SIMPO 2025

SIMStation

# Simulation Centres Territory for Medical Innovations

Joachim Hilbrand
Jiří Travěnec

# Joachim Hilbrand

CEO and co-founder

SIMStation GmbH

Vienna, Austria

SIMStation

# Jiří Travěnec

Deputy Director for Technology

SIMU MED MUNI

Brno, Czech Republic

MUNI | SIMU
MED

# Simulation Centres Will Be The R&D Testbeds for Tomorrow's Medicine

SIMStation

MUNI | SIMU MED

# Advantages of Teaching in SC

- **Repeatable and predictable environment** – learners can practise until mastery.
- **Safe and controlled setting** – mistakes do not harm patients.
- **Standardised training** – every student faces the same conditions.
- **Objective measurement** – performance can be assessed and tracked.
- **Immediate feedback and debriefing** – accelerating learning cycles.

**Goal: safer and better clinical care**

MUNI | SIMU MED

SIMStation

# Research and Development Needs

- **Controlled and reproducible** – reliable testing of prototypes and workflows.
- **Safe and neutral space** – no direct impact on patients or clinical operations.
- **Standardised methodology** – experiments can be replicated and validated.
- **Quantifiable outcomes** – data can be measured and benchmarked.
- **Real-time observation and iteration** – innovations can be rapidly improved.

**Goal: safer and better clinical care**

MUNI | SIMU MED

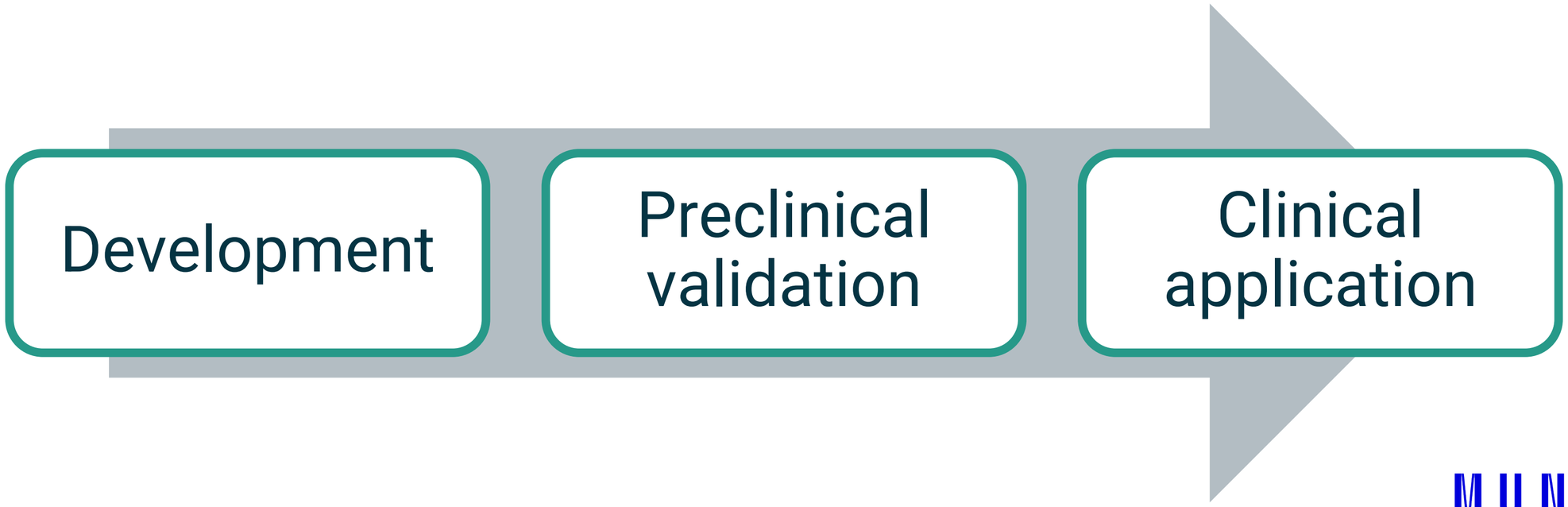
SIMStation

# Bridge Between Classroom and Real Patient Care


MUNI | SIMU MED

SIMStation

# Bridge Between Prototype and Real Medicine




MUNI | SIMU MED

SIMStation

# Universities are designed for Teaching

They already provide:

