A NOVEL EXPLANATION OF WHY ORGANIZATIONS FAIL TO ADOPT PROVEN TECHNOLOGIES

The Special Case of Imaging in the Healthcare Sector

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ABSTRACT

Models of adoption of technological innovations generally focus on the process of adoption and the factors acting as barriers and facilitators to this process. A challenging problem is the phenomenon whereby organizations are reluctant, lethargic, or resistant to adopt technologies that have been proven to be effective and to provide demonstrable benefits to adopters.

Although healthcare delivery organizations have been relatively less aggressive in adopting new technologies than other sectors, they have made notable progress in recent years. We report the preliminary results from a study, conducted in the USA, of the adoption processes and mechanisms of imaging technologies in the healthcare sector, in particular the example of Picture Archiving and Communication System (PACS). The study involved 219 hospitals and medical centers who responded to a research questionnaire. We found that one of the key barriers to the slow or non-adoption of such systems is the relationship of the perceived or actual benefits to the evaluation criteria of the organization and its members. This study of evaluation metrics may lead to new directions in the research on adoption of new technologies.

A. RESEARCH QUESTIONS

- Why organizations are slow or reluctant to adopt proven technologies?
- What are the barriers to adoption of these technologies at each stage of the adoption and implementation process?
- What are the barriers to adoption specific to the PACS technology and the healthcare sector?
- How can organizations overcome such barriers to adoption of proven technologies?

B. STUDY DESIGN

- We constructed a Model of the Adoption and Implementation of the PACS technology in hospitals.
- We identified the stages in this model.
- We selected a random sample of 700 hospitals and medical centers from a population of 7000 hospitals in the United States.
- We designed a questionnaire which identified barriers and facilitators to adoption for each of the stages.

C. METHODOLOGY

We sent the Questionnaire to the sample of 700 hospitals.

We received 219 completed responses: about 30% return.

We analyzed the responses with regard to the level of adoption.

