Enterprise Knowledge Computing Case Examples

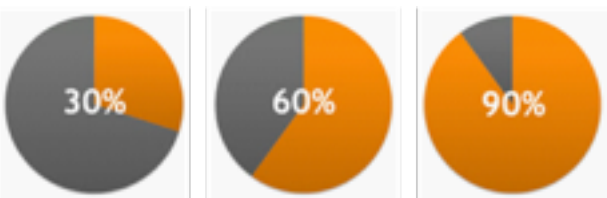
Ontology Summit
February 16, 2012

Mills Davis
Project 10x

Big Impact

- **Solve complexity:**
- handle tens of thousands of rules, ranging from national to international legislation, and many bi-lateral treaties
- treat every customer as an individual;
- one application covers 1,600 permit types
- **Fast time to market:**
- a complete Tax Service in 6 months
- a multi-benefits solution in 9 months
- licensing and enforcement application in 3.5 months.
- **High productivity:**
- Reduce time to implement regulatory changes (from 9 months to 2 days).
- < 2 hours / function point (full cycle)
- traditional approach would have cost at least 20 times more (Tax Service);

- **Low Total Cost of Ownership:**
  - up to 70% TCO reduction in permitting;
- **Operational cost reduction:**
  - 30% reduction in administrative burden for police officers;
  - reduce over 90% of all manual labor at a pension fund administrator;
  - 99.2% of all cases handled straight through in government administration.
- **Compliant and Correct:**
  - Transparent: “We now know we always apply the correct set of rules”
  - We now know who decided what, based upon which facts and applying which rules.



Case Example: Property Registry

- *Problem* — The functioning of Dutch society depends on the information the national property registry and mapping agency provides, which promotes legal certainty in transactions through clarity about who a certain moveable or immoveable property belongs to and what its characteristics are. Must process 1 million deeds per year, and more than 16 million information requests annually. Legacy mainframe systems (40 years old) at end of life. Have to be replaced. Staff expertise retiring. Several prior replacement programs failed.
- *Solution* — Transform to a knowledge model driven object- and property rights system, replacing mainframe infrastructure and core legacy systems. New platform processes all legal deeds (property, ships, planes, mortgages, government plans) in one generic end-to-end process. Geospatial integration. Provides legal reasoning over time and space. Multi-channel front-end raises service levels.
- *Benefit* — Fast implementation required 18 – 24 months to replace all systems (vs. alternative plan of 6 years). Expected operational cost reduction of > 50% and TCO reduction > 70%. Planned extensions to more systems and into the cloud.

Central Administration Office

- *Problem* — The Dutch Central Administration Office (CAK) employs 400 FTEs responsible for Health Programs that serve over 3.1 million customers and manage more than 5 billion Euros in payments annually. It is a highly regulated, complex legal environment, subject to numerous parliamentary amendments. Multiple complicated processes determine whether citizens receive compensation for certain healthcare costs. High transaction volumes demand high-throughput processing. New legislation could not be implemented on time using conventional approaches and existing infrastructure.
- *Solution* — Greenfield approach. Semantic model-driven solution. With Be Informed, design and development was fast and the solution went live well within the time and budget constraints.
- *Benefit* — Be Informed semantic technology platform, development methodology, and solution concepts met high performance requirements including 99.2% straight through processing, < 0.28 second transaction throughput, 99.8% first line call center resolution, and rapid response to legislative changes. Based on success of its implementation, CAK is replacing other core systems with semantic solutions.

Immigration Service

- *Problem* — The Dutch Immigration Service responsibilities have expanded to handle asylum, naturalization, alien registration, and other functions relating to the management of borders. A court audit concluded that the time to adapt to new legislation was too long, arrears were increasing, and error rates were too high. 165 business processes, 50 changes in legislation per year, and high workload — demanded a change in systems and transformation in way of working.
- *Solution* — Transform core systems and multiple business processes with one knowledge model driven solution that provided agile capabilities for: customer interaction management; managed automated decisions and decision support; and context driven dynamic process support that is easily maintained by business owners.
- *Benefit* — Reduced complexity. 20 percent less labor, while improving service levels. Business users fully in control. IT able to evolve the supporting infrastructure. Rapid changes — new regulations from 9 months to a few days.

Ministry of Infrastructure

- *Problem* — The Dutch Ministry of Infrastructure oversees permitting through out the country. For example, to move a bottling plant from one town to another, what authorities need to be contacted and what permits obtained…when, and how? The permitting process was complicated: 25 types of licenses, 1600 procedures, and 600 authorities to satisfy. Very time-consuming for citizens, and subject to costly errors and omissions.
- *Solution* — Single goal-driven knowledge-integrated process for all permits and jurisdictions. Laws, regulations, and policies are modeled in a knowledgebase. The new system is a virtual assistant. Proactive process suggests which licenses are needed, when, and orchestrates activities required.
- *Benefit* — Greatly reduced permitting red tape. Improved citizen-centric service. Operational cost reduction exceeded 130M Euros in first year. Approach now being adopted by other jurisdictions.

WHAT IF EVERYTHING YOU KNOW ABOUT SYSTEM ENGINEERING IS WRONG?

