

Strategic Marketing Plan

for

Mean Green Clean Machine



19-692: Strategic Marketing and Product Management for Technological Innovations

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1. Executive Summary

The Mean Green Clean Machine (MGCM) is an indoor automatic cleaner that aims to help day care or elementary school classroom instructors maintain a clean and sanitary classroom environment both throughout the day and after the school day has ended. The MGCM is an autonomous robot that detects, picks up, cleans, and replaces dirty toys that are thrown around the classroom after children are done playing with them. The robot is designed particularly with the needs of private day care instructors in mind, but also may be applicable to public day care and higher level (elementary and middle) schools once the technology matures further. The MGCM increases the frequency of cleaning, maximizes the amount of time instructors can focus on and interact with children, reduces the spread of germs and diseases to both the students and the staff, and saves the day care centers money by reducing the staffing requirements and time investment of janitorial staff. The product uniquely is able to autonomously detect, pick up, and clean toys and small objects from the ground in a safe and reliable manner. It is a semi-exclusive and investment heavy system, but the lifetime savings it provides the classrooms and daycare centers are projected to be great. The system will cost around \$3,500, with slight deviations for different payment plans and added services. Customers in tech savvy areas will be targeted first, by a field sales team and presentations at conferences and expos. Once customers have been contacted and the brand grows sufficiently, strategic partnerships with retailers will be forged and mail orders will be sent to extend the customer base and bring the product closer to the customer's current purchasing practices. In the short-term, the technology must still be investigated and the system components would need to be integrated to create a functioning product. Additionally, efforts to reach out to and forge relationships with tech savvy day care centers is essential. In the long-term, the MGCM aims to improve health and wellness of day care families, children, and staff and revolutionize the ways children are exposed to robotics and automation. Additionally, a high volume of day care centers adapting multiple systems and using them regularly is a long-term goal.

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3. *Product Idea*

3.1 Idea Brief

In classrooms at preschools and across the country, children wreak havoc on the entropic state of cleanliness. Daily, instructors and classroom assistants are needed to sanitize the piles of toys that have been passed from hand to hand, and in younger classrooms from mouth to mouth for up to ten hours that day. After sanitization, the hard surfaces need to be wiped down and the shelves must be restocked with the mounds of clean toys classrooms are known to have. In some instances, the need to clean requires staff to stay hours after closing or to close off spaces early or periodically throughout the day. Currently, it is most common to have additional staff to support the classroom cleanliness or to have a much more specialized custodial service, both of which cost thousands of dollars in salaries annually. The Mean Green Clean Machine is an automated toy shelving and cleaning robot aimed for day care, elementary and pre-school classrooms across the US. It can be used by classroom instructors during mid-day breaks, while students are in the room, or at the end of the day to restore classroom order for the next day.

The system would have a clean and aesthetically pleasing monster exterior with very contained electronics. It would drive around the classroom with rubberized wheels. The system would be a mid-sized cylindrical shape with a rectangular cutout. The rectangular cutout would be the sanitation chamber, so small to mid-sized toys could be moved into the chamber with claw-like arms, sanitized, then placed onto the shelf with the same arms. The claws at the end of the arms would be rubberized as well for added grip and toy safety. To make the design friendly and interactive for the classroom, accessories and add-ons could be provided by means of collectible and varied exteriors, facial features, or add on body parts (tails, scales, antennae, etc.). The robot would charge using a normal outlet. Cleaning would be performed with high intensity waves (UV) in the cleaning chamber. The system would have automated scanning sensors to localize itself in rooms as well as locate shelves and toys. A computer software package would have to be developed so instructors could input the desired location and stacking arrangement of each toy then download the information to the robot, via USB cable.

With the main selling factor being economic savings, a strong focus on improved health is also a goal of the MGCM. It aims to measurably reduce the germs and bacteria present on toys throughout the day, in addition to simply making the job of the day care instructors simpler.

3.2 Idea Background

The inspiration for this product came from my personal experience working in the infant wing of a daycare center for two years. During a typical three-hour shift, I would spend an hour to an hour and a half cleaning the back room of the infant wing space, which required all the children to be moved to the front room. Closing one room made the space much more crowded, which is less preferable in terms of safety and parent perception of individualized attention to their children.

As a mechanical engineering student with a background and experience in robotics, I identified the opportunity to create an automated system to perform this task while children were in the room, out of the

room on walks, or after hours in order to maximum the use of the space. The majority of the technology required (ultraviolet cleaning, room navigation, obstacle avoidance, robotic arms, localization, etc.) is all mature enough for commercialization and is utilized in commercial products in other categories. An existing product category for an autonomous room cleaner does not yet exist. In its simplest form, the MGCM would still require integration of various technologies and systems in a unique and innovative manner, thus would require heavy research and development efforts. The product, however, would ideally be entirely achievable given the proper timeline and resources.

4. Customer Analysis

4.1 Customer Profile

Customer Personas & Roles

<i>Persona</i>	<i>Role</i>
<i>Elementary/preschool teacher</i>	User
<i>Parent</i>	Influencer
<i>Child/student</i>	Influencer <small>(potential in certain school environments, unlikely in most)</small>
<i>Safety supervisor</i>	Gatekeeper
<i>Board of Education</i>	Initiator, Gatekeeper, Influencer
<i>Parent Teacher Association</i>	Initiator, Influencer
<i>Superintendent</i>	Buyer, Influencer
<i>Janitor/sanitation staff</i>	Influencer

Elementary School Teacher (User) Customer Profile



School teacher^[1]

Roles: Primary User

Background:

- ◆ 22-40, generally female
- ◆ Education: College Degree
- ◆ Experience through student teaching, past employment, or tenure
- ◆ Low training and experience with commercial technologies
- ◆ Extensive experience with household appliances (dishwashers, etc.)
- ◆ Stressed by long, demanding hours and comparably low salary

Attitudes & Beliefs:

- ◆ A clean classroom is a healthy classroom.
- ◆ “Student learning needs are the primary focus.”^[2]
- ◆ “I touch the future. I teach.”^[2]

Behaviours:

- ◆ Spends long hours outside of school creating lesson plans
- ◆ Constantly observes classroom state to ensure adequate learning environment
- ◆ Expends a lot of energy during the day to keep up with the students/children

Goals & Motivations:

- ◆ Satisfaction arises from creating learning opportunities for children
- ◆ Strives to motivate and enlighten the future generation
- ◆ Leaves each day having learned new things or grown as an individual

Success: Creates a healthy and active educational environment in the classroom to spark a desire to learn amongst students.

Use Cases

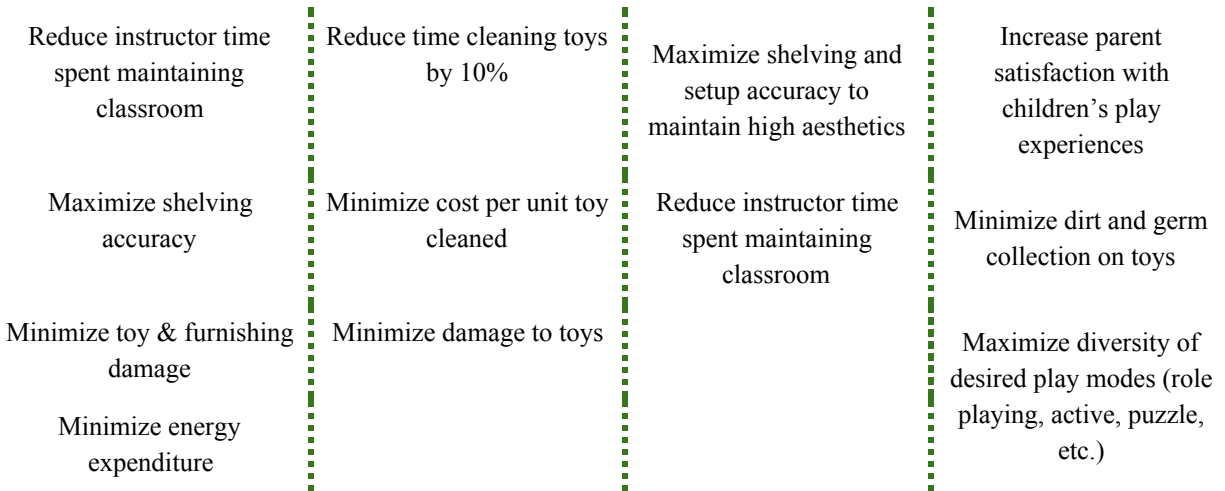
<i>At end of day</i>	At the end of the day, a classroom instructor would need to clean the room for the next morning. There will be no children left in the room. The instructor may be powering off and unplugging appliances for the night. The instructor may be entering and exiting the room.
<i>During snack breaks</i>	During the day, there may be a reduced number of students in the classroom while students are in the cafeteria eating. The instructor may want to clean the classroom during this time so the children come back to clean toys and a clean room. There will be few to no students and full power in the classroom. Instructors may or may not be present.
<i>During nap time</i>	During the school day, the instructor may want to tidy up a very messy room since children have likely taken toys off the shelves and left them laying around the floor. Some toys may no longer be in use. There will be children and staff present and not moving, and full access to all appliances
<i>With "students" in room</i>	During the school day, the instructor may want to tidy up a very messy room since children have likely taken toys off the shelves and left them laying around the floor. Some toys may no longer be in use. There will be children and staff present and moving, and full access to all appliances.

Jobs To Be Done

<i>At end of day</i>	<i>During snack break</i>	<i>During nap time</i>	<i>With kids in room</i>
Straighten up Classroom	Straighten up Classroom	Straighten up Classroom	Straighten up Classroom
Clean Toys	Clean Toys	Clean Toys	Clean Toys
Reset Classroom for next day	--	--	Improve play experience

Outcomes

<i>Straighten Up Classroom</i>	<i>Clean Toys</i>	<i>Reset Classroom for Next Day</i>	<i>Improve Play Experience</i>
Maximize speed of toy pickup	Minimize present bacteria/germs	Minimize time spent prepping for next day	Maximize giggles
Minimize energy expenditure	Maximize cleaning reliability	Maximize teacher comfort while arranging classroom	Increase children's interaction with others and objects
Minimize damage to toys	Minimize energy to sanitize toys	Minimize energy expenditure required	Minimize toy territorial arguments



4.2 Customer Journey (current state)

Persona: Classroom Instructor

Job to be Done: Clean the toys in the classroom (without MGCM)

