

# ***Project Feasibility Document***

## ***kAltchen: Cooking got Empowered***

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Date: 22/10/2024

Version: 0.1

Circulation: Internal, Project Partners, Public

## **1. Statement of Work**

The project's initial focus is to bring an automated kitchen environment to the B2B market, targeting institutions, healthcare facilities, and specialized service providers who assist physically challenged individuals.

The project's aim is to develop an automated kitchen environment to assist physically challenged individuals with daily tasks. The aim is to integrate both existing and custom-built smart gadgets, providing specialized interfaces tailored to different user groups based on their specific needs. The goal is for users to control the kitchen through various input methods, such as voice, touch, and gesture commands, supported by a natural language processing (NLP) system trained on specific use cases. Another objective is to study accessibility challenges to inform the infrastructure design. Additionally, the plan is to incorporate a robot capable of autonomously performing kitchen tasks, further enhancing user independence.

## **2. Business Objectives**

- **Economic business objectives:**
  - a. **Expand Market Reach:** Target a niche market of physically challenged individuals by offering specialized, accessible kitchen solutions, filling a gap in the smart home industry.
  - b. **Product Customization for Different Needs:** Develop a modular product offering, where users can purchase only the gadgets and interfaces they need, increasing affordability and market adaptability.
  - c. **Partnership with Appliance Manufacturers:** Establish collaborations with smart appliance manufacturers to integrate the system with

existing kitchen gadgets, reducing development costs and increasing brand visibility.

- d. **Revenue through Subscription Models:** Offer subscription services for regular software updates, advanced features, and premium support, creating a steady revenue stream.
- e. **Licensing of NLP Technology:** License the developed natural language processing (NLP) system for use in other assistive technologies, generating additional revenue from intellectual property.
- f. **Focus on Government and Health Sector Funding:** Explore opportunities for government grants and healthcare partnerships aimed at improving accessibility for disabled individuals, potentially lowering initial development costs.
- g. **After-Sales Support and Training Services:** Offer paid after-sales support, installation, and training services, creating a new revenue stream while ensuring customer satisfaction and reducing the likelihood of returns.
- **Social business objectives:**
  - a. **Enhance Accessibility for Disabled Individuals:** Provide innovative kitchen solutions that significantly improve the quality of life for people with physical disabilities, enabling greater independence and autonomy in their daily tasks.
  - b. **Promote Inclusivity in Smart Technology:** Design products that cater to a diverse range of abilities, ensuring that technology is inclusive and accessible to all, regardless of physical limitations.
  - c. **Raise Awareness of Assistive Technologies:** Increase public awareness of the importance and availability of assistive technologies for physically challenged individuals, advocating for more inclusive environments in both private and public spaces.
  - d. **Collaborate with Disability Advocacy Groups:** Partner with organizations that represent disabled communities to ensure that the products are tailored to real needs, and to create a feedback loop for continuous improvement.
  - e. **Promote Sustainable Living:** Incorporate eco-friendly materials and energy-efficient technology in the design of gadgets and interfaces, contributing to broader sustainability goals while improving accessibility.

### 3. Summary of the Budget

#### Expenses (In the first 2 year before launch):

**Total Estimated Budget: \$1,580,000**

##### Budget Categories:

- **Research & Development (R&D):** \$450,000  
(Includes smart gadgets, software, NLP, and accessibility research)
- **Manufacturing & Production:** \$300,000  
(Initial prototyping and production costs)
- **Marketing & Outreach:** \$120,000  
(Branding, marketing campaigns, and partnership development)
- **Operations:** \$610,000  
(Salaries, office space, equipment, and customer support)
- **Contingency & Miscellaneous:** \$150,000  
(Miscellaneous expenses and contingency fund)

##### Additional Notes:

- **Grants & Government Funding:** Part of the budget could be subsidized through government grants or healthcare funding aimed at improving accessibility for disabled individuals.
- **Potential Partnerships:** Collaborating with smart appliance manufacturers could reduce manufacturing costs.
- **Revenue Considerations:** Product sales, licensing of the NLP system, and potential subscription models for software updates can offset some of the operational and R&D expenses.

