10^{-10} Hz 10^{3} Hz 10^{20} Hz

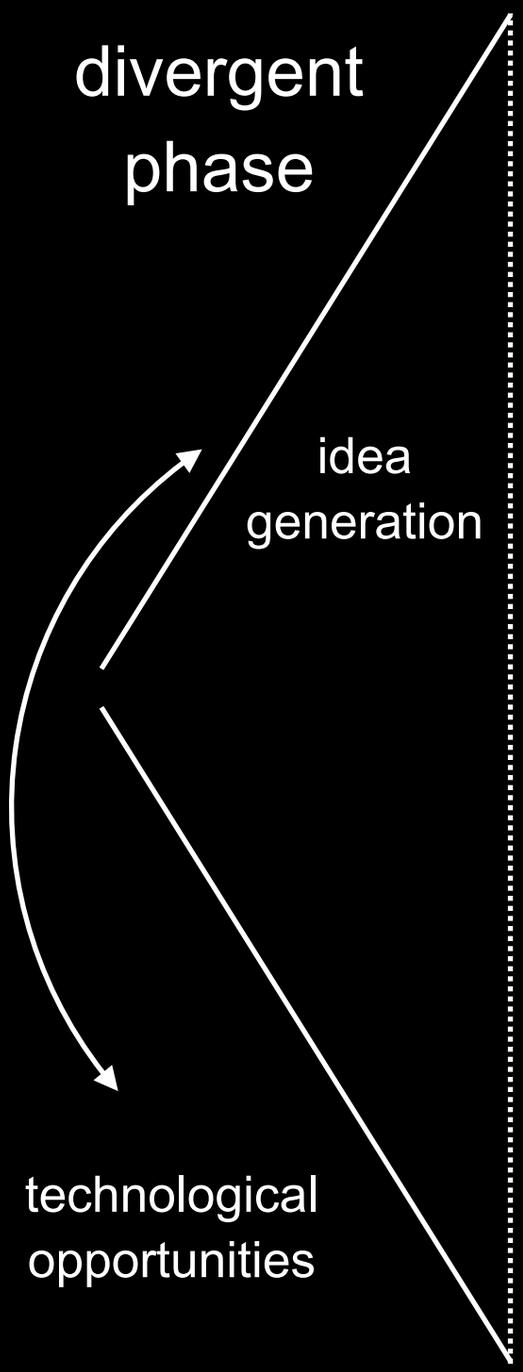
Living review update

Session II

Ultra-High-Frequency GWs
Where to Next?