☺ Point of Delight

☹ Point of Pain

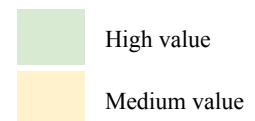
○ Opportunity

Step	<i>Assess Classroom State (toys)</i>	<i>Relocate Students from Room</i>	<i>Collect Toys</i>	<i>Sanitize Toys</i>	<i>Re-shelve Toys</i>	<i>Re-asses Classroom State (toys)</i>	<i>Relocate Students to Room</i>
<i>Tasks</i>	Visual scan of classroom ○ Careful inspection of select toys (saliva content, visible dirt, etc.) ○☹ Optional: swab toy samples ☹	Count students ☹ Calculate proper student/faculty ratio ☹○ Determine appropriate external space Move students to new space ☹	Pick toys up ☹○ Move toys to single location ☹ Separate hard and soft toys ☹○ Arrange in orderly, spaced out pattern ☺	Spray toys with toy cleaner ☹○ Flip toys over Spray other side with toy cleaner Wipe toys dry ☹○	Sort toys into like categories ☹ Pick up toys ☹○ Place toys on shelf ☹○ Arrange toys neatly in clusters on shelves ☺☹○	Visual scan of classroom ☺○ Careful inspection of select toys (saliva content, visible dirt, etc.) ☺○ Confirm no missed toys (if necessary, return to step 3 ☹ otherwise continue ☺)	Count students ☹ Calculate proper student/faculty ratio ☹○ Determine appropriate external space Move students to new space ☹
<i>Touchpoints</i>	Classroom furnishings & appliances Toys/books/etc. Other instructors	Other instructors Other students Classroom appliances & furnishings Toys/books/etc.	Toys/books/etc. Classroom furnishings & appliances Bacteria/germs/dirt Classroom floor	Toys/books/etc. Classroom floor Bacteria & germs Cleaner Washcloth	Toys/books/etc. Classroom furnishings & appliances	Classroom furnishings & appliances Toys/books/etc. Other instructors	Other instructors Other students Classroom appliances & furnishings Toys/books/etc.
<i>Emotions</i>	Disgust	Distress	Boredom	Disgust	Boredom	Happiness	Excitement

Measures	Irritation Sadness Authorship	Urgency Concern	Disgust	Boredom Irritation Frustration	Calm Satisfaction	Relief Contentedness Excitement	Happiness Satisfaction
	Decision to clean or not to clean classroom Improved understanding of cleanliness of room	Reduced student population in target classroom Students safely moved to other classroom	Neat arrangement of toys Clear classroom floor & shelves	Reduction of surface germs No remaining moisture or dust Sanitary standards met	Toys aligned on proper shelf Toys surrounded by like toys No remaining toys on floor	Decision to continue cleaning or relocate students to room made Safety of room/play environment confirmed	Students moved back to the now clean room Room is safe and child play experience is improved

4.3 Value Opportunity Analysis

Problem / Value Opportunity	Importance	Satisfaction	Importance - Satisfaction	Rating
<i>There exists an opportunity to automate the inspection of toys while the primary user is assessing the classroom.</i>	9	6	3	12
<i>An opportunity to automate the scanning of the classroom for cleanliness standards violations (or unsatisfactory cleanliness) exists to improve the elementary school teacher's efficiency while scanning his/her classroom.</i>	8	5	3	11
<i>A third-party counting system could be implemented to reduce the teacher's time spent counting students and calculating the proper student-teacher ratio as he/she relocates students to/from the classroom.</i>	3	8	-5	3
<i>Automating the toy pick up process while the instructor collects and re-shelves toys could increase the efficiency and save valuable instructor time.</i>	7	2	5	12
<i>There exists an opportunity to automate the hard/soft toy separation task as the instructor collects toys while cleaning the classroom.</i>	5	3	2	7
<i>An opportunity to automate and improve the toy spraying process for instructors as they sanitize toys while cleaning their classrooms.</i>	10	3	7	17
<i>An opportunity to automate and improve the toy drying process for instructors as they sanitize toys while cleaning their classrooms.</i>	5	4	1	6
<i>The process of placing the toys back on the shelves in neat clusters can be improved or automated to aid the instructors as they clean the classroom.</i>	4	7	-3	4



5. Market Analysis

5.1 Market Segments

Initially, we will consider only the domestic market, restricting all market segments to the United States. Within this, the unifying industry that includes the identified personas is early childhood education, as this is where users have a need to clean up classrooms and daycare spaces (in many daycare centers the rooms are divided up by age and are treated as classrooms, thus will subsequently be referred to in the classroom category). Childhood education in the United States is broken up into three main segments by age: pre-primary education, primary education, and secondary education. Pre-primary, pre-kindergarten, or nursery school includes children younger than age 4. Primary education, or elementary school, is generally aged 4-11 in the United States and falls between pre-k education and secondary education. Secondary education generally captures students aged 11-17, which is frequently split into middle and high schools.

In each age group, the main distinguishing factors are size, location, & organizational structure. Some schools are very small, with one to five classrooms, while some are significantly larger. Traditionally, smaller schools are in more rural areas and larger schools exist in more populous areas, however the geographical location can play a part in the practices of the school and how students are transported to and from the school. Additionally, in terms of funding and purchasing processes, a school's organizational structure as either public or private is a large differentiating factor.

Overview

<i>Market Segment</i>	<i>US Daycare Centers</i>	<i>Public US Elementary Schools</i>	<i>Private US Elementary Schools</i>
Segment Definition*	United states day care centers serving children aged 3mo-5yr	Publicly owned/operated elementary schools, serving children aged 5-11 yrs	Privately owned elementary schools, serving children aged 5-11 yrs
Size**	53,000 commercial facilities w/ \$21 billion annual revenue 21,000 not-for-profit facilities w/ \$13 billion annual revenue ^[6]	85,530 traditional public schools ^[7] 4,480 public charter schools ^[7] \$600 billion industry total ^[7]	30,861 ^[5] \$600 billion industry total ^[7]
Trends (Growth Rate?)	Growing 9% annually in 2014 ^[3] Demand projected to increase until 2020 ^[4] Enrollment in childcare facilities has been steadily increasing since 1990 ^[5]	Relatively stable, slight increase ^[5] Enrollment in public elementary schools is expected to grow 5% between 2013 and 2023 ^[8]	Relatively stable, slight decrease ^[5,8] Enrollment in private elementary and secondary schools fell from 11.7% in 2001 to 9.6% in 2011 ^[8]

Demand Drivers	<p>Strong drivers</p> <p>Increased parental employment</p> <p>Cultural value of education</p> <p>Disease outbreaks</p>	<p>Moderate drivers</p> <p>Cultural focus on/value of education</p> <p>Disease outbreaks</p>	<p>Moderate drivers</p> <p>Cultural focus on/value of education</p> <p>Disease Outbreaks</p>
Market Readiness	<p>Early Adopters</p> <p>(due to increasing parental pressures for improved safety, day cares tend to support new philosophies and technologies if they are supported with safety approval and certification)</p>	<p>Laggards</p> <p>(with variable funding, sometimes being extremely limited, and much higher regulation in terms of government policy, public schools often wait for technology to become necessary or thoroughly tested)</p>	<p>Early Adopters</p> <p>(due to increasing parental pressures for improved safety and value, public schools tend to support new philosophies and technologies more readily)</p>
Accessibility	<p>Relatively easy to find</p> <p>Accessible through targeted advertising, direct contact, and partnerships or promotion with/by early childhood education groups</p>	<p>Easy to find, hard to sell</p> <p>State run, easy to identify from state and federal documentation; Generally need to be approached by government & regulatory bodies or reached through school boards and groups</p>	<p>Relatively easy to find</p> <p>Targeted marketing and direct contact;</p> <p>Promotion/partnerships with education groups</p>
Entry Barrier	<p>High entry barriers</p> <p>Must have extensive safety testing and certification for use and approval around young children; Validation will take time and money; Technology development could be costly</p>	<p>Highest entry barriers</p> <p>Must have extensive safety testing and certification for use and approval around young children; Validation will take time and money; Technology development could be costly; Must be approved by PTA, BOE, and meet stricter state regulation</p>	<p>High entry barriers</p> <p>Must have extensive safety testing and certification for use and approval around young children; Validation will take time and money; Technology development could be costly</p>
Buying Practice	<p>Moderate</p> <p>Instructors generally have classroom budget with larger/full school purchases being completed by an authorized staff member; most centers are sole-proprietors^[6];</p>	<p>Complex</p> <p>Large purchases or things that affect classroom structure generally need to be approved by various boards (PTAs, BOEs, etc.); Typically have less flexibility in spending,</p>	<p>Moderate</p> <p>Similar to day cares; Generally instructors have more control over classroom purchases and there are fewer authoritative groups that must approve the process</p>

can be effectively reached with advertising since budget is state determined

- * General definition ages assumed, confirmed by multiple sources with small discrepancies in age
- ** The system would be designed to have one MGCM per classroom with toys, which means that each school/daycare would purchase between 1 and 10 systems. An average of 4 would be reasonable to assume, as some centers would choose to use a single one in multiple classrooms less frequently.

Analysis

A variety of resources were used to analyze the readiness and attractiveness of each market. First, to classify each category, statistics from the Bureau of Labor Statistics, National Center for Educational Statistics, and other organizations, as well as news articles were collected to determine various trends and common differentiating factors. Since the product would be sold to organizations and businesses, identifying the potential pool of buyers is relatively simple - the number of that type of school. Additionally, typical expenditures and revenue for the categories is heavily documented by various government organizations including the Bureau of Labor Statistics, the National Center for Education Statistics, and the Census Bureau.

The major factors to evaluate include cultural trends and inclinations, government regulation and policy, and economic factors. Ultimately, the industry has had relatively consistent performance, even amidst times of economic downturn, which makes projection and trend discovery relatively simple and it should represent a reliable prediction.

6. *Competition and Non-Market Factors Analysis*

6.1 Product Category

The Mean Green Clean Machine aims to create a unique new product that doesn't necessarily fall into any existing categories. With nearly all of its functionality currently performed by human workers, the need for the product is difficult to quantify and the category it will fill is hard to classify. At the product category level, the main competitors are janitorial services and doing it yourself, whereas the MGCM falls into a new "indoor automated cleaner" category. This new category name was determined by comparing similar product categories, as characterized by various online retailers (Amazon, eBay, etc.). Comparable categories include Industrial Robotic Vacuum, Commercial Robotic Vacuum, and Robotic Pool Cleaners. The most comparable existing commercial technology is indoor robotic vacuums and floor scrubbers (most commonly iRobot's Roomba), thus this would represent the most direct competition.

Currently, most cleaning of classrooms is performed by either hired part time employees, a janitorial staff, or the teachers themselves. Thus, manual contracted or personal labor is the most common substitute, representing a different industry entirely, making it a strong indirect competitor.

Additionally, a large non-market factor will be the policies and regulations (federal and state level) relevant to cleanliness standards. With increasing parental pressures to protect and nourish their children in the healthiest possible environment, policy is beginning to promote stricter regulation of supervision, cleanliness, and classroom practices. If it can be proven that the MGCM can reduce the spread of diseases and germs in the classroom, not only would the economic value skyrocket (less paid sick days) but the policies could affirm and promote the transition to the reliable cleaning system that the MGCM would include.

