Standards for Computing and Communications

Stanley M. Huff, MD

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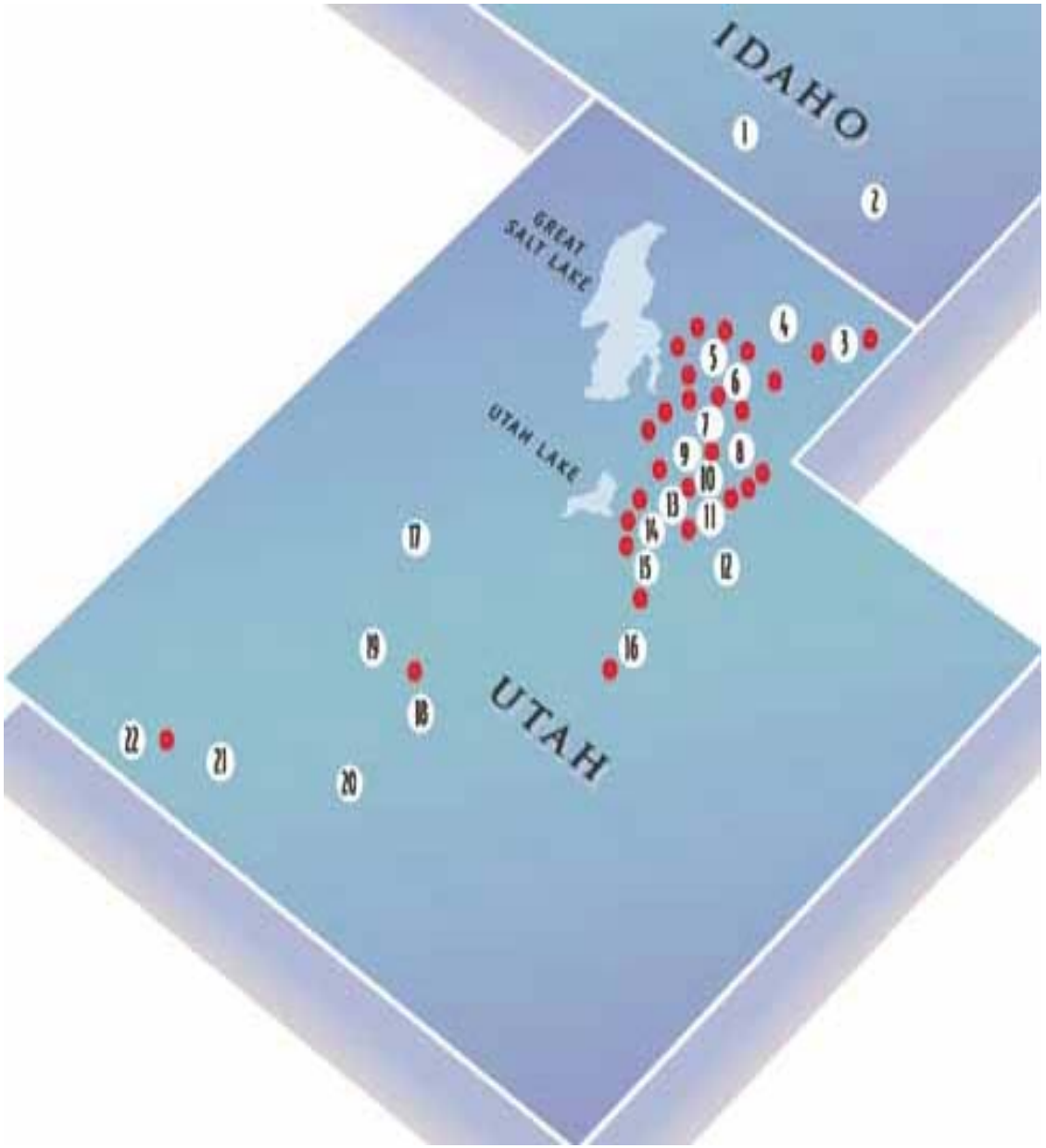
http://www.ihc.com
coshuff@ihc.com

Topics

- Standards at IHC
- The key standards to use
- Challenges to the use of standards
- Opportunities for cancer registries
- Some current experiments

Intermountain Health Care (IHC)



- Not for profit corporation
- 22 Hospitals
  - 500 to 25 beds
  - ~ 1.1 million patients/members
- 24 Clinics
- 14 Urgent Care Centers
- Health Plans Division (Insurance)
- Physician's Division (~400 employed physicians)

Decision Support

'... All confirm what would be expected from common sense: The complexity of modern medicine exceeds the inherent limitations of the unaided human mind.'

