# AAOS Project for ACME Insurance Solutions

420-436-VA: Deliverable 7

#### Team AAOS:

Alexander Cécile (1655919@edu.vaniercollege.qc.ca, tel. 514-984-8350)

Amer Al Jawabra (2205182@edu.vaniercollege.qc.ca, tel. 514-799-9024)

Olivier Leone (2045231@edu.vaniercollege.qc.ca, tel. 450-601-8296)

Saâd Salmane (2256755@edu.vaniercollege.qc.ca, tel. 438-540-5970)

Client contact: John Smith

#### - Antoine de Saint-Exupéry

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# **Executive Overview**

This report provides a detailed analysis of the current business environment for ACME Insurance Solutions, a leading provider in the Canadian life and health insurance sector. It examines the specific operational challenges faced by the company, particularly focusing on the inefficiencies and inaccuracies in its manual claim submission and review processes. These issues have been identified as significant bottlenecks, resulting in delayed claim processing and reduced customer satisfaction. The report underscores the importance of addressing these challenges to enhance time efficiency and resource utilization, thereby improving overall productivity and customer experience. Through a thorough understanding of ACME's requirements, the report outlines the strategic measures necessary to streamline operations and maintain ACME's competitive edge in the industry.

# Summary description of the client, including the final business problem addressed.

Despite its strong market presence and reputation, ACME Insurance Solutions faces a significant challenge with its existing claim processing system. The primary business problem is the inefficiency and error-proneness of the current manual claim submission and review process. This outdated method has led to several critical issues:

**Operational Bottlenecks:** The manual process creates delays, slowing down the overall claim processing time and leading to customer dissatisfaction.

**High Error Rate:** Manual data entry and review are prone to errors, resulting in incorrect claim assessments and potential disputes with clients.

**Resource Drain:** The manual process is labor-intensive, requiring considerable time and effort from the staff, which could be better allocated to more strategic and value-added tasks.

The new system aims to address these challenges by implementing automation and technological advancements to streamline the claim process. The key goals are to:

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**Enhance Efficiency:** Automate repetitive tasks to speed up claim processing and reduce turnaround times.

**Increase Accuracy:** Utilize technology to minimize errors and ensure accurate claim assessments.

**Optimize Resources:** Free up human resources by reducing the need for manual intervention, allowing staff to focus on more critical and strategic functions.

By resolving these issues, ACME Insurance Solutions aims to maintain its competitive edge, improve customer satisfaction, and continue its legacy of providing top-tier insurance services in the Canadian market.

# Revised summary narrative description of the system

The redesigned system for ACME Insurance Solutions is an advanced platform developed to streamline the manual claim submission and review process. This new system integrates modern technology to enhance efficiency, accuracy, and user experience while maintaining human oversight in the claim review process.

# **Key Features**

#### Streamlined Claim Submission

Users can easily submit claims through an intuitive online interface, reducing the time and effort required for manual paperwork.

## **User-Friendly Interface**

The system offers a user-centric design that facilitates easy navigation, allowing users to access account information, submit claims, and receive real-time updates on claim statuses.

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# Roles and Responsibilities

#### User Role

Users, both authenticated and unauthenticated, interact with the system to submit claims, access their account details, and track the progress of their claims.

#### Administrator Role

Administrators manage the system's operations, review submitted claims, approve, or deny claims based on policy criteria, and oversee user management and system performance.

# System Benefits

## Efficiency

The system reduces the time required for claim submission and provides a centralized platform for managing claims, enhancing overall efficiency.

## Accuracy

By reducing manual paperwork and centralizing data, the system minimizes errors associated with manual data entry and processing.

# **Resource Optimization**

The streamlined process allows staff to focus on critical tasks such as claim review and decision-making, improving productivity and service quality.

This redesigned system reflects ACME Insurance Solutions' dedication to improving operational efficiency and customer satisfaction through technological advancements, while ensuring that the critical task of claim review remains under expert human oversight.

