**BUSINESS PLAN**

**Commercializing Low Earth Orbit (LEO)**

**-NAVA-**

**2025**

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| **1.** **Business Description and Objectives** |
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| Nava is a company that aims to develop and implement a solution to extend the lifespan of satellites operating in Low Earth Orbit (LEO), as well as to create space facilities for the growth of protein crystals used in the study of molecular structures.  Over the past two decades, research on protein crystals has gained significant momentum. Driven by the desire for knowledge, remarkable discoveries have been made regarding the medicinal potential of these crystals. With a better understanding of their crystalline structure, we can develop important new drugs and hope for cures for diseases such as Alzheimer’s, muscular dystrophy, and various types of cancer.  At Nava, we pursue efficiency and are guided by the vision of a better society. Therefore, our main objective is the deployment and monitoring of these protein crystals, as well as the safe delivery of the results back to certified laboratories on Earth.  This delivery process is a complex one, involving a retriever and an incubator integrated within the rocket, as well as specialized equipment for handling, observation, and cryogenic preservation of the crystallization process in space. What differentiates us from our competitors is the complete absence of human presence onboard the rocket — the entire process of propulsion, docking, detachment, crystal development, and delivery is fully automated.  Furthermore, with the help of the Nava Rocket, we can extend the lifespan of dozens or even hundreds of satellites in LEO, and even refuel major technological achievements such as the Hubble Telescope, among others.  The members of Nava are fully aware of the difficulty of the mission ahead, yet confident in their abilities and in the success of this initiative.  **Objectives:** |
| **Short-Term Objectives (Current Year)** |
| * Establish the company structure and form specialized research and engineering teams. * Secure necessary aerospace and biotechnology certifications to validate Nava’s operational field. * Design and prototype the automated satellite servicing module for in-orbit maintenance and refueling. * Develop the initial concept for the microgravity protein crystal growth chamber. * Initiate partnerships with research institutions and space agencies for data sharing and technical validation. |
| **Medium-Term Objectives (Next 2 Years)** |
| * Conduct testing and validation missions in low Earth orbit (LEO) for both the satellite service module and the protein crystal growth system. * Optimize the automated retrieval and delivery mechanism for protein samples to Earth laboratories. * Improve the AI-based navigation and docking system to increase mission reliability and reduce operational costs. * Begin the certification and approval process for commercial use of Nava’s in-orbit service * Explore collaborations with pharmaceutical and biomedical companies interested in microgravity research applications. |
| **Long-Term Objectives (3–5 Years)** |
| * Deploy fully operational missions capable of extending the lifespan of multiple satellites and scientific platforms in LEO. * Establish a continuous protein crystal growth program in orbit with regular retrieval and data transmission cycles. * Expand infrastructure to support multiple concurrent missions, enabling scalable commercial services. * Form long-term partnerships with government agencies, private satellite operators, and research organizations. * Position Nava as a leading innovator in automated orbital maintenance and space-based biomedical research. |
| **Initial Investment** |
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| We estimate an initial investment of approximately $20–25 million to support Nava’s development in the first phases of operations. The majority of this funding will be allocated to research and development, reflecting the emerging and highly specialized nature of our technology. Specifically, initial funds will focus on the design and prototyping of the autonomous satellite servicing module and the space-based protein crystal growth system, including ground-based demonstrations and subsystem testing.  A portion of the budget will be dedicated to engineering team salaries, regulatory compliance, and early partnerships with research institutions and aerospace agencies. Early-stage investment will also cover IoT and sensor integration for real-time monitoring of satellite servicing and protein growth processes.  In the first two years, approximately 40% of the funds will cover operational costs, such as facility setup, laboratory testing, and team salaries, while the remaining 60% will be invested in R&D for materials, propulsion and robotics subsystems, autonomous docking, and cryogenic handling technologies. This allocation ensures that Nava can validate its prototypes, refine processes, and establish a foundation for the first in-orbit missions. |
