International Telecommunication Union

Medical records and medical data: models of electronic data interchange

Melvin Reynolds

Senior Partner, AMS Consulting, UK

Deputy Chair ISO/TC215/WG2, Vice Chair IEEE1073, Convenor CEN/TC251/WG4

Workshop on Standardization in E-health
Geneva, 23-25 May 2003

Overview

- Definitions and observations
- The health information space
- The stages of health information management
- Methods of information exchange
- Multimedia reporting
- Scenarios & use cases
- Summary

Definitions and observations

- eHealth = healthcare facilitated by electronic means

So what?

- bHealth = healthcare facilitated by built facilities!?

Definitions and observations

- ICT = Information and Communications Technology
- So that gives us:

  Health informatics

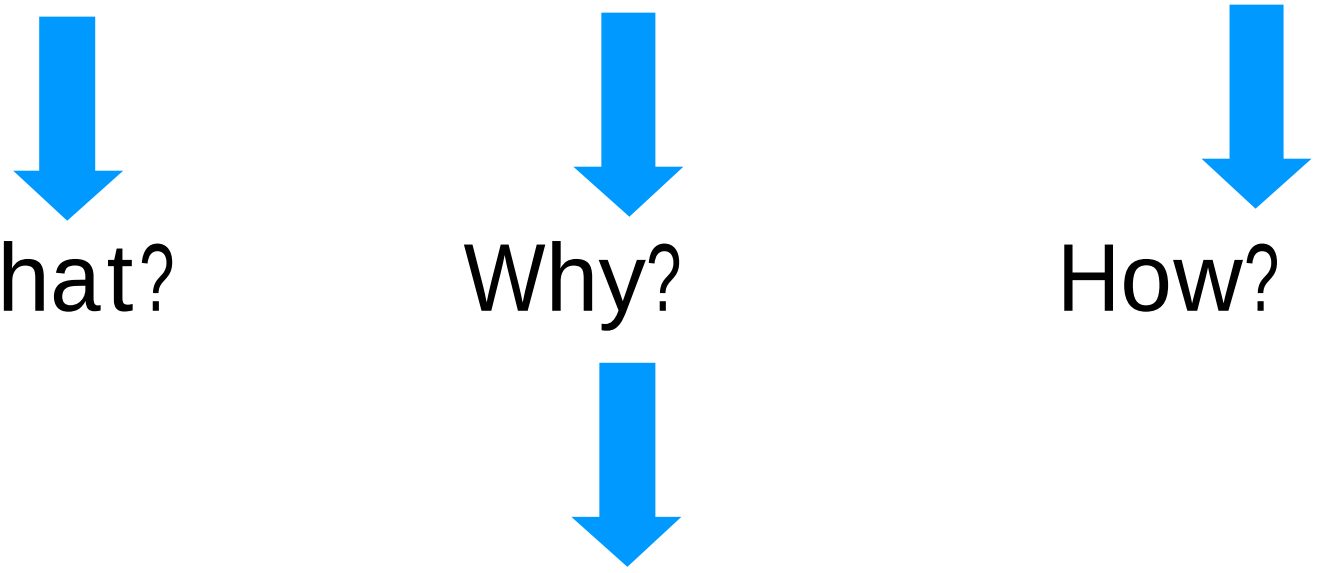
  and