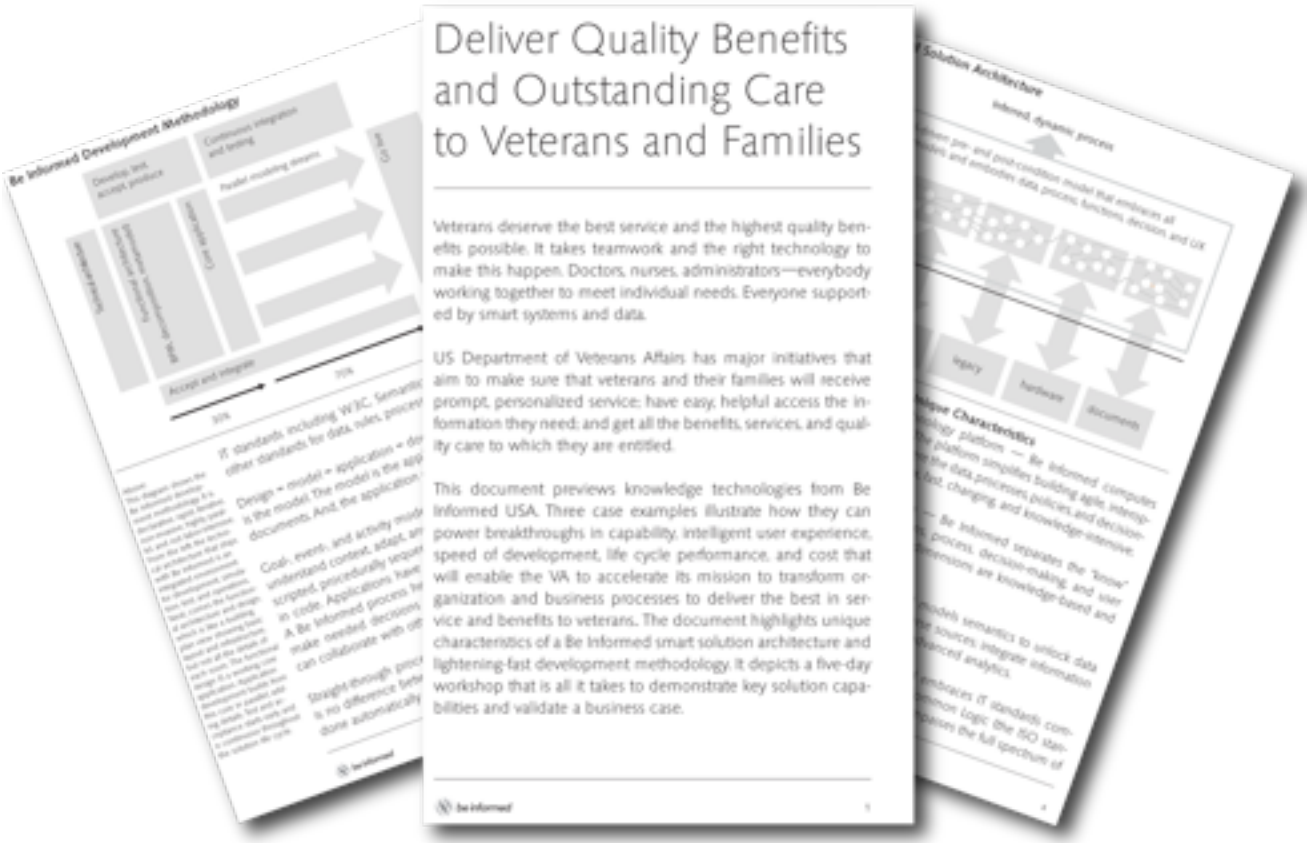
WHAT IF THERE IS A METHODOLOGY THAT IS 5-10 TIMES FASTER TO SOLUTION... WHERE DEVELOPMENT IS DECLARATIVE, RAPID, ITERATIVE, NON-INVASIVE, AND LEAN?

WHAT IF KNOWLEDGE COMPUTING SOLUTIONS ARE CHEAPER TO OPERATE, LESS COSTLY TO OWN, AND EASY TO REVISE, EXTEND, AND UPDATE BY MODIFYING ITS KNOWLEDGE MODELS? OH YEAH, AND BY PEOPLE WHO DON'T NEED TECHNICAL TRAINING?

WITH KNOWLEDGE COMPUTING, THE DEFINITION BECOMES THE DESIGN.
THE DESIGN IS THE MODEL. THE MODEL IS THE APPLICATION.
THE APPLICATION IS SELF-DOCUMENTING, SELF-JOURNALING,
AND CAN EXPLAN ITS EVERY DECISION.

10x

Motivation = Give Best Service



Veterans Affairs

Problem = Process is Slow & Complicated

VA Website

RULES, REGULATIONS & POLICIES

But, what if…

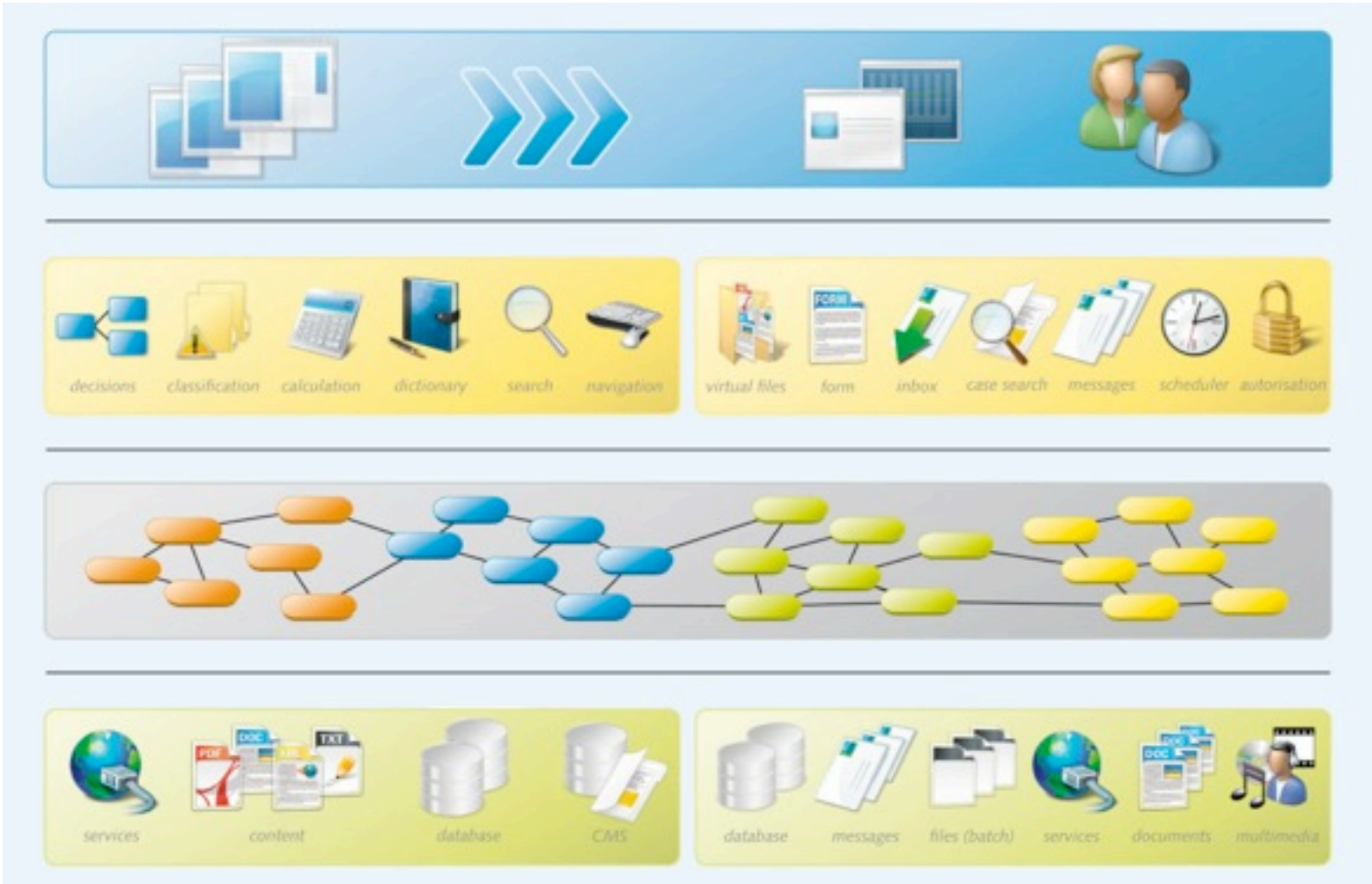
- We integrate all the knowledge needed to apply and decide eligibility, and create one simple, fast, and helpful way for veterans and their families to get the benefits and care they need?

