Ministry of I.C.T

IRANIAN SPACE AGENCY

UNITED NATIONS
Office for Outer Space Affairs

UNOOSA/I.R.I Workshop on Space Technology Applications for Drought, Flood and Water Resources Management

UNITED NATIONS
Office for Outer Space Affairs

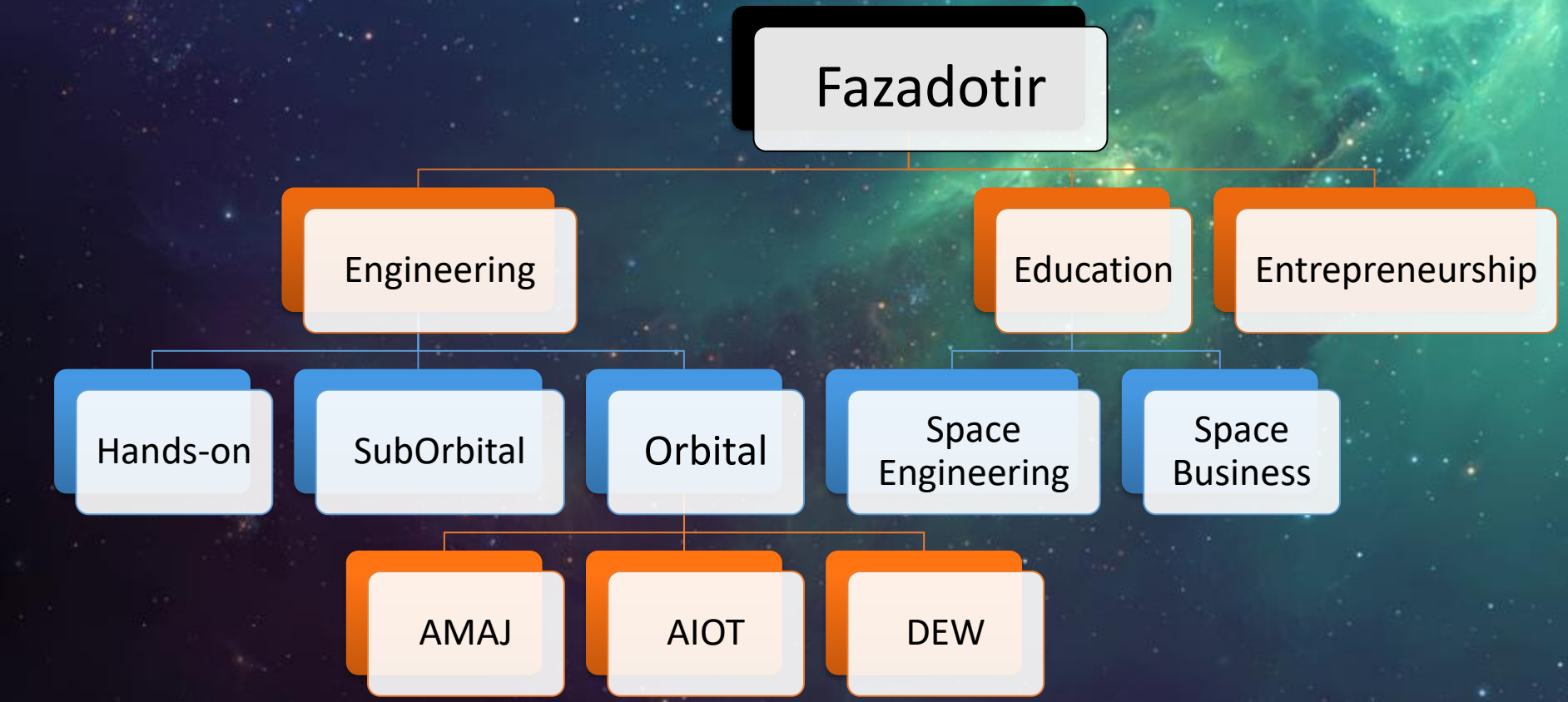
DEWConst

Affordable Space Solution to Water Related Disasters

by Sajjad Ghazanfarinia

http://www.faza.ir

- Sajjad Ghazanfarinia, Founder
  - Space Education and Outreach
  - Hands-on Development on Cubesats
  - Engineering on Satellite Solutions
  - Space Entrepreneurship


