SAHAYAK

MINI PROJECT REPORT

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BONAFIDE CERTIFICATE

Certified that the 21CSC203P Advance Programming Practice course project report titled **"SAHAYAK"** is the bonafide work done by **VANSH SRIVASTAVA [RA2311003011846], TEJAS BAHADUR [RA2311003011820]** and **ASHMITA CHAKRABORTY [RA2311003011848] of II Year/III Sem B.Tech(CSE)** who carried out the mini project under my supervision.

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ABSTRACT

Sahayak is an innovative healthcare platform designed to support individuals with disabilities by providing seamless access to essential services such as full-time nurses, personal assistants, and wheelchair assistance. In response to the unique challenges faced by people with disabilities in managing their healthcare needs, **Sahayak** offers an easy-to-use, accessible solution that empowers users to arrange and schedule the support they need with just a few clicks.

The platform is built with a focus on inclusivity, featuring a user-friendly interface that supports screen readers, high-contrast design, and multiple language options, ensuring accessibility for users with diverse needs. Key functionalities include a secure and efficient booking system, customizable service options, and detailed caregiver profiles that allow users to select caregivers based on their qualifications, experience, and ratings. **Sahayak** also integrates a reliable payment system and provides 24/7 customer support to ensure smooth service delivery.

By connecting people with disabilities to professional caregivers and mobility assistance, **Sahayak** enhances users' independence and improves their overall quality of life. The platform aims to reduce barriers to healthcare, offering a more inclusive and efficient approach to meeting the medical and personal care needs of individuals with disabilities. **Sahayak** fosters a sense of dignity, trust, and empowerment, making healthcare services more accessible and convenient for those who need them most.

Through this project, **Sahayak** seeks to bridge gaps in the current healthcare system, promoting inclusivity and equality by ensuring that people with disabilities can access the care and support they deserve, when they need it.

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1. Introduction

Accessing healthcare services can be a complex and overwhelming experience for individuals with disabilities. Limited mobility, communication barriers, and lack of accessibility often make it difficult for them to receive the care and support they need.

Sahayak aims to address these challenges by providing an easy-to-use, accessible online platform that connects individuals with disabilities to essential healthcare services such as full-time nurses, personal assistants, and wheelchair assistance. Our goal is to simplify and streamline the process of obtaining medical support, ensuring that users can manage their health with ease and confidence.

Mainly our objective is to :

1. To provide automated medical support to disabled patients
2. To make the process of seeking prescriptions, doctor's advice, and assistance simple and user-friendly

2. Literature Survey

The need for accessible healthcare services for individuals with disabilities has been well-documented in existing research, with studies highlighting significant gaps in service delivery, particularly in terms of mobility assistance, personal care, and medical support. According to the **World Health Organization (WHO)**, over one billion people worldwide live with some form of disability, and these individuals often face higher health risks, limited access to healthcare, and barriers to full participation in society (WHO, 2011). The lack of specialized services, as well as the complexity of navigating the healthcare system, can lead to disparities in healthcare access and outcomes for disabled individuals.

A major challenge in healthcare for people with disabilities is the accessibility of services. Research by **De-Philippis et al. (2017)** found that people with disabilities frequently encounter difficulties in scheduling healthcare appointments, accessing transportation, and securing assistance for daily activities, all of which negatively impact their ability to manage their health effectively. Similarly, **Shaw and Cooper (2019)** found that while technology has the potential to bridge these gaps, many existing solutions are either not integrated into accessible platforms or are not tailored to the specific needs of disabled individuals.

In conclusion, while there have been efforts to address healthcare access for people with disabilities, there is still a significant gap in providing a holistic, accessible platform that integrates healthcare services with personal assistance and mobility support. **Sahayak** seeks to fill this gap by offering an all-in-one, automated platform designed to make it easier for individuals with disabilities to access the essential services they need, such as full-time care, mobility aids, and medical advice, all from a single, user-friendly interface.

3. Requirements

3.1 Requirement Analysis

From the given scenario, we draw the following requirements:

- **User Registration and Profile Management**: Users can create and update profiles with personal and medical details.
- **Service Booking and Scheduling**: Users can search, book, and schedule healthcare services like nurses and assistants.
- **Payment Integration**: Secure payment options for services, including credit/debit cards and PayPal.
- **Communication**: In-app messaging or chat for user-caregiver interactions and support.
- **Emergency Support**: An option for urgent assistance requests.
- **Medical Assistance and Prescription Management**: Users can request medical advice and prescriptions via the platform.
- **Data Security and Privacy**: Compliant with data privacy regulations, with encrypted and secure user data storage.

