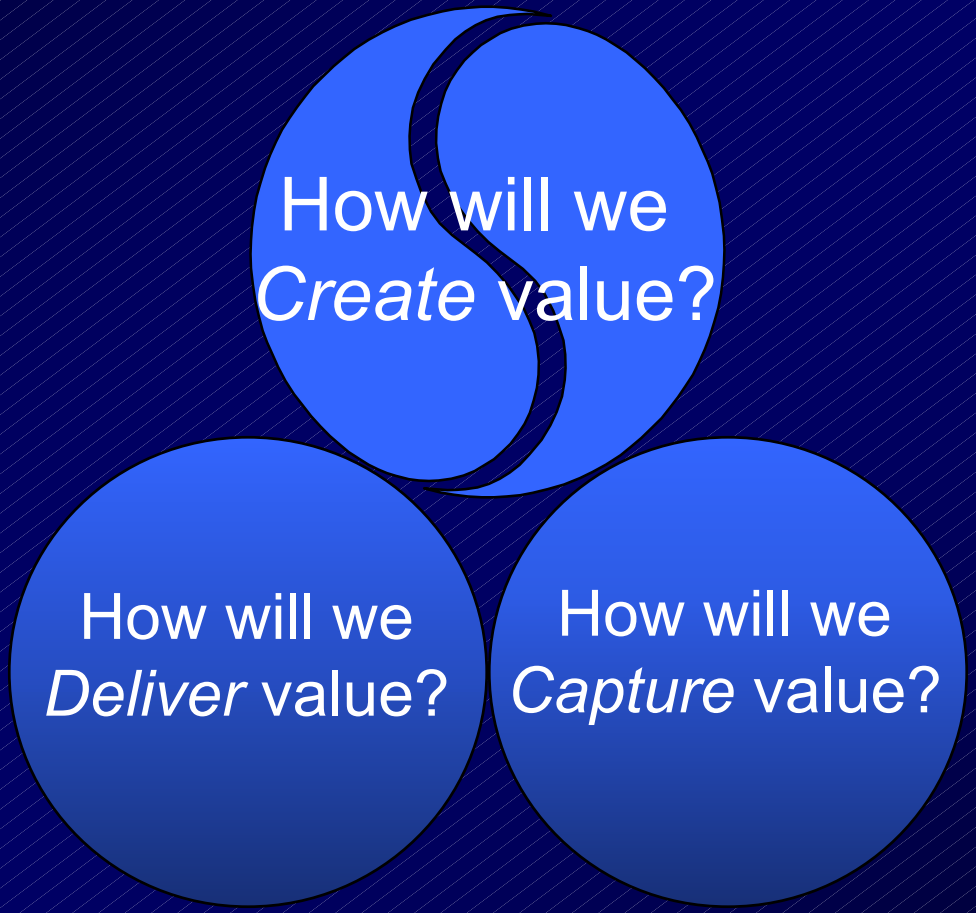
Creating Value: Predicting the path of technological evolution

The first of 3 key questions



Creating Value:

- Understand how customer needs will evolve
- Understand how technologies will evolve
  - (Both your own and those on which you rely)

- Develop world class products and services that meet customer needs

Agenda

- Can the future of technology be predicted?
  - Forecasting techniques
  - The product/process transition
  - Technological “exhaustion”
- How do markets evolve as technologies change?
  - Basic segmentation
  - Crossing the chasm
  - New technologies, new needs

Can one forecast the path of technological change?

- No

But

- Delphi models
- Forecasting by analogy
- Trend extrapolation

Delphi Models

- Ask the experts!
  - A committee?
  - Structured questionnaires?
- Pros
  - Field experts are often years ahead of day to day practice: technologies do not “come from no where”
- Cons
  - They sometimes have little knowledge of possible applications
  - They can be enthusiastic

