The Patient Chart

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In this report touches on the basic architectural components of the patient chart.

The patient chart is the heart of a clinical information system. It is built from a number of smaller applications.

The data types in the patient chart are

1. unstructured text, templates
2. structured text, forms
3. numerical data, objects
4. enumerated data, list
5. scanned documents, faxes
6. dictation
7. plans
8. photo
9. x-ray images
10. sounds
11. graphics
12. video
13. three dimensional images

Some of the data is manipulated by applications and the results are stored back into the patient chart.

1. trend plots: Takes numerical data and generate graphics
2. flow sheets: Takes numerical data and generate graphics
3. transcription: Takes dictation and generate un-structured text

4. OCR: takes scanned images and generates un-structured text
5. calculations: take numerical and enumerated data into numerical data. Examples are indices, acuity, units, and age.

There is an organization superimposed on these data elements.

1. temporal - organized by time
2. legal - organized by incarnation and signatures
3. hierarchy - organized by parent-child relationships
4. list - organized by order
5. set - organized by uniqueness
6. maps - 1 to 1, 1 to many, many to 1, many to many. Example of such maps are the patient, department, problem, encounter, episode, and problem.

The chart has many surveillance agents.

1. observer - this element observes another element. When one changes the observers are notified. An observer is free to take the necessary actions including nothing.
2. guardian - acts like an observer but can veto the changes.
3. security

The patient chart has many physical location organizations.

1. distributed by patient, health care provider, physical location., department.
2. replicated data
3. archives data
4. partitioned

The patient chart has to interface to the sources of information.

1. medical equipment - MIB
2. printing
3. standard interface protocols like HL7
4. electronic mail

The chart has many indexes for fast retrieval and for query processing.

1. text-index system.
2. clinical encoding with indexing system

Now that we have all that data we need to process the data into information by generating reports.

1. Total Quality Management
2. Continuous Quality Improvement

3. Quality Assurance

TABLE 1. Tools, Technology, and Applications

Tool	Technology	Applications
unstructured text	word processor templates spell checker medicate dictionary medicate thesaurus	To produce any piece of paper that is currently produced thought out the health care institute
structured numerical enumerated	data dictionary interpreted language	medical calculator laboratory results
list manager	relational database	formulary list of procedures, CPT4 list of Disease, ICD9 any medical list
structured text	visual basic database forms	any piece of paper that is currently produced at the health care institute that lends itself to a well structured definition. Results and orders
relationship tool maps 1-1, 1-many	relational databases data rings	MPI Rosters Census Locator
index and query tool	text indexing tools text query language report writer	TQM CQI QA systems
time and legal storage	transaction processing RCS	patient chart
interface tool	content free grammars lex and yacc state transition tools	HL7 MIB LAB

The seed funding for Health Objects came from private saving of the founder. Health Objects is looking for first round funding of $4 million. This is enough funding for two years of the company and caries the company well into first product delivery of several of the small applications and associated revenue generation. In the third year, an addition $8 million of funding is required. This funding level plus profits will position the company in two years to the product delivery of several of the major application suites. At which time the company should be at 150 employees with a revenue stream of $100 million.