Fazadotir
Engineering
Education
Entrepreneurship
Hands-on
SubOrbital
Orbital
Space Engineering
Space Business
AMAJ
AIOT
DEW

CONTENTS

Need Analysis

Clean Water
Accessible for All

Safe Life
Early Warning

Data Products
Bring Space to Daily Life

Environment
Climate Changes

Food Security
Secure Smart Agriculture

Infrastructure
Training and Experience

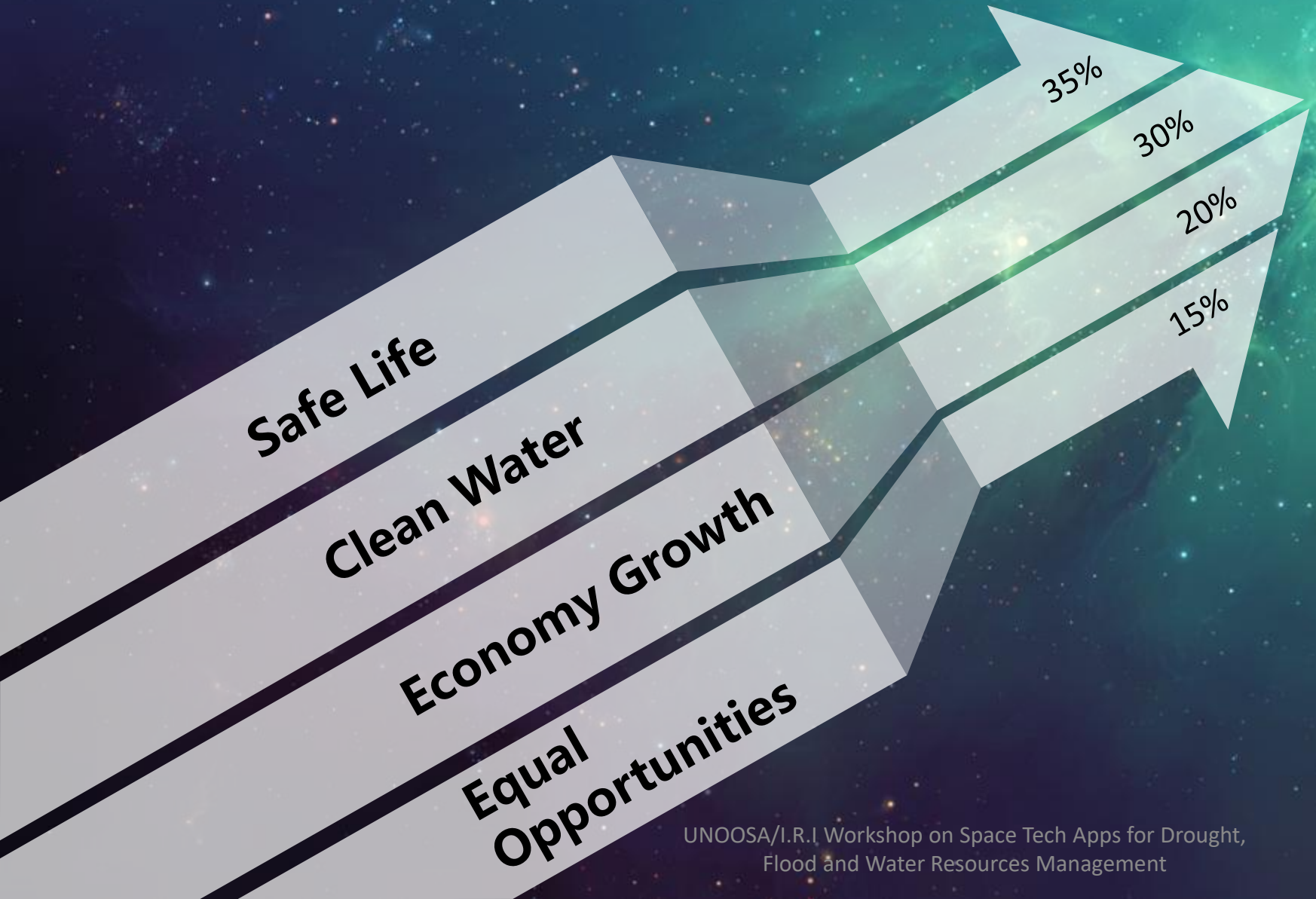
Industry