#### Expenses after the product launch (Yearly):

**Total Estimated Budget:  $\$1,000,000 + (200,000 * 100) = \$21,000,000$**

##### Budget Categories:

- **Research & Development (R&D):** \$100,000  
(Includes smart gadgets, software, NLP, and accessibility research)
- **Production:** \$200,000 (per piece)  
(production costs, **expected units sold:** 100)
- **Marketing & Outreach:** \$120,000  
(Branding, marketing campaigns, and partnership development)

- **Operations:** \$610,000  
(Salaries, office space, equipment, and customer support)
- **Contingency & Miscellaneous:** \$150,000  
(Miscellaneous expenses and contingency fund)

## **Incomes (Yearly, after the product launches):**

**Total gains: \$30,620,000**

**Product Sales: \$30,000,000**

Revenue generated from selling the automated kitchen systems to target customers, including healthcare institutions, assisted living facilities, and individual households.

- **Expected Units Sold:** 100
- **Price per Unit:** \$300,000.
- **Total Sales Revenue:** \$35,000,000

**NLP System Licensing: \$500,000**

Income from licensing the customized natural language processing (NLP) system to third-party manufacturers and appliance companies interested in accessibility-enhanced products.

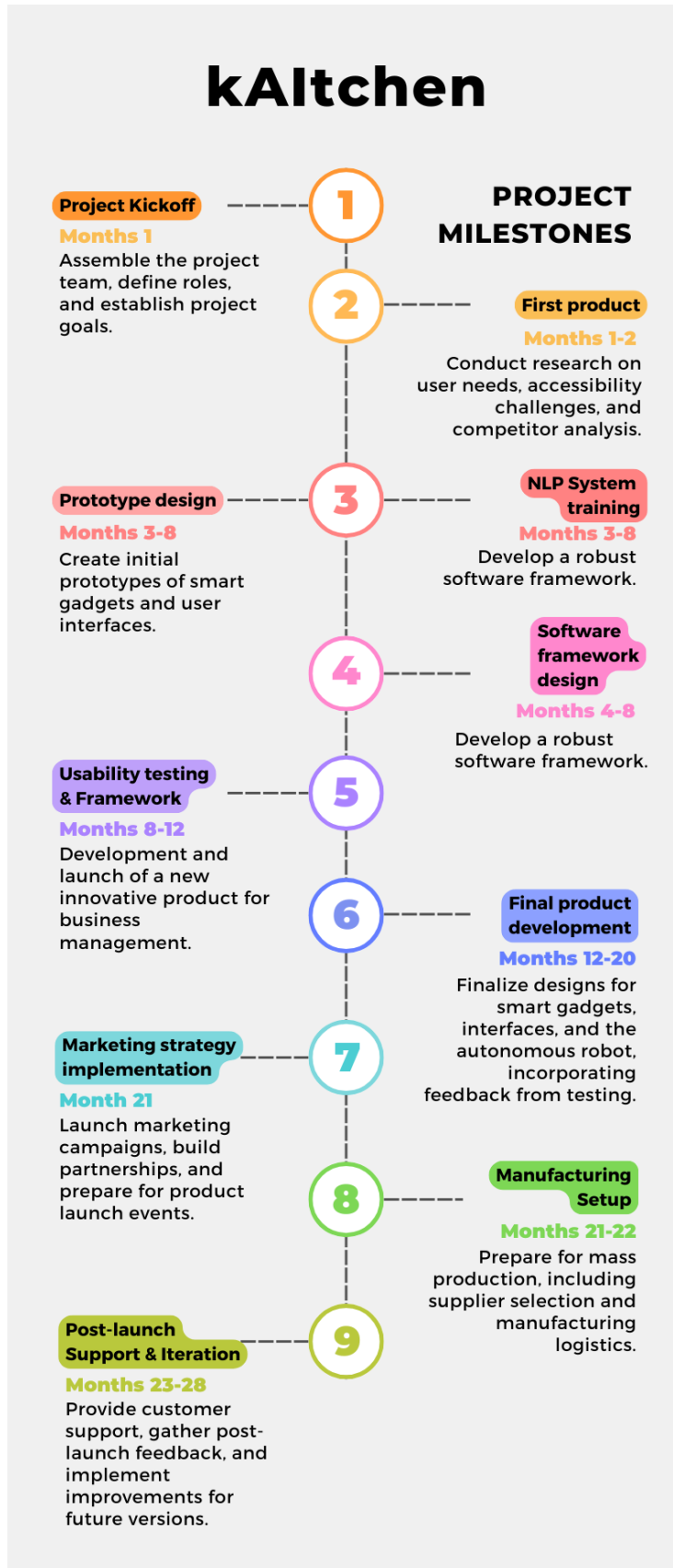
- **License Fee per Manufacturer:** \$100,000.
- **Expected Number of Licenses:** 5
- **Total Licensing Revenue:** \$500,000 annually.