- **Qualified human resources** – academic staff, technical specialists, and students eager to learn
- **Specialised equipment and facilities** – laboratories, skills labs, simulation centres
- **Safe and controlled environments** – where learners can practise without patient risk

MUNI | SIMU MED

SIMStation

# Universities are also ideal for R&D and Innovation

They also possess:

- **Expertise and personnel** – researchers, interdisciplinary teams
- **Infrastructure** – labs, simulation environments, high-tech equipment
- **Safe and controlled spaces** – where prototypes can be tested away from patients
- **Freedom from clinical regulations**

MUNI | SIMU MED

SIMStation

# Healthcare Simulation is Costy

- **Teaching-focused activities** – not revenue generating
- **High operation costs** – equipment, technology, facility costs, human resources
- **Resource intensive** – staff time, consumables, manikins

⇒ **University funding, Grants, Donations**

MUNI | SIMU MED

SIMStation

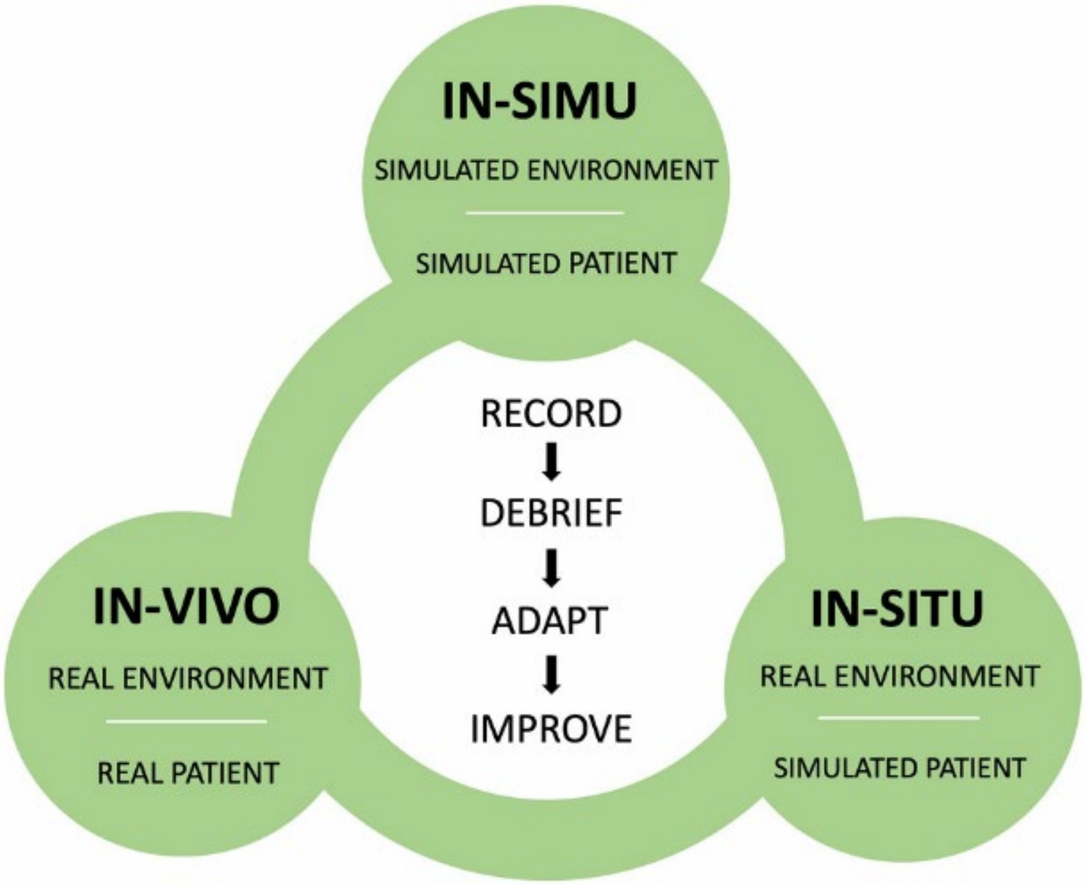
# R&D Creates Revenue Opportunities

- **Paid research and industry collaborations** – testing for manufactures, training studies, clinical workflows, MDR
- **Certification and training programs** for external clients
- **Grants and funded projects** – co-development, research funding
- **Long-term ROI possibilities** – licensing, patents, or spin-off ventures

