

Assignment #1

Team Vichaar Kranti

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Submission Date: 25:09:24

Course: Entrepreneurship & Management functions

Question #1

- a. Our team has finalized the concept of an autonomous paint robot designed to safely and efficiently paint various surfaces while reducing labour costs and environmental impact
- b. Here are the Problem/Opportunity statement for our autonomous paint robot:
 1. Mitigate the risk of accidents for painters by eliminating the need to work at hazardous heights.
 2. Enhance painting efficiency by completing tasks more quickly and consistently compared to manual labour.
 3. Reduce labour costs and minimize paint wastage through precise, automated application.
 4. Lower environmental impact by optimizing paint usage and reducing overspray, minimizing the release of volatile organic compounds (VOCs).
 5. Enable adaptability for various building sizes, shapes, and surfaces, expanding the robot's applicability across industries.
 6. Simplify the creation of complex patterns with high precision, making intricate designs achievable with ease.
- c.
 - **Positive Feedback:**
 - i. Peer 1: Great idea for improving painter safety by eliminating the need to work at dangerous heights.
 - ii. Peer 2: Using a robot to paint tall buildings is a modern and innovative approach.
 - iii. Peer 3: The ability to save paint and complete the job quickly is a significant advantage. The robot's adaptability to different types of buildings makes it useful in many sectors.
 - **Constructive Feedback:**
 - i. Peer 4: Consider how the robot will handle challenging surfaces and weather conditions, like wind or rain. Ensure that the robot is affordable for companies of all sizes and doesn't incur high build or maintenance costs.

- ii. Peer 5: Some may worry about job displacement. Emphasize how the robot can work alongside humans. Focus on making the robot easy to repair and durable, with a long operational lifespan.

Question #2

Our product is an autonomous wall-climbing robot designed specifically for painting and surface maintenance tasks. It can climb vertical surfaces, such as walls, the walls may be interior or exterior how tall may be the building and perform automated painting efficiently, reducing the need for human labour in hard-to-reach or dangerous areas. This innovative solution is ideal for building maintenance, and industrial use, offering enhanced safety, precision, and productivity for large-scale surface work.

a) Here are some prominent entrepreneurs and key players in the field of autonomous robots, particularly focused on painting tasks which is our project area of interest:

- **Mist-by Gia Liu:** Mist is developed by Mobile Intelligent Spraying Technologies, a team of mechatronics engineering students from the University of Waterloo. Their aim is to create a more efficient and safer painting process through automation. The team includes Shubham Aggarwal, Utkarsh Saini, Baraa Hamodi, Hammad Mirza, and Dhruv Sharma ([MIST Technologies](#))
- **Okibo:** Okibo is an Israeli company that has developed a fully autonomous wall painting robot. It focuses on construction automation, including autonomous painting and plastering solutions.
- **Just Right Robotics:** This startup specializes in developing robots for tasks like painting. Information on the specific team behind this company is not widely available but it focuses on creating solutions for automation in home improvement.
- **Dafang AI:** Based in China, Dafang AI develops robots for various construction tasks, including autonomous wall painting. The company uses AI to drive innovations in automation within the construction industry.

- **Roboprint's PBOT:** Roboprint, based in France, developed PBOT, a painting robot that automates the process of applying large surface wall prints. The team behind this project focuses on combining robotics and design for large-scale applications.

b)

1. We would rather like to consider our product as a good rather than service because by definition:

Good: - A good is a tangible item that can be touched, like a car, phone, or laptop. You own it and use it as much as you want.

Service: - A service is intangible and involves performing an action or providing a benefit for the customer, like consulting, repairs, or a cleaning service. Services are consumed at the time of delivery and cannot be stored or owned.

Reasons we consider our product as good are: -

- It's a physical, tangible item that can be owned.
- It can be purchased and used repeatedly for various projects.
- Ownership allows the buyer to control its use and deployment.
- It is a durable product, lasting over time and can be maintained or upgraded.
- It can be mass-produced as a standardized unit.