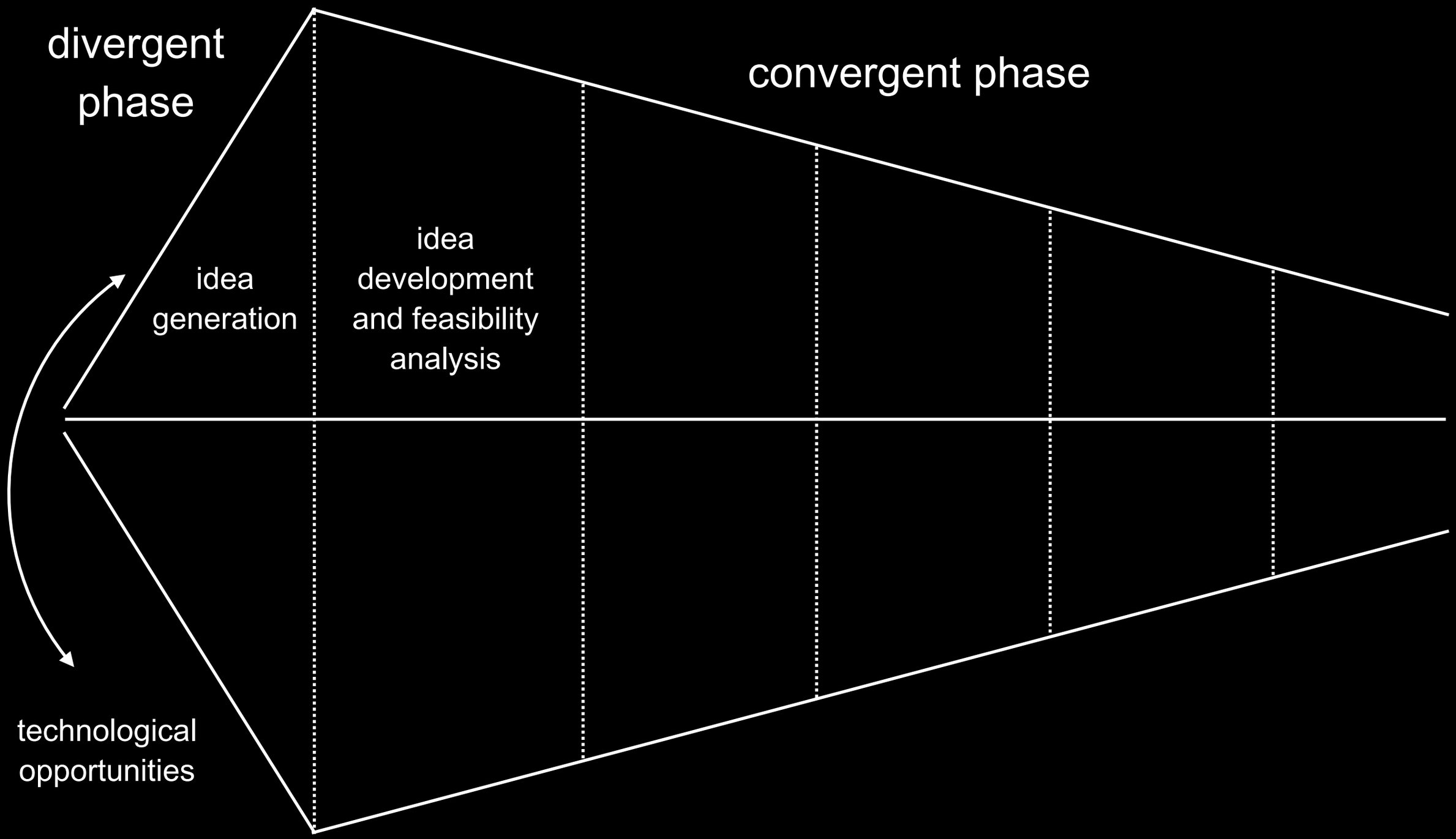
Monumental innovation project

STAGE-GATE MODEL



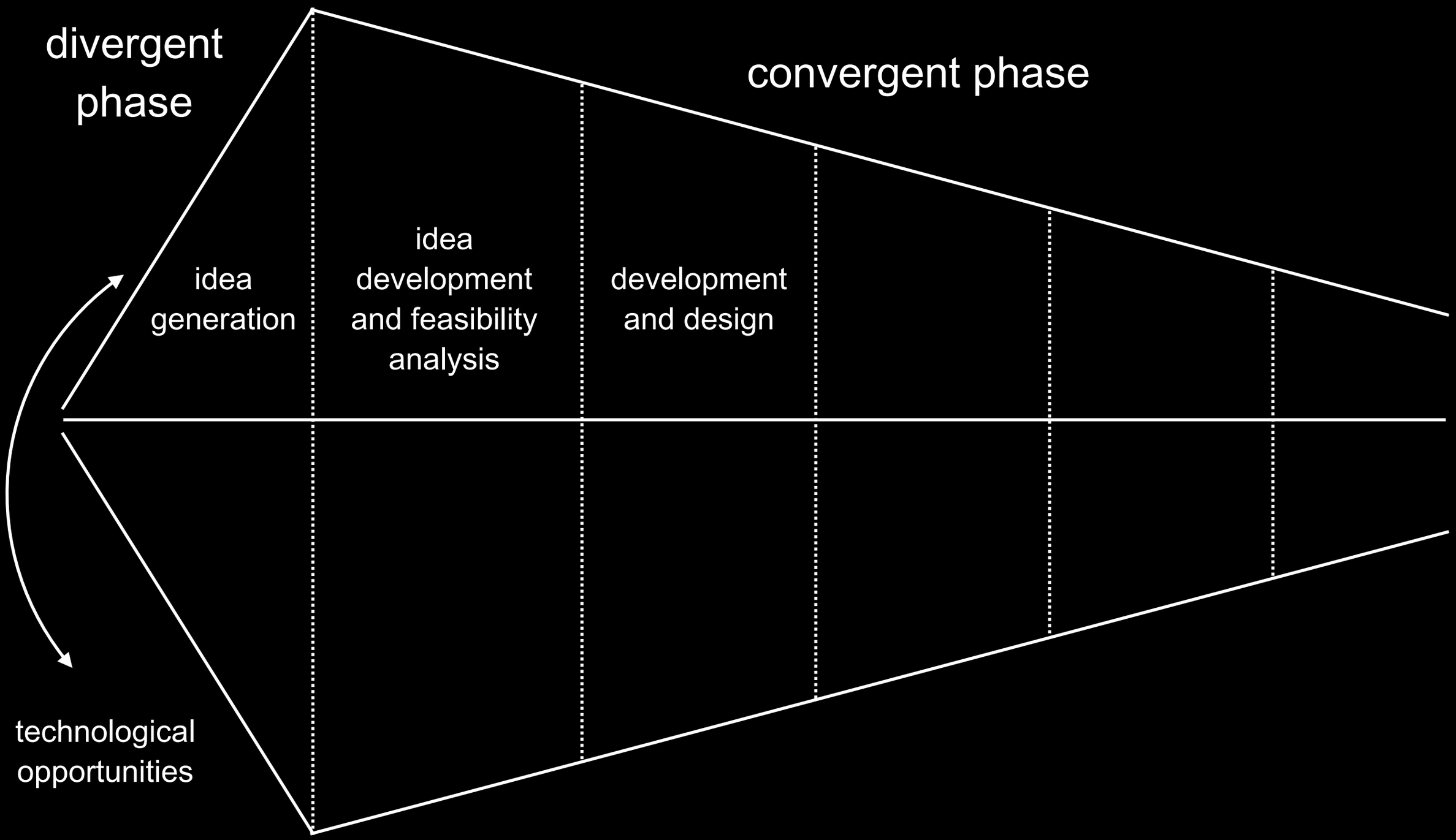
Monumental innovation project