David M. Eddy, MD, Ph.D.
Clinical Decision Making
JAMA 263:1265-75, 1990

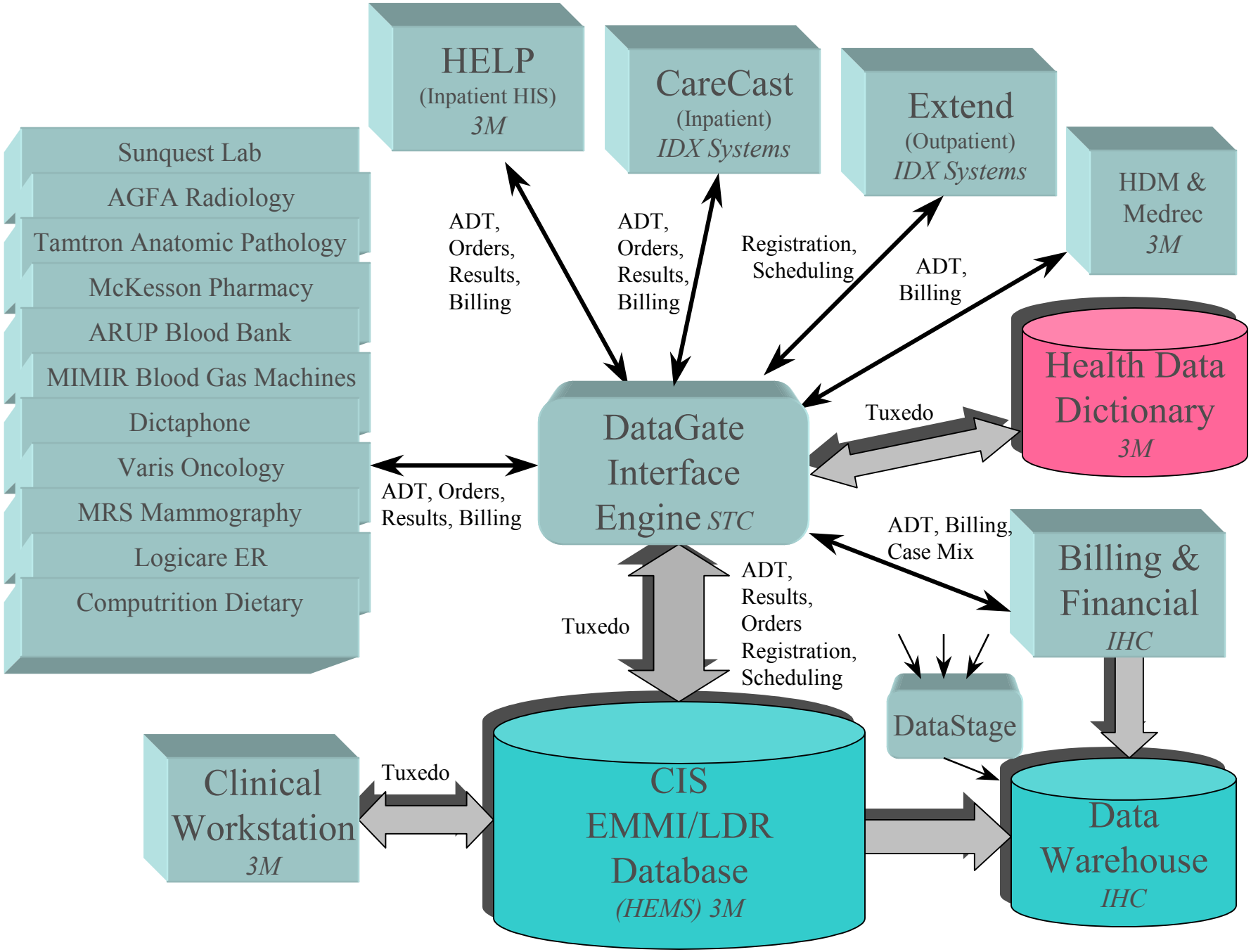
Decision Support

‘... man is not perfectible. There are limits to man’s capabilities as an information processor that assure the occurrence of random errors in his activities.’