| **2. Team Competence and Experience** |
| **Professional Experience and Team Background:** |
| Our team, primarily composed of engineers and computer science students, has participated in multiple educational and research projects, including NASA-supported initiatives for designing robots capable of operating on Mars, as well as various projects in sensor technology and automation. Several team members have pursued specialized training relevant to our business in robotics, sensors, and microelectronics. |
| **Below is an overview of the current team members and their educational background, highlighting their relevance to Nava’s activities:** |
| **Alexandru Petrescu** – Student at the Faculty of Automation and Computer Science, University of Craiova. Alexandru has extensive international experience in robotics competitions and is also one of the potential initial investors in the company.  **Bogdan-Valentin Macreanu** – Student at the Faculty of Electrical Engineering, University Politehnica of Bucharest (UPB), with interests in material structure and applications in electrotechnical systems.  **Rareș-Andrei Burada** – Student at the Faculty of Intelligent Industrial Engineering, UPB, passionate about smart industrialization and automation.  **Radu Marcea** – Student at the Faculty of Automation, UPB, with a strong interest in electronic devices and embedded systems programming.  **Cristian Stoian** – Student at the Faculty of Automation, University of Craiova, specializing in programming and automation.  **Mihai Țuinea** – Student at the Faculty of Computer Science, University of Craiova, focused on software development, algorithms, and sensor data integration. |
| **Relevance to the Business:** |
| The combined expertise of the team in **electrical engineering, automation, robotics, and computer science** directly supports Nava’s objectives in designing autonomous spacecraft systems, robotic satellite servicing arms, and automated protein crystal growth facilities in orbit. Their educational background and practical project experience provide the technical skills necessary to develop, test, and implement these advanced space technologies effectively. |

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| **3.** **Target Audience** |
| **How many potential clients do you estimate you will have in the next 6 months?** |
| We do not expect any clients in the first 6 months due to the scale of the project. The first months will be spent searching for investors that will believe in our vision and desire to fund a prototype.    We estimate approximately 5–10 potential clients(investors) will come along in the first 2 years of operating the company , mainly consisting of research institutions, biotechnology companies, and satellite operators interested in orbital maintenance or microgravity experiments.  Examples of potential clients/investors include:   * NASA, ESA (European Space Agency), and JAXA for satellite servicing and scientific missions. * Pfizer, Novartis, and Roche for microgravity protein crystallization research to support drug development. * SpaceX, Planet Labs, and OneWeb for in-orbit satellite maintenance and refueling services. |
| **Briefly describe your client profile based on the information provided earlier.** |
| Our clients are space agencies, pharmaceutical and biotechnology companies, and private satellite operators seeking innovative, cost-efficient, and automated space solutions. They are organizations focused on scientific research, satellite performance optimization, and advanced drug discovery. |
| **What market need or problem does your product/service solve?** |
| Nava addresses two critical market needs:   1. Extending the operational lifespan of satellites in LEO, reducing space debris and lowering replacement costs. 2. Enabling protein crystal growth in microgravity, which enhances molecular research and supports the development of new, more effective medicines. |
| **Explain how you determined the price of your product/service relative to your client profile** |
| Pricing is established through a value-based approach, considering the high cost of satellite replacement, the savings offered by in-orbit servicing, and the scientific value of microgravity research. We benchmark against existing orbital service missions and microgravity experiment costs, ensuring a competitive yet sustainable pricing model aligned with our clients’ R&D budgets and long-term investment strategies. |

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| **4. Market and Competition Analysis** | |
| **Market Overview** | |