Regional Synchronization

Innovation
Save Brilliant Minds

Education
Equal for All

Economy
Opportunities for Growth

Main Focus



Priority

Precents are chosen based on Preliminary Evaluation and may vary Country by Country and Person by Person.
These Values Does not Affect this Research in the Following Case.

Solution

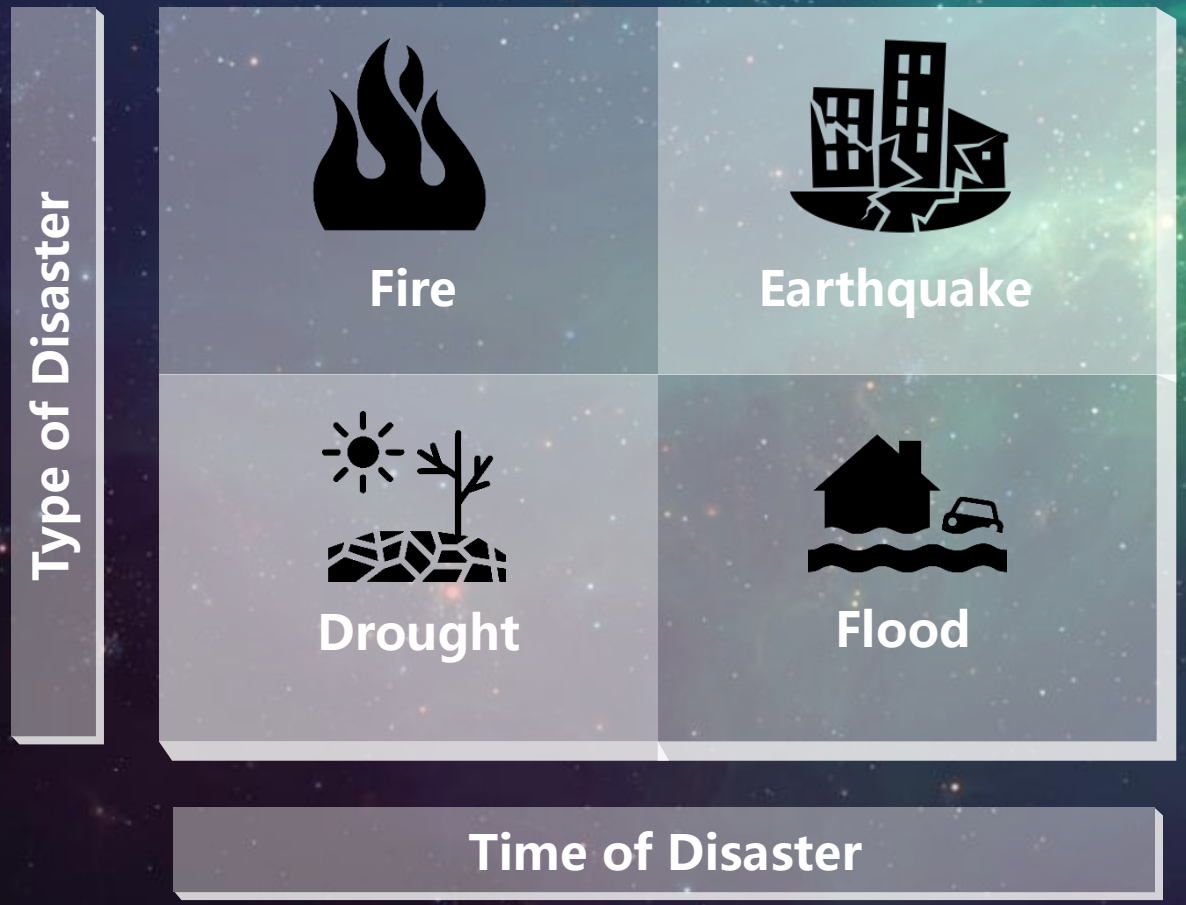
Launch
Test the Concept in Orbit
with the First DEWCubesat

