INTRODUCTION TO EMBEDDED SYSTEMS

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NON OPERATIONAL QUALITY ATTRIBUTES

- Testability & Debug-ability
- Evolvability
- Portability
- Time to prototype and market
- Per unit and total revenue

TESTABILITY & DEBUG-ABILITY

Testability

How easily one can tests design, application.

Embedded hardware testing

Firmware testing

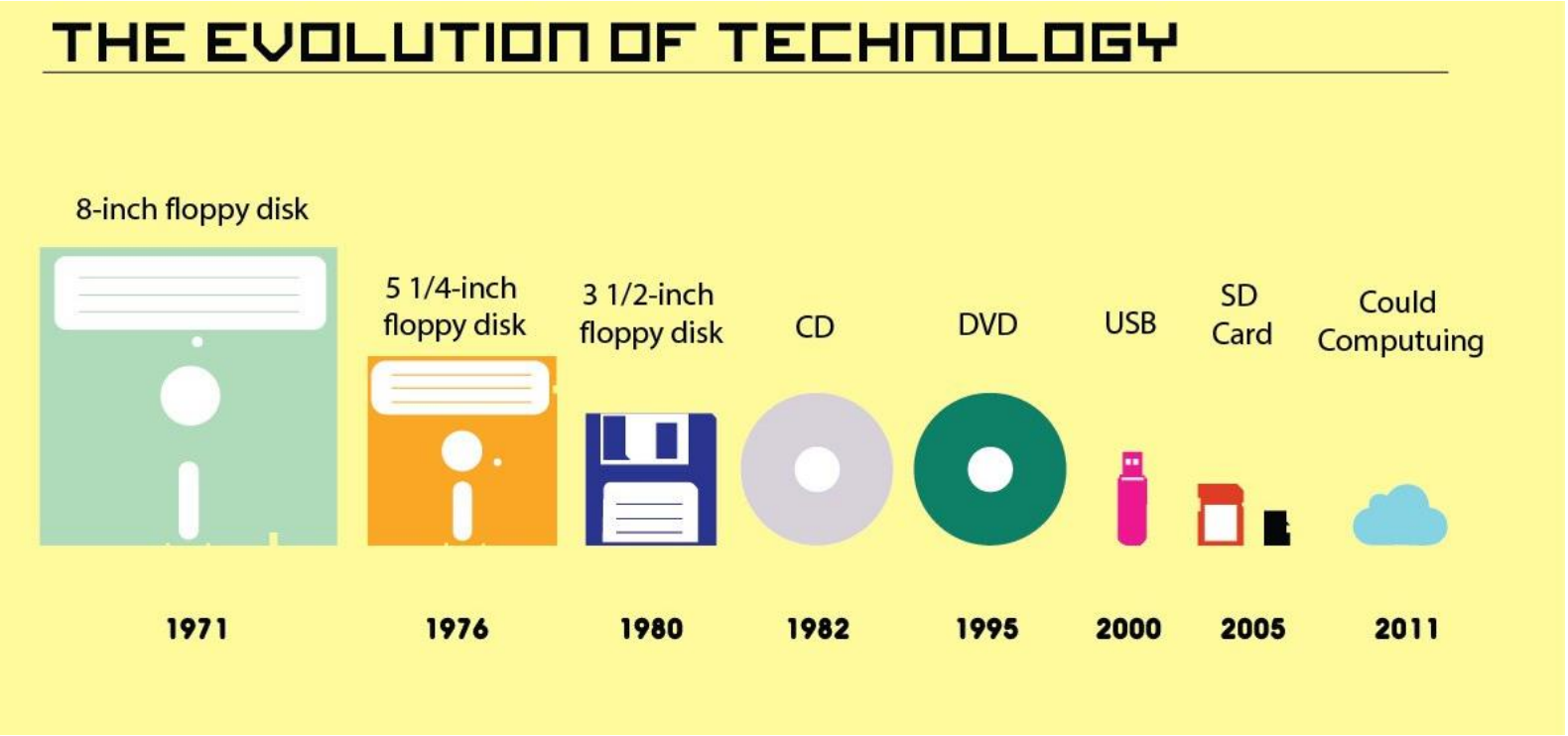
