**Design Thinking Project Workbook**

**Don't find customers for your product but find products for your customers**

**1. Team**

**Team Name:**

**BrainStorm Battalion**

**Team Logo (if any):**

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**Team Members:**

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**2. Problem/Opportunity Domain**

**Domain of Interest: The specific industry or field where your innovative idea will be applied.**

**The domain of interest for our innovative idea be the Healthcare Industry, specifically in the Neurology and Medical Imaging sectors. Our brain stroke detection solution using machine learning can apply to:**

**Clinical Decision Support Systems (CDSS): Assisting doctors in diagnosing strokes early by analyzing patient data and medical images.**

**Telemedicine: Providing remote stroke risk assessment or detection, especially in rural or underserved areas.**

**Healthcare Diagnostics: Automating stroke detection and improving diagnostic accuracy in hospitals and clinics.**

**Medical Research: Helping researchers identify patterns or biomarkers associated with strokes.**

**By applying ML, We aim to enhance early detection, streamline diagnostics, and improve patient outcomes in the field of stroke detection.**

**Description of the Domain: A brief overview of the key elements, challenges, and opportunities within the domain.**

**The domain for our project is the Healthcare Industry, specifically focusing on Neurology (study of the brain) and Medical Imaging (scans like MRIs and CTs). This area involves using technology to help detect, diagnose, and treat brain conditions, particularly strokes.**

**In this domain:**

**Neurology deals with brain disorders, including strokes, which occur when blood flow to part of the brain is interrupted.**

**Medical Imaging provides detailed pictures of the brain, helping doctors spot signs of strokes and other conditions.**

**Machine Learning can be used to analyze these images and patient data, helping doctors make faster and more accurate decisions.**

**Our project aims to use machine learning to improve stroke detection, making healthcare more efficient and accessible.**

**Why did you choose this domain?: The personal or strategic reasons for selecting this domain, such as passion, market potential, or solving a specific problem.**

**We have choosen this domain for**

**High Impact on Public Health: Strokes are a leading cause of death and disability worldwide, affecting millions of people. Early detection can save lives and prevent severe long-term damage.**

**Time-Sensitive Condition: Strokes require immediate medical intervention. Quick diagnosis is critical, and using technology like machine learning can speed up detection, allowing for faster treatment.**

**Preventable and Treatable: With the right tools, many strokes can be prevented or treated more effectively. By focusing on stroke detection, we can help reduce the burden of this condition on patients and healthcare systems.**

**Room for Innovation: There is a growing need for advanced tools in stroke detection. Machine learning can help analyze complex brain scans and patient data more accurately than traditional methods, leading to earlier and more precise diagnoses.**

**In summary, the brain stroke domain is chosen because improving early detection and intervention can significantly improve patient outcomes, making a positive difference in global health.**

**3. Problem/Opportunity Statement**

**Problem Statement: A clear and specific articulation of the problem, outlining its importance.**

Strokes are a leading cause of death and long-term disability worldwide, yet early detection remains a significant challenge due to limited access to timely diagnosis, especially in rural or underserved areas. Traditional diagnostic methods are often slow and require specialized expertise, resulting in delayed treatment, which can lead to severe brain damage or death.

The problem is to develop an efficient and accurate machine learning-based system for early brain stroke detection, utilizing patient data and medical imaging, to assist healthcare professionals in making faster, more reliable diagnoses, ultimately improving patient outcomes and reducing the impact of strokes on individuals and healthcare systems.

**Problem Description: A concise explanation of the issue or challenge that needs to be solved.**

Strokes are a leading cause of death and disability, requiring rapid diagnosis and treatment to minimize brain damage. However, early detection is challenging, especially in rural areas with limited access to specialists and advanced imaging tools. Current diagnostic methods can be slow and prone to errors, leading to delays in treatment.

There is a pressing need for an automated, reliable machine learning system that can analyze medical images and patient data quickly. Such a system would assist healthcare providers in detecting strokes earlier, ultimately improving patient outcomes and reducing the impact of strokes on individuals and healthcare systems.

