CHATBOT TRANSMILENIO

Representation, Sensitivity, and Emergence

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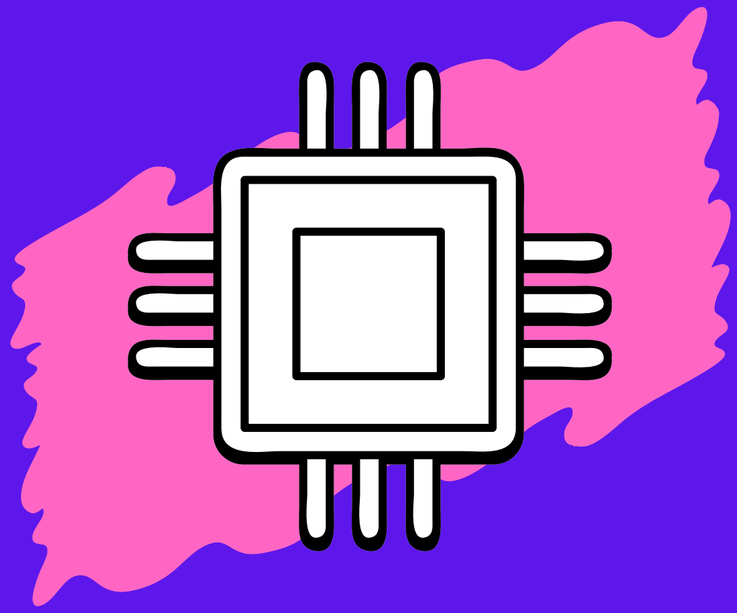
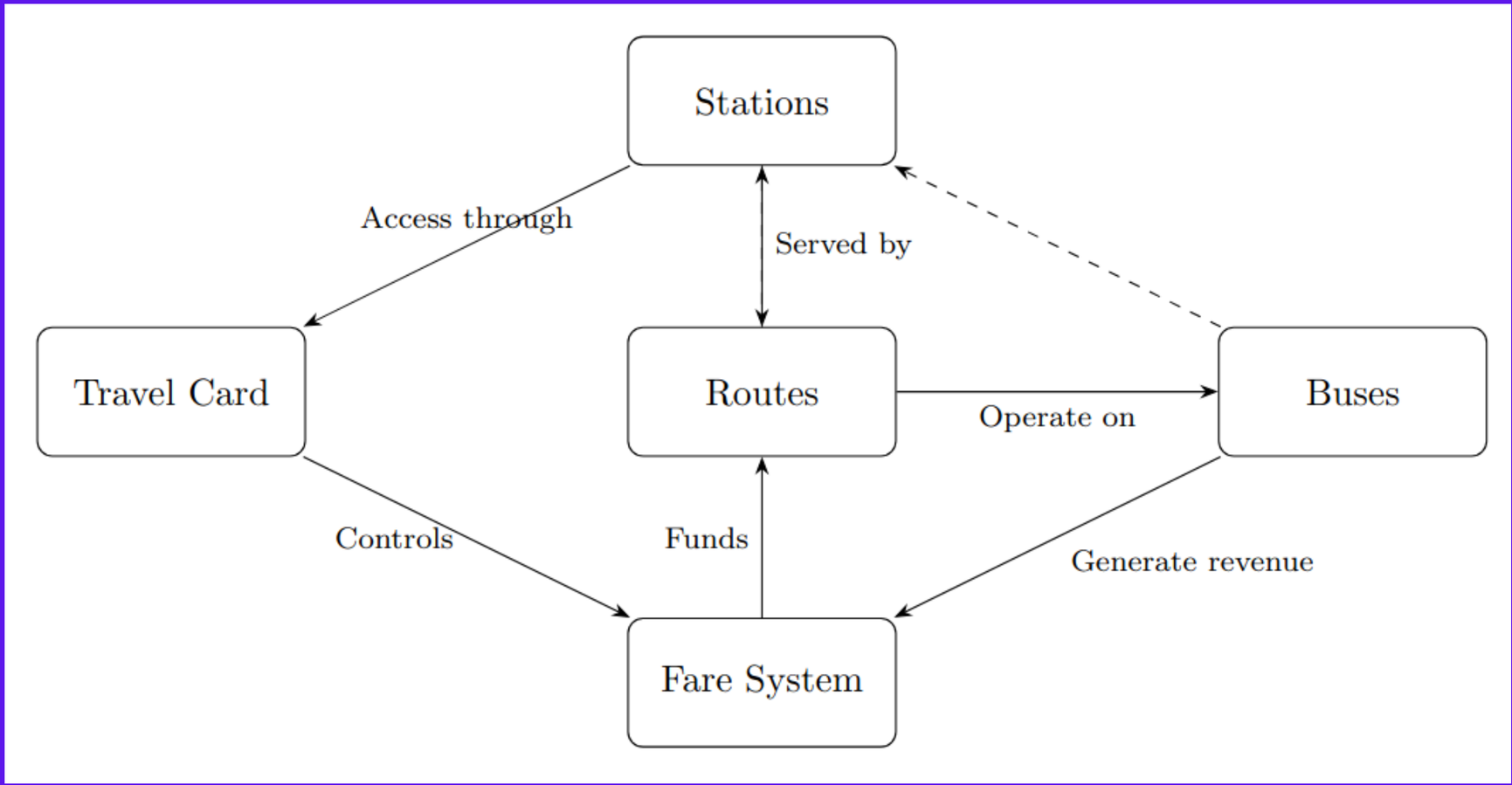
Topics