New S curves may be hard to spot in advance

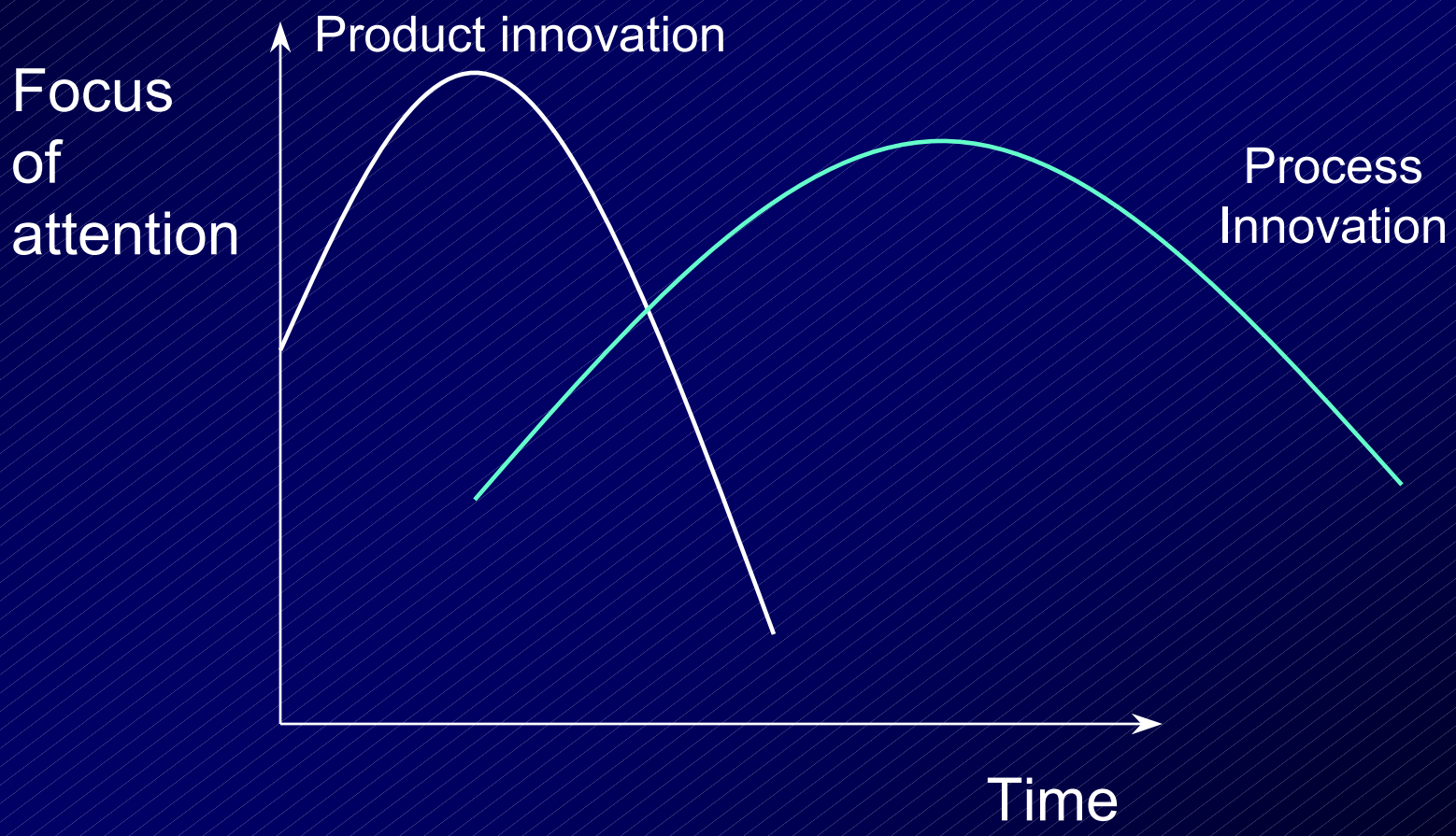
Forecasting by Analogy

- Is nanotechnology like semiconductors?
- Or like biotechnology
- Or like something else altogether?