**Context (When does the problem occur): The specific situations or conditions under which the problem arises.**

**The problem arises in emergencies and underserved areas**

 **Onset of Symptoms**: Immediate diagnosis is crucial when patients show stroke symptoms.

 **Emergency Room Visits**: Time constraints can delay accurate diagnoses in emergency settings.

 **Rural and Underserved Areas**: Limited access to specialists and imaging tools leads to delays.

 **Post-Diagnosis Treatment**: Inefficient detection can hinder timely treatment decisions.

 **Follow-Up Care**: Ongoing care for stroke patients requires rapid and reliable diagnostics.

**Alternatives (What does the customer do to fix the problem): Existing solutions or actions taken by customers to address the issue.**

Existing solutions and actions taken by healthcare providers to address stroke detection issues include:

1. **Advanced Imaging Techniques**: Many hospitals have adopted high-resolution imaging technologies, such as CT and MRI scans, to improve the accuracy of stroke diagnosis.
2. **Telemedicine Services**: Telehealth platforms are increasingly used to connect patients with specialists remotely, allowing for quicker evaluations and recommendations.
3. **Stroke Protocols**: Hospitals have implemented standardized stroke protocols (e.g., the "Stroke Code") to streamline emergency response and ensure rapid assessment and treatment.
4. **AI and ML Tools**: Some healthcare systems have begun integrating machine learning algorithms to assist in analyzing imaging data and identifying strokes more quickly.
5. **Public Education Campaigns**: Many organizations run campaigns to raise awareness about stroke symptoms and the importance of seeking immediate care, which helps reduce the time to treatment.
6. **Collaboration with Research Institutions**: Hospitals often partner with research institutions to study stroke patterns and improve diagnostic methods through ongoing clinical research.
7. **Training Programs**: Continuous education and training for healthcare professionals on the latest diagnostic tools and best practices for stroke care.

**Customers (Who has the problem most often): The primary group of individuals or organizations affected by the problem.**

The problem of stroke detection most often affects:

1. **Patients at High Risk**: Individuals with risk factors such as high blood pressure, diabetes, heart disease, obesity, or a family history of strokes.
2. **Elderly Population**: Older adults are at a greater risk for strokes due to age-related factors and comorbidities.
3. **Residents in Rural Areas**: People living in remote or underserved regions often have limited access to medical facilities and specialists, making timely stroke detection challenging.
4. **Emergency Medical Services (EMS)**: Paramedics and emergency responders face difficulties in quickly assessing and diagnosing strokes in the field.
5. **Healthcare Facilities with Limited Resources**: Hospitals or clinics without advanced imaging technology or specialized stroke care teams may struggle to provide timely diagnoses.
6. **Individuals with Limited Awareness**: Patients who are unaware of stroke symptoms may delay seeking medical attention, exacerbating the problem.

**Emotional Impact (How does the customer feel): The emotions or frustrations experienced by the customer due to the problem.**

**The emotions or frustrations experienced by the customer due to this problem are**

 **Urgency and Anxiety**: Healthcare providers feel immense pressure to diagnose strokes quickly, knowing that delays can lead to severe consequences for patients.

 **Frustration**: Providers may be frustrated by the limitations of current diagnostic tools and the time it takes to analyze imaging, which can hinder timely treatment.

 **Helplessness**: Patients and their families may feel helpless when experiencing stroke symptoms, especially if they are in areas without immediate access to specialized care.

 **Concern for Outcomes**: Both patients and healthcare professionals worry about the potential for long-term disabilities or death due to delayed diagnosis and treatment.

 **Disappointment**: Patients may feel disappointed with the healthcare system if they perceive delays or inadequacies in stroke detection and care.

**Quantifiable Impact (What is the measurable impact): The measurable effects of the problem, such as financial losses or time wasted.**

 **Increased Healthcare Costs**: Delayed diagnosis can lead to more complex and costly treatments, longer hospital stays, and higher overall healthcare expenses for patients and hospitals.

 **Lost Productivity**: For patients, prolonged recovery or disabilities resulting from untreated strokes can lead to significant lost income and decreased productivity in the workplace.

 **Emergency Response Time**: Delays in diagnosing strokes can increase the time emergency services spend on cases, potentially diverting resources from other patients in need.

 **Longer Treatment Times**: Patients may require extended rehabilitation and follow-up care due to complications from late diagnosis, resulting in higher healthcare utilization.

 **Increased Mortality Rates**: Delays in detection and treatment can lead to higher mortality rates, impacting public health statistics and community well-being.

 **Emotional and Psychological Impact**: The stress and anxiety faced by patients and families can lead to mental health issues, further straining healthcare resources.

