



# Smarter Healthcare Content Management

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## Agenda

- Overview of Australian Healthcare System & Agenda
- Document Capture for Healthcare
- Words and Numbers Converging to Provide Successful Healthcare Transformation



## Australian Health Expenditure Breakdown 2008-2009

- Total expenditure **AUD\$112.8B** = 9.0% of GDP
    - Per person = \$5,190
  - Who spent it?
    - Federal Government 43.2% or \$48.8B
    - State Government 26.5% or \$29.9B
    - Health funds 7.2% or \$7.8B
    - Individuals 15.42% or \$19.4B
    - Other (workers comp) 5.2% or \$5.7B
  - Where did it go?
    - Public Hospitals 31.2% or \$33.4B
    - Private Hospitals 7.8% or \$8.4B
    - Medical Services (GP etc) 18.5% or \$19.8B
    - Dental Services 6.3% or \$6.6B
    - Other Health Practitioners 3.2% or \$3.4B
    - Medications 14.2% or \$15.2B
    - Other Health 18.8% or \$20.2B
- Aihw.gov.au, November 2011





# Australia - Healthcare Challenges

## Ageing Population

We have an ageing population with higher life expectancy, consuming additional health funds, as diseases such as cancer are becoming more prevalent in old age

## Threat of Pandemics

The ability to respond is real. With threats of Avian Flu, SARS (& even terror attacks), Govts are pressured to spend to ensure preparedness for “emergency” outbreaks

## Reform

Australia’s healthcare system is undergoing substantial reform. An integrated and optimised health care system will lower the costs of providing care.



## Maturing Workforce

With 39% of employees are over the age of 45, significant funds will need to be spent on attraction strategies, training and knowledge transfer

## Escalating Costs

Health expenditure as a proportion of GDP more than doubled over last four decades. Aust/ spent \$78 billion in 2003-04, (approx 69% government of which 46% Australian Government, 23% state/territory)

## Public Pressure

High public focus on patient safety and risk management. Media & public focus is on this and so it is a potent “campaign” tool used by political parties to dent opposition credibility.



## National Health Reform Program

8 streams:

1. Hospitals
2. GP and Primary Health Care
3. Aged Care
4. Mental Health
5. National Standards and Performance
6. Workforce
7. Prevention
8. eHealth





# Federal Health Reform Funding

Health ICT spending across DoHa, NEHTA, NBN, State Health Depts. = \$150+M

## Emerging Market

Telehealth \$100m

Chronic Disease Management \$450m

Super Clinics, Medicare Locals \$840m

Aged Care \$386m

New Hospitals \$4.5b

Mental Health \$2.2B over 5 years

## Building Blocks of a Sustainable Healthcare System

### Total Spend for Health Reform Building Blocks

Regional Integration \$290m

IT (eHealth) \$477.6m

Skilled Workforce \$1.1B

Infrastructure \$650m

Financing & System Performance \$600m

Digital Economy–NBN– Digital Regions Initiative & eHub \$125m

Nation Building Health and Hospital Fund \$5B

## Opportunities

### ICT Health Spend

National Identifiers – HI, NASH \$150m

eHealth Records

National PCEHR, Community PCEHR \$142m

Reporting & Performance (ABF), Analytics \$150m



# Document Capture for Healthcare

David Jenness, Market Segment Manager, Document Imaging & Capture





## Health System Before Document Capture Implemented

- Valuable real estate taken by patient charts
- Charts could only be viewed by a single person at a time
- Medical records and full-charts were routinely misplaced and lost, leading to new tests performed







## Health System After Document Capture Implemented

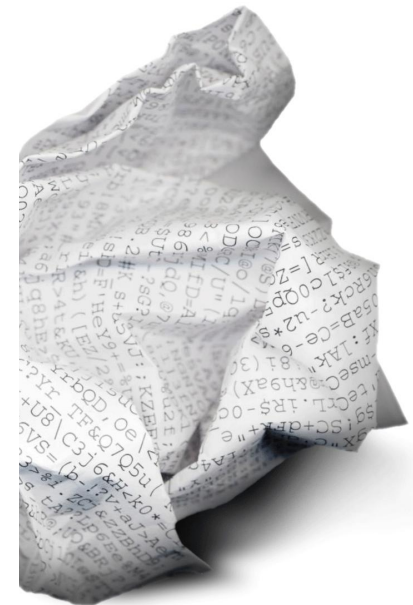
- Reclaimed space converted into clinics - improving patient care
- Online access to patient information anywhere from the healthcare system networks
- Faster processing of physician signature process via electronic signature
- Reduced FTEs
- Improved accuracy