Rules & Regulations

One Knowledge Model

New VA Website

Multi-Benefits Platform

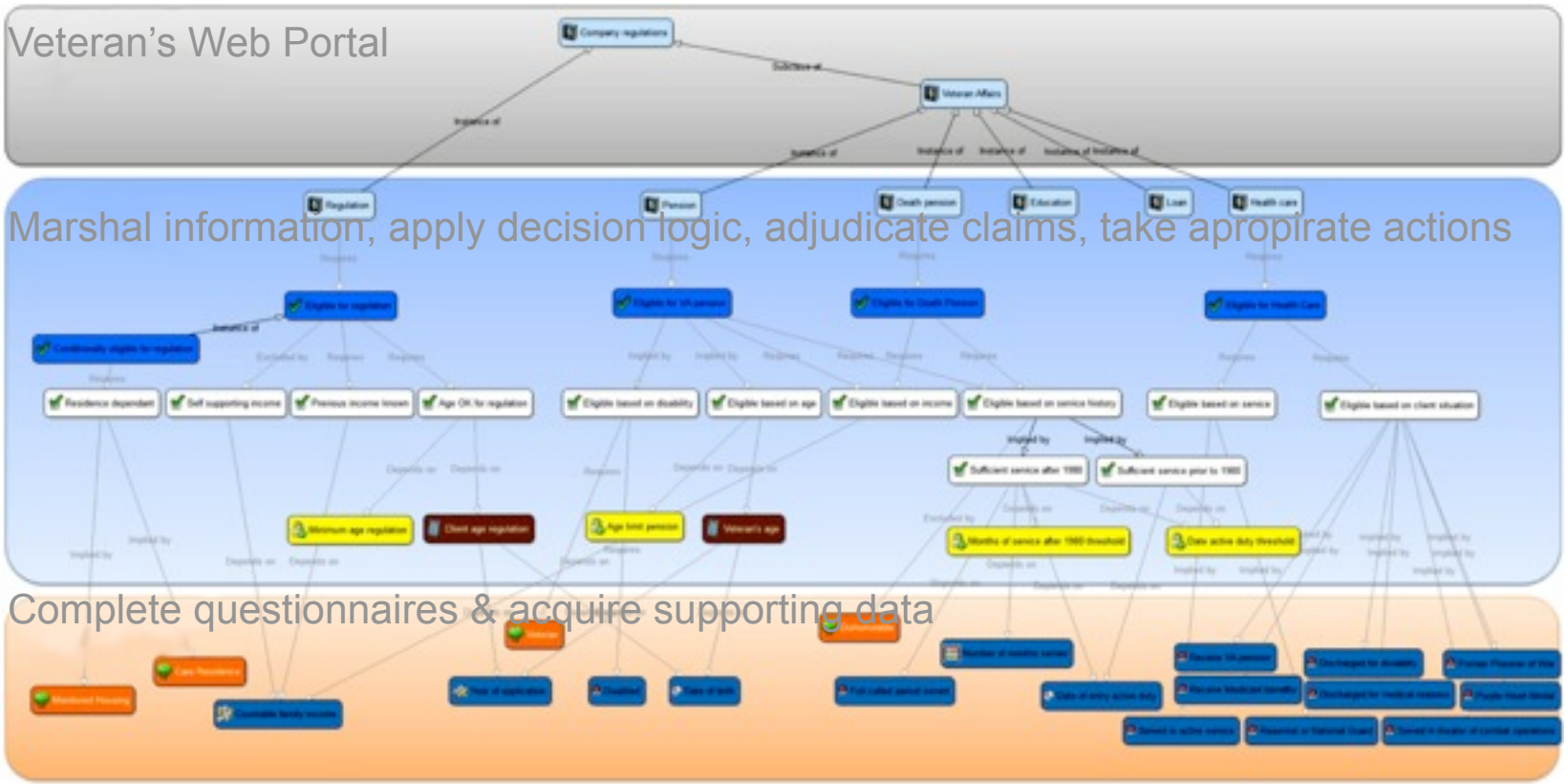


Multi-Benefits Platform

- One business model for all benefit and care delivery programs -- all services and products.
- A core business process pattern design defines common functions.
- Specific requirements of individual programs are specializations.
- This simplifies and accelerates eligibility determination, enrollment, service delivery, and treatment assessment, while ensuring compliance.

System that Knows

- One knowledge model orchestrates gathering information, determining eligibility, analyzing clinical data, adjudicating claims, explaining and communicating decisions.