  (Health information) communications technology

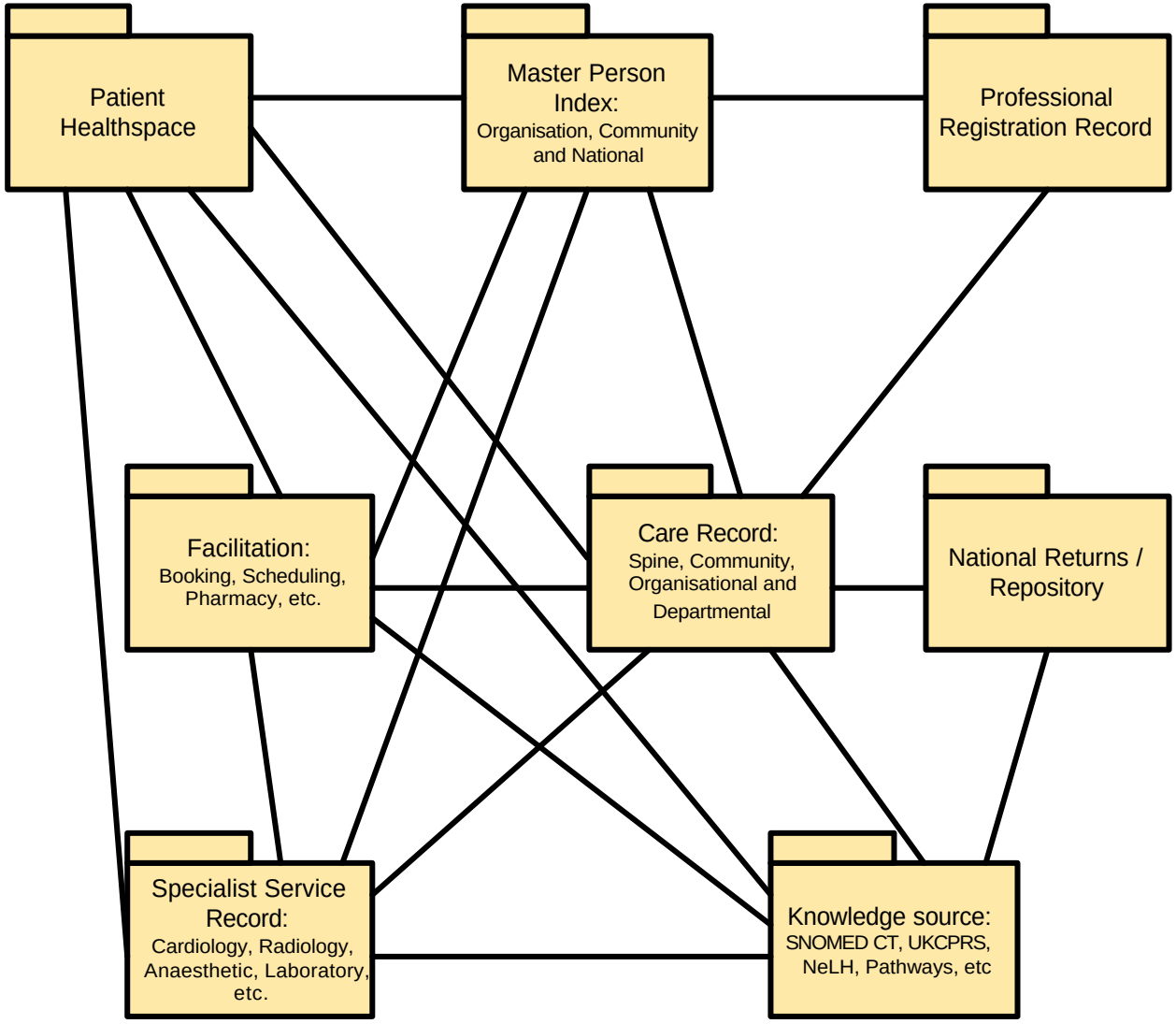
Definitions and observations

ICT =

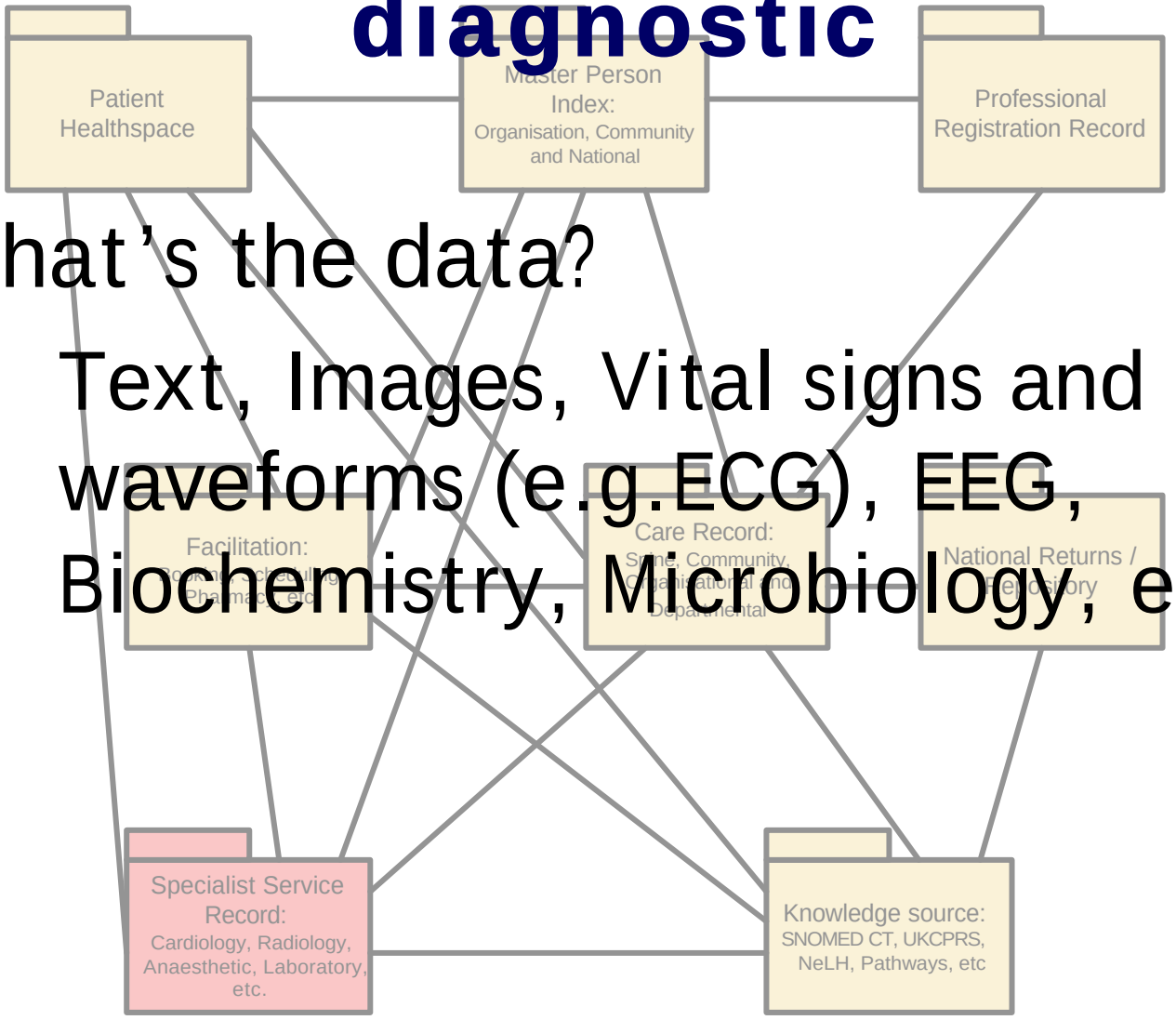
Information Management & Technology



Health information space

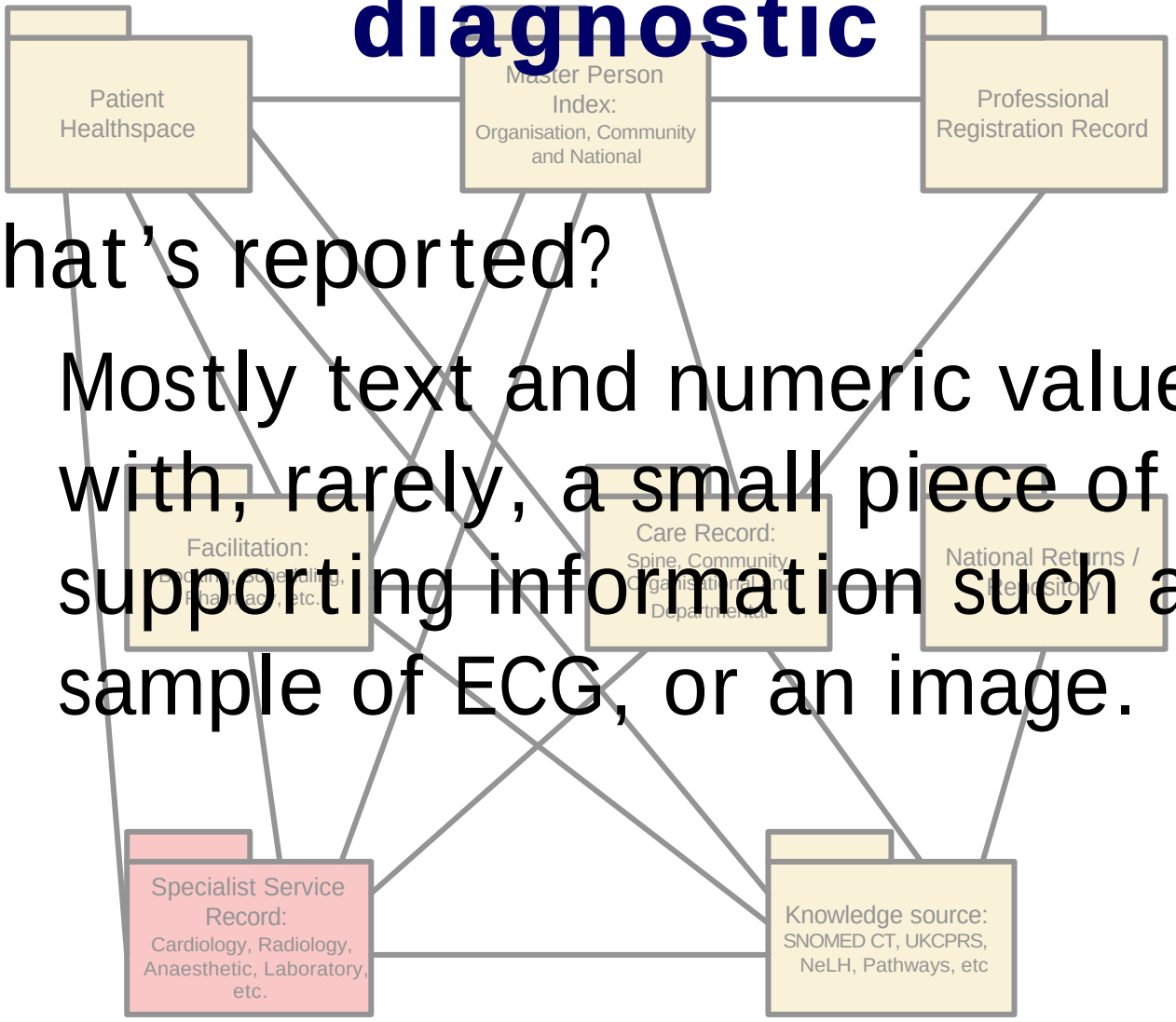


Specialist service record: diagnostic



- What's the data?
  - Text, Images, Vital signs and waveforms (e.g.ECG), EEG, Biochemistry, Microbiology, etc.

