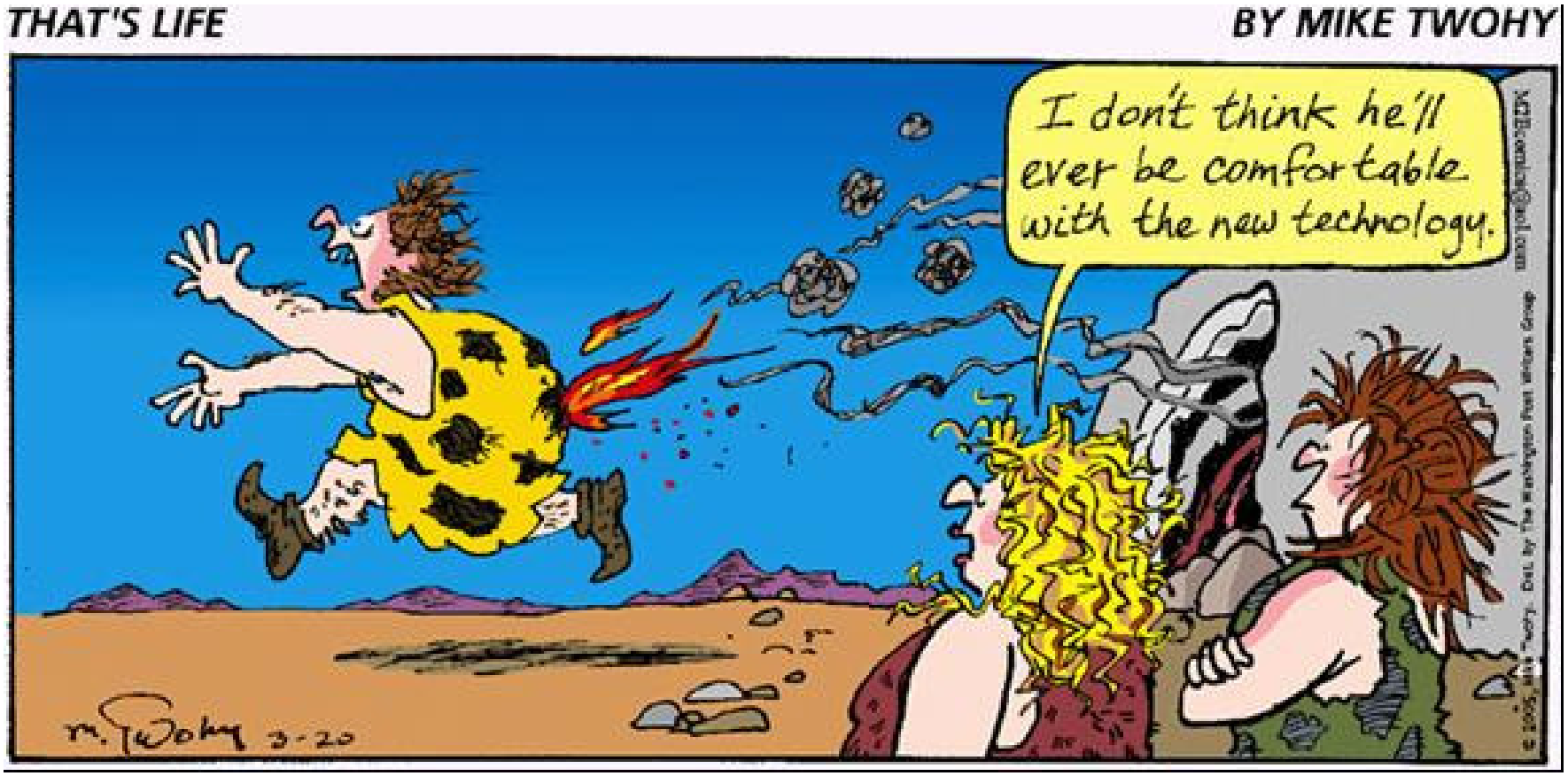
Clinical and Business Process Optimization

29 January 2007

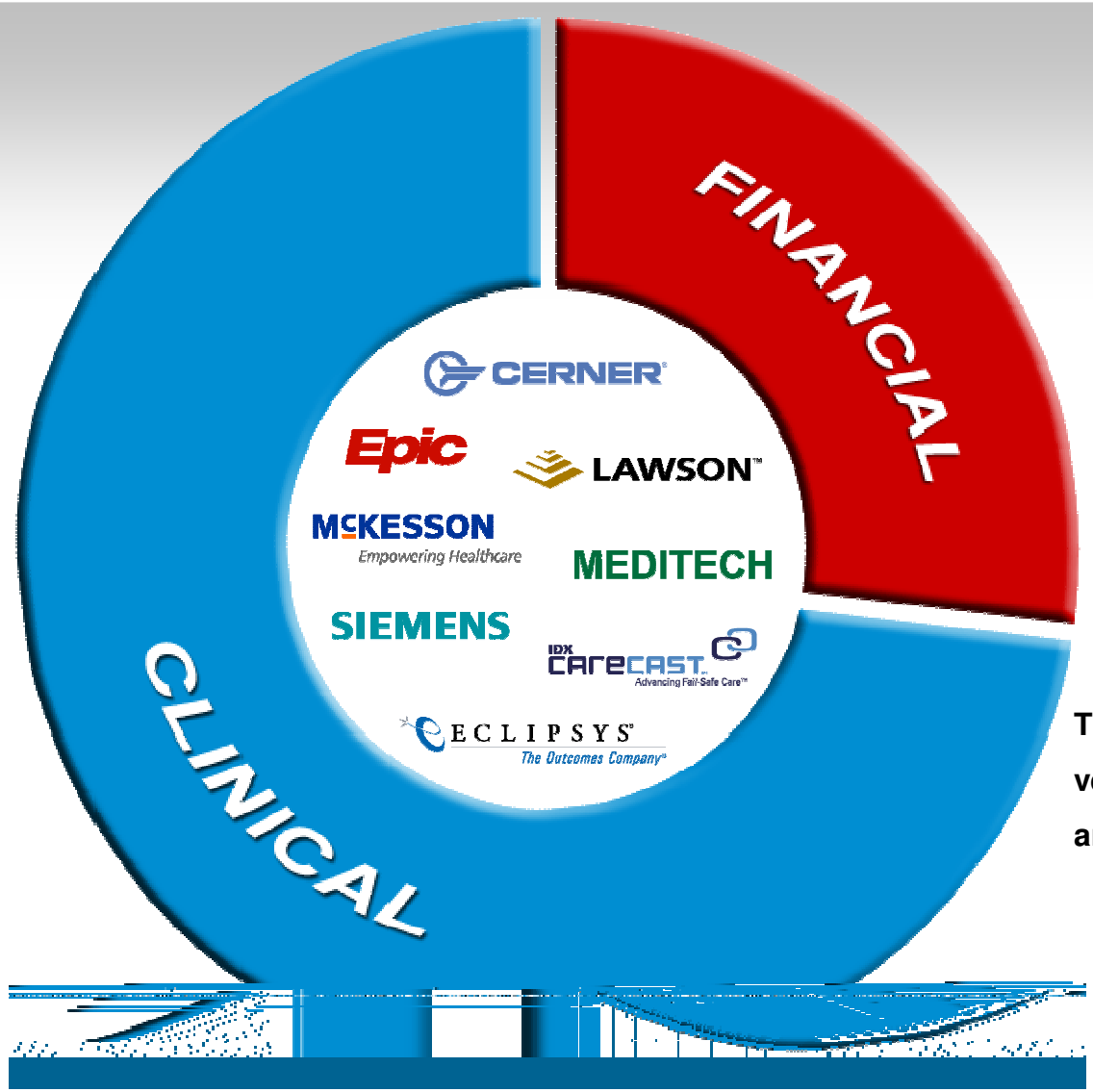
Tim Dion, RN
Middle East Healthcare Business Development



Healthlink, an IBM Division Overview

- **Focus** — Dedicated healthcare practice **focused on Clinical & Business Optimization**
- **Experience** — Extensive **industry and vendor knowledge** with large scale/ multi-entity implementation experience
- **Track-record** — **First in KLAS** for clinical implementations
- **300+ Clinicians** — Nation's **largest consulting team of MDs, RNs and RPHs,** and ability to leverage thousands of cross industry resources
- **Expert Staff** — 60% of consultants with more than **16** years of relevant healthcare business, clinical, and IT operational experience
- **End to End Solution** — Deep clinical and business, process and IT knowledge coupled with proven methodologies, tools and innovation

Implementation Projects



2500+ PROJECTS
1100+ CLIENTS WW

This is only a partial list of clinical and financial vendors which include global, international and regional vendors

Benefits depend on the organisation's propensity to change

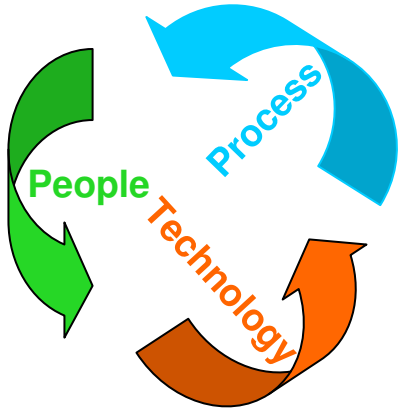
There are 4 ways to realise the value from an IT investment

1. Purchase an integrated system with rich **functionality**
2. Ensure the software allows for **flexibility** of design

10% of value

3. Implement **best practice processes**
4. Persuade **people to change**

90% of value



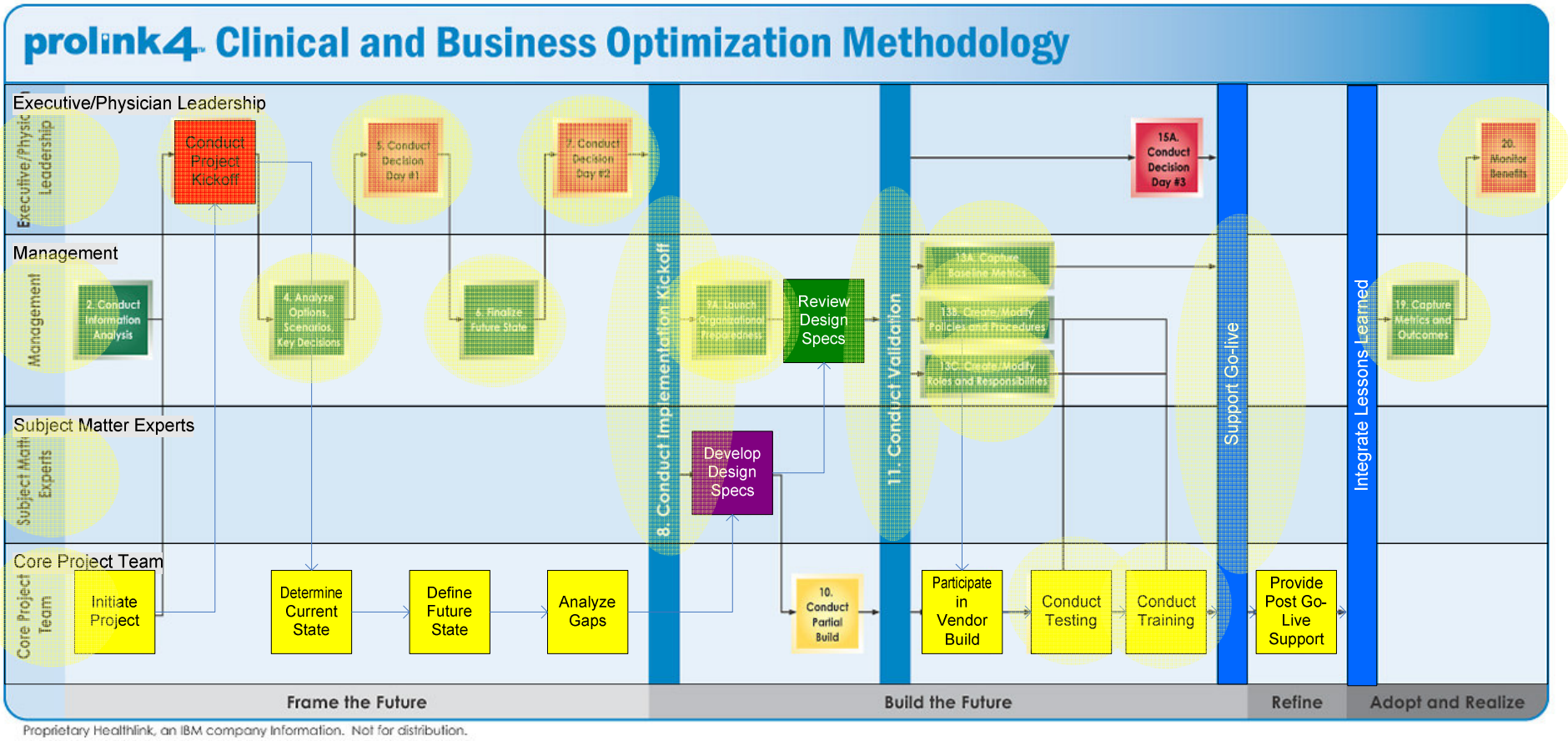
80-90% of major change projects fail to achieve their human and technical objectives on time and within budget