Overview of Product Categories

Product Category	Indoor Automated Cleaner	Janitorial/sanitation Services	Do it Yourself
Product Type	Hardware (robot)	Service	Activity/process
Primary Function	Clean indoor spaces (commercial & private spaces)	Clean variety of spaces (indoor, outdoor, commercial, private)	Clean personal space
Primary Usage Occasions	When not in room/with limited time Continuously	End of day End of week With limited time	When room is messy (large or small) Before guests visit

	throughout day With tight finances When mess is small	Without heavy financial constraints When mess is large	During free time With critically tight finances
Common Attributes	Vacuuming Navigation Coverage boundaries Obstacle avoidance Planar surfaces (floor or window)	Deep, thorough cleaning Variety of surfaces (floor, window, shelves, etc.) Visual inspection	User control Visual inspection Variety of surfaces (floor, window, shelves, etc.)
Key Technology Used	Localization (and other) sensors Motors Microcontrollers Software Power/battery	Manual cleaning tools (gloves, mops, brushes, scrapers, etc. industrial or consumer strength) Chemical cleaners (industrial or consumer strength)	Manual cleaning tools (gloves, mops, brushes, scrapers, etc. consumer strength only) Chemical cleaners (industrial or consumer strength)
Tech Adoption Stage	Innovators	Laggards	Laggards
Annual Revenue	\$2.6 billion ^[10]	\$40 billion ^[11]	N/A, not sold
Annual Units Sold	1.6 million ^[12]	55,000 janitorial establishments (single-location companies and units of multi-location companies) 8,000 carpet and upholstery cleaning establishments ^{[11]*}	N/A
Trends	Growing market, around 10% annual revenue increase ^[13,15]	Stable, annual growth of 1.4% ^[14]	N/A
Notes	Since this is a new ill-defined market, limited data is available	Value is in time. Assuming 1 hr/day spent cleaning, 180 school days, 3.6 million teachers ^[16] , and average hourly pay of \$25 ^[17] then \$16.2 billion is spent tidying classrooms by teachers. If minimum wage workers are paid on average \$8 per hour then \$5.2 billion is spent annually tidying classrooms.	

* Since it is a service not a product, the units sold doesn't represent the market. Establishments give a relatively similar understanding of market size. Contracts executed would be an ideal comparison, however this data varies widely by company and isn't publicly available.

6.2 Product Level Competitors

Since the market is relatively new and undefined, the iRobot Roomba has been selected as a competitor. The Roomba is able to navigate a room and clean the carpet, which is similar to what the MGCM would aim to do, without the focus on toy cleaning and re-shelving for classroom applications.

Competitor Overview

Product Name	Mean Green Clean Machine (for comparison)	Roomba® 980	Room Tidying Pickup Robot ^[20]
Company	Mean Grean Automation, Inc.	iRobot®	Hammacher Schlemmer
Product Type	Indoor Robotic Cleaner	Indoor Robotic Vacuum	Remote Control Robot
Product Attributes	<ul style="list-style-type: none"> Long battery life Cleans all types of toys (hard & soft) Navigates autonomously over all surfaces Increased cleanliness and reliability Adapts to room environment (children presence) 	<ul style="list-style-type: none"> Automatically charges Cleans entire level of home Cleans under sofas and chairs Connects from anywhere Cleans all floor types Detects and increases performance on high demand spots 	<ul style="list-style-type: none"> Picks up objects at user command Cargo bed for object dropoff Remote control Small 1oz items can be picked up Infrared vision Rubber wheels for floor navigation
Key Technology	<ul style="list-style-type: none"> UV cleaning & shielding Visual scanning & localization Dirt detection sensors Software control Autonomous navigation Efficient path planning Robotic arm motions Sensitive gripping methodology 	<ul style="list-style-type: none"> HEPA filtering Visual scanning & localization Dirt & dust detection sensors iOS control (HOME app) Autonomous navigation (iAdapt 2.0) Path tracking Sensors (cliff detection, objection localization) Brushless extractors Aeroforce cleaning technology 	<ul style="list-style-type: none"> Infrared vision Localization sensors Remote control Targeted vibration “Autonomous” mode Sensitive gripping Robotic arm motions
Uses	<ul style="list-style-type: none"> Cleaning a classroom with children present ... without children present ... at end of school day 	<ul style="list-style-type: none"> Vacuuming a carpet (when home or away from home) 	<ul style="list-style-type: none"> Picking up toys in a room Play/entertainment (can also whack objects)

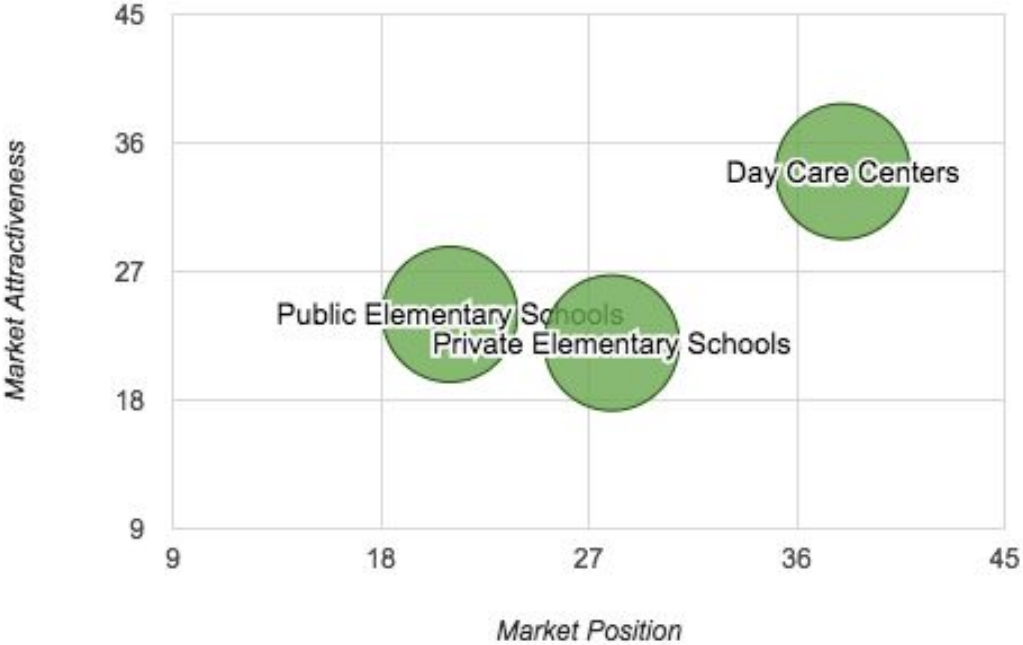
Value Claims	Doesn't damage toys Increases toy lifetime Reduces spread of germs Increases cleaning efficiency Interacts safely with children	Keeps going until the job is done Smart, simple, powerful	Making a "cleaner world" Intelligent response Tidies rooms Safe for child interaction
Uniqueness	Toy pickup and cleaning technology Re-shelving capabilities Interaction with children (could benefit students with special needs) Adaptability to space/environment	Battery life App control Path efficiency Filtration Cleaning effectiveness	Functionality/toy pick-up Entertainment value
Target Markets	Day Care Centers Private Elementary Schools Public Elementary Schools	Wealthy homeowners Pet owners Busy homeowners	Children 6+
Customers	School boards Teachers	Homeowners/renters	Parents (for child use)
Channels	Partnerships & agreements with teaching boards/groups Targeted advertising State/federal cleanliness policy	Advertising Website Word of mouth Retail stores	No longer produced/for sale
Business Performance	N/A	9% Five-year annual growth rate \$616.78 million in revenue ^[20]	No longer sold
Strength	Advanced technology Innovation ability Robotics & day care experienced personnel	Incumbent (experienced) Industry leader Large potential market	Fun Unique
Weakness	Relatively smaller market High development cost	Limited functionality	Small market Limited functionality
Notes		One of many variations of Roomba Priced at \$899	No longer for sale Was priced at \$69.95 Served as a toy

7. Target Markets and Marketing Strategy

7.1 Target Market Analysis

To create a comprehensive rating for each segment to determine the best segments to target, an indexing method has been utilized to determine both market attractiveness and market position. For each main factor, a score of 1 to 5 was given (1 is low attractiveness, 5 is high attractiveness). Each factor is weighted with a value of 1, except market size and growth rate within market attractiveness and solution importance, competitive landscape, and adoption of alternatives within market position which are all weighted at 2. The cumulative index is calculated as the weighted sum of the product ratings for each segment. See appendix for detailed computation.

Figure 1: Target Market Matrix



The above matrix shows that daycare centers are likely to be the most attractive market to target. private elementary schools are the second best, trailed closely by public elementary schools.

7.2 Marketing Strategy Overview

Start: January 2016

Segment: US Day Care Centers

Journey Steps: Clean/Sanitize Toys in Classroom

Opportunity: Improve cleanliness and sanitation to reduce spread of disease and germs

Proof of Concept Dec. 2016	Experimental Testing Mar. 2017	Design Modification May 2017	Final Product Design (DFM/DFX) Aug. 2017	Formal Testing & Certification Dec. 2017	Product Release Mar. 2018	Adoption of multiple systems Nov. 2018	Product-Market Fit Mar. 2019
First prototype	Design & execute cleaning experiments	Second prototype	Design of final system and technology	Second round of testing to ensure all federal and state standards are met	Successful product launch	50% of day care centers with systems own multiple	31,800 units in regular (daily) use
Design and build preliminary version of system with cleaning and grasping functionality	Partner with Cyert Center to do preliminary testing and collect user feedback	Rebuild system by incorporating customer feedback and information gathered from observing use in classroom Reach out to additional centers for preliminary testing opportunities	Ensure design focus added and perfected to reach aesthetic goals Gather feedback via focus groups about exterior design options Open pre-order	Consult with legal advisers to ensure any necessary certifications are earned and collect data for advertising purposes	Product receives design award and recognition on launch Target 500 daycares participating in pre-order	Target 7,500 participating day care centers	Assuming 53,000 commercial day cares are potential customers, purchasing two systems each and 30% adoption.

Early adopters are likely to be tech savvy day care instructors who work at private day care centers. Due to the technical nature of a robotic system, an instructor is unlikely to accept the utility unless he/she has experience with other high-tech products. Additionally, the daycare realm is much less regulated than public elementary schools, making adoption less of a regulatory concern and more a financial concern.

In order to target these audiences best, day cares for faculty and staff at tech companies will be targeted first. While R&D is in progress, the MGCM should seek partnership with the Cyert Center for Early Education at Carnegie Mellon University. This daycare has six classrooms (divide by age The Infant Wing, ages 3 months to 1 year; Young Toddler, ages 1 to 2 years; Older Toddler, ages 2 to 3 years; Preschool 1, ages 3 to 4 years; Preschool 2, ages 4 to 5 years; PreK/Kindergarten, ages 5 to 6 years) and many of the parents come from technical professions and are highly familiar with the research and development that goes on in and around the CMU campus.

In terms of technology, the product will start by focusing on the toy cleaning technology, with shelving software coming later once stability and the capability of cleaning technology has been established and widely recognized.

7.3 Market Coverage Strategy

Initially, day care centers will be focused on. Once positive customer reviews have been received from the first pool of day care centers participating in preliminary testing, additional testing should be performed in private elementary schools. If the experiments determine that the same or a similar product would be beneficial and has potential for wide adoption in the elementary school setting, development should continue to adapt the system for any additional or different needs the elementary school has (ie: cleaning and picking up thin, paperback books and smaller blocks).

Once the product has been developed, a differentiated strategy should be used to ensure the product can be successful in both the daycare and private elementary school markets. While this includes higher risk, as it requires intensive investment in product development and the development of a unique marketing mix for each market, we expect similar technologies will be required with only small modifications required. With unique models to fit each market this, the MGCM will be able to be more successful in each market.

7.4 Market Entry Strategy

Once a sufficiently functional product is completed and ready for expansion based on feedback from the CMU day care center, similar settings will be targeted: day care facilities connected to tech companies and research universities (ie: Stock Farm Roads Children's Center at Stanford, Harold E. Jones Child Study Center at UC Berkeley, The Children's Center at CalTech, Lincoln Laboratory Childcare Center and others at MIT, Google Day Care Centers at Google in Mountain View, and Milpitas Daycare Center at Cisco in San Jose). To ensure the early phase of adoption provides valuable feedback, a micromarketing strategy will be utilized. This will create a positive reputation for the company so a positive brand image can be developed. Additionally, by fostering these close connections MGCM can establish a symbiotic relationship with our early customers where information and feedback can flow freely, thus aiding in the product development cycle. Additionally, it is unlikely that many large companies would consider entering a similar market to provide direct competition. iRobot, the closest competitor, focuses more on commercial products for the home, which makes the day care segment far too small for them to be a reasonable threat.

