

COS 214 PRAC 6



Group members:

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Functional requirements:

1. Buildings:

- 1.1. Build different types of buildings as listed below:
 - 1.1.1. Residential
 - 1.1.2. Commercial
 - 1.1.3. Industrial
 - 1.1.4. Landmarks
- 1.2. Every building has different attributes and differ in their utilization.
 - 1.2.1. Buildings can be improved which will result in increase of citizen satisfaction.
- 1.3. Buildings can be destructed.
- 1.4. You can calculate the citizen satisfaction of a building.
- 1.5. Building has impact on economy and economic growth as listed below:
 - 1.5.1. Citizens will pay monthly rent.
- 1.6. Buildings get provided utilities.

2. Utilities:

- 2.1. Build different utilities as listed below:
 - 2.1.1. Power plants
 - 2.1.2. Water supply
 - 2.1.3. Waste management
 - 2.1.4. Sewage systems
- 2.2. Utilities will be provided to the different buildings.
- 2.3. Utilities can affect buildings, which can affect citizen satisfaction.

3. Transportation:

- 3.1. Different types of transportation are used as listed below:
 - 3.1.1. Public
 - 3.1.2. Trains

- 3.1.3. Airports
- 3.1.4. Cars
- 3.2. For each of the transport types, there is a seating capacity.
- 3.3. Roads, railways and runways can do the following:
 - 3.3.1. Have different commute times.
 - 3.3.2. Connect the different parts of the city.

4. Citizens

- 4.1.1. Citizens can have jobs, income and property.
- 4.2. Create and destroy citizens. (For legal reasons, we are not murdering them 😊)
- 4.3. Citizen satisfaction will be influenced by different factors:
 - 4.3.1. Taxes
 - 4.3.2. Buildings, thus also utilities and resources.
 - 4.3.3. Transport commute time
- 4.4. Citizens should respond to the following:
 - 4.4.1. Government policies (law).
 - 4.4.2. Economic changes (new buildings, jobs and different tax rates).
 - 4.4.3. Infrastructural development (new buildings and utilities).

5. Government

- 5.1. Oversee the different aspects of taxes
 - 5.1.1. Collection of taxes.
 - 5.1.2. Allocation of taxes.
 - 5.1.3. Tax rates.
- 5.2. Oversee the city budget, this includes the following:
 - 5.2.1. Allocating budget to improve landmarks, education, buildings, security, services and utilities.
 - 5.2.2. City projects – like a cancer awareness campaign.
- 5.3. Oversee the policies of the city.

5.3.1. The laws and regulations of the city.

5.3.1.1. Examples are, having industrial zone away from the residential areas

5.4. Oversee the public services of the city.

5.5. Government will have an impact on citizen satisfaction.

5.6. The government can impact economic growth and city development (mentioned before).

6. Resources

6.1. Different types of resources will be available as listed below:

6.1.1. Energy to provide to power plants.

6.1.2. Water to provide to water systems.

6.1.3. Budget (control handed over to government).

6.2. Resources will be supplied to utilities and buildings.

6.3. Enable city expansion on the availability of resources.

7. Taxes

7.1. Control of taxes is handled by the government.

7.2. Includes tax rates, collection of taxes, allocation of taxes and the impact taxes have.

7.3. Citizen satisfaction and the economy is affected by taxes.

8. City growth

8.1. City growth is influenced by:

8.1.1. Population growth.

8.1.1.1. Birth rates and economic opportunities.

8.1.2. Housing needs.

8.1.2.1. Driven by population growth.

8.1.2.2. Expansion of the number of buildings.

8.1.3. Economic development.

8.1.3.1. Increase in the city budget.

8.1.3.2. Also influenced by population growth.

8.1.4. Infrastructure development.

8.1.4.1. Based on population growth and economic development.

8.1.4.2. Expansion of the number of landmarks, industrial buildings and commercial buildings, which will provide more jobs.

Design patterns:

1. Façade

- Overview of whole system, especially city growth.

2. Singleton

- Resources and resource management.

3. Visitor

- Taxes and citizen satisfaction

4. Factory method

- Buildings, utilities and transportation infrastructure.

5. Observer

- Population growth
- 6. Prototype
 - Building cloning
- 7. Command
 - Taxes
- 8. Chain of responsibility
 - City growth
- 9. Strategy
 - Transport
- 10. Composite
 - Government

References

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Slides

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