Gamification as a Collaborative Approach for Shaping Space Governance

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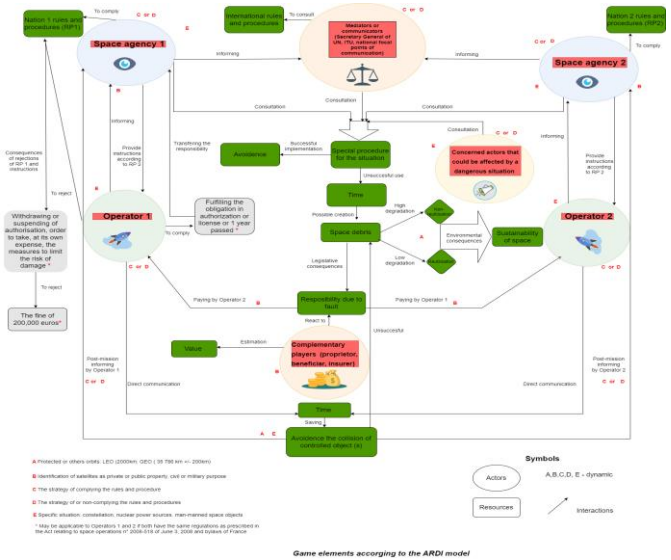
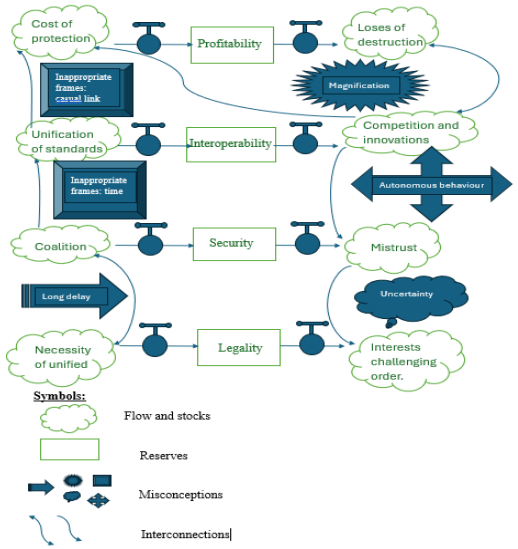


Game elements accorging to the ARDI model



How the game can change the law

- **The law is abstractive reflection of the current experience and further expectations, but they are close to reality and complex.**
- **The game is also an abstraction allowing by simplification of reality.**
- **By drawing on space law and game rules, we can more comprehensively observe and understand the interactions between actors and conditions. Analyzing these interactions at varying levels of abstraction not only provides deeper insights into their dynamics but also helps to propose updates.**

The aim is to examine the interaction of game structure and functionality with the actual chain of action of managing space activity through current and perspective law.

What we gain in and out the game?

In the game (for the players):

- ✓**To collect more capital - «*Astracoins*» .**
- ✓**To provide more services for the customers.**
- ✓**To ensure the best functionality of the satellite**

Out of the game (for the model of interaction in space activity through the game):

Mitigating misunderstandings in uncertain communication scenarios by creating standardized behavioral algorithms for cases with multiple variables.

Learning the legal and policy frameworks to improve communication during rendezvous, maneuvering, and other activities related to space debris mitigation.

Developing mediation skills, eliminating cognitive biases caused by emotional factors and unclear communication, and enhancing the ability to quickly and accurately assess risks.

Identifying the limits of existing laws and testing new best practices to resolve emerging issues.

Alignment of game mechanics with game objectives

Game mechanics

GM 1 Players have 5 minutes on the hourglass to solve each challenge.

GM2 Division of regions.

GM3 Lack of the information about purpose of satellite.

GM4 Introduction about the basic rules of the game and communication to precise current regulation.

Target

T1 To train skills of choosing how to act and to find the errors under the time pressure.

T2 To understand the export control limitations on trading space services.

T3 To learn the strategies of the making decisions in the incertitude.

T4 To learn the legal and policy framework, etc.