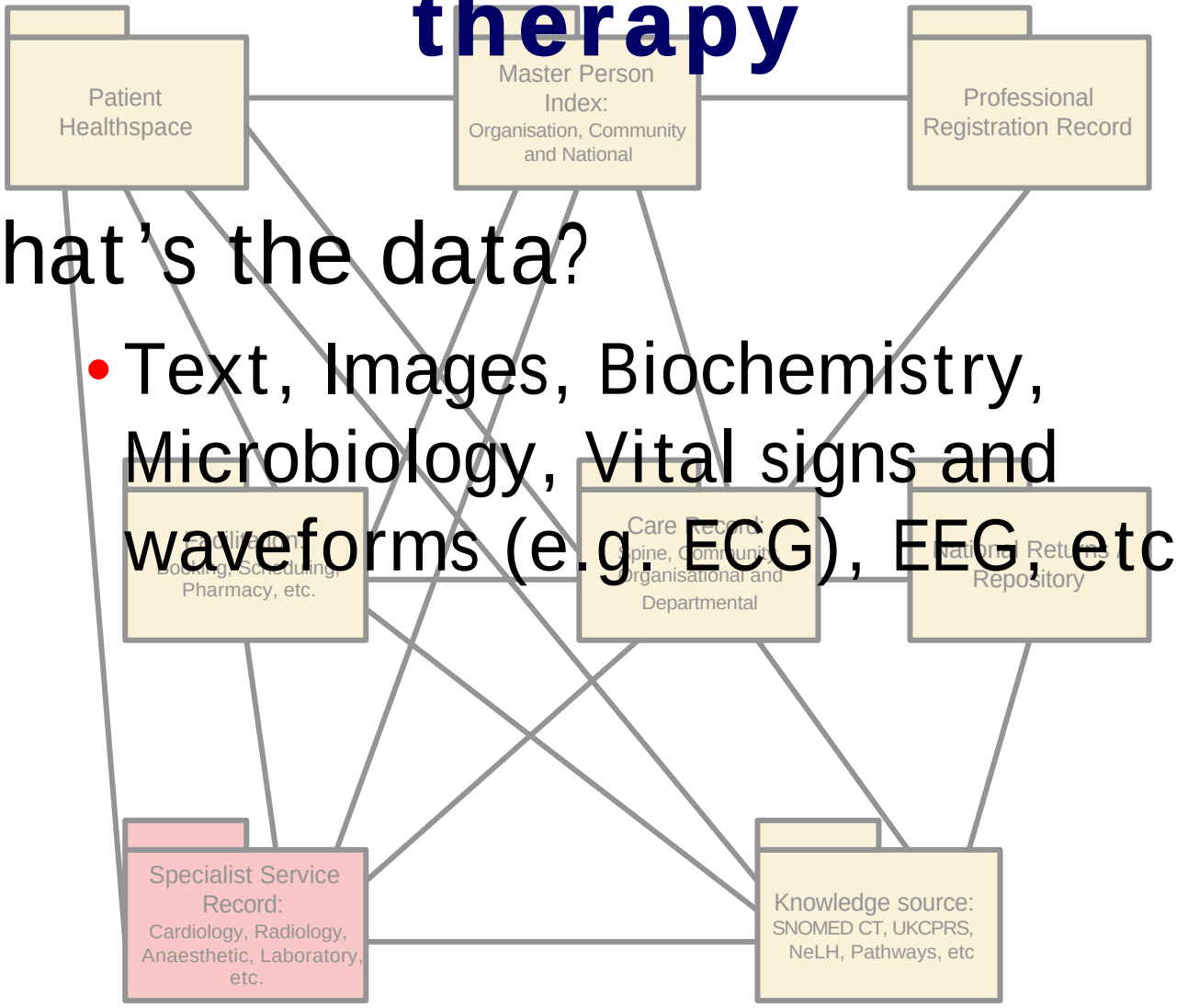
Specialist service record: diagnostic



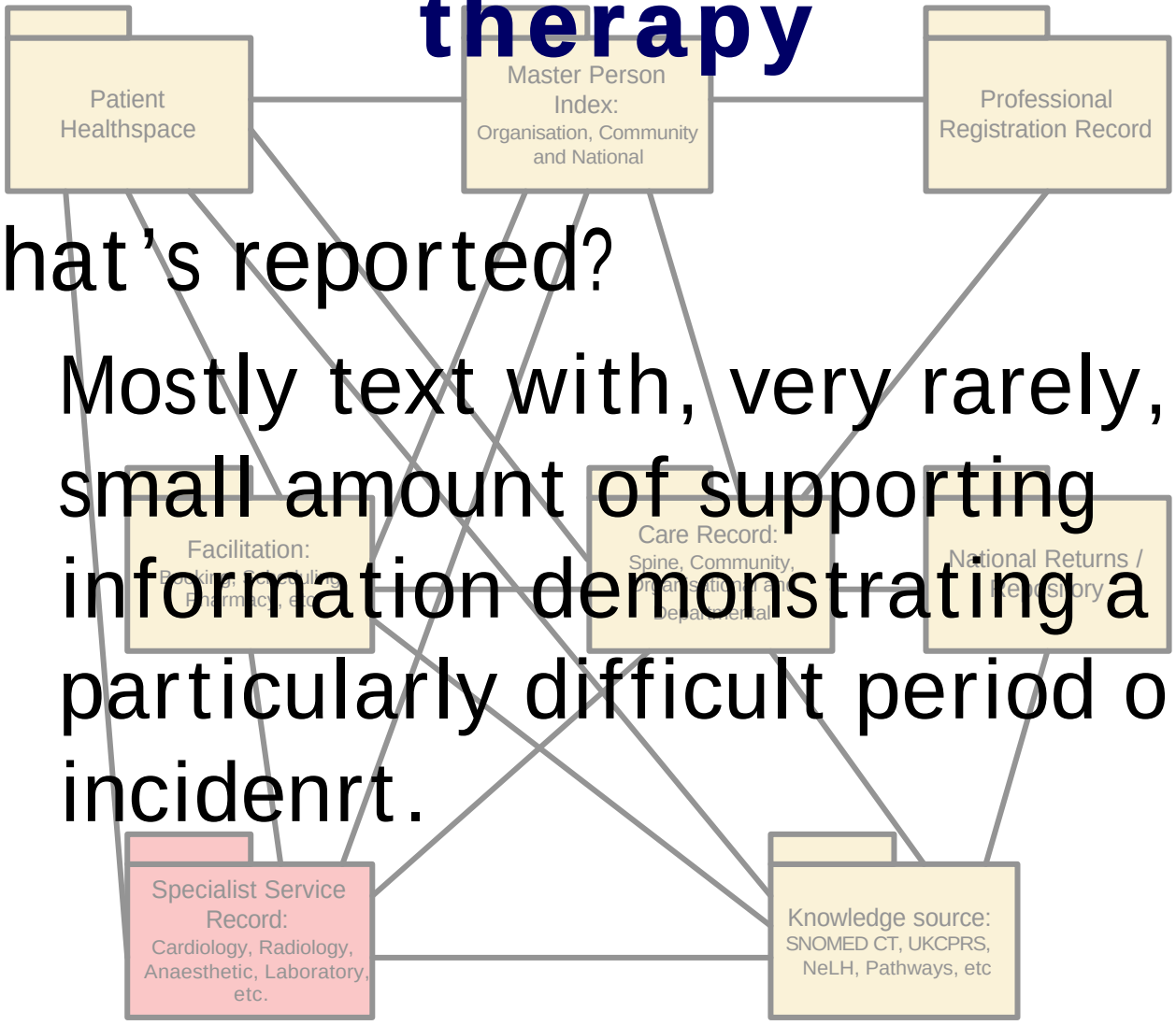
- What's reported?
  - Mostly text and numeric values with, rarely, a small piece of supporting information such as a sample of ECG, or an image.

Specialist service record: therapy

- What's the data?
  - Text, Images, Biochemistry, Microbiology, Vital signs and waveforms (e.g. ECG), EEG, etc.