# Client comments

## Client's Positive Feedback

# **Efficiency Boost**

"The streamlined claim submission process has notably accelerated our service delivery, resulting in heightened client satisfaction."

#### Intuitive Interface

"Users and staff alike find the system's interface remarkably user-friendly, reducing training time and increasing productivity."

#### **Precision in Processing**

"With fewer errors detected post-implementation, our confidence in the system's accuracy has significantly improved, leading to smoother claim assessments."

#### Fortified Security Measures

"We commend the system's robust security features, such as multi-factor authentication and data encryption, ensuring our clients' data remains safeguarded."

### **Optimized Resource Allocation**

"By automating mundane tasks, our team can now dedicate more time to strategic endeavors, fostering a more efficient and motivated workforce."

# Client's Areas for Improvement

## **Initial Deployment Hurdles**

"The setup and transition phase presented notable challenges, requiring considerable time and resources for staff training."

#### **Customization Limitations**

"While functional, the system lacks certain customization options, hindering our ability to tailor features to our specific requirements."

#### Occasional Downtime Concerns

"We've experienced intermittent system downtimes, disrupting our workflow. Ensuring consistent uptime would be advantageous for uninterrupted operations."

# **Design and Implementation Decisions**

In the development of the system for ACME Insurance Solutions, several critical decisions were made regarding both the design and implementation, focusing on functionality, aesthetics, and the chosen programming environment of PHP alongside HTML and CSS.

# Visual Design Decisions and Consistency with Client Preferences

We prioritized aligning the visual design of the system with the preferences outlined by the client. This involved incorporating design elements provided by the client and ensuring that the overall aesthetic matched their vision for the system.

# **Responsive Design**

Recognizing the importance of accessibility across devices, we implemented a responsive design approach using HTML and CSS. This decision ensures that the system is optimized for various screen sizes, providing users with a seamless experience across desktop, tablet, and mobile devices.

### Visual Coherence with HTML/CSS

Leveraging the capabilities of HTML and CSS, we focused on creating a visually cohesive interface that enhances user engagement and promotes ease of navigation. This involved employing consistent color schemes, typography, and layout principles to maintain a unified design language throughout the system.

# Software Design Decisions and Functionality Alignment

The design and implementation of system functionality were closely aligned with the client's requirements and objectives. Using PHP, we developed robust backend logic to handle critical operations such as claim submission, processing, and user management, ensuring that the system delivers its intended functionalities effectively.

# **Database Integration**

PHP was used alongside HTML and CSS to integrate seamlessly with the MySQL database, facilitating efficient data storage and retrieval processes. This decision enables the system to manage and manipulate data dynamically, supporting real-time updates and interactions for users and administrators.

# **Security Measures**

Security considerations were paramount in the design and implementation of the system. We implemented robust security measures within the PHP codebase to prevent common vulnerabilities such as SQL injection, ensuring the confidentiality, integrity, and availability of sensitive client information.

# Scalability and Maintainability

With PHP as the primary programming language, we adopted scalable and maintainable coding practices to support future enhancements and modifications to the system. This includes modularizing code components, adhering to coding standards, and documenting key functionalities to facilitate ongoing development and maintenance efforts.

In summary, the design and implementation decisions made for the system leveraged the capabilities of PHP, HTML, and CSS to deliver a visually appealing, functional, and secure solution that meets the client's requirements while ensuring scalability and maintainability for future growth.

# Description of current security measures

In the development of the system for ACME Insurance Solutions, stringent security measures were implemented to protect against common vulnerabilities, including SQL injection attacks. The following are key security measures in place to safeguard sensitive data and ensure the integrity of the system:

# **Prepared Statements**

Prepared statements were extensively utilized throughout the PHP codebase to execute SQL queries safely. By separating SQL logic from user input, prepared statements prevent malicious SQL injection attempts by treating user input as data rather than executable code.

# Parameterized Queries

Parameterized queries were employed when interacting with the MySQL database. This approach involves passing parameters separately from the SQL query, ensuring that user input is properly sanitized and preventing attackers from injecting malicious SQL code.