STAGE-GATE MODEL



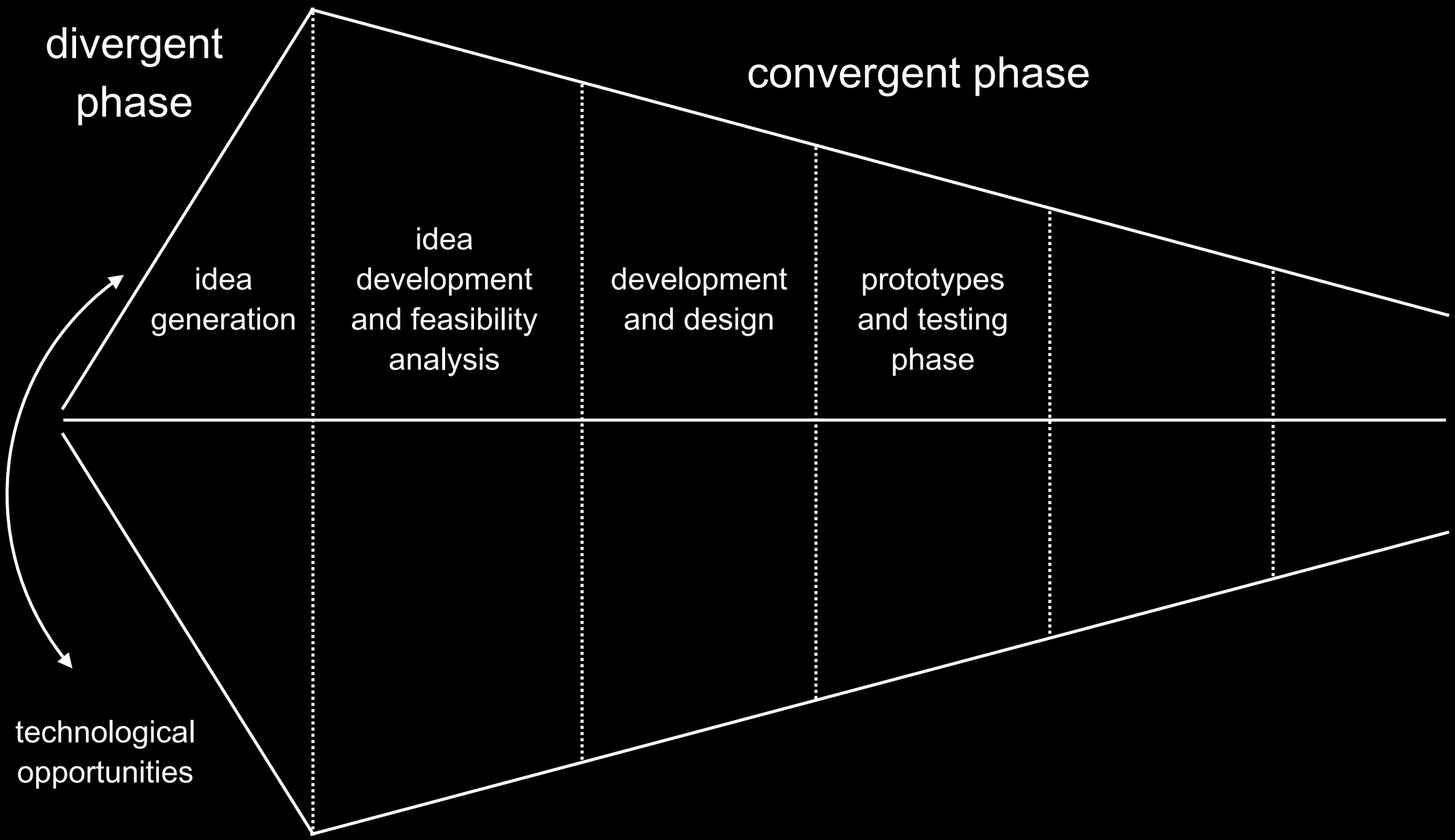
Monumental innovation project

STAGE-GATE MODEL



Monumental innovation project

