,000	$6,210	$6,427	$6,652
Machine Maintenance	$3,746	$3,877	$4,012	$4,153	$4,298
Research and Development	$0	$0	$50,000	$90,000	$120,000
Total General & Administrative Expenses	$2,754,075	$2,648,688	$2,781,499	$3,058,176	$3,346,461
Earnings Before Interest and Taxes	($1,348,026)	($207,058)	$214,148	$758,964	$1,354,548
Interest Expense	$6,622	$207,058	$308,912	$334,042	$302,251
Earnings Before Taxes	($1,354,648)	($816,897)	($94,765)	$424,923	$1,052,297
Income Tax Expense	$0	$0	$0	$42,067	$104,17
Net Income or Loss	($1,354,648)	($816,897)	($94,765)	$382,855	$948,199
Beginning Balance or Retained Earnings	$0	($1,354,648)	($2,171,545)	($2,266,309)	($1,883,454)
Net Income(loss)	($1,354,648)	($816,897)	($94,765)	$382,855	$948,199
Distributions to Owners	$0	$0	$0	$0	$329,380
Ending Retained Earnings	($1,354,648)	($2,171,545)	($2,266,309)	($1,883,454)	($1,264,715)

Exhibit 12: WakeRing Balance Sheet

	As of Inception	Fiscal year				
		2024	2025	2026	2027	2028
Assets						
Current Assets						
Cash and Cash Equivalents	$362,559	$368,940	$401,897	$443,376	$487,611	$521,026
Accounts Receivable	$0	$340,304	$432,643	$570,850	$689,008	$816,667
Inventory	$0	$222,324	$255,165	$282,793	$313,109	$350,683
Total Current Assets	$362,559	$931,568	$1,089,706	$1,297,019	$1,489,729	$1,688,376
Fixed (Long-Term) Assets						
Machinery and Equipment	$107,020	$107,020	$107,020	$107,020	$107,020	$107,020
Buildings	$538,000	$538,000	$538,000	$538,000	$538,000	$538,000
Total Gross Fixed Assets	$645,020	$645,020	$645,020	$645,020	$645,020	$645,020
Less: Accumulated Depreciation	$0	$57,271	$114,541	$171,812	$229,083	$286,353
Net Fixed Assets	$645,020	$587,217	$530,479	$473,208	$415,937	$358,667
Total Assets	$1,007,579	$1,519,317	$1,620,185	$1,770,277	$1,905,666	$2,047,043
Liabilities						
Current Liabilities						
Accounts Payable	$0	$95,583	$126,796	$152,225	$180,359	$202,082
Accrued Salaries and Wages	$0	$21,521	$22,187	$22,853	$23,538	$24,244
Accrued Payroll Taxes and Benefits	$0	$6,354	$6,551	$6,747	$6,950	$7,158
Total Current Liabilities	$0	$123,459	$155,534	$181,825	$210,847	$233,485
Long-Term Liabilities						
SBA Loan	$57,579	$1,800,506	$2,686,195	$2,904,712	$2,628,273	$2,128,273
Total Liabilities	$57,579	$1,923,965	$2,841,729	$3,086,537	$2,839,120	$2,361,757
Owners' Equity						
Common Stock	$950,000	$950,000	$950,000	$950,000	$950,000	$950,000
Retained Earnings	$0	$(1,354,648)	$(2,171,545)	$(2,266,309)	$(1,883,454)	$(1,264,715)
Total Owners' Equity	$950,000	$(404,648)	$(1,221,545)	$(1,316,309)	$(933,454)	$(314,715)
Total Liabilities and Owners' Equity	$1,007,579	$1,519,317	$1,620,185	$1,770,277	$1,905,666	$2,047,043