**Alternative Shortcomings (What are the disadvantages of the alternatives): The limitations or downsides of the current solutions customers use.**

 **Slow Diagnosis**: Traditional imaging methods (like CT and MRI scans) can be time-consuming, leading to delays in treatment.

 **Limited Access to Specialists**: In rural or underserved areas, patients may not have immediate access to neurologists or stroke specialists, affecting timely diagnosis.

 **Human Error**: Manual interpretation of imaging results can be subjective and prone to errors, which may lead to misdiagnosis or missed cases.

 **Resource Intensive**: Advanced imaging technologies require significant financial and human resources, which may not be available in all healthcare settings.

 **Public Awareness**: Many people are not educated about stroke symptoms, which can delay their decision to seek help, further complicating early detection.

 **Integration Challenges**: Implementing new technology, like machine learning systems, may face hurdles in integration with existing healthcare workflows and electronic health records.

 **Training Needs**: Healthcare providers may need additional training to effectively use new diagnostic tools or technologies, creating barriers to implementation.

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**3. Addressing SDGs**

**Relevant Sustainable Development Goals (SDGs): Identify which of the 17 SDGs are directly impacted by the problem or opportunity.**

 **No Poverty**: End poverty in all its forms everywhere.

 **Zero Hunger**: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.

 **Good Health and Well-Being**: Ensure healthy lives and promote well-being for all at all ages.

 **Quality Education**: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

 **Gender Equality**: Achieve gender equality and empower all women and girls.

 **Clean Water and Sanitation**: Ensure availability and sustainable management of water and sanitation for all.

 **Affordable and Clean Energy**: Ensure access to affordable, reliable, sustainable, and modern energy for all.

 **Decent Work and Economic Growth**: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.

 **Industry, Innovation, and Infrastructure**: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.

 **Reduced Inequalities**: Reduce inequality within and among countries.

 **Sustainable Cities and Communities**: Make cities and human settlements inclusive, safe, resilient, and sustainable.

 **Responsible Consumption and Production**: Ensure sustainable consumption and production patterns.

 **Climate Action**: Take urgent action to combat climate change and its impacts.

 **Life Below Water**: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.

 **Life on Land**: Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

 **Peace, Justice, and Strong Institutions**: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.

 **Partnerships for the Goals**: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

**How does your problem/opportunity address these SDGs?: Describe how solving the problem or leveraging the opportunity will contribute to achieving one or more SDGs.**

 **SDG 3: Good Health and Well-Being**

* By enhancing stroke detection, we can reduce mortality and morbidity associated with strokes, ensuring better health outcomes for individuals. Early detection and treatment can improve overall well-being and decrease the burden on healthcare systems.

 **SDG 9: Industry, Innovation, and Infrastructure**

* Implementing advanced technologies like machine learning and AI in stroke detection promotes innovation in healthcare. This encourages the development of new diagnostic tools and improves the infrastructure of healthcare services.

 **SDG 10: Reduced Inequalities**

* Improving stroke detection capabilities, especially in rural and underserved areas, ensures equitable access to healthcare services. This can help bridge the gap in healthcare disparities, providing timely care to populations that may otherwise be overlooked.

 **SDG 17: Partnerships for the Goals**

* Collaborating with technology firms, research institutions, and healthcare providers fosters partnerships that can lead to innovative solutions for stroke detection. These collaborations can strengthen healthcare systems and improve health outcomes.

**4. Stakeholders**

Answer these below questions to understand the stakeholder related to your project

1. **Who are the key stakeholders involved in or affected by this project?**

 Patients

 Healthcare Providers

 Medical Institutions

 Technology Companies

 Researchers

 Public Health Organizations

 Insurance Providers

 Policy Makers

 Caregivers and Family Members

1. **What roles do the stakeholders play in the success of the innovation?**

 **Patients**: Provide feedback on their experiences and needs, helping to shape user-friendly solutions.

 **Healthcare Providers**: Implement and use the new diagnostic tools, ensuring they meet clinical needs and improve patient care.

 **Medical Institutions**: Facilitate the integration of new technologies into existing workflows and support staff training.

 **Technology Companies**: Develop and maintain the machine learning algorithms and imaging technologies, ensuring they are effective and reliable.

 **Researchers**: Conduct studies to validate the effectiveness of the innovation and contribute to ongoing improvements based on data.