STAGE-GATE MODEL



Monumental innovation project

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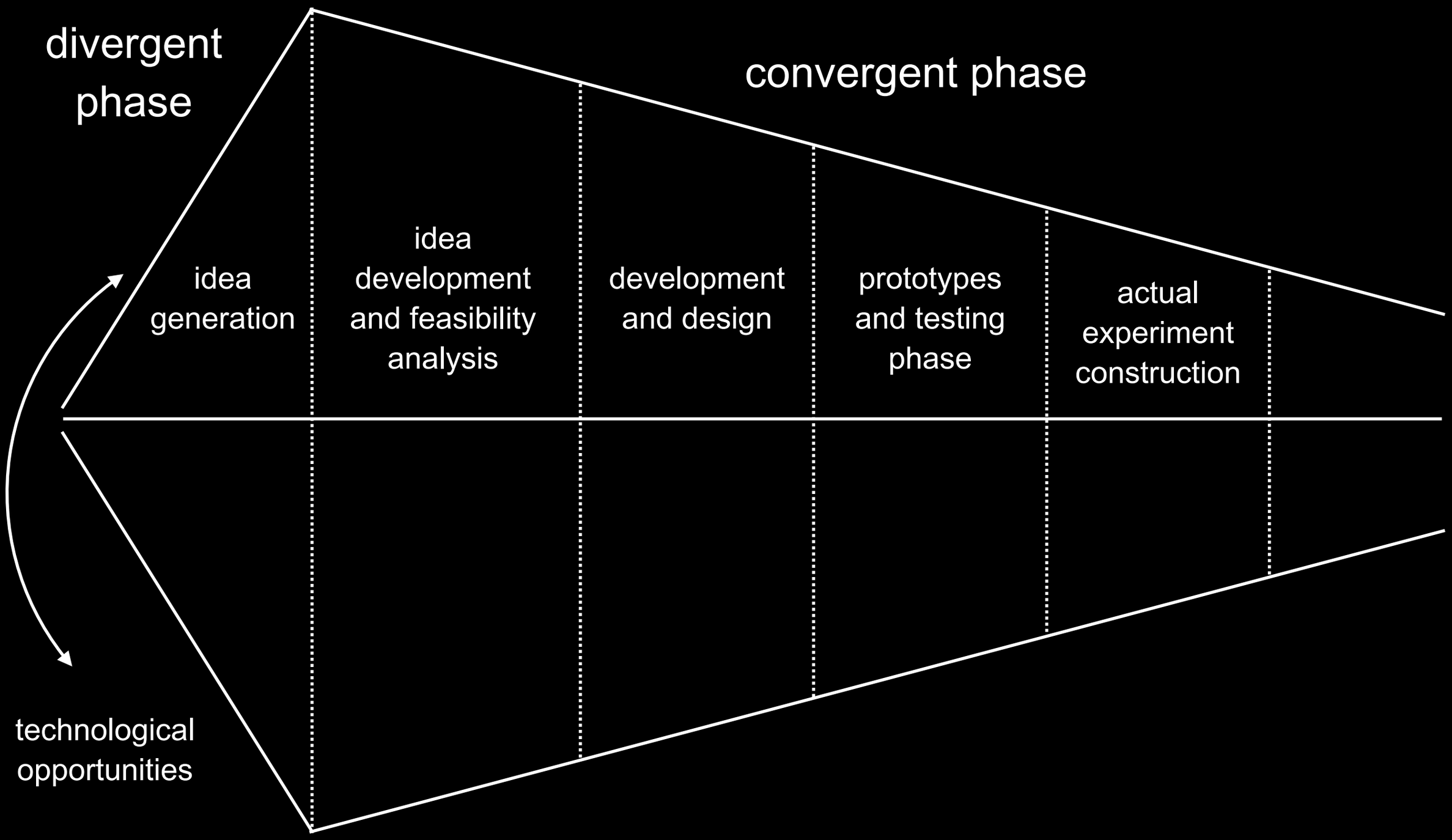