MUNI | SIMU MED

SIMStation

# Cycle of Safety




MUNI | SIMU MED

SIMStation

# Audience Engagement

*Who works in a simulation centre or lab that…*

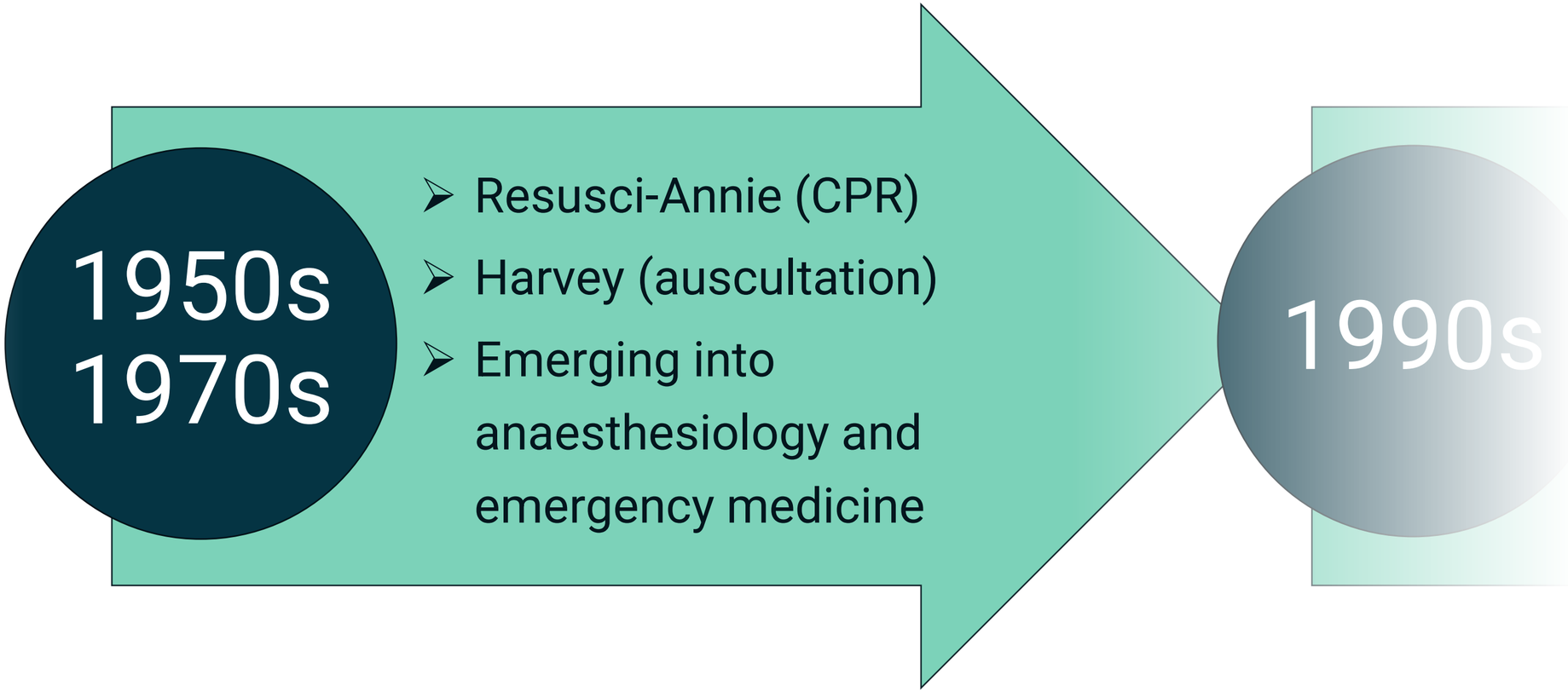
*conducts **any form** of research, development, or innovation – basically anything beyond teaching?*

