<ProjectName>
(Business Case)

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Digital transformation in education has accelerated due to the pandemic and the rise of remote and hybrid learning. Despite the availability of online platforms like Zoom or MS Teams, students report decreased engagement, lower retention, and reduced interaction in virtual environments. Additionally, the absence of hands-on experience in technical or practical subjects creates significant learning gaps.

Metaverse and Virtual Reality technologies are emerging as promising solutions to these challenges. They enable immersive, interactive, and collaborative environments that can simulate real-life scenarios, support practical training, and foster community, even when physical presence is not possible.

1. Problems

Students in remote and hybrid learning environments often feel disconnected and less engaged compared to traditional, in-person classes [1]. This lack of interaction with peers and instructors contributes to lower academic motivation and performance. Furthermore, conventional e-learning tools such as static presentations, recorded lectures, or documents fail to provide the hands-on, practical experience needed in fields like medicine, engineering, or natural sciences. This makes it difficult for students to fully grasp complex concepts or develop technical skills [2]. Additionally, first-year students frequently struggle with adapting to the university environment, finding classrooms and offices, and integrating into the student community. These issues combined result in reduced learning effectiveness, decreased student satisfaction, and higher dropout rates.

2. Solution outline

Create a centralized Metaverse and Virtual Reality-based learning platform for university event management that:

- **Virtual Classrooms & Labs**: Simulate real-world environments for hands-on learning.
- **Immersive Campus Tours**: Help first-year students navigate the university and integrate into the community.
- **Social & Collaborative Spaces**: Support peer interaction and group work to reduce isolation.
- **Interactive Instructor Sessions**: Enable real-time mentoring and support through VR.
- **Gamified Learning**: Boost engagement and retention with simulations and interactive scenarios.
- **Practical Learning**: Allowing students to participate in simulations, 3D explorations, and real-world scenario-based learning.

3. Options

Do nothing:
Continue with traditional online platforms like Zoom or MS Teams. While convenient and familiar, these tools lack immersive engagement and practical training capabilities. The student experience remains limited, and issues such as disengagement and lack of collaboration persist.

Implement basic VR onboarding:
Develop a limited VR solution that offers only virtual campus tours for new students. This addresses orientation challenges but fails to solve broader problems such as lack of interaction in courses, insufficient hands-on learning, and weak peer collaboration.

Full Metaverse/VR solution:
Develop and implement a comprehensive educational platform using Metaverse and Virtual Reality technologies. This includes features such as virtual classrooms, labs, orientation spaces, social zones, and gamified learning. It addresses multiple pain points across student learning, integration, and satisfaction.

4. Benefits and Results

Expected Benefits:

- Significantly increased student engagement through immersive and interactive environments.
- Better conceptual understanding and memory retention, especially in STEM and practical subjects.
- More inclusive onboarding experience for first-year students.
- Enhanced collaboration and a stronger sense of community, even in remote settings.
- Reusable and scalable infrastructure for future academic uses (e.g., virtual conferences, career fairs).

Expected Dis-benefits:

- A short initial learning curve and resistance to change from both students and instructors.
- Potential inequality if some students lack access to necessary hardware (e.g., VR headsets or powerful computers).

5. Timescales

- **Project Duration:** April – August 2025
- **Earliest Start:** April 22, 2025
- **Latest Completion:** August 31, 2025

Key Stages:

- Design & Planning: April – early May
- Development (MVP): May – June
- Testing & Refinement: July
- Deployment: August
- Benefit Realization: From September 2025 (start of academic year)

When to Pay:

- Initial development: April–June
- Hosting & maintenance: from August onward

When Benefits Begin:

- First benefits visible from September 2025
- Full impact by end of academic year 2025/26

6. Costs

- **Development costs:** Minimal (realized as a student/university project)
- **VR content creation (optional expansion):** ~5,000–10,000 PLN
- **Infrastructure (servers, hosting, support):** ~500 PLN/month
- **Hardware (optional pilot program):** Cost depends on scale, e.g., ~1,500–2,000 PLN per VR set
- **Training and onboarding:** Provided internally through short workshops or video tutorials

7. Investment Appraisal

Return on Investment (ROI):
High, especially considering minimal initial costs. Benefits such as increased retention, better learning outcomes, and improved student experience significantly outweigh the limited budgetary outlay.

Payback Period:
Immediate to 1 academic semester – as educational benefits begin to appear with the first student cohort using the platform.

Funding:
Internal university support, academic grants, or potential partnerships with Tech startups.

8. Major Risks

- Users may be reluctant to adopt a new platform due to unfamiliarity with VR/Metaverse technologies.
- Not all students have access to VR-compatible devices or powerful computers.
- Platform instability, crashes, or performance issues during live sessions.
- Improper handling of student data, especially with avatars, voice, and behavior logs (or other security concerns)
- The success of the pilot may attract other faculties or grant providers (positive risk!!!!)

9. References

[1] Exploring Student and Teacher Experiences in Hybrid Learning Environments: Does Presence Matter? - https://link.springer.com/article/10.1007/s42438-021-00274-0

[2] The impact of virtual reality on practical skills for students in science and engineering education: a meta-analysis - https://www.researchgate.net/publication/381518839_The_impact_of_virtual_reality_on_practical_skills_for_students_in_science_and_engineering_education_a_meta-analysis

Accepted by:

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