# What is **Document Automation** for Healthcare?

- **Converting health-related paper documents into *actionable* data**
- **What kind of paper documents?**
  - **Registration:** driver's license, ID cards, physician's orders, consent forms, family history, medical data, etc.
  - **Scheduling:** Requests, confirmations of appointment
  - **Services:** Immunisation, additional forms for services performed
  - **Medical Records:** Transfer summaries, legal records
  - **Back-Office:** Invoices, purchase orders, HR, expense reports, payroll, contracts
  - **More:**
    - Test results, correspondence, certification, customer satisfaction surveys, reporting, etc.





## Why **Document Automation** for Healthcare?

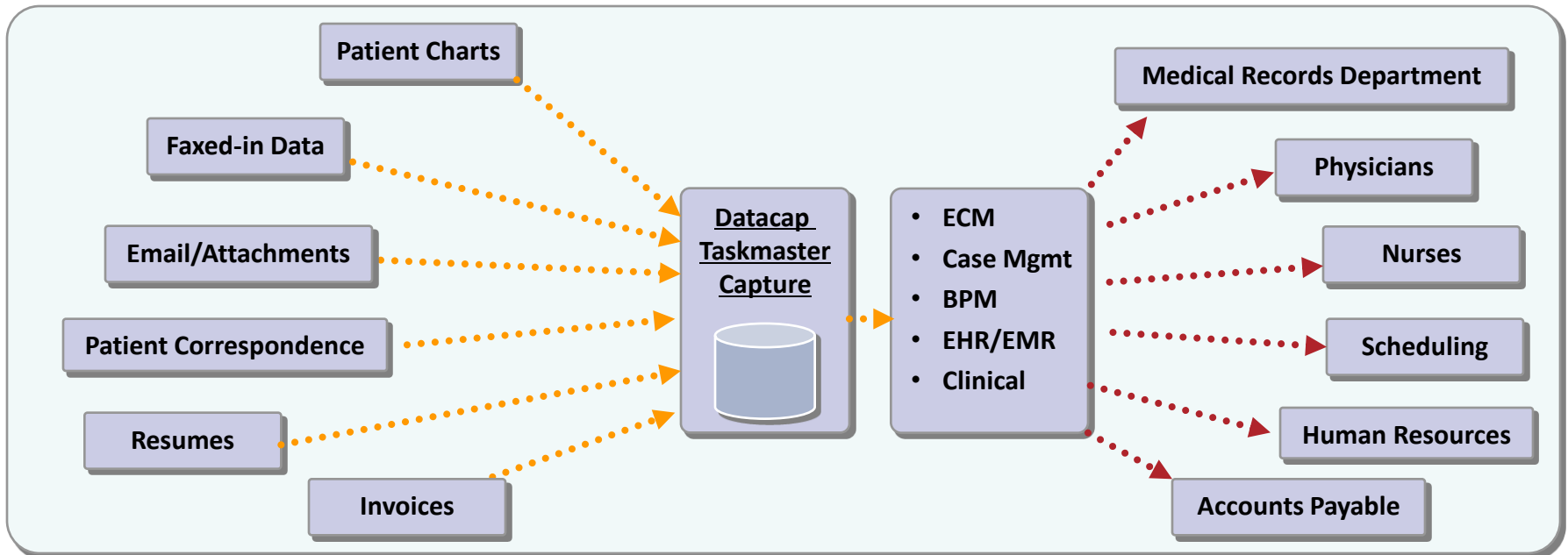
- You “unlock” health data when it’s in electronic format
  - Fast storage and retrieval
  - Support EHR/EMR systems
  - Rapid and accurate access by other healthcare providers
  - Eliminate lost documents
  - Efficient, accurate audit trail
- Manual data entry is costly, time-consuming and error prone
- Capture systems create digital images and extract data
  - Feed data to Line of Business systems
  - Fast, efficient storage and retrieval for ECM repositories
  - Set retention schedules, data extraction based on document type