Debug-ability

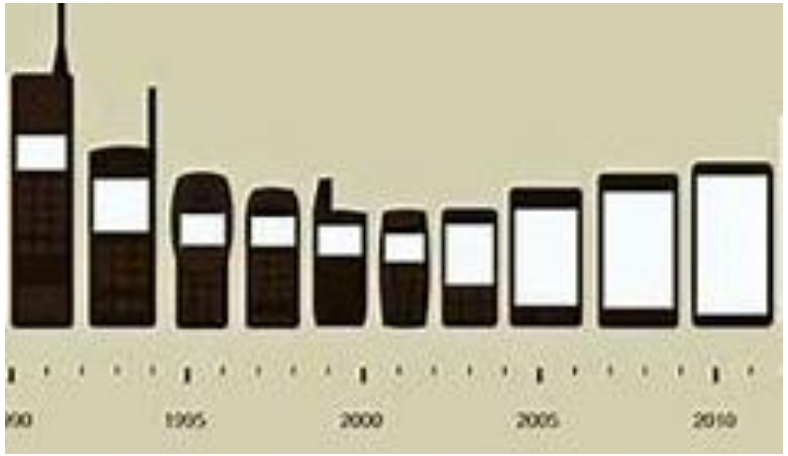
Figuring out the probable sources that create unexpected behaviour in the total system

Figuring out the probable errors that appear as a result of flaws in the firmware

EVOLVABILITY

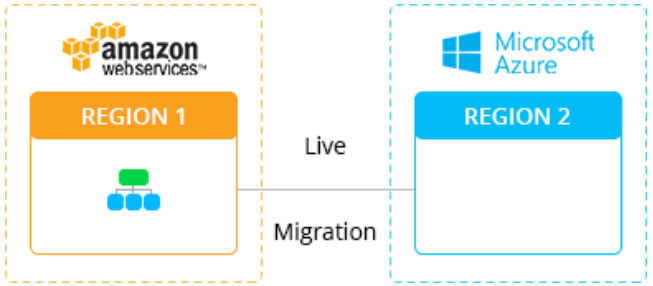
Ease with which the embedded product can be modified to take advantage of new firmware or hardware technologies.