Monumental innovation project

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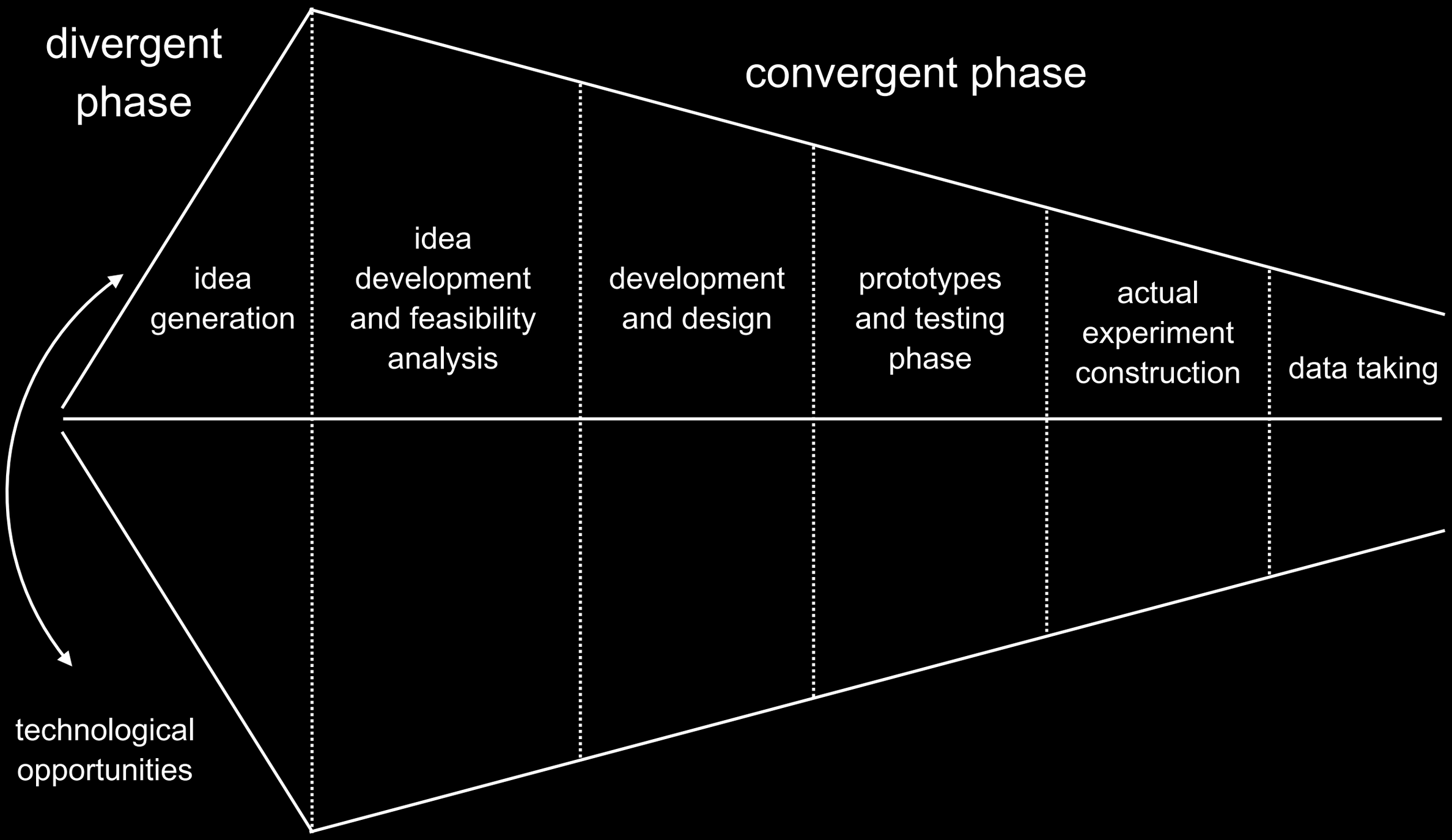