3.2 Hardware Requirements

To support the development and deployment of **Sahayak**, the following hardware resources will be required:

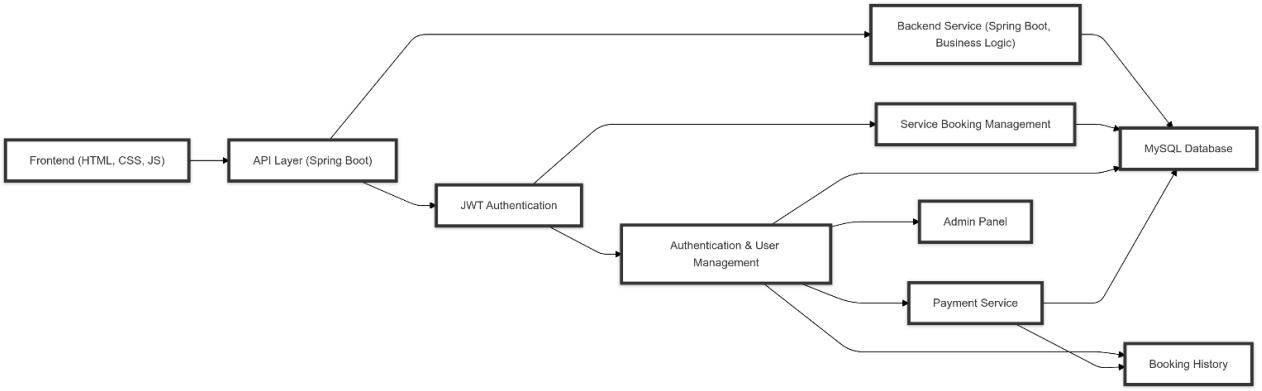
- **Web Servers**: High-performance servers to host the platform and manage user traffic.
- **Database Servers**: Powerful database systems to store user data, service details, and caregiver profiles.
- **Networking**: High-speed internet connection and load balancing systems to handle large traffic volumes.

3.3 Software Requirements

The development of **Sahayak** requires various software tools and technologies to create a robust and efficient platform. These include:

- **Frontend Development**: HTML, CSS, JavaScript, and framework Spring Boot.
- **Backend Development**: Java for server-side applications.
- **Database Management**: MySQL database for user data storage.
- **Payment Gateway Integration**: Razorpay or PayPal for secure transaction processing.

4. Architecture Design



5. Implementation

The following steps were involved in the successful implementation of the platform.

5.1 Frontend Development:

- **Technologies Used**: HTML5, CSS3, JavaScript
- **Key Features Implemented**:
- **Responsive Design**: The layout was designed using CSS and media queries to ensure the site is fully responsive.
- **Accessible Forms**: The booking forms for nurses, assistants, and wheelchair services are designed with large fields and labels, high contrast colors, and clear instructions to make them usable for those with visual impairments or other disabilities.
- **Keyboard Navigation**: Ensured that the website can be fully navigated using only a keyboard for users who cannot use a mouse.

5.2 Backend Development:

- **Technologies Used:** Java, Spring Boot, MySQL, JPA (Java Persistence API), Spring Security.
- **Key Features Implemented:**
- **RESTful API Endpoints:** Spring Boot was used to create RESTful endpoints for user registration, login, service bookings, and profile management.
- **Service Booking Logic:** When a user submits a booking, the backend verifies service availability (based on caregiver or service availability) and processes the request accordingly.
- **User Authentication & Authorization:** Implemented Spring Security to manage user authentication and role-based authorization. Users must log in to book services, and only authenticated users can access their profiles and booking history.
- **Database Interaction:** Using JPA and MySQL, data was persisted to the database for users, bookings, and service availability.

5.3 Security Features:

Security was implemented at multiple levels to protect sensitive user data.

- **Password Encryption**: Passwords are hashed using BCrypt to ensure secure storage.
- **JWT Authentication**: Users must log in via JWT-based authentication before they can access the booking system.
- **Role-based Access Control**: The system uses Spring Security to enforce role-based access control, ensuring that only authorized users can book services or access certain resources.