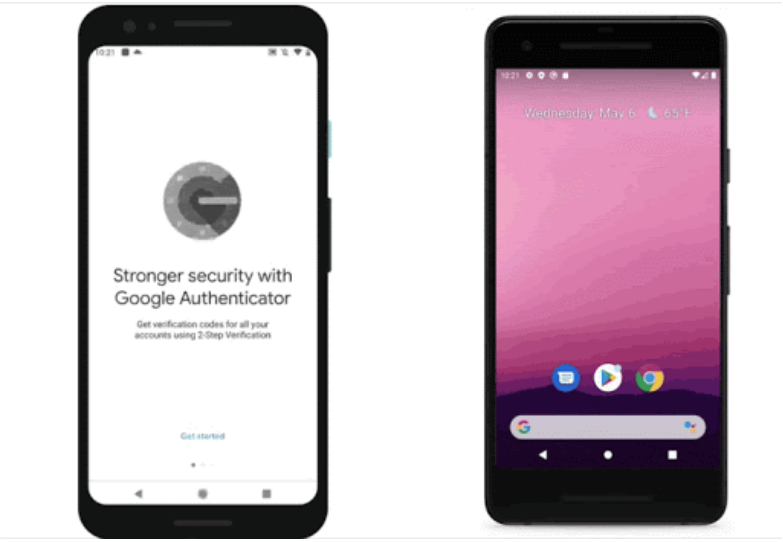


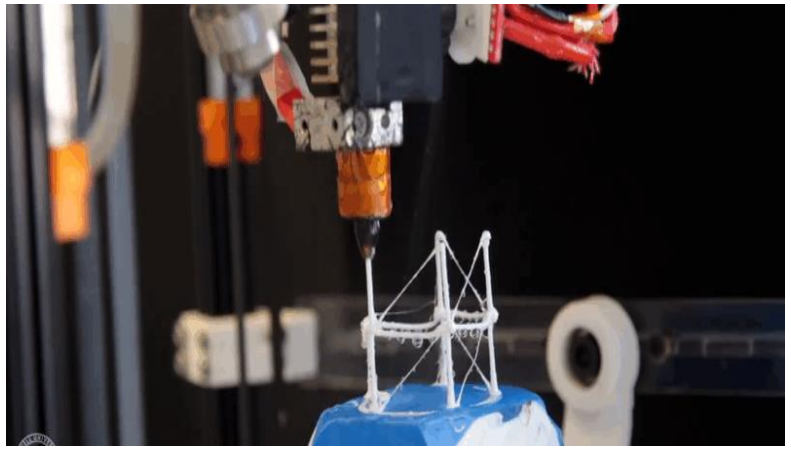


PORTABILITY

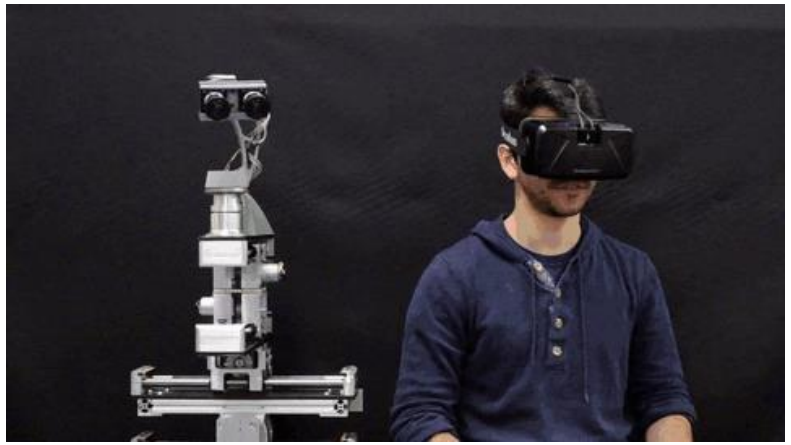
- Measure of ‘system independence’
- Capable of functioning ‘as such’ in various environments
- Migration of the embedded firmware written for one target processor to a different target processor
- Firmware written in high level language, is very easy to port the firmware for the new processor







TIME–TO–PROTOTYPE AND MARKET



Time to market is the time elapsed between conceptualisation of a product and the time at which product is ready for selling.