 **Public Health Organizations**: Raise awareness about the importance of early stroke detection and advocate for the use of new technologies in healthcare settings.

 **Insurance Providers**: Influence access to the innovation by covering costs and facilitating reimbursement processes for new diagnostic methods.

 **Policy Makers**: Create supportive regulations and policies that promote the adoption of innovative stroke detection solutions.

 **Caregivers and Family Members**: Support patients in navigating the healthcare system and encourage timely treatment, providing valuable insights into patient needs.

1. **What are the main interests and concerns of each stakeholder?**

 **Patients**:

* **Interests**: Timely and accurate diagnosis, effective treatment, and improved health outcomes.
* **Concerns**: Access to care, quality of service, and potential costs of treatments.

 **Healthcare Providers**:

* **Interests**: Enhanced diagnostic tools, improved patient outcomes, and efficient workflows.
* **Concerns**: Reliability of new technologies, training requirements, and potential disruptions to existing practices.

 **Medical Institutions**:

* **Interests**: Improved patient care, enhanced reputation, and operational efficiency.
* **Concerns**: Costs of implementing new technologies and staff training needs.

 **Technology Companies**:

* **Interests**: Successful deployment of their products and gaining market share.
* **Concerns**: Regulatory compliance, data security, and user adoption rates.

 **Researchers**:

* **Interests**: Advancing knowledge in stroke detection and contributing to public health.
* **Concerns**: Funding for research, access to data, and practical application of findings.

 **Public Health Organizations**:

* **Interests**: Raising awareness about strokes and promoting preventive measures.
* **Concerns**: Funding for initiatives and ensuring community access to new technologies.

 **Insurance Providers**:

* **Interests**: Cost-effective treatment options and managing claims efficiently.
* **Concerns**: The financial implications of covering new technologies and potential overutilization.

 **Policy Makers**:

* **Interests**: Promoting public health and ensuring equitable access to care.
* **Concerns**: Balancing regulation with innovation and managing public health funding.

 **Caregivers and Family Members**:

* **Interests**: Support for patients and ensuring timely and effective care.
* **Concerns**: Emotional and financial burdens associated with caregiving and navigating the healthcare system.

1. **How much influence does each stakeholder have on the outcome of the project?**

* **Patients**:
  + **Interests**: Quick diagnosis and effective treatment.
  + **Concerns**: Access to care and treatment costs.
* **Healthcare Providers**:
  + **Interests**: Better tools for diagnosis and improved patient care.
  + **Concerns**: Reliability of technology and training needs.
* **Medical Institutions**:
  + **Interests**: Quality care and efficient operations.
  + **Concerns**: Implementation costs and staff training.
* **Technology Companies**:
  + **Interests**: Successful product use and market growth.
  + **Concerns**: Compliance with regulations and user adoption.
* **Researchers**:
  + **Interests**: Advancing stroke detection knowledge.
  + **Concerns**: Funding and applying research findings.
* **Public Health Organizations**:
  + **Interests**: Raising awareness and promoting prevention.
  + **Concerns**: Funding and community access to care.
* **Insurance Providers**:
  + **Interests**: Cost-effective treatments.
  + **Concerns**: Financial implications and claims management.
* **Policy Makers**:
  + **Interests**: Public health and equitable care access.
  + **Concerns**: Balancing regulations with innovation.
* **Caregivers and Family Members**:
  + **Interests**: Supporting patients effectively.
  + **Concerns**: Emotional and financial burdens.

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##### You said:

4. How much influence does each stakeholder have on the outcome of the project?

###### ChatGPT said:

ChatGPT

### Influence of Each Stakeholder on the Project Outcome

* **Patients**:
  + **Influence**: High. Their feedback and experiences can shape the design and effectiveness of the solution.
* **Healthcare Providers**:
  + **Influence**: High. Their adoption and use of the technology are crucial for successful implementation and patient outcomes.
* **Medical Institutions**:
  + **Influence**: High. Their willingness to integrate new tools and allocate resources can determine the project's success.
* **Technology Companies**:
  + **Influence**: Medium to High. Their innovation and support are essential for developing effective solutions, but user adoption ultimately drives success.
* **Researchers**:
  + **Influence**: Medium. Their studies can validate the effectiveness of the solutions, influencing broader acceptance and implementation.
* **Public Health Organizations**:
  + **Influence**: Medium. They can raise awareness and promote the technology, affecting its adoption in the community.
* **Insurance Providers**:
  + **Influence**: Medium. Their coverage decisions can affect patient access to new technologies and treatments.
* **Policy Makers**:
  + **Influence**: Medium. Their regulations and policies can facilitate or hinder the adoption of new solutions.
* **Caregivers and Family Members**:
  + **Influence**: Low to Medium. While they support patients, their influence on the project is indirect compared to other stakeholders.