5.4 Testing and Debugging:

A thorough testing process was conducted to ensure that both the frontend and backend functioned as expected:

- **Unit Testing**: Used JUnit and Mockito for backend unit testing, ensuring that methods in the controller, service, and repository layers worked as expected.
- **Integration Testing**: Ensured that the database interaction (JPA) and service booking logic functioned correctly.
- **Frontend Testing**: Used manual testing and browser developer tools to test the responsiveness and accessibility of the website.

6. Experiment Result and Analysis

6.1 Application Running Status:

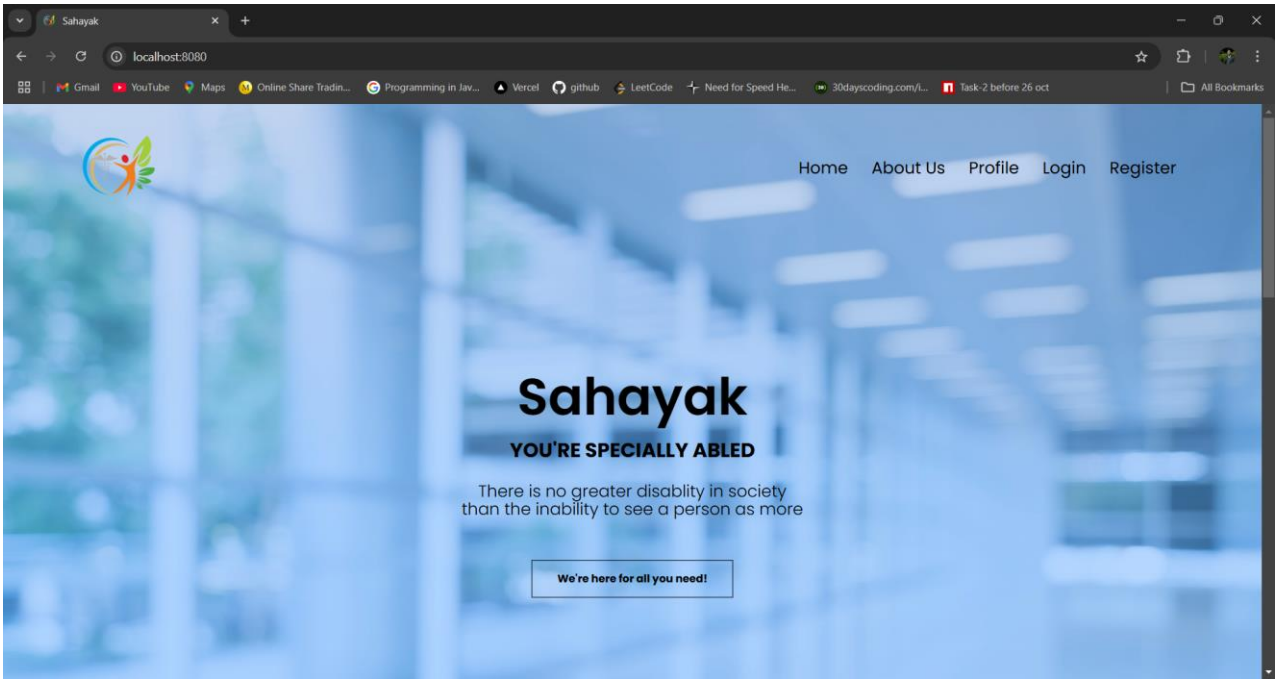
The spring boot application is running successfully by checking the terminal status

```
2024-11-11T01:27:22.549+05:30  INFO 5816 --- [demo] [  restartedMain] com.example.demo.DemoApplication         : Started DemoApplication in 3.345 seconds (process run
ning for 3.757)
2024-11-11T01:27:22.549+05:30 DEBUG 5816 --- [demo] [  restartedMain] o.s.b.a.ApplicationAvailabilityBean      : Application availability state LivenessState changed
to CORRECT
2024-11-11T01:27:22.553+05:30 DEBUG 5816 --- [demo] [  restartedMain] o.s.boot.devtools.restart.Restarter      : Creating new Restarter for thread Thread[#1,main,5,ma
in]
2024-11-11T01:27:22.554+05:30 DEBUG 5816 --- [demo] [  restartedMain] o.s.boot.devtools.restart.Restarter      : Immediately restarting application
2024-11-11T01:27:22.554+05:30 DEBUG 5816 --- [demo] [  restartedMain] o.s.boot.devtools.restart.Restarter      : Starting application com.example.demo.DemoApplication
 with URLs [file:/D:/java%20codes/App%20-%20sahayak/demo/target/classes/]
2024-11-11T01:27:22.554+05:30 DEBUG 5816 --- [demo] [  restartedMain] o.s.b.a.ApplicationAvailabilityBean      : Application availability state ReadinessState changed
 to ACCEPTING_TRAFFIC
```