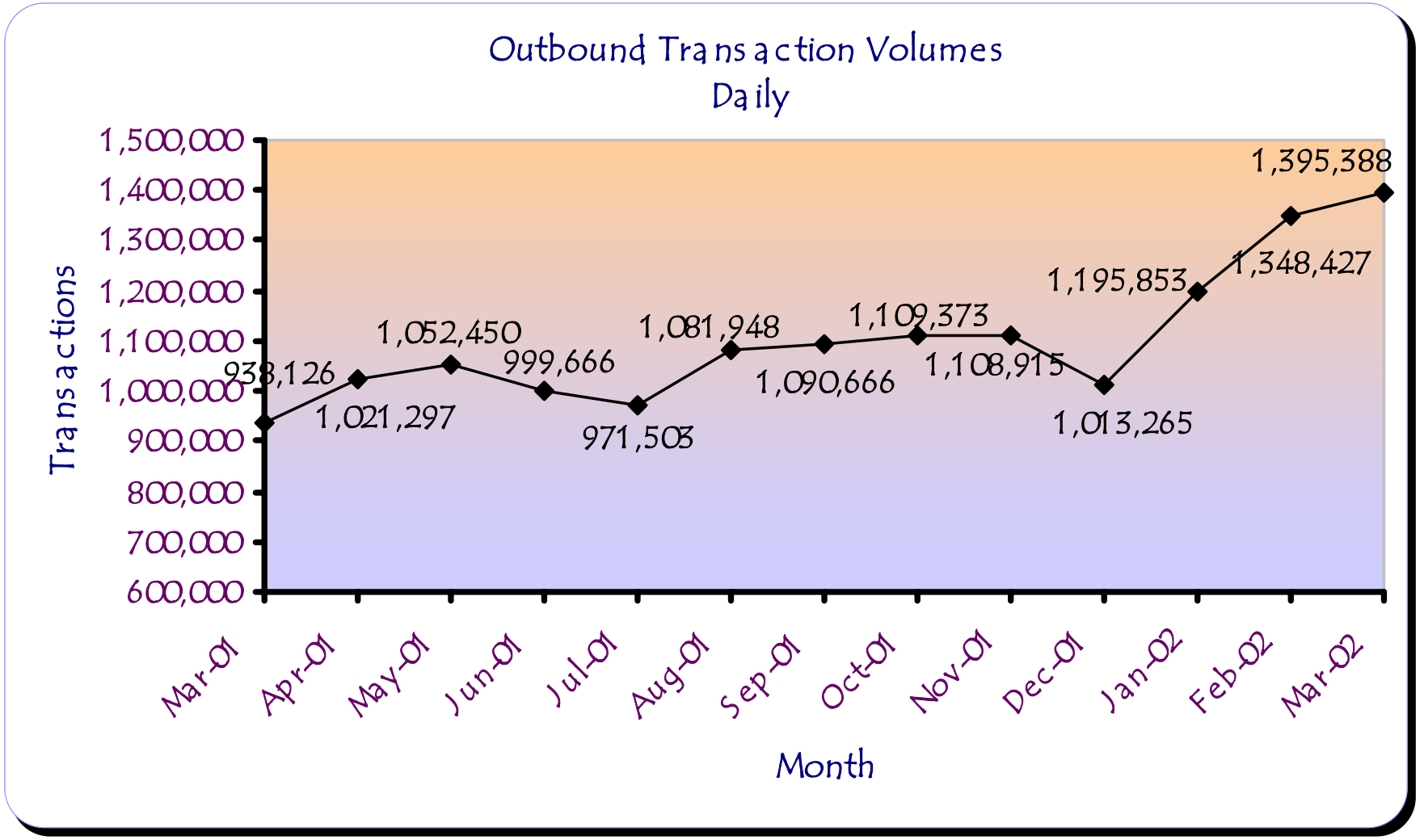
Clement J. McDonald
New England Journal of Medicine
1976

