End Of Life Wearout & Replacement

Michael Collins.

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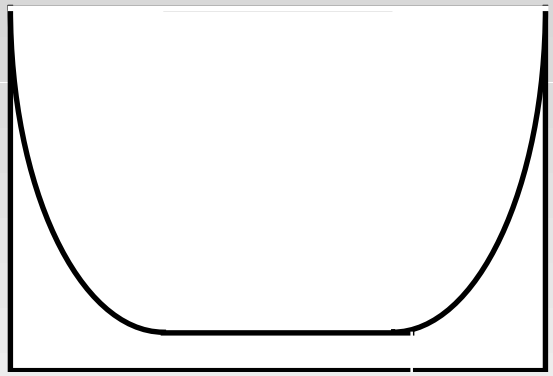
End Of Life

- Where we are
- Discussion points
  - What is End Of Life?
  - Premature junking
  - Hierarchical replacement
  - Maintenance Techniques
  - Reasons for long term survival

What is end of life?

- Bathtub Curve
- Interested in the far end
- Where does this leave software?
  - Y2K
  - Heisei Calendar & Fifth Generation Banking



Relationships

- Profits/Business Models
  - Planned obsolescence
  - Internal maintenance
- Ultra-dependability
- Shoddy Spares/Customer Circumvention
  - Simple remedies
  - Operator demands

Premature Junking

- Most products don't reach end of life
  - Moore's Law
  - Legal & Regulatory Concerns
  - Customer junking
- Hidden flaws
  - Skibo, Navy, UCC
- Life vs. *useful* Life

Hierarchical Replacement

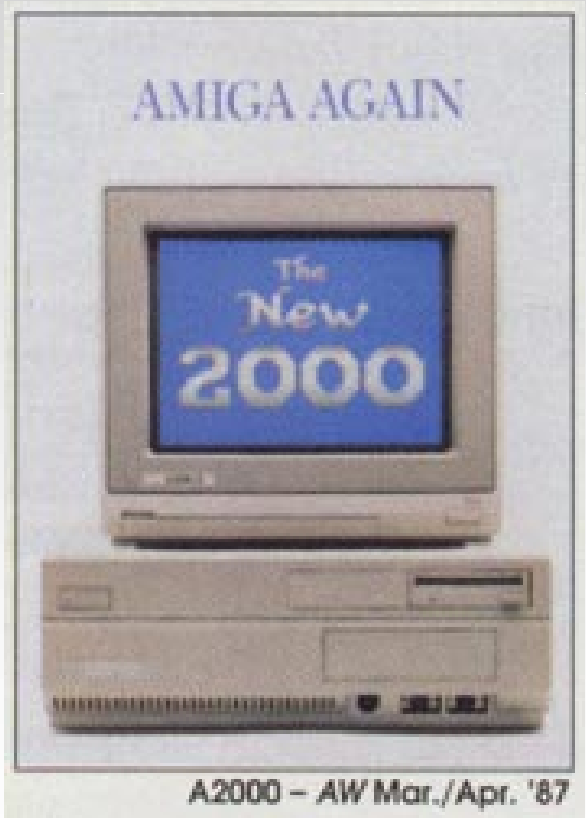
- Hardware handed down in hierarchies
  - Faculty, Staff, Students
  - Research Project, Faculty, Research Staff, Administrators
  - Clusters, Faculty, Staff, Group Projects
- Car Resales
  - Purely economic hierarchy

Maintenance Techniques

- Simple Remedies
  - Playstation Coolers
- Organizations
  - Parts Companies
  - User Groups
- Reverse Engineering
  - Emulator Culture

Reasons For Prolongation

- Operators
  - Downgrading
  - Platform preference
- Cash
  - Nonprofit organizations,
  - nonprofit nations
- Continuous Operation
- Failed Upgrades



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Conclusions

- End of life maintenance is expensive
  - Most likely costs more than replacement
  - Requires creative solutions, replacements for supply infrastructure
- Human factors keep systems in place
  - Operator conservatism, resistance to change
  - lifecycle estimation is difficult

Paper

- There aren’t many papers
  - Lot of time hoofing
- Discusses several key points
  - Inefficiency of replacement
  - Operator driven conservatism
  - Cost of replacement vs. rebuilding