# **Input Validation**

Comprehensive input validation mechanisms were implemented to validate user input before processing it in PHP scripts. This includes sanitizing and validating input data to ensure it conforms to expected formats and does not contain potentially harmful characters or SQL commands.

# **Escape Characters**

Escape characters were utilized to mitigate the risk of SQL injection by escaping special characters in user input before incorporating them into SQL queries. This prevents attackers from manipulating SQL queries to execute arbitrary commands or extract sensitive information from the database.

# **Database User Privileges**

The principle of least privilege was applied when configuring database user accounts. Each user account was granted only the necessary privileges required for its intended functionality, reducing the potential impact of a successful SQL injection attack.

These security measures collectively serve to protect the system against SQL injection attacks by ensuring that user input is properly sanitized, validated, and processed in a secure manner. By adopting a proactive approach to security, ACME Insurance Solutions can effectively mitigate the risk of data breaches and unauthorized access to sensitive information, safeguarding the confidentiality and integrity of client data.

# **Future work**

# User interface improvements

- Responsive Design: Ensure all pages are fully responsive and provide a seamless experience on mobile devices.
- Intuitive Navigation: Improve the navigation menu to be more user-friendly and accessible.
- Consistent Styling: Apply a consistent styling across all pages, using a modern color palette and clean design elements.
- Interactive Elements: Add interactive elements such as tooltips, modals, and loading indicators to enhance user engagement.
- Accessibility: Implement accessibility features such as ARIA labels, high-contrast themes, and keyboard navigation support.

# Unimplemented user stories and functions

- Developing a payment generation system for approved claims.
- Implementing categorization and assignment features for claim processing.
- Providing a detailed claim view with interaction history and audit results.
- Creating a secure archiving system for historical claims data.
- Building self-service tools for customers to track claim progress and upload documents.
- Conducting user satisfaction surveys.
- Implementing role-based access controls.
- Enabling timely updates and alerts for users.
- Adding options for policy endorsements, automatic payments, and discount notifications.

# Recommendations regarding future security measures to be taken

- Data Encryption: Implement encryption for sensitive data both in transit and at rest.
- Regular Security Audits: Conduct regular security audits and vulnerability assessments to identify and mitigate potential threats.
- Access Controls: Implement role-based access controls (RBAC) to restrict access to sensitive data based on user roles.

• Data Backup: Establish a robust data backup and recovery plan to prevent data loss in case of system failures or cyber-attacks.

# Recommendations regarding unit and integration test strategies to be used

- Unit Testing: Write comprehensive unit tests for all critical components and functions to ensure they work as expected in isolation.
- Integration Testing: Develop integration tests to verify that different modules and components interact correctly and that data flows seamlessly through the system.
- Automated Testing: Utilize automated testing tools to run tests frequently and efficiently, ensuring that new changes do not introduce regressions.
- Continuous Integration: Implement a continuous integration (CI) pipeline to automatically run tests and deploy code changes to staging environments for further testing.
- User Acceptance Testing: Conduct user acceptance testing (UAT) with actual users to validate that the system meets their needs and requirements before final deployment.

"Il semble que la perfection soit atteinte non quand il n'y a plus rien à ajouter, mais quand il n'y a plus rien à retrancher"