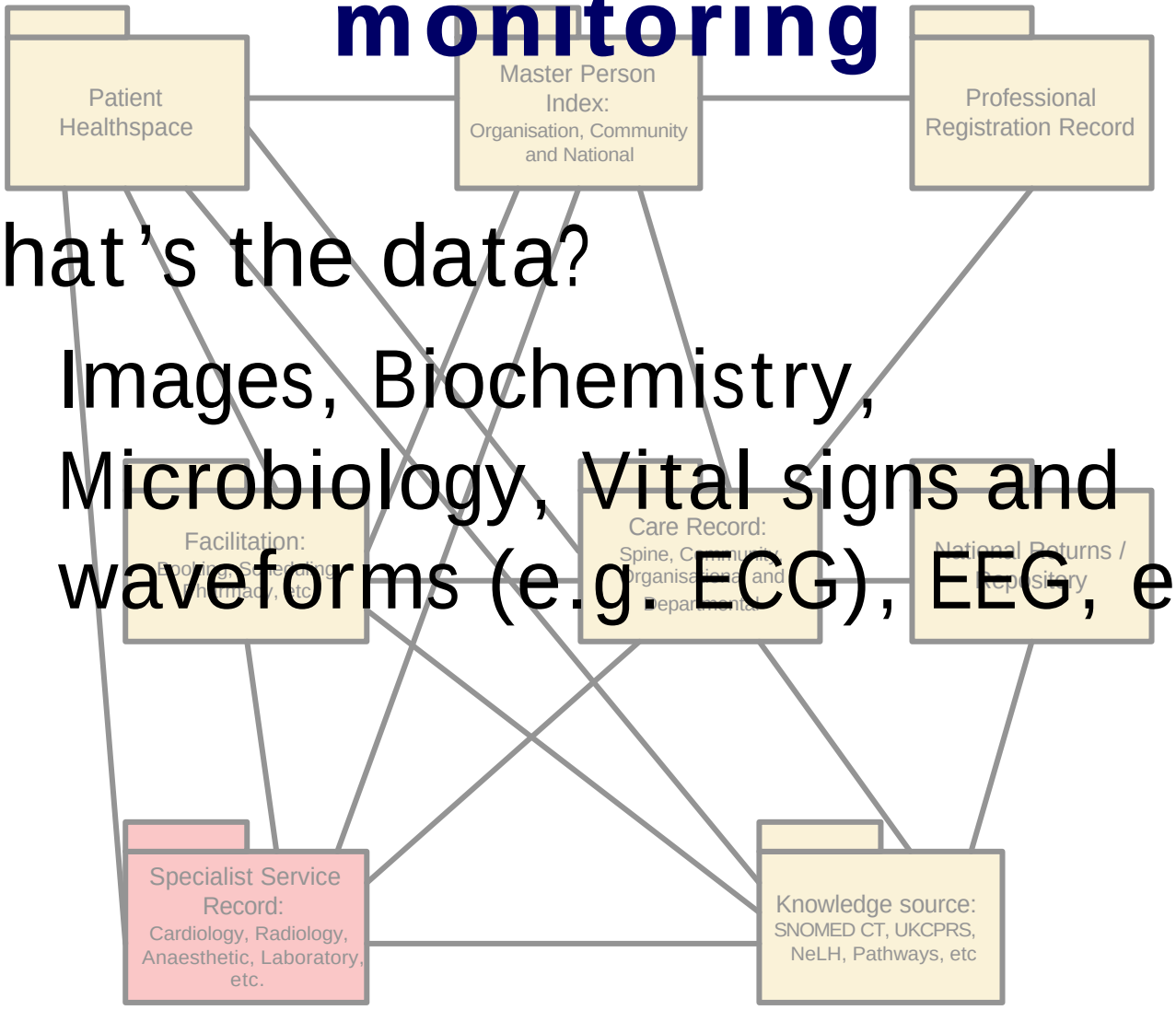


Specialist service record: therapy



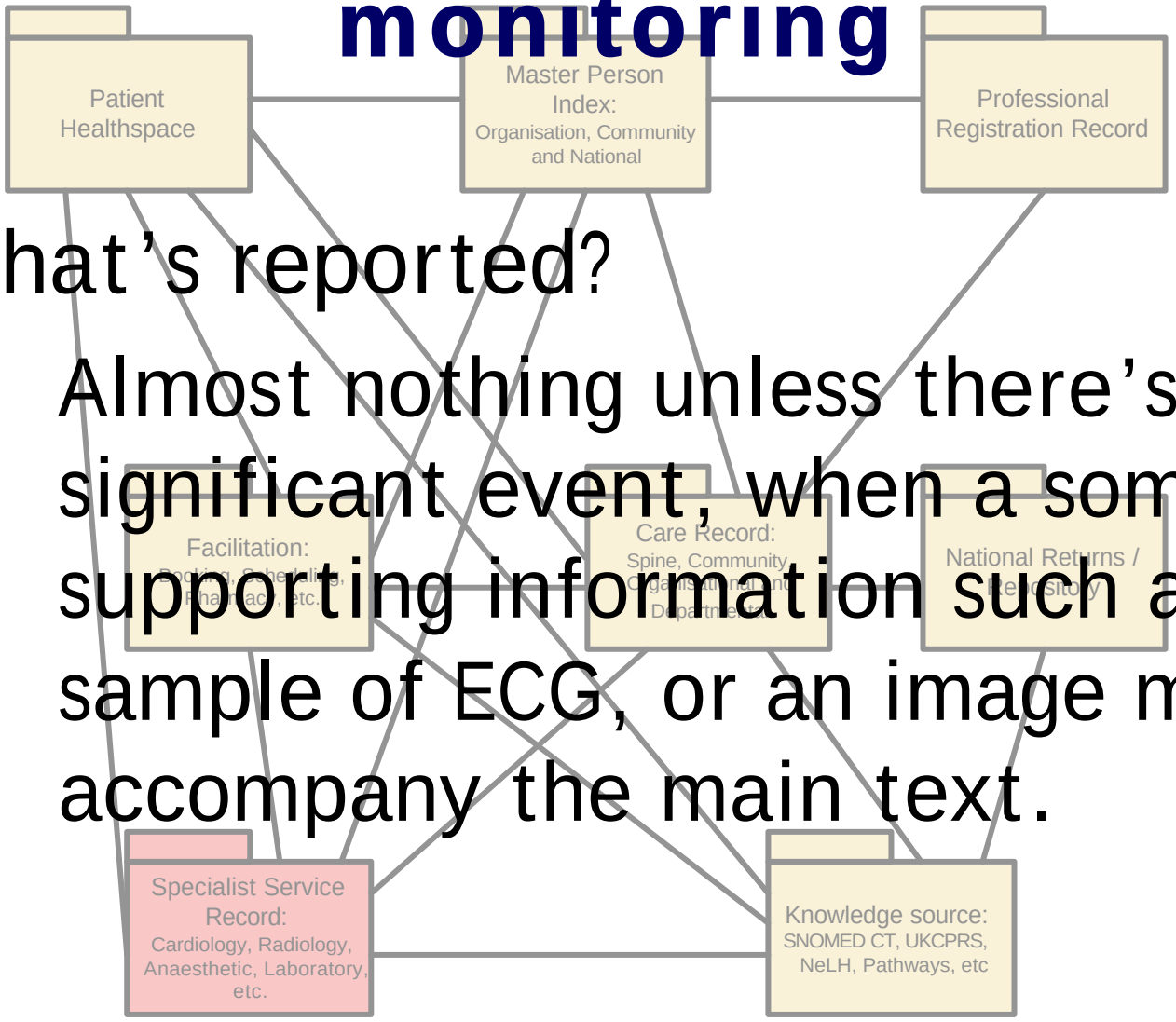
- What's reported?
  - Mostly text with, very rarely, a small amount of supporting information demonstrating a particularly difficult period or incidenrt.