# Mission of **Document Capture** in Healthcare

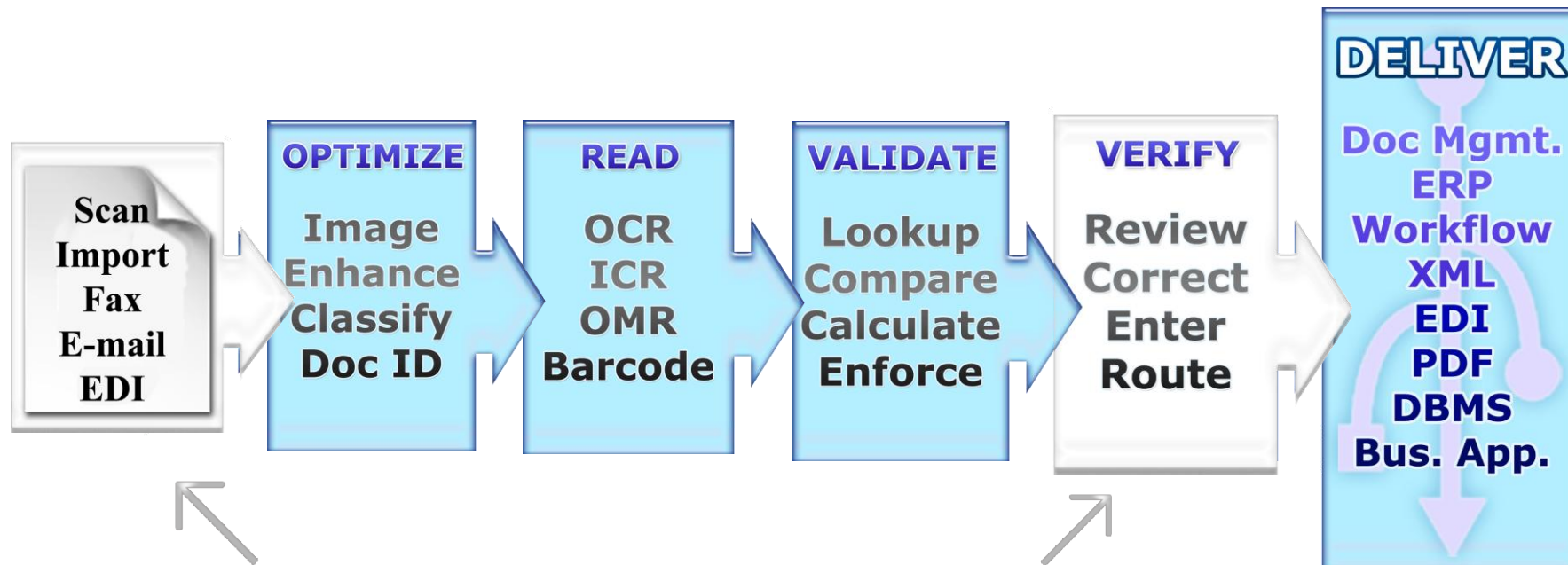
Convert paper to electronic and route to proper department

- **Medical Records:** charts can range in size from 20 –1000+ pages with varying paper sizes, colors, thickness
- **Back office:** Human Resources, contracts, payroll, procurement, operations
- **Accounts Payable:** Invoices, POs, Expenses





# Datacap Document Capture Process



# Taskmaster Web



## Use Case - Objectives

- Health System Overview

- Large healthcare system in Southern U.S. - 11 hospitals, 12 acute care facilities, 20,000 employees, a network of affiliated physicians and numerous specialty programs and services

- Objective implementing Datacap

- High volume conversion of paper to digital
- Tight integration with IBM FileNet Content Manager (ECM), EMR, Clinical Systems
- Support low volume registration desk capture with high volume centralised medical record scanning

- Implementation

- 23,000+ end users
- 9000+ different form types
- Live since 2000, added to every year, solution consolidated at all facilities
- 240 million documents stored – 4 million a month



## Use Case - Results

### Benefits:

- **Eliminated data entry** – 95% of documents are indexed automatically and never require human interaction
- **Repurposed space** – patient care, not paper
- **Reduced A/R time from Bill to Payment** -15% faster means better cash flow
- **Improved customer service** – most answers provided on initial call
- **Eliminated lost documents** – No need to waste time searching or to schedule repeat tests to replace missing data
- **Better management of assets** - improved contract management
- **Improved patient outcomes** – Access to EMR in ER, acute care
- **Disaster/Recover Strategy** – Offload to tape once a month
- **Predictive Analytics** – Improving outcomes and quality of care by being prepared



# Words and Numbers Converging to Provide Successful Healthcare Transformation

Campbell Robertson, Program Director Industry Strategy & Solutions





DATE OF ADMISSION: MM/DD/YYYY

DATE OF DISCHARGE: MM/DD/YYYY

ADMITTING DIAGNOSIS: Syncope.