Huge competition in the market

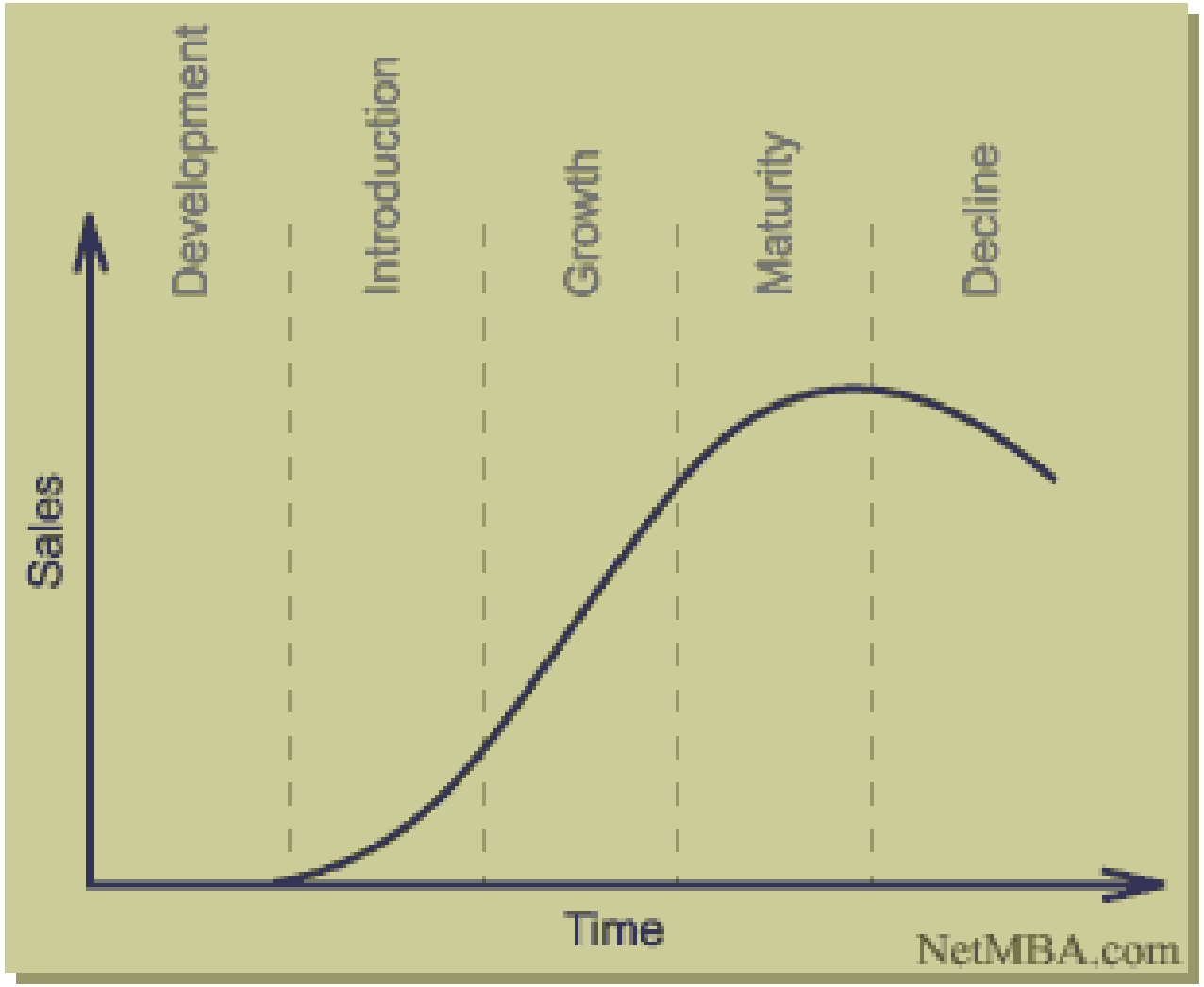
If the prototype is developed faster, the actual estimated development time can be brought down significantly

PER UNIT COST AND REVENUE

- Cost is the highly sensitive factor
- Proper market study and cost benefit analysis
- Budget and total system cost should be properly balanced to provide a marginal profit

PER UNIT COST AND REVENUE

- **Product life cycle**
  - Design and development stage
  - Introduction stage
  - Growth stage
  - Maturity stage
  - Retirement / Decline



SUMMARY

- Introduction:
  - Embedded Systems and general purpose computer systems
  - History
  - Classifications
  - Applications and purpose of embedded systems

SUMMARY

- Core of embedded systems:
  - Microprocessors and microcontrollers
  - RISC and CISC controllers
  - Application specific Ics
  - Programmable logic devices
  - COTS
  - Sensors and actuators
  - Communication interface
  - Other system components

SUMMARY

- Characteristics and Quality Attributes of Embedded Systems
  - Characteristics
  - Operational Quality Attributes
  - Non-Operational Quality Attributes


Thank
You