90% of project failures are due to neglecting the human factors of the project

$1 of IT capital should add $10 of additional value. But firms must adopt computers as part of a "cluster" of mutually reinforcing organisational changes. Otherwise the investment can create significant productivity losses as ***any benefits of computerisation are more than outweighed by negative interactions with existing organisational practices****.*

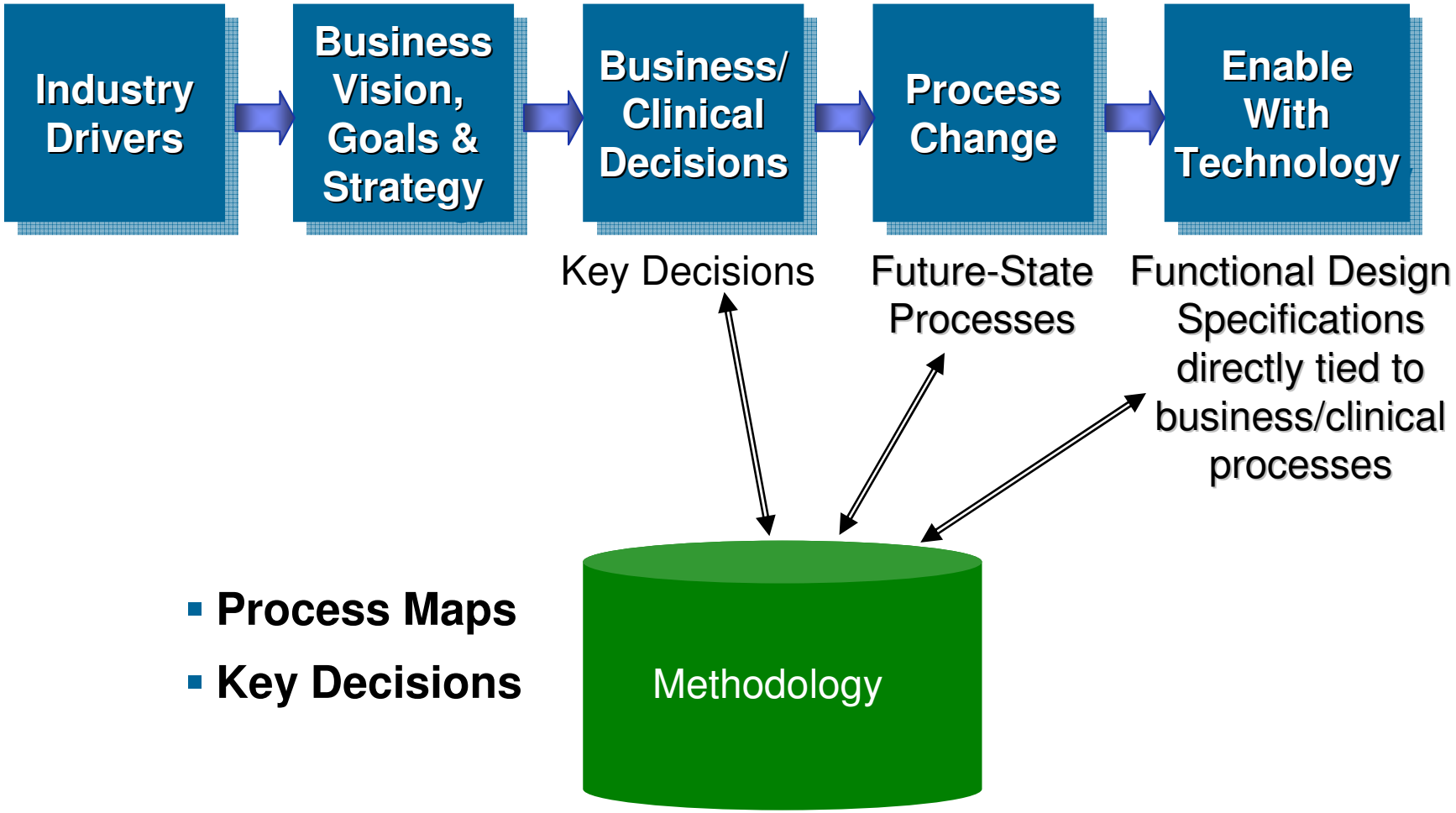
Brynjolfsson Erik, Lorin Hitt: Beyond computation: Information Technology, Organisational Transformation and Business Performance.

A Clinical & Business Optimization Methodology



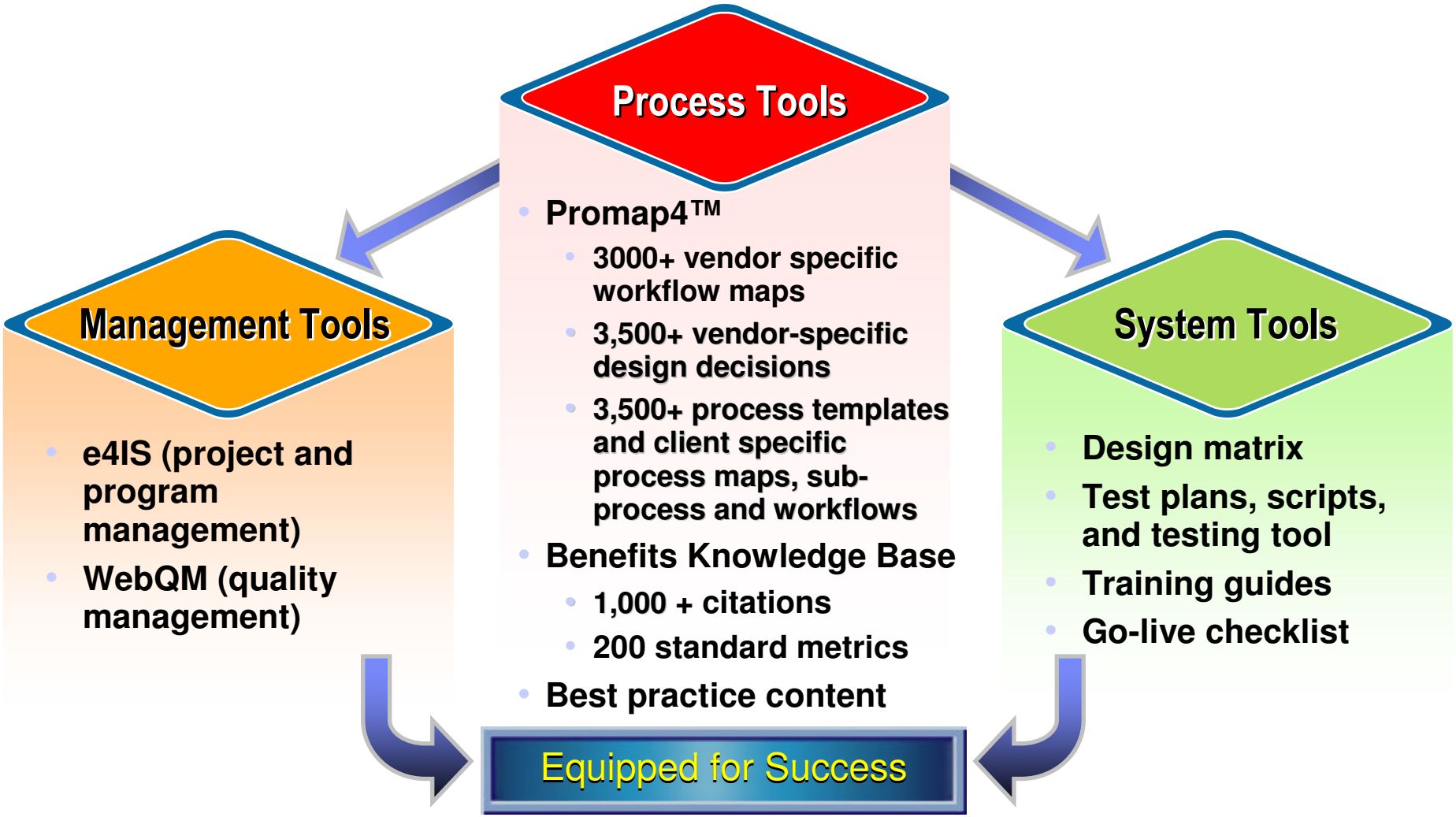
Along with a proven approach to project management incorporates a benefits/ROI approach to the project to ensure the implementation focuses on quantifiable goals

