Week 5
System Selection and Acquisition

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Week 5 Outline

- Reading: Chapter 5, System Acquisition, p141– p177

    - Learning Objectives
    - System Acquisition – A definition
    - System Development Lifecyle
    - System Acquisition Process
    - Things that can go wrong
    - Information Technology Architecture

Learning Objectives

- Explain the process health care organisations go through to select information systems
- Be able to describe the systems development lifecycle
- Discuss various methods to acquire health care systems
- Discuss the purpose for Request for Information and Request for Proposal
- Gain insights into the system acquisition process
- Gain some understanding of the HC IT industry and resources available to select health care IT vendors

Introduction

- Health Care service providers need methods to enable the selection of applications and services that fit their particular requirements
- It is not feasible, nor sensible to select the first system that is shown, nor is it acceptable to think the buyer knows best
- Often no existing solutions exist – what next, where do we go, who do we talk to?
- A poor choice made when selecting a new IS can be disastrous

System Acquisition - Definition

- System Acquisition refers to the process through which the need for a new system is identified to the point that a contract (agreement) is signed with the service provider

- The duration of this process can be weeks or may take many months

- Implementation is a separate but related process

System Acquisition

- The over-arching process is commonly called the Systems Development Life Cycle

- Not the same as the Software Development Life Cycle which is related to analysis, design, development, testing and implementation of software systems
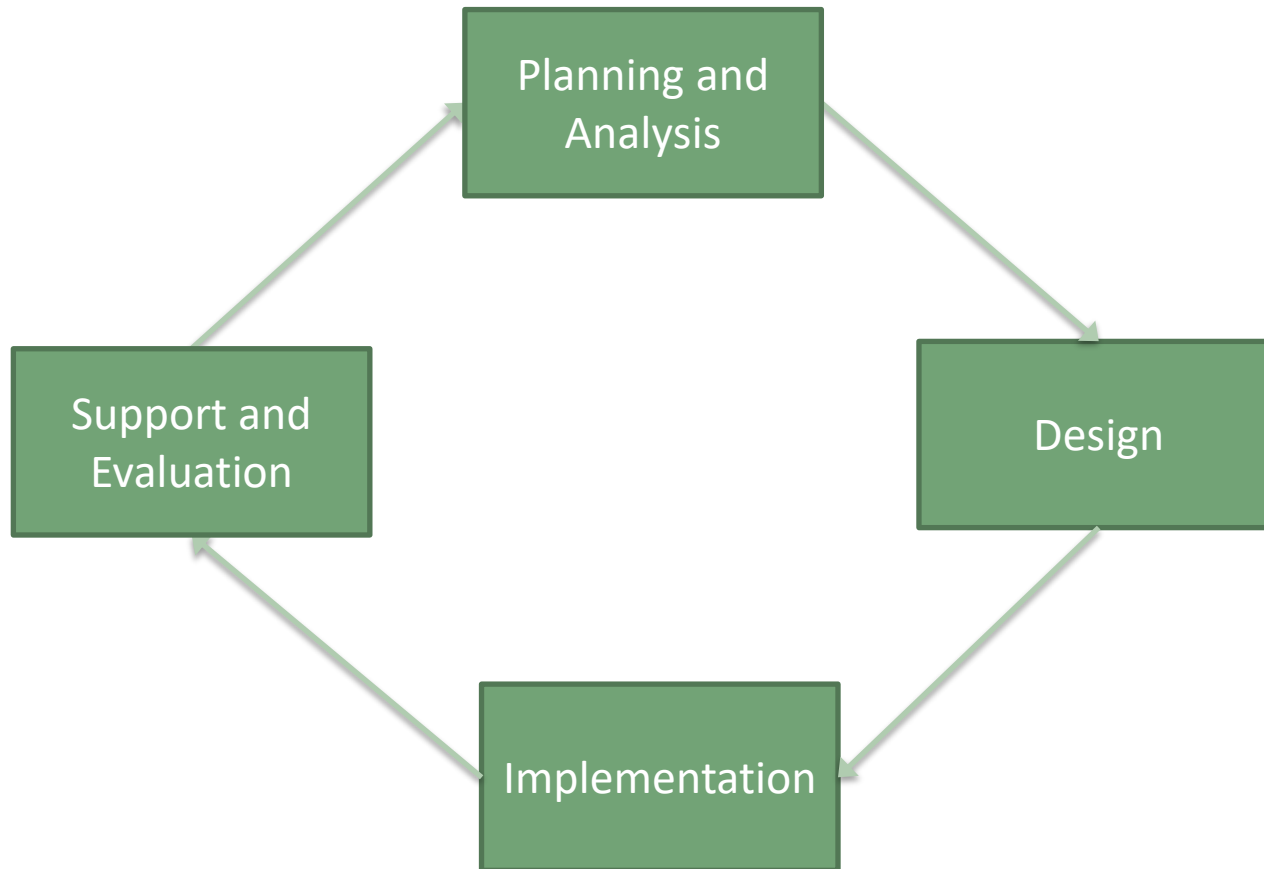
Systems Development Life Cycle

