

# Open Source Models in Satellite Communications

# OpenSatCom.org

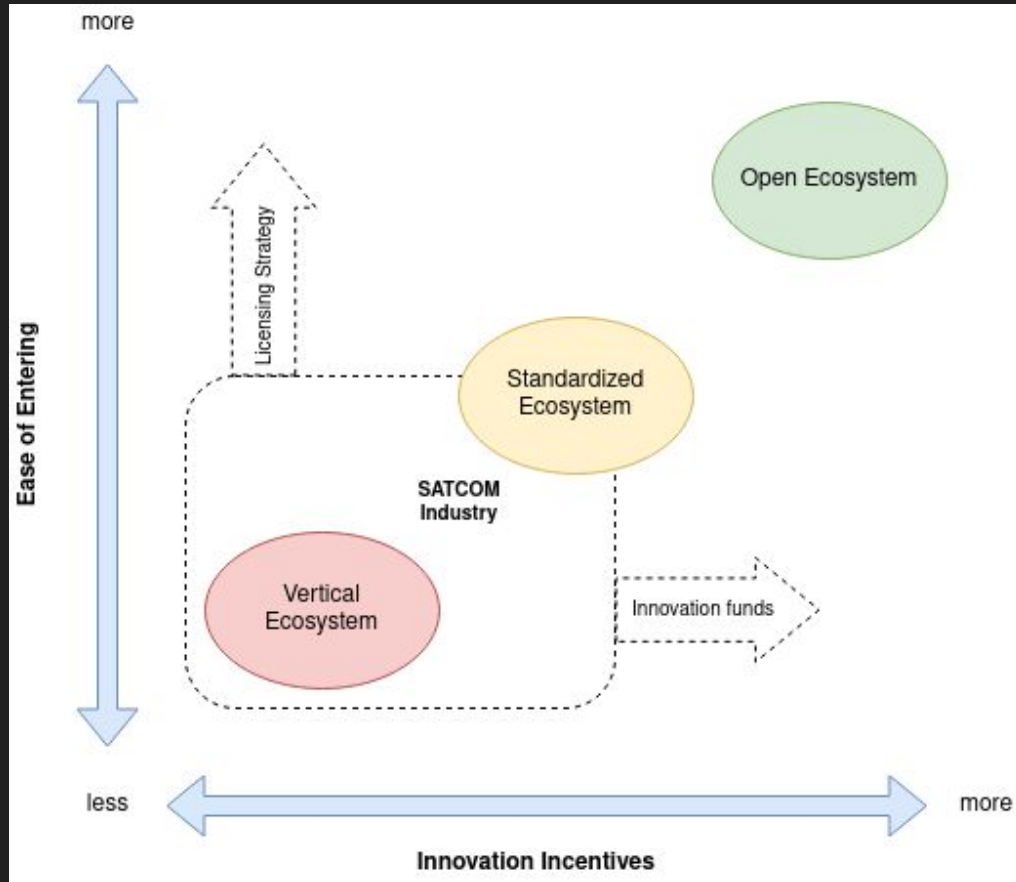
- European Space Agency activity
- Implemented by Libre Space Foundation & inno<sup>3</sup>.
- Evaluation of Open Source Models in Satellite Communications
- Identify existing Open-Source projects related to Satellite Communications
- Co-ordinated sub-activities to increase the impact of OpenSatCom.org

# Intro

- Open Source Models include technological development aspects, licensing/legal considerations, revenue and community aspects
- Licenses strongly impact such models
- Open Standards are a key step towards an Open Ecosystem but must be coupled with licenses and governance
- Open Source is nowadays the basis of many technical stacks