Alignment of Drivers, Mission and Process

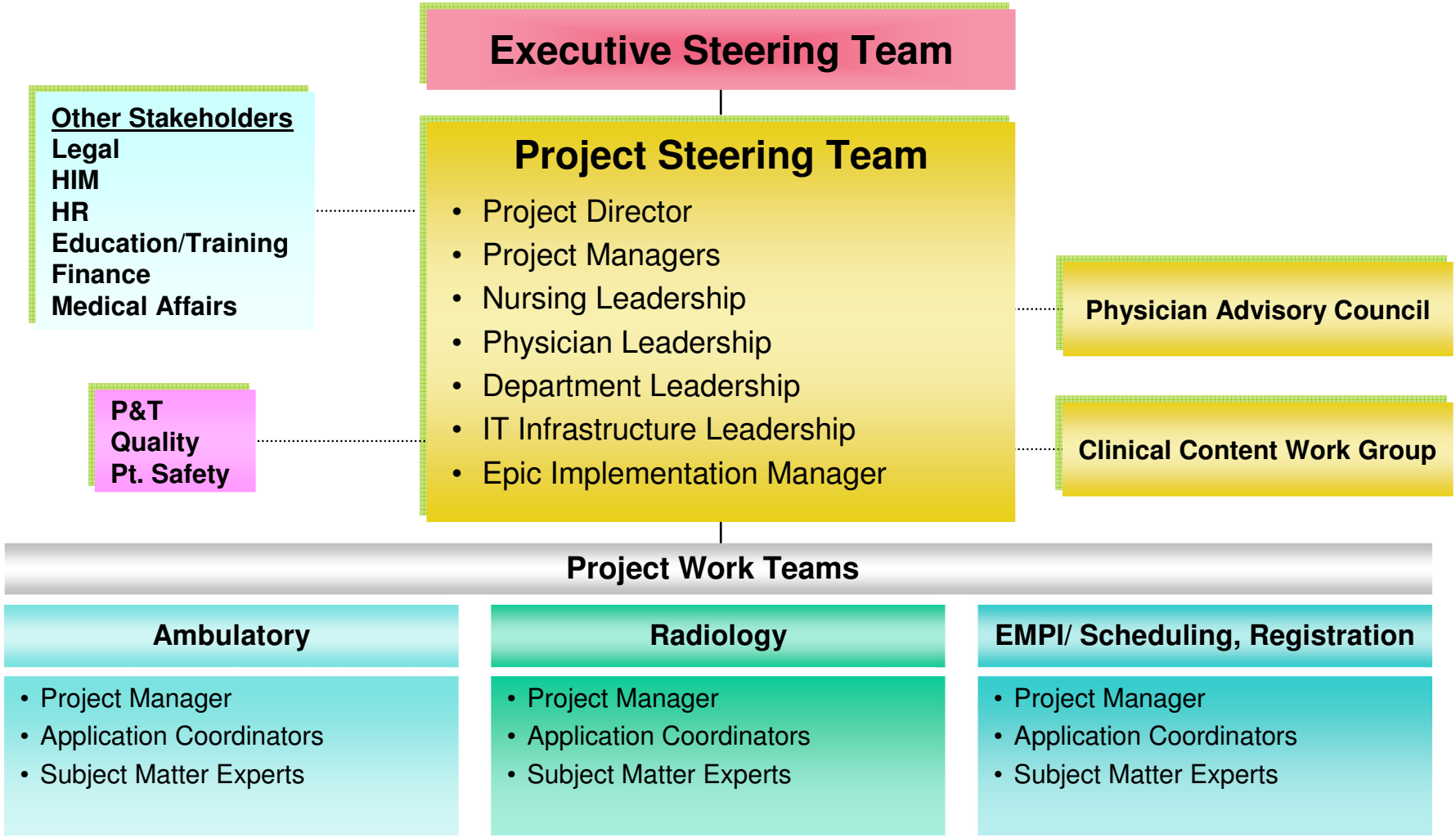


- **Process Maps**
- **Key Decisions**

Prolink4™ Knowledge Tools and Content

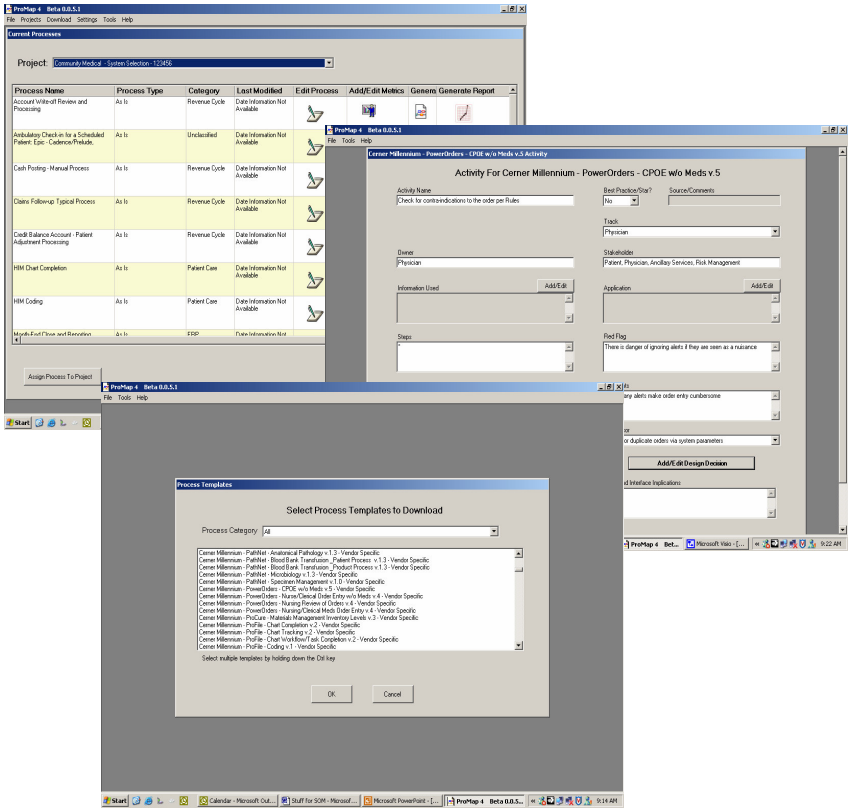


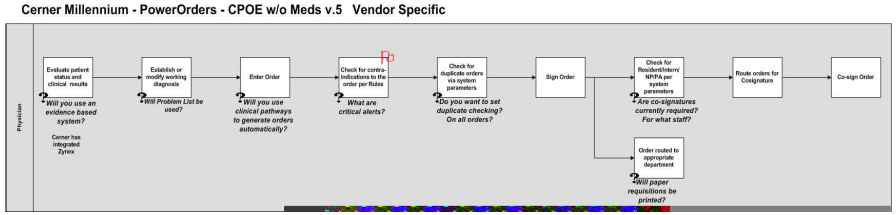
Suggested Project Governance



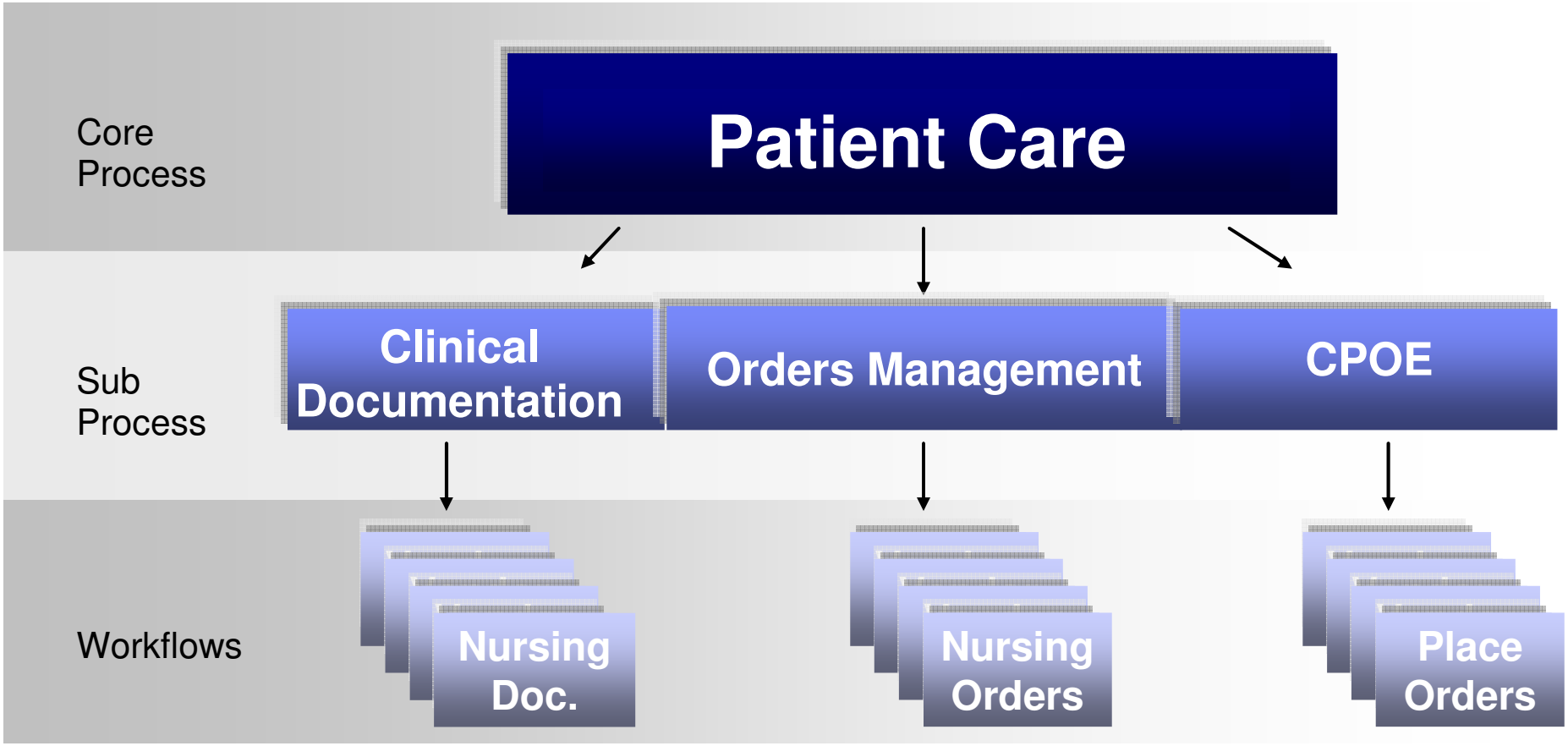
Process mapping knowledge tool

- Process mapping tool
- Database of business processes and vendor specific workflows
- Defines and supports industry best practices
- Vendor-specific decisions, optimal process maps and metrics to accelerate change management efforts
- Components
  - 8 core processes
  - 184 sub-processes
  - 4700+ workflows representing major vendors