CHIEF COMPLAINT: Lightheadedness.

HISTORY OF PRESENT ILLNESS: This is an (XX)-year-old male with a past medical history of coronary artery disease, CABG done a few years ago, hypertension, peripheral neuropathy, type 2 diabetes, hyperlipidemia, and chronic kidney disease. He has been under consideration for ventral hernia repair and has a background of aortic valve replacement and known coronary artery disease. The patient was admitted with complaints of abdominal pain, anorexia, and vomiting. She underwent a CT scan of the abdomen and pelvis and this showed the ventral hernia involving the transverse colon, but without strangulation. There were no hepatic right kidney. She had bilateral renal cysts. The hepatic flexure wall was thickened. There was sigmoid diverticulosis without diverticulitis. It has been recommended to her that she undergo repair of the ventral hernia. For this reason, cardiology consult is obtained to assess whether she can be cared from the cardiac standpoint.

**Echocardiogram Sample Report:**  
DATE OF STUDY: MM/DD/YYYY

**DATE OF INTERPRETATION OF STUDY:**  
Echocardiogram was obtained for assessment of left ventricular function. The patient has been admitted with syncope. Overall, the study was suboptimal due to a sclerotic heart disease, pleural effusion, and was limited by the study. The study was limited by the study. The study was limited by the study.

**FINDINGS:**  
1. Aortic root appears normal.  
2. Left atrium is mildly dilated. No grossly enlarged, although subtle abnormality of the left atrium is of normal dimension.  
3. There is echo dropout of the interventricular septum which could not be excluded.  
4. Right and left ventricles are normal in size. Left ventricular systolic function appears to be mildly reduced with an ejection fraction of about 55%. Again, due to the suboptimal quality of the study, abnormalities in the distribution of late systolic flow could not be excluded.  
5. Aortic valve is sclerotic with normal leaflet motion. Doppler study demonstrates trace aortic regurgitation.  
6. Mitral valve leaflets are also sclerotic with normal leaflet motion. Doppler study demonstrates mild mitral regurgitation.  
7. Tricuspid valve is delicate and opens normally. No evidence of pericardial effusion.

**CONCLUSIONS:**  
1. Poor quality study.  
2. Eyeball ejection fraction is 55%.  
3. Trace to mild degree of mitral regurgitation.  
4. Trace aortic regurgitation.

**LABORATORY TESTS:**  
The patient had a chest x-ray, which showed cardiomegaly, a left costophrenic angle which has not changed, and a head CT, which showed atrophy with old ischemic changes.

REFERRING PHYSICIAN: John Doe, MD

CONSULTING PHYSICIAN: Jane Doe, MD

**HISTORY OF PRESENT ILLNESS:** This (XX)-year-old lady is seen in consultation for Dr. John Doe. She has been under consideration for ventral hernia repair and has a background of aortic valve replacement and known coronary artery disease. The patient was admitted with complaints of abdominal pain, anorexia, and vomiting. She underwent a CT scan of the abdomen and pelvis and this showed the ventral hernia involving the transverse colon, but without strangulation. There were no hepatic right kidney. She had bilateral renal cysts. The hepatic flexure wall was thickened. There was sigmoid diverticulosis without diverticulitis. It has been recommended to her that she undergo repair of the ventral hernia. For this reason, cardiology consult is obtained to assess whether she can be cared from the cardiac standpoint.

**PAST CARDIAC HISTORY:** Bypass surgery. She underwent echocardiography and cardiac catheterization prior to the operation. Echocardiography showed an ejection fraction of 50%. There was marked left ventricular hypertrophy with septal wall 1.60 cm and posterior wall 1.55 cm. Coronary arteriography showed 90% stenosis in the anterior descending artery, situated distally just before the apex of the left ventricle. Only mild to moderate narrowing was seen elsewhere in the coronary circulation.

**CORONARY RISK FACTORS:** Her father had an irregular heartbeat and her brother had a fatal heart attack. She herself has had high blood pressure for 20 years. She has elevated cholesterol and takes Lipitor. She has had diabetes for 20 years. She is not a cigarette smoker. She does little physical exercise.