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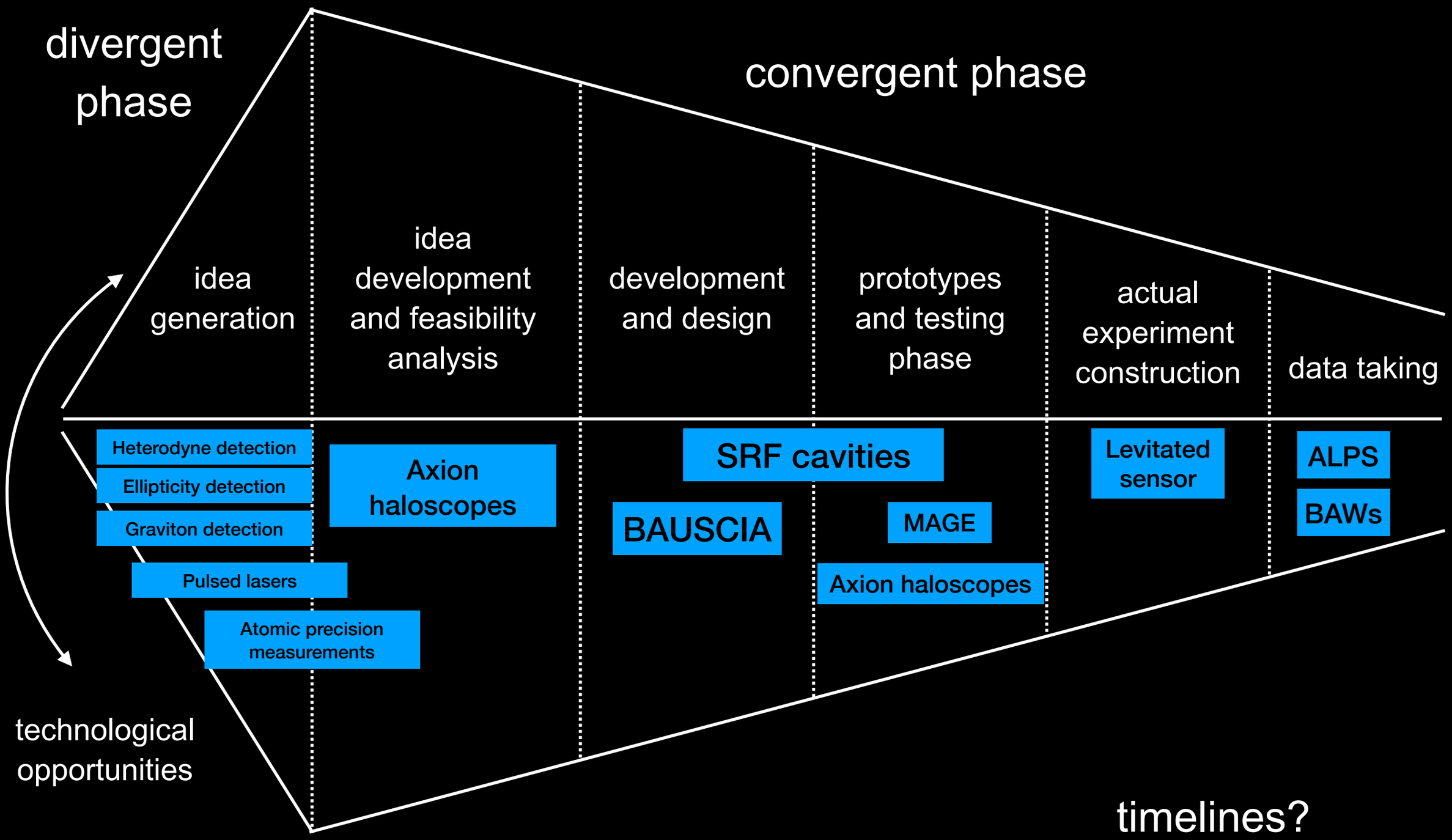