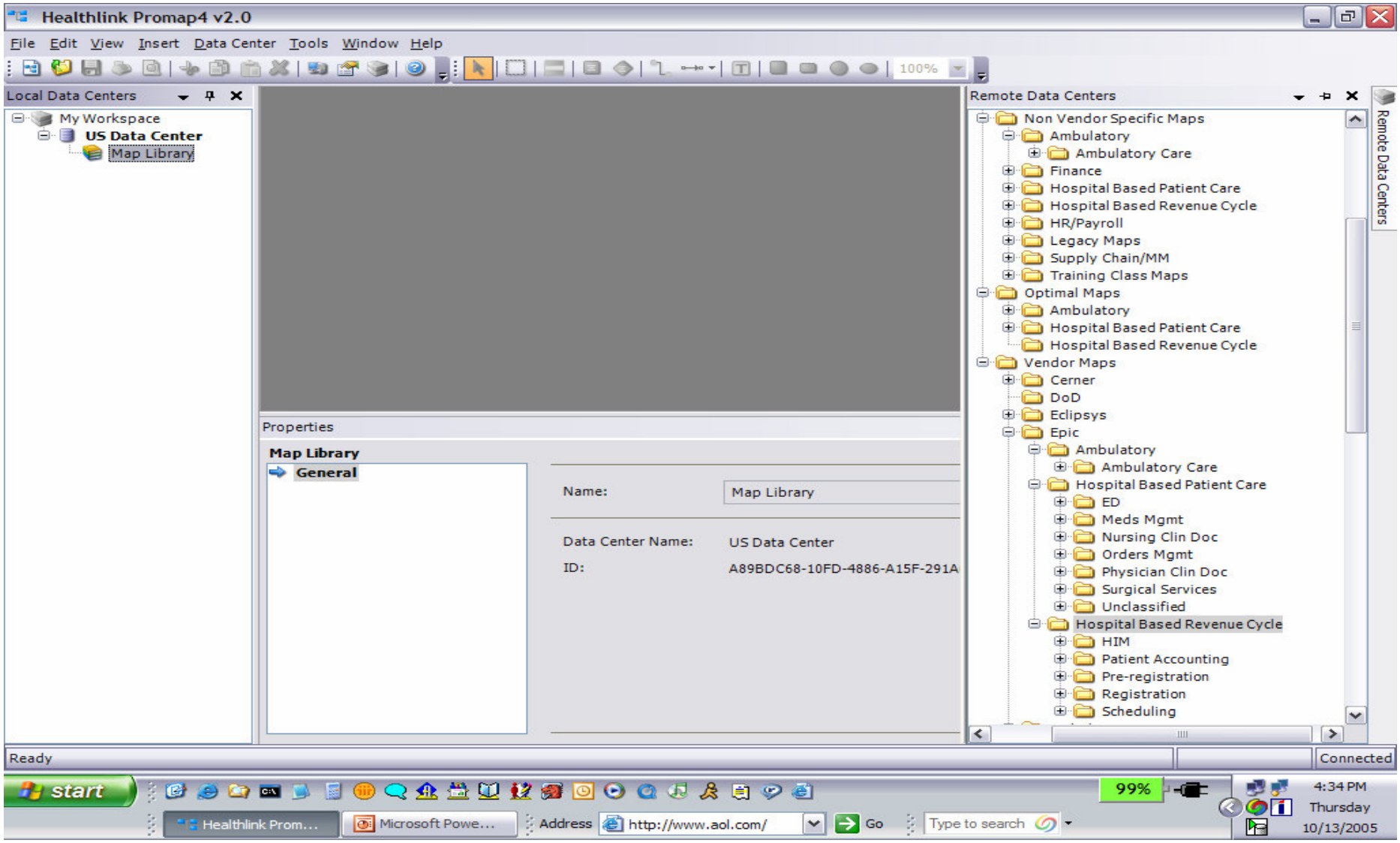




Example of Process and Workflow

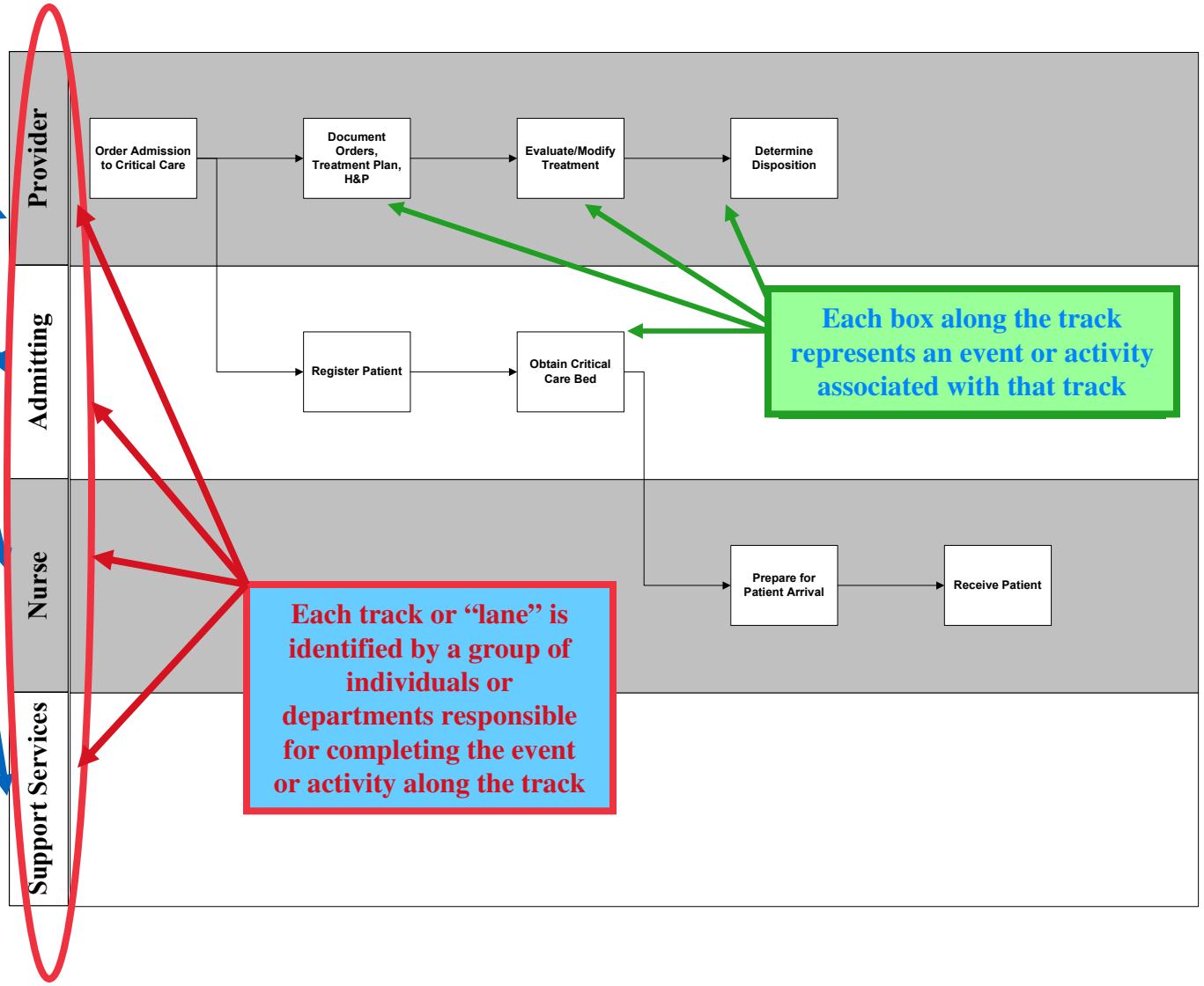


Promap4 Knowledge Base

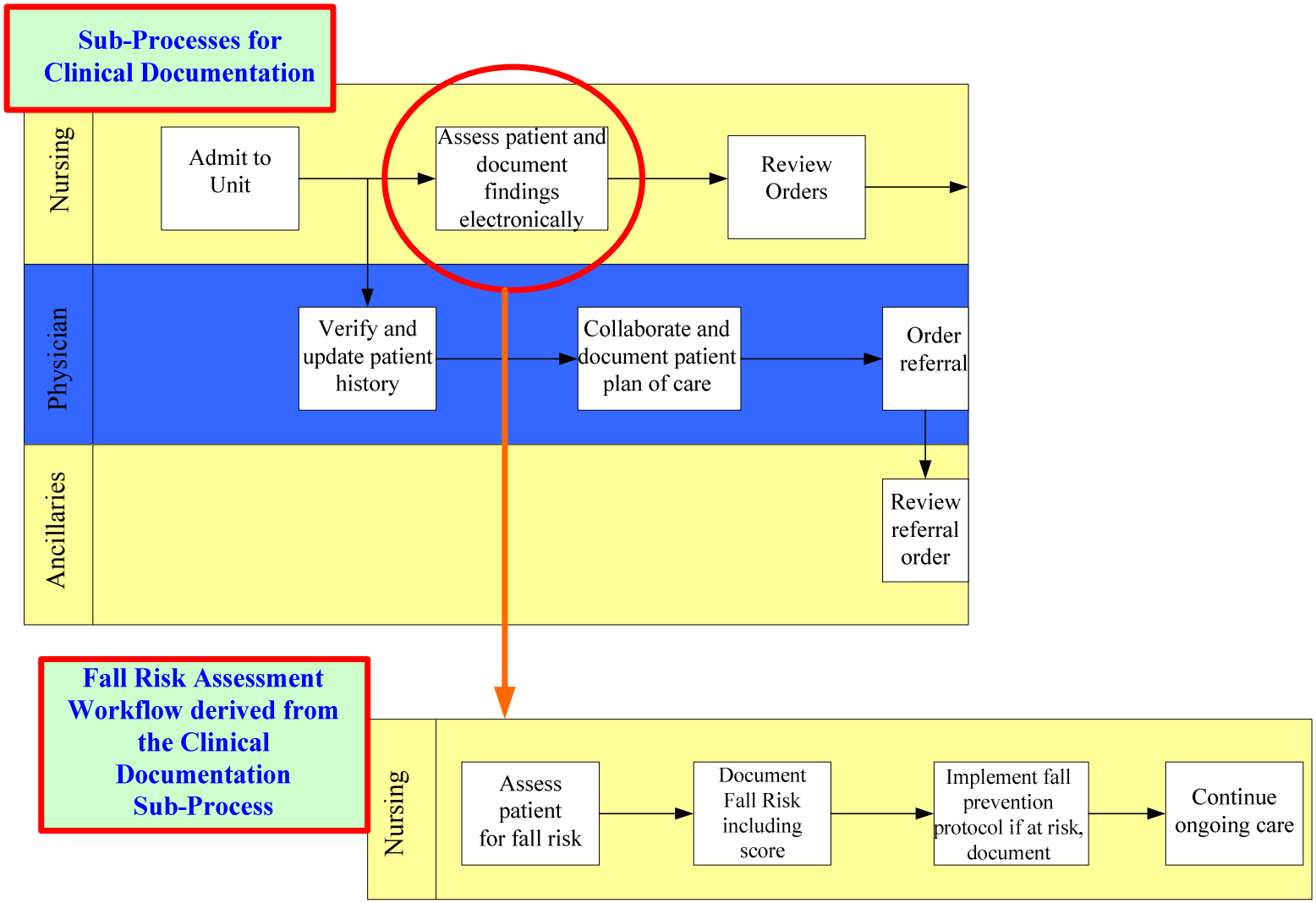


Anatomy of a Process Map

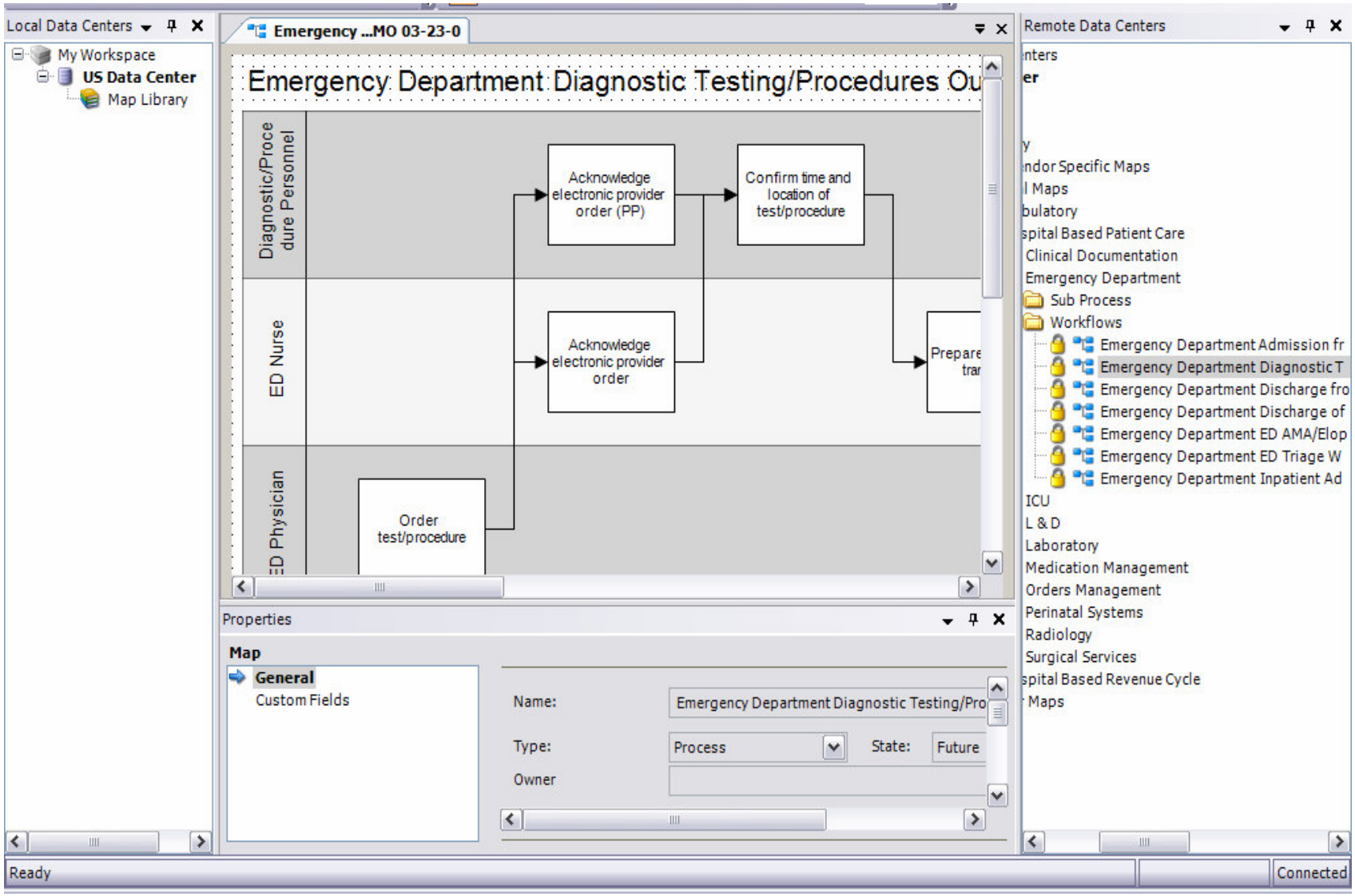
Process maps are made up of tracks or "swim lanes" – represented by the gray and white shaded areas



