Example of a Sustainability Requirement Pattern:

**Incentivizing Minimal Resource Consumption**

**Summary**

Pattern Domain:
This pattern can be used for various types of resources within several different domains such as, packaging in e-commerce systems, water use in personal home resources tracking systems, and so on. The domain of a hotel management system that tracks a guest’s resource consumption is used where applicable.

Frequency:
This pattern can be used to create an unlimited number of requirements.

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**Applicability**

This pattern should be used to specify a way in which a system should incentivize users to reduce their resource consumption, mainly by influencing user behavior. This pattern should not be used to communicate a user’s resource consumption. Although communication can be a form of incentive, the “communicating resource consumption pattern” should be used instead.

This pattern is meant to address the problem of consumers who are overly wasteful because there are no direct or immediate benefits associated with reducing their resource consumption.

One motivation behind this pattern is that incentivizing users to reduce their resource consumption will frequently reduce business costs. For instance, the cost of water associated with washing towels in a hotel could be lowered if guests were encouraged to reuse their towels during their stay.

**Content**

Requirements derived from this pattern may contain one or more of the following:

1. The resource(s) consumption that should be reduced. For example, energy, packaging materials, water, gas, towels, etc.
2. In what way the system shall incentivize the user, to reduce resource consumption. See the discussion section for ideas on incentivizing.
3. Motivation behind why the desired behavior is important to the system, the user, or the environment.
4. When incentives should be used within the system. The following should be considered:
5. How incentives should be used within the system. The following should be considered:

**Archetype**

Here we provide a generalized requirement from which more detailed instances can be derived and tailored.

“The system shall provide a form of incentive to encourage the user to reduce their resource consumption.”

**Examples**

- The system shall provide a list of incentives to the user.
- The system shall allow users to accumulate incentive points over time.
The system shall allow users to redeem points for rewards.
The system shall allow competition among users.
The system shall provide sustainable living tips upon request.

Discussion

One way to incentivize users is through the use of a points system. This allows users to redeem awards from the points when they reach a given benchmark. In addition, it allows the developers and stakeholders to set a benchmark for how much of a reduction in resource consumption a user must achieve to start receiving points and to continue receiving points. Another way would be to have users compete against other users for minimal consumption of each resource.

The following are some of the ways to incentivize users: provide a sustainability score to each user, provide points and rewards, provide a list of incentives, provide a list of sustainable living tips related to each resource to educate user’s about the benefits and ways of a sustainable lifestyle, allow guests to set limits on their resource consumption, allow users to set personal goals, alert users when a particular resource usage passes a set benchmark, allow users to view their progress towards a specific reward, allow users to share resource consumption on media sites such as Facebook, and have user’s compete against each other for rewards/points, this can be made into a game.

In some instances, these requirements may require the business to spend time explaining a new system to users or in extreme cases they may even reduce the profit a business makes. Although the authors believe these to be negligible consequences in the long run, the stakeholders should be consulted to ensure that it is not an unrecoverable or critical loss. Stakeholders may be encouraged to accept the potential profit reduction by understanding the extent of the resulting environmental benefits, or by the prospect of increased revenue from green business advertisement.

Related Patterns

- Communicating Resource Consumption
- Tracking Resource Consumption