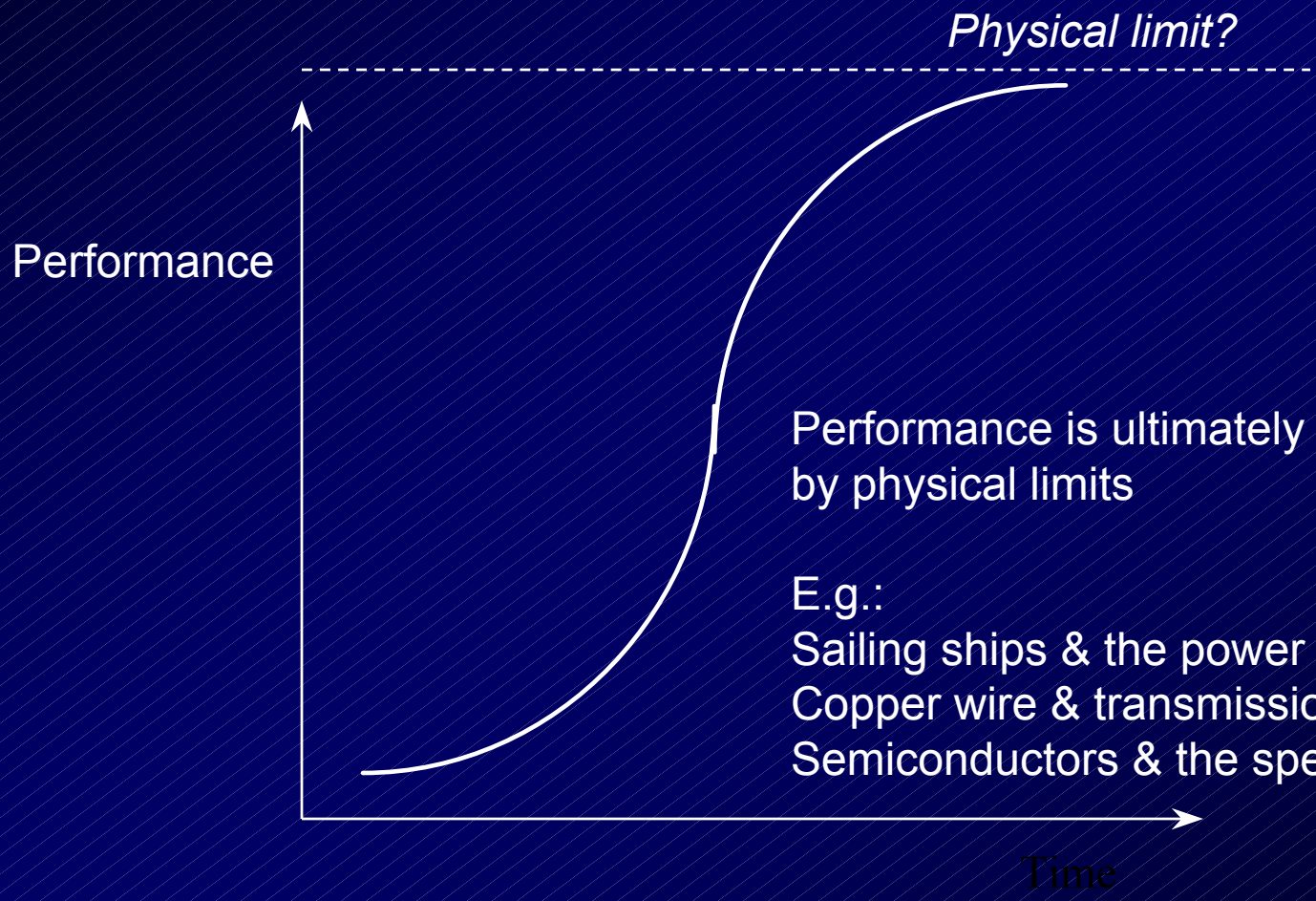
Issues in Trend Extrapolation

- Do all good things come to an end?
- Progress as a result of the passage of time versus progress as the result of returns to effort
- Predicting progress in complementary technologies