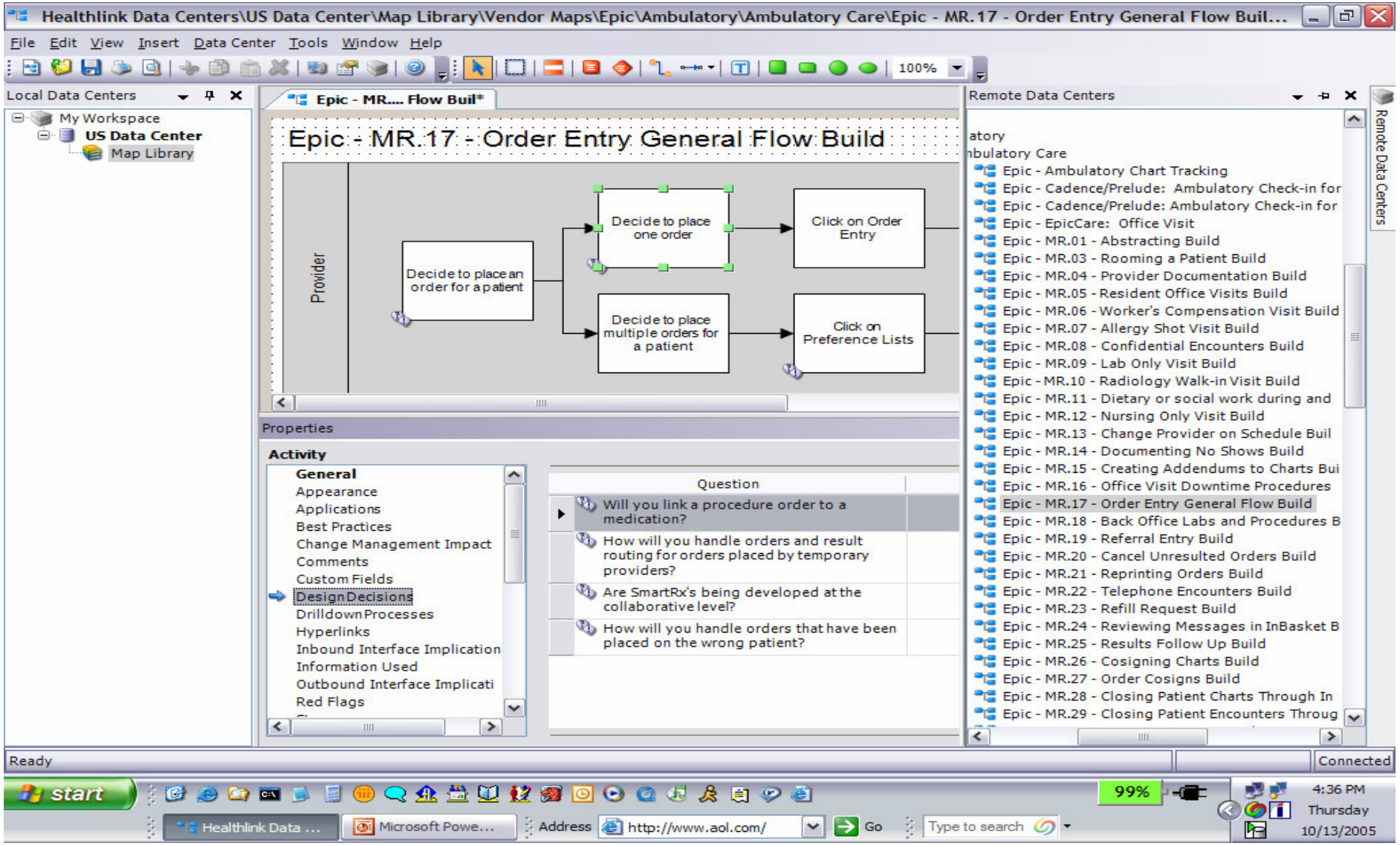
Workflow maps roll up to Successful Practice Sub Process map



How it Works



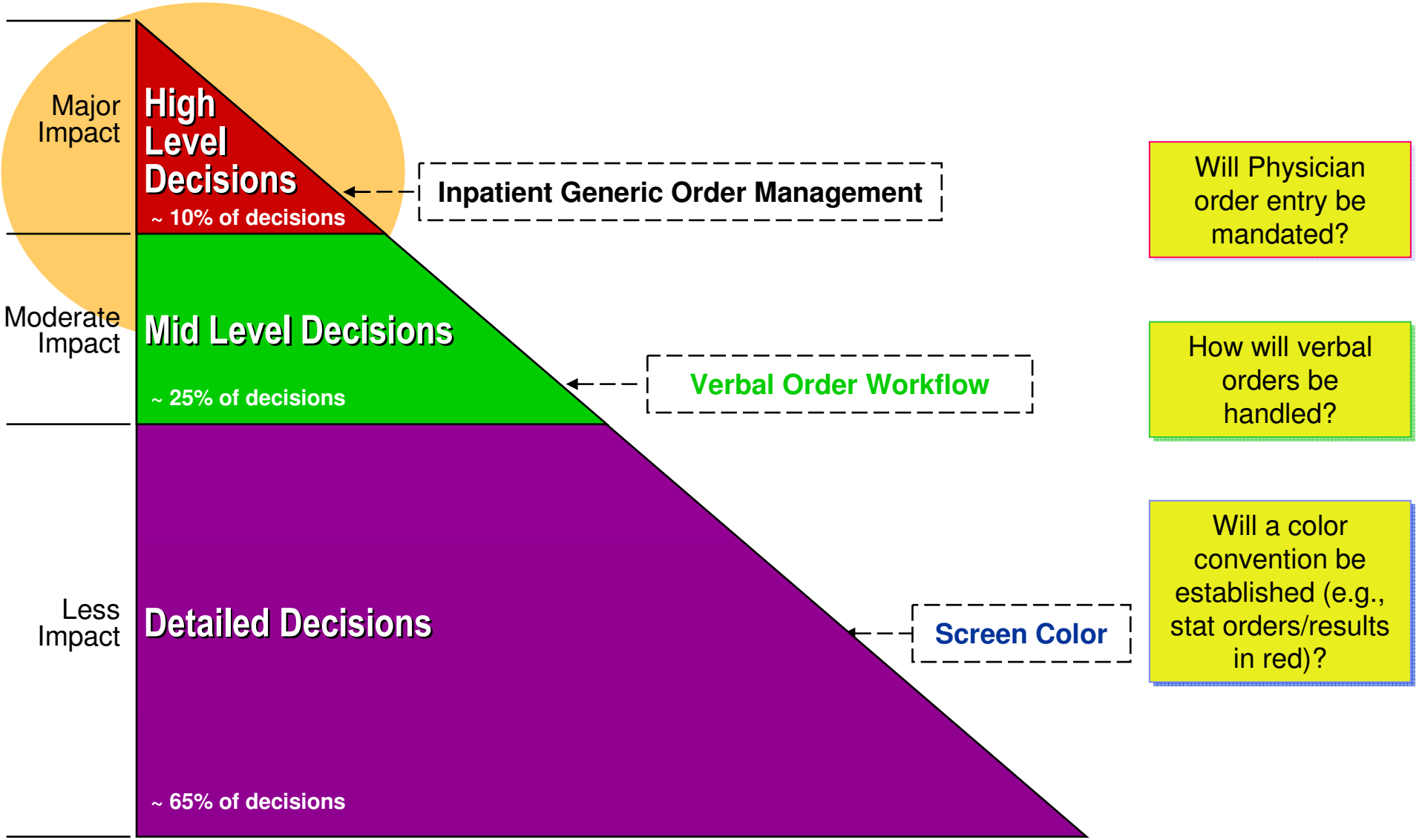
Promap4 Knowledge Base



Orders Management Best Practice Key Business Decisions (Example is subset)

Practice
1. Will Computerized Provider Order Entry (CPOE) be implemented?
2. Will the hospital use a phased approach to EMR/CPOE implementation or will all functionalities be implemented at the same time?
3. Will implementation for all departments/units occur simultaneously or in a phased approach?
4. Will it be mandated that all physicians use CPOE?
5. Will the electronic record be the primary chart (i.e. is your goal to move toward paperless?)
6. Will it be allowed to print user documents like worklists? (I.e. will the organization mandate use of on line worklists?)
7. Will physicians have remote access for CPOE from off-site locations such as their homes and offices for reviewing results and ordering?
8. Will you have a fully redundant technical environment?
9. Will CPOE be well integrated with other components of the EMR? (I.e. clinical documentation, medications management, results, chart review, PACs, etc.)
10. Will allergies be discrete data (i.e. not free text) and required?
11. Will all diagnoses and problem lists be required and coded fields?
12. Will you automate alert notifications to providers by pager or cell phone etc. when appropriate?
13. Will the EMR/CPOE system interface with ADT so that there will be a unique patient identifier across the clinical enterprise?
14. Will the system identify clinic, ED, IP, etc visits clearly so that a physician can easily select the appropriate encounter?
15. Will the EMR/CPOE system interface with the current billing application?

The Importance Of Multi-Level Interdisciplinary Decision Making



Example: How the methodology facilitates rapid decision making

Mary Smith, 69 years old, is scheduled for an elective outpatient procedure at the hospital where she previously received treatment. Her physician had previously completed the procedure orders.

Mary brings a copy of her pre-procedure lab work with her and *the document is scanned*.

The methodology facilitates the right person making the right decision at the right time

Mary brings a copy of her pre-procedure lab work with her and ***the document is scanned.***

Will non-system results be scanned into Clinical System?

YES

NO

Benefits

- *Clinical information is available at point of care*
- *Clinical information is available through remote access*
- *Enhances continuity of care*

Implications

- *Need to determine scanning workflow - centralized, point of care, combination*
- *Multiple document types impacted*
- *Scanning solution must serve broader audience than clinicians*
- *Scanned results will not trigger order/results rules*

Cost

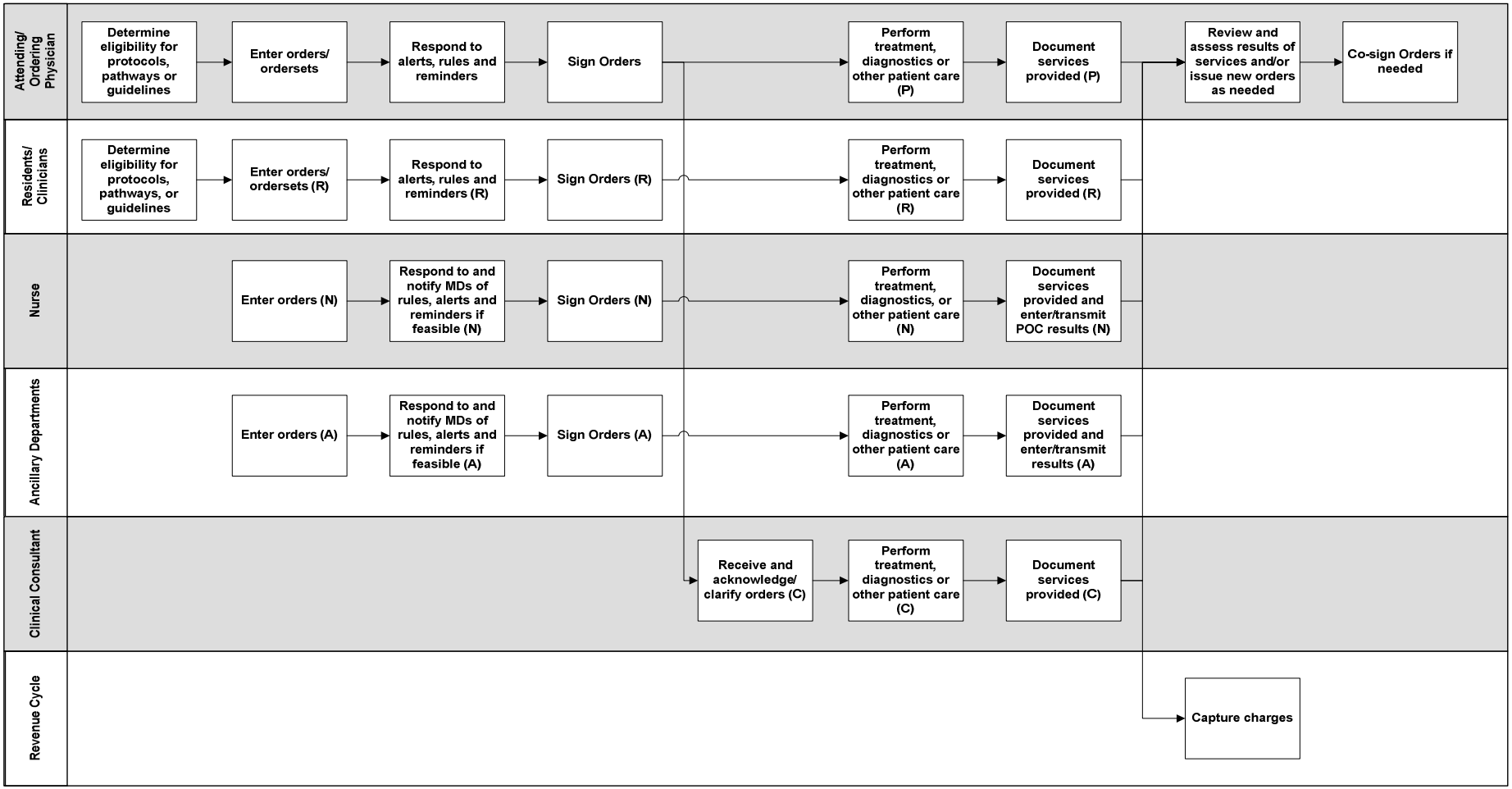
- *Equipment/infrastructure - scanning devices installation and policy/ procedure development*
- *Training for clinicians, providers, and non-clinicians*