Exhibit 13: WakeRing Cash Flow Statement

	Fiscal year				
	2024	**2025**	**2026**	**2027**	**2028**
Cash Flows From (For) Operations					
Net Income	$(1,354,648)	$(816,897)	$(94,765)	$382,855	$948,119
Depreciation & Amortization	$57,271	$57,271	$57,271	$57,271	$57,271
Changes in Current Accounts					
Accounts Receivable	$(340,304)	$(92,339)	$(138,207)	$(118,157)	$(127,659)
Inventory	$(222,324)	$(32,841)	$(27,628)	$(30,317)	$(37,573)
Accounts Payable	$95,583	$31,213	$25,429	$28,134	$21,723
Accrued Salaries and Wages	$21,521	$666	$666	$686	$6706
Accrued Payroll Taxes and Benefits	$6,354	$197	$197	$202	$208
Net Cash Flow From (For) Operating	$(1,736,546)	$(852,731)	$(177,038)	$320,674	$862,796
Cash Flow (For) From Investing Activities					
Fixed Asset Purchases	$0	$0	$0	$0	$0
Net Cash Flow from Investing	$0	$0	$0	$0	$0
Cash Flow From (For) Financing Activities					
Issuance of Common Stock	$0	$0	$0	$0	$0
Long Term Debt Borrowings	$1,742,927	$885,689	$218,517	$0	$0
Long Term Debt Payments	$0	$0	$0	$(276,439)	$(500,000)
Dividends Paid to Stockholders	$0	$0	$0	$0	$329,380
Net Cash Flows From (For) Financing	$1,742,927	$885,689	$218,517	$(276,439)	$(829,380
Net Change in Cash	$6,381	$32,958	$41,479	$44,235	$33,416
Adjustments	$0	$(1)	$0	$0	$0
Beginning Cash Balance	$362,559	$368,940	$401,897	$443,376	$487,611
Net Change in Cash	$6,381	$32,958	$41,479	$44,235	$33,416
Ending Cash Balance	$368,940	$401,897	$443,376	$487,611	$521,027

Exhibit 14: WakeRing Financial Statement Notes

- The initial start-up costs are funded using a $57,579 SBA loan with an 11.5% annual interest rate, over a 10-year period. The founders will contribute $350,000, as well as an angel Investor equity investment for $600,000.
- At the end of year one, we took out a $1,742,927 SBA loan with an 11.5% annual interest rate over a ten-year period.
- At the end of year two, we took out a $885,689 SBA loan with an 11.5% annual interest rate over a ten-year period.
- At the end of year three, we took a $218,517 SBA loan with an 11.5% annual interest rate over a ten-year period.
- We used straight line depreciation for all our depreciable assets.
- Costs of goods sold include materials, assembly workers, factory equipment depreciation, and two-thirds of rent and utilities.
- Accrued wages are assumed to be 5 business days of annual salaries and wages.
- Salaries and wages do not include the assembly associates, they are included in the costs of goods sold.
- Taxes and Licenses included environmental taxes, OSHA inspections, and regulatory/compliance fees.
- Commissions are given to sales associates at 25% of the sales they bring in.
- Advertising is calculated using 30% of revenue for year one, 20% of revenue for year two, and 15% of revenue for all following years.
- Machine maintenance was found using 3.5% of total machine cost, with additional annual increases based off of a 3.5% inflation rate.
- In Years three and four we used our excess funds to pay down our long-term debt.
- Year five we used our excess funds to pay out as dividends and to pay down our long-term debt.
- Over the 5 years we invest $260,000 in Research Development
- We use an Inflation Rate of 3.5% to calculate basic cost increases in recurring investments

Risk Assessment

There is inherent risk associated with our operations stemming from our large use of long-term debt, the potential for other competitors to enter the market, and our reliance on outside investment. Our high liquidity ratios, as well as our high debt equity ratio pose risks with monetary efficiency, and raise the risk of bankruptcy

Exhibit 15: WakeRing Financial Ratios

	Fiscal year					
	2023	**2024**	**2025**	**2026**	**2027**	**Industry**
Liquidity Ratios						
Current Ratio	7.55 ×	7.01 ×	7.13 ×	7.07 ×	7.23 ×	1.75×
Quick Ratio	2.99 ×	2.58 ×	2.44 ×	2.31 ×	2.23 ×	1.02 ×
Operating cycle (days)	54.76	56.45	58.20	60.00	61.80	45
Leverage Ratios						
Debt/Equity	N/A	2.99	3.25	2.99	2.49	0.4
Times Interest Earned	N/A	-2.95 x	0.69 x	2.27 ×	4.48 ×	2.5 ×
Asset Management Ratios						
Inventory Turnover	14.36 ×	13.94 ×	14.44 ×	14.45 ×	14.29 ×	14.29 ×
Receivables Turnover	17.65 ×	17.65 x	17.6 x	17.65 x	17.65 x	8.91 x
Fixed Asset Turnover	10.22 x	14.39 ×	21.29 ×	29.23 ×	40.18 ×	18.11 ×
Profitability Ratios						
Gross Profit Margin	46.83%	53.47%	59.47%	62.79%	65.24%	21.14%
Operating Profit Margin	-57.83%	-22.34%	-3.51%	5.27%	18.35%	6.63%
Return on Assets	-89.16%	-50,42%	-5.35%	20.09%	46.32%	5.6%
DuPont Analysis						
Net Profit Margin	-45.11%	-21.40%	-1.88%	6.30%	13.16%	9.85%
Total Asset Turnover	3.95 ×	2.36 ×	2.85 ×	3.19 ×	3.52 ×	2.38 ×
Equity Multiplier	-3.75 x	-1.33 ×	-1.34 ×	-2.04 ×	-6.50 ×	1.5 ×
Return on Equity	334.77%	66.87%	7.20%	-41.01%	-301.26%	45%