**REVIEW OF SYMPTOMS:** CARDIOVASCULAR AND RESPIRATORY: She has no chest pain. She sometimes becomes short of breath if she walks too far. No cough. She has occasional swelling of her feet. Occasionally, she gets mildly lightheaded. Has not lost consciousness. She tends to be aware of her heartbeat when she is tired. She has no history of heart murmur or rheumatic fever. GASTROINTESTINAL: Recent GI symptoms as noted above, but she does not usually have such problems. She has had no hematemesis. She has no history of ulcer or jaundice. She sometimes has nausea and no blood in the stool. GENITOURINARY: She tends to have urinary frequency once at night to pass urine. No dysuria, incontinence. She has had urinary tract infections on, hearing, or speech. No limb weakness. MUSCULOSKELETAL: She has had joint pains and has a history of gout. HEMATOLOGIC: No anemia, leukopenia, or leukocytosis. GYNECOLOGIC: No gynecologic or breast problems.

**Cardiology Consultation Transcribed Medical Transcription Sample Reports**

DATE OF CONSULTATION: MM/DD/YYYY

REFERRING PHYSICIAN: John Doe, MD

CONSULTING PHYSICIAN: Jane Doe, MD

**REASON FOR CONSULTATION:** Surgical evaluation for coronary artery disease.  
**HISTORY OF PRESENT ILLNESS:** The patient is a (XX)-year-old female who has a known history of coronary artery disease. She underwent previous PTCA and stenting procedures in December and most recently in August. Since that time, she has been relatively stable with medical management. However, in the past several weeks, she started to notice some exertional dyspnea with chest pain. For the most part, the pain subsides with rest. For this reason, she was re-evaluated with a cardiac catheterization. This demonstrated 3-vessel coronary artery disease with a 70% lesion to the right coronary artery; this was a proximal lesion. The left main had a 70% stenosis. The circumflex also had a 99% stenosis. Overall left ventricular function was mildly reduced with an ejection fraction of about 45%. The left ventriculogram did note some apical hypokinesis. In view of these findings, surgical consultation was requested and the patient was seen and evaluated by Dr. Doe.

**PAST MEDICAL HISTORY:**  
1. Coronary artery disease as described above with previous PTCA and stenting procedures.  
2. Dyslipidemia.  
3. Hypertension.  
4. Status post breast lumpectomy.

**ALLERGIES:** None.  
**MEDICATIONS:** Aspirin 81 mg daily, Plavix 75 mg daily, Altace 2.5 mg daily, metoprolol 50 mg b.i.d. and Lipitor 10 mg q.h.s.

**SOCIAL HISTORY:** She quit smoking 10 years ago. She does not abuse alcohol.  
**FAMILY MEDICAL HISTORY:** Mother died prematurely of breast cancer. Her father died prematurely of gastric carcinoma.

**REVIEW OF SYMPTOMS:** There is no chest pain, no cough, no shortness of breath, no lightheadedness, no hemoptysis or productive cough. There is no chest pain, no cough, no shortness of breath, no lightheadedness, no hemoptysis or productive cough. She notes no nausea, vomiting, constipation, diarrhea, but immediately prior to admission, she did develop some diffuse abdominal discomfort. She says that since then, this has resolved. No diabetes or thyroid problem. There is no depression or psychiatric problem. There is no loss of consciousness, no dizziness, no syncope, no palpitations or blood dyscrasias. No recent fevers, malaise, changes in appetite or weight changes in weight.  
**PHYSICAL EXAMINATION:** Her temperature is 98.2 degrees Fahrenheit. She is in a sinus rhythm on the EKG monitor. Respirations are 18 and unlabored. Temperature is 98.2 degrees Fahrenheit. She weighs 160 pounds, she is 5 feet 4 inches. In general, this was an elderly appearing, pleasant female who currently is not in acute distress. Skin color and turgor are good. Pupils were equal and reactive to light. Conjunctivae clear. Throat is benign. Mucosa was moist and noncyanotic. Neck veins not distended at 90 degrees. Carotids had 2+ upstrokes bilaterally without bruits. No lymphadenopathy was appreciated. Chest had a normal AP diameter. The lungs were clear in the apices and bases, no wheezing or egophony appreciated. The heart had a normal S1, S2. No murmurs, clicks or gallops. The abdomen was soft, nontender, nondistended. Good bowel sounds present. No hepatosplenomegaly was appreciated. No pulsatile masses were felt. No abdominal bruits were heard. Her pulses are 2+ and equal bilaterally in the upper and lower extremities. No clubbing is appreciated. She is oriented x3. Demonstrated a good amount of strength in the upper and lower extremities. Face was symmetrical. She had a normal gait.