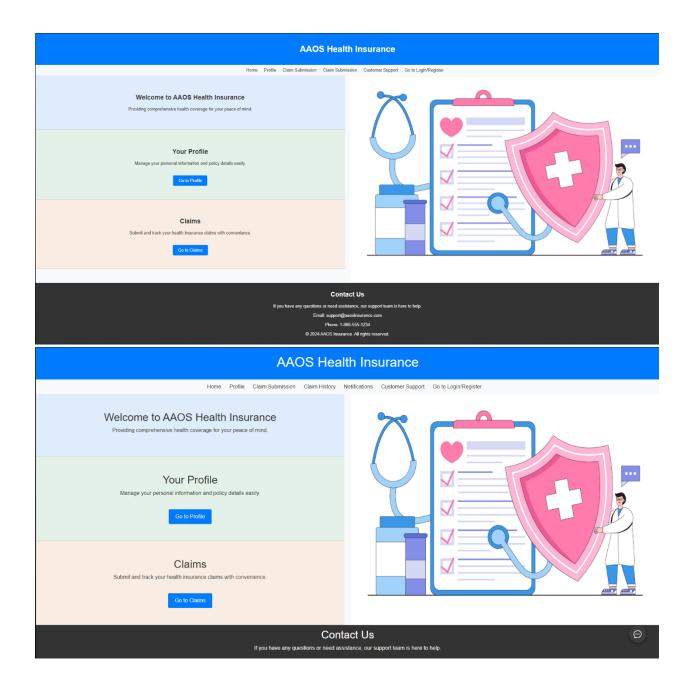
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	Manage Claim				Manage User Profile		
Claim Review	View Claim	Admin login	User login	Payment Generation	Search User profile information	Claim Submission	
^ RELEASEL							
Claim Approval/Denial	Claim Tracking		Access Customer Support	Generate receipt	Claim History	receive notifications	
	Claim Categorization				Claim Status Updates		
	Claim Assignment						
^ RELEASEZ							
Additional Information Request	Claim Processing audit		Help documentation Access		View/Sort Submitted Claims		
	Claim Analysis				Password reset		

# Appendix 1

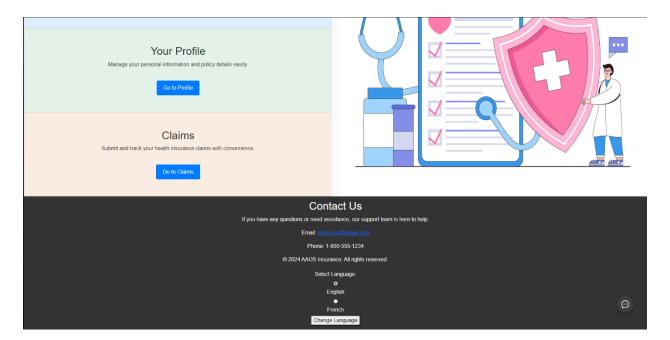
Home Page

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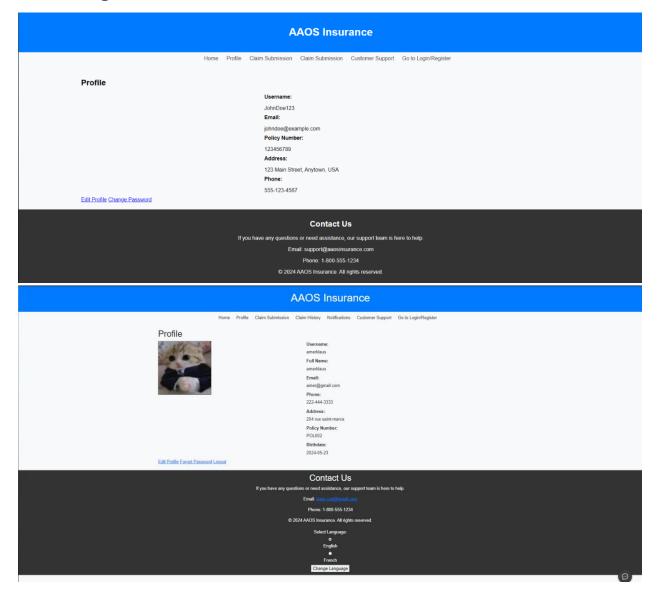
- Antoine de Saint-Exupéry



## Changes:

For the home page, the design remains the same, only thing that was added was the option to translate the page to French or English language.