2. As definition goes: -

Industry- It is a group of companies or organizations that produce similar products or services. It focuses on a specific economic activity. Ex- Automotive industry

Sector- It is a broader classification that considers multiple industries with related activities. Ex-transportation sector includes the automotive industry, aviation, shipping, and public transit.

Our product belongs to: -

Sector- Construction and Maintenance

Industry- Robotics

c)

1. List of firms in the autonomous robotics and construction industry, with a focus on wall-climbing and painting robots or related areas: -

Indian Firms: -

- Larsen & Toubro (L&T)
- Saarthi Robotics
- Intello Labs
- Robotic Automation
- Adroitec Engineering Solution

Global firms: -

- Fanuc Corporation
- ABB Robotics
- KUKA Robotics
- Boston Dynamics
- Scape Technologies

2. First let's discuss what are different types of ownership models then we will by classifying them on the basis of ownership model we can get a better knowledge of their pros and cons: -

- **Publicly Traded Companies:** -

Owned by the public, they have to regularly share their financial performance with the public. They can get funds by selling shares on the stock market.

Pros:

- i. Easier access to large capital pools.
- ii. Increased brand visibility and market reach.
- iii. Liquidity for shareholders who can easily buy and sell shares.

Cons:

- i. Subject to shareholder pressure for short-term results.
- ii. High regulatory and compliance costs.
- iii. Diluted control, especially for founders, as ownership is spread across many shareholders.

Examples: L&T(India), Fanuc Corporation (Japan), ABB Robotics (Switzerland)

- **Private Companies: -**

A small group of people or investors owns these company, not the public. They don't have to share financial details with the public. They can't sell shares to the public, so they rely on private investors.

Pros:

- i. Greater control over business decisions for owners.
- ii. Flexibility to make long-term strategic choices without shareholder pressure.
- iii. Lower regulatory and compliance burdens compared to public companies.

Cons:

- i. Limited access to capital compared to public companies.
- ii. Growth may be slower due to the lack of public investment.

- iii. May eventually face pressure from private investors (VCs or private equity) to sell or go public for returns.

Examples: Saarthi Robotics, Robotic Automation (India), Scape Technologies (Global)

- **Subsidiaries of Large Corporations :-**

A larger company owns and controls the business. They get financial and operational support from the parent company. They often have to follow the bigger company's rules and decisions.

Pros:

- i. Strong financial and operational support from the parent company.
- ii. Can leverage the brand, network, and infrastructure of the parent company.
- iii. Stability and reduced risk due to backing from a larger organization.

Cons:

- i. Limited independence in decision-making.
- ii. Goals may need to align with the parent company's broader strategy, which might stifle innovation.
- iii. Profits are usually directed back to the parent company rather than reinvested in the subsidiary.

Examples: Boston Dynamics (subsidiary of Hyundai Motor Group)

Question #3

a.) For our autonomous wall-climbing robot project designed for painting and surface maintenance, key market players would include companies and startups already working in the field of construction robotics, autonomous systems, and wall-painting automation. Here's a list of relevant competitors and market players: -

1. **Okibo** – Focuses on autonomous construction robots, including wall painting robots. Okibo's systems are designed to enhance productivity and reduce labor in the construction industry.
2. **MIST** – Created by a team of engineers from the University of Waterloo, MIST developed an autonomous painting robot known for its precision and safety features, intended for both interior and exterior painting ([MIST Technologies](#)).
3. **Roboprint** – A French company that focuses on robotic solutions for large surface painting projects, particularly for buildings, bridges, and other large infrastructure ([Curious Cat Gadgets](#)).
4. **Dafang AI** – This Chinese company is leveraging AI and robotics for construction tasks like wall painting, focusing on industrial-grade solutions.
5. **Just Right Robotics** – Specializes in the development of robots for home improvement and construction tasks, including automated wall painting systems.
6. **Ekso Bionics** – Though not primarily in wall painting, Ekso Bionics develops robotic exoskeletons and other robotic solutions that assist in various construction tasks, which could be a potential competitor in the broader construction robotics market.
7. **Construction Robotics** – A US-based company focused on automation in construction, particularly robotics for tasks like bricklaying, which is complementary to painting and other surface work.