# Impact

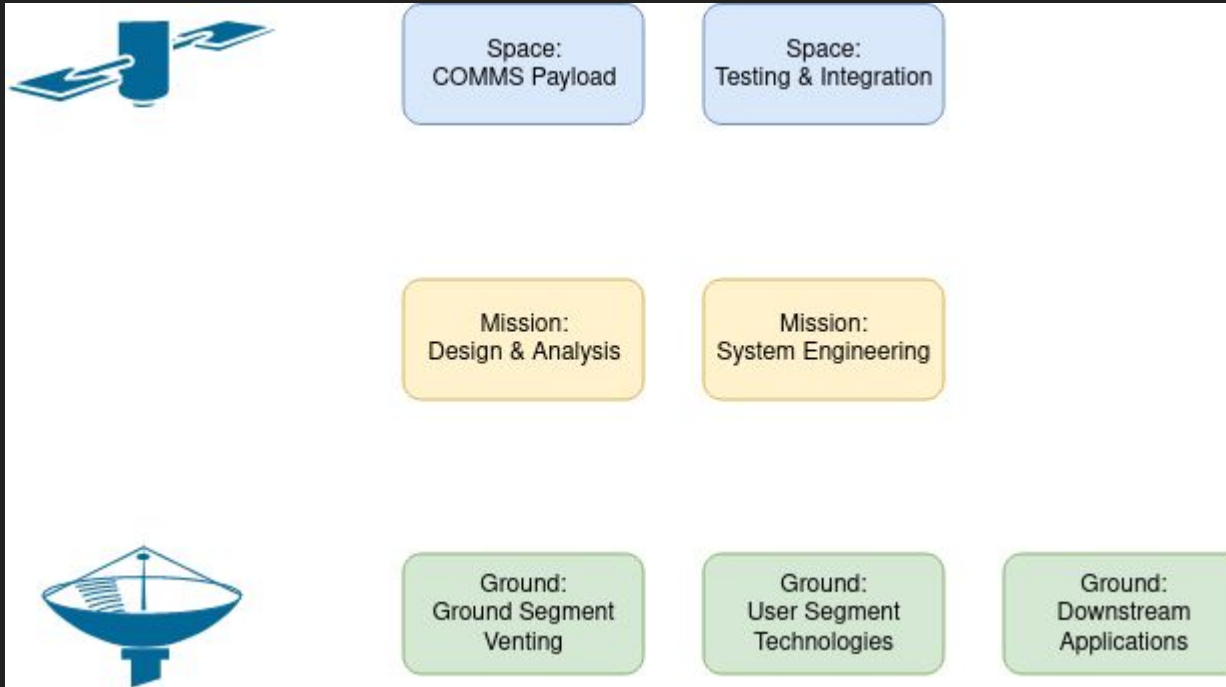
- An open ecosystem not only promotes the standardization of its technologies, but also promotes open implementations and is much more approachable for new entrants
- Open Source business models are still evolving
- Governance can be key for viability (p.e. Blender 3D)
- Success is not restricted to maximization of generated profits but distribution of the generated value



# Open Source Development Models

- Business to Business open-source (Android/Capella)
- Controlled Ecosystem (Wordpress/SatNOGS)
- Common Upstream (OpenSSL/Orekit)
- Ethically open-source (Diaspora, poliastro)
- Open Hardware - Design Focus (Arduino/ HackRF)
- Opportunistic Open Source (code dumps)
- Mass-Market Open Source (Firefox/FreeCAD)

# Satellite Communications Domains



## COMMS Payload

- 8 open-source projects identified
- Business to Business & Common-Upstream & Open Hardware Design Focus

## Testing and Integration

- 10 Open source projects identified
- Common Upstream & Open Hardware Design Focus (for environmental testing)



## Mission: Design & Analysis

- 30 Open-source projects identified
- Controller Ecosystem & Ethically Open-source

## System Engineering

- 8 Open-source projects identified
- Common Upstream

## Ground Segment Vending

- 9 Open-source projects identified
- Business to Business & Controlled Ecosystem