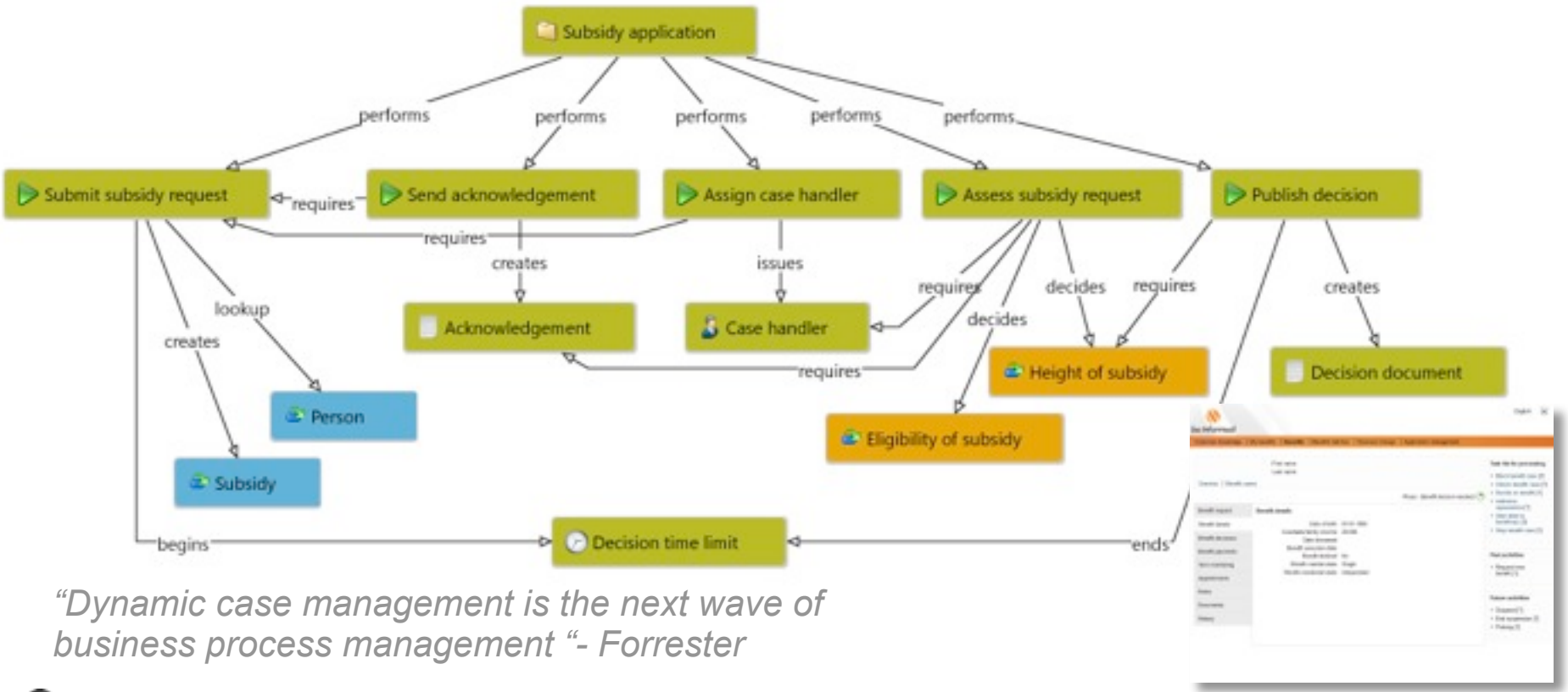


System that Knows

- System captures all legislation, regulation, and policies needed to decide eligibility, enroll beneficiaries, monitor and interpret medical treatment, and provide veteran-centric services for every benefit program. Business logic is expressed as a knowledge model and is managed in one environment.
- Knowledge model(s) execute to make decisions and deliver system functionality.
- Decisions evaluate conditions, business rules, and required information sources.
- System knowledge updates quickly, without having to rebuild databases or compile new program code.
- Knowledge-as-a-service can be used by other applications.

Model is the Application

- One knowledge model directs goal driven processes, and is used to inform, advise, apply, decide eligibility, track treatment, adjudicate claims for all benefits programs as well as to explain and communicate decisions.



"Dynamic case management is the next wave of business process management "- Forrester

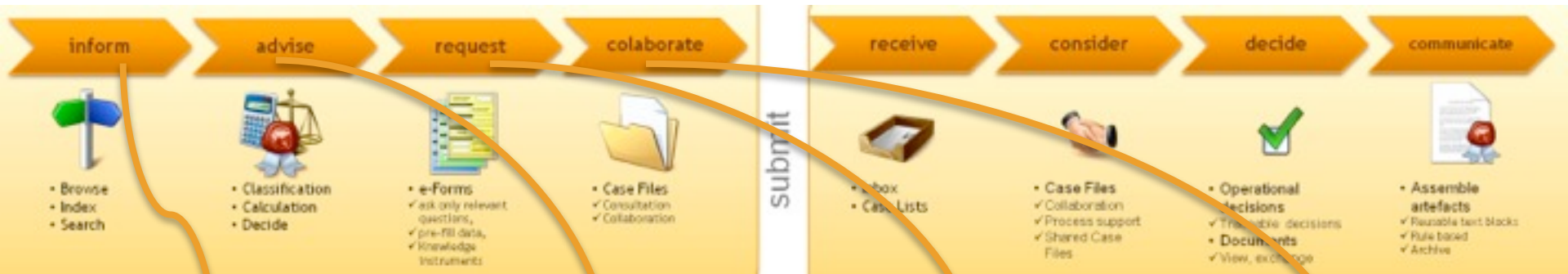
Knowledge Model = Application

- Processes are goal oriented and event-driven.
- Process adapts, self-configures and optimizes when events happen, exceptions occur, or needs change.
- Like a GPS navigation system, process interprets events, computes the best route based on current context.

"A GPS for Business Processes"

Citizen-Centric Services

- Start with a goal-oriented business process pattern



Inform

Understand available benefits

Advise

Learn how to apply

Request

Get help to apply for benefits

Collaborate

Establish a case

Demo = Citizen-Centric Services

Download video at:

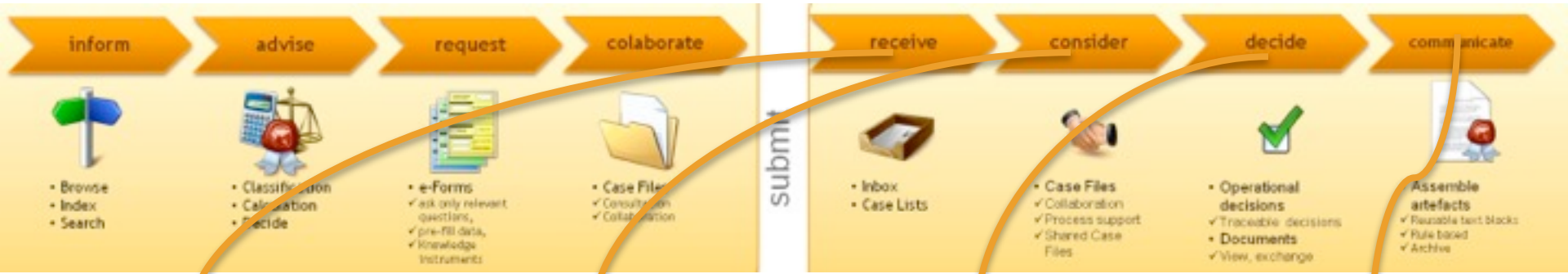
http://www.project10x.com/millsdavis/demo1_vetcentric_1stop_services.mov

Citizen-Centric Services

- Provide helpful assistance, faster service, multi-channel communications
- One-step qualification for all benefits
- Status always always current, visible; advises next best action to achieve goal;
- Context-aware help is always available, only one click away.
- Better, user experience.