1. **What is the level of engagement or support expected from each stakeholder?**

**Patients**:

**Engagement**: Active. Their participation in feedback sessions and trials is crucial for refining the solution.

**Healthcare Providers**:

**Engagement**: High. Their support in implementing and using the technology is essential for its success.

**Medical Institutions**:

**Engagement**: High. They are expected to provide resources, training, and infrastructure for the project.

**Technology Companies**:

**Engagement**: High. Their ongoing support and collaboration are needed for development and maintenance.

**Researchers**:

**Engagement**: Moderate. Their involvement in validating the technology and providing insights is valuable but not as hands-on.

**Public Health Organizations**:

**Engagement**: Moderate to High. They are expected to promote awareness and advocate for the technology in the community.

**Insurance Providers**:

**Engagement**: Moderate. Their involvement in discussions about coverage and reimbursement is important for access.

**Policy Makers**:

**Engagement**: Moderate. Their support in creating favorable regulations and policies is beneficial but may vary.

**Caregivers and Family Members**:

**Engagement**: Low to Moderate. While they can provide support and insights, their engagement in the project is generally indirect.

1. **Are there any conflicts of interest between stakeholders? If so, how can they be addressed?**

 **Patients vs. Insurance Providers**:

* **Conflict**: Patients want the best treatments; insurers want to keep costs low.
* **Solution**: Improve communication about what’s covered and support policies that prioritize patient care.

 **Healthcare Providers vs. Medical Institutions**:

* **Conflict**: Providers may want to use new tools, while institutions focus on costs.
* **Solution**: Hold discussions to align care goals with available resources.

 **Technology Companies vs. Healthcare Providers**:

* **Conflict**: Providers might hesitate to use new technology if it’s hard to learn.
* **Solution**: Involve providers in the design process to ensure tools are user-friendly.

 **Researchers vs. Technology Companies**:

* **Conflict**: Researchers want thorough testing; companies may want to launch quickly.
* **Solution**: Create partnerships that balance careful research with the need to go to market.

 **Public Health Organizations vs. Policy Makers**:

* **Conflict**: Public health wants broad solutions; policy makers may focus on budgets.
* **Solution**: Advocate for policies that support long-term health benefits.

 **Caregivers vs. Patients**:

* **Conflict**: Caregivers may have different priorities than patients.
* **Solution**: Encourage open conversations between patients and caregivers to align on care decisions.

1. **How will you communicate and collaborate with stakeholders throughout the project?**

**We can communicate and collaborate with stakeholders through**

 **Regular Meetings**

 **Surveys and Feedback Forms**

 **Workshops and Training Sessions**

 **Dedicated Online Platform**

 **Newsletters**

 **Focus Groups**

 **Partnership Meetings**

 **Public Awareness Campaigns**

1. **What potential risks do stakeholders bring to the project, and how can these be mitigated?**

 **Patients**:

* **Risk**: Low engagement or feedback.
* **Mitigation**: Actively involve them through incentives for participation and ensure easy access to feedback channels.

 **Healthcare Providers**:

* **Risk**: Resistance to adopting new technology.
* **Mitigation**: Provide thorough training and demonstrate clear benefits to their workflow and patient care.

 **Medical Institutions**:

* **Risk**: Resource constraints or budget cuts.
* **Mitigation**: Align project goals with institutional priorities and demonstrate potential cost savings.

 **Technology Companies**:

* **Risk**: Technical issues or delays in development.
* **Mitigation**: Establish clear timelines, regular check-ins, and contingency plans for troubleshooting.

 **Researchers**:

* **Risk**: Conflicting research goals or priorities.
* **Mitigation**: Foster collaboration and ensure alignment of objectives from the outset.

 **Public Health Organizations**:

* **Risk**: Limited outreach or engagement in the community.
* **Mitigation**: Collaborate closely on awareness campaigns and utilize their networks effectively.