**Subscription Model for Software Updates and Maintenance: \$120,000**

Recurring revenue generated from offering subscription services for software updates, new features, maintenance and continued NLP system improvements for end-users.

- **Monthly Subscription Fee:** \$1,000 per month per product sold
- **Total Subscription Revenue:**  $\$1,000 * 100 * 12 = 120,000$

## 4. Summary of the Project Milestones



### Project Kickoff

- **Timeline:** Month 1
- **Objective:** Assemble the project team, define roles, and establish project goals.

### Market Research & Accessibility Study

- **Timeline:** Months 1-2
- **Objective:** Conduct research on user needs, accessibility challenges, and competitor analysis.

### Prototype Development

- **Timeline:** Months 3-8
- **Objective:** Create initial prototypes of smart gadgets and user interfaces

### Natural Language Processing (NLP) System Training

- **Timeline:** Months 3-8
- **Objective:** Develop and train the NLP system to support various input methods for the kitchen environment.

### Software Framework Design

- **Timeline:** Months 4-8
- **Objective:** Develop a robust software framework.

### Usability Testing & Feedback

- **Timeline:** Months 8-12
- **Objective:** Conduct usability testing with target

users, gather feedback, and make necessary adjustments to prototypes.

### **Final Product Development**

- **Timeline:** Months 12-20
- **Objective:** Finalize designs for smart gadgets, interfaces, and the autonomous robot, incorporating feedback from testing.

### **Manufacturing Setup**

- **Timeline:** Months 21-22
- **Objective:** Prepare for mass production, including supplier selection and manufacturing logistics.

### **Marketing Strategy Implementation**

- **Timeline:** Month 21
- **Objective:** Launch marketing campaigns, build partnerships, and prepare for product launch events.

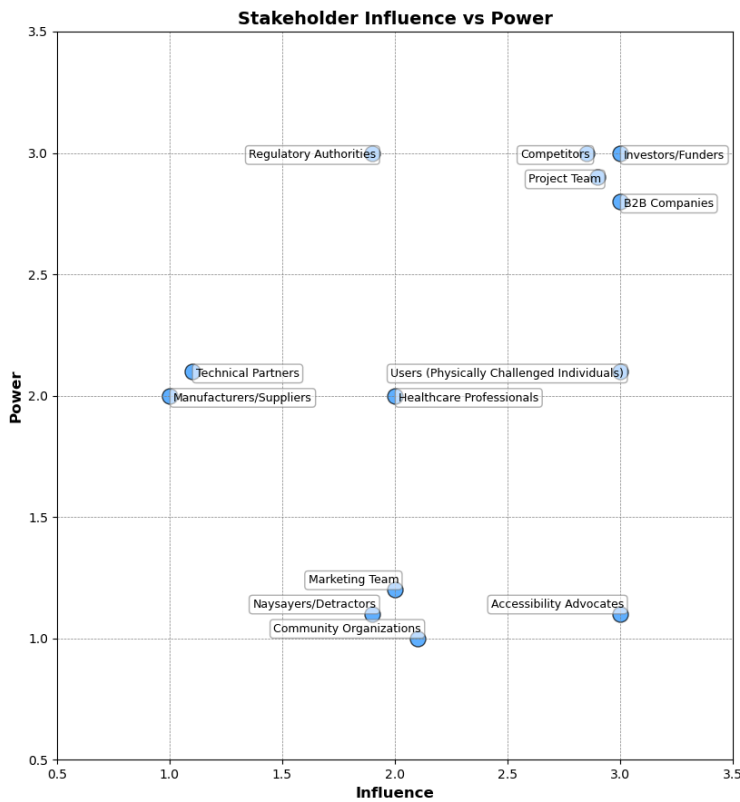
### **Product Launch**

- **Timeline:** Month 23
- **Objective:** Officially release the product to the market, accompanied by promotional events and demonstrations.

