THE SOCIAL LIFE
OF A DATA BASE
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NOTE TO REVIEWERS:
ALL THE PRACA MATERIAL COMES FROM THE LARGER
PRACA STUDY, WHICH HAS APPEARED BOTH AS A REPORT
AND NASA/TM-2002-211846. BOTH HAVE ALREADY BEEN
CLEARED FOR EXPORT CONTROL, AND ARE
PUBLICALLY AVAILABLE.

Social Construction of
Mechanisms of Memory

- It is well known that memory is socially constructed
- Studies have examined various mechanisms of social memory:
  - Archives (Trouillot)
  - Memorial Statuary (Nora)
  - Historical Theme Parks (Samuel)
  - Museums (White)
  - Holiday Observances (Connerton, Yerushalmi)
  - Institutional Narrative (Linde)
Data Bases: The Invisible Memory Mechanism

- Social science has paid little or no attention to data bases as socially constructed forms of memory
- Computer data bases are thought of as technological objects
- One might think it possible to study the social aspect of data bases by studying the processes of their construction
- However, databases are embedded within complex work systems
  - Many layers of human work required to produce and maintain their function
- These work practices are invisible to their designers and users

The Human in the Machine

- This paper shows some of the complex social life of a large data base:
  - Construction of data entries,
  - Human escorting of data within and across organizational boundaries,
  - Ongoing movement between paper and electronic data recording
  - Social practices which compensate for design deficiencies, but also mask their existence.
Data of the Study: A Large-Scale Problem Reporting Data Base

- This talk reports on a study of a NASA data base for reporting problems discovered in the inspection and refitting process for the Space Shuttle
  - PRACA (Problem Reporting And Corrective Action)
- PRACA is a complex system, distributed among several NASA centers and contracting organizations.
  - This complexity is not unique to NASA: many public and private institutions maintain enormous data bases, incorporating legacy systems which are resistant to change because their structure is no longer apparent.

The PRACA Study

- Purpose: evaluate and quantify the technical aspects of PRACA systems and recommend enhancements future system upgrades.
- The study of the work system of PRACA reported on in this talk was part of a larger study mapping the locations, technologies, languages, and institutional responsibilities for PRACA
- Method for: preliminary study of work practices
  - Interviews with data base users and managers
  - Two sites
    - Kennedy Space Center – shuttle refitting
    - Johnson Space Center – go/no go decision on shuttle flight
  - Large study would involve ethnographic observation
Description of PRACA

- P 21, PRACA report, diagram, p 22
PRACA and Paper

- PRACA is thought of as a data base, but moves from paper to electrons to paper to conversation at various stages of its use.
Multiple Uses of PRACA

- Work Process Scheduling
- Flight Readiness Decision-making
- Statistical Analysis of Part and Process Failures
- Data for Mandated Investigations

The Work of PRACA

- Initial Problem Entry
- Checking the form and the work
- Passing the report from KSC to JSC
- Getting report to Deputy Manager for Operations, Space Shuttle Vehicle Engineering Office (Go/No go decision maker)
- Tracking required repairs
- Using PRACA retrospectively
Multiple Forms of Invisibility

- Each of the above uses is invisible to users of all other types
- Paper instantiations of PRACA are invisible to computer designers and users
- Work of making PRACA work is invisible to high-level users

Such Systems are Everywhere

- This is an outmoded system
  - Opaque to users
  - Possesses emergent properties not intended by or known to original designers
  - No single owner of the design or implementation
- Such a system is more the rule than the exception
  - Legacy data bases are everywhere
    - Legacy data bases imply the existence of complex work practice systems, not just outmoded machines or languages
Two Morals to the Story

• Data Base Designers and Users
  – Be aware that data entry, interpretation and use are pervasively social activities, part of an integrated work system

• Anthropologists
  – Begin the analysis of these complex memory technologies as a locus for social activity as well as social construction