6.2 Application Accessibility:

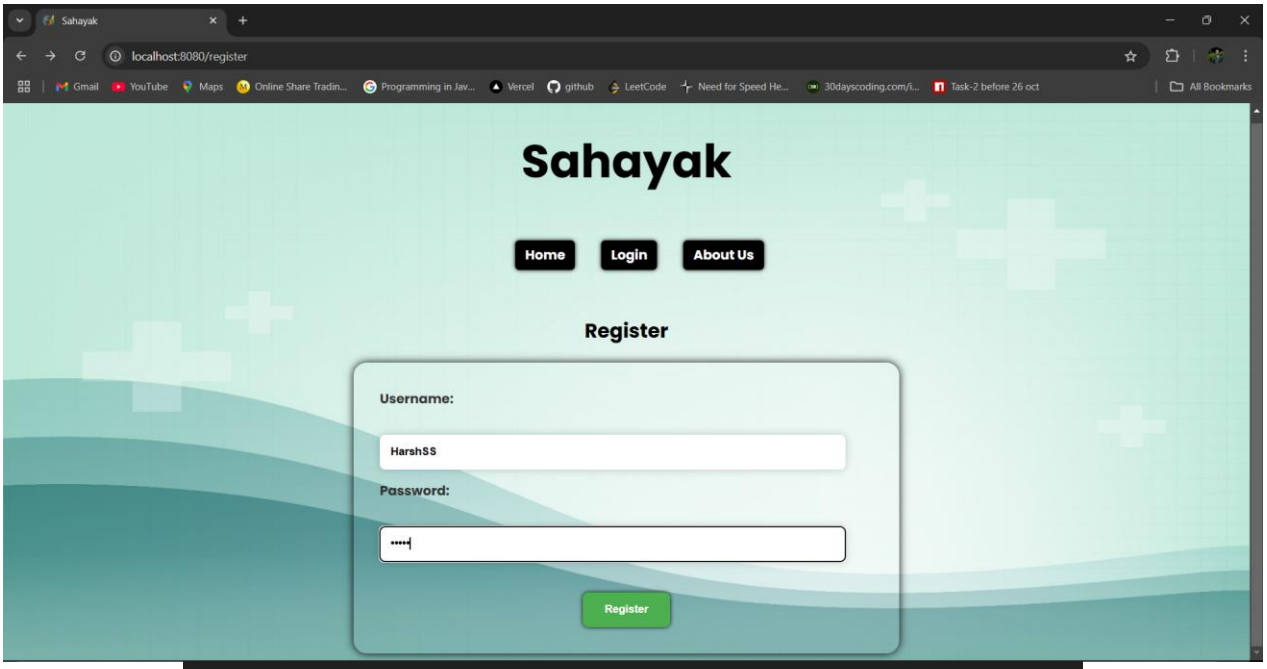
The website was tested on various browsers (Chrome, Firefox, Safari, Edge) and on different devices (desktop, tablet, mobile) to ensure compatibility.

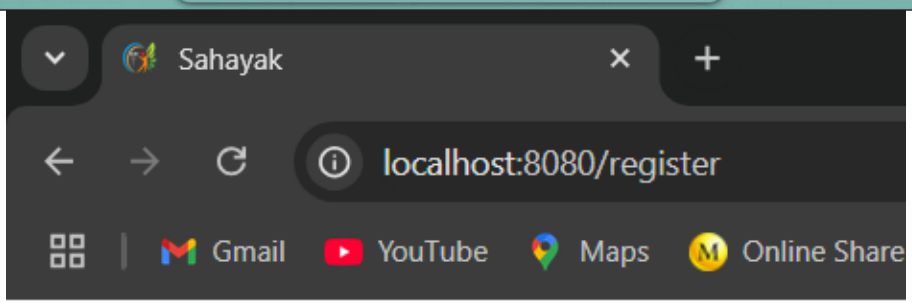
Result: The website worked as expected across all tested browsers and devices. No browser-specific issues were encountered.



