Assessment of PACS: An Impact Analysis

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About the project

- started in January 1996
- finished in December 1996
- is funded by the Vienna Hospital Cooperation (KAV) and the Ministry of Science (BMWVK)
- is carried out by ÖAW
About the project

- aim
  - technology assessment to gather experiences of the day-to-day practice, organisational aspects and hindrances to develop the full potential of the PACS installation
About the project

**method**

» an interdisciplinary team of 3 researchers stayed at SMZO (Danube) for 3 months: participatory observation, interviews with experts and data collection

» an international literature analysis of 300 citations

» visits to and interviews with experts in other hospitals
  • national: LBK-Wien & LKH-Steyr
  • international: Hammersmith & Skejby
PACS variants & extensions

- evolutionary way
  - from already digitized image procedures
  - via inclusion of the other modalities
  - to the radiology-internal networking
- no parallel-running of analog & digital radiology
- high priority: full digitalisation of radiology
- less priority: distribution of images
PACS variants & extensions

◆ question of interfaces
  » interfaces between different modalities as well as in the integration of various subsystems (PACS-RIS-HIS)

◆ two fundamental principles
  » the administration of patient data must take place in HIS
  » information flow between HIS and other systems must be steered by HIS

◆ international standards
Technical function analysis

- not limited to one topology
- backbone technologies
  - FDDI or ATM networks limited to rad. dep. & some clinical areas
- necessary:
  - error handling with scenarios, organisational and technical controls, automatic mechanisms
  - explicit as well as implicit measures for quality assurance with functions for monitoring
Technical function analysis

◆ for radiologists
  » reporting must be easier
  » storage of individual settings
  » access to data of other patients while dealing with one patient
  » online help and tutorials
  » adequate (automatic) pre-fetching and autorouting functions
Technical function analysis

- for clinicians
  - no slow computers in clinical areas with unprofessional user interfaces
  - PCs as PACS-computers

- maintenance
  - systematized & consistently performed
  - an own system administrator
  - for guiding system development according to hospital management needs & priorities
Work organisation

❖ work shifts
  » administrative & archiving work by radiologists
  » introduction of PACS is concentrated upon radiologists ⇒ without re-shifting of tasks a dequalification of radiographers can be foreseen

❖ radiology examination requests
  » too high
  » cutting down repeated image production
  » but supplementary & follow-up images
Work organisation

- **technology** $\Rightarrow$ a transformation process
  - radiological images are (theoretically) available immediately after acquisition $\Rightarrow$ expectations of clinicians increased regarding the speed of results
  - radiologists want to establish themselves as highly qualified specialists and partners of clinicians instead being computer specialists
Quality of medical care

- improved
  - reduction of radiation doses
  - quality of reporting regarding post-processing possibilities
  - interdisciplinarity partly in training, research, and in documentation

- evidences for other factors are missing
  - reduction of radiological services
  - decrease of lengths-of-stay time of patients in hospital
Perception of users

- varying perceptions
  - radiologists: PACS as work relief
  - clinicians: disappointed regarding the availability of images
    - no access rights
    - just-after-acquisition access
  - position of radiologist is questioned
  - radiologists should share the decisions about requested examinations
  - high competition between disciplines
Economic issues

- saving potentials
  - in avoiding film costs
  - in related costs for development and disposal
  - in personnel costs
  - in space
  - through efficient controlling giving overview of services & costs ⇒ cost-awareness

- no connection between
  - digital radiology & reduction of length-of-stay in hospital could be established
Conclusion

- PACS is a
  - “a logical consequence” and
  - a step in the direction of an electronic patient record
  - which is still a vision and – at least in Austria – far from reality