Dynamic Case Management

- Start with a goal-oriented business process pattern



Receive

Acknowledge and route for processing

Consider

Verify information

Decide

Determine eligibility and benefits

Communicate

Explain benefits

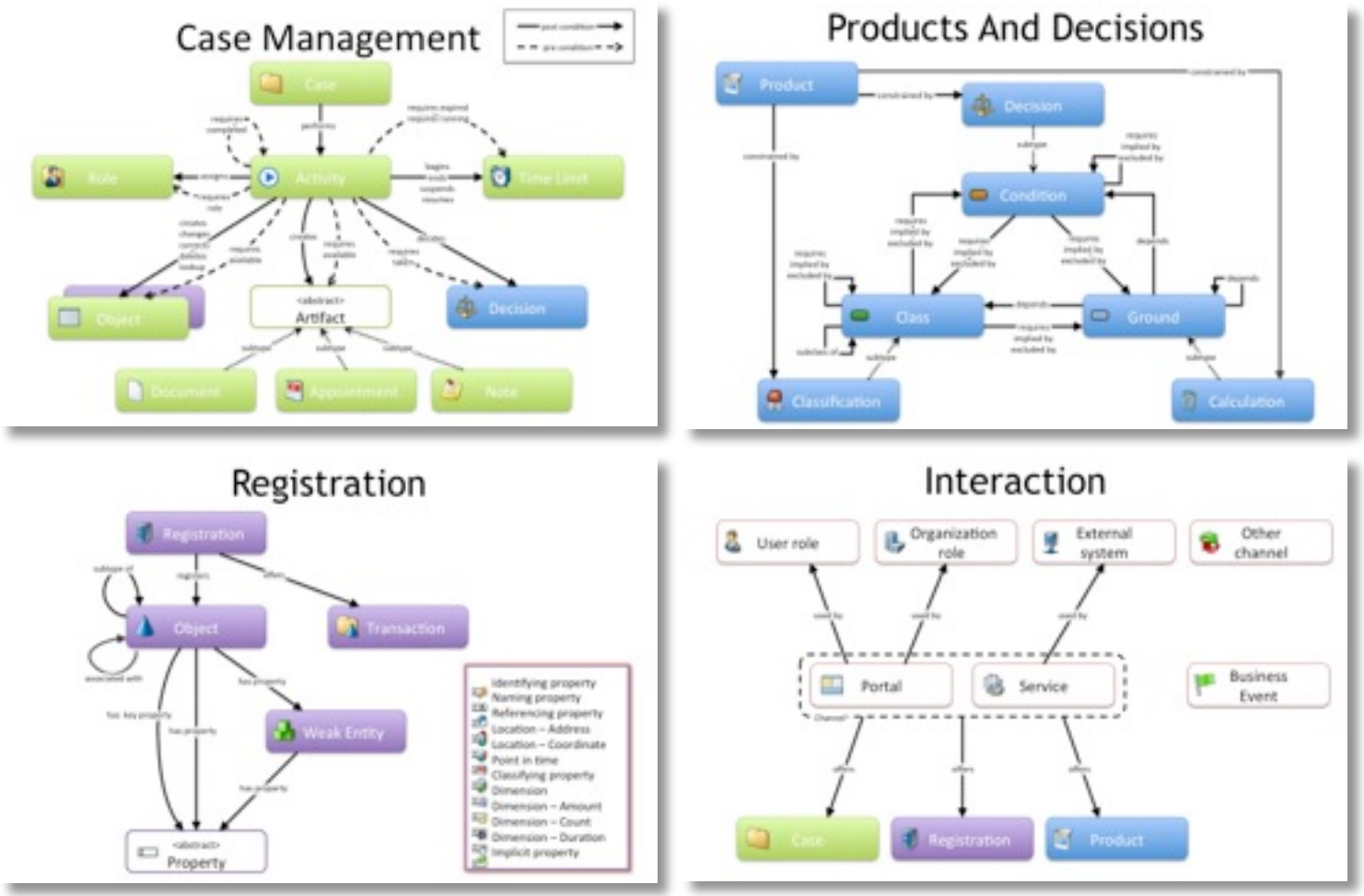
Demo = Changing the Model Updates System Behavior

Download video at:

http://www.project10x.com/millsdavis/demo2_changing_decision_models.mov

Integrated Modeling Environment

- One environment for all types of modeling



Source: Be Informed

Dynamic Case Management

- System captures business logic in knowledge models for decision making and orchestration of services.
- No difference between straight-through-processing and exception handling. What can, is. What can't, isn't.
- Process self-documents, journals everything, and can explain every decision.
- Communications and actions get generated from the model and data provided, and are always traceable and provably compliant.
- Validity of the models gets established using the simulation and test server.

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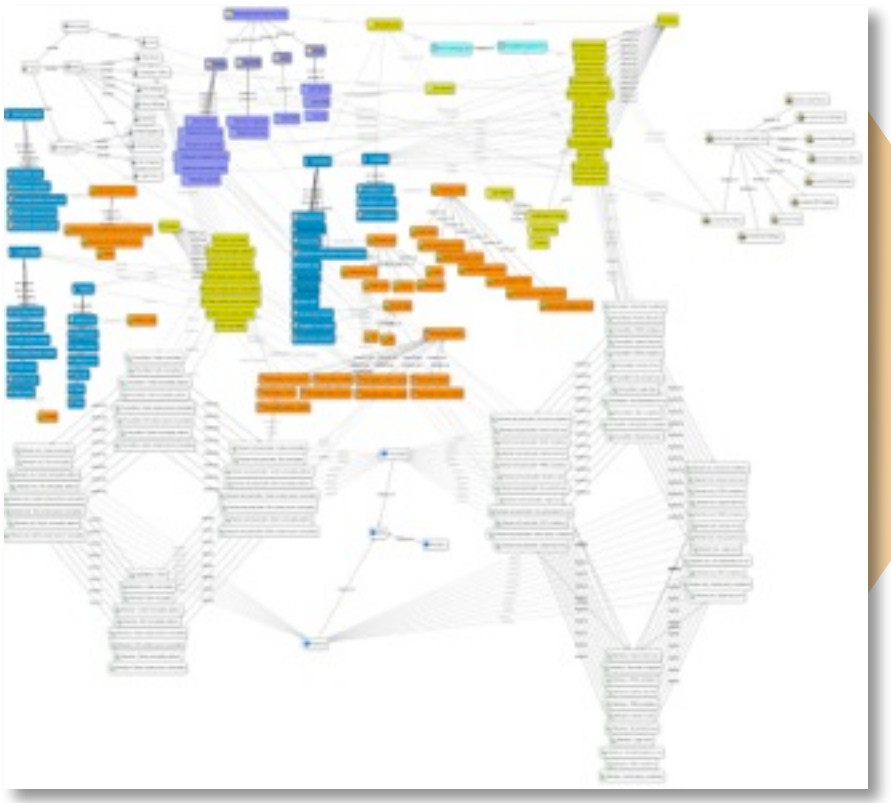
Integrated Modeling Environment

- Integrated modeling environment simplifies all kinds of modeling — data, process, decision, user experience, and infrastructure. One environment handles them all.
- Self-documentation, self-explanation, self-help, and do-it-yourself facilities empower both business users and IT specialists.
- Unified modeling environment has fewer pieces, steps, and operations to learn, manage, and govern. Modest investment to learn. Easy to use.
- By comparison, BPM and other enterprise application suites require separate tools for process management, business rules, data, and integration, etc., and more tools to make separate models work together. This means significant additional programming and application complexity.