Cultural Change

- *Change in workflow and access to clinical information*

Orders Management Best Practice Sub Process Map (Example)

To_Be_ Orders Management_Sub Process_02-21-05 To Be



Example: Orders Management - CPOE Best Practice

The process begins with the provider initiating an order/order set and ends with charge/utilization capture. This process includes the following:

Orders Management Sub Process

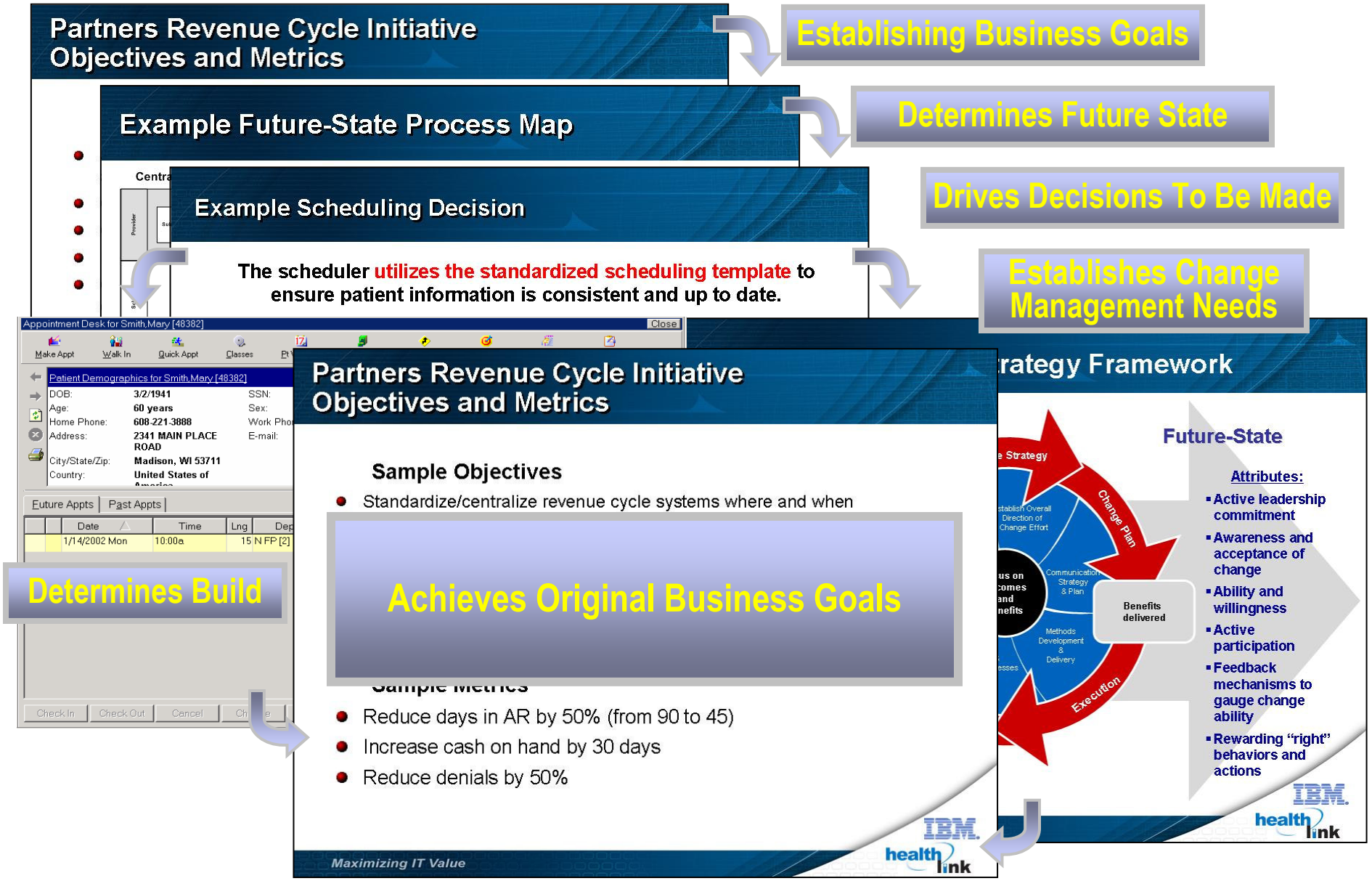
Orders Management Workflows:

- General Order Entry Orders
- Cancel/Discontinue Orders
- Co-Sign Orders
- Nursing Orders
- Point of Care Orders
- Referral/Consult Orders
- Telephone Orders
- Verbal Orders

Orders Management Best Practice Key Performance Metric Indicators

- **CPOE Utilization**
  - Percent utilization overall
  - Percent physicians utilizing CPOE
- **Cost Reductions**
  - Percent reduction in duplicate orders
  - Cost savings from prevention of duplicate orders
  - Reduction in overall hospital costs and length of stay
- **Reduction in Verbal Orders**
  - Percent decrease in verbal orders
- **Physician/Nursing Satisfaction**
  - Percent increase in physician/nursing satisfaction
- **Improved preventative care/disease management based on reminders/alerts**
  - Percent of patients on protocols, pathways and guidelines
- **Orders Changed Based on Rules/Alerts/Reminders**
  - Percent of orders changed based on rules/alerts/reminders

Methodology Approach



Templates and Examples

- Standard Metrics Sorted by Patient Care Process

Metrics Standardization

ID	Proposed Category	Proposed Name	Proposed BKB Definitions	Proposed BKB Calculations	Associated Applications							
					Rad	HIM	MM	PC	CD	OM	CPOE	eMAR
Lock Down	Care Guidelines	Preventative Care / Disease Management Improvement Rate Based on Reminders / Alerts	Percent of patients on protocols, pathways and guidelines.					PC		OM		
189	Care Guidelines	System Alerts Established	The total number of documentation alerts used by an organization.	The sum of the documentation alerts used by an organization	Rad			PC	CD			
190	Charge Capture	Charge Capture Quality Compliance Ratio	The percent of charges not captured at time of service as identified through a charge audit.	(The amount of charges not captured / the total amount of captured charges) x 100	Rad	HIM		PC				
Lock Down	Charge Capture	Documentation Charge Capture Rate	Percent of charge capture related to documentation. A fiscal benefit.					PC	CD			
192 & LD	Charge Capture	Lost Charges Rate	The percent of charges that are missed or lost and are not billed.	(Total lost charges / total charges) x 100	Rad		MM	PC		OM		eMAR
176 & LD	Clinical Orders	Duplicate Orders Rate	The percent of duplicate clinical orders presented to a department.	(Number of duplicate orders / Total clinical orders) x 100	Rad		MM	PC		OM		
177 & LD	Clinical Orders	Order Changes	The percent of changes made to orders by the ordering physician before the order was finalized due to system notifications and/or alerts.	(Number of changed orders / total orders) x 100	Rad		MM	PC		OM		
179	Clinical Orders	Unnecessary Orders Cost Savings	Cost savings identified from orders not performed due to system alerts and/or duplicate order notification.	(Total department cost / total orders received = average cost of order) x number of unnecessary orders	Rad		MM	PC				
98	Cost of Service	Cost Per Patient Day	Average inpatient cost including labor, supplies and medication per patient day.	(Labor cost + supply cost + medication cost for inpatients) / total patient days				PC				
97	Cost of Service	Nursing Cost Per Patient Day	Average daily inpatient nursing labor cost to provide patient care.	Total Inpatient Nursing Labor Cost / total Patient Days				PC				

Case Study: University of Pennsylvania Health System

Project Type: **Optimization of EpicCare Ambulatory application in the OB/GYN Department of UPHS and throughout the organization**

Goal

- UPHS is a large academic medical center with 8 hospitals, 4000 beds, 12,000 users and started their EpicCare implementation approximately 4 years ago. During that time, the application has been deployed in only 25% of the clinics. Healthlink was asked to evaluate how UPHS could better utilize Epic in their current departments and how they could roll Epic out to the rest of the organization.

Solution

- Evaluated the Gynecology departments utilization of Epic looking at the use of the application itself, the support and involvement of the IS department and most importantly at the clinical work flows.
  - Created a governance structure that involved and empowered the physicians
  - Redesigned clinical work flows to leverage the system and improve care delivery
  - Made application changes to take advantage of Epic

Outcome

- UPHS is changing their governance structure, decision making process and support approach to enable their departments to leverage the Epic applications and improve the physicians' practice.
  - **New governance structure involves physicians at all levels**
  - **Fixes made to the application to enhance the workflow of the physicians**
  - **New responsibilities of the clinical staff improve the overall process of care delivery**

Case Study: The American Hospital Dubai

Project Type: **System Selection**

Goal

- The American Hospital Dubai desired to develop a long term information technology (IT) strategy. Define requirements and select a complete Hospital Information System (HIS) for inpatient and outpatient clinical, patient administration, revenue cycle, laboratory, diagnostic imaging (RIS & PACS), finance, materials management, ER, Pharmacy

Solution

Phase 1

Develop a long term IT strategy for AHD, showing the capital expenditures required for 3-5 year term for IT initiatives.

Phase 2

Prepare the RFQ for a complete IT system

Phase 3

Assist in vendor evaluation and selection

Outcome

- The American Hospital Dubai is currently in the contracting phase of the vendor selection process

Case Study: South East Essex England

Project Type: Development of new integrated care pathways for stroke and heart failure patients in the South East Essex local health community

Goal

- The South East Essex local heath community consists of 8 Acute Trust, 70 GP clinics, an Ambulance Trust, and 2 Primary Care Trusts. They asked Healthlink to help them redesign their care delivery process for patients across the healthcare continuum and prepare for the national implementation of the iSoft applications.

Solution

- Created new integrated care pathways for stroke and heart failure patients:
  - Created a new decision making process that can be used by the community going forward
  - Designed new multi-disciplinary teams to deliver care
  - Leveraged existing technology and expanded it's use to new users
  - Created an implementation plan, impact analysis and communication plan for all new changes

Outcome

- PAC members now prepared to make informed decisions about how care delivery will occur in their new environment:
  - There is now a mechanism to realize improved patient outcomes including reduced mortality rates and reduced length of stays
  - There are specific people responsible and accountable for realizing individual metrics
  - **The community can realize a revenue of 1.4 million pounds sterling with the implementation of all changes**

Potential for Adverse Drug Event reductions using CPOE

Montefiore Medical Center Bronx, New York is the most advanced and successful implementer of CPOE in the USA .

CPOE go live March, 1999.

100% CPOE for all 1100 acute care beds ALL medication, diagnostic, laboratory, and care orders.

100% compliance: no verbal or paper orders.

Over a 75% proven reduction in potential ADEs.

Use of expert rules for formulary management and cost savings.

Bonus payments Empire BC/BS of $400K

Malpractice premiums?