- During the IT panning process the need for new systems and service will be identified

- The organisation then follows a defined process for analysis and system selection

- Models vary based on the organisation and the need
  - If need is urgent then maybe a shortcut is permitted?

Systems Development Life Cycle

Planning and Analysis → Design → Implementation → Support and Evaluation → (back to Planning and Analysis)

Health Care Information Systems, Fig 5.1 p144

SDLC – Planning and Analysis

- Focusses on the business need and business strategy goals and objectives)

- Analysis is required to define functional system requirements and information needs

- Requires contribution from all aspects of the business (and users)

- At this point the scope of the work needs to be identified

SDLC - Design

- Begin to vision what the new system will be like

- Is it designed in house? By contractors or a vendor?

- What is the business standard practice?
  - Option 1 – Commercial Off The Shelf (COTS)
  - Option 2 - Custom Externally built
  - Option 3 – Custom Internally built

- Cost benefit analysis of options

- Solution is selected and contracts negotiated and signed

SDLC - Implementation

- A project required to implement (deploy) the solution
  - Data conversion (or loading)
  - User training
  - Infrastructure building
  - ORA (Operational Readiness Assessment) – try to break system and see if it can recover
  - Software install and configuration
  - Testing
  - User Acceptance Testing
  - Workflow changes
  - Organisational Change Management
  - Go-Live

SDLC – Support and Evaluation

- Maintain the software and related systems
- Support the busines users
- Enhancements
- New reports
- Bug/Defect fixing
- Document Known Problems
- Infrastructure upgrades (refresh)
- Operating System patches

- Evaluation – has the new service realised the benefits identified?

- Eventually the new system will be replaced by something better!

System Acquisition Process

- In the context of the SDLC – the Analysis and Requirements phase and the Design phase constitute System Acquisition

- Depending on the complexity of the new service we may need to vary the details of the process followed

  - Critical/Major Systems Acquisition will require considerable due diligence and management
  - Small systems may reduce the scale, but not eliminate the overall process

- The following pages highlight some important steps in a complex/critical project, scale down from this for smaller less critical new systems

System Acquisition Process

- Establish project Steering Committee and appoint PM
- Define project objectives and scope of analysis
- Screen market place (COTS first!)
- Determine system goals
- Determine and prioritise system requirements
- Develop and distribute RFP and RFI
- Explore other options for acquiring system, custom build, lease (software as a service)
- Evaluate vendor proposals (weighting/scorecard, site visits, vendor analysis – are they a reliable service provider? Sole source?)
- Cost Benefit Analysis
- Prepare summary report and recommendations
- Contract negotiations

Steering Committee & PM

- Critical to the success of the introduction of a new service is to have a strong steering committee of individuals with a vested interest in the project

- Combination of Clinical representatives (CMIO), Business Executives, ICT CIO, main system user representative

- Need decision makers with authority and accountability

- The Project Manager will take ownership of the process and reporting to the Steering Committee on regular intervals

Define Project Objectives and Scope

- Define the scope (charge) of the role and nature of the committees involvement with the project (and often to define what is not in their scope)

- Define the process through which the investigation will take, timeliness, meeting frequency, milestones

- Set the Communication process

- Resources that the committees need to carry out its charge (achieve goals and objectives)

- Agree the evaluation methods and criteria (what is important to the selection decision)

- Detail the extent to which options should be explored, what is not in scope or should be avoided, e.g. Cloud Services or a poor performing vendor.