Specialist service record: monitoring



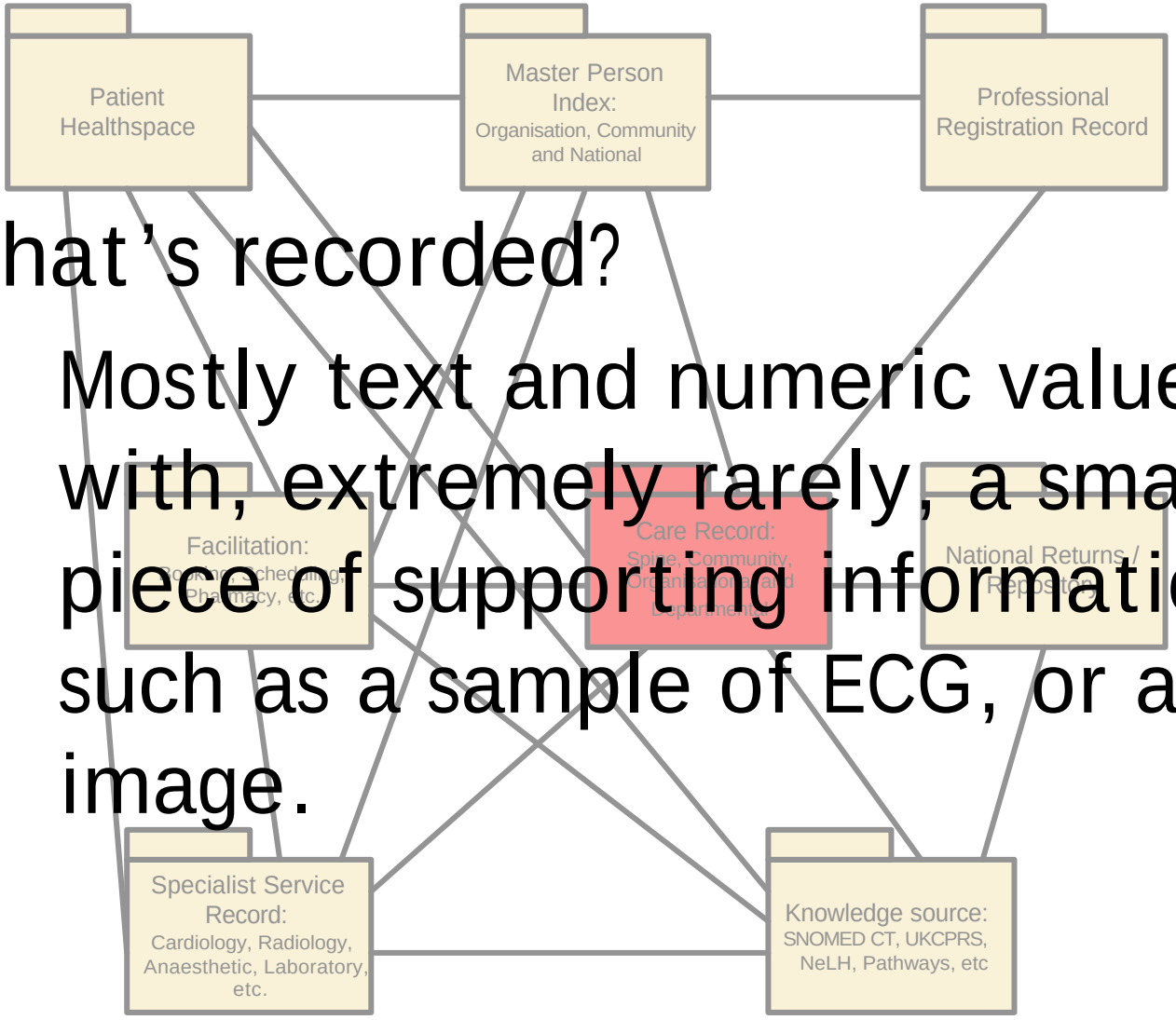
- What's the data?
  - Images, Biochemistry, Microbiology, Vital signs and waveforms (e.g. ECG), EEG, etc.

Specialist service record: monitoring



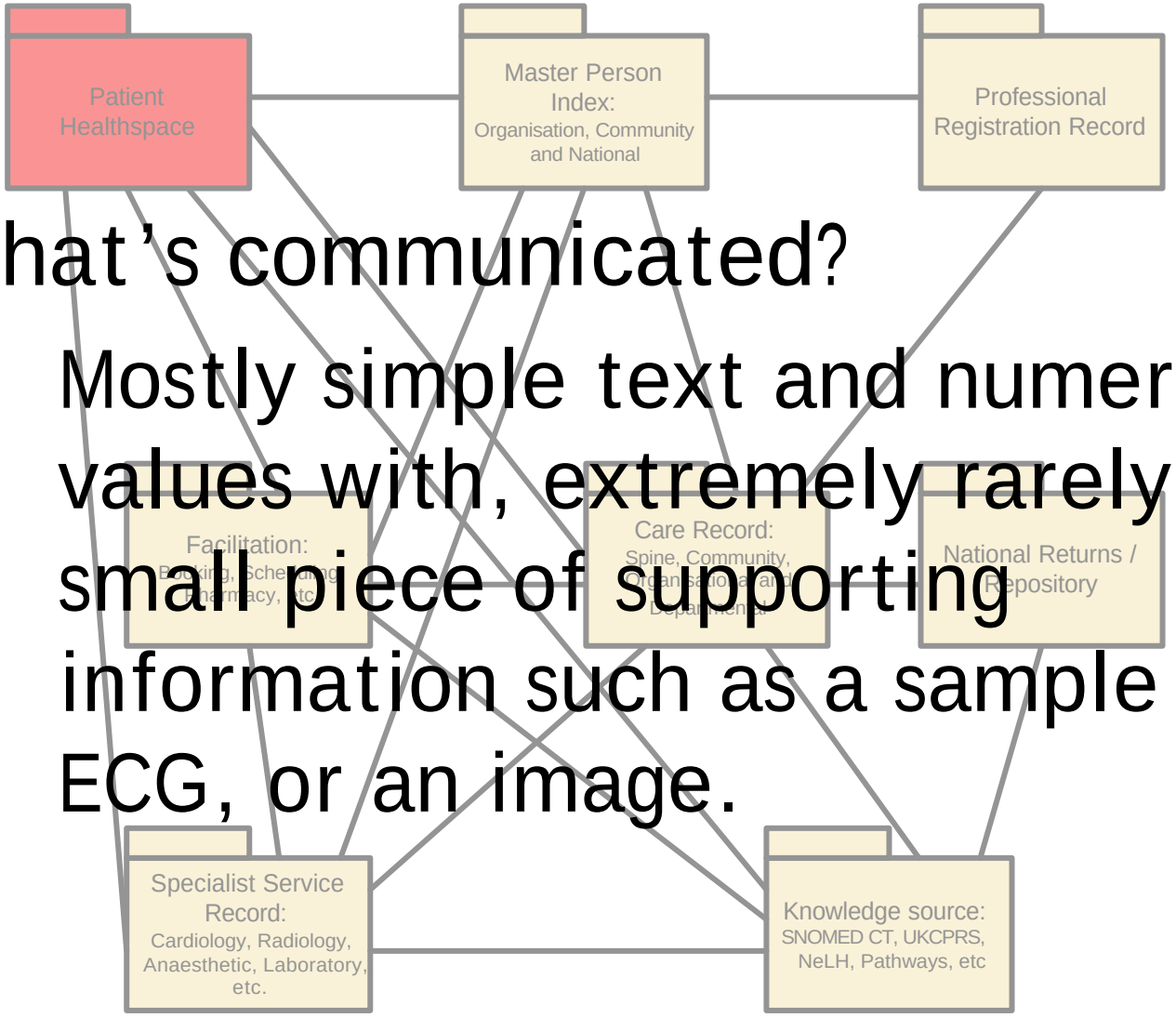
- What's reported?
  - Almost nothing unless there's a significant event, when a some of supporting information such as a sample of ECG, or an image may accompany the main text.