 **Insurance Providers**:

* **Risk**: Delays in coverage decisions affecting access.
* **Mitigation**: Engage them early in discussions to facilitate smoother approval processes.

 **Policy Makers**:

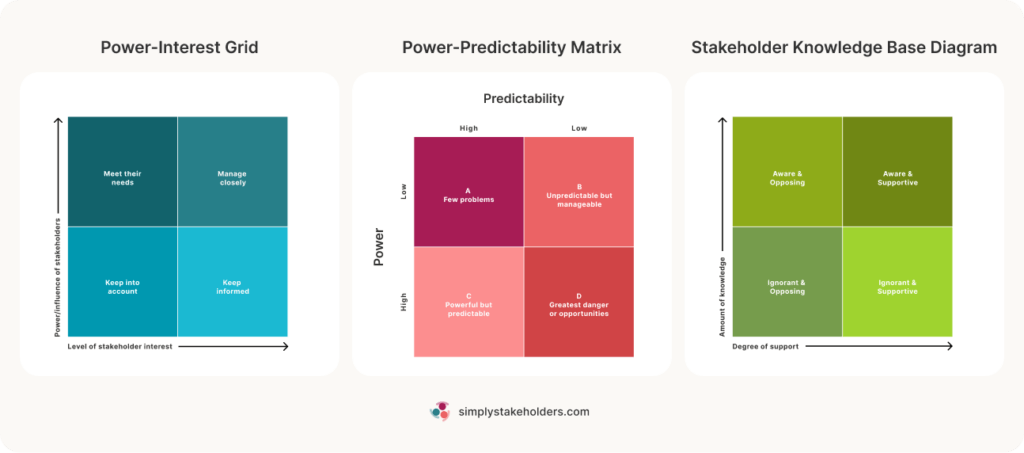
* **Risk**: Regulatory hurdles or changes in policy.
* **Mitigation**: Maintain open communication and advocate for supportive policies throughout the project.

 **Caregivers and Family Members**:

* **Risk**: Misalignment of priorities with patient needs.
* **Mitigation**: Facilitate discussions between caregivers and patients to ensure a unified approach to care.

**5. Power Interest Matrix of Stakeholders**

**Power Interest Matrix: Provide a diagrammatic representation of Power Interest Matrix**



1. **Empathetic Interviews**

**Conduct Skilled interview with at least 30 citizens/Users by asking open ended questions (What, why/How etc) and list the insights as per the format below**

|  |  |  |
| --- | --- | --- |
| **I need to know**  **(thoughts, feelings, actions)** | **Questions I will ask**  **(open questions)** | **Insights I hope to gain** |
| Thoughts | What do you think about using technology to help with stroke care? | How people view the role of technology in stroke care. |
|  | How can teaching people about strokes make a difference | Ideas on how important education and awareness are for stroke prevention. |
|  |  |  |
| Feelings | How do you feel when you hear someone had a stroke? | People’s emotional responses to strokes. |
|  | How do you feel about using AI to help save lives | How people feel about using technology like AI in healthcare. |
|  |  |  |
| actions | What can people do to lower their chances of having a stroke? | Practical actions people can take to prevent strokes. |
|  | How can AI help doctors treat stroke patients faster? | How AI can be used in emergencies to save lives. |
|  |  |  |

**SKILLED INTERVIEW REPORT**

**(Examples are given. Erase them and fill with your user information.)**

|  |  |  |
| --- | --- | --- |
| **User/Interviewee** | **Questions Asked** | **Insights gained (NOT THEIR ANSWERS)** |
| Abhishek Verma, Student | What are your thoughts on using AI to help with stroke diagnosis? | People are hopeful that AI can speed up stroke detection and improve patient outcomes. |
| Srinivasan P., Parent | How do you feel about stroke care and recovery? | People are empathetic towards stroke survivors and hope for better rehabilitation methods. |
|  | How can we educate more people about stroke symptoms? | Raising awareness about stroke symptoms can help reduce response times and save lives. |
|  |  |  |
|  |  |  |

**Key Insights Gained:**

* **Insight 1** : AI is seen as a valuable tool for improving stroke diagnosis and care.
* **Insight 2** : Public education about stroke symptoms can make a significant difference in emergency response.