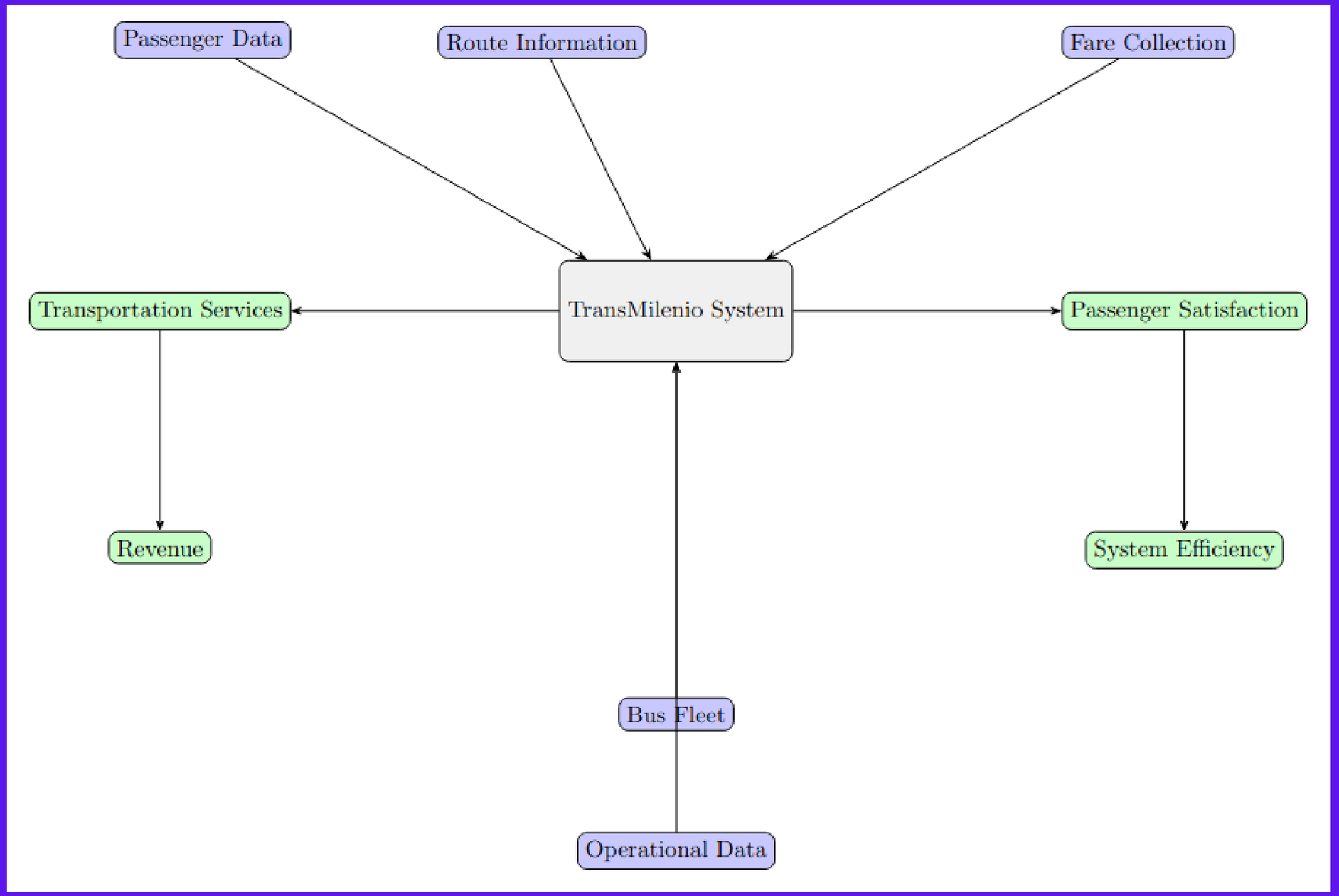
1. General Representation of Systems
2. System Sensitivity Analysis
3. System Complexity Analysis
4. Emergent Behaviors



General Representation of the system

SYSTEM COMPONENTS AND THEIR RELATIONS





Outputs

Inputs

The 95% of revenues are for private enterprises.