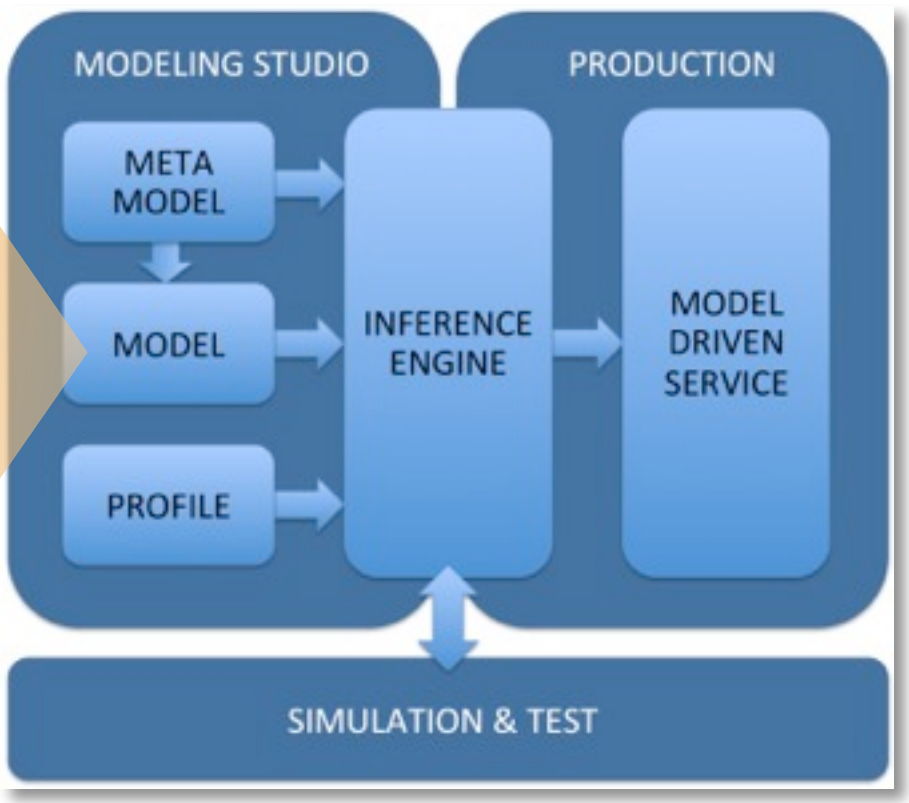
Integrated Execution Environment

- One inference space for development, testing, and production

Integrated Knowledge Models



N-ary Inference Space

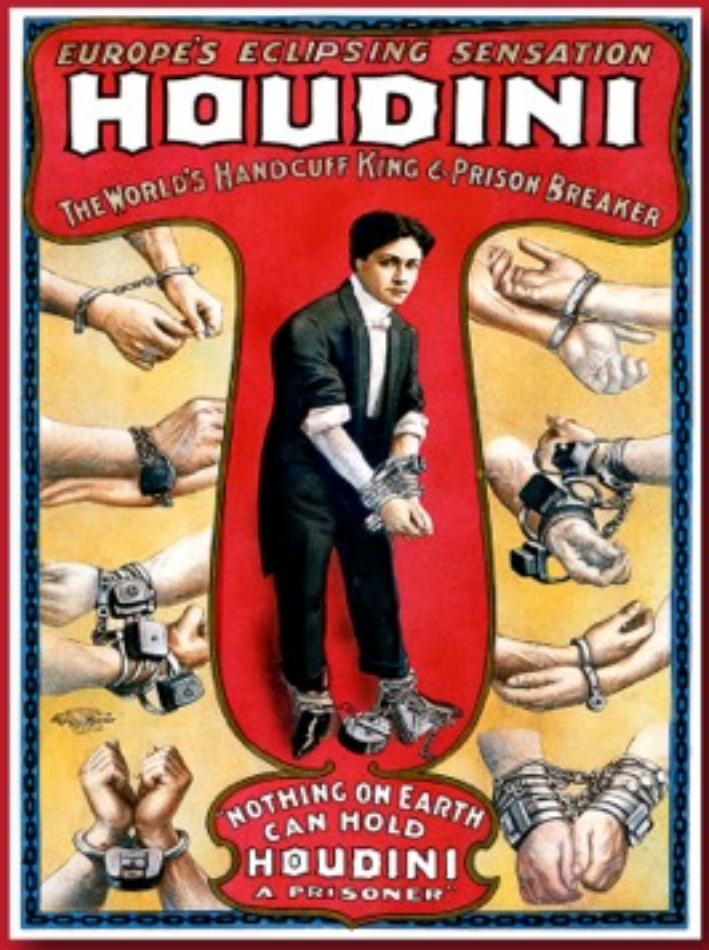


Integrated Execution Environment

- Models, at every stage of development execute locally through a browser. The model is the application.
- Simulation and testing is built in and uses the same models.
- Models and inference space deploy for production behind the firewall on mainframes or commodity servers, or in parallel execution across a cloud.
- Common knowledge-driven environment for development, operations, and growing live reduces costs, is more productive, and requires fewer resources and less time.

CAN YOU ESCAPE YOUR LEGACY SYSTEMS?