Monumental innovation project

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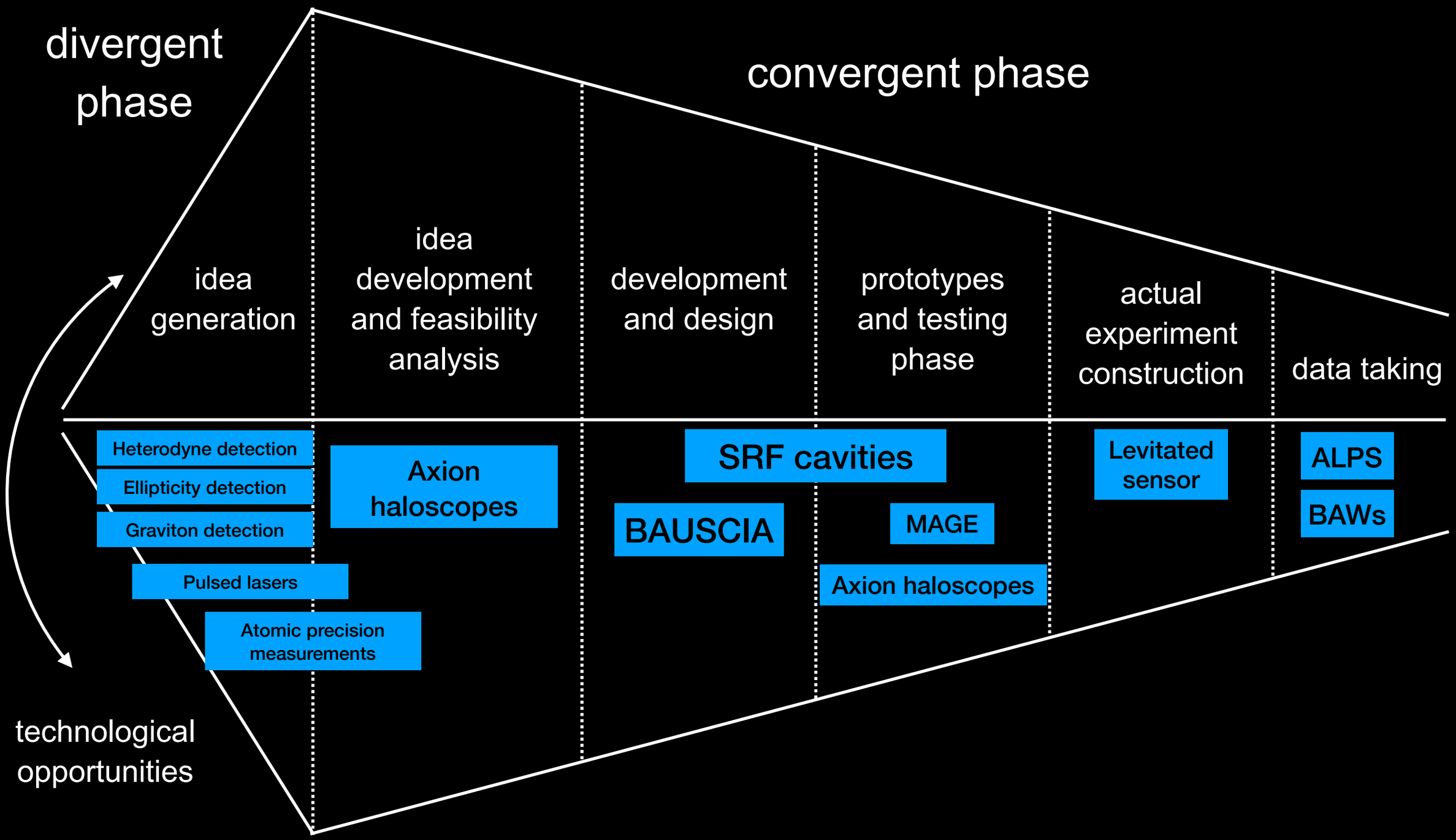
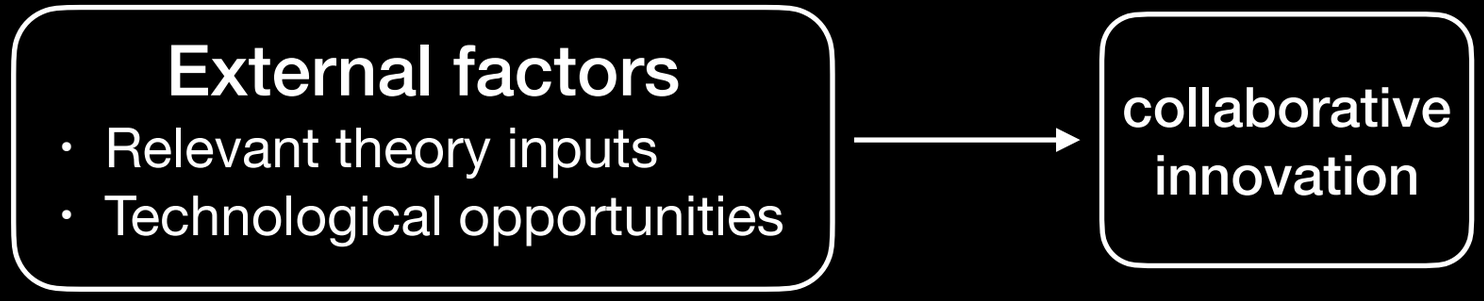