| The global space industry has entered a new era, marked by rapid commercialization and an increasing number of private players. The market for satellite servicing, refueling, and in-orbit maintenance is projected to exceed **$10 billion** by 2035, driven by the need to extend the operational life of expensive satellite assets and reduce orbital debris.  In parallel, the microgravity research market, particularly in the field of protein crystallization and drug discovery, has gained significant attention from pharmaceutical companies and research institutions. Microgravity conditions allow protein crystals to form with fewer defects and greater uniformity, enabling more accurate molecular analysis and the development of more effective drugs.  Nava operates at the intersection of these two high-potential sectors: orbital servicing and space-based biotechnology. This dual focus positions the company to benefit from both the commercial satellite market and the biomedical research industry, offering innovative solutions that merge aerospace engineering with life sciences. | |
| **Competitor 1: Northrop Grumman (U.S.) –** developer of the Mission Extension Vehicle (MEV) for satellite life extension. | |
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| **Strengths:** | **Weaknesses:** |
| * Proven operational success — successfully docked with commercial satellites and extended their missions. * Strong financial and technical resources due to its position as a major aerospace contractor. * Advanced robotic docking systems tested in real missions. | * Focuses primarily on large, expensive GEO satellites, not on the LEO market. * High mission costs and long development cycles. * Heavy reliance on human oversight and complex logistics compared to newer autonomous models. |
| **Competitor 2:** **Orbit Fab (U.S.)** - Development of orbital refueling infrastructure (“Gas Stations in Space”). | |
| **Strengths:** | **Weaknesses:** |
| * Unique focus on **refueling technology** — a critical element for long-term satellite maintenance. * Strong collaborations with NASA and the U.S. Space Force. * Modular “tanker” approach compatible with various spacecraft types. | * Concentrates only on **fuel supply**, not reboost or other servicing functions. * Requires a large network of compatible satellites to be effective. * Technology still early-stage and reliant on wide industry adoption. |
| **Our business:** | |
| **What are the main characteristics through which your business differentiates itself from competitors?** | |
| The company aims to successfully develop and implement advanced orbital technologies and automated protein crystal growth systems that are largely overlooked by other players in the space industry. | |
| **Strengths:** | **Weaknesses:** |
| * Cutting-edge automation and robotics for fully unmanned satellite servicing. * Expertise in both aerospace engineering and microgravity scientific research. * Ability to conduct simultaneous commercial satellite servicing and scientific payload operations. * Flexibility in innovation and rapid adaptation to emerging space technologies. | * Limited partnerships with established space agencies and commercial satellite operators. * High initial R&D costs and long development cycles. * Dependence on complex regulatory approvals and launch licensing. * Limited operational experience in commercial orbital missions. |
| **Opportunities(Current and Future):** | **Threats(Current and Future):** |
| * Access to national and international space innovation grants and funding programs (ESA, NASA, Horizon Europe). * Growing demand for satellite life-extension services and in-orbit scientific research. * Expansion into international markets with commercial satellite operators. * Collaboration opportunities with pharmaceutical and biotech companies for protein crystal research. | * Highly competitive and capital-intensive aerospace sector. * Technological risks, including potential failures in robotics, propulsion, or cryogenic systems. * Regulatory and compliance challenges in multiple jurisdictions (U.S., EU, New Zealand, etc.). * Dependence on successful initial missions to build credibility and secure future contracts. |
| **5.** **Marketing and Sales Plan** | |
| * **How will you promote your business?**  Nava aims to position itself as a pioneer in automated orbital maintenance and space-based biomedical research. The company’s marketing strategy focuses on building trust, credibility, and visibility within the aerospace and biotechnology sectors through a multi-channel approach combining digital presence, strategic partnerships, and participation in international events. | |
| * Website (promotional site) * Website (e-Commerce platform) * Promotion (online) * Promotion (print, radio, TV) | |
| **Choose 3 promotion methods and describe how they will help your company achieve its objectives.** | |