- Narrow the choices to well used services, not bleeding edge

Screen the Market Place

- Begin initial exploration of "what is out there", what does the steering committee have experience of or have heard from other service providers in other areas

- Research information, e.g. Gartner, Canadian Health Network, Medical Associations

- Talk to others in a similar position in another province

- Start collecting and sharing the information with the steering committee and other project resources

Determine System Goals

- System goals, what are the main goals of the system?

- What needs to be accomplished

- What are they looking for in the new system?

    - Ability to measure the cost of clinical services
    - Aid the practice of quality monitoring
    - Reduce Patient Wait Times
    - Improve staff efficiency (how?)

Determine Requirements Priorities

- As system requirements are identified (after goals are set) requirements can be defined and documented

- It is common at these initial stages to not really know what we want it takes time to question and refine

- As the requirements are collected they can be ranked in terms of importance

- Critical requirements must be ranked (prioritised) over lesser important requirements (is it critical or a "bell's and whistle"?)

- Should reflect specific strategic goals

- The list can then be shared with vendors and service providers

- Often it is helpful to group into categories, like Software, Infrastructure, Integration (Interoperability)

Develop and Distribute RFP/RFI

- Taking the prioritised requirements and other non-functional requirements they can be organised RFP or RFI package
- Typically HC providers use Request for Proposals to collect proposals from vendors
- The RFP details functions and requirements that the vendor can detail their capabilities in each of the areas (often with a need to provide evidence of that capability)
- Often needs to be accompanied with a formal quote or costing based on identified criteria (e.g. number of users, system size)
- The RFP document will detail to the vendor how they are to respond, when by, where to, their contact information
- Non-Disclosure Agreement signatures from both parties
- Other vendor organisation information, size, #employees, #customers for the product, references, history in area
- Scorecard criteria
- Operational support, update releases, contact/help desk, hours of operation

Distributing the Request for Information

- Often as product information is sparse the HIS provider may send out a high level RFI as a way to collect more information form vendors around their products and services

- May initiate early meetings and demonstrations of capabilities

- Can be used to provide more information back to the steering committee

- https://www.merx.com/

Issues with RFP/RFI

- Can take a lot of time to create package, collet responses then need a team of expiring in each category to review, as time is a pressure, due diligence can become a time/resource sink
- If there are too many responses then more time is consumed, needs the steering committee to set scope and eliminate unnecessary analysis of some responses
- Often an RFP can be 400-500 pages
- Sometime a scaled back RFP is required, focus on the important priorities
- One option is to use a "Sole Source" a vendor who has related products and services (with a good record!)
- Look for weaknesses in responses and eliminate early

Explore Other Acquisition Options

- Sometimes organisations will opt to obtain access to services and applications through Software as a Service option, where a vendor hosts and manages the application and infrastructure on behalf of the customer – Cloud Services

- Go to external software development shops or internal software development teams for the building of a customised solution

Cloud Computing – Why?

- Not enough technical staff to support internally hosted applications

- High up front capital costs, often they have to purchase a system which is too large in size that they never realise full utilisation or takes many years to extract the full benefits of the solution

- Pay-for-what you use, only pay for the level of service that is utilised (user licenses or volumes of transactions, easy to add/remove as busines changes)

- No infrastructure to manage, configure, patch, update

- Focus on core busines

Cloud Computing – Drawbacks?

- Difficult to customise standard software, often means business has to adapt to the software rather than have it meet their true business needs

- Operational support, unrealistic the believe the vendors support team really know your business in detail, they know their service but not how your business operates

- Sometimes you just need a local technical resource handy who can do things that the remote support team cannot (printers!)