Serious Game

3 types of actors, based on their interests and functions:

Operators – control

Administrators – regulation

Financiers – money circulation

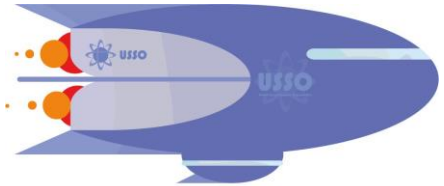
Resources: time to find the solution, « Astracoins », on-orbit servicing to extend functioning, rules and procedures.

Two types of challenges: **independent** (risk of collision, loss of control, etc.) and **sequential** (risk of collision, obtaining the administrator' instructions or rejecting), creation of debris, responsibility, etc.

The board of operators

- Operators can take control over the satellites with different aims:
- Dual-use.
- Commercial.
- Civil.

Nobody knows who is who.



Scientific Satelite

Comertial Satelite

Military Satelite
Dual Use

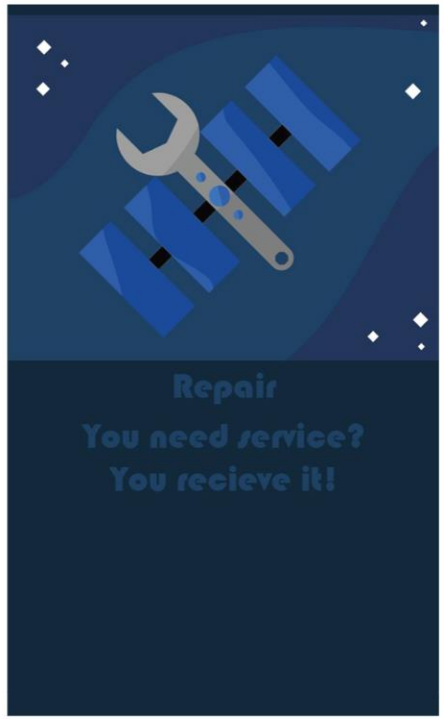
The board of operators

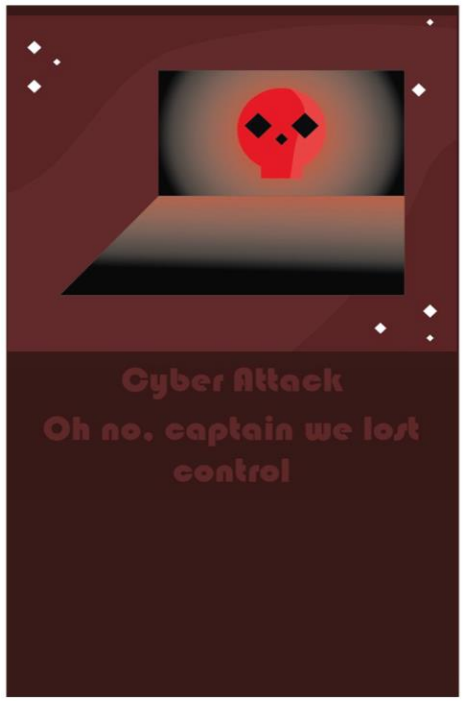
- ✓All satellites move in one direction – counterclockwise.
- ✓They also shift perpendicularly to their position.
- ✓Changing the orbit up and down is possible, but it requires fuel, or the operator must pay to use a tug.
- ✓For a certain amount of « Astracoins » operator can buy another satellite and continue the game.
- ✓In the case of collision, each satellite can create 2-5 pieces of space debris, which the operator can spread on the game board or send to a graveyard orbit.