Health care record



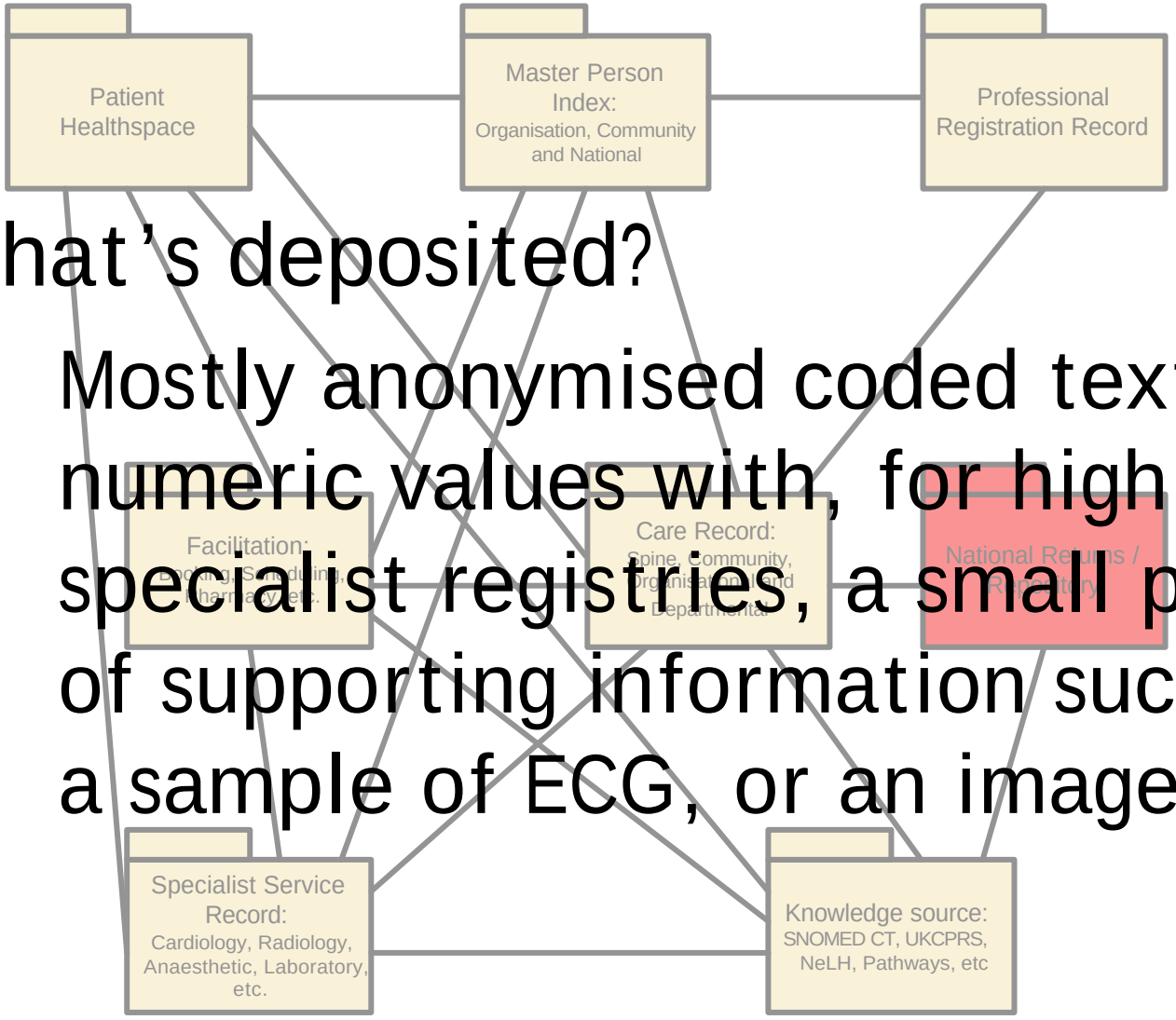
- What's recorded?
  - Mostly text and numeric values with, extremely rarely, a small piece of supporting information such as a sample of ECG, or an image.

Patient's healthspace



- What's communicated?
  - Mostly simple text and numeric values with, extremely rarely, a small piece of supporting information such as a sample of ECG, or an image.

Statistical repository

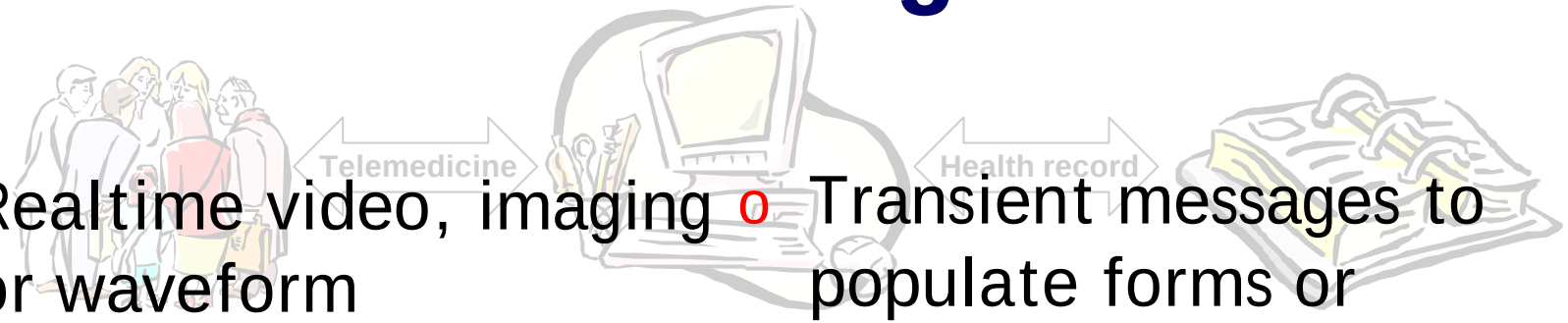


- What's deposited?
  - Mostly anonymised coded text and numeric values with, for highly specialist registries, a small piece of supporting information such as a sample of ECG, or an image.