Decrease Length of Stay by 2.2 days? (cause and effect)

MONTEFIORE

IBM is playing an instrumental role in shaping the German eHealth project

bIT4Health

Dominant Consulting Project with Ministry for the overall Architecture & Solution Design

Industry Partners

- IBM (Leading Advisor)
- SAP
- Orga
- Fraunhofer
- Intercomponentware

Major Tasks

- Planning and development of frame architecture
- Reaching acceptance of all involved parties
- Quality security and risk minimisation
- Scientific monitoring of test phases

Business Development

Marketing

Public relations

Lobbying

Prototype Development

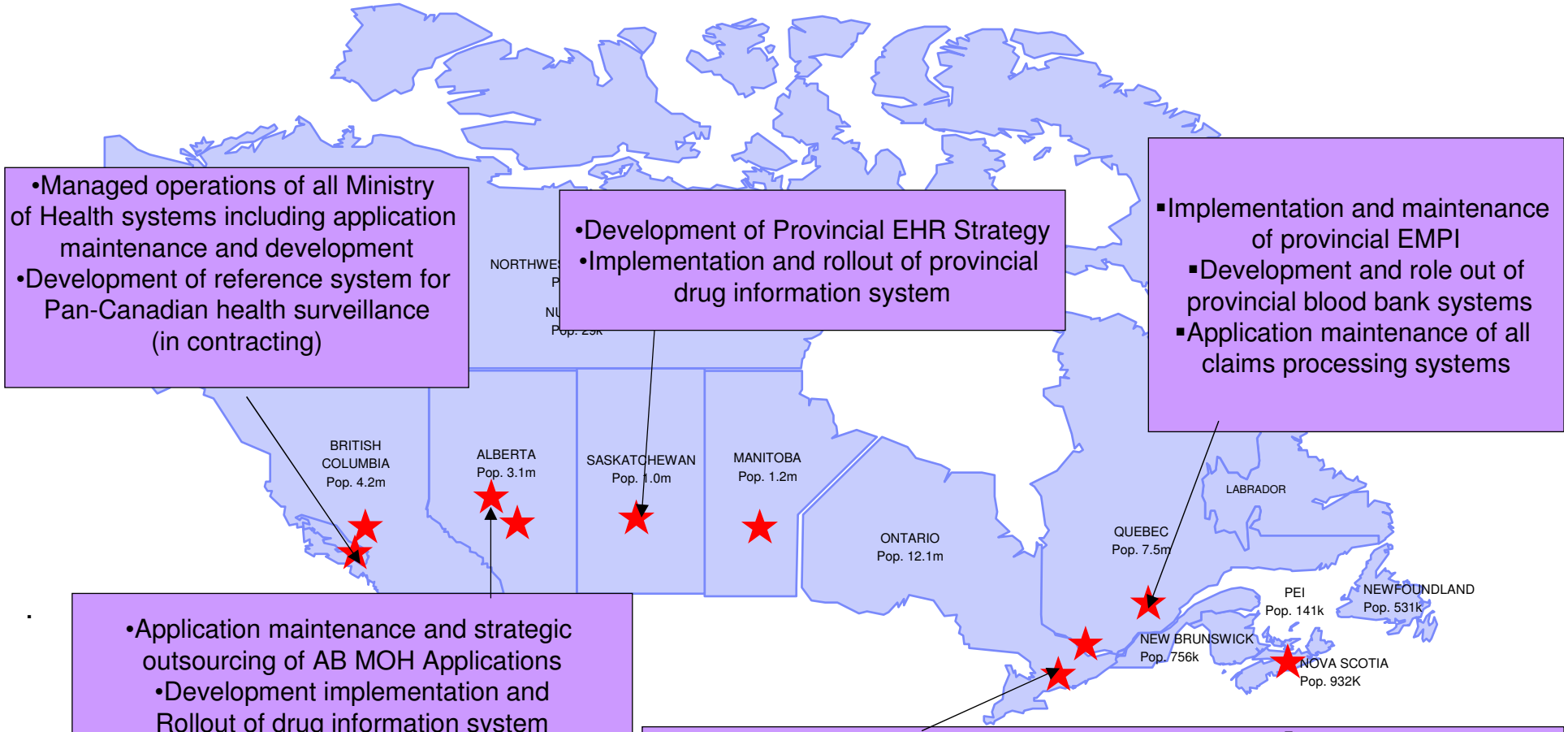
Customer events

Industry partnerships

Industry trade fairs

Canadian HealthCare - IBM Serving The Government Marketplace - examples

31.56M people, 10 provinces, 3 territories, 6 time zones



Danish eHealth Portal

Information providers:

- Counties and Hospitals
- National Board of Health
- Ministry of Health
- Danish Medicines Agency
- Other

Benefits for:

- Society
- Patients
- Medical Professionals
- Regional/National Institutions
- Researchers

Professional users
- General practitioners
- Hospital physicians
- Nurses
- Dentists
- Home care staff
- Therapists
- Laboratory staff

General information

Communication

Specific information

Citizens
- Patients
- Relatives
- Information seekers
- Chronically ill

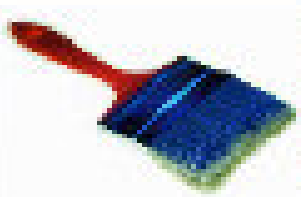
Data sources:

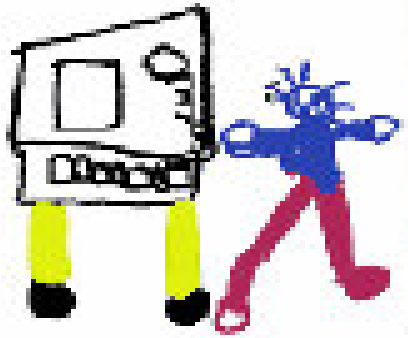
- EPR
- MedCOM
- Medicine Profile
- National registers
- Other

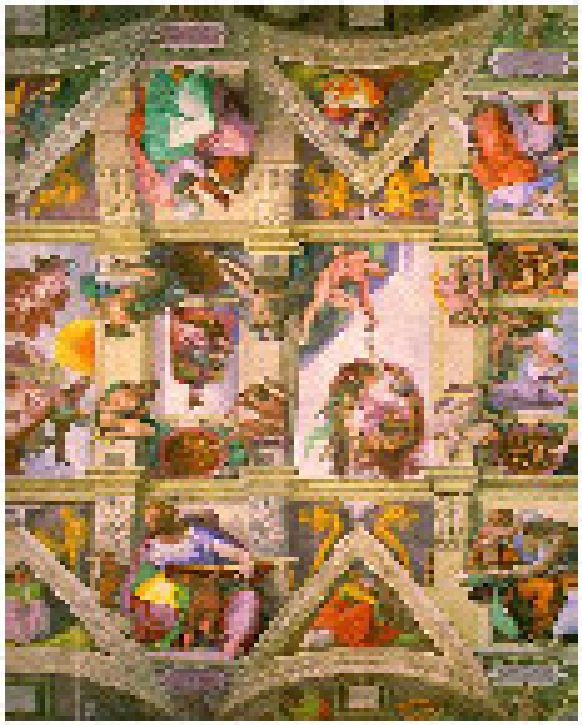
"The best way to predict the future is to create it."

- Peter F. Drucker

Technology is just a tool...







...how much value we create is up to us!

Additional Decision Day Example: Clinical Documentation

Additional Decision Day Example: Clinical Documentation

Using the EHR, the nurse asks key questions pertinent to this visit and verifies previous information. Mary and her family are relieved and feel that they are 'known' by the hospital staff, a major factor in patient satisfaction.

The nurse *reviews Mary's history* in the electronic health record (EHR) and verifies her medical history (hypertension, diabetes, leg ulcer, smoker) and her on-line medication profile (enalapril, glyBURIDE and an estrogen/progesterone combination). The nurse confirms Mary has no latex allergy.

Mary's mother suffered a fatal cerebr… accident (CVA) at age 66. The nurse… *history.*

Clinical Documentation

The nurse *reviews Mary's history* in the electronic health record (EHR) and verifies her medical history… Mary's mother suffered a fatal cerebrovascular accident (CVA) at age 66. The nurse *updates Mary's family history*.

Will patient history be verified at each encounter?

YES

NO

Benefits

- *Information will remain current and changes can be recognized promptly*
- *Patient safety*

Implications

- *None identified*

Cultural Change

…od allows …rofile to be …profile …d to the …licy of …nformation

Cost

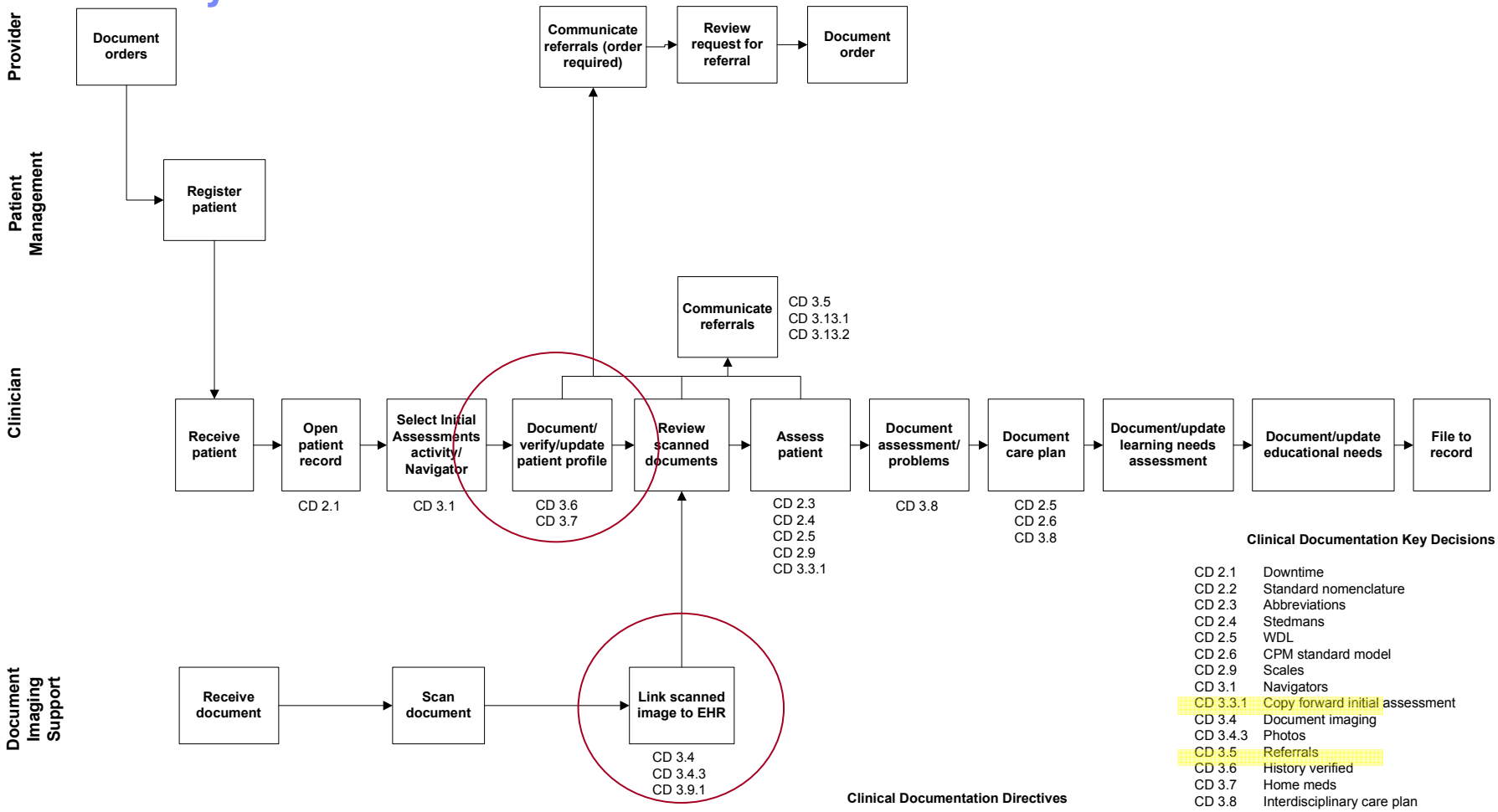
- *None identified*

Again, the Decision Is Tied to DBV and Workflows

Will patient history be verified at each encounter?

Summary of DD1 Discussion	Recommendation	Risks	DBV and Workflow Impacts
Guiding Principle/Directive: • Standardize documentation data elements, methods, and processes across all THR facilities • Standardize patient profile data elements beginning at the point of entry (e.g., data should flow from initial capture throughout the encounter) Considerations • Maintenance of current information • Patient safety	Yes for three reasons: • JCAHO Standard PC.2.120 …updates to the patient's condition since the assessments are recorded at the time of admission. • JCAHO IM.6.10 The hospital has a complete and accurate medical record for every patient assessed or treated. • JCAHO standard MM.1.10 Patient-specific information is readily accessible to those involved in the medication management system (note elements of performance in this standard)	• Staff needs to be trained to include patient history verification in each encounter.	Volume 2, Section 11, Chapter 1, Inpatient Initial Assessments Activity ECInp 110 Inpatient Admission ECInp 330 Initial Assessments Activity Flow

Future State Process Map with Document Scanning and Patient History Verification



Clinical Documentation Directives

- Standardize data elements used to document initial screenings
- Standardize the screening and referral notification process
- Standardize patient profile data elements beginning at the point of entry.