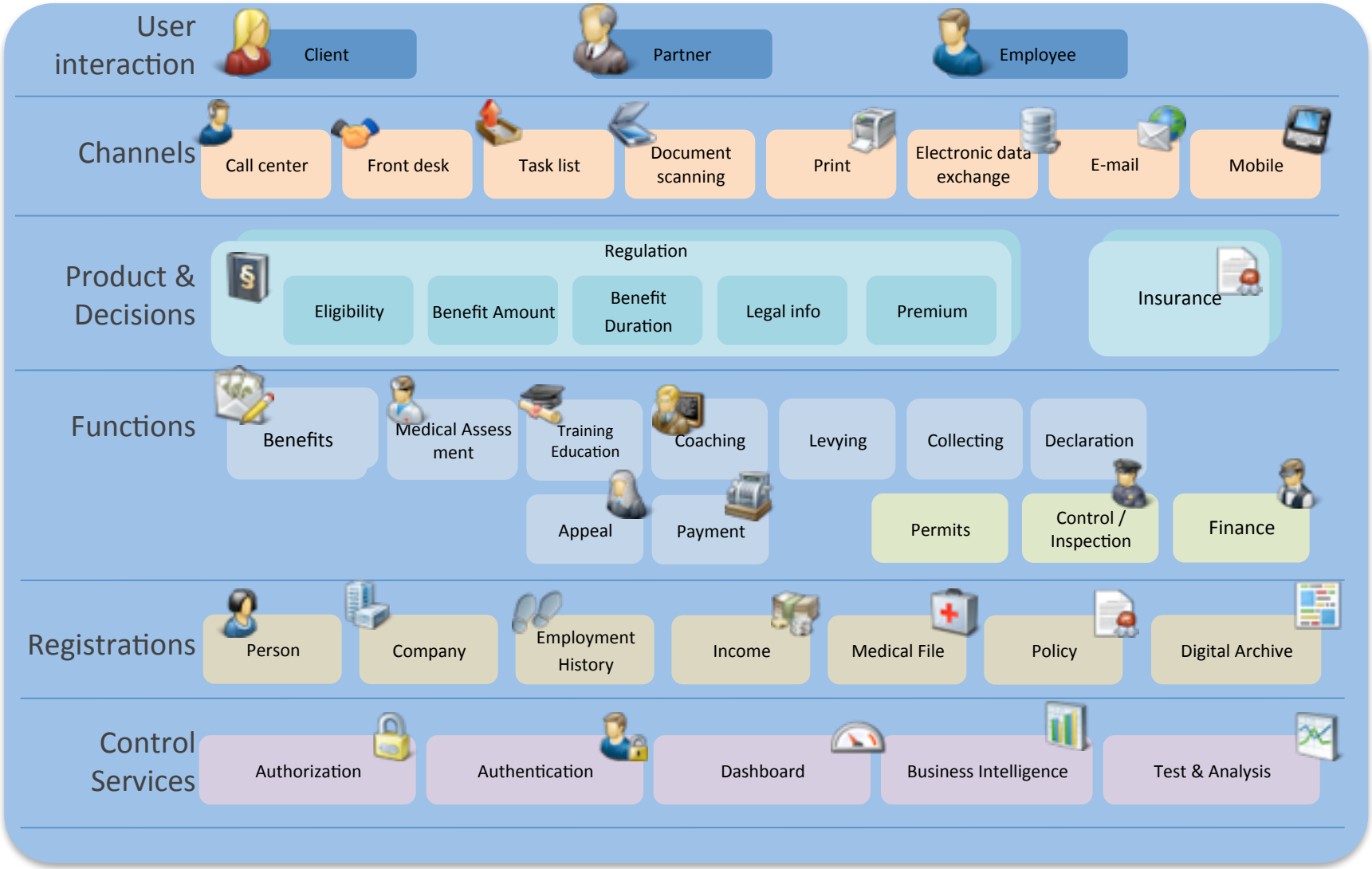
BUSINESS IS COMPLEX, BUT IT DOESN'T NEED TO BE COMPLICATED!



KNOWLEDGE MODELS INTEGRATE SYSTEMS & DATA NON-INVASIVELY.

USE ABOVE THE LINE ARCHITECTURE.
STANDARDIZE AT A HIGHER LEVEL.
TRANSFORM INCREMENTALLY. INTERCEPT THE FUTURE.

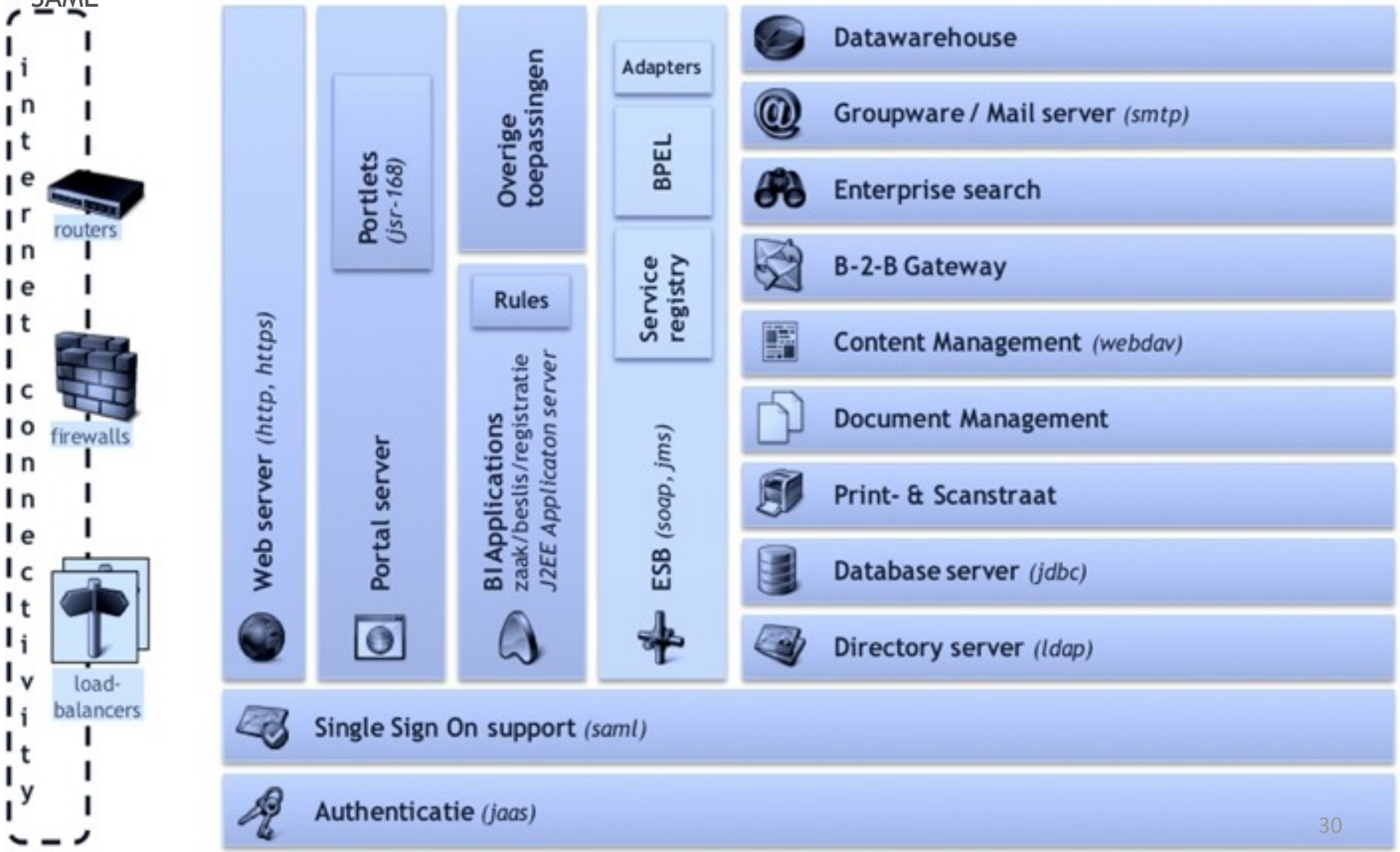
Above the Line Knowledge Models



Above the line: standards equivalent to ISO Common Logic. Embrace all IT open standards.