Exhibit 16: WakeRing Financial Analysis

Liquidity

On average, our current ratio was 4.1 times higher than the industry average, so that means we might want to put more money into investment activities. In comparison, our quick ratio, on average, is 2.4 times higher than the industry average. Our operating cycle, on average, is 1.2 times higher than the industry average

Financial Leverage

Our debt-to-equity ratio on average is 5.8 times higher than the industry average, while our times interest on average is about equal to the industry average.

Asset Management

Both our inventory turnover and receivables turnover on average are about two times higher than the industry average, while our fixed asset turnover on average is about equal to the industry average.

Profitability

Our gross profit margin on average is 2.7 times higher than the industry average. Our operating profit margin is 1.8 lower than the industry average, and our return on assets is 2.8 times lower than the industry average.

DuPont Analysis

Our net profit margin on average is 0.9 times lower than the industry average. Our total asset turnover on average is about equal to the industry average, and our equity multiplier is 1.9 times lower than the industry average. Our return on equity is .3 times higher than the industry average.

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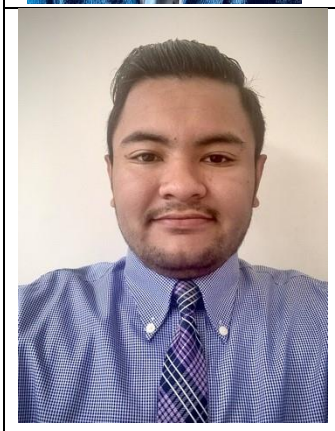
Bios/Photos

	My name is Avery Gould and I'm from Flemington, New Jersey. I'm a member of Epsilon Nu Tau, an entrepreneurship fraternity and am majoring in marketing and minoring in economics. I love looking at businesses marketing campaigns and digital media tactics. Moving forward, I aim to help companies grow with creative and unique approaches to marketing.
	Hello, my name is Jason Brown, and I am from Mechanicsville, Virginia. I am currently pursuing a degree in finance and a minor in economics at James Madison University. In my free time I enjoy working out and swimming. In the future I hope to pursue a career in financial advising.
	My name is Michael Aleksa, and I am currently a junior majoring in Finance from Richmond, Virginia. I am involved in the Kappa Sigma Fraternity as the Risk Management chair. In my free time I enjoy spending time with friends playing intramural sports or watching football and baseball. I am the youngest of 3, all of which have gone to JMU. I hope one day to pursue a career in consulting or becoming an analyst that allows me to provide for my family.
	My name is Peyton Raphael, and I am a junior accounting major at James Madison University. I am from Reston, Virginia. I belong to the Pi Kappa Phi Fraternity. In my free time I enjoy spending time with my friends and family, as well as playing basketball and watching all sorts of sports. I hope to someday start my own company and be able to make a difference in the world through entrepreneurship.

	My name is Sophia LaManna, I am a junior finance major. I'm from Ridgefield Connecticut, but my grandparents are from Richmond Virginia, so I always spent the holidays in Virginia and knew I wanted to go to school around JMU! I work at UREC as a lifeguard and at home, I am the head waterfront director at the Candlewood fishing camp! I have two pugs at home named Bogie and Angus. In the future, I hope to pursue a job in personal finance after I graduate.
	My Name is William Park, I am from Virginia Beach, Virginia. I am currently majoring in Business Management. In my free time, I like to spend time with friends and family, play golf, and watch sports. Football is my sport, but I also enjoy watching basketball and golf. Growing up in Virginia Beach I am always around a body of water, so I love to surf and spend time on the boat as well.
	My name is Jhoan Sebastian Fierro, I was born in Bogota, Colombia, but have lived in the United States since the age of 10. Before attending James Madison, I attended George Mason to pursue a degree in civil engineering but realized that I'm truly passionate about having my own business. I changed schools, changed my major, and now I am pursuing a degree in Business Management with a minor in Spanish. My biggest passions are playing and watching soccer, playing video games, and the outdoors; specifically, I love hiking and fishing most of all.