**IMPRESSION:** This is a (XX)-year-old female with significant multivessel coronary artery disease. The patient also has a left main lesion. She has undergone several PTCA and stenting procedures within the last year to year and a half. At this point, in order to reduce the risk of any possible ischemia in the future, surgical myocardial revascularization is recommended.  
**PLAN:** We will plan to proceed with surgical myocardial revascularization. The risks and benefits of this procedure were explained to the patient. All questions pertaining to this procedure were answered.

She has had shoulder and hand injuries and has had carpal tunnel and has been on insulin. She has chronic renal insufficiency with as had hypothyroidism. She has had morbid obesity. She has chronic uses BiPAP. She has had hysterectomy and oophorectomy in the past. She was admitted to the hospital, she was taking glipizide XL 2.5 mg daily, metoprolol 50 mg daily, atorvastatin 40 mg daily, Synthroid 75 mcg daily, aspirin 81 mg daily, currently, she is taking Lipitor 40 mg daily, Lantus 10 units at bedtime, metoprolol 50 mg b.i.d., and Zosyn 2.25 grams q.6h. She does not drink alcohol. She is not currently dyspneic, in no distress. She is alert, oriented, and does not react normally. No icterus. Mucous membranes well colored. No lymphadenopathy. Jugular venous pressure not elevated. Carotids equal. Heart rate regular and the blood pressure 132/78. The cardiac exam is normal. There is a grade 3/6 ejection systolic murmur heard medial to the sternum with well heard radiation to the neck vessels. No rales. No abdominal distention. Normal respiratory effort. No peripheral edema. The presence of a large ventral hernia is noted. No lower extremity edema. Posterior tibial pulses were felt bilaterally, but I did not feel the femoral pulses. No lesions are noted.

**OSTIC DATA:** Electrolytes are normal. BUN and creatinine 18/2.2. Hemoglobin is 7.6, hemoglobin 11.7 with hematocrit 34.9, platelets 187,000. Hemoglobin A1c 7.7. TSH 1.82. Troponin I was normal on three occasions. The patient had a normal sized heart with postoperative changes, but no evidence of acute myocardial infarction. Low voltage QRS, probable inferior wall territory wall infarction, age undetermined.

with bioprosthetic valve. Residual systolic murmur. She has severe stenosis in anterior descending artery, but this is only a small mass of myocardium. The EKG appearance of previous myocardial infarction, indicating multiple other medical problems as listed above the chart. It appears that she does not wish to proceed with the surgery if such surgery is not

# Unstructured data is messy but filled with key medical facts

## Medications, diseases, symptoms, non-symptoms, lab measurements, social history, family history and much more



# Coping with the **complexity of content** is core to effective delivery of effective Healthcare

## Content creators

- Employees
- Doctors
- Policy analysts
- HIF, EMR,EHR
- Citizens
- Exceptions
- Hospitals
- Clinics
- Therapists

## Content types

- Social media
- Documents
- Images
- Web forms
- Video and audio
- Email applications
- Mobile applications
- Business applications
- Structured data

## Content stores

- Repositories
- File cabinets
- File servers
- Email archives
- Enterprise resource planning (ERP) systems
- Web servers
- Wikis and blogs
- Databases
- Storage devices