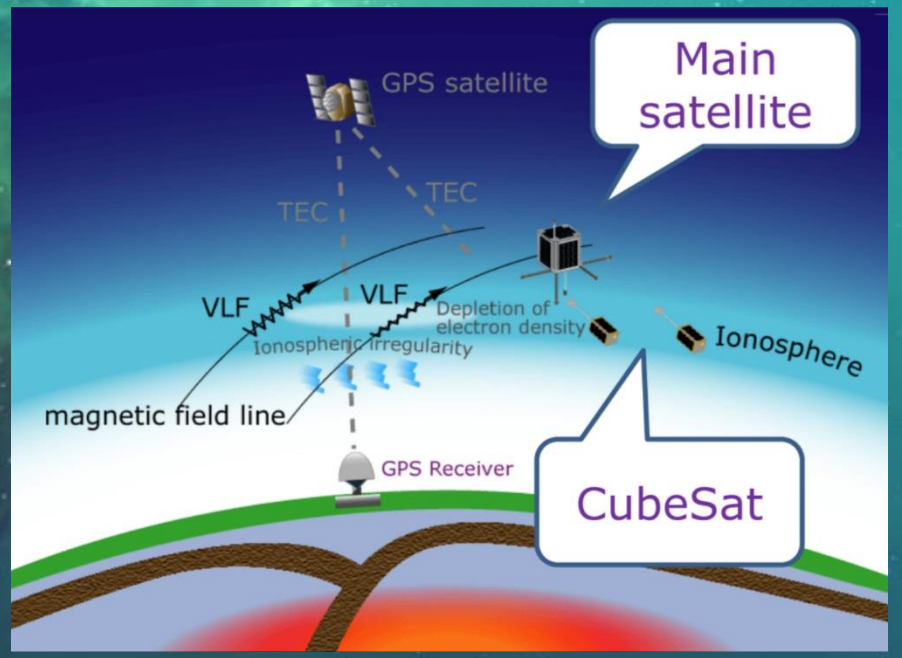
Data Bank
Run Big Data Analysis on Free Images and
Data from Constellation and Report

Constellation Operation
Launching Satellite for Each Country
and forming Constellation