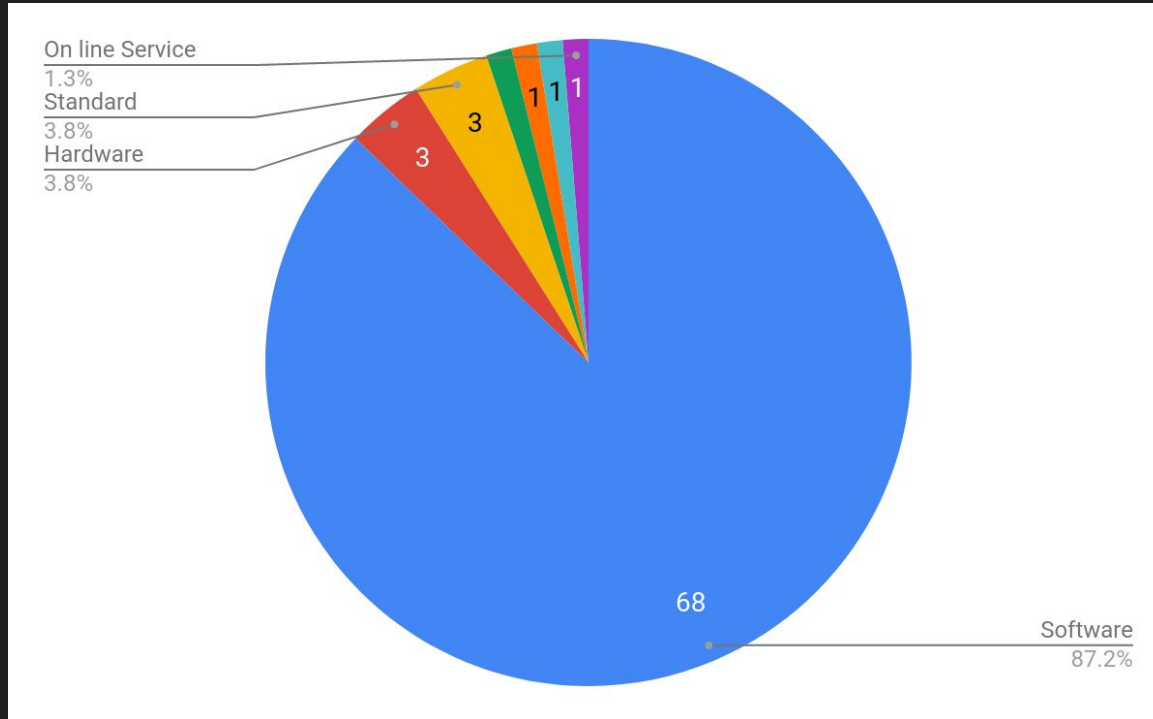
## User Segment-technologies

- 1 Open-source project identified
- Controlled Ecosystem & Open Hardware-Design Focus

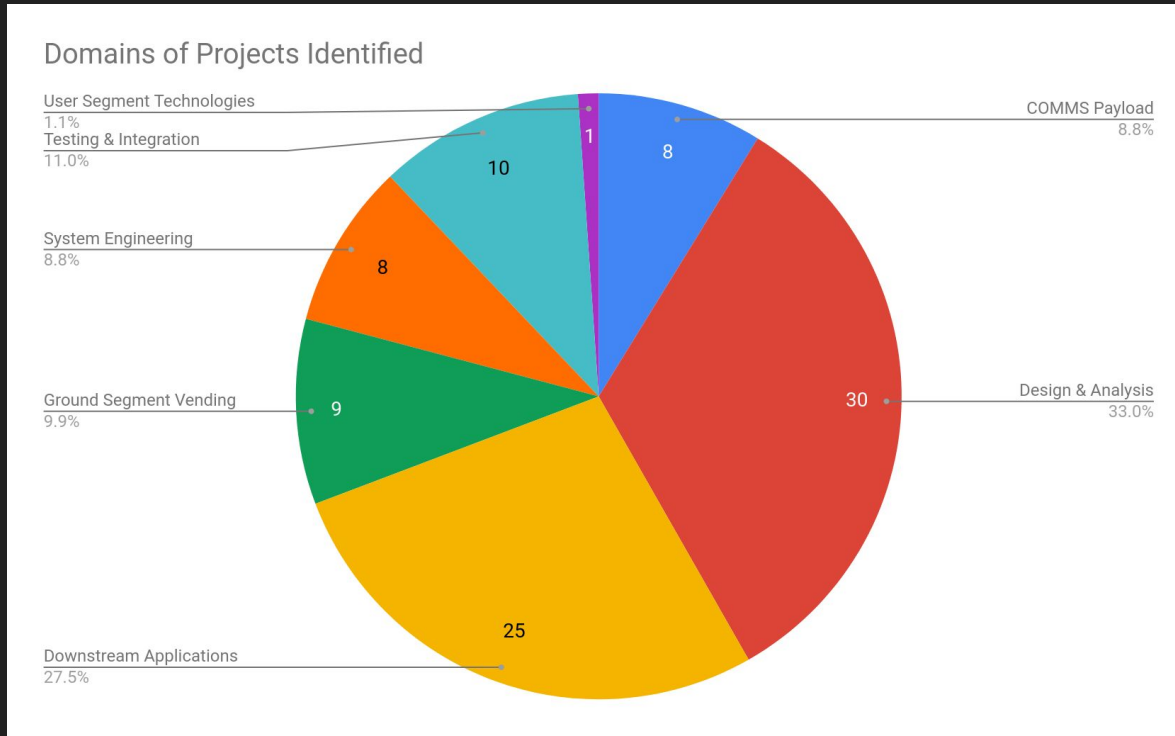
## Downstream Applications

- 25 Open-source projects identified
- Common Upstream & Mass Market open-source

# Projects identified



# Project Domains



# Current Sub-activities

- Opensatcom.org and Open Source Models on Satellite Communications Report
- Bounty support of open-source satellite communications projects
- Survey of adoption and expectations among European satellite communications stakeholders
- Constellation definition/designer on OreKit/poliastro

# Thank you!

For questions, input and ideas on this presentation don't hesitate to contact me at  
[elkos@libre.space](mailto:elkos@libre.space)

Eleftherios Kosmas, Libre Space Foundation