b.) Here are some prominent entrepreneurs and key players in the field of autonomous robots, particularly focused

Porter's Five Forces analysis for autonomous wall-climbing painting robot:

1. Threat of New Entrants: Moderate to High:

- **High R&D Costs:** It's expensive to develop such robots, which can keep new players out.
- **Technology is Getting Cheaper:** As tech like AI becomes cheaper, more companies can enter the market.
- **Tough to Build Brand Trust:** If big companies lock in customers early, new entrants will struggle.
- **Government Rules:** Meeting safety and legal standards can discourage some new companies.

2. Bargaining Power of Suppliers: Moderate:

- **Special Parts Needed:** The robot requires advanced parts like sensors and AI components that a few suppliers control.
- **Limited Supplier Choices:** If only a few companies make key parts, they can charge more or influence costs.
- **In-House Manufacturing:** Big companies might start making their own parts, reducing supplier power.

3. Bargaining Power of Buyers: High:

- **Many Alternatives:** Buyers can still choose manual painting or cheaper methods, so they have options.
- **Price:** Buyers in cost-sensitive markets (like India) may avoid expensive robots.
- **Customization:** Buyers might want special features, giving them power to negotiate.

4. Threat of Substitutes: Moderate:

- **Manual Labour:** In many places, human painters are still cheaper and easier to hire.
- **Drones:** Painting drones could be a new alternative, especially for outdoor walls.
- **Existing Tech:** Automated spray-painting machines are already in use and might be simpler to adopt.

5. Industry Rivalry: High:

- **Strong rivals:** Companies like ABB, Fanuc, and KUKA are already strong in robotics and could enter this space.
- **Fast-Paced Innovation:** Robotics evolves quickly, meaning competitors could outpace each other.
- **Local vs Global:** Global companies may have better tech, but local ones can compete on price and understanding the local market.

Question #4

a.) One of the best examples of product-market fit is Netflix's streaming service. Originally, consumers had to physically rent movies, managing their collections like a trip to the library—borrowing a DVD, watching it quickly, and returning it to avoid late fees. There was a large, unmet demand from customers who wanted more convenient access to entertainment.

Netflix introduced a transformative solution: as internet speeds and streaming technologies evolved, they pivoted their business model to offer video streaming directly to homes. This eliminated the need for physical stores, mail services, or DVDs, and customers quickly embraced the change.

Several factors contributed to Netflix's product-market fit:

- **Growing customer base quickly:** The streaming model caught on fast because customers already had the desire to access entertainment in a simpler, more efficient way. Netflix didn't have to wait for massive marketing efforts; the service spread organically as people shared the experience.
- **Decreased cost per acquisition:** Netflix's word-of-mouth popularity led to less reliance on advertising, reducing customer acquisition costs.
- **Increased profits:** With high customer demand, users were willing to pay for the service. For instance, other companies like Strava increased their subscription prices without losing users, demonstrating the power of product-market fit in sustaining profitability.

b.) Our product, an autonomous wall-climbing robot for painting and surface maintenance, demonstrates strong product-market fit through the following factors:

- **Safety:** The robot eliminates the need for human painters to work at dangerous heights, improving worker safety, especially in high-rise buildings.
- **Efficiency:** Compared to manual labor, the robot delivers faster and more consistent painting results. This leads to reduced operational time, allowing businesses to complete projects quicker.
- **Adaptability:** The robot's ability to adjust to different building types, shapes, and surfaces makes it appealing to various industries such as construction, real estate, and industrial maintenance.
- **Cost-effectiveness:** By lowering labor costs and reducing paint wastage, the robot helps businesses save money and increase profit margins. This makes the solution not only innovative but also financially attractive to companies looking to cut expenses.