7.5 Growth Strategy

By targeting similar facilities, geographical boundaries can begin to be surmounted and each new center partnered with would allow for the technology to spread in each region. Tech-related daycare and pre-school centers will be targeted across the United States. After targeting and successfully acquiring various local centers, we hope we can use local press, parental word of mouth, and then social pressure to encourage other local day care centers to also buy into the MGCM. Within the geographical expansion

and growth, a concentrated market coverage strategy will be utilized. This will aid in maintaining the strong customer relationships local day care centers would expect, as this would sequentially follow the micromarketing strategy for growth. Additionally it will keep all costs other than product development lower. Establishing a strong position, which a concentrated strategy is good for, is absolutely integral for creating the new market and industry that the MGCM aims to do.

8. *Goals*

8.1 Short-term Goals

The short term goals for the Mean Green Clean Machine include:

- 1) Developing and maturing necessary technology
- 2) Building strong relationships with target day care centers
- 3) Acquire project publicity and recognition from robotics, engineering, design, and teaching organizations

To measure the development and maturity of technology, research papers and press releases should be regularly released publicly. Additionally, an intensive timeline with regular gateways and checkpoints should be created and adhered to. Missed deadlines can be considered roadblocks to the technology development. While the technology is finalized, an open conversation and preliminary surveys should be created with a variety of day care centers. By beginning with strong relationships, the MGCM will be more likely to find willing partners for testing, as well as potential early adopters. Additionally, with the main selling point being improved reliability and effectiveness with respect to cleaning, and thus the reduced spread of germs and diseases, social awareness and publicity are requisite for successful launch and market growth. By receiving recognition in multiple industries, the product can be established as not only a unique product, but also a responsible and respectable company.

These goals were selected within the context of targeting day care centers in tech savvy areas with the assumption that instructors/teachers are cleaning their classroom. These short term goals will get the product from the idea to development phase effectively, however these short term goals only provided the basis for a successful product launch. In order to guarantee widespread adoption and eventual product-market fit, additional goals and strategies must be utilized along the way to transition from the more developmental phase to the product selling and management phase.

8.2 Product-market Fit

The process for establishing product-market fit will include efforts to receive recognition and acclaim for unique engineering and robotic design with socially conscious motivation. If sufficient hype and enthusiasm can be created for the product, this will aid significantly in advertising and building brand image. The main goal will be to partner with and be endorsed by various professional education organizations. If a successful endorsement can be established, partnered with efforts to reform and promote increased cleanliness standards in day care centers and pre-school environments, a social movement and pressure can be placed on day care centers to adopt our technology. If enough hype is produced, then it is likely other companies will become competitors, but the prior knowledge MGCM has and the feedback and learning it would have acquired by this point would give it a significant advantage in terms of product development.

Product-market fit can be measured by having 31,800 units in regular use. This comes from assuming that 30% of the 53,000 potential commercial day cares purchase two systems and use them regularly (daily). At the point product-market fit is established within day care centers, the MCGM should be about 50% of the way to product market fit in the private elementary school market as well.

9. Positioning Strategy

9.1 Evaluation Factors and Criteria

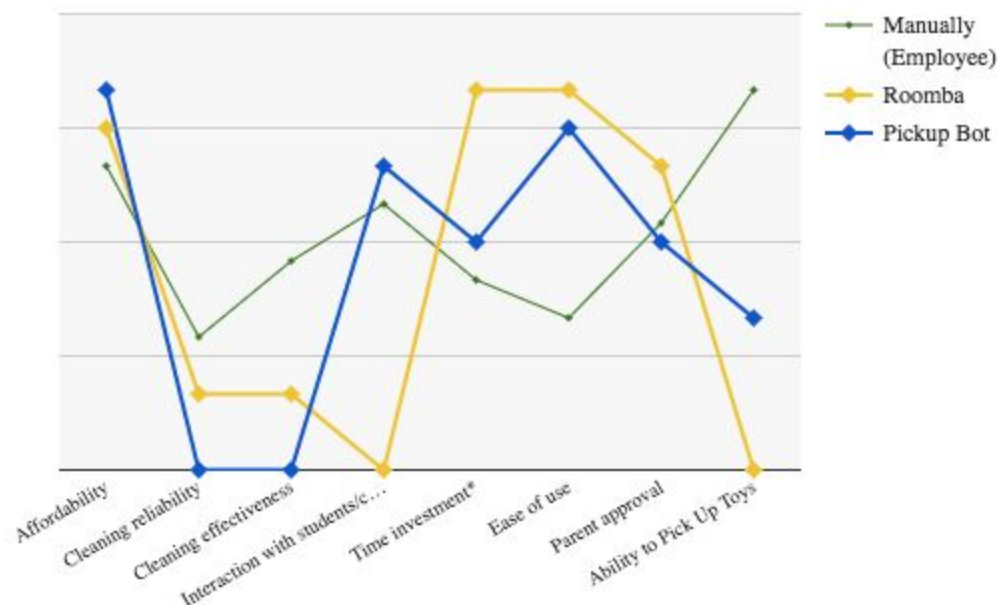
The evaluation criteria include:

1. Affordability (based on annual cost)
2. Cleaning reliability (does it clean every time)
3. Cleaning effectiveness (how well does it clean)
4. Interaction with students/children (fun v. distracted)
5. Time investment
6. Ease of use in active classroom
7. Parent approval rating
8. Ability to pick-up/put down toys

Affordability is approximated on an annual basis*. Cleaning reliability and effectiveness include the time invested, the potential classroom disruptions, and the consistency of the cleaning. Interaction with students is determined by the necessity to relocate students and the potential to create valuable and educational interactions. Time investment includes training costs and time invested in cleaning processes. Ease of use refers to the simplicity of initiating cleaning as well as the complexity of the cleaning procedure. Parental approval is based off the likelihood of positive parental ratings and satisfaction with the cleaning practise. The ability to pick-up/put down toys refers to the robot's ability to autonomously locate, pickup, and place down toys.

* Approximated by using estimated hourly wage of \$8/hr, cleaning 1.5 hrs/day 260 days/yr.

Figure 2: Evaluation Criteria



9.2 Differentiation

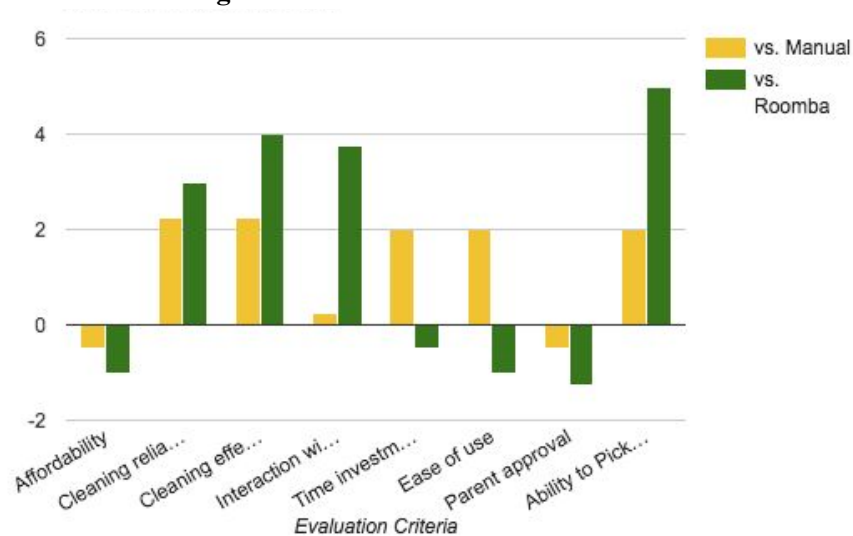
As is evident by the plot above, there is a gap in high cleaning reliability and effectiveness. Of the robotic systems, there is also a lack of the ability to autonomously pick up toys. There is also a gap in low time investment, ease of use, and parental approval, however having low ratings in these categories is undesirable for the customer.

Table 1: MGCM Differentiation

Eliminate Overuse of instructor time on menial tasks Company spending (affordability)	Add Cleaning efficiency Cleaning reliability
Reduce Time investment Complexity of use (ease of use)	Create Autonomous pick-up Autonomous put down

By estimating the success and features of the MCGM, it can be determined that cleaning reliability, cleaning efficiency, time investment, ease of use, and autonomous pickup ability are the most highly differentiated positive factors with respect to manual cleaning. As compared to the Roomba, cleaning reliability, cleaning effectiveness, interaction with children, and ability to pick-up/put down are the most positively differentiated factors. The plot below shows the net benefit, which is the difference of the MGCM value and the next best option - manual employee cleaning or Roomba - for each evaluation criteria shown above.

Figure 3: MGCM Net Benefit

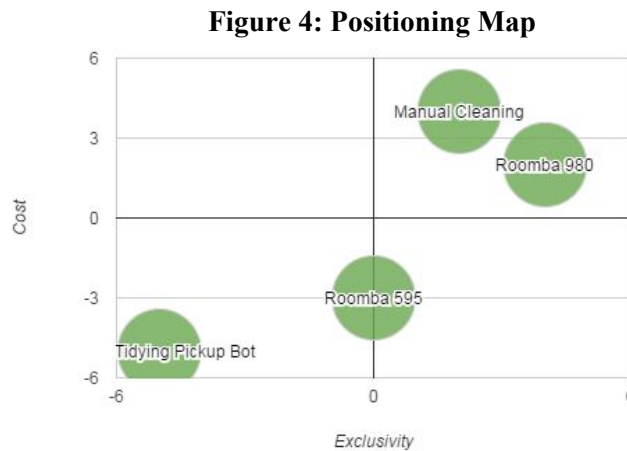


With this method of displaying the data, it becomes extremely evident that the cleaning factors (reliability and efficiency) and the ability to autonomously pick-up/put down toys are the key differentiating factors

of the MGCM. The positive value indicates that the MGCM provides additional benefits, as compared to the current solutions. With the opportunity open to improve cleaning and toy manipulation, as is evident by the unoccupied space on the chart, and the available technology, this is the best place for the MGCM to differentiate itself. Many of the other options (Roomba and Pickup Bot) include the time investment reduction and the ease of use that are also potential points of differentiation from the manual cleaning method. These alternatives however also leave open the space to improve cleaning effectiveness and reliability and to autonomously pick up and put down the toys.

9.3 Positioning Strategy

The positioning map of the competition is below:



As is evident by the map above, exclusive high-cost products are the most present in today’s market. The few data points selected are arranged approximately along the diagonal from bottom left to upper right. This makes sense, as that line would represent a direct correlation between exclusivity and cost.

In order to differentiate the MGCM, the most available spots are in high exclusivity low cost and low exclusivity high cost. While it is important to note that none of these “competitors” accomplish the same job to be done, they still demonstrate the current market trends.