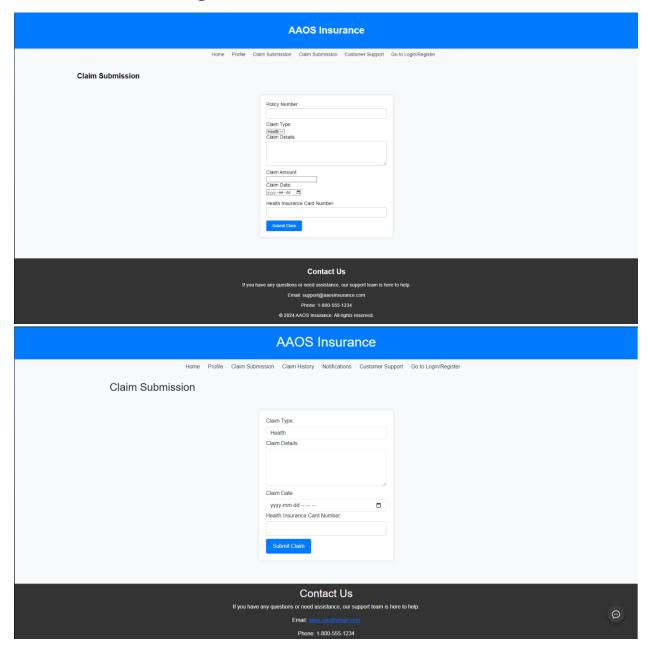
# Profile Page



#### Changes:

For the profile page, the design remains the same, only thing that changed was the addition of the logout button so the user can logout, and the ability to translate the page to French or English.

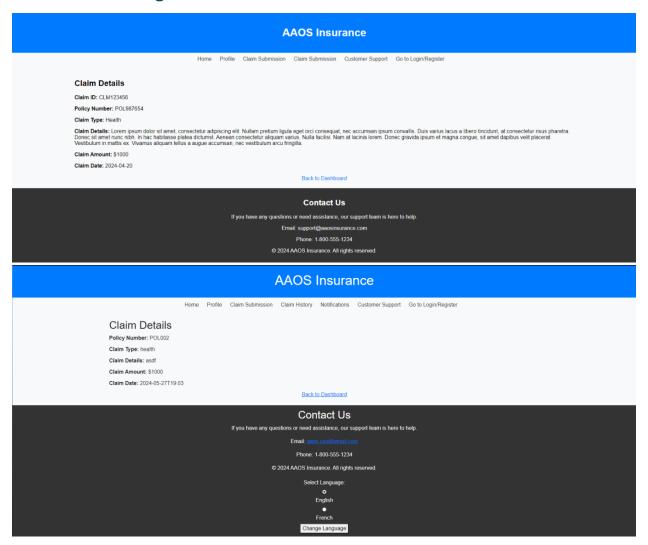
# Claim Submission Page



#### Changes:

For the Claim Submission page, the design was improved by removing the policy number and amount, we decided to integrate the policy number through the profile and amount ourselves so that the user can have an easier and more user-friendly experience when submitting a claim. Of course, the ability to translate to French or English was also added, I will not show it since the footer is the same across all pages.

# Claim Details Page



#### Changes:

For the Claim Details page, as you can probably see we removed it from the navigation menu and added it to appear once the user submits a claim. We did this because it makes more sense to show the details of the claim that is more recently submitted rather than having the user go over the details of one claim, we added a Claim History page instead for listing all Claims the user has submitted.