Collaborative innovation

Collaborative innovation



Collaborative innovation

Facilitating factors

- Compatible goals
- Reciprocal trust and absence of opportunistic behaviours
- High-quality communication
- Constructive committment
- Perception of equity in the share of risks and benefits

External factors

- Relevant theory inputs
- Technological opportunities

→ **collaborative innovation**

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collaborative innovation

Opposition factors

- Physical and technical barriers
- Complexities of coordinating international efforts
- Fear of losing control over a field or a technology
- Frustration if not all partners are equally committed
- Perception of inequity

Collaborative innovation

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collaborative innovation

Results

- Speed up of the process
- Risk sharing
- Cost sharing
- Higher innovation rate

Opposition factors

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A path to the holy grail

$h = 10^{-21}$

continuous involvement of new students and people

$h = 10^{-35}$

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dedicated research groups and centers?

SQMS brings together more than 500 experts from 30 partner institutions—national laboratories, academia and industry—in a mission-driven, multidisciplinary collaboration that integrates deep expertise in quantum information science, material science, applied and theoretical superconductivity, computational science, particle and condensed matter physics, cryogenics, microwave devices and controls engineering, industry applications and more.

A path to the holy grail

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detection

New structure of the review

1. **Introduction**

2. **Setting up the Notation: Comparing Different GW Sources and Detectors** - (sarellis@protonmail.com)

3. **Sources**

    3.1 Late Universe - Gabriele Franciolini (gabriele.franciolini@cern.ch)

    3.2 Early Universe - Andreas Ringwald (andreas.ringwald@desy.de)

4. **Detection of Gravitational Waves at High-Frequencies** - Axel Lindner (axel.lindner@desy.de)

    4.1 Laser Interferometers and Resonant Mass Detectors and Their Limitations

    4.2 Modern resonant mass detectors - Diego Blas (dblas@ifae.es)

        4.2.1 Optically Levitated Sensors

        4.2.2 BAWs

        4.2.3 GW deformation of microwave cavities

    4.3 GW-EM conversion in the lab - Sung Mook Lee (sungmook.lee@yonsei.ac.kr)

        4.3.1 Light shining through a wall

        4.3.2 SRF cavities

        4.3.3 Axion haloscopes

        4.3.4 High energy pulsed lasers

        4.3.5 Others

    4.4 Astrophysical and cosmological detection concepts - Jamie McDonald (jamie.mcdonald@manchester.ac.uk)

    4.5 Alternative concepts - Asuka Ito (asuka.ito@kek.jp)

    4.6 Summary of detector sensitivities - TO BE REVISED

    4.7 Cross-correlation detectors - Giancarlo Cella & Kristof Schmieden (giancarlo.cella@pi.infn.it, kschmied@cern.ch)

5. **Conclusions**

FIRST DRAFT IS DUE ON THE 1st OF MARCH

Thank you all!