6.3 Database Connection:

Database for registration of users and user authentication, profile details and for order history and list of hospitals and services provided.





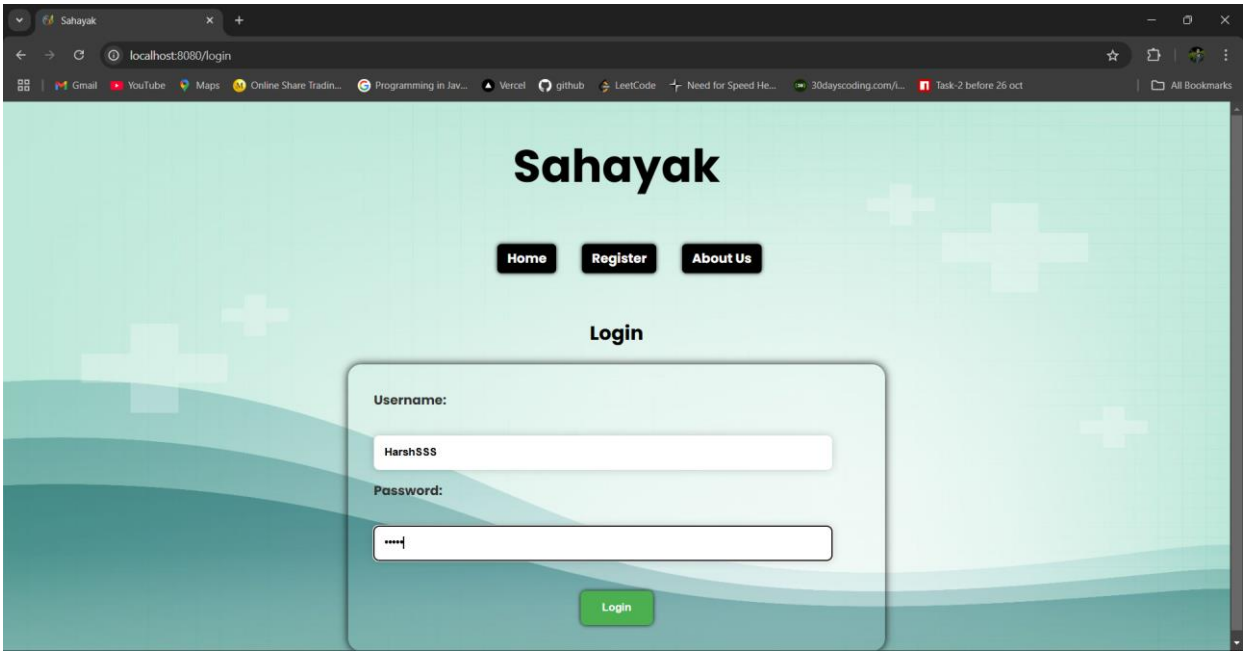
User registered successfully!

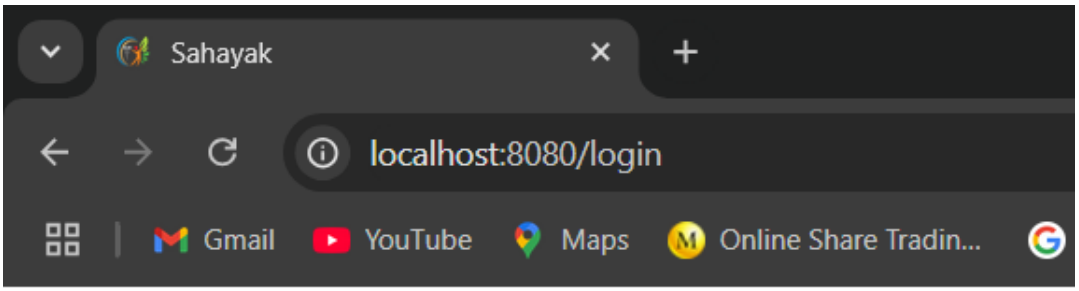
Go back

id	username	password
Filter...	Filter...	Filter...
1	vanshSrivastava	123456
2	Manav	12345
3	Vansh	12345
4	VanshS	1234
5	HarshS	12345
6	HarshSS	12345
7	HarshSSS	12345

6.4 User Authentication:

User authentication ensures that only authorized users can access the features, such as booking services, managing their profiles, or processing payments.