Clinical Documentation Key Decisions

CD 2.1	Downtime
CD 2.2	Standard nomenclature
CD 2.3	Abbreviations
CD 2.4	Stedmans
CD 2.5	WDL
CD 2.6	CPM standard model
CD 2.9	Scales
CD 3.1	Navigators
CD 3.3.1	Copy forward initial assessment
CD 3.4	Document imaging
CD 3.4.3	Photos
CD 3.5	Referrals
CD 3.6	History verified
CD 3.7	Home meds
CD 3.8	Interdisciplinary care plan
CD 3.8	Interdisciplinary problem list
CD 3.9.1	Consent forms
CD 3.13.1	Alerts from day one
CD 3.13.2	Central coordination of alerts

Advanced Assessment Questionnaire

CLINIC/AREA NAME

SAMPLE -- EPIC DEPARTMENT PROFILE CHECKLIST

Introduction

The following questions will provide necessary information for the team to complete a risk assessment for the implementation of *Cadence and* the ambulatory Electronic Medical Record (EMR), EpicCare in your clinic. By answering the questions and providing the requested data listed below the team *will be able to better* identify and mitigate risks to *result in a successful* implementation of the EMR in your clinic.

The questions are grouped by topic: Demographic, Workflow, Billing & Coding and Scheduling. When appropriate, please attach any documentation that will help clarify *your answers to the* questions. *Please also provide* copies of clinic encounter forms, billing forms, patient correspondence, etc.

If you have not already filled out the Department User Contact Spreadsheet at this time, please fill out and return with the Epic Department Pr

Demographics

	Question
1.	*Where* is the physical location of t*Department* (i.e., building, floor, ro numbers). Are there any plans to relocate or renovate in the next twelve months?
2.	What are the hours of operation?

Workflow

	Question	Yes/No	Answer/Comment
1.	What Transcription Dictation System is currently used? NOTE: Transolutions is the only dictation system interfaced to EpicCare.		
	Are physicians planning to continue to dictate or document in EpicCare? I	☐ Yes ☐ No	If yes, please specify:
	Do you currently use any macros for transcription that should be converted to Epic Smart tools?	☐ Yes ☐ No	If yes, please specify:

Used by the "SWAT" team to determine organizational readiness of each facility.

Clinic Workbook Table of Contents

WORKBOOK INDEX

Challenges

- **Enterprise-wide communication**
  - Comprehension
  - Buy-in
- **Standardization**
  - Collaborative process
  - Appropriate staffing, from executives to SME's
- **Scope definition and effect**
  - Organization
  - System
- **Clinical content**
  - Interdisciplinary
  - Effect on medical practice
  - Ambulatory/Inpatient

Enterprise-Wide Activities

Project Initiation

- Complete pre-implementation planning
- Confirm application sequencing
- Determine deployment sequencing
- Finalize cost projections finalization
- Analyze current state
- Initiate communication plan
- Solidify physician integration plan
- Develop staffing plan

Process Standardization & Metrics Definition

- Identify best practice
- Define scope of practice
- Conduct future state process modeling
- Perform gap analysis and identification of key decisions
- Develop optimal story with associated metrics
- Establish project guardrails for DBV sessions
- Organize for DBV's

Design/Build/Validate & Organizational Preparedness

- Conduct DBV's
- Analyze and develop interfaces
- Design Security management
- Begin clinical content analysis
- Launch organizational preparedness
- Establish metrics plan
- Validate infrastructure
- Verify rollout plan
- Confirm conversion activities
- Consider abstraction options

Enterprise Wide-Training Plan

Establish training methodology

Determine training development and delivery resources

Create base curriculum incorporating future state roles and responsibilities and policies and procedures

Recurring Deployment Activities

Operational and Infrastructure Assessment

- Review future state with stakeholders
- Perform business process analysis
- Conduct readiness and risk assessment
- Assess infrastructure needs
- Begin current state metrics capture

Gap Analysis and Risk Management

- Provide documentation of process changes
- Build to Department -specific requirements

Test and Train

- Validate infrastructure and software
- Test with future state scenarios
- Train around future state processes
- Perform conversions
- Abstract patient data
- Load users and security

Implementation Go-live and Support

Conduct go/no-go meeting

Establish command center for go-live support

Validate system performance

Perform go-live support

Capture post go-live metrics

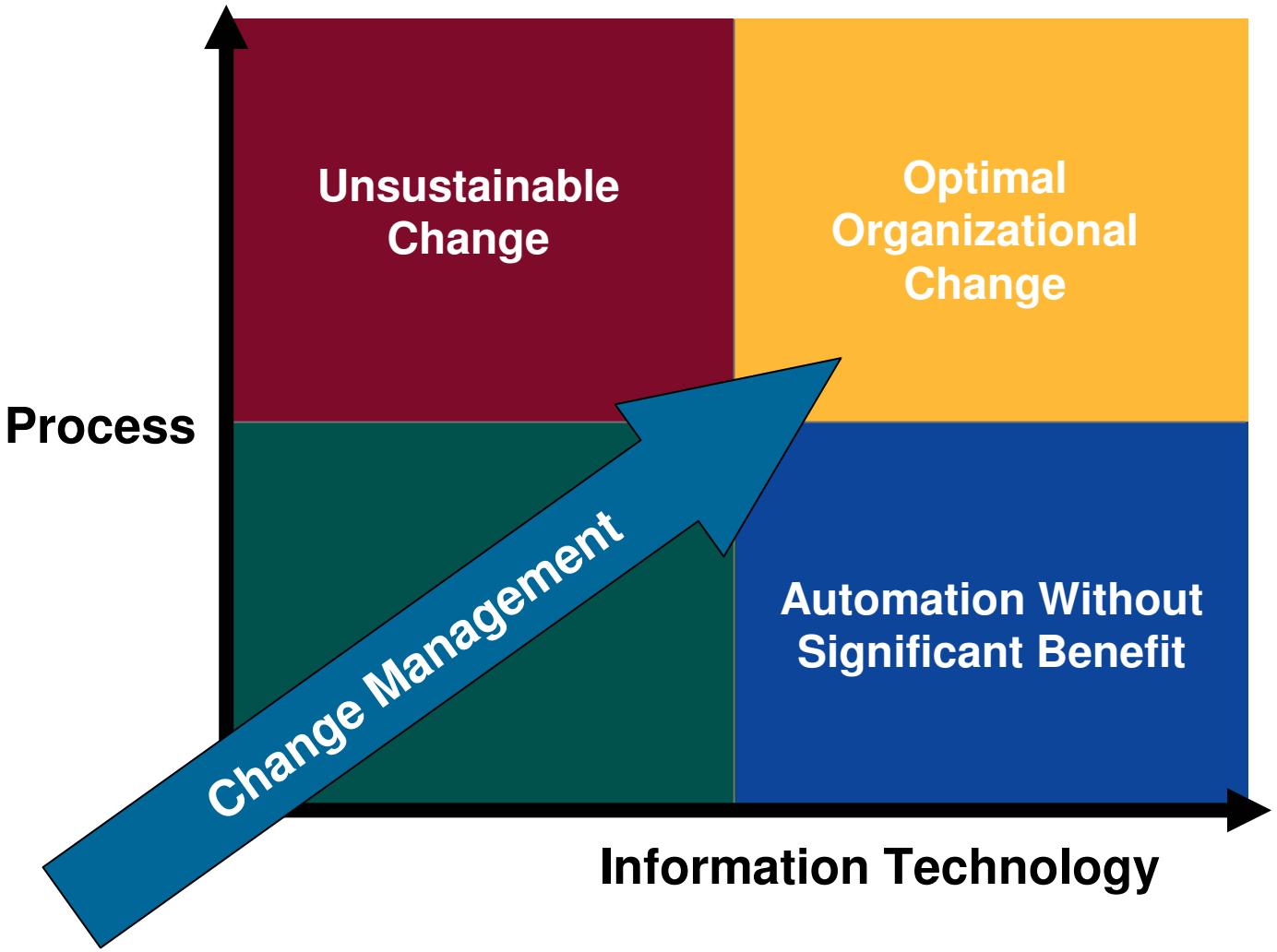
Objectives

- To understand what is meant by clinical computing and clinical transformation
- To understand the major activities that encompass clinical transformation
- To recognize at least four (4) tools used in clinical transformation

Operational Definitions

- Clinical Computing
  - Is…
    - An integrated application and process strategy that ultimately automates the entire clinical process
    - A strategy built around a core solution that may include
      - Patient Administrative
      - Core Clinical (orders/results, clinical documentation, medication management)
      - Clinical Ancillaries (Lab, Radiology, Pharmacy)
      - Clinical Specialties such as OR, ED, ICU, OB/GYN
  - Is Not…
    - A single vendor solution
    - Computerized Provider/Physician Order Entry (CPOE)
- Clinical Transformation
  - A significant, substantial change in form, nature, and function of how work is carried out and enabled by information technology, in the delivery and support of clinical care.

Implementation Approaches



Change Management

Healthlink's change management program consists of 6 initiatives to determine and manage the "people" dimension of change:

Conduct Current State Analysis

- Conduct Informational analysis
  - Interview key stakeholders and leadership across the hospital
  - Observation of care delivery
  - Document current state
    - High-level process maps using Visio
    - Opportunities for improvement
    - Best practices being performed

Leadership Involvement

- **Executive Kickoff Meeting**
  - Project governance structure
  - Charter approved
  - Review current state findings

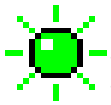
Readiness Assessment Summary

Category	Readiness
Culture	
Care Delivery	
Coworker Technology Experiences	
IT Training and Support	
Medical and Surgical Physicians	

Legend

High Priority
- Marginal development
- Lack of existing infrastructure
- High level of effort

Medium Priority
- Partially developed
- Some infrastructure
- Mid-level of effort



Low Priority
- Well developed
- Solid infrastructure
- Continue efforts

Framing the Future

A	B	C	E	F	G	H	I	J	K	L	M	N	O	P	
Step 1						Step 2					Step 3	Step 4	Step 5		
Reference No	Functional Area	Category		Entered By	Area of Opportunity	Business Requirement (Recommendation)	*Red Flag/ Gold Star Number*	Clinical Objective	Best Practice & Source	Other Standards / References & Source	Key Decision	Decision Level	Optimal Story Slide Owner	Areas of Impact or Overlap	Vision
LAB01 **EXAMPLE**	Laboratory		Cerner	Sheryl LaBauve							Will the starting set of reference ranges be standardized for non-numeric laboratory procedures only?				Establishe Allows lab population available.
SCH06	Scheduling	R	Pending vendor selection	Judie Steinkamp	Patient NO SHOWS are not being tracked at most facilities resulting in no follow-up with patient or physician and impacting customer satisfaction, productivity and revenue	2) Implement process to track and follow-up all NO SHOW appointments					Tactical (Mid -Level)				

Framing the Future

- **Analyze Options, Scenarios, Key Decisions**
  - Identify areas of opportunity
  - Identify best practices observed during current state
  - Conduct best practice research
  - Identify design principles
  - Finalize future state recommendations

Framing the Future

Will allergy information be required prior to order placement?

Benefits:
- Improve patient safety

Implications:
- Process for entry, update and verification

Cost:
- Negligible

Cultural Change:
- Additional allergy information required

Change Management

- Change management team will:
  - Introduce change:
    - Develop hospital specific communication plan
    - Communicate key decisions made and major process changes
    - Review how success will be measured (metrics)
  - Assess readiness:
    - Assess staff, physical facility readiness including network, furniture, hardware, remodeling, etc.
  - Risk assessment
  - Mitigation plan
  - Executive action plan

Change Management

- Change management team will:
  - Distribute information on…
    - How the world will change
      - Processes, Policies, Procedures, Roles, Job Descriptions
    - Capturing baseline metrics
    - Training plans and expectations
    - Activation strategy
  - Prepare for change
    - Begin preparation of detailed go-live plan
    - Begin communication and training on downtime procedures
    - Conduct informational meetings with departments, physicians and administration
    - Order, install and test network and equipment