## Content consumers

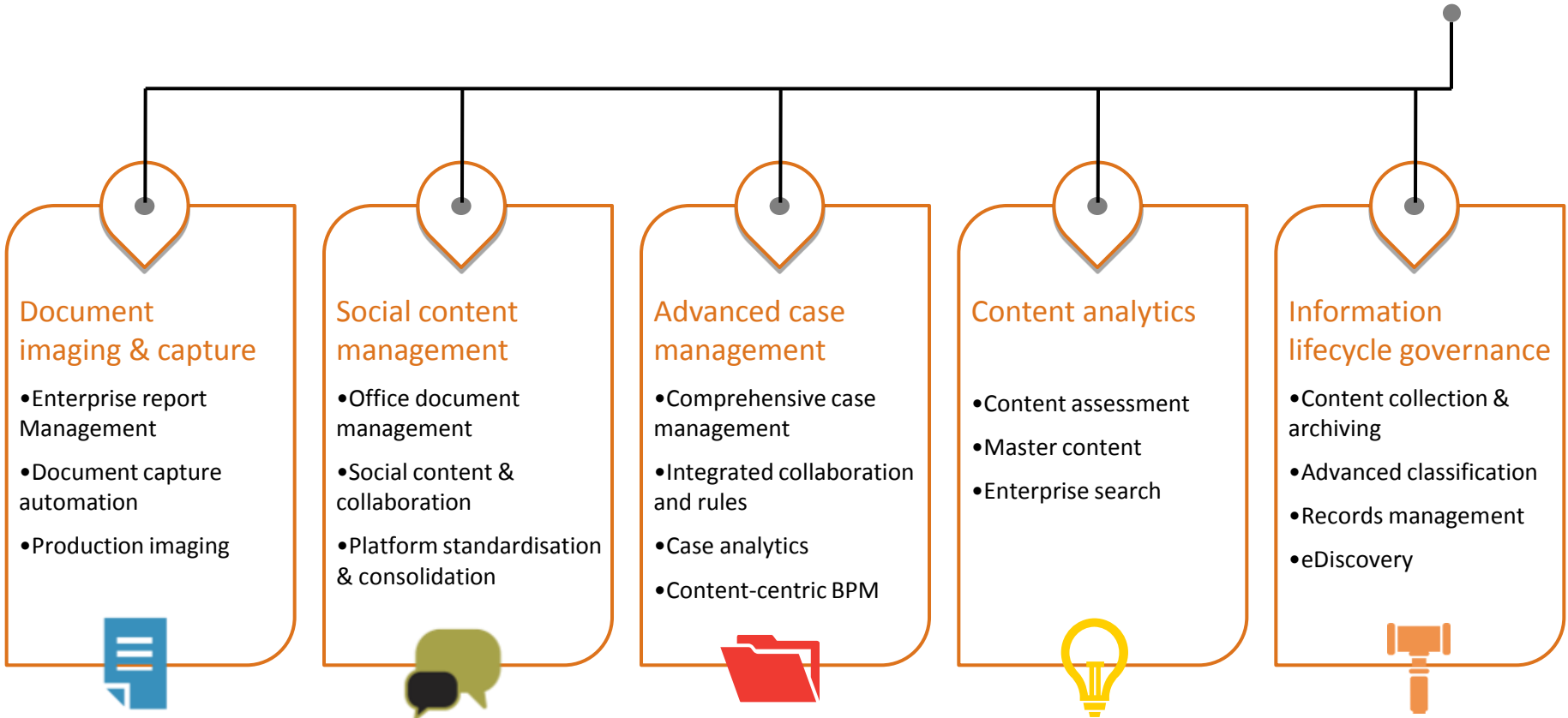
- Employees
- HIE, EMR, EHR
- Managers
- Supervisors
- Citizens
- Auditors
- *Doctors*
- *Nurses*
- *Administrators*
- ...





# IBM Enterprise Content Management

The path to value lies along one or more specific *business solution entry points*





# Enterprise Content Management (ECM) solutions from IBM

Improve patient care, reduce costs and improve operational efficiency





## Advanced Case Management

- Equitable Decisions
- Integrity of Cases
- Productivity
- Compliance



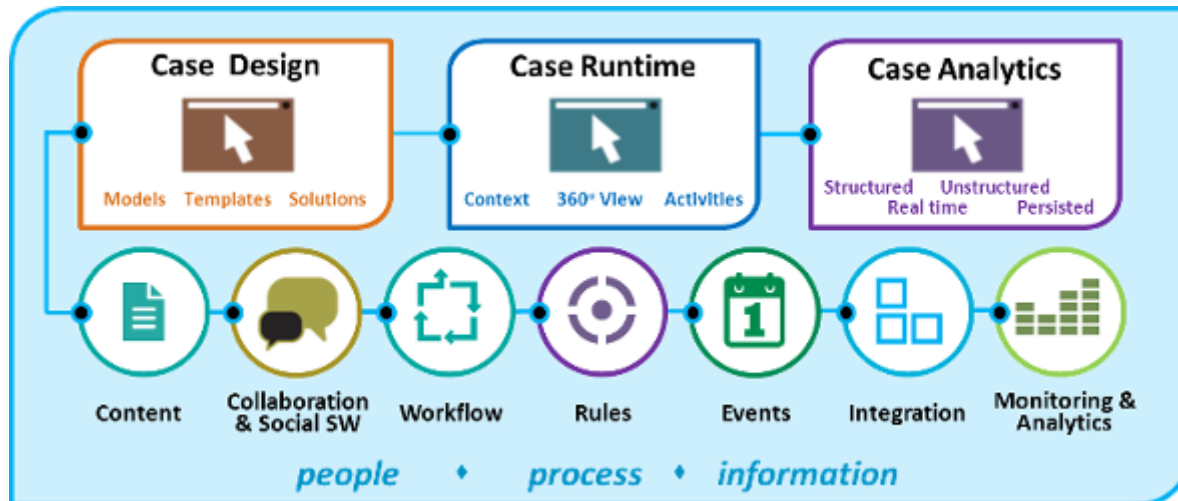
Can you measure success ?