D. The Stage Model of Adoption

I • Decision to allocate capital budget to PACS

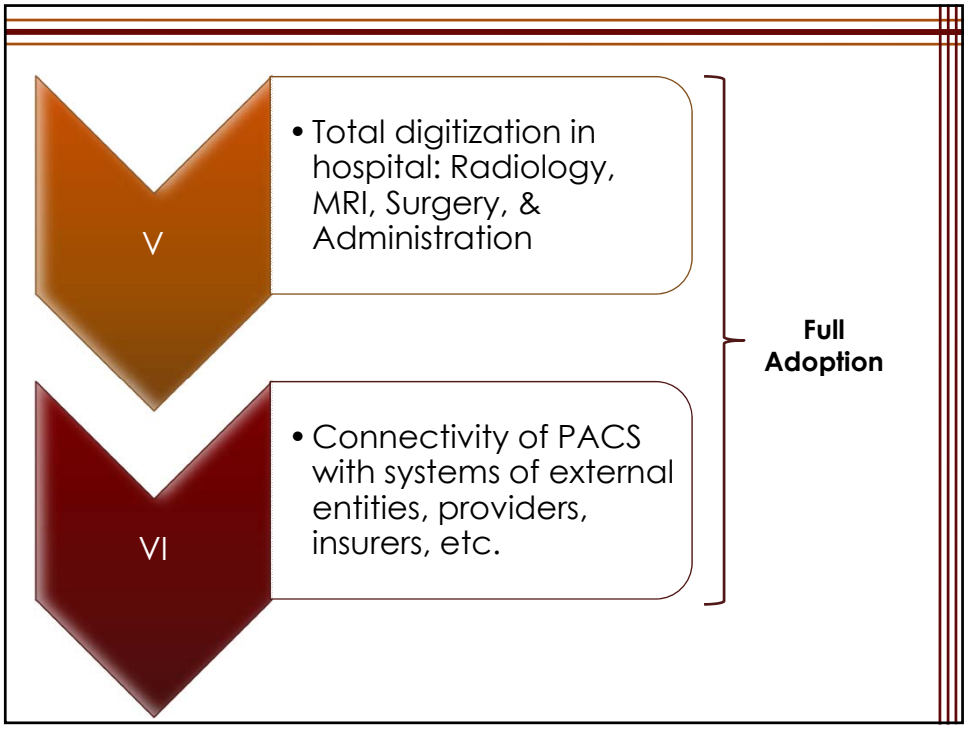
II • Selecting vendor/s initiating RFQ

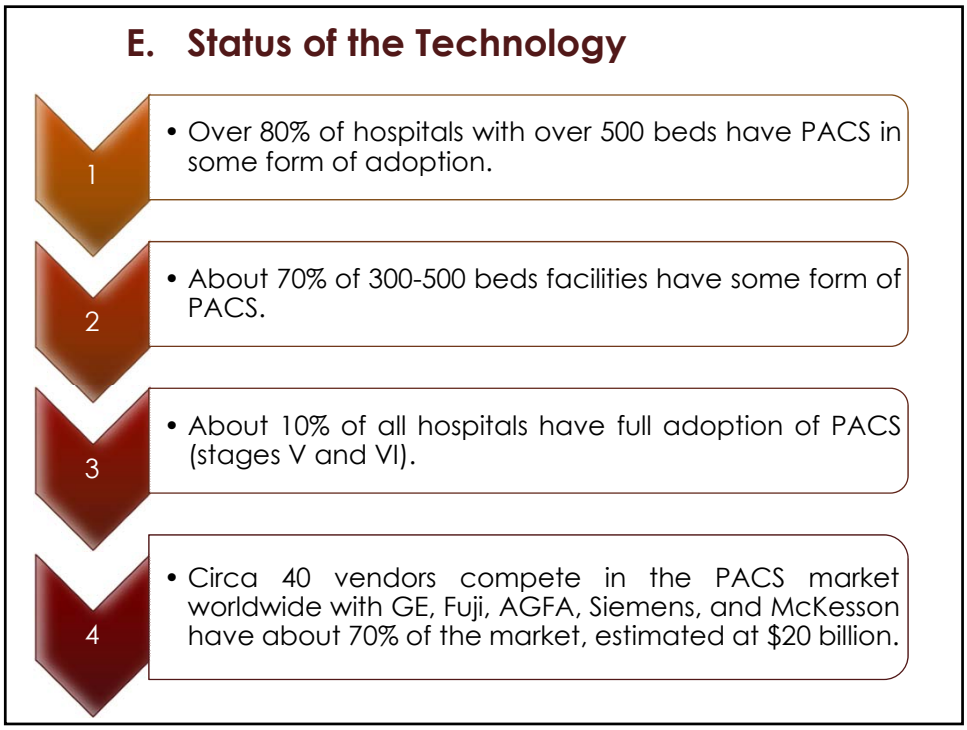
Pre-Adoption

III • Digital use in radiology alongside films.

IV • Full digitization in radiology.

Partial Adoption

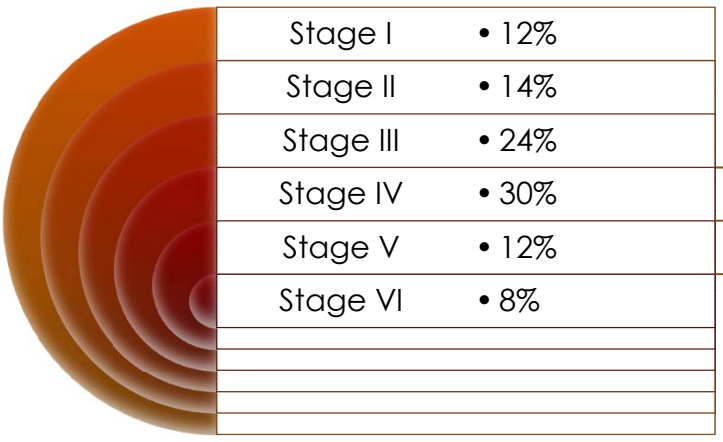

V
• Total digitization in hospital: Radiology, MRI, Surgery, & Administration
VI
• Connectivity of PACS with systems of external entities, providers, insurers, etc.
Full Adoption


E. Status of the Technology
1
• Over 80% of hospitals with over 500 beds have PACS in some form of adoption.
2
• About 70% of 300-500 beds facilities have some form of PACS.
3
• About 10% of all hospitals have full adoption of PACS (stages V and VI).
4
• Circa 40 vendors compete in the PACS market worldwide with GE, Fuji, AGFA, Siemens, and McKesson have about 70% of the market, estimated at $20 billion.

F. Sample Characteristics

1	Profession of Respondents	
	M.D.	28%
	R.N.	40%
	Clinical Technician	11%
	Administrator	21%
2	Hospital Size	
	fewer than 100 beds	13%
	100-200 beds	22%
	300+ beds	65%
3	Ownership	
	Privately owned	56%
	Publicly owned	44%
4	Respondent's Experience with PACS	
	0-5 years	27%
	6-10 years	73%

5. Level of PACS Adoption



G. Barriers to Adoption

1. Pre-Adoption

Stage I

- Cost issues: The technology is too expensive.
- Perception that benefits from the technology are not commensurate with the cost or expectations of the clinical staff.
- Perception that adoption of PACS will disrupt the hospital's routine.

Stage II

- Lack of trust in vendors.
- Prior negative experience with the adoption and implementation in the hospital of large IT systems.

2. Partial Adoption

Stage III

- Radiologists reluctant to learn new systems.
- Ease of use.
- Perceived gap between the promise of PACS and its benefits, and the criteria used by the hospital to evaluate the performance of radiologists and their function on the organization.

Stage IV

- Issues of storage and cost of storage.
- Issues of standards of different vendors.
- Issues of learning and adaptation to total digitization.
- Ease of use.
- Vendor support.