### **Post-Launch Support & Iteration**

- **Timeline:** Months 23-28
- **Objective:** Provide customer support, gather post-launch feedback, and implement improvements for future versions.

## 5. Stakeholder Analysis



We are considering 3 tiers of **Power** and **Influence**:

- 1 = **low**
- 2 = **Medium**
- 3 = **High**

In the graph view we can also see a distinction between different stakeholders in the same tier.

Stakeholder	Role	Interest/Impact	Engagement Strategy	Power	Influence
Investors/Funders	Provide financial backing	Interested in the project's success and return on investment.	Regular financial reports and progress updates.	3	3
Project Team	Developers, designers, and project managers	Directly involved in execution and development of the project.	Regular meetings, updates, and collaborative tools.	3	3
Users (Physically Challenged Individuals)	End-users of the smart kitchen system	Primary beneficiaries; their needs and feedback shape the product.	User testing, surveys, and focus groups.	2	3

Regulatory Authorities	Ensure compliance with safety and accessibility standards	Interested in adherence to legal requirements.	Regular updates and submissions for compliance review.	3	2
Healthcare Professionals	Consultants and advisors	Can provide insights on accessibility and usability.	Workshops and consultation meetings.	2	2
Accessibility Advocates	Promote rights and needs of disabled individuals	Their feedback is crucial for ensuring usability and compliance.	Engaging in discussions and feedback sessions.	1	3
Community Organizations	Support groups for disabled individuals	Can help with outreach and feedback from target users.	Partnerships for testing and community engagement.	1	2
Marketing Team	Responsible for promotion and outreach	Interested in product features and market reception.	Collaborate on messaging and promotional strategies.	1	2
Manufacturers/Suppliers	Provide materials and production capabilities	Interested in contract opportunities and production timelines.	Regular communication and meetings to discuss progress.	2	1
Technical Partners	Collaborate on software and hardware integration	Concerned with technical compatibility and performance.	Joint development meetings and testing phases.	2	1



Competitors	Other companies in the smart kitchen market	May attempt to undermine project success or market position.	Monitor market trends and competitor strategies.	3	3
B2B Companies	Initial clients and end-users	Interested in the system's adaptability, efficiency, and benefits for end-users; key to early success.	Regular client meetings, product demonstrations, customized training sessions, and feedback loops.	3	3

## 6. Risks

### Technical Risks

- **Integration Complexity:** Coordinating various devices and technologies, including smart kitchen gadgets and NLP systems, may result in unexpected compatibility issues.
- **Data Security and Privacy:** Managing user data, especially for a vulnerable population, requires strict adherence to data privacy regulations (GDPR) and high security to prevent unauthorized access.
- **Reliability of NLP Systems:** NLP-based interfaces may struggle with varied speech patterns or accents, affecting user experience. We cannot afford the system to fail catastrophically in any case because we are working with people that are already at risk.

### Financial Risks

- **High Initial Investment:** Developing customized devices and advanced software frameworks demands significant upfront investment, which may strain budgets.
- **Limited Market Revenue:** The accessibility tech market, while growing, can be challenging for generating high revenue if initial adoption is limited. We will need governments and community organizations to start adopting our solutions very soon after the release of the project.
- **Funding Dependence:** Relying heavily on investors or grants increases financial risk if expected funds don't materialize.

### Market and Regulatory Risks

- **Regulatory Compliance:** Accessibility technology must comply with specific regulatory standards that may vary across regions. Changes in these regulations could impact development timelines.