Strategic Concepts

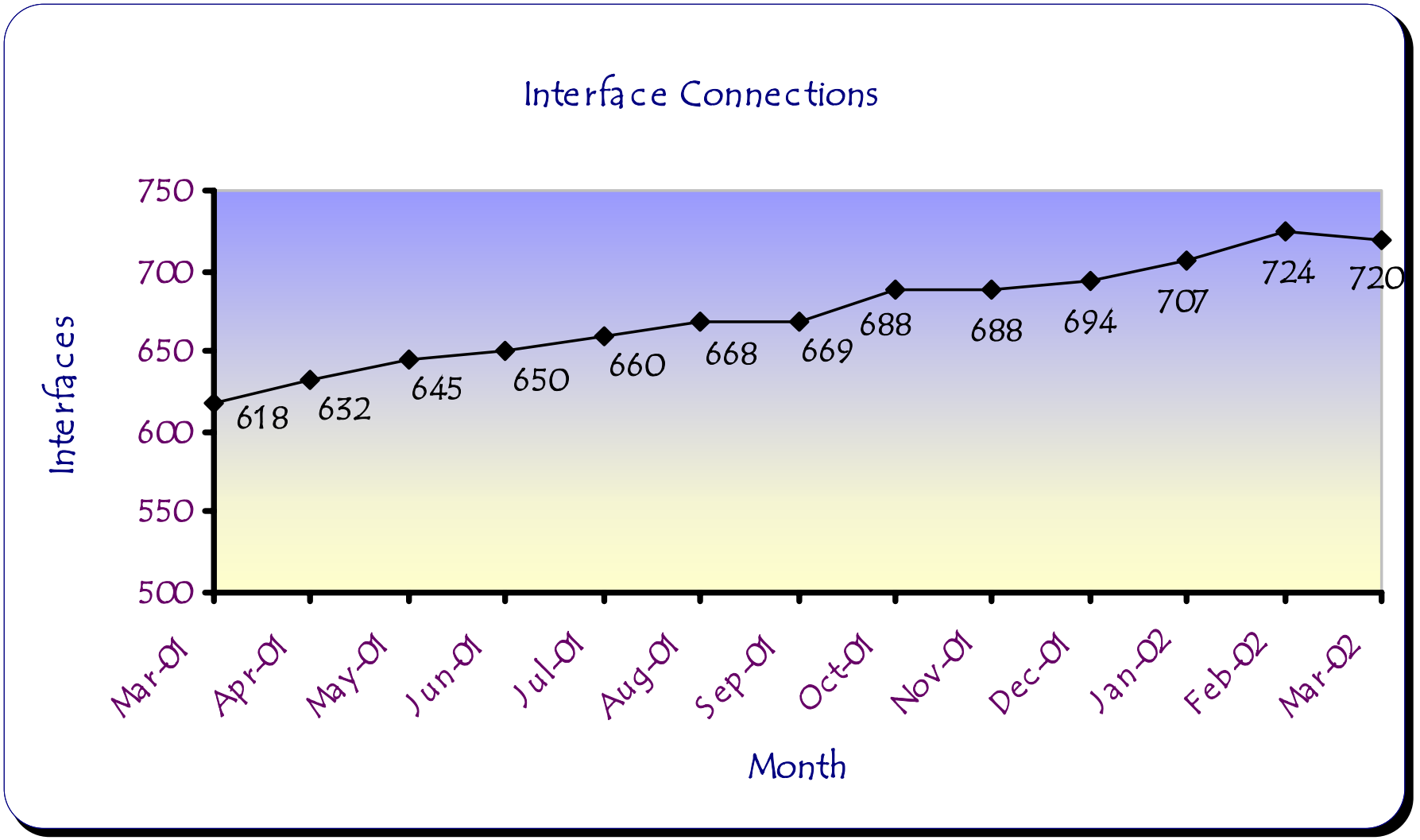
- People need help (decision support)
  - Patient centered record
  - Decision support integrated with patient care process
  - Clinical and administrative research
- Capture data only once
  - Data capture is expensive in time and resources
  - Real time, at the point of care
- Data content changes slowly
- Technology changes quickly
- No vendor does it all


HELP
(Inpatient HIS)
3M
CareCast
(Inpatient)
IDX Systems
Extend
(Outpatient)
IDX Systems
HDM &
Medrec
3M
Sunquest Lab
AGFA Radiology
Tamtron Anatomic Pathology
McKesson Pharmacy
ARUP Blood Bank
MIMIR Blood Gas Machines
Dictaphone
Varis Oncology
MRS Mammography
Logicare ER
Computrition Dietary
ADT,
Orders,
Results,
Billing
ADT,
Orders,
Results,
Billing
Registration,
Scheduling
ADT,
Billing
Health Data
Dictionary
3M
Tuxedo
DataGate
Interface
Engine STC
ADT, Orders,
Results, Billing
ADT, Billing,
Case Mix
Billing &
Financial
IHC
Tuxedo
ADT,
Results,
Orders
Registration,
Scheduling
DataStage
Clinical
Workstation
3M
Tuxedo
CIS
EMMI/LDR
Database
(HEMS) 3M
Data
Warehouse
IHC