| 1. **Digital promotion**  * Development of an interactive website showcasing Nava’s technology, including 3D simulations, mission animations, and technical documentation on the satellite servicing module and microgravity protein crystal chamber. * Use of professional social media platforms such as LinkedIn, YouTube, and X (formerly Twitter) to share updates on technological progress, partnerships, and mission milestones. * Creation of short educational and promotional videos explaining the benefits of automated orbital servicing and the impact of microgravity research on drug discovery. * Implementation of a targeted SEO and PR strategy through collaborations with specialized companies to reach key audiences in aerospace and biotechnology. | |
| 1. **Participation in Events**  * Attendance at major aerospace, technology, and biotechnology conferences such as the International Astronautical Congress (IAC), Space Tech Expo, and BIO International Convention, where Nava can showcase its prototypes and mission concepts. * Organization of demonstration booths and networking sessions to engage with potential collaborators, investors, and clients. * Active participation in panels and workshops to present Nava’s vision for sustainable orbital operations and microgravity science. | |
| 1. **Institutional and B2B Collaborations**  * Development of partnerships with space agencies (NASA, ESA, JAXA), biotechnology firms (Pfizer, Novartis, Roche), and private satellite operators (SpaceX, Planet Labs, OneWeb) for pilot missions and technology validation. * Proposal of joint research programs with universities and research institutes to test and refine the protein crystallization system. * Establishment of long-term service agreements for in-orbit maintenance and refueling with satellite operators and government entities. | |
| **6.** **Operational Plan** | |
| **Key Suppliers and Partners:** | |
| **Supplier 1:** | |
| **Company:** | **Form of Collaboration:** |
| **Airbus Defence and Space – European Space Components Supplier**  <https://www.airbus.com/en> | * Contractual; * Project-based;   **Contractual:**  A mid-term (24–36 months) supply contract will be established for the procurement of essential satellite subsystems, such as xenon propulsion modules, guidance components, and structural materials. The contract will include clauses for delivery schedules, quality assurance, and penalties for delays.  **Project-based (for prototyping):**  During prototype and pre-production phases, small batch orders will be placed for specific components required for subsystem testing, integration, and validation in laboratory conditions. |
| **Service/Product Provided:** |
| **Type of enterprise:** Aerospace component manufacturer and distributor.  **Products Supplied:** Propulsion subsystems, satellite communication modules, cryogenic storage materials, and docking interface components.  **Advantages:** High reliability, compliance with European Space Agency (ESA) standards, and technical support for integration testing. |
| **Supplier 2:** | |
| **Company:** | **Form of Collaboration:** |
| **SpacePharma SA – Microgravity Research Platform Partner**  <https://www.spacepharma.health/> | * Contractual; * Project-based;   **Project-based:**  Initial collaboration will focus on testing microgravity-compatible biotechnological payloads for protein crystal growth. This includes consultancy and hardware validation for the crystallization capsules designed by Nava  **Contractual (optional , long-term):** After successful prototype validation, a long-term collaboration agreement may be signed to standardize payload interfaces and enable recurring flight opportunities. |
| **Service/Product Provided:** |
| **Type of enterprise:** Microgravity research and biotechnology service provider.    **Products Supplied:** Modular bioreactor systems, crystallization capsules, and telemetry integration tools.  **Advantages:** Proven track record in ISS experiments, adaptability to new payloads, and access to biomedical research networks. |
| **Operational Phases** **Phase Breakdown with Funding**   * **Q4 2025 – Concept Phase (Seed Round, $3–5M)**   + Market research & partnerships.   + Early spacecraft design studies.   + Seed capital funds salaries for core engineering team, regulatory filings, and proof-of-concept demos (lab-based fuel transfer & robotics). * **2026 – Pre-Production (Series A, $15–25M)**   + Subsystem contracts signed (xenon propulsion, RAFTI refueling, robotic arms, cryogenic payload box).   + Initial ground-based proof-of-concept demonstrations.   + Series A funds: engineering hires, hardware procurement, cryogenic preservation tests, and regulatory compliance. * **2027 – Production (Series B, $40–60M)**   + Flight hardware fabrication (main bus, robotic servicing arm, cryogenic return capsule).   + **Key milestone**: Autonomous docking + cryogenic transfer demo at ISS or commercial station.   + Series B funds: system integration, testing facilities, mission simulation environments. * **2028 – Polish (Bridge / Pre-Series C, $25–40M)**   + Flight unit qualification, insurance, and launch integration.   + **Feature Complete**: spacecraft and systems validated.   + **Content Complete**: regulatory clearances, ground operations running.   + Bridge round funds: launch prep, insurance, ground ops. * **Q4 2028 – Launch & Early Operations (First Revenue)**   + First mission launch & operations.   + On-orbit servicing begins (satellite refueling + deorbit demo).   + First protein crystal payload returns to Earth.   + First **revenue event** from commercial servicing contracts. * **2029 – Post-Launch Expansion (Series C / Revenue-Funded Growth)**   + Monetization through recurring satellite servicing and science return contracts.   + Expansion: second-generation spacecraft, refueling network buildout, GEO servicing R&D.   + Depending on growth rate, expansion can be Series C funded or bootstrapped by revenues. | |
| **What are the legal regulations that must be observed during the course of the activity?** | |
| In carrying out the activities of **Nava**, a company focused on the development and operation of space technologies including satellite life extension systems and orbital facilities for automated protein crystal growth strict compliance with national and international space regulations is essential. The company is committed to upholding all legal, environmental, and safety standards applicable to the aerospace and research sectors.  **1. International Space Law and Treaties**  Nava will adhere to the main international treaties that govern outer space activities:   * **The Outer Space Treaty (1967)** – establishes that outer space shall be used for peaceful purposes and that states bear international responsibility for national space activities, including those conducted by private companies. * **The Liability Convention (1972)** – defines liability for damage caused by space objects on Earth or in outer space. * **The Registration Convention (1976)** – requires the registration of all space objects launched into orbit with national and international authorities. * **The UN Space Debris Mitigation Guidelines** – ensure responsible management of satellites and spacecraft to prevent orbital pollution.   **2. National Legislation (depending on launch site)**  **United States**  If launches or operations are conducted in partnership with U.S. entities or from U.S. soil:   * **Commercial Space Launch Act (CSLA, 1984, as amended)** – regulates commercial space transportation through the **Federal Aviation Administration (FAA)**, requiring launch licenses and safety reviews. * **Federal Communications Commission (FCC)** – governs spectrum allocation for satellite communications. * **National Environmental Policy Act (NEPA)** – requires environmental impact assessments for launch operations. * **Export Administration Regulations (EAR)** and **International Traffic in Arms Regulations (ITAR)** – control the export of sensitive space technology.   **New Zealand**  If activities involve launches or collaboration with New Zealand’s space sector (e.g., Rocket Lab):   * **Outer Space and High-altitude Activities Act (2017)** – regulates the launch and operation of spacecraft and high-altitude vehicles, ensuring safety and environmental protection. * **Environmental Protection Authority (EPA) Regulations** – mandate environmental impact assessments for space-related operations. * **Civil Aviation Rules Part 101/102** – ensure airspace safety for launches and recoveries.   **European Union / Romania**  For operations based or registered in Europe:   * **EU Space Programme Regulation (2021/696)** – provides governance for space activities under the EU framework, including data protection, cybersecurity, and sustainability. * **Romanian Space Agency (ROSA)** – oversight body responsible for national compliance and coordination with the European Space Agency (ESA). * **Law no. 319/2006 on Occupational Safety and Health** – ensures workplace safety in laboratories and testing environments. * **Law no. 211/2011 on Waste Management** – regulates proper disposal of electronic and industrial waste from the manufacturing of satellite components.   At Nava, sustainability and compliance measures are key to our development as a company. We will guarantee implementing a **Compliance and Sustainability Program**, including:   **Environmental audits** before and after each project phase to ensure alignment with national and international environmental regulations.   **Data security and export control protocols**, ensuring compliance with ITAR/EAR and GDPR where applicable.   **Orbital debris management policies**, including deorbiting plans and propulsion system safeguards.   **Continuous collaboration** with national space agencies (NASA, ESA, ROSA, NZSA) and environmental authorities for licensing and verification.  We vow to upheld our standards and moral values and ensure that all of our projects and missions will follow principles of sustainability, safety, and transparency, ensuring minimal ecological footprint both on Earth and in orbit. | |