Based off the target customers and the user needs, it is most likely that the MGCM would be most successful with a position of moderate exclusivity and medium high cost - putting it between the manual cleaning and Roomba bubbles on the positioning map. In order to keep the experienced cost low, the machine would need to provide substantial savings or valuable benefits to the customer, since the technology will likely be of relatively high cost. Thus, it will be best to advertise the estimated savings or cost equivalent benefits that the machine would be producing in order to incentivize customers to purchase and use the MGCM.

In terms of exclusivity, it should be considered a relatively exclusive, but not prohibitively exclusive machine. By having a more “exclusive” reputation, the idea that MGCM would help differentiate a daycare center would be much more valuable. Since the reduction in the spread of germs and diseases, thus the reduction in sick days for faculty, as well as the increased customer satisfaction for day care

using families are highlights of the product, a moderate level of exclusivity would be required. It is imperative however that the machine not seem too exclusive, as that could prevent daycare families from supporting the use of the MGCM in their children's classrooms. The exclusivity factor, however, is not a main criteria of the MGCM, and thus it is less critical to focus on the differentiation with respect to exclusivity. It is most critical to improve and differentiate based on the features evaluated above and the affordability/cost.

10. Customer Value Proposition

10.1 Primary User Value Proposition Statement

Primary User: Daycare Teacher

*For day care instructors
Who regularly need to clean dirty, used toys
We offer the Mean Green Clean Machine (MGCM)
An automated toy cleaning system
That provides improved cleaning reliability and efficiency,
As compared to manual cleaning by employees,
Thus reducing the spread of germs, protecting children, their families, and day care instructors
from undesirable illness and disease that cause sick days and loss of productivity or pay.*

The specific values that were selected and highlighted in the Day Care Instructor value proposition statement were:

- ◆ Cleaning Reliability
- ◆ Cleaning Efficiency

With the emphasis on:

- ◆ Reducing the spread of germs
- ◆ Protecting children from disease
- ◆ Protecting families from disease
- ◆ Protecting day care instructors from disease

This statement was designed to be extremely short and to appeal mostly to emotions of a daycare teacher. The typical day care instructor is a very compassionate, caring person who is most heavily concerned with the health and well-being of the children in his/her classroom. Thus, by telling them that the MGCM can help improve the health of the classroom and the children, their most pressing concern is being addressed. Additionally, since the individual instructors would likely not be the day care staff person to actually purchase the MGCM, it is less important to convince them that the machine is absolutely necessary and is much more important that they accept and acknowledge the usefulness of it. The added information about the reduction of sick days for all parties involved plays mildly to the economic savings that would be experienced by a MGCM using school, however this is not a main point to compel instructors to buy in.

10.2 Primary Buyer Value Proposition Statement

Primary Buyer: Superintendent/Daycare Director

*For day care directors
Who have budget or staffing constraints
We offer the Mean Green Clean Machine (MGCM)*

*An automated toy cleaning system
That provides improved cleaning reliability and efficiency,
As compared to manual cleaning by employees,
Thus reducing daycare spending on employee salaries, increases employee happiness by allowing
the instructors to spend time with the children plus it also decreases the spread of germs,
protecting children, their families, and staff members from undesirable illness and disease and
improving the daycare center's brand image.*

The specific values that were selected and highlighted in the Day Care Instructor value proposition statement were:

- ◆ Cleaning Reliability
- ◆ Cleaning Efficiency
- ◆ Affordability

With the emphasis on:

- ◆ Reduced spending
- ◆ Increased employee happiness
- ◆ Reducing the spread of germs
- ◆ Protecting children from disease
- ◆ Protecting families from disease
- ◆ Protecting staff from disease
- ◆ Improving day care center image

This statement was designed to be a bit longer to fully sell the product and to appeal to both economic interests and emotion. The typical daycare director or supervisor is a very compassionate, caring person who is most heavily concerned with the health and well-being of the children in his/her daycare, but comes with a much more economically motivated background than the individual instructors in the daycare. Thus, by telling them that the MGCM can help improve the health of the classroom, the children and the staff, their most pressing concern for the children as well as their concerns for the staff are all addressed. Additionally, since the director is likely the one authorizing and completing the purchase, they must be made aware of the economic factors, since a large investment would not be in their best interest if the product wouldn't result in tangible benefits. Thus, by including the reduction in spending and the improvement of the image outcomes, the economic concerns can be addressed.

The savings from reduced sick days for day care employees and the savings in labor time are the largest sources of savings from the day care perspective. The use of the MGCM would also provide savings to the families that send their children to participating day care centers, which would in turn increase the reputation of the day care and potentially allow the daycare to charge higher enrollment fees. These changes, however, would likely not be present until a more widespread adoption or awareness of the benefits of MGCM were available, thus they have been left out of this estimation. The total overall savings for the superintendent worrying about budgeting is \$14,925.42 each year for a typical day care center, or \$3,731.36 per classroom (See Appendix for detailed calculation).

11. Product Strategy

11.1 Solution Components

<i>Component</i>	<i>Provided by</i>
Robot (hardware)	Mean Green Clean Machine
Robot Accessories (charger, maintenance package)	Mean Green Clean Machine
Robot (software)	Mean Green Clean Machine
Computer Program/Interface (software)	Mean Green Clean Machine (Apple & Windows in future releases)
Toys	Day Care Center
Control (start/stop)	Day Care Instructor/User (MGCM Automation Software in future releases)
Schedule	Day Care Instructor/User
Information (input to software ie: cleaning schedule, etc.)	Day Care Instructor/User

11.2 Product Requirements

Functional (F):

- ◆ The product shall have an automated cleaning method for sanitizing toys.
 - The cleaning method shall be safe (non-hazardous) to humans.
 - (S) The cleaning method should be at least 98% effective.
 - (S) The cleaning method shall be repeatable up to 500 times per battery charge.
- ◆ The product shall have a protected, isolated cleaning chamber.
 - (S) The cleaning chamber must fit toys at least 8"x8"x8".
 - The chamber shall be accessible by the pickup method.
- ◆ The product shall have an automated way of picking up toys and placing them into the cleaning chamber.
 - The pickup method must be robust as to not drop toys.
 - (S) The pickup method must be able to lift toys that are up to 8"x8"x8".
 - (S) The pickup method must be able to lift toys up to 1.5 pounds.
 - The pickup method must be gentle enough to not crack brittle toys.
- ◆ The product must have an automated manner of safely navigating a room.
 - The product must have an automated way to avoid collisions.

- (S) The product must have an automated manner of detecting room boundaries.
- ◆ The product must have a battery life sufficient to clean 200 toys in a 400 square foot room.
 - (S) The product must have a method (light) to indicate when charging is necessary.

System (S):

- ◆ The product must have clean packaging.
 - The product must be insulated or protected to avoid damage during trucking transport.
 - The product must come in a box that can be lifted by an average human (<40 pounds).
- ◆ The product must have a means of being recharged by cable interfacing with a NEMA 5-15 standard outlet.
- ◆ The product must have an accessible port to install software updates to the processor/controller on board.
 - The software update port must be USB compatible to interface with the daycare center's computer.

Non-functional (NF):

- ◆ The product shall have a child friendly exterior.
 - The exterior must be aesthetically pleasing to children.
 - The exterior must be soft to avoid injuring children.
 - The exterior must be washable.
- ◆ The product must be movable by typical humans.
 - The product shall have a maximum weight of 25 pounds.
 - The product must have ergonomic grips to lift it for transportation.
 - The ergonomic and functional components must be designed to meet the aesthetic vision.
- ◆ The product must be easy to interface with accessory products.
 - The charging cable must be easy to attach and detach.
 - The software download cable must be easy to attach and detach.

11.3 Initial Product Release

The Figure 5 on the following page demonstrates the relative value and cost associated with the development and implementation of each general feature or product requirement. The upper left quadrant is the most desirable, as it is low cost and high value. Upper right is the next highest priority, as it contains high value features, however these features are also high cost. The lead preferable is the bottom right quadrant, as they are low value, high cost features to implement. The MGCM, however, doesn't appear to have any features in this category, which is desirable for product development.

Figure 5: Feature Values vs. Cost

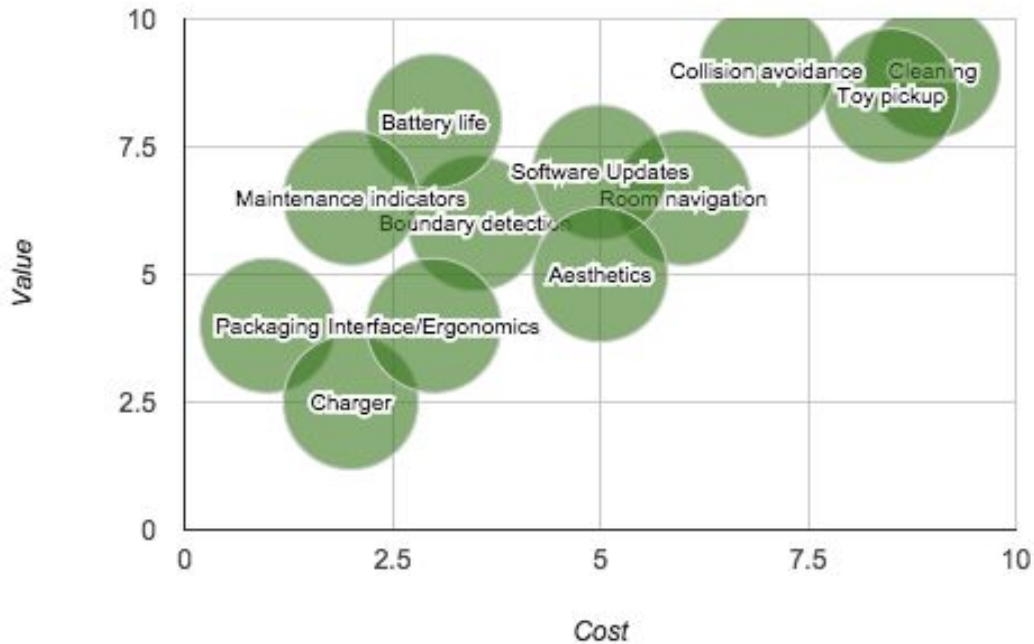


Table 2: Product release plan

No.	Product Requirements	Feature	Priority
1	<ul style="list-style-type: none"> The cleaning method shall be safe (non-hazardous) to humans. The cleaning method should be at least 98% effective. The cleaning method shall be repeatable up to 500 times per battery charge. The cleaning chamber must fit toys at least 8"x8"x8". The chamber shall be accessible by the pickup method. 	Toy Cleaning Capability	High
2	<ul style="list-style-type: none"> The pickup method must be robust as to not drop toys. The pickup method must be able to lift toys that are up to 8"x8"x8". The pickup method must be able to lift toys up to 1.5 pounds. The pickup method must be gentle enough to not crack brittle toys. 	Toy Pickup Capability	High
3	<ul style="list-style-type: none"> The product must have an automated manner of safely navigating a room. 	Autonomous Room Navigation	Moderate
4	<ul style="list-style-type: none"> The product must have an automated way to avoid collisions. 	Automated Collision Avoidance	High
5	<ul style="list-style-type: none"> The product must have an automated manner of detecting room boundaries. 	Room Boundary Detection	Low
6	<ul style="list-style-type: none"> The product must have a battery life sufficient to clean 200 toys in a 400 square foot room. 	High Battery Life	Moderate
7	<ul style="list-style-type: none"> The product must have a method (light) to indicate when charging is necessary. 	Easy to Interpret Maintenance Indicators	Moderate

8	<ul style="list-style-type: none"> The product must be insulated or protected to avoid damage during trucking transport. The product must come in a box that can be lifted by an average human (<40 pounds). 	User-Friendly Packaging	Low
9	<ul style="list-style-type: none"> The product must have a means of being recharged by cable interfacing with a NEMA 5-15 standard outlet. 	Easy to Use Charger	Low
10	<ul style="list-style-type: none"> The product must have an accessible port to install software updates to the processor/controller on board. The software update port must be USB compatible to interface with the daycare center's computer. 	Possibility for Software Updates	Moderate
11	<ul style="list-style-type: none"> The exterior must be aesthetically pleasing to children. The exterior must be soft to avoid injuring children. The exterior must be washable. 	Strong Aesthetic Focus	Moderate
12	<ul style="list-style-type: none"> The product shall have a maximum weight of 25 pounds. The product must have ergonomic grips to lift it for transportation. The ergonomic and functional components must be designed to meet the aesthetic vision. 	Ergonomic and Pleasant User Interfaces	Moderate

The first release of the product should focus on the high and moderate priority features. Creating a platform that demonstrates commercial success and growth promise. The low priority features are less critical for initial success and thus should be focused on for future improvements.