# Audience Engagement

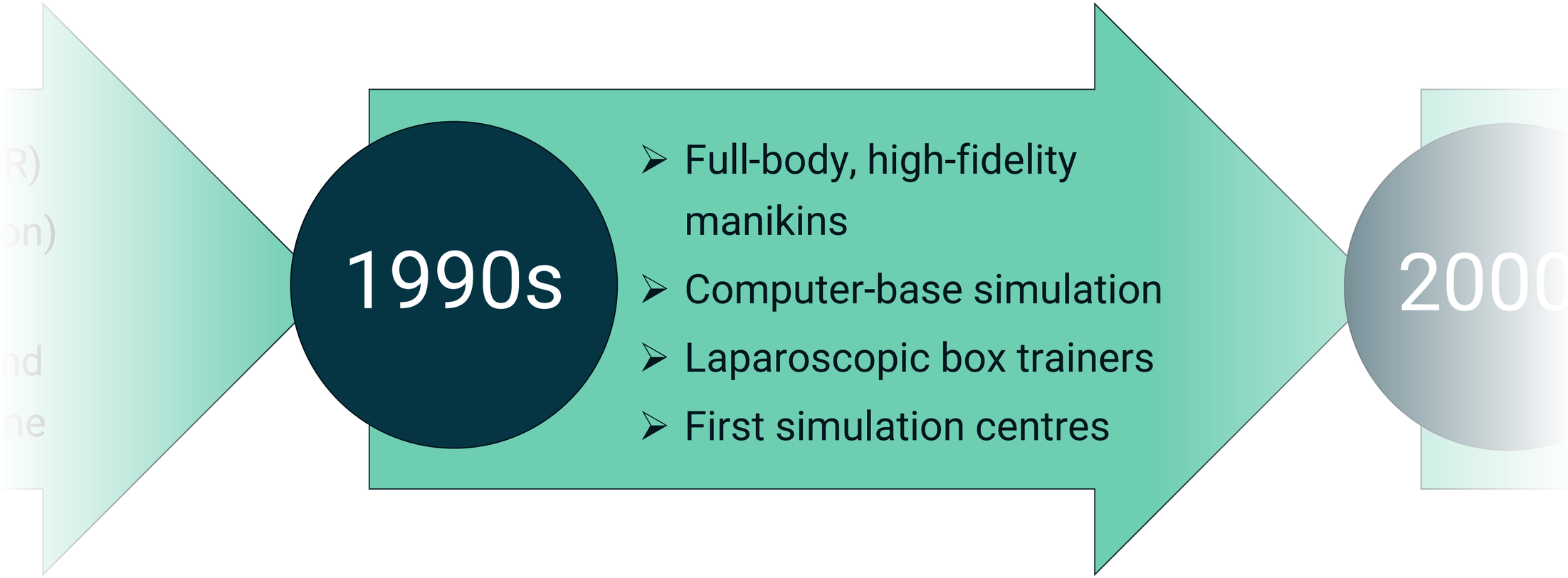
*And who here is involved in R&D or innovation, in the simulation centre or lab,…*

