



Some Economics of Digital Preservation

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So, What is Preservation?

- **It has to be attached to something. Information? Artifact? Both?**
- **Preservation activity affects the flow of current and future services available from the “object.”**
- **Basic production function setup -- Flow of services at t depends on all that happens in the past, including the things that we call preservation (or nonpreservation). The potential usefulness at t depends on the past uses, and on preservation.**

Lifecycle cost according to LIFE1

$$L_T = Aq + I_T + M_T + Ac_T + S_T + P_T$$

L = Lifecycle cost

T = Time

Aq = Acquisition

I = Ingest

M = Metadata

Ac = Access

S = Storage

P = preservation

BENEFITS -- Accessibility, Usability,
Reliability, future costs forgone

Stocks and Flows

- **Stocks are accumulations of stuff**



Flows are Flows



Sustainable Flows



A Principle

- **The duty imposed by sustainability is to bequeath to posterity not any particular thing – with rare exceptions such as Yosemite, for example – but rather to endow them with whatever it takes to achieve a standard of living at least as good as our own and to look after the next generation similarly. We are not to consume humanity’s capital, in the broadest sense.**

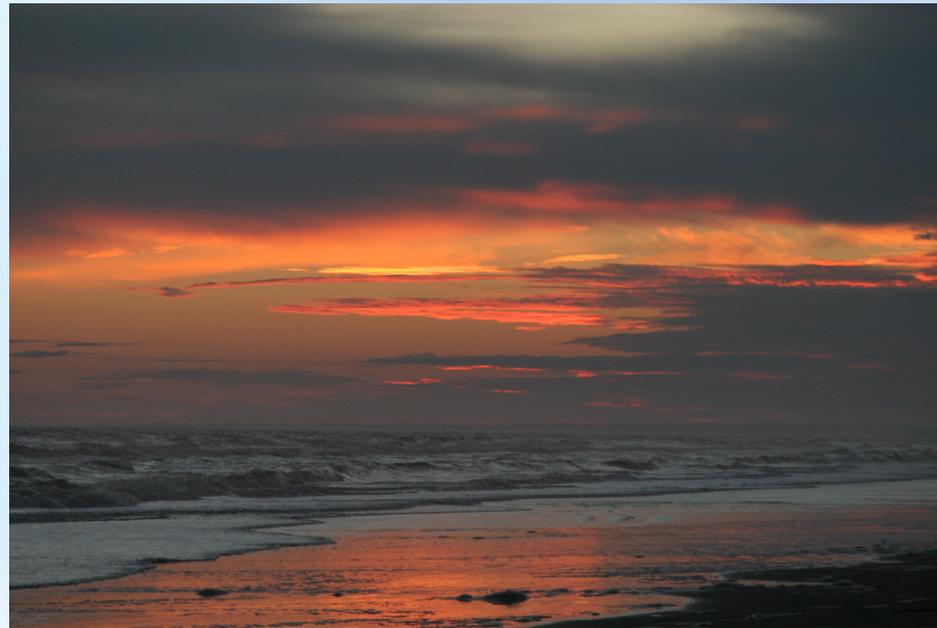
(Robert Solow 1992)

Markets Won't Do It

...the obligation of sustainability cannot be left entirely to the market. The future is not adequately represented by the market – at least not the distant future – and there is no reason that ordinary market behavior will take care of whatever obligation we have to the future. Universalism {the doctrine that it should not matter when in human history you live, as an ethical principle} demands that the state should serve as a trustee for the interests of future generations. Government policies ... can adapt the incentive structure in ways that protect the global environment and resource base for people yet to be born. (Anand and Sen, 2000)

Natural Resource Economics

- **Public Good**
- **Use Value**
- **Existence Value**
- **Option Value**



Sustainability (Indefinite Preservation)

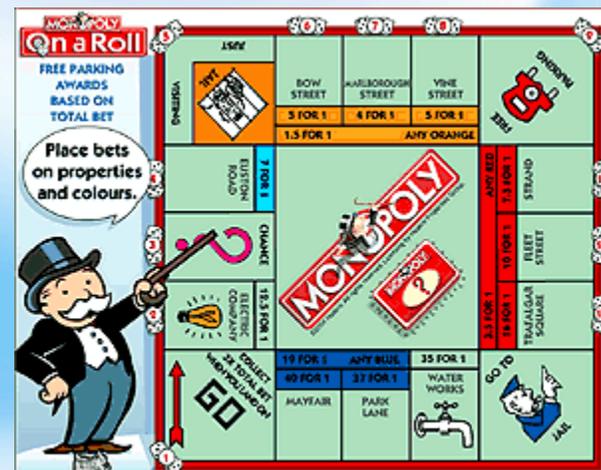
- **Specific Sustainability**
- **Value Sustainability (Solow)**

- **Economics**
 - Endowment?

- **Organization**
 - Business Models
 - Handoffs

Business Models

- {Incredibly apt illustration showing mix of ongoing demand, endowments, charitable gifts, rainfall, rivers, reservoirs, dogs combining to allow something to be sustained over time.}



Attributes of a Business Model

- **Recognition of benefits of preservation by people who can move resources (Demand)**
- **Incentives to people who have the stuff**
- **Mechanisms to move resources to the stuff as routine or default, including handoffs**
- **Efficient use (don't save everything perfectly, make choices)**
- **Organization and governance of the many relevant players**

- **Adapted from discussions in the NSF BRP on Economically Sustainable Digital Preservation and Access.**

Endowing a Chair

- $Y = rE$
- $S = Y$

Scholarship



Research/Create



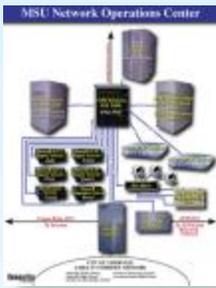
Write



Review/Edit



Copy edit/Format/Prod.



Network/delivery sys



Market



Distribute



Curate, archive
and retrieve

What's Different About Digital?

- **Fragile ?**
- **Too Much Stuff**
- **Rights Environment**
- **Use doesn't wear it out (and may even make it more usable in the future)**
- **Functionality and Links (very fragile)**

- **Public Goods Implications**



Academic Library Collections

Cost for users: relatively low

- Time
- Research
- Computer

Cost for preservationists: relatively high

- Servers
- Infrastructure
- Maintenance
- Staff
- Metadata
- And on . . .



Preservation of Digital Scholarship

- **Easy (sort of) cases**

- Digitized print (Google and the SDR)
- Journals (Portico, LOCKSS, Some National Libraries)
- Astronomical Data

- **Harder cases**

- Multimedia projects
- Things with links and embedded functionality (from excel spreadsheets on up)
- Data from Chemistry experiments

- **Hardest**

- The cultural record itself
- Business records, etc.

A Really Bad Idea

- **ONLY COLLECT WHAT YOU KNOW YOU CAN SUSTAINABLY (INDEFINITELY) KEEP**



Thank You

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