

# IN-ORBIT SERVICING & MANUFACTURING COMPETITION

2023 - 24

## CHALLENGE 2



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## **IOSM CHALLENGE 2: BUSINESS CASE**

### **Introduction**

This document details the work you are expected to produce for the second UKSEDS IOSM Competition challenge.

Each section has either a word limit or a page limit, Please ensure to follow these guidelines as mentioned in each section otherwise the work exceeding the limit will not be marked. The first page should be a title/cover page.

Please contact [iosm@ukseds.org](mailto:iosm@ukseds.org) if you have any further questions.

### **Deadline**

The deadline for the submission of your Challenge Two report is:

**Friday 10th May 2024.**

### **Submission**

Please upload your completed report in PDF format to your team's UKSEDS Google Drive folder.

### **Feedback**

Your submitted reports will be reviewed and marked by IOSM industry experts, and feedback will be provided. The mark given for this submission will account for 45% of your final mark for the overall competition.



## THE CHALLENGE

Now that you have studied the IOSM market and chosen your particular area in Challenge 1, this challenge tasks you with formulating the vision for your business and mission in greater depth. The report produced will act as the foundation of your business proposal, outlining the key points for potential hypothetical investors in the next challenge. The reader should be able to ascertain the essential details pertaining to the overall business, mission, and technological ideas that you are proposing – it is thus key that you always justify your ideas.

In summary, you are being tasked with producing a report outlining the initial business case for your idea. Be sure to make it absolutely clear what the crux of your idea is, why it's technologically innovative, and why it's worthy of investment!

### Key points to keep in mind:

- This is a proposal for a business that sells an IOSM-specific service or product to its customers – how are you pushing the industry forward?
- Where possible, back-up your claims with numbers (calculated or referenced).
- Graphs, infographics, diagrams, etc. are encouraged to reinforce your answers.
- The primary aim of this exercise is to justify your new business, mission, and technology ideas.
- This document will be used throughout the rest of the competition.
- Ultimately you will need to pitch your business idea to a panel of hypothetical investors, so you must be able to justify your decisions.
- You must answer each top-level subsection for each main section (e.g. Section 4 has 4 subsections). The additional bullet points below each subsection that are pointers are there for your guidance only; you are not expected to break down the subsections further to explicitly answer the additional pointers, they are just there to prompt you and give you an idea of what to include. For example, where a subsection includes “Some things to think about”, you are not expected to answer each individual point beneath it. Your submission should read like a formal report/proposal.



### Challenge Two

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- Do not feel like you need to hit the word/page limits, but do not exceed them.
- Be careful with terminology:
  - Your business is the company or enterprise that provides goods or services in the commercial space industry with the goal of generating profit.
  - Your mission is a specific effort by your space business to achieve a specific goal in space, typically involving the launch, deployment and operation of a spacecraft and/or a space-based asset. A business could operate on a “one customer per mission” basis, or a “many customers per mission” basis.

## REPORT SECTIONS

### Section 1 – Cover Page

(1 page max)

- This should include your business name and logo, your university, and the names and roles of all team members

### Section 2 – Executive Summary

(1 page max)

- A good executive summary acts as a miniature version of the main report, summarising the main points in a concise way

### Section 3 – Business Model

(3000 words max)

1. What is your business’s vision statement?
  - A concise statement of why your business exists and what its top-level goals are
2. Provide an overview of your business idea
  - Elaborate on your vision statement.
  - What does your business do? Does it provide a product or a service?



3. What is your company's value proposition?
  - A value proposition is a simple statement that summarises why a customer would choose your product or service.
  - It communicates the clearest benefits that customers receive by giving you their business, and should speak to a customer's needs and make the case for your company as the problem-solver.
  - Some things to think about (non-exhaustive):
    - i. What customer challenges or problems will your business address and solve?
    - ii. What benefits will your business deliver and how? (e.g. improves performance, reduces costs, saves time, retires risk)
    - iii. What features of your business will deliver these benefits?
    - iv. Why is this unique and compelling?
    - v. Why now?
4. Carry out a customer analysis of your target market segment(s)
  - Some things to think about (non-exhaustive)
    - i. Who are the key customers your business will target?
    - ii. What sort of entities are they? (e.g. civil, commercial, defence)
    - iii. Where are they based? (e.g. US market, European)
    - iv. What are their priorities? (e.g. speed, cost, reliability, performance)
    - v. How many (roughly) of these customer types are there ?
5. Conduct a competitor analysis of your target market segment(s)
  - Some things to think about (non-exhaustive):
    - i. Who are the competitors (direct and indirect) currently operating in this space?
    - ii. Where do they operate from?
    - iii. What is their business offering, why is yours better than others (unique selling point)?
    - iv. How large are these competitors? How mature are they?
    - v. Have they got any partnerships within the industry? (e.g with a national space agency)
    - vi. What are their strengths and weaknesses?



## Section 4 – System Architecture and Mission Profile

(3000 words max)

1. What are your key mission requirements for an example/generic customer?
  - Requirements describe the necessary functions and features of the service needed to achieve the overall objectives and fulfil the customer's needs.
  - E.g. if it's a refuelling satellite, it will need to dock, to change orbit etc
2. Outline your concept of operations (ConOps) for an example target customer.
  - A ConOps is often represented in pictorial form, and is used to facilitate a common understanding of a future system by outlining the different phases involved in the mission.
  - Example mission phases could include launch, rendezvous, docking, servicing, un-docking, disposal/reuse etc. Consider what your system needs to do in each phase.
3. What is your system architecture?
  - An overview of the different components of your system and how they interact, highlighting what service you're providing. This can be presented however you feel is appropriate, but a common method is a block diagram that shows the interconnections and interfaces between the various internal and external systems involved.
  - Visual representation of the overall system, and how the separate subsystems interface with each other (e.g. docking, solar array, structure, mechanical components, comms etc).
  - Also include how the overall system interfaces with other systems (eg launcher, ground stations, client spacecraft etc)
4. Identify the critical elements that need to be developed for your mission (i.e. discuss the *new* technology/mission/system associated with your business)
  - For example, this could be a new docking technology, or it could be an innovative way to use a satellite swarm for active debris removal.



- Describe what this technology/product is, and give a top-level overview of how it will work. What is innovative about your idea that separates you from the competition?
- What technical challenges may be encountered in the design and development of the technology/product?

## USEFUL LINKS

ESA Technology Readiness Levels

[https://www.esa.int/Enabling\\_Support/Space\\_Engineering\\_Technology/Shaping\\_the\\_Future/Technology\\_Readiness\\_Levels\\_TRL](https://www.esa.int/Enabling_Support/Space_Engineering_Technology/Shaping_the_Future/Technology_Readiness_Levels_TRL)

ECSS Space Project Risk Management (download PDF)

[http://everyspec.com/ESA/ECSS-M-ST-80C\\_47919/](http://everyspec.com/ESA/ECSS-M-ST-80C_47919/)

System Architecture diagram (see figures 27, 28, 29)

<https://earth.esa.int/web/eoportal/satellite-missions/c-missions/coms-1>

Mission Profile diagram (image at bottom of page)

<https://astroscale.com/astroscale-awarded-uk-space-agency-bid-to-study-removal-of-two-defunct-satellites-from-space/>

Business links:

<https://www.investopedia.com>

<https://www.stratechi.com>

<https://www.grammarly.com/blog/business-proposal/>