... And Non-Invasive Below the Line Integrations

Open standards: RDF/OWL, BPML, Java, JDBC, SQL, XML Web Services, HTTP(S), HTML, LDAP, SAML

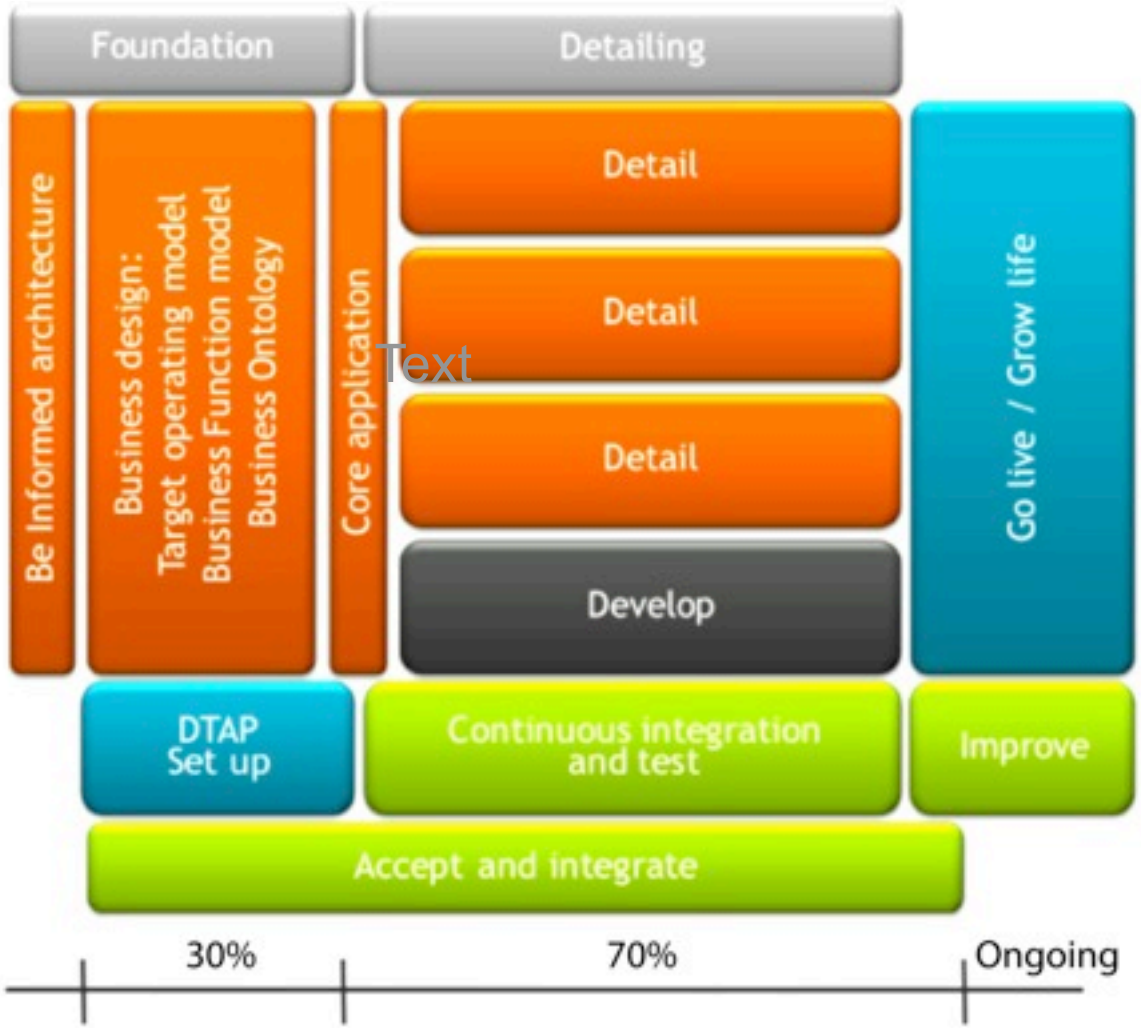


Knowledge-Enabled Integration

- "Above the line models" — Integrate the knowledge first; then execute it.
- Complements multiple existing approaches to enterprise architecture (e.g. DoDAF, TOGAF, Zachman, etc.)
- Facilitates non-invasive interfaces with legacy systems.
- Standards compatible with ISO 24707 Common Logic (CL).
- Comprehensive support for open standards e.g. W3C, RDF/OWL, BPMN, SOA, J2EE stack, JDBC, MySQL, JSON, and other IT standards, which are subsets of Common Logic.
- Operates over all major software stacks, including open source, Linux, IBM, Microsoft, major app servers (Jboss, Oracle, Websphere) and all major browsers.
- Integrates with existing change management software practices.
- Deploys behind the firewall or in the secure cloud.

Integrated Development Environment

Project Approach



Integrated Development Environment

- Packaged solution models speed getting there: choice is to adopt, adapt, or customize.
- Knowledge-driven platform integrates tools used across each stage of development: requirements, modeling, detailing, simulation, test, documentation, and project management. Provides deep traceability end-to-end.
- Knowledge-centric methodology includes discovery, design, development, and deployment activities. Foundation phase defines and implements core business design. Detailing phase adds specifics in parallel. Integration testing and acceptance starts early and is ongoing.
- Business and IT users have a choice of modeling methods including graphical modeling, natural language, forms, and spreadsheet style tabular modeling.
- Getting there is fast, iterative, non-invasive, and lean (fewer people).

Solutions that Grow Live

- Models enable “growing live” — Change, extend, enhance and evolve system capabilities rapidly and at low cost.
- Analytics to monitor performance, identify problems areas, explore improvement opportunities.
- Business users can manage changes to business logic; simulation and testing the impact of changes is a built-in function; changes to models can take effect immediately or scheduled point in time.
- IT can manage changes to infrastructure and external systems as well as tune solution performance.

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- Mills Davis is founder and managing director of Project10X. He is a professional services executive, industry analyst, consultant, and entrepreneur.
- Mr. Davis advises clients about emerging technologies, innovation strategy, and advanced applications of semantics and knowledge technology.
- He conducts industry research and is author of more than 50 reports, whitepapers, articles, and industry studies.

Case examples complements of BeInformed

For more info: www.beinformed.com