Over 1.4 Million transactions per day



700+ Unique Point-to-Point Connections



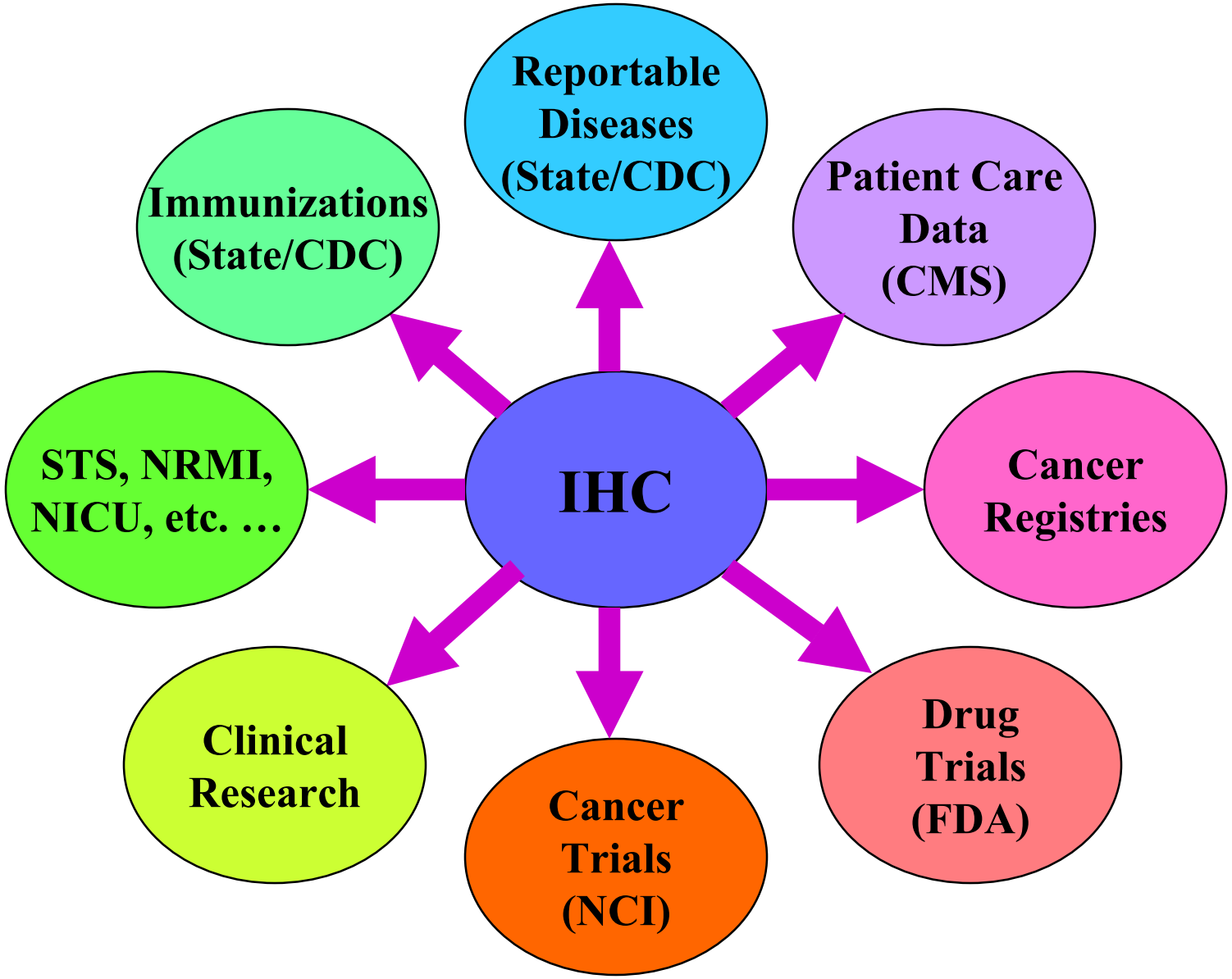
Statistical Profile

- HDD (Healthcare Data Dictionary)
  - 538,774 Concepts
  - 3,496,281 Terms
- Interfaces
  - 60+ different interfaces
  - 720+ interface instances
- Work to do:
  - 20+ interfaces in current development
  - 50+ new interfaces on the “To Do” list

What is my point?

