

7.2a System Selection, Implementation, and Optimization

10x10 – Introduction to Biomedical Informatics & Artificial Intelligence
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System selection and implementation

Complex, with no single solution and varying for different settings, specialties, etc.

Discussion will cover

- Finding information
- System selection
- System implementation
- System optimization

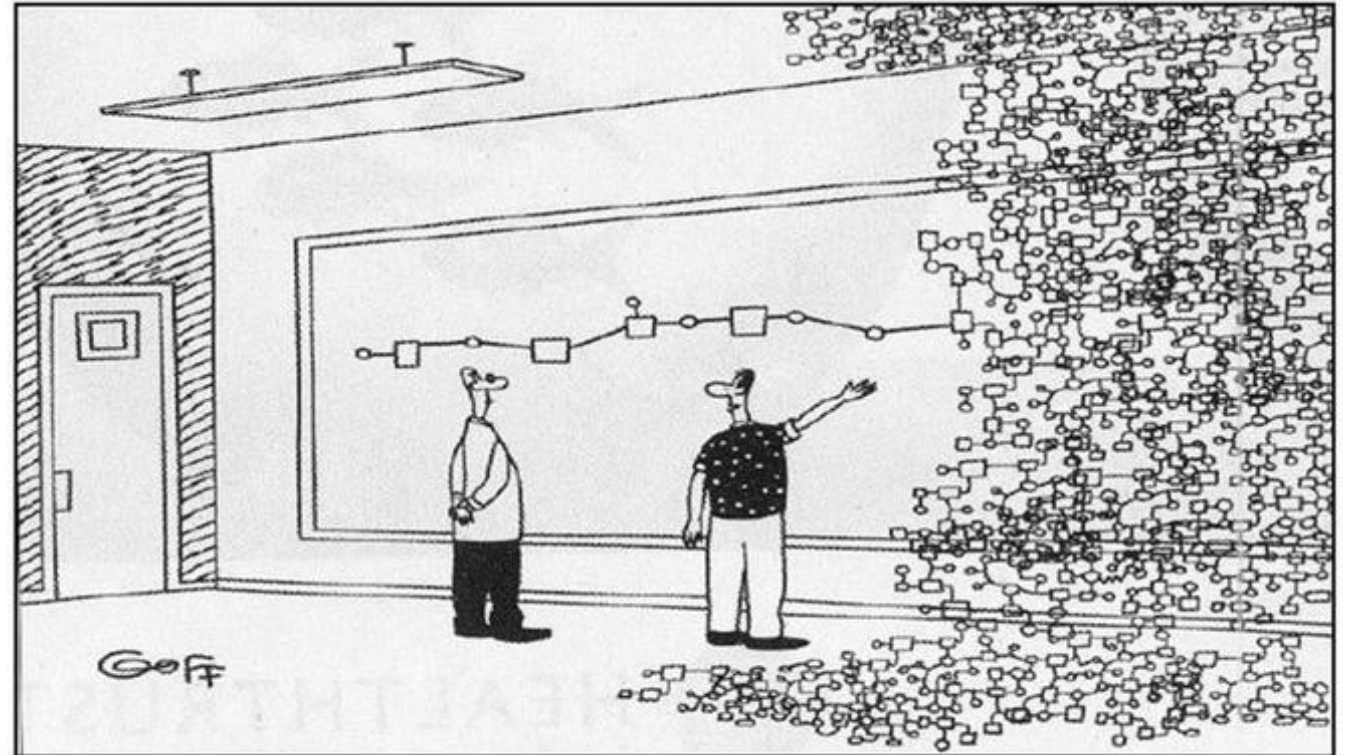
Finding information

Books

Web resources

Reports and articles

Commercial information



"This is where the idea for the new EMR starts getting a little complicated."