Operation Evaluation
In Orbit Testing and Evaluation of
Mission Operation

DEW Concept

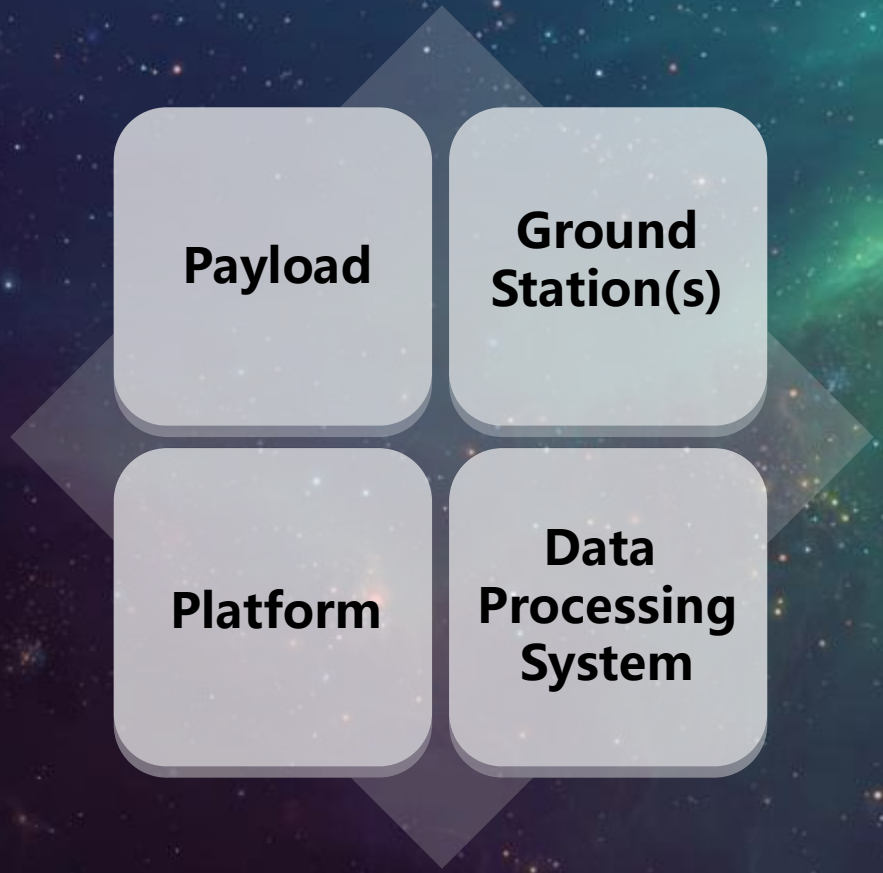




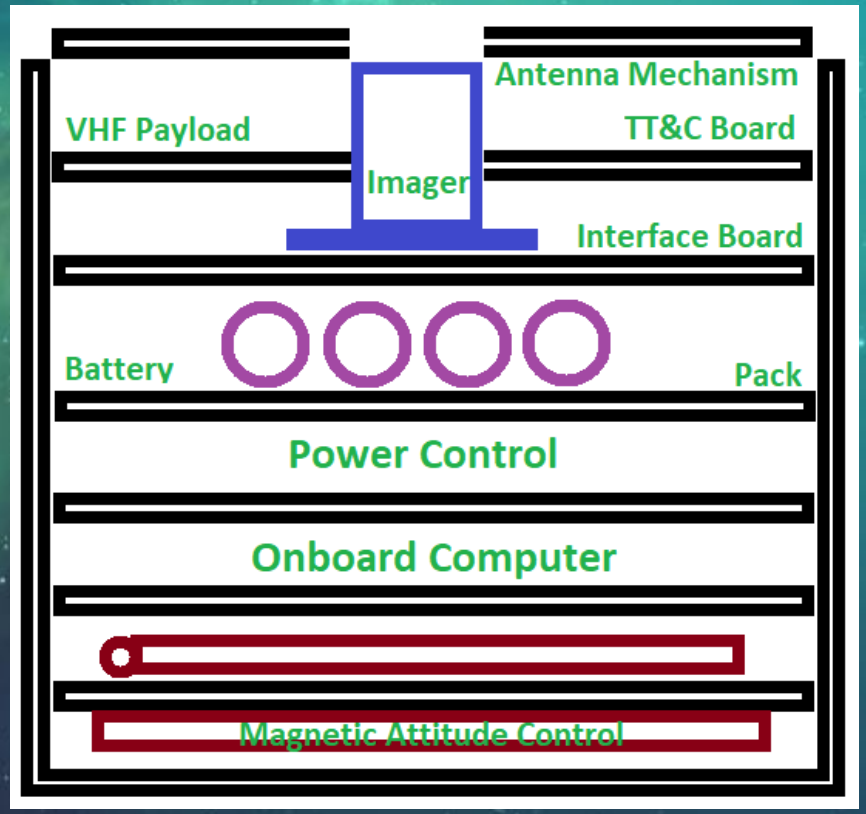
1U Cubesat – 2 Payloads

Find Symptoms for Earthquakes
Monitor Surface Waters, Snow and Ice
Monitor Possible Fires in Important Locations