- IHC must use standards or we have no hope of dealing with the complexity of the integrated system
- Messaging standards
  - HL7 – Clinical data
  - X12 – Financial data, HIPAA mandated transactions
  - DICOM – Images
  - IEEE – Bedside instruments
- Terminology standards
  - LOINC – Logical observation identifier names and codes
  - Drugs – NLM/FDA/VA collaboration, proprietary codes
  - Billing – CPT, ICD-9CM
  - Clinical – UMLS, SNOMED and others

Data exchange to the outside world



The wonderful thing about standards…

… is that there are so many to choose from!

- Vertical (within discipline) standards
  - NAACCR
  - NCI data elements
  - FDA drug trial submissions
  - STS (Society of Thoracic Surgeons)
  - NRMI (National Registry of Myocardial Infarctions)
  - Neonatal data sets
- General (global to industry) standards
  - Messages
    - HL7, X12, DICOM, IEEE
  - Terminology
    - LOINC, UMLS, ICD-9CM, CPT, SNOMED

What to do?

- Vertical standards help a given discipline, but they do not scale for health care providers
- General standards provide tremendous value in reuse of interfaces, commercial tools, consultants, and staff training
- **Issues**
- My code/term is not there!
  - *Get them to add it!*
- The message format is too general!
  - *Create implementation guides specific to the domain!*
- It is too hard to implement the standard!
  - *The value is in 2nd, 3rd, and 4th interfaces!*

Issue: Granularity of Coding Systems

SNOMED	Clinical Concept	ICD-O 2/3
T-63000	Gallbladder, NOS	C23.9
T-63000	Cholecystic	C23.9
T-63000	Cholecysto-	C23.9
T-63010	Fundus of gallbladder	C23.9
T-63020	Body of gallbladder	C23.9
T-63030	Neck of gallbladder	C23.9
T-63040	Valve of Heister	C23.9
T-63100	Mucosa of gallbladder	C23.9
T-63110	Mucous gland of gallbladder	C23.9
T-63200	Muscularis of gallbladder	C23.9
T-63300	Serosa of gallbladder	C23.9
T-63310	Subserosa of gallbladder	C23.9
T-63320	Luschka's ducts	C23.9

Issue: Styles of Data Representation

Positional Strategy ("flat file")

… T1 N0 M0 19860628 C50.4 M8500 l …

OBR and OBX Strategy ("Name Value Pairs)

OBR|XYZ^Registry|22051-7^Stage/prognostic factors^LN|
OBX|21899-0^TNM PATH T^LN|T1^T1 STAGE^AJCC|
OBX|21900-6^TNM PATH N^LN|N0^N0 STAGE^AJCC|
OBX|21901-4^TNM PATH M^LN|M0^M0N STAGE^AJCC|

Issue: Where do I put the information?

Interface A (Rheumatologist view)

OBX|4821-5^HLA-B27^LN|1|G-A203^Present^SNI|

Interface B (Paternity testing)