- **Market Acceptance:** Some users may be reluctant to adopt smart kitchen technology due to cost, privacy concerns, or unfamiliarity with the tech. At first glance our project could scare people who are afraid that the time spent to learn how to use our product won't make up for the gain they get in the long run.
- **Competitive Landscape:** The smart home industry is competitive, with new players frequently entering the market, which may reduce the project's market share. We must be able to make it clear that our solution is the only one that responds to the needs of disabled people.
- **Public Perception Risks:** Accessibility-focused technology is often subject to scrutiny from advocacy groups, and any perceived shortcomings could harm the project's reputation. We need to analyze in detail the legislation and clear any concern from the start.

## 7. Alternatives

Some of the already existing alternatives are:

- **Moley Robotics** which claims to be the world's first fully automated robotic kitchen, combining robotics with AI to prepare a range of recipes. Their system offers residential and commercial kitchen models equipped with robotic arms that can replicate chef-quality cooking by following recipe libraries. Moley aims to provide convenient, healthy meals through automation, making fresh, home-cooked food accessible to everyone.
- **Voice assistants** like Alexa and Google home. They perform various tasks such as controlling smart home gadgets, providing information, setting reminders, playing music, and more. Both use natural language processing and AI to understand and respond to commands, with Alexa integrated deeply into Amazon's ecosystem and Google Home leveraging Google's extensive search and data capabilities. They also support integrations with third-party apps and smart devices for broader functionality.
- **Rev-A-Shelf:** Known for its accessible and customizable shelving systems, Rev-A-Shelf offers pull-out and adjustable shelves to make storage easier for people with mobility issues. Combined with smart technologies, these solutions can create an adaptable kitchen environment tailored to user needs.
- **IKEA's Inclusive Kitchen Range:** IKEA has developed kitchen models that incorporate accessible features, such as pull-down shelving and lowered countertops, designed to support various physical needs. Combining these with smart technologies provides an accessible yet high-tech solution.
- **Chefling:** Chefling is a virtual assistant designed to assist with kitchen tasks, offering recipe suggestions based on available ingredients, meal planning, and voice-guided cooking. Integrated with Alexa, it makes smart kitchens more user-friendly, especially for those who may benefit from guided cooking processes.
- **Bixi:** Bixi is a smart controller that uses gestures to control various devices without needing physical contact. This touch-free solution can be ideal for people with disabilities or limited dexterity, allowing them to control smart appliances, lights, and other devices through hand motions.

## 8. Evaluation

### SWOT:



### Strengths

- **Innovative Technology:** Utilizes cutting-edge technologies like NLP, smart gadgets, and robotics, making it a forward-thinking solution.
- **User-Centric Design:** Tailored interfaces based on user needs enhance usability and accessibility.
- **Independence for Users:** Empowers physically challenged individuals to perform daily tasks autonomously, improving their quality of life.
- **Market Demand:** Growing awareness and need for assistive technologies present significant opportunities for market penetration.

### Weaknesses

- **High Development Costs:** Creating custom-built gadgets and integrating various technologies can be expensive.
- **Complexity of Integration:** Ensuring seamless interaction between different devices and technologies may pose challenges.
- **User Training:** Users may require training to effectively utilize the new technologies and interfaces.
- **Dependence on new Technology:** Over-reliance on technology may lead to challenges if the system fails or malfunctions.

### Opportunities

- **Growing Aging Population:** An increasing number of elderly individuals may benefit from assistive kitchen technologies.
- **Partnerships:** Collaborations with healthcare organizations, tech companies, and research institutions could enhance development and outreach.
- **Grants and Funding:** Opportunities for funding from government and non-profit organizations focused on accessibility and disability support.
- **Expanding Market:** Potential to expand into other areas of the home or provide solutions for various disabilities.

## Threats

- **Technological Advancements:** The advancement in technology might not be fast enough in order to allow us to reach our goals.
- **Competition:** Existing companies may develop similar solutions, increasing competition in the market.
- **Regulatory Challenges:** Navigating regulations around assistive technologies and user safety can be complex.
- **User Acceptance:** Resistance to new technologies from users or caregivers could hinder adoption.

