Insights on Studying History of Information Ecosystems

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I wrote the first broad national history of a nation’s experience with information. It yields lessons useful to societies today.

- Covers all aspects of a nation’s experiences: Business, Government, Private Life
- Identifies national patterns of behavior over multiple generations
- Links role of ICTs and older information artifacts to the use of information
- Puts into context contemporary uses of the Internet and other forms of IT
Americans have been extensive users of information since the 1600s, more so during the Second and Third Industrial Revolutions.

- Built a massive, complex *information infrastructure*
- Used every form of *information handling tools* available
- Resulting in a thick *information ecosystem*
- No aspect of American life was immune from the process
- Their dependence on information is increasing
- Included business, government, private life
- Europe had a similar experience, most in the North, least in the South, most to the West least to the East
What has prior research on information to teach us about studying the issues faced by today’s conference?

✓ How do you study the evolution in uses of information by organizations?
✓ How do you understand the role of scientific knowledge and its diffusion in management and operations?
✓ How do you identify and understand information as an asset of an organization?
✓ To what extent are today’s digital transformations part of a longer history of computer science and of management information systems?
✓ How do you study information’s history in accounting, finance, marketing, training, knowledge, and ICT?

There may be an answer . . .
Begin by doing what historians have always done when confronted with new topics, themes, and conditions.

• Begin by deciding what questions to ask
  – Why examine information’s role in a particular company or government agency?
  – What should I look for?
  – What was the role of information in XYZ?
• Define what you mean by information
  – Accounting? Process descriptions? Statistics?
• Document existing information and its role in area of your interest
  – Old accounting records, process steps, laws, etc.
• Explain the context in which information flourished and existed
  – Role of regulations, economic conditions, role of individuals
My favorite general questions to ask about information are . . .

- What media were used to collect and store information in xyz enterprise, industry, economy?
- By profession or job, what information was collected, used, and shared?
- What patterns of adoption and use of information emerged over time?
- How did the use of information influence the work and lives of specific people and groups?
- What other historical discourses should be viewed as information history?
- What are the intrinsic features of facts and how did those affect the creation and use of other facts?
Treat these questions within a context useful for the study of information.

• Think about *frameworks*
• Describe *information infrastructures*
• Document *information flows*
• Do all of this to describe *information ecosystems*:

“An information ecosystem is a collection of knowledge, experts and users much as academics think of a discipline, but with the important difference that this body of knowledge and associated communities were far broader/larger than an academic discipline.”

“*Information flows is the movement of information from one place to another for different purposes and consequences.*”
The central strategy for studying information’s role is to reconstruct an information ecosystem—they always exist, are always hidden.

- Includes all participants
- Involves more than you originally thought
- Evolves over time
- Usually leaves behind documentation
- Applies to any firm, society, economy, association, or group of people
- Everyone & everything acts like a biological jungle of plants, weather, and animals co-dependent for survival
But, you must also study the information infrastructure that supports the ecosystem for your subject.

Two Components of Infrastructure

- **Physical**
  - Includes postal services, email, Internet, company manuals, roads, airplanes
- **Content**
  - Networks of publications & reports used regularly
  - Information that is informal but influential used regularly, such as gossip, personal friendships, contracts

- **Networks of physical items**
  - That make movement and use of information possible
- **ICT systems**
  - They are physical AND content

Both Sustain Each Other

Such as railroads, trucks, telegraph, newspapers, books, PCs, Internet

Such as reports, e-mail, charts, spreadsheets, data, pictures, text
You learn quickly there are hierarchies of firms, people, industries, and information in information ecosystems.
Building graphs of these help you and your audiences understand the unseen roles of information. For example . . .

Spanish diplomatic information ecosystem, 1815-1936
Graphically documenting activities this way works in any information ecosystem. For example, with farm wives . . . .

- County Ag Agents
- Cookbook Writers
- Newspaper Reporters
- High School Teachers
- Future Homemakers of America
- Girls & Daughters
- Girls & Daughters
- Female Relatives
- College Professors
- 4-H Members, Scouts
- State Home Economists
- Other Homemakers
An example from business . . . IBM sales organization, 1940s-1980s.

- Corporate Headquarters
  - US Domestic
    - Sales Division Headquarters (e.g., Data Processing, General Systems, Office Products)
    - Regional or Area Headquarters
    - Branch Offices, sometimes within individual sales divisions
  - World Trade Headquarters
    - IBM National Companies (e.g., IBM France, IBM Japan)
    - Regions within Countries or Geographic areas
    - Branch Offices, sometimes within individual sales divisions
You can even define a corporate structure within to place your findings about information. IBM again . . .

- IBM’s corporate structure, 1920s-1980s
- IBM’s internal information flows
- Notice how hierarchy is less important to where information moves back and forth
- This behavior changes less than the organization or administrative processes
- Always ties to the actual mission of the organization
Organizations do not change as much as we are told because ICTs and information act as constraints on changes for good reasons. An example from IBM sales organizations:

**IBM Sales Branch Office Organization, circa 1920s-1930s**

- **Branch Manager**
- **Salesman**
- **Administrator & Secretary**
- **Service Personnel (1-5)**
- **Salesmen (5-20)**

**IBM Sales Branch Office Organization, circa 1970s-1980s**

- **Branch Manager**
- **Marketing Managers (3-4)**
- **Administration Manager**
- **Systems Engineering Managers (3-4)**
- **Systems engineers (7-12 each)**
- **Salesmen (5-12 each)**
- **Secretaries, administrators (10-20 staff)**
You can document before and after information ecosystems based on the influence of ICTs. An example from your family.

**Studying Family History *before* the Internet**

Two Components of Infrastructure

- **Physical**
  - Books, bibles
  - File cabinets, boxes
  - Paper files, folders
  - Newspaper clippings
  - Telephones
  - Photographs, albums
  - Home movies
  - Scrap books, letters
  - School records
  - Military, work files
  - Postal service

- **Content**
  - Census
  - Birth, death, marriage
  - Memories, stories
  - Family activities
  - Work events
  - Tombstone data
  - News stories
  - Travel, immigration
  - Accounts of events
  - Medical records
  - Local history

Both Sustain Each Other

- Communications
  - Transportation
  - Libraries and archives
  - Bookstores

- Family tree facts
  - Work, school records
  - Family events
  - Family histories
And after the arrival of ICTs, especially the Internet.

Studying Family History after the Internet’s arrival

Two Additional Components of Infrastructure

- Personal computers
- Laptops
- Telephone lines
- Modems
- Smart phones
- Scanners
- Software
- CDs, DVDs
- Cloud account
- “How-To” manuals
- Word processors

- Printed family trees
- Integrated text and images (still, moving)
- Spreadsheets
- E-mail
- Scans of paper texts
- Databases
- Charts showing trends
- Recorded speech
- More data than before
- Extended fact sharing

Physical Content

Both Sustain Each Other

Hardware
- Software
- Internet
- Tech Retailers

Integrated facts, (such as charts, images, and text)

• Notice that as information infrastructures change older infrastructures and practices remain
• New infrastructures, tools, and information are added to the ecosystem
So, where are we today in the study of information history?

Mamie, c’est facile. Tu vas dans Paramètres, tu sélectionnes Wi-Fi... Vas-y, sélectionne-le! Touche-le avec ton doigt... Un doigt !!!! Grrrrr!

- We are defining the subject, childlike but starting...
- We are describing what we see
- We then can turn our attention to context & significance
Do you have any questions?

If you do later, contact me at jcornada@umn.edu. And for the book, check out http://www.amazon.com/All-Facts-History-Information-United