OBX|4694-6^HLA-TYPE^LN|1|F-C4327^B27^SNI|

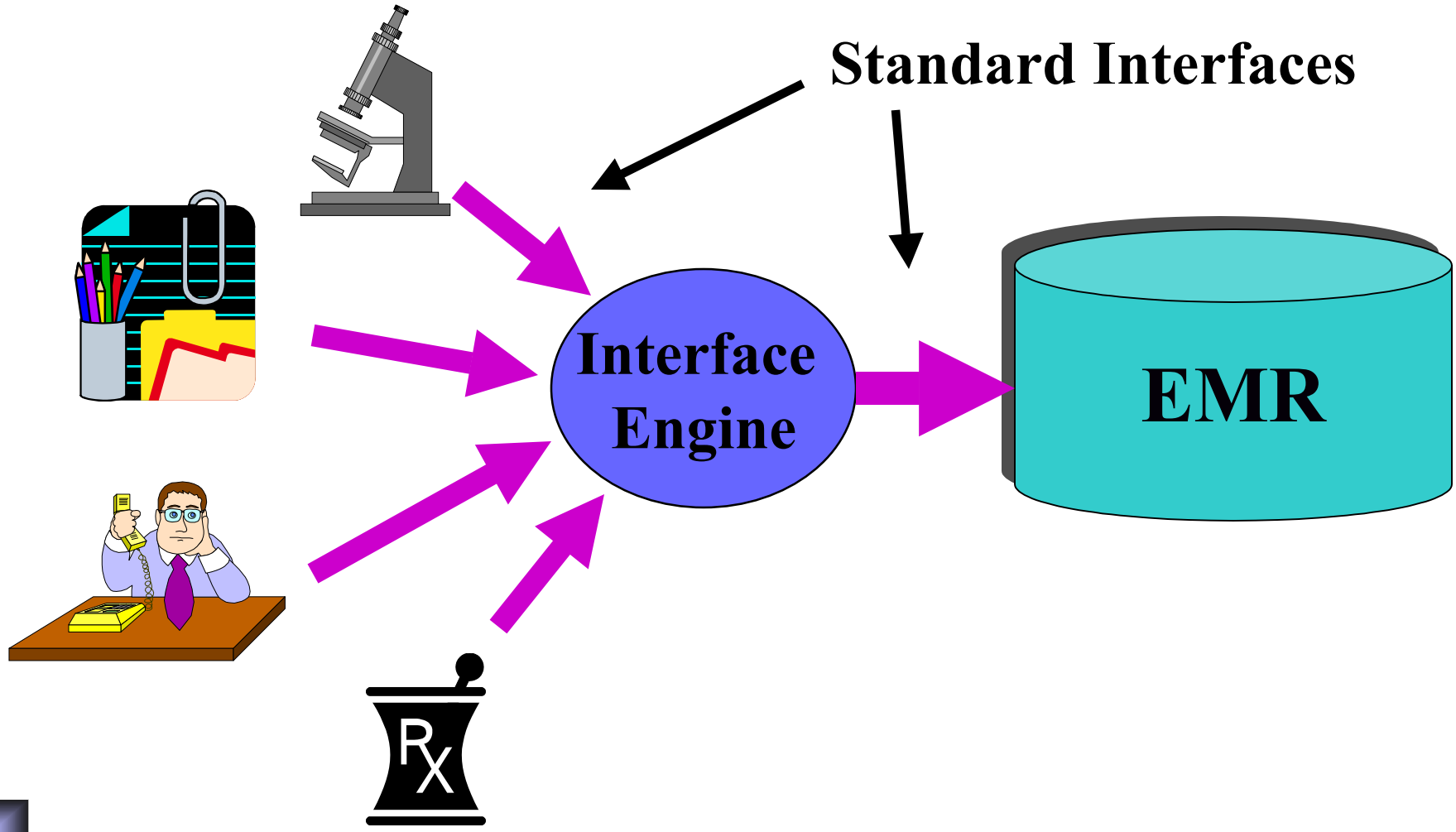
Issue: Relational table implications

Patient Id	DateAndTime	Test Name	Test Result
1234567	1/22/01 10:20:00 AM	HLA B27 Antigen	Present