3. Full Adoption

Stage V

- Perception by clinicians that the benefits from widespread adoption of PACS in the hospital fall short of expectation and not commensurate with how clinicians are compensated/reimbursed by insurance and evaluated by the hospital.
- Issues of connectivity and standards.
- Issues of data management.
- Linkage of benefits from PACS and quality of care that clinicians can provide their patients.

Stage VI

- Perceived gap between benefits from full adoption of PACS and criteria of compensation and performance evaluation of clinicians throughout the hospital and in practitioner groups.
- Issues of costs of implementation.
- Issues of standards.
- Issues of data storage, management, and exchange.
- Regulations (HIPPA).
- Issues of privacy and confidentiality.
- Perceived gap between benefits from PACS (e.g., cost-efficiencies) and quality of care.

H. Initial Conclusions

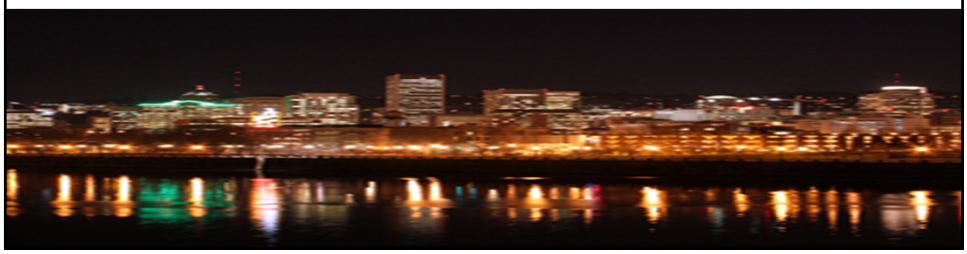
1. Reluctance to fully adopt a proven technology such as PACS may be attributed to traditional barriers (such as cost, vendor support, and ease of use) to perceived gap between the promised or actual benefits from the technology and criteria used to evaluate the performance of clinicians.

2. The more advanced the stage of the adoption and implementation of the technology, the more the perceived gap (benefits-evaluation criteria) will impede the adoption and implementation.

3. In order to overcome this resistance, organizations need to ***align*** their expectations from the technology to be adopted—with the criteria they apply in their evaluation of the performance of those who will use the technology.

I. Future Research

- These findings and conclusions are a small portion of the results from our study.
- Further research should explore other proven technologies—in the healthcare and other sectors.
- Future research should relate the gap in perceived expectations to the strategic tenets of the organizations.



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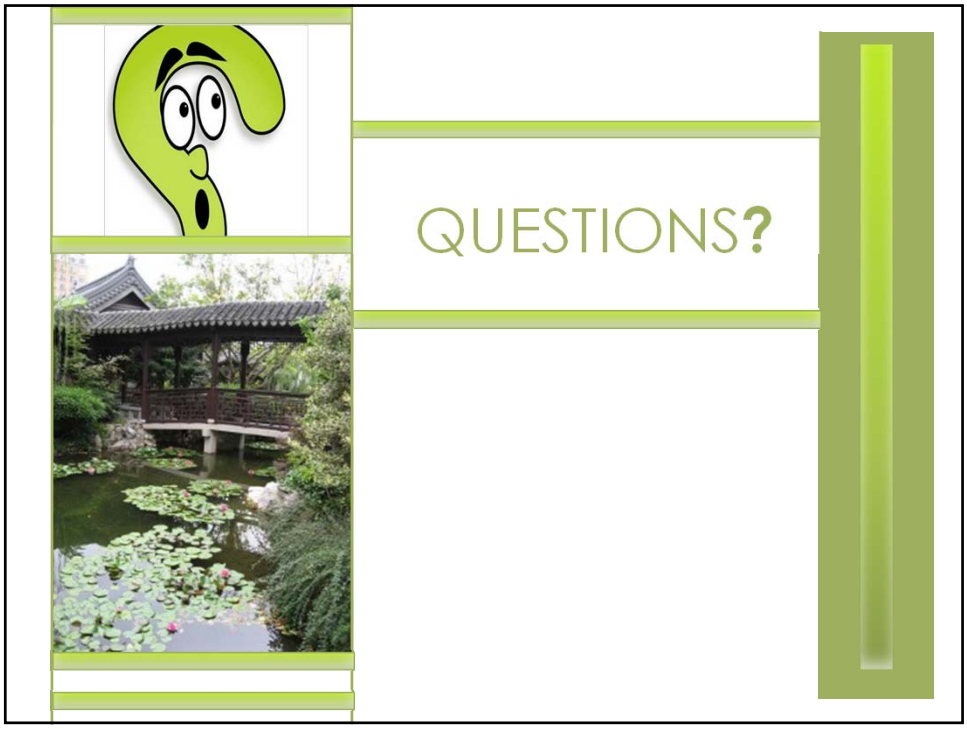
QUESTIONS?