Thus, the minimum viable product is an autonomous robot that can navigate a room without collisions and pick up and sanitize toys. It must have a rechargeable battery and be reasonable to maintain (additional maintenance indicators should be determined based on customer experience and feedback). Additionally, a workable exterior should be released and modified based off of focus groups and surveys. It is also possible that interchangeable exterior coverings can be created in future product releases to allow for improved child/robot interactions.

11.3 Product Roadmap

<i>Time</i>	March 2018	May 2018	November 2018
<i>Target Market/segment</i>	Private Day Care Centers in Tech Savvy Areas	Private Day Care Centers	Day Care Centers
<i>Opportunity</i>	Cleaning toys in a classroom Day Care Instructors With and without students present	Cleaning toys in a classroom Day Care Instructors With and without students present	Clean up day care classroom Get classroom ready for next day Day Care Instructors Day Care Owners

			With and without students present
<i>Product Name</i>	Mean Green Clean Machine v 1.0	Mean Green Clean Machine v. 1.2	Mean Green Clean Machine v. 2.0
<i>Key Benefits</i>	Reduced spread of germs and diseases Increased savings for day care centers Improved experience for children and families	Improved child relations Improved sensors and cleaning algorithms Increased parental approval	Increased savings for day care centers Increased cleanliness of classroom Increased benefits for children, staff, and families
<i>Key Features</i>	Randomized toy pickup and sanitation (Mobility platform, cleaning subsystem) Automated toy cleaning/sanitation Child-friendly	Better randomized toy pickup and sanitation Improved automated toy cleaning/sanitation Improved interactive experience	Automated toy re-shelving Targeted toy sanitizing Improved interactive experience with children

The MGCM will progress to the point of mature technology using a versioning product strategy. New releases of the MGCM will incorporate feedback and experimental data collected from early adopters. Additionally, the algorithms and technology will be refined further to provide improved value with subsequent releases. Once a stable technological platform is released, a vertical product strategy should be adopted to create tiered options ranging from basic, randomized movement and cleaning only, to advanced, programmable, robot with reshelving capabilities. This will potentially allow the MGCM to enter new markets, including high-end residential systems or nursing home uses, by leveraging the core technologies and capabilities created with the original MGCM.

11.4 Future-state Customer Journey Map (Compared to Current State)

Persona: Classroom Instructor

Job to be Done: Clean the toys in the classroom (without MGCM)

Decision Initiator: End of day approaches

MGCM Improved
 MGCM Will Improve
 MGCM Eliminated
 No Change

	Assess Classroom State (toys)	Relocate Students from Room	Collect Toys	Sanitize Toys	Deploy MGCM	Re-shelve Toys	Re-asses Classroom State (toys)	Relocate Students to Room
Step	Visual scan of classroom ○	Count students →	Pick toys up →	Spray toys with toy cleaner →	Unplug MGCM Charger	Sort toys into like categories →	Visual scan of classroom ○	Count students →
Tasks	Careful inspection of select toys (saliva content, visible dirt, etc.)	Calculate proper student/faculty ratio →	Move toys to single location →	Flip toys over	Power MGCM on	Pick up toys →	Careful inspection of select toys (saliva content, visible dirt,	Calculate proper student/faculty ratio →
		Determine	Separate hard and soft toys →	Spray other side with toy	Select cleaning mode (based on MGCM)	Place toys on shelf →	visible dirt,	Determine

	Optional: swab toy samples ↻	appropriate external-space Move students to new space ↻	Arrange in orderly, spaced-out pattern ↻	cleaner Wipe toys dry ↻	model) Wait for MGCM to finish navigating room Power off MGCM and re plug into charger	Arrange toys neatly in clusters on shelves ↻ (Eventually the deploy MGCM step will include this step as well)	etc.) Confirm no missed toys (if necessary, return to step 3 otherwise continue)	appropriate external-space Move students to new space ↻
<i>Touchpoints</i>	Classroom furnishings & appliances Toys/books/etc. Other instructors	Other instructors Other students Classroom appliances & furnishings Toys/books/etc.	Toys/books/etc. Classroom furnishings & appliances Bacteria/germs/dirt Classroom floor	Toys/books/etc. Classroom floor Bacteria & germs Cleaner Washcloth	Mode selection interface (LCD screen/buttons on bot) Charger Children	Toys/books/etc. Classroom furnishings & appliances	Classroom furnishings & appliances Toys/books/etc. Other instructors	Other instructors Other students Classroom appliances & furnishings Toys/books/etc.
<i>Emotions</i>	Disgust Irritation Sadness Authorship	Distress Urgency Concern	Boredom Disgust	Disgust Boredom Irritation Frustration	Relief Happiness Calm	Boredom Calm Satisfaction (Relief, Happiness, Calm)	Happiness Relief Contentedness Excitement	Excitement Happiness Satisfaction
<i>Measures</i>	Decision to clean or not to clean classroom Improved understanding of cleanliness of room	Reduced student population in target classroom Students safely moved to other classroom	Neat arrangement of toys Clear classroom floor & shelves	Reduction of surface germs No remaining moisture or dust Met sanitary standards	Robot moving and picking up toys No collisions with children Toys have reduced surface germs	Toys aligned on proper shelf Toys surrounded by like toys No remaining toys on floor	Decision to continue cleaning or relocate students to room made Safety of room/play environment confirmed	Students moved back to the now clean room Room is safe and child play experience is improved

12. Pricing Strategy

12.1 Value-based pricing

In order to estimate the price ceiling, the economic value provided to the customer by the MGCM is compared to a reference price. The Roomba 980 was selected as the reference price, as it is the closest commercial technology available. Even though manual cleaning is the most common current method used, it was not selected as the reference price, as the cost varies greatly based on geographic location and long term contractual agreements. Additionally, the economic value provided to a customer is a central selling point, thus it is critical to lay out the savings to buyers.

Table 3 below details the calculation. Supporting analysis for the cost savings due to reduced labor and employment costs and reduced losses due to employee sick days can be found in the appendix. Other costs would be difficult to predict, as they are based heavily on both the complexity and robustness of the system, thus estimates have been included.

Table 3: Price Ceiling Calculation

Price Type	Value	Logic
Reference Price (Roomba 980)	\$899	Next best product
Reduced Employee Sick Days*	+\$421.92	See pg. 30
Reduced Labor Expenditure*	+\$3,309.44	See pg. 30
Maintenance Costs*	-\$500	Assumed cost of replacing parts and servicing machines
Justification to Parents	-\$150	Cost of printing informative pamphlets for parents and in class demo time
Total	\$3,980.36	

* Per year

12.2 Initial price

The main deterrent with adoption of the MGCM is likely to come from the uncertainty and novelty of the product category, as it is almost entirely new. Thus, a variety of purchase will be offered. To encourage day care centers to adopt the product and help provide critical feedback to improve the design, a low cost monthly rental plan will be offered with the initial release. This will make the high cost investment and the perceived permanence of the product less threatening. To promote a strong relationship with the MGCM company and to lock consumers in, an option to purchase the machine will also be available.

The initial price will vary based on the purchase plan chosen. The price ceiling, as calculated above, is approximately \$3,980. To encourage adopters, the price will be moderately lower than this ceiling, as it should still allow for sufficient profit margins. It is expected the components can be purchased for less than \$1,000, thus the main cost that needs to be recovered is the high R&D costs.

Monthly rental:

\$299/month (equivalent to \$3,588 per year) for minimum 6 months

This is slightly less than the average full time employee would be paid in a week (\$8/hrx40hr/wk = \$320/wk), which should make it a manageable investment for most day care centers. This would allow day care centers to rent the equipment, with a guarantee of at least \$1,794 paid to MGCM which will offset the variable cost of production of the machine.

System purchase:

\$3,399 (or monthly payments of \$145 for 24 months, equivalent to \$3,480)

This is a savings of \$189 over the annual rental. Additionally, a purchase payment plan can be offered that will allow smaller companies to purchase the MGCM for less than \$150 per month (approximately what a cleaning staff person would make in a week) and pay it off over two years.

Extended warranty/service package:

\$200/yr

A full warranty can be provided to allow for the customer to mail their MGCM back to headquarters for full service for any malfunctions with a substitute MGCM provided to use in the interim. Additionally, the warranty and service package will include extended tech support hours with a partner call service.

12.3 Lifetime Price

As the product develops and there is more specialized software, the basic randomized MGCM should reduce in cost as production costs are reduced. Once there are more options for algorithmic sophistication and efficiency, the higher end MGCM bots should be sold for higher prices. Additionally, various software options can be made available to either lease/rent or purchase licenses to the different software types. Wherever possible, software updates should be made compatible with existing hardware.

Additional MGCM accessories may also be sold to change the appearance of the cleaning monster. This would improve and vary the interactions children have with the robot and could make it a fun way to introduce technology to the classroom. While accessories and skins should be offered down the line, they will not be essential to the operation of the machine, and thus will not be included in a long term price paid, but they will contribute to profits and continued relationships between the MGCM and the customers.