DEWCube



System Elements



The Satellite is made up of Payload (Camera & Passive Radar) and Simple 1U Cubesat Platform. The Mission Cannot be done with out Ground Measurement Units, Ground Station(s) and Data Processing System.

and Constellation

System Management
Network of Satellites, Ground Stations and Ground Measurement Units which are Managed by MCC based on System States and Configuration

Orbit
Combination of Orbits which make the System to Cover and Pass through the Subject Area

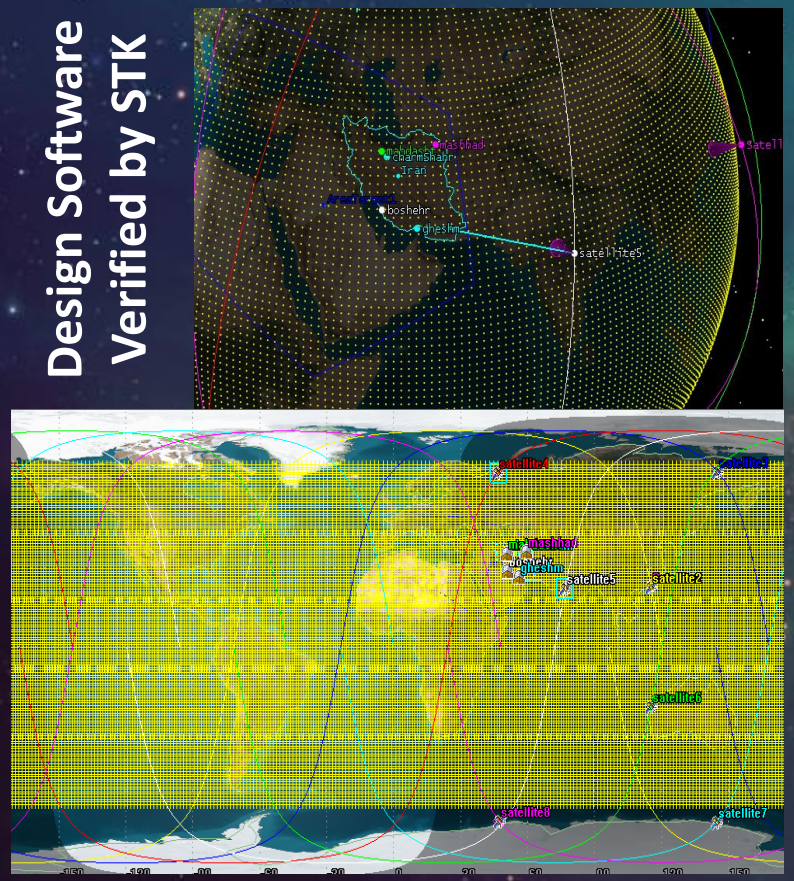
Measurement
Payloads on Satellites and Units on Ground to quantify the Mission Parameters

Satellites
DEWCubesatellites developed under teams in Countries Involved in the Project

Reporting
Processing Data from All Space and Ground Element and Prepare Reports

Constellation Specification

Design Software
Verified by STK



Data Set
Start Time: 23 Oct 2019 12:00:00
Stop Time: 24 Oct 2019 12:00:00
Epoch Time: 20 Jul 2019 12:00:00

Create Name
Scenario Name: Scenario8
Constellation Name: EhsanConstellation

Input Parameter
Number Satellite: 8
Semi Major Axis: 6978
Eccentricity: 0
Inclination: 55
Argument Of Perige: 350
RAAN: 40
Mean Anomaly: 10