*that has a **tangible impact on actual clinical practice**?*

# History of Healthcare Simulation

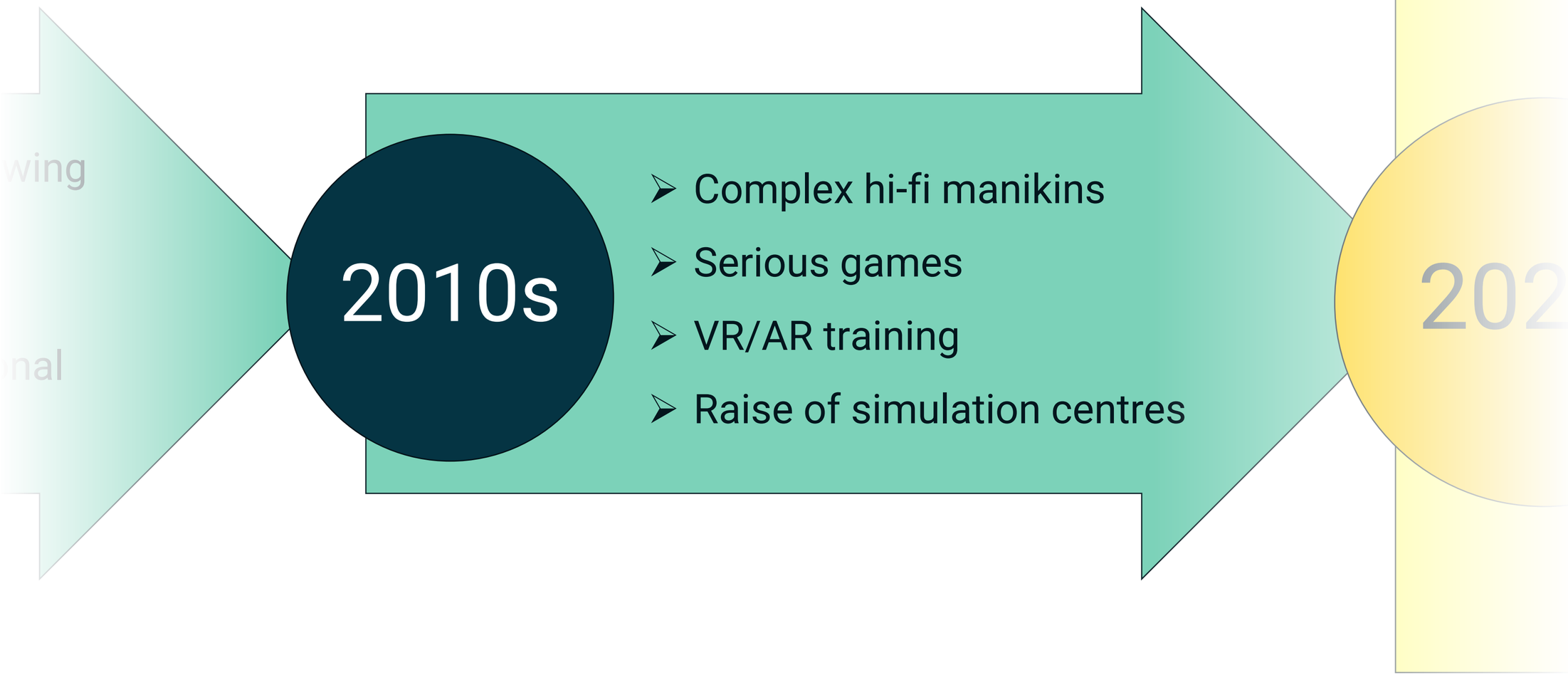


# History of Healthcare Simulation



# History of Healthcare Simulation

# History of Healthcare Simulation



# Present of Healthcare Simulation

2020s

- Artificial intelligence
- Extended reality
- Immersive technologies
- Digital twins
- Adaptive learning
- Clinical debriefing
- Global standardization
- Simulation becomes strategic instrument
- Raise of research and innovation laboratories

# Opportunity to Shape the Future

1. **Testing new medical devices** – try prototypes in realistic scenarios before clinical trials.
2. **Workflow optimisation** – simulate hospital processes to improve efficiency and reduce errors.
3. **Human factors research** – study teamwork, communication, and decision-making in safe settings.
4. **Digital health validation** – test AI, apps, and monitoring systems before patient use.

MUNI | SIMU MED

SIMStation

# Opportunity to Shape the Future

5. **Clinical procedure innovation** – experiment with novel surgical or procedural techniques safely.
6. **Risk-free patient safety research** – analyse potential errors and develop mitigation strategies.
7. **Training and certification research** – measure effectiveness of new educational methods or curricula.
8. **Prototype-to-practice translation** – accelerate innovation from lab ideas to real-world implementation.

MUNI | SIMU MED

SIMStation

# Conclusion

SIMStation

MUNI | SIMU MED

# Role of Simulation Centres in R&D

Simulation centres can serve as testing grounds for all new clinical technologies.

Collaboration with healthcare technology companies to develop and refine future Clinical Decision Support Systems (CDSS).

Revenue opportunity for simulation centres.

MUNI | SIMU MED

SIMStation

# Benefits of Using Simulation Centres as Testbeds

Safe environment to test and iterate on new technologies before clinical deployment.

Well equipped with ability to gather real-time feedback and data to improve system functionality.

Enhanced training for healthcare professionals on the use of new decision support tools.

MUNI | SIMU MED

SIMStation

SIMStation

SIMStation
Better Simulation.

# Thank you!