# IBM Case Manager: An Agile, Flexible Platform

Simplifying the delivery of solutions

- Agile / flexible platform - Leverage across departments or agencies to reduce costs & promote best practices
- Lower barriers to delivering solutions and effecting change in organizations  
Business users can design and deliver solutions
- Leverage current investments – Easily integrate with existing processes and include information from content repositories





# Extending ICPA with Care Planning and Coordination

ICM Care Management extends IBM Case Manager with a patient-centric care management platform that empowers Care Coordinators



## Healthcare Operations

- Patient Intake
- Patient Release
- Care Planning
- Patient Population Analysis
- Audits/Forensic Accounting
- Administrative Task Efficiency
- Collaborative co-ordination from release to prescription management to care plan
- Mobile Care Management access

## Healthcare Imperatives

- Decrease the medical and administrative cost of patient care
- Enable care managers to focus on critical clinical tasks
- Improve care management quality by fostering guideline compliance
- Improve quality of patient care by improving clinical outcomes
- Improve member satisfaction thru a personalized care experience
- Provide a secure collaborative communications platform for the exchange of health information
- Reduce the number of avoidable hospital readmissions

## Required Capabilities

- Case Aggregation
- Team Collaboration
- Care Plan Management
- Medical Text Analytics
- Care Plan Business rules
- Care Plan/Population Analytics
- Solution development and deployment
- Risk/Compliance
- Interoperability

KEY: Both *immediate* and *longitudinal* in nature

KEY: A *patient* and *their information* is the primary focus of care co-ordination

KEY: Solution is optimized for the *patient context* a case



# IBM is helping to transform healthcare

Revealing clinical and operational insights in the high impact overlap between clinical and operational – enabling low cost accountable care

## IBM Content and Predictive Analytics for Healthcare

Diagnostic assistance  
Clinical treatment effectiveness  
Critical care intervention  
Research for improved disease management



Readmission prevention  
Claims management  
Fraud detection and prevention  
Voice of the patient  
Patient discharge and follow-up care

- ✓ Improved patient satisfaction at lower costs
- ✓ Enhanced patient care with optimised outcomes





# Get the basics right and link to **processes**

## Enterprise Content Management

- Establish good content governance:
  - Have accountability for bodies of content
  - Give operational support
- Have good answers to these questions:
  - Who will own what content?
  - How will content be categorized and tagged?
  - Who will establish and maintain the retention policy?
  - How will adherence to ECM policies be measured and enforced?
- Don't manage all content at the enterprise or business-unit level
- Use Business Process Management (BPM) to enforce a content management life cycle
- Leverage virtual team spaces for unmanaged, shared “working” content
- Assess policy and process alignment

## Information Lifecycle Management

- Create a cross-functional oversight team including business, IT, legal and finance personnel as well as an executive sponsor
- Identify compliance requirements (program, regulatory, legal, fiscal)
- Draft the appropriate records management policies and processes
- Build a retention schedule and file plan
- Determine functional and technical requirements
- Select and deploy records management technology
- Communicate records management policies and processes
- Establish continuous audit and review processes



# Why IBM?



IBM has the experience, solutions and roadmap to help healthcare organizations become smarter. We deliver:

- **A commitment** to progress and a century's worth of proven solutions
- **Solutions** that deliver value and address today's challenges and goals while creating a foundation for tomorrow
- **Leadership** that helps build smarter governments and a smarter planet
- **A strong portfolio** with complementary partners that address public sector needs



# Questions