The board of operators: challenges

Difficult negotiation is ahead

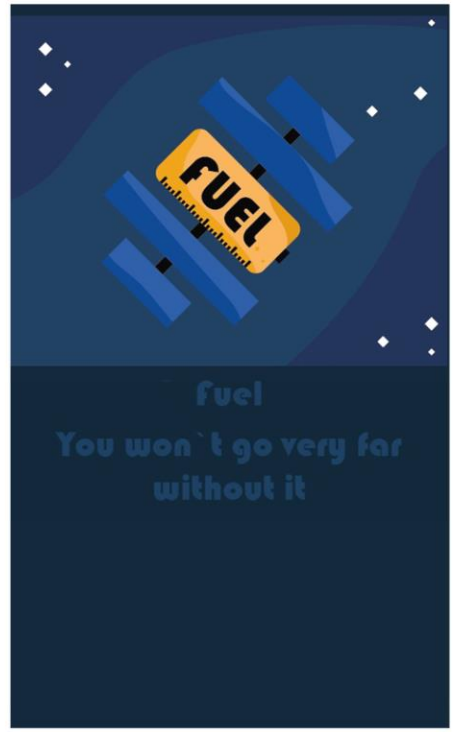
It is necessary to negotiate about service operation





The satellite is blocked, so it can make only one more forward, if no one declare control over it

Now satellite needs to make few maneuvers



Operators need to pay for recharging

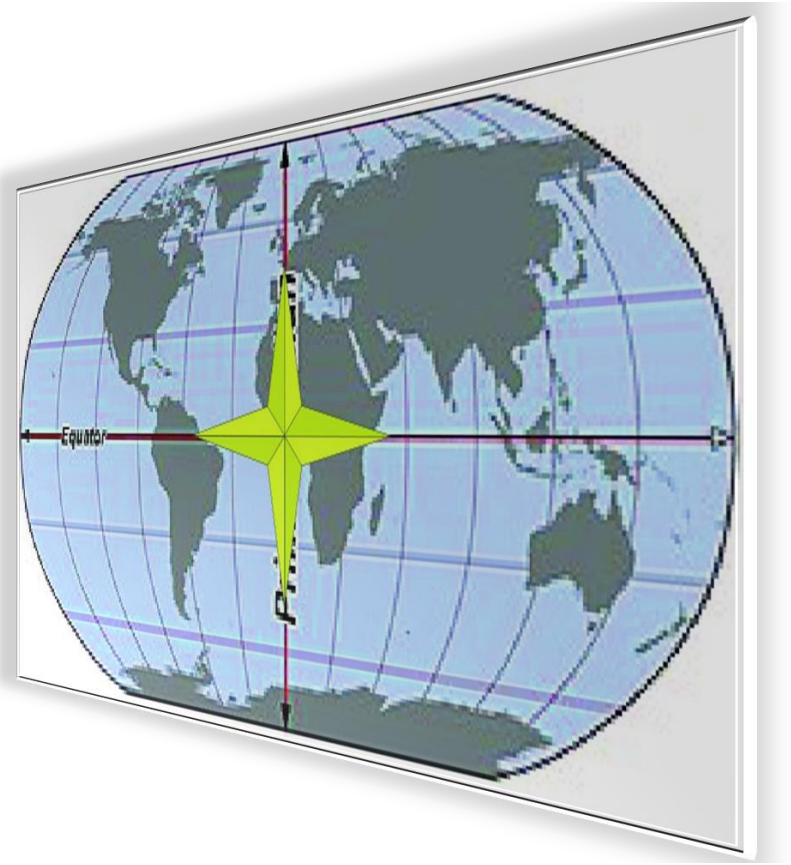
The board of administrators (State Space Agencies, ESA, Secretary General of UN, ITU, national focal points of communication)

Administrators have the possibilities:

- ✓To ban service delivery.
- ✓To provide information concerning the identification of a satellite under their jurisdiction in cases of collision, cyberattacks, and other incidents.
- ✓To coordinate maneuvering.
- ✓To offer consultations.
- ✓To provide authorization and supervision.

The board of financiers
(owner, insurer, customer, on-orbit service provider)

- ✓ The game board is divided into four regional sectors.
- ✓ The customers in each sector pay "Astracoins" to the proprietors of satellites in that sector.
- ✓ "Astracoins" can be used for repairs or fuel supply.
- ✓ If a satellite is located within its jurisdictional region, it earns more "Astracoins.“
- ✓ In other regions, customers negotiate with satellite owners and operators regarding the price.
- ✓ The owner of each satellite may buy and sell satellites to earn more money from different regions, but export control requirements must be taken into consideration.



Let’s play and make space governance better together!

Questions and suggestions:
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