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| **7.** **Innovative Element of the Business** |
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| Nava offers an innovative solution in the field of space technology: a **fully automated system for in-orbit satellite servicing and protein crystal growth**, designed to operate without any human presence onboard the spacecraft. This approach transforms traditional space research and satellite maintenance by combining robotics, AI, and real-time command systems to maximize efficiency and safety.  Key innovative features of Nava include:   1. **Fully Automated Robotic Operations** • The spacecraft integrates a robotic arm capable of performing all satellite servicing tasks, including docking, refueling, and component maintenance. • Protein crystal growth chambers are monitored and adjusted in real-time without human intervention, ensuring precise control of microgravity experiments. 2. **Real-Time Monitoring and Control** • Advanced sensors provide continuous data on the status of both satellite servicing operations and protein crystallization processes. • All operations are coordinated remotely from Earth, allowing for safe and efficient mission management. 3. **Sustainable and Scalable Space Solutions**   • By extending the lifespan of satellites in Low Earth Orbit (LEO), Nava contributes to reducing space debris and improving the sustainability of space infrastructure. • The automated system enables repeated missions with minimal operational costs, making satellite servicing and protein crystal research scalable for multiple clients.   1. **Alignment with Global Innovation Trend**   • The solution leverages cutting-edge robotics, AI, and space technology to address growing demands in both commercial satellite operations and biomedical research. • Nava’s approach promotes innovation in orbital research while delivering tangible benefits in pharmaceuticals, materials science, and satellite sustainability. |

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| **8.** **Risk Management** |
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| 1. **Technological Risks** The technologies involved in autonomous satellite servicing and in-orbit protein crystal growth are cutting-edge and still under development. Potential challenges include failures in robotic operations, docking errors, cryogenic preservation issues, or malfunction of automated systems.  **Mitigation Measures:**  • Extensive prototyping and ground-based simulations.  • Collaboration with aerospace research centers and universities.  • Continuous testing and iteration of software and hardware subsystems.  • Implementation of redundant systems and fail-safes for critical operations.  2. **Financial Risks** High R&D costs, long development cycles, and the uncertainty of market adoption can impact cash flow and financial sustainability, particularly before the first commercial missions.  **Mitigation Measures:**  • Access to grants, space innovation funds, and venture capital.  • Phased development approach, starting with small-scale demonstration missions.  • Diversification of revenue streams (satellite servicing contracts, protein crystal research services).  • Strategic partnerships with government agencies, research institutions, and commercial satellite operators.  3. **Regulatory and Legal Risks** Compliance with space law, launch regulations, and biosafety standards is critical. Delays or non-compliance could halt operations.  **Mitigation Measures:**  • Early engagement with national and international space agencies.  • Continuous monitoring of regulatory changes and compliance audits.  • Employ legal advisors specialized in aerospace and biotechnology law.  4. **Market Risks** Reticence from satellite operators, pharmaceutical companies, or research institutions toward new technologies could slow adoption.  **Mitigation Measures:**  • Demonstration missions to showcase reliability and safety.  • Targeted marketing campaigns highlighting the benefits of extended satellite lifespans and in-orbit protein crystal growth.  • Pilot projects in partnership with research labs or commercial satellite operators.  5. **Operational and Environmental Risks** Space is an inherently risky environment: orbital debris, launch failures, extreme temperatures, and radiation can compromise missions.  **Mitigation Measures:**  • Robust spacecraft design with shielding and redundancy.  • Real-time monitoring of orbital conditions and automated safety protocols.  • Insurance coverage for launch and in-orbit operations.  • Modular spacecraft design to allow replacement of critical components. |