Can the Life Cycle be Predicted? The product/process transition



Do all good things come to an end? Technological exhaustion

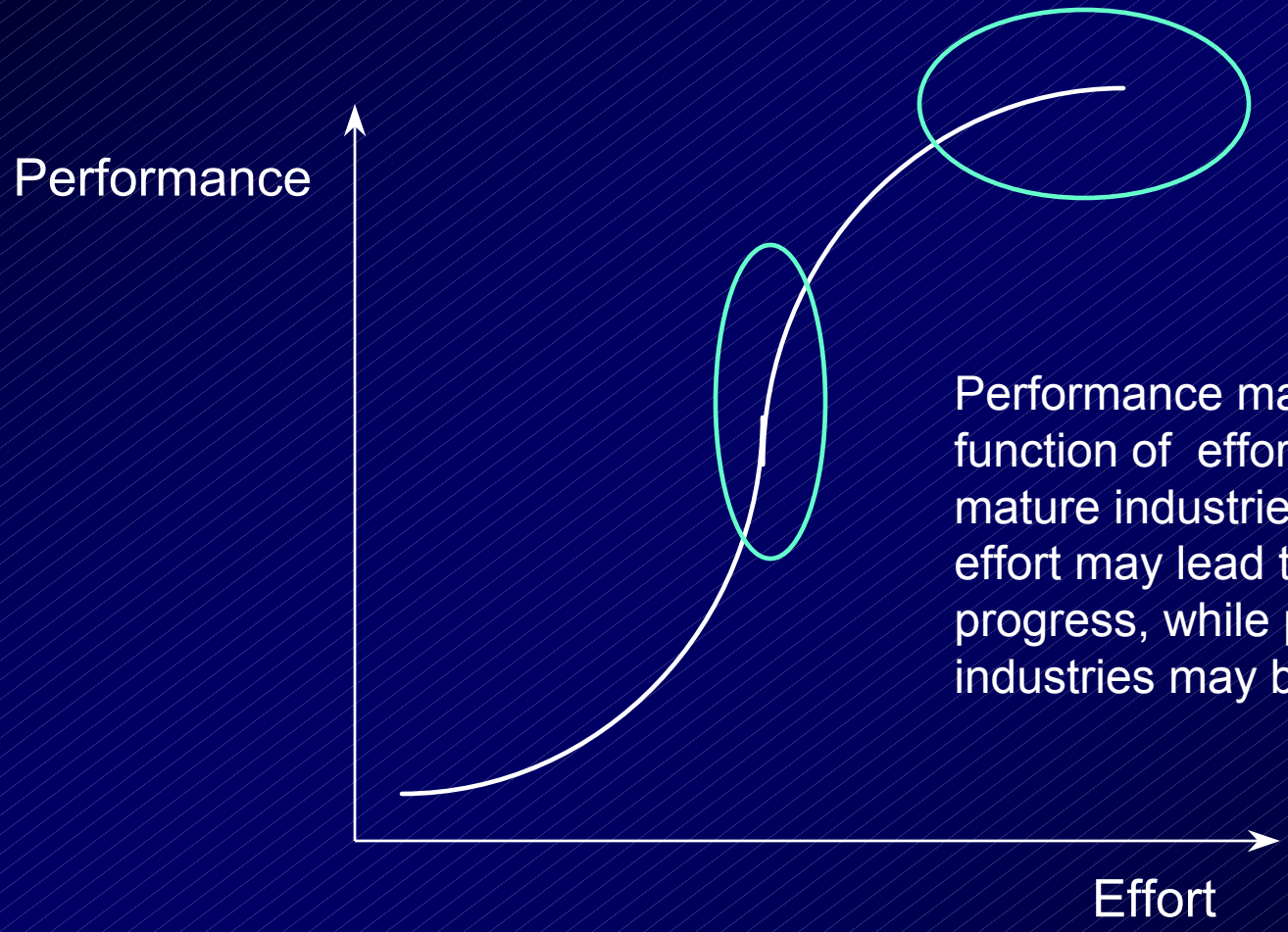


Performance is ultimately constrained by physical limits

E.g.:
Sailing ships & the power of the wind
Copper wire & transmission capability
Semiconductors & the speed of the electron

But predicted limits may change…

Modeling the returns to *effort* vs. *time*



Performance may be a non linear function of effort expended: in mature industries more and more effort may lead to less and less progress, while progress in emerging industries may be “surprisingly” fast

Using S curves:

- How are the S curve and the industry life cycle related?
- Do technological cycles drive organizational cycles?
- What is the right level of analysis at which to construct an S curve?
- How does one choose what to plot on the vertical axis?

- *What question are you trying to answer?*