Propagate Set
Propagator: ePropagatorTwoBody
ePropagatorTwoBody
Coordinate System: eCoordinateSystemJ2000
eCoordinateSystemJ2000

Facility Set
Read From File | Write to File
Insert Row | Delet Row | Clear Table

	Latitude	Longitu
1	35.7500	51.3
2	36.2869	59.5
3	32.6806	51.6
4	35.8427	50.9
5	38.0793	46.2

Access Time [minute]
Access Min Duration [minute]: 14.0182 | Access Row Min: 1 | Strat Time Min: 23 Oct 2019 18:35:24.61387 | Stop Time Min: 23 Oct 2019 18:49:25.7032
Access Max Duration [minute]: 23.539 | Access Row Max: 7 | Start Time Max: 24 Oct 2019 04:38:03.74988 | Stop Time Max: 24 Oct 2019 05:01:36.0878
Access Mean Duration [minute]: 20.1145
Number of Days Running: 2 | Access Number: 9 | Access Total [minute]: 181.03
Run Project

Time To Cover By Region
Region Name: AreaTarget
Minimum Time [minute]: 0.845802
Maximum Time [minute]: 599.564
Average Time [minute]: 254.067

All Region for "Area Target" By Pass Coverage

	amount [minute]	Asset Name	Num Access	% Coverage	Area Coverage	Access Start	Access End
Duration Min :	0.000113	Camera_7	39	0.115834	3314.94	24 Oct 2019 06:28:53.8266	24 Oct 2019 06:28:53.8334
Duration Max :	9.18168	Camera_5	13	83.6918	2.39509e+06	23 Oct 2019 21:56:08.7252	23 Oct 2019 22:05:19.6261
Mean Duration :	5.71204						

Total Num Access: 44

Partial Coverage

	Min Percent	Max Percent
Number	4	2
Coverage Start	24 Oct 2019 03:09:14.2	23 Oct 2019 21:53:39.53
Coverage End	24 Oct 2019 03:13:11.7	23 Oct 2019 22:05:59.27
Duration	3.95953	12.3279
Percent	0.274967	0.856101

Total Number Partial Coverage: 7

Figere Of Merit

Region Stats
Region Name: AreaTarget
Num Access: 44
Minimum: 198.654
Maximum: 206.589
Average: 202.859
Sum: 158839

Value by Lat & Long
Latitude
Min Access Lat: 198.654 | On Lat: 30
Max Access Lat: 206.589 | On Lat: 40
Sum Latitude: 11851.3

Longitude
Min Access Long: 198.654 | On Long: 57
Max Access Long: 206.589 | On Long: 52
Sum Longitude: 10964.4

# of Sats	Orbit Altitude	Orbit Inclination	# of Plane(s)	Full Coverage
8	500 km	55 deg	1	(in) 5 days

Progress

Design

Design Constellation
Design Payload(s)
Design Satellite(s)

Development and Evaluation

Develop Satellite(s)
Train Teams to Design
Evaluate Performance

Data Gathering and Processing

Receive Images
Measure from Space
Gather and Process Data

Service

Launch the Service
Support on App Businesses
Maintain the Constellation

Serving SDGs

No Drought

Water Waste Management and Surface Water Storage

Space Ecosystem

Space Ecosystem both in Upstream and Downstream could help the Economy to Improve and Grow

Education

Having Right Education and Training, all the Member States have their own Infrastructure

Earthquake Prediction and Monitoring

Getting Ready for Earthquake and Using Space Data for Post Crisis Management Activities

Identification

Space Weather for Storms
Space Weather for Earthquake

Next Step

Publish Results

Yearly Online Report
Collaborative Papers

Inspire for More

Make Videos and Prepare Educational Materials

Zoom on Application

Share Data in RAW and Processed Format

Share and Negotiate

Expand the Network for More Involvement in Development and Application

Next Generation of the Constellation and Maintenance will be Done

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Thanks for the Time
Question?

Contact US
info@faza.ir

Contact Me
founder@faza.ir