**Project Report: SomGas Project**

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**Completion Date:** [January 7, 2025]

**Introduction**

The SomGas Project is a web-based application developed to streamline and digitize the management of gas distribution for organizations and institutions. The system aims to provide a secure, transparent, and efficient method for tracking gas supply and consumption. By leveraging modern web technologies, it addresses issues like manual inventory tracking, supply inconsistencies, and lack of real-time data.

**System Description**

**Features:**

* **User Authentication:** Secure login for customers and administrators.
* **Inventory Management:** Admins can add, update, or remove gas inventory.
* **Order Module:** Customers can place orders securely.
* **Real-Time Tracking:** Display of live gas supply and consumption data.
* **Audit Logs:** Record of all actions for transparency.

**Technologies Used:**

* **Framework:** ASP.NET Core MVC
* **Programming Language:** C#, HTML, CSS, JavaScript
* **Database:** SQL Server
* **Hosting Environment:** IIS or Cloud Hosting (e.g., Azure, AWS)

**Architecture:**  
The system uses the Model-View-Controller (MVC) architecture to separate concerns, ensuring maintainability and scalability.

**Development Process**

**Design Phase:**

* **Requirement Gathering:** Identified user needs through interviews and surveys.
* **Wireframes and Mockups:** Created initial design layouts for user feedback.

**Implementation Phase:**

* Developed a secure login system using ASP.NET Identity.
* Designed a user-friendly interface for both admins and customers.
* Implemented database models to handle inventory and customer order data.

**Testing Phase:**

* Conducted unit tests on core functionalities (e.g., authentication, inventory management).
* Performed integration tests to ensure all components work together seamlessly.
* Organized a mock supply chain simulation to test real-world performance and gather feedback.

**Deployment Phase:**

* Deployed the system on a staging server for final validation.
* Migrated to the production environment upon successful testing.

**Outcome**

The SomGas Project met the project objectives by providing:

* A secure platform for customers to manage orders.
* Accurate and real-time tracking of gas inventory and distribution.
* An intuitive admin interface for managing the supply chain.

The system was successfully deployed and received positive feedback from users for its simplicity and reliability.

**Challenges and Solutions**

* **Challenge:** Ensuring secure order placement to prevent fraud.  
  **Solution:** Implemented encryption for order data and secure authentication mechanisms.
* **Challenge:** Real-time inventory updates under high server load.  
  **Solution:** Optimized database queries and leveraged caching techniques.

**Conclusion**

This project achieved its goals of digitizing gas management processes and providing a robust, scalable solution. Future enhancements could include:

* Integration of IoT sensors for automated inventory tracking.
* Multi-language support for wider accessibility.
* Mobile application development for on-the-go management.

**References**

* Official ASP.NET Core Documentation: <https://learn.microsoft.com/en-us/aspnet/core/>
* SQL Server Tutorials: <https://docs.microsoft.com/en-us/sql/>
* Feedback from supply chain simulation participants.

**Appendices**

* Screenshots of the application.
* Sample database schema.
* User feedback summary.