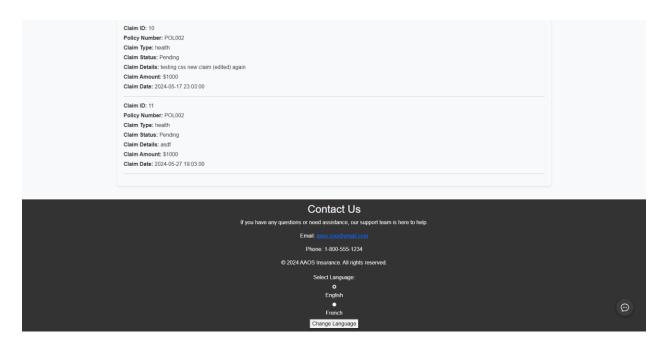
# Claim History Page

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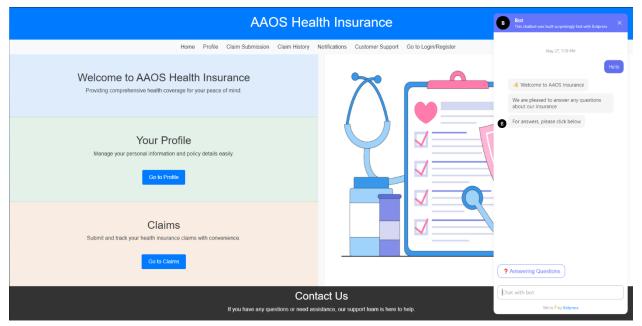
- Antoine de Saint-Exupéry



This page was made to list all Claims the user has submitted in the past with all the details.

All the other pages look the same in terms of the user-interface designed implementation. There are new pages that have been added that we will present in Appendix 3.

# Appendix 3

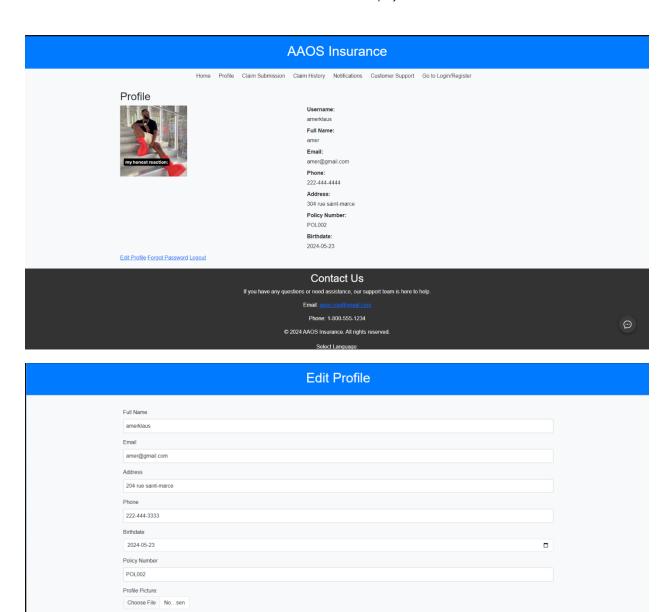


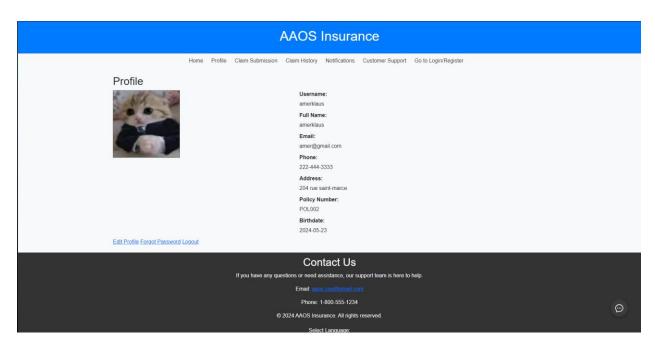
As a user, I want to have access to a virtual assistant or FAQ bot that can provide instant answers to common insurance-related queries.

As an admin, I want to integrate AI-powered chatbots to assist users with frequently asked questions and reduce the workload on customer support staff.