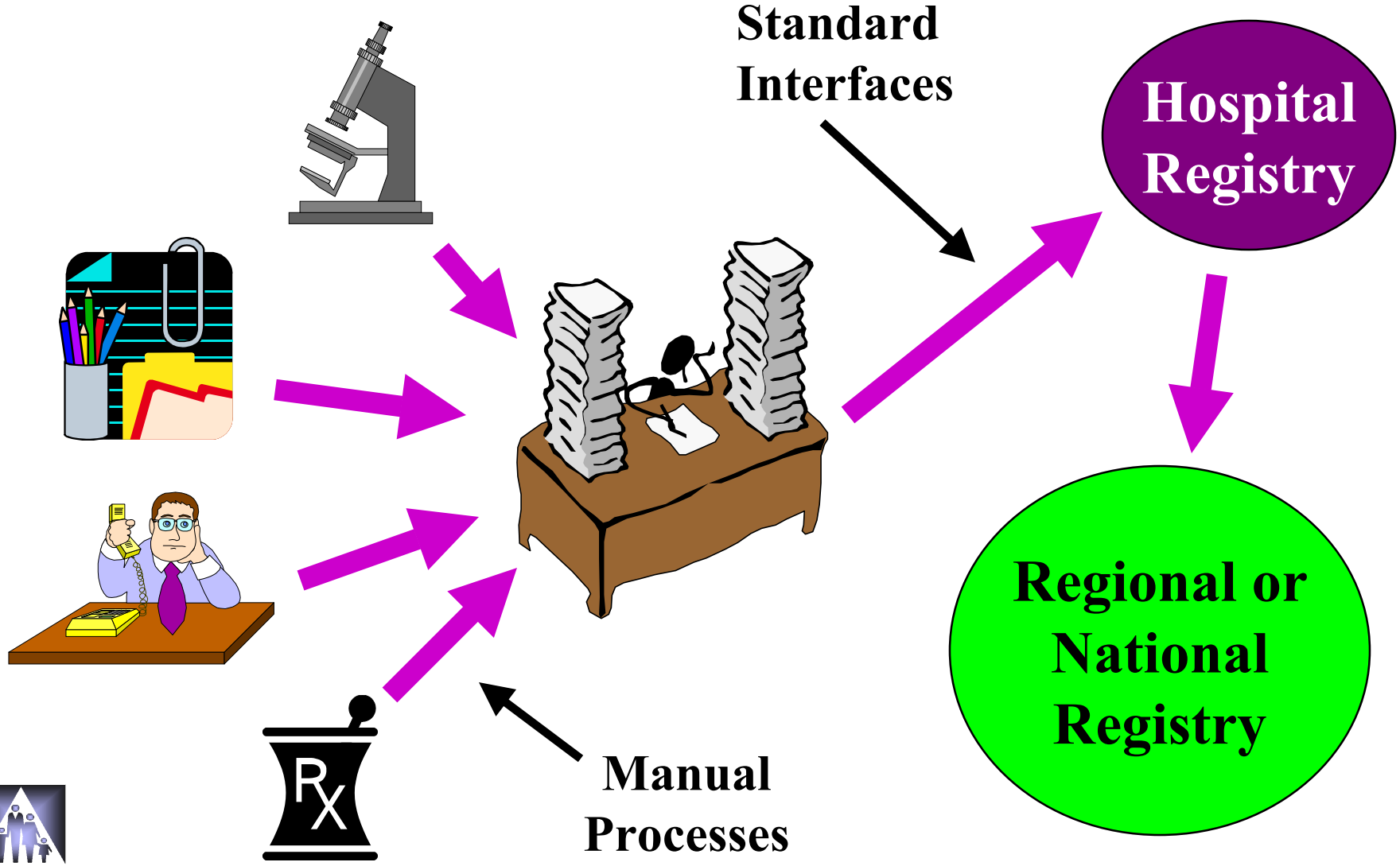
Patient Id	DateAndTime	Test Name	Test Result
1234567	1/22/01 10:20:00 AM	HLA Antigen Found	B27

Terminology and structure must be coordinated to achieve an integrated whole and consistency in data exchange.

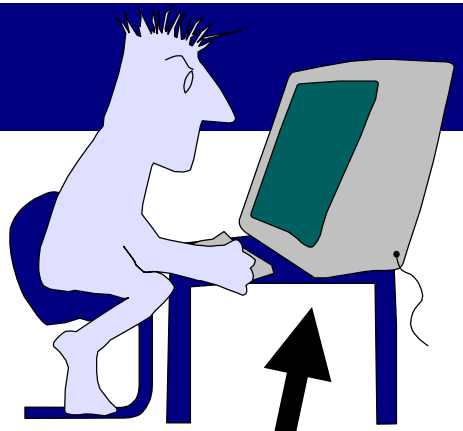
“Almost” Typical Clinical Data Flow

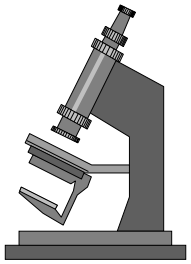


Cancer Registry Data Flow (worst case)



Future?





Filtering
and Processing

Hospital
Registry

Interface
Engine

Standard
Interfaces

Regional or
National
Registry

Opportunity: The value of general standards

- Human resources (people) perform data review, quality assurance, validity, rather than data entry and discovery
- Decreased cost because data is re-used (not re-entered)
- Data is more timely because of automated processes
- Data is more accurate (decreased data entry errors)
- Data is more comprehensive (if available electronically)
- Decreased cost and time to deploy because of re-use of existing interfaces
- Better commercial and public domain tools

Experiments using general standards

- Experiments using HL7 and LOINC to transmit cancer registry data
- Synoptic reporting developed by the Cancer Committee in the College of American Pathologists
- SNOMED encoded pathology databases
- SPIN – Shared Pathology Information Networks
- Direct communication of filtered clinical data to cancer registries