System Sensitivity Analysis

CRITICAL PARAMETERS

- **Bus Frequency:** How variations in frequency affect availability and wait times.
- **Passenger Demand:** Fluctuations in the number of passengers during different times (peak hours vs. off-peak hours).
- **Traffic Conditions:** The impact of traffic congestion on travel times.
- **Bus Capacity:** How the number of seats and passenger overload affect user experience.
- **Operational Costs:** Changes in fuel, maintenance, and personnel costs.
- **Fare Evasion:** The presence of passengers who enter the system without paying the fare, impacting both capacity and revenue.

BUS FREQUENCY

Implement dynamic adjustments in bus frequency..

IMPROVE INFRASTRUCTURE

Invest in infrastructure improvements to reduce congestion.

STRATEGIES

There is a need to ensure user privacy, especially if personal data is collected to enhance service or for personalization.

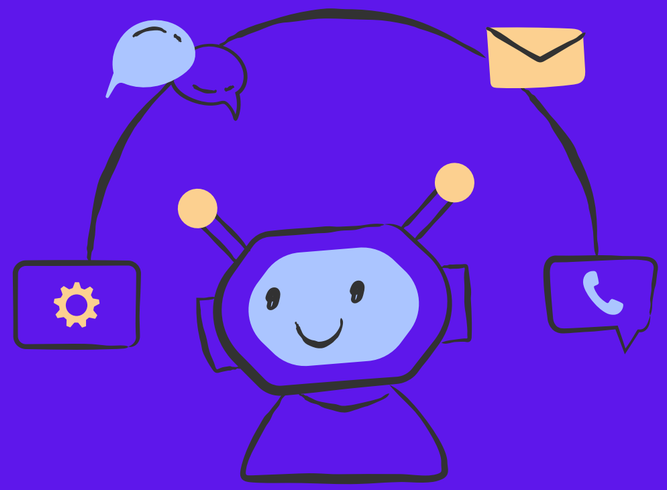
System Complexity Analysis

SYSTEM COMPONENTS

- **Users:** Diverse profiles (students, workers, tourists) with varying needs and levels of knowledge about the transportation system.
- **Database**: Information about routes, schedules, fares, and services that must be updated in real-time.
- **User Interface:** A design that must be intuitive and accessible for all users.
- **Integration with Other Systems:** The chatbot may need to access other systems, such as real-time bus information, to provide accurate responses.

INTERACTIONS

- Interactions between the chatbot and users can be varied and complex, as users may ask questions in multiple ways.
- The system must be capable of understanding natural language and responding effectively, requiring natural language processing (NLP).



VARIABILITY AND ADAPTABILITY

- The chatbot must adapt to changes in routes, fares, or any other aspect of the transportation system, implying a flexible structure to manage frequent updates.
- It can also learn from past interactions to improve its responses and recommendations.

SYSTEM LOAD

During peak hours, the chatbot may face high demand for inquiries, requiring efficient load management and possibly the implementation of queues for users.

PRIVACY AND SECURITY

There is a need to ensure user privacy, especially if personal data is collected to enhance service or for personalization.

Emergent Behaviors

USAGE PATTERNS

As the chatbot is used, patterns in frequently asked questions may emerge. This can lead to adjustments in the database to address common user needs, such as improving responses or adding new features.

USAGE SATISFACTION

Continuous interaction with the chatbot may reveal emergent behaviors regarding user satisfaction. If the chatbot responds effectively, it can foster more frequent use and trust in the transportation system.

COLLABORATION AMONG USERS

Users may begin to share information about their experiences with the chatbot, potentially creating a community that collaborates to inform about delays or unavailable services, improving real-time information

CONTINUOUS IMPROVEMENT

Over time, the chatbot can adapt and evolve based on user feedback, enhancing not only its responsiveness but also its knowledge of the transportation system, resulting in an emergent behavior of self-improvement.

GRACIAS