

BPM+ HEALTH

Teaching BPM+ Interoperable Clinical Pathway Standards through Modeling Tools

Presented by

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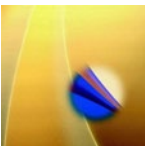
and

Anna Orlova, Tufts University

Anna.Orlova@TUFTS.EDU

June 25, 2020

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Visible Systems Corporation and Tufts University

- Visible Systems Corporation www.visible-systems.com
 - Leading provider of modeling software to universities throughout the world.
- Tufts University <https://www.tufts.edu/>
 - Recognized as a premier university dedicated to educating new leaders for a changing world.

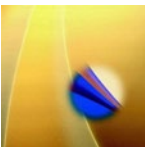