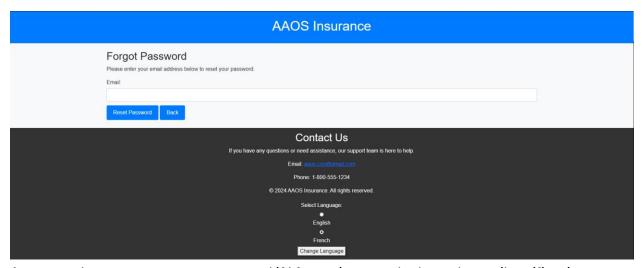
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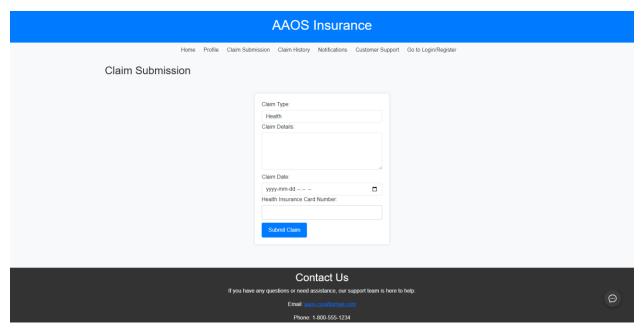


As a user, I want to update my profile information if needed, such as contact details or address.

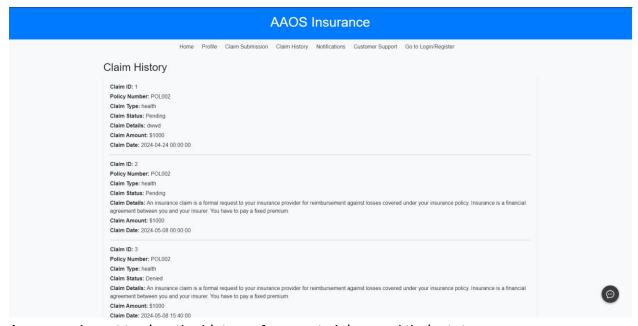


As a user, I want to reset my password if I forget it securely through email verification.

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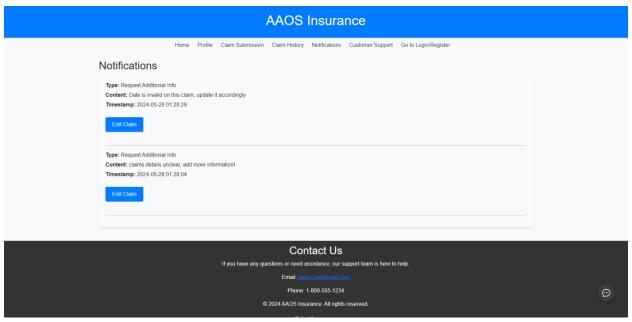


As a user, I want to submit claim documents easily through the web application.

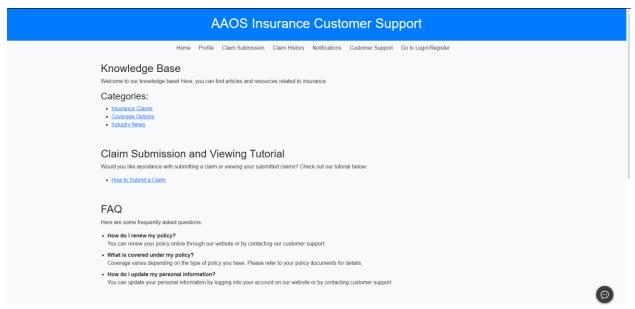


As a user, I want to view the history of my past claims and their statuses.

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As a user, I want to receive notifications about important updates or changes in the system, such as policy revisions or system maintenance.



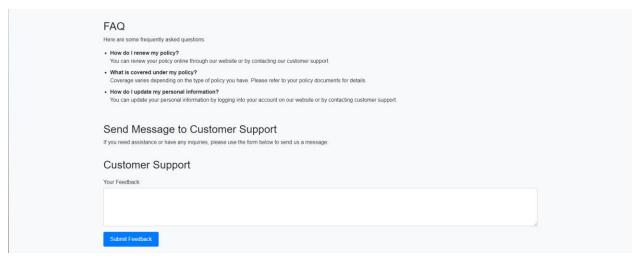
As a user, I want to access help documentation or tutorials to understand how to use the system effectively, including FAQs and user guides.