Login successful!

Go back

7. Future Scope

The **future scope** of your healthcare website project can be outlined in terms of adding new features, improving existing functionalities, scaling the application, and enhancing user experience.

Some of them are:

7.1 Integration of Artificial Intelligence:

- **AI-based Health Monitoring and Recommendations:** Implement AI algorithms to analyze user health data and provide personalized health advice, lifestyle recommendations, and preventive care suggestions. This could involve analyzing patient history, wearables data, and behavior patterns.
- **AI-powered Virtual Assistant:** Develop an AI-powered chatbot or virtual assistant to provide 24/7 support for users, answer common medical queries, schedule appointments, and help with booking services.
- **Predictive Analytics for Healthcare Needs:** Use AI and machine learning models to predict future healthcare needs for users, such as identifying high-risk patients, suggesting timely care, or improving service delivery efficiency.

7.2 Mobile Application Development:

- **Cross-Platform Mobile App:** Build a mobile application (iOS and Android) to allow users to access services on-the-go, book caregivers, track appointments, and communicate with healthcare providers through their smartphones.
- **Push Notifications and Alerts:** Integrate push notifications for appointment reminders, health tips, service updates, and payment reminders to keep users engaged and informed.

7.3 Integration with Healthcare Ecosystem:

- **Electronic Health Record (EHR) Integration:** Integrate the platform with Electronic Health Record (EHR) systems to provide healthcare providers with access to real-time, accurate patient information during virtual consultations and care provision.
- **Insurance Integration:** Enable users to check insurance coverage and submit claims directly through the platform. Integrate with health insurance providers to streamline billing and claims processes.
- **Partnerships with Local Clinics and Hospitals:** Expand the platform's reach by partnering with healthcare providers, local clinics, and hospitals to offer a wider range of services (e.g., diagnostics, in-person consultations).

7.4 Voice Assistant Integration:

- **Voice-Activated Booking:** Implement voice assistants like Amazon Alexa, Google Assistant, or Siri to enable users to book services, check appointments, or receive health advice hands-free.
- **Voice Search for Health Tips:** Allow users to query the platform for health tips, service availability, or specific medical information via voice commands.

7.5 Improved Payment and Billing System:

- **Integrated Payment Gateway:** Add additional payment gateways to support multiple currencies and payment methods (credit cards, mobile wallets, etc.), ensuring that users can easily pay for services no matter their location.
- **Subscription Plans:** Introduce subscription models where users can subscribe for long-term care packages (e.g., monthly nurse or assistant services) with added benefits such as discounts or priority booking.

8. Conclusion

In conclusion, this healthcare website project for disabled individuals aims to address a critical gap in the accessibility and availability of healthcare services for people with disabilities. By offering a seamless platform where users can easily book services such as full-time nurses, personal assistants, and wheelchair services, the website enhances the quality of life for those in need of specialized care.

The use of modern technologies such as **Java, HTML, CSS, JavaScript, Spring Boot**, and **MySQL** has ensured that the platform is robust, scalable, and capable of handling the diverse needs of users. Additionally, the integration of an easy-to-navigate user interface and secure backend functionalities provides a user-friendly experience for both healthcare professionals and patients.

Overall, this project lays the foundation for creating an inclusive, accessible, and efficient healthcare solution that can cater to the diverse and evolving needs of people with disabilities. By continuing to innovate and expand the platform's capabilities, it can become a key player in improving healthcare delivery for individuals with special needs, ensuring that they have access to the support they require to lead healthier, more independent lives.

This project is not just about technology; it’s about improving lives, creating an inclusive healthcare environment, and empowering disabled individuals to take control of their health and well-being with dignity and ease.

9. References

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National Institute of Health (NIH)

https://pmc.ncbi.nlm.nih.gov/articles/PMC2690111/