Books on EHR implementation

Sayles, *Introduction to Information Systems for Health Information Technology*, AHIMA, 2023 (Chapters 4-5)

Payne, *Practical Guide to Clinical Computing Systems, Second Edition: Design, Operations, and Infrastructure*, Elsevier, 2014

Haugen, *Beyond Implementation: A Prescription for the Adoption of Healthcare Technology*, Magnusson Skor, 2016

Amatayakul, *Health IT and EHRs: Principles and Practice*, AHIMA, 2017

Scariati, *EHR Governance: A Practical Guide to User Centric, Consensus Driven Optimization*, HIMSS, 2023

Web resources

[ONC/ASTP Health IT Playbook](#)

- [EHRs](#)

American Medical Association (AMA)
[STEPS Forward](#) for clinical practices

- [Taming the EHR Playbook](#)

[Oregon Health IT Playbook](#) (Leake, 2025)



Reports and articles

Implementation for high-value primary care (Sinsky, 2014)

- Within larger advice for building high-functioning teams (Smith, 2018)

Six habits of highly successful health IT (Ray, 2019)

- Put patient care first
- Assemble team with right skills
- Relentlessly ask why
- Keep it simple
- Be Darwinian
- Not losing the forest for the trees

“Game changers” in eight organizations describe EHR improvements (Adams, 2022)

Reports on aspects of EHR implementation

Training

- Associated with user satisfaction (Longhurst, 2019)
- Best practices for physician training (Pantaleoni, 2015)
- Use of high-fidelity simulation and educational approach (Mohan, 2021)

Change management (Ficksenscher, 2011)

Leadership and governance (Ficksenscher, 2011)

Process redesign (Ficksenscher, 2011)

Involvement of academic informatics

- Integration with operational IT (Mann, 2024)
- Multi-faceted education (Russo, 2024)

Other literature on EHR implementation

Usability and safety challenges during EHR implementation and variance from stakeholder perspectives (Ratwani, 2016)

- Cost and resources
- Risk assessment
- Governance and consensus building
- Customization
- Clinical workflow and usability testing
- Training

Facilitation and barriers with adoption (Kruse, 2016)

- Facilitators included efficiency, hospital size, quality, access to data, perceived value, and ability to transfer information
- Barriers were cost, consuming of time, perception of uselessness, transition of data, facility location, and implementation issues

Commercial information

Commercial services that provide advice, evaluate systems, etc.

- [Health IT Answers](#)
- [KLAS](#)

As always, consultant\$ are eager to help

- Or better yet, maybe you can become one!

System selection (Sayles, 2023)

Planning

Organization of project

Request for Proposal

Evaluation of systems

Selection of system

Contract negotiation

Planning

Organizations should set their own goals and objectives BUT much decision-making now be driven by billing and regulatory incentives

Project management and leadership essential

- Define key roles: project manager, CIO, CMIO, etc.

Also key is obtaining buy-in from management and users

Many reasons for failure related to lack of planning

- Lack of clear vision
- Inadequate or inappropriately used resources
- Lack of experienced staff
- Unrealistic expectations



Organization

Need a project team – may differ depending on size and resources of organization but should include

- Project manager – coordinates project
- Project steering committee – responsible for implementing project, often led by CIO or CMIO
- User task force – organizes and represents users
- Vendor representative – allowing direct communications
- Consultant – may be hired to help obtain best value

Knowledge and training required of project team

Request for Proposal (RFP)

RFP is formal detailed document that should include

- Information about organization
- Requirements for proposed system
- Request for information from vendor, including company profile, sample contracts, system testing and training requirements
- Process for evaluating responses

May start with Request for Information (RFI) to obtain basic information about products and narrow to whom RFP is sent

Evaluation of systems

Process should have been determined in planning and organization steps

Evaluation should include

- Reviewing RFP responses
- On-site visits – vendors coming to give demonstration
- Site visits – seeing system(s) used elsewhere
- Reference checks



Selection of system

Project team should make based on criteria established in planning and organization steps

Meeting goals in system requirements is key, but other considerations include

- Cost – start-up and ongoing
- Technology issues
 - Build vs. buy
 - Local vs. hosted
 - Interfaces with other systems
 - Open source?



Contract negotiations

Many important considerations

- Delivery dates
- Warranties and guarantees
- Costs and payment terms
- Software source code in escrow used by many
- Penalties
- Maintenance and updates
- Training responsibilities

Involve local organizational expertise