Healthcare work stages

- Dealing with information in healthcare is a multi-stage process:

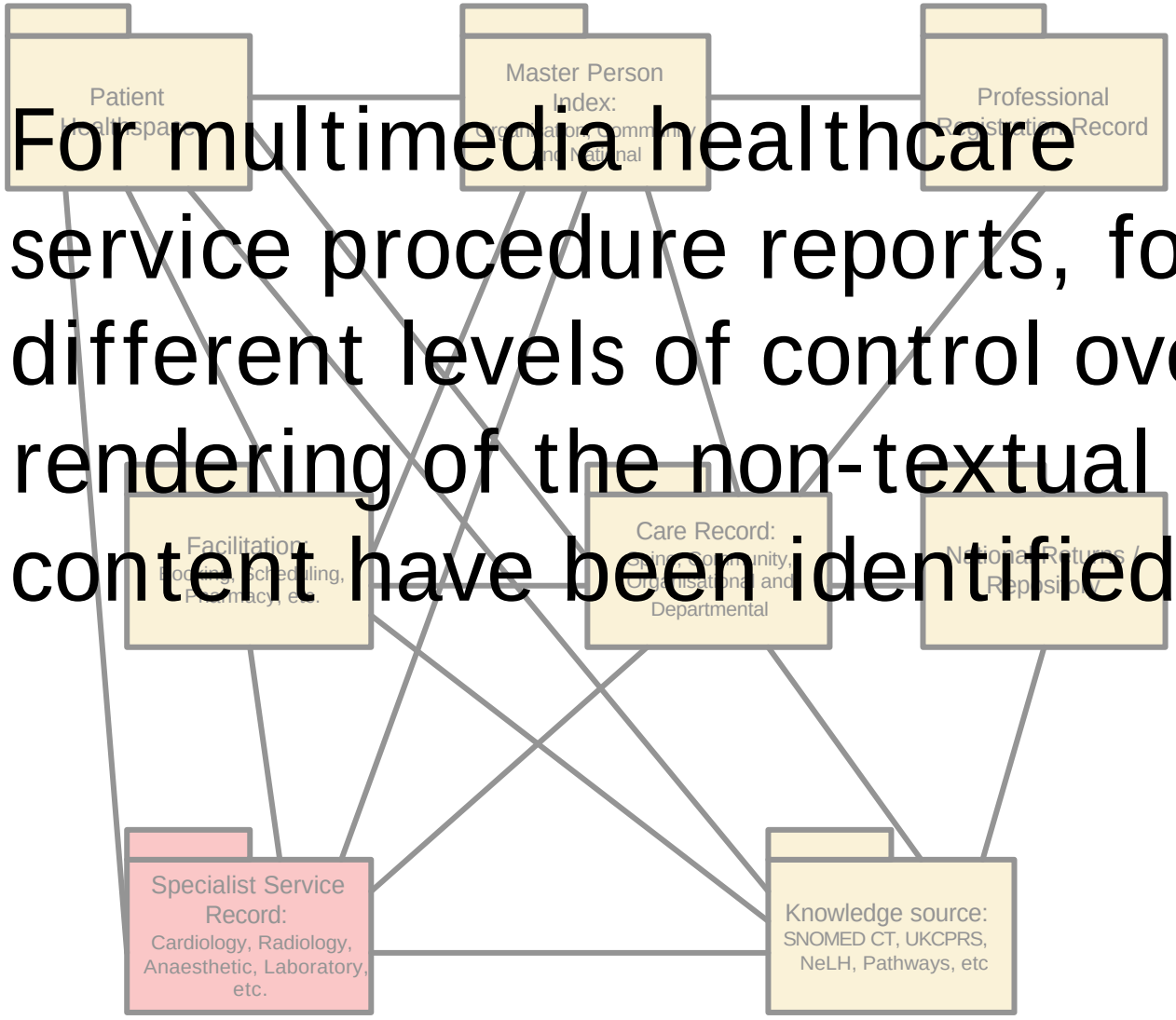
Methods of information exchange



- Realtime video, imaging or waveform
- Store and forward video, imaging or waveform
- Simple numeric values in near realtime
- Store and forward of simple numeric values
- Transient messages to populate forms or databases
- Fragments of clinical record to populate databases
- Validated clinical 'documents' for retention
- All above with, or w/o, complex data payloads

Multimedia reporting

- For multimedia healthcare service procedure reports, four different levels of control over rendering of the non-textual content have been identified:



Multimedia reporting

- No possibility of adjustment of rendering
  - Material can be presented only as specified by the creator.
    Using an x-ray as an example, this is analogous to supplying a hard-copy print or film.

Multimedia reporting

- Control of basic aspects of rendering
  - Basic object manipulation is possible, such as zoom and pan into image or curve, adjustment of video frame rate, cine loop cycle rate. However, this only permits viewing of a product, the characteristics of which have already been determined.

Multimedia reporting

- Multimedia with possibility of interactive adjustment of rendering
  - In addition to the ability to manipulate the object, the specialist user has control over conversion of the object data into a presented graphical representation. In the case of medical images this rendering is often described as "windowing".

Multimedia reporting

- Possibility to select other images and amend text
  - It can be necessary to produce, by collation, a new layout of material, including procedure products, not selected by the previous operator . This capability might become important when a subsequent review of the results is needed, perhaps years later.

Annotation of Multimedia

- The Synchronized Multimedia Integration Language (SMIL) is written as an XML application and is a current W3C recommendation.
  - SMIL supports the synchronized presentation of a set of images, sound and text objects within defined areas of a window of specified size.

Links to other sources

- A text healthcare service procedure report may be in the form of simple text or may contain hyperlinks to image data files and associated text annotation and/or graphics annotation.
  - e.g. as regions of interest, that are superimposed upon the digital rendered procedure product by the end user system.

Scenarios and use cases

- The scenarios worth considering when defining a healthcare procedure report specification should include the following:

Scenarios and use cases

- viewing of a healthcare procedure report and one or more procedure products by activation of hyperlinks;
- viewing of a healthcare procedure report and a set of procedure products and annotation by activation of hyperlinks;

Scenarios and use cases

- addition of annotation to a single procedure product;
- addition of annotation to a set of single procedure products laid out according to an existing layout specification;

Scenarios and use cases

- creation of a procedure report that references selected previously received procedure product data files and associated annotation;
- creation of a procedure report that references selected previously received procedure product data files with associated annotation together with a layout specification.

Scenarios and use cases

- This list is not intended to be exhaustive; indeed it is likely that further scenarios might emerge during consideration of a particular reporting relationship. Identified scenarios should be used to create more formal use cases, from which to derive use profiles and specifications.

Starting point for discussion?

- Acquiring and viewing multimedia is not today's biggest problem.
- Integrating the results of that interaction, together with relevant multimdedia data, into the patient record is the real problem.

Conclusions

- Medical records and medical data: models of electronic data interchange:
  - Text, and rarely with supplementary complex information
  - As messages or documents
  - Need to understand how to do information management and technology:
    - what, why and how?
    - by whom, and when?

International Telecommunication Union

End

Medical records and medical data: models of electronic data interchange

Thank you.

Melvin Reynolds

MelvinR@AMS-Consulting.co.uk

AMS Consulting, HR9 5PQ, UK

Workshop on Standardization in E-health
Geneva, 23-25 May 2003