**Empathy Map**



Your Answer:

Your Answer:

Who is your Customer Segment:

Idea/Innovation Title:

Designed By:

Date of Submission:

Your Answer:

Your Answer:

Your Answer:

Your Answer:

Your Answer:

Your Answer:

Your Answer:

1. **Empathy Map**
2. **Who is your Customer?**

**.**

**Stroke Patients** – Individuals who have experienced a brain stroke and need immediate medical attention, diagnosis, treatment, and long-term rehabilitation. Their primary needs include early detection of stroke symptoms, fast access to medical care, and personalized recovery plans for regaining lost functions.

**Key points:**

* **Define the customer profile clearly (e.g., age, profession, interests).**

 **Age**: Primarily individuals over the age of 50, though younger adults may also experience strokes due to genetic factors, lifestyle, or underlying conditions.

 **Profession**: Varies widely. Stroke patients can come from any professional background (e.g., retirees, working professionals, manual laborers), as stroke risk isn’t confined to a specific profession.

 **Interests**: Post-stroke, patients are typically focused on recovery, maintaining mobility, regaining cognitive and motor skills, and improving their quality of life. They might be interested in rehabilitation programs, wellness activities, and healthy lifestyle changes.

* **State their goals and needs related to the innovation or product.**

 **Early Detection**: Stroke patients need fast and accurate stroke detection to improve treatment outcomes. They benefit from AI tools that quickly diagnose strokes from brain scans or symptoms.

 **Timely Treatment**: They require immediate access to medical interventions, such as clot-busting drugs for ischemic stroke, within the critical time window.

 **Personalized Rehabilitation**: After the stroke, patients need tailored rehabilitation plans, guided by AI, to help regain lost motor functions, speech, or cognitive abilities.

 **Monitoring & Support**: Stroke patients often require long-term monitoring for potential complications. AI-based health tracking can provide personalized feedback on progress

* **Context in which the user will interact with your solution.**

**During an Emergency**: AI solutions can help medical professionals quickly diagnose and triage stroke patients in the emergency room or even in ambulances.

**Rehabilitation Centers**: Post-stroke, patients will interact with AI-driven rehabilitation tools in hospitals, rehabilitation centers, or home settings to monitor progress and assist in exercises.

**Home Use for Monitoring**: AI-based apps or wearable devices could help patients track their health status, detect warning signs of another stroke, and adjust rehabilitation exercises.

1. **Who are we empathizing with?**

We are empathizing with **stroke patients**, primarily over the age of 50, though younger individuals can also be affected.

These patients often face sudden health changes, experiencing physical and cognitive challenges that impact their daily lives. They may feel fear and uncertainty about their recovery.

Stroke patients are key players in their own care, needing support and tools to help them regain independence and improve their quality of life. Understanding their perspective is essential for creating effective solutions tailored to their needs.

**Key points:**

* **Define the user's characteristics**

**Personality**: Resilient but may feel vulnerable and anxious.

**Values**: Independence, quality of life, and family engagement.

**Responsibilities**: Caregiving roles or family obligations.

* **State the user's goals and challenges in their environment.**

**Goals**: Regain mobility, return to daily activities, and improve communication.

**Challenges**: Physical limitations, emotional distress, and navigating healthcare.

* **What is the user's broader situation (professionally or personally)?**

**Professionally**: Many may be retired or unable to return to work.

**Personally**: Family responsibilities and potential social isolation due to health changes.

1. **What do they need to DO?**

This section outlines the actions and decisions stroke patients face in their recovery.**.**

**Key points:**

* **Clarify the tasks or actions the user needs to complete.**

Complete rehabilitation exercises and attend therapy sessions.

Keep medical appointments for evaluations and treatments.

Track health metrics, like medication adherence.

* **What decisions do they need to make?**

Select a suitable rehabilitation program or therapist.

Choose lifestyle changes for better recovery.

Decide when to seek emergency help for new symptoms.

* **How do they define success or failure in their tasks?**

**Success**: Regaining mobility, performing daily tasks independently, and improving health.

**Failure**: Setbacks in recovery, inability to carry out daily activities, or complications.

1. **What do they SEE?**

This section highlights the visual elements that stroke patients encounter in their environment.

**Key points:**

* **What do users see in their physical and digital environment?**

Hospital settings with medical equipment and staff.

Rehabilitation centers with therapy tools and support.

Home environments that may need modifications for accessibility.

* **What trends or competitors do they notice?**

Health apps for tracking recovery and exercises.

Online resources and forums for stroke information and support.