- Data ownership, where does the clinical data reside, within Canada?

- How can we be sure that it is separate from data from other health care customers using the same application?

Cloud Computing – Today?

- Virtual Visits (just gone live in Manitoba) allows doctors to consult with patients via computer video and microphone. The back end service is a cloud service, the wait-room scheduler and desktop performing service is locally built software

- Telemedicine remote specialists can guide local healthcare staff with patient care

- Public Health, COVID-19 has highlighted many new external cloud based solutions because they exists and are ready to use, minimises implementation time

- Radiology Imaging sharing images with other specialist and consultants are not available locally (or overworked)

Option to Contract with System Developer or Build In-House

- Custom building applications is an option that offers complete control over the services and ensuring it does what the business needs without necessarily negatively impacting internal operations

- Often needed when the requirements are very unique and nothing exists as COTS solution

- May offer some kind of advantage (in a private HC environment)

- May take a long time to design and implement

- Can be comparatively expensive to build and will not benefit from reselling (unless in a private HC environment)

- Needs a well resourced development team and support model

- Rare for HC organisations to build major information systems

Evaluation of Vendor Proposals

- Develop and agree weighting criteria, preferably before the RFR package is distributed

- Assign weighting scores to factors to focus on the main objectives and goals, be wary of weighting something that could imbalance the scorecard

- Refer to main information as provided, only use supplementary information when needed (e.g. tied score)

- Committee members prepare and finalise selection and distribute to the larger steering committee

Vendor Demonstrations

- Demonstrations ("Demo's") are an important part of understanding software capability, look and feel, how the application may work in your business environment
- Get users involved, obtain their feedback and compile feedback
- Discuss your unique requirements and understand their ability to meet them
- Be consistent with each vendor, have a plan of what functions must be reviewed
- Avoid bias, preference over vendors, past experience, this can be incorporated later in the process
- Ask for access to a training environment so that staff can "play"

Make Site Visits and Check References

- If at all possible go and see the system in use in another clinical facility, seek permission and approvals, remember there is the possibility of seeing patient information and the request may be rejected

- Talk to existing users, send questionnaire to known user groups and ask for feedback

- Ask what problems the solution had solved for them

- User satisfaction, down-side, up-sides?

Vendor Analysis

- Collate all known information from RFR, scorecards, demonstrations etc. and compile a consistent report that scores the vendors solution

- Complete the vendor Analysis Report that summarises the major findings and comparisons between the vendors and their reputations, i.e. The pro's and cons of each vendor in comparison to their competition (this is a competition between vendors)

- Think about historical trends, low prices that increases rapidly over following years, what are their annual support and maintenance renewal practices?

Cost Benefit Analysis

- Prepare the final evaluation through a Cost Benefit Analysis by summarising the scorecards, operating and capital costs

- Summarise license models based on expected and projected use

- Establish a Total Cost of Ownership over a planned term, this needs to include your own operating costs from supporting the application, and any additional infrastructure and software costs

- What do we need to operate the service outside what the vendor is selling?

Summary Report & Recommendations

- The final report should summarise the approach taken when determining the vendor or alternative approach selection

- For each activity summarise the results & conclusions

- Include the Goals and Objectives

- Cost benefit analysis report

- Final recommendations and vendor rankings

Contract Negotiations

- The final step is the agreement between vendor and customer

- Will require legal representation and understanding of all of the contract clauses

- Understand liabilities, contract terminations, risk default, payment, issue resolutions, definitions, update releases, in-scop and out of scope, duration, financial liabilities for data infringements, 3rd party licensing, default, non-production versus production, use of data for secondary research and analysis, software code ownership, IP

- Establish timelines for implementation and delivery

Things That Can Go Wrong

- The RFP process relies on strong leadership and decision making

- Needs fairness and an unbiased approach by all parties involved

- Even so, there are things that can go wrong or there are common pitfalls that need to be managed by the PM and leadership

Manage Vendor Access to Leadership

- Vendors will look for access to the decision makers and try to influence then outside of the process

- Sales done on the golf-course

- Influence choices and decisions made by the committee

- PM needs to ensure that EVERYONE involved in the RFP is aware that communication, contact and questions/responses go through them and the steering committee

Failing to keep the process objective

- The steering committee must assume the leadership role and make sure there is clearly defined methods and criteria for selecting the vendor

- Stay focussed and do not get swayed by vendor razzle dazzle (mis-direction outside of the accrual software system, gifts, tickets to events etc.)