13. Route to Market Strategy

13.1 Sales Channel Coverage Strategy

Figure 6: Selected Sales/Distribution Channels

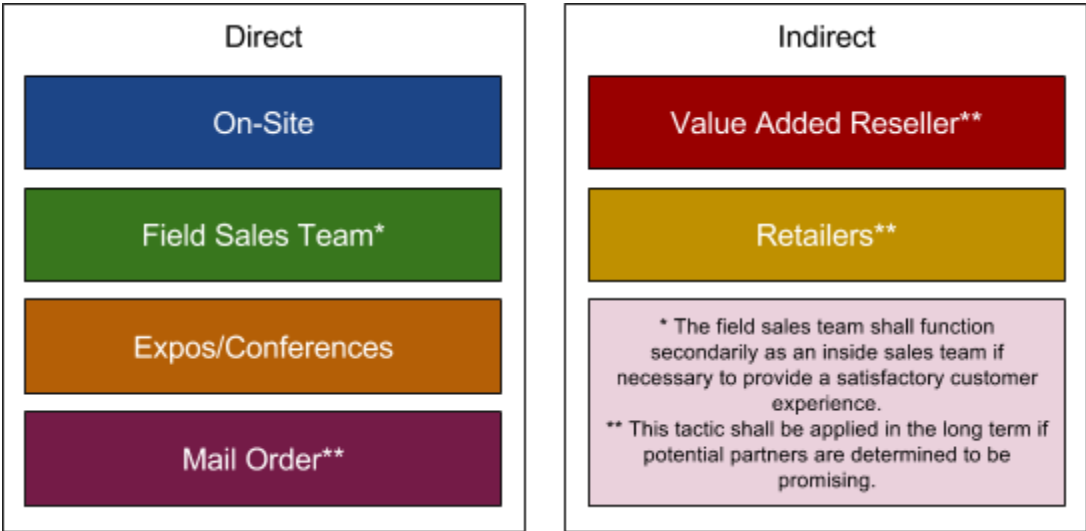


Table 4: How Channels Address Customer Purchasing Needs

Purchasing Needs	Importance	On-Site	Field Sales Team	Expos/Conferences	Mail Order	VAR	Retailer
Trial/Demo	High	X	X	X	X	X	X*
Customer Reviews	Medium	X	X	X	X	X	X
Training Available	Medium-Low	X*	X	X	X	X	X*
Support Available	Medium-Low	X*	X	X	X	X	X*
Knowledge of Total Cost	Medium	X	X	X	X	X	X
Other Required Products	Low	X	X	X	X	X	X

* Must take care to ensure these criteria are met (carefully select retailers to ensure employees can provide training and support, ensure an active forum and highly informational training videos are present on website)

On-Site:

A MGCM website shall be created with the ability to purchase directly from the company. This should serve as a strong marketing and promotion source as well as the primary purchase forum in early stages.

Field Sales Team:

A small sales team/task force shall be employed to identify organizations to target and setup on-site demonstrations to promote MGCM sale. They shall also give pitches at conferences. This will allow for the MGCM to foster strong relationships with the customers, as these relationships are critical to the development of the MGCM, particularly in the early stages.

Expos/Conferences:

The field sales team shall present the MGCM at engineering, technology, and early childhood education conferences, expos, and seminars. Since conferences will bring together potential investors and buyers, they provide a strong medium to reach potential consumers. By having company representatives and salespeople pitch and demo the MGCM, they can promote brand awareness and potentially make direct sales at these events.

Mail Order:

Once it is more known what the MGCM is, mailorder postcards shall be sent to daycare centers as at a minimum a promotion mechanism, but also as a potential purchase method (phone number to call to place order for direct purchase and link to website for indirect purchase). This will enable the MGCM to reach a wider base of potential customers and open up the doors to establish customer relationships. If purchasing after the promotional mail doesn't occur, then at the very least brand knowledge will grow.

VAR:

After the MGCM is more established as a successful and recognized product, MGCM can look to work with VARs to provide customized MGCMs to customers. This should only be considered if the market is promising and growing as the product develops. Some potential VAR partners include Avnet and Arrow²⁵. Avnet is a large distributor of electronic components, thus they could be helpful in providing sensors or other components to customize the MGCM for a specific customer. Arrow, Inc. is a specialized technology and electronic components value added retailer based in Colorado. The domestic focus could be beneficial and they would be able to provide similar customized electronics or sensors to customers. Since the system is already a relatively expensive system and customization would allow for greater price increase, there are large margins that could be earned by these companies. Additionally, the successful customization of one system would likely lead to more day care centers opting for similar customization in their systems.

Retailers:

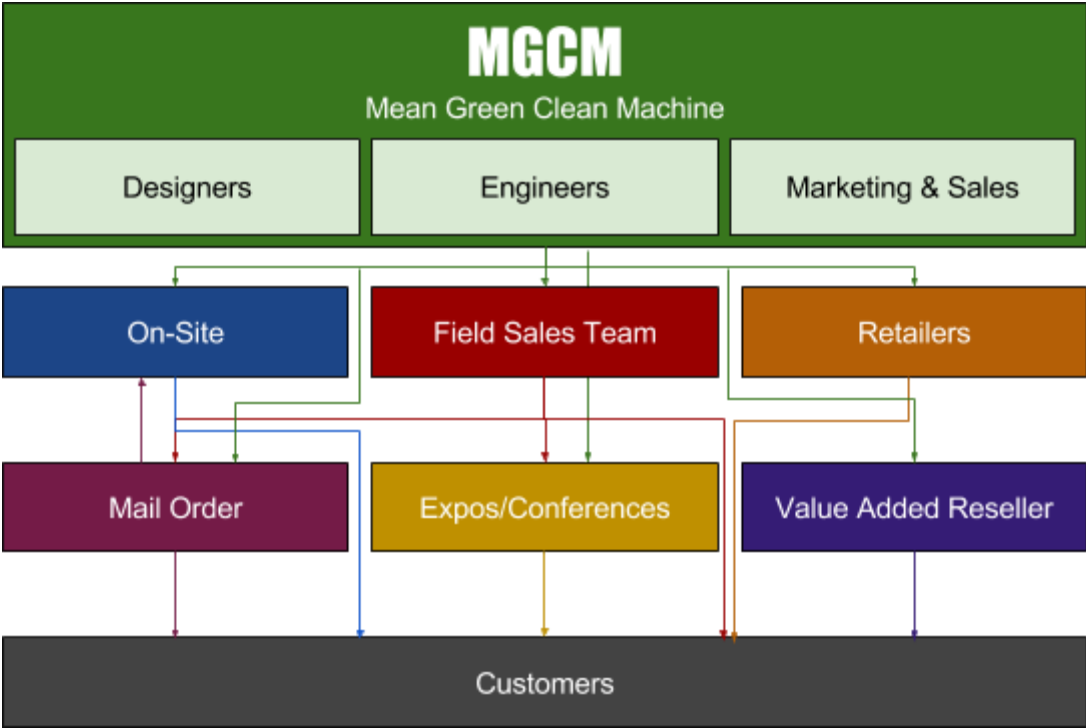
Once the MGCM is established as a known and successful product, the MGCM should look into retailing through online and in-store retailers. Potential retailers include Best Buy, Amazon, Classroom Direct.com, and Teacher Storehouse²⁶. This will make it more simple for day care centers to add the MGCM to their typical retail orders, making the system purchase a bit less personal but more simple to add into their current practices.

Best Buy has many in-store locations worldwide. By bringing the MGCM closer to the customer and giving them the ability to see the machine in person could potentially help them purchase the product without relying on the field sales team providing demos on site. Best Buy sells many home electronics, so even though the product is unique it would still fit reasonably into their product offerings.

Amazon is currently used by many day care centers and schools for purchasing, as it offers quick shipping and has a reputable and reliable brand. By working with Amazon, the MGCM could attract some of the customer service excellence and reputation of Amazon by providing quick delivery and easy ordering. It would also be simple for customers to add a MGCM to their normal orders. Since the MGCM is aimed at improving quality of life, Amazon would also gain a positive image and would profit reasonably from the sale of the MGCM. Educational specific retailers like ClassroomDirect.com and Teacher Storehouse likewise would be able to sell the MGCM with relatively substantial markups and the product aligns well with their education and school focused product offerings. Since these retailers have a large pool of educators as current customers, it would benefit MCGM to reach the already targeted customers through them.

13.2 Sales Channel Map

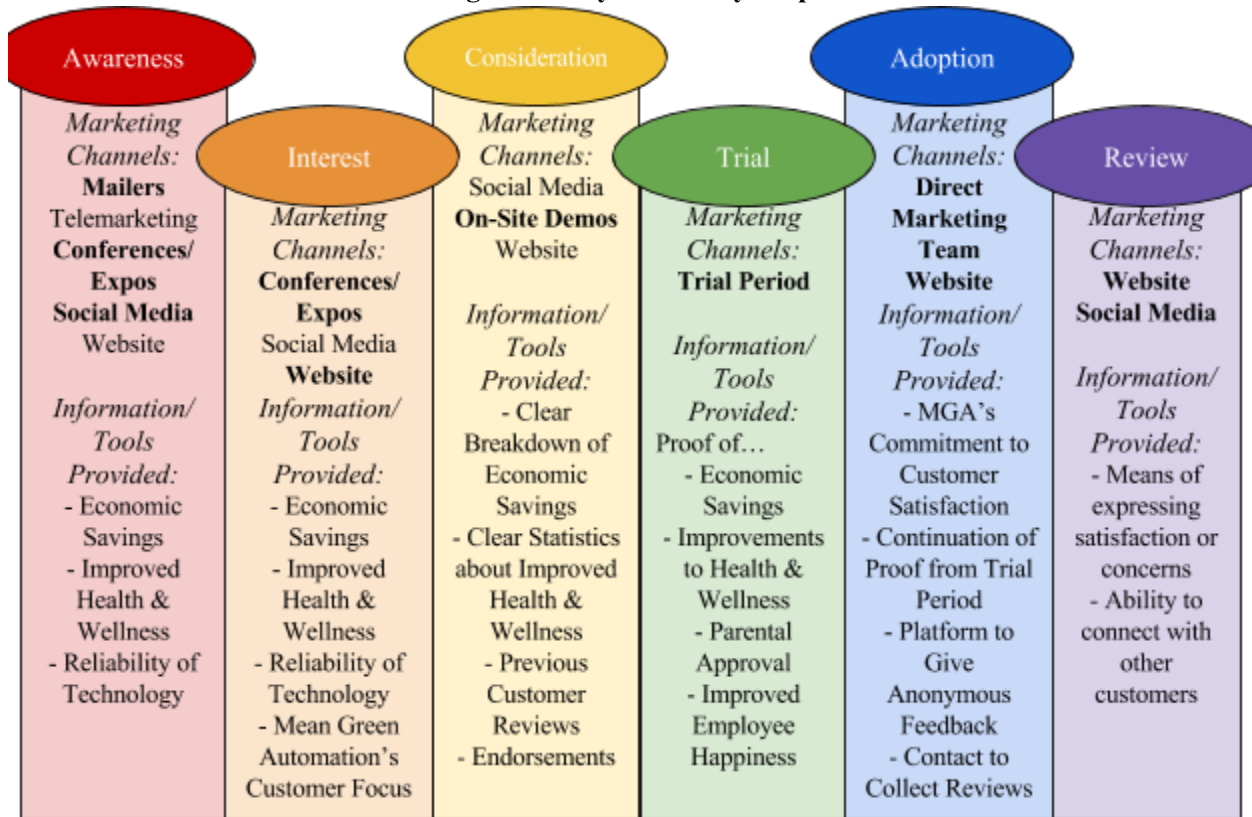
Figure 7: Sales Channel Map



14. Market Development Strategy

14.1 Buyer Journey Map

Figure 8: Buyer Journey Map



Critical Marketing Channel
 Other Marketing Channel

The key marketing channels selected are listed below with an explanation of why they were selected and what portions of the customer journey they will be applicable for.

Mailers/Postal Promotion:

MGA should invest in sending advertisement postcards to potential customers. By selecting various day care centers and sending them direct mail, awareness about the MGMC will be promoted and the mailer will potentially catch the eye of a select number of day care centers to transition them to the interest phase.

Telemarketing:

A skilled but small telemarketing team should be assembled to aid in increasing awareness as well. The specialized team can contact the same day care centers that are selected to receive the mailers as an additional means of contact and knowledge of the MGCM. The telemarketing team, however, should also

be able to receive incoming calls to further pitch the MGCM to potentially interested buyers and direct them further through the purchase journey.