As a user, I want to have access to a user-friendly interface that guides me through the claim's submission process step-by-step

As a user, I want to have access to a knowledge base of articles and resources related to insurance claims, coverage options, and industry news.

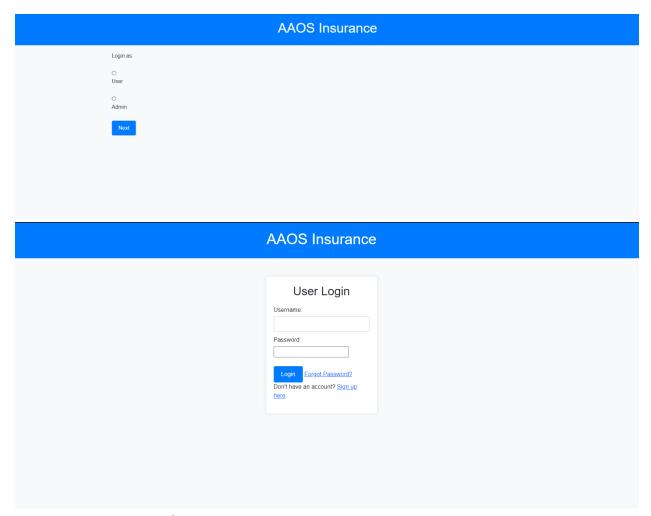
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As an admin, I want to streamline the process of onboarding new claimants by providing pre-filled forms and guided submission instructions.

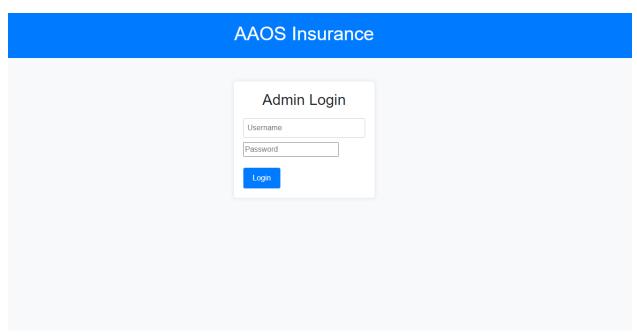


As a user, I want to be able to submit feedback or complaints regarding my claims experience directly through the web application.

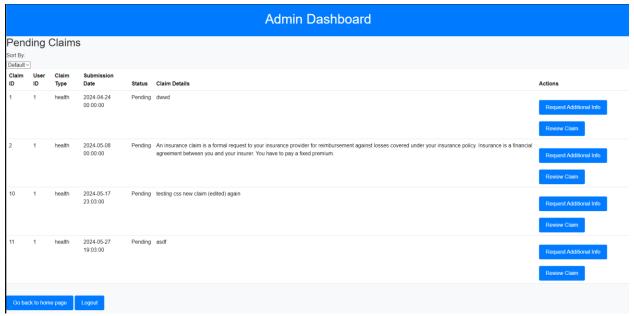
As a user, I want to be able to contact customer support for assistance with my claim through ticket support on the website.



As a user, I want to log in securely to access the system.



As an admin, I want to be able to log in securely to the system.

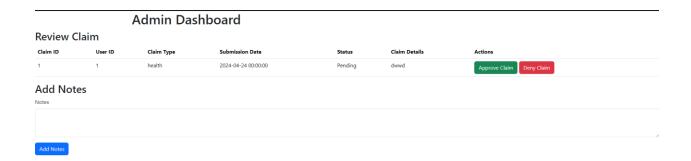


As an admin, I want to categorize claims based on urgency and priority for streamlined processing.

As an admin, I want to track the status of each claim in real-time to ensure timely resolution.

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As an admin, I want to review submitted claim documents for completeness and accuracy.

As an admin, I want to have the ability to approve or deny claims based on policy criteria.

As an admin, I want to automate routine tasks in claim processing, such as data entry or document verification, to improve efficiency.

Request Additional Information						
	Enter Missing Information:					
	Submit					

As an admin, I want to request additional information from customers if necessary.