Telehealth platforms for virtual consultations.

* **How do these visual elements influence their behavior?**

A supportive, accessible environment can boost motivation for recovery.

Engaging digital tools can encourage adherence to rehabilitation exercises.

Awareness of new therapies may prompt patients to seek innovative treatments.

1. **What do they SAY?**

This section captures the expressions and sentiments of stroke patients in conversations and feedback.

**Key points:**

* **What might users express openly in conversation about their problems?**

"I feel overwhelmed by my recovery process."

"I wish I understood more about my condition."

"It’s frustrating to regain my strength."

* **How do they express their goals or frustrations?**

"I want to be independent again and do things for myself."

"I’m struggling to remember my exercises."

"I need more support from my family and doctors."

* **What are their words during customer interviews or feedback?**

"The rehabilitation sessions are helping, but I need more variety."

"I wish there were easier ways to track my progress."

"I want to connect with others who’ve had similar experiences."

1. **What do they DO?**

This section focuses on the behaviors and actions of stroke patients in their recovery journey.

**Key points:**

* **What observable actions do users take?**

Attending physical therapy and rehabilitation sessions regularly.

Engaging in prescribed exercises at home.

Monitoring health metrics, such as blood pressure and medication intake.

* **What habits or routines do they follow?**

Following a daily routine that includes exercise, rest, and healthy meals.

Keeping a journal to track progress and feelings.

Participating in support groups or online forums for encouragement.

* **What might users do to try and solve their problems?**

Researching information about stroke recovery and therapies.

Seeking second opinions from different healthcare providers.

Using health apps to track exercises and progress.

1. **What do they HEAR?**

This section focuses on the information and influences that stroke patients receive from external sources.

**Key points:**

* **What are they hearing from peers, mentors, or the industry?**

Encouragement and advice from fellow stroke survivors about their recovery experiences.

Feedback from healthcare professionals regarding rehabilitation progress and strategies.

* **What media or channels of information are they exposed to?**

Health-related articles and news about stroke recovery and treatment advancements.

Social media groups and forums where stroke patients share tips and support.

Educational videos or podcasts focusing on health management after a stroke

* **Are there any strong influencers guiding their behavior?**

Healthcare providers who advocate for specific treatments or therapies.

Stroke survivor advocates sharing their stories and inspiring others.

Family and friends who provide emotional support and practical advice.

1. **What do they THINK and FEEL?**

This section explores the user's internal emotions, concerns, and motivations, revealing their deep-rooted feelings.

**Key points:**

* **What are their fears, worries, and anxieties?**

**Fear of Failure:** Worries about not meeting personal or external expectations.

**Security Concerns:** Anxiety about privacy and reliability in technology.

**Imposter Syndrome:** Doubts about their skills and qualifications.

* **What are their motivations and desires?**

**Desire for Success:** A strong drive to achieve their goals and excel.

**Need for Recognition:** Seeking validation for their efforts and accomplishments.

**Passion for Learning:** An eagerness for personal and professional growth.

* **How do their thoughts and feelings align with their actions?**

**Goal-Oriented Behavior:** Motivations often translate into proactive actions, like studying or networking.

**Coping Mechanisms:** Anxiety can lead to procrastination or over-preparation.

**Resilience:** Users may face fears head-on, demonstrating a complex interplay between emotions and actions.

1. **Pains and Gains**

This section addresses the user’s frustrations and desired outcomes, framing their challenges (pains) and the benefits they seek (gains).

**Key points:**

* **What are the user’s main pain points?**

**Time Constraints:** Difficulty managing time effectively due to competing priorities.

**Lack of Resources:** Limited access to information, tools, or support needed to achieve goals.

**Overwhelm:** Feeling stressed or anxious from juggling multiple responsibilities or facing complex tasks.

* **What would make their life easier or more fulfilling?**

**Streamlined Processes:** Solutions that simplify tasks and reduce complexity.

**Access to Support:** Availability of guidance, resources, or mentorship to navigate challenges.

**Enhanced Efficiency:** Tools that help manage time better and prioritize effectively.

* **What benefits do they hope to achieve from your product or solution?**

**Improved Performance:** Increased productivity and success in academic or professional pursuits.

**Greater Confidence:** Enhanced self-assurance in their abilities and decisions.

**Work-Life Balance:** A healthier balance between responsibilities and personal life, leading to greater fulfillment.