## Score matrices:

Factor	Description	Weight	Your Project	Total	Moley Robotics	Total	Voice Assist ants	Total
Cost	The expense associated with the product development and deployment	3	5	15	6	18	9	27
Customiz ation	The ability to tailor the product to individual user needs	3	10	30	6	18	5	15
Accessibil ity Features	Features specifically designed to support accessibility for physically challenged users	3	9	27	7	21	6	18
User Independe	The degree to which	2	10	20	8	16	5	10

nce	the product enables users to complete tasks independently							
Technical Support	Availability of ongoing support for users	1	7	7	6	6	8	8
Ease of Integration	How easily the product can be integrated with other systems	1	8	8	6	6	9	9
Ease of Use	How intuitive and user-friendly the product is	2	8	16	7	14	9	18
Number of Functions	The range of features and functionalities available	3	10	30	8	24	8	24
Expandability	The ability to add new features or integrate with additional tools	2	9	18	6	12	7	14
Stakeholders	The ease of managing stakeholders and meeting their requirements	-2	2	-4	4	-8	3	-6

## Financial method:

**Total Expenses Before Launch:** \$1,580,000

**Total Expenses After Launch (Yearly):** \$21,000,000

**Total Revenue (Yearly):** \$35,500,000

**Net Profit Calculation Post-Launch:**

- **Yearly Net Profit:**  $\text{Total Revenue} - \text{Total Expenses (Yearly)} = \$35,500,000 - \$21,000,000 = \$14,500,000$

**Total Profit Over 4 Years** (First 2 years with no revenue):

- **Total Profit in Year 3 and Year 4:**  $2 \times \text{Yearly Net Profit} = 2 \times \$14,500,000 = \$29,000,000$

**Total Profit Calculation** (considering initial investment):

- **Total Profit After 4 Years:**  $\text{Total Profit Over 4 Years} - \text{Total Expenses Before Launch} = \$29,000,000 - \$1,580,000 = \$27,420,000$

**ROI Calculation:**

- **ROI:**  $(\text{Total Profit After 4 Years} / \text{Initial Investment}) \times 100 = (\$27,420,000 / \$1,580,000) \times 100 \approx 1,735.4\%$

## Conclusions:

Our analysis of the alternatives in the automated kitchen environment space reveals that while several companies offer products that cater to specific functionalities, none provide the comprehensive set of features that our system aims to deliver. Although consumers can purchase various solutions from different vendors to achieve a similar outcome, the effectiveness and integration of these solutions will not match the quality and user experience that our all-inclusive system promises.

The score matrix we created clearly demonstrates that our project significantly outperforms competitors, including Moley Robotics, across several key factors. Our project excels in customization, accessibility features, user independence, and the number of functions offered. This competitive advantage positions us favorably to meet the needs of physically challenged individuals seeking enhanced independence in the kitchen.

With an ROI of approximately **1,735.4%** over four years, our project demonstrates exceptional financial potential, indicating it is well-positioned in the market. Although the payback period is around **two years**, this relatively swift recovery reinforces the opportunity for ongoing development and scalability beyond the initial investment. The substantial net profit generated in the years following the launch provides a solid foundation for growth as we continue to expand our market presence and enhance our product offerings.

The high costs associated with our project stem from its strategic focus on the B2B sector, where delivering specialized solutions is essential for meeting the needs of businesses and institutions. This approach requires significant investment in research, development, and tailored marketing to ensure our automated kitchen systems meet the rigorous standards of healthcare institutions and assisted living facilities. While these upfront expenses may seem substantial, they are vital for establishing a competitive edge and driving long-term value in the B2B market.

We also plan to reach out to the companies behind the alternatives we analyzed. Collaborating with these entities may enhance our framework by integrating their technologies and solutions, which could lead to mutual benefits. While we cannot predict their willingness to partner with us at this stage, we hope that none will directly compete with our innovative approach.

Since none of the alternatives are specifically designed to meet the unique needs of our target audience, we believe there is minimal risk of them pivoting their projects to directly challenge our initiative. Instead, their focus on niche markets may allow us to carve out a significant space for our comprehensive solution, catering specifically to the needs of physically challenged individuals and enhancing their independence in the kitchen environment.

In conclusion, our project stands out not only for its potential financial return but also for its commitment to providing an all-encompassing solution tailored to the accessibility needs of users. The favorable results from our score matrix further solidify our competitive advantages in the market. We remain optimistic about the opportunity to innovate and improve the quality of life for our target demographic while fostering collaborations that can further strengthen our offering.