Conferences/Expos:

Presenting at design, education, and engineering conferences and expos across the country will be the best means of publicity and marketing for the awareness and interest phase. Since they will already attract potential partners or customers by the nature of the gathering, a solid presentation will likely provide a higher transition rate from one phase of the customer journey to the next. Since many conferences are highly selective in terms of presenters and attendees, being selected for and present at many conferences will also add legitimacy to the MGCM brand.

Social Media:

Reaching a wide audience of targeted people through social media will help significantly with the awareness phase of the customer journey. In addition to being able to market towards specific groups (ie: members of the 14,685 member Early Childhood Education group on Facebook), general promotion towards an undifferentiated audience could improve the awareness among potential influencers (parents of children especially). Additionally, social media would be an ideal place for customers to share their reviews and experiences with the MGCM, post adoption.

Website:

One of the central methods of sales, communication, and advertising particularly in the early phase of the MGCM will be the MGCM website. The website should include a shareable video/demo/commercial as well as purchasing and contact information. The website will be able to cite conferences that have been presented at and certifications and awards received. The website will not only connect the customers directly to the MGCM sales team, but will also provide a sense of legitimacy to the company and brand. Since retailers will likely not begin carrying the MGCM in its initial phase, it is also critical as the main purchasing channel. The website also will include an easy way to pay and select a payment plan, so as to facilitate the purchase process. The website should have customer feedback features as well to allow for customer reviews and experiences to be documented and collected.

On-site Demos:

The MGCM field sales team will provide live demonstrations either at the day cares of interested buyers or at neutral locations and invite representatives from many day care centers. These on site demos will be critical for customers in the consideration phase to help them transition to trial and adoption.

Trial Period:

By offering a trial period (either at a lower cost or for free) to customers, they will hopefully be able to experience the benefits of the MGCM first hand, which will prompt them to transition from the consideration and trial phase to full adoption of the system.

Direct Marketing Team:

A direct marketing team will help assist customers in the trial period and provide them the knowledge, support, and procedural information required to transition to adoption and purchase the MGCM system.

14.2 MGCM Key Ideas

MGCM (working) Tagline:

With the Mean Green Clean Machine, health and wellness don't have to be costly and boring.

Key Ideas to Communicate to Customers:

1. The Mean Green Clean Machine is child-friendly, parent approved, and will improve your child's day care experience.
2. The Mean Green Clean Machine effectively sanitizes toys in a safe way to help keep children and students safe from the spread of germs and bacteria.
3. The MGCM effectively reduces the amount of time investment required for daily cleaning and maintenance tasks, saving the day care centers thousands of dollars annually.
4. The MGCM helps make instructors happier and allows them to focus more on the children they love by reducing the need for them to sanitize heavily mouthed or soiled toys throughout the day.
5. The MGCM helps introduce children to technology and robotics early on and in a friendly, positive manner to help make the children of tomorrow aware of and interested in assistive technology.

15. Appendix

15.1 Supplemental Analysis

Target marketing matrix creation analysis

Market Attractiveness

<i>Market Segment</i>	<i>US Daycare Centers</i>	<i>Public US Elementary Schools</i>	<i>Private US Elementary Schools</i>
Segment Definition	United states day care centers serving children aged 3mo-5yr	Publicly owned/operated elementary schools, serving children aged 5-11 yrs	Privately owned elementary schools, serving children aged 5-11 yrs
Size*	3	5	2
Trends*	5	3	1
Demand Drivers	4	2	2
Market Readiness	4	1	4
Accessibility	4	3	4
Entry Barrier	3	1	3
Buying Practice	3	1	3
Index	34	24	22

* Factor weighted at 2

The maximum possible index is 45 and the minimum is 9. An index of 31 (assuming a rating between 3 and 4 for all factors) is considered highly attractive. An index between 22 and 31 (assuming a rating between 2 and 3 for all factors) is considered moderately attractive. And an index below 22 is considered to characterize an unattractive market segment.

Market Position

<i>Market Segment</i>	<i>US Daycare Centers</i>	<i>Public US Elementary Schools</i>	<i>Private US Elementary Schools</i>
Segment Definition	United states day care centers serving children aged 3mo-5yr	Publicly owned/operated elementary schools, serving children aged 5-11 yrs	Privately owned elementary schools, serving children aged 5-11 yrs

Solution Importance*	5	2	3
Competitive Landscape*	4	1	3
Market Adoption of Alternatives*	4	3	3
Uniqueness	5	5	5
Trends	3	1	2
Fits your strengths	4	3	3
Index	38	21	28

* Factor weighted at 2

The maximum possible index is 45 and the minimum is 9. An index of 31 (assuming a rating between 3 and 4 for all factors) is considered highly attractive. An index between 22 and 31 (assuming a rating between 2 and 3 for all factors) is considered moderately attractive. And an index below 22 is considered to characterize an unattractive market segment.

Quantified Value Provided by MGCM

Since economic savings are a huge motivating factor for the buyer, below is a sample quantification of the projected savings.

Assuming:

- An average of 1.5 hours daily is spent cleaning and picking up toys, per classroom
- An average of four³ classrooms per day care
- An average hourly wage of \$8.79²¹ per cleaning employee
- 251 working days per year²²

$$\begin{aligned} \text{Annual savings} &= \text{working days} * \text{hours cleaning/day} * \text{pay/hour} * \text{number of rooms} \\ &= \$13,237.74 \\ &\text{or } \$3,309.44 \text{ per classroom on labor savings} \end{aligned}$$

Assuming:

- Increased cleaning leads to 2 less sick days per year
- Three²⁴ instructors per classroom
- Four²³ classrooms per day care

$$\begin{aligned} \text{Annual savings} &= \text{saved sick days} * \text{number instructors} * \text{number of rooms} * \text{pay/hr} * \text{hours worked/day} \\ &= \$1,687.68 \\ &\text{or } \$421.92 \text{ per classroom on reduced sick days} \end{aligned}$$

15.2 References

- [1] *Teacher Sitting at Desk*. Digital image. *Clip Art Monk*. N.p., n.d. Web. 7 Feb. 2016.
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- [3] <http://www.forbes.com/sites/sageworks/2014/06/15/heres-the-growth-chart-on-day-care-businesses/#413ccce36405>
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- [21] <http://www.bls.gov/oes/current/oes399011.htm>
- [22] http://www.calendar-12.com/working_days/2016
- [23] Since the typical day care center separates children by age, this assumes a 0-1yr classroom, a 1-2 yr classroom, a 2-3yr classroom and a 3-5yr classroom.
- [24] <http://www.childdevelopmentcouncil.org/faqs/view/8>
- [25] http://www.eetimes.com/document.asp?doc_id=1266961
- [26] <http://www.childcarelounge.com/resources/shop-supplies.php>

15.3 Discussion of Changes

Generic changes made to the report include modifying the formatting and organization of a few sections and figures. The font scheme and color scheme of the report was adjusted to be uniform and readable. Some of the analysis was moved from the relevant sections to the Appendix to improve readability. Much of the report, however, doesn't include any dramatic changes.

The changes that were made to each section are listed below:

Product Idea: The toy cleaner/reshelver should be considered as an ideal system, but likely not entirely released in the first version. The toy sanitation, automated detection, pick-up and put-down features should be focused on for the first release with software and algorithms for reshelving to be developed once a successful platform is released to market. The information was also all collected and written in narrative form, instead of as sentence fragments answering a variety of questions.

Customer Analysis: The present state customer journey was modified to be present state/not include the robot in the customer journey map.

Positioning: An emphasis on cost over exclusivity was created. Additionally, the ability to autonomously pick-up and put down toys was added as an evaluation criteria to better align with the straighten up a room job to be done. This allows for a more accurate evaluation of the competition with respect to accomplishing the full job to be done, rather than just focusing on the features they have.

Value Proposition: The changes in the positioning strategy were carried through the value propositions for different user profiles.

15.4 Uncertainties and Implications

The biggest point and problem with this product is that it creates an entirely new category of product: autonomous robotic toy/room cleaners. Since the market is yet-to-be-created, a reasonable amount of extrapolation and comparison to the perceived next-best options was required, and few assumptions were made. In general, assumptions were made about the structure and organization based on my experience working at the Cyert Center and narratives from friends back home who have worked at a few different day care centers.

15.5 Final Assignment Answer

What would be the implications on your strategic marketing plan if you changed your target market segment(s) to another target market segment(s)? You should use a market segment that you analyzed/profiled, but you did not use as a target market for your strategy.

If a different target market was selected, such as public elementary schools, large changes would need to be made to the marketing strategy, the product and the positioning strategies. Initial market launch would be requisite on school boards and educational departments of states certifying and approving the cleaning reliability more heavily, as they are much more regulated industries. This would likely make lobbying and/or legal consultation a critical part of the pre-launch marketing and awareness product promotion. Due to the increased complexity of gaining the right to enter the market, a concentrated or niche marketing strategy would likely be most useful for market entry. By focusing on creating the single marketing mix and pressuring state or local governments to adopt stricter sanitation standards in the schools they oversee, the MGCM would be able to establish itself as the only alternative to a significant increase in staffing or time requirements for current employees. Regardless of whether or not new

regulation is passed, however, it would be critical for the MGCM to be legally and politically involved with school boards and local government to ensure that if a school were to adopt the MGCM, they would not be at risk for violating any standards. This would focus the MGCM exclusively on targeting public elementary schools and would require only a single marketing effort. Once entry and growth was achieved in the public elementary school market, similarly to how the current marketing strategy evolves, a differentiated or segmented marketing strategy could be used.

The product itself would need to be differentiated and positioned a bit differently, and the route to market would change dramatically as well. If the goal was to target public schools, a significantly different purchasing procedure would be involved, as most public schools are funded by tax money. Since much of the funding comes from government, purchasing an expensive system would need to be approved by a much larger oversight board, and finances are much less flexible. Thus, agreements would likely need to be forged with the government to help distribute the MGCM to schools as a selective opt-in program, rather than a unilateral decision to purchase by the school or school district. Even if it were to be a unilateral school decision, the board of education, teachers coalitions, and the school management would all need to approve the purchase. Public schools generally have much larger boards and groups of influencers than a private school or daycare center would.

With respect to differentiation and positioning, the cost would need to be reduced. This could potentially be achieved by partnering with the government and using federal or state research grants in the R&D process, so that less R&D investment would need to be recovered with robot sales. If there was no relationship or commitment between the MGCM and local governments, then reducing the price significantly enough to make the MGCM purchasable by many school districts then the success would likely be minimal.

With a different approach, vastly different marketing channels would be essential for the success of the machine. Social media would not target the decision makers as well and the positive perception of the system it could create would be less central to the decision making process. Telemarketing and promotional mailers would not be the most effective way to contact public schools, as it would be much easier to go through the oversight education committees in various states or regions. Presenting at conferences and expos, however, would remain a critical marketing method, as it would contribute to the legitimacy and spread awareness to potentially interested parties across different regions. A similar structure of providing demos and trial periods could be helpful, but it is likely that these demos can be more effective in group settings rather than by targeting individual potential buyers.

Ultimately, the strategy surrounding the marketing and development of the MGCM would vary greatly if an alternate target market was selected. Since each component is highly interconnected and the components as a whole must work to support the overarching strategy of the product, a small change in one facet of the plan creates waves of necessary change in order to maintain the symbiotic and harmonious connection of the plan as a whole.