- Consider the political implications and do not let the vendor drive the result

- Avoid favoritism, often the committee will be ask by the vendors who fail – why they didn't win a competition and want proof

Over and under-doing the RFP

- It takes experience to produce and RFP that hits the right level, too much detail or too little can impact the value of the recommendation and selection

- Too little detail with heavy weightings can impact the result

- Define and control the way a vendor can respond to a question, be specific and not 'loosey-goosey"

- System needs to support over 500 concurrent users – y/n? vs "is it multi-user?"

Fail to Involve Leadership & Users

- Common issue with alienating users and senior management is when they are not involved in the selection process

- Include them in the process and listen to them

- Include in demonstrations, presentations, site visits

- Engagement is key

- Lack of engagement leads to bad selection choices and a question of "how (or who) was this ever selected?"

Negotiations are Not a Blood-Sport

- Poor negotiations can lead to a broken relationships
- Do not beat the vendor up/grind them down to a point where it becomes of little value to them
- It needs to be a win-win between the vendor and customer, if either is unhappy then it is a bad start to the relationship
- Fairness is important, if you want a Platinum customer experience, expect to pay comparatively
- How much power do you actually have?

Information Technology Architecture

- Executives and Senior Management should be aware of the organisations current and planned architecture

- Selecting technologies that work together to create a cohesive infrastructure landscape

- The coming together of interoperable systems does not just happen it has to be engineered

41

Architecture Definition

- Similar to designing a house it has an architecture, what do we want in our house, 4 bedrooms 2 bath, garage, kitchen

- Same with IT Architecture, what are our business objectives and what systems and services are needed to achieve this – EPR, Integration, RIS-PACS, Patient Scheduling… and the desired properties, multi-user, security, intranet, internet, extranet, analytics

Architecture Definition

- Therefore the IT Architecture "consists of concepts, strategies and principles that guide the organisations choices"

  - The organisation must use industry standard technology, as this will have lower risk and higher reliability
  - Windows 10 Operating System for desktop/workstations and MS SQL as standard database backend
  - Network technology, security detection service, encryption, control of desktop images, high availability for critical applications

Characteristics and Capabilities

- Characteristics can be applied to the information itself - The information systems must be agile, efficient (low cost) to support, and highly reliable

- Capabilities – what must the information system do (non-functional), accessible by patients for home, mobile device accessible must be able to incorporate clinical decision support, allows providers to structure clinical documents

- These choices then determine/impact the selection of technologies and applications

Application Integration

- Best of Breed : architecture that allows departments to pick the best solution for their needs then integrate to other services using an interface engine

- Monolithic: a set of applications and services provided by one vendor all using one common database (e.g. SAP)

- Visual Integration: wraps a common user interface (browser) across a set of diverse applicators, allows the user to use one main screen to access to the functions from many applications but it looks like one application, for clinical staff this could be patient data, schedule, PACS images and diagnostic results

Observations about Architecture

- Architecture can often be bypassed, leading to poor decisions and system selection choices

- E.g. the may omit to plan for system integration and create siloed applications

- The organisation needs to develop an enterprise architecture document that defines standards that need to be include when selection new services

- The architecture team are a key member of the senior leadership team

- Often a vendors application architecture does not agree with the organisation standard and accommodations must be made (not necessarily wrong but needs documenting)

Summary

- The selection of new services can be a major undertaking with long term implications
- We can adapt the overall selection process based on criteria set by the senior management team and steering committee
- Identify the key member of the team and have them included in the project
- An unbiased approach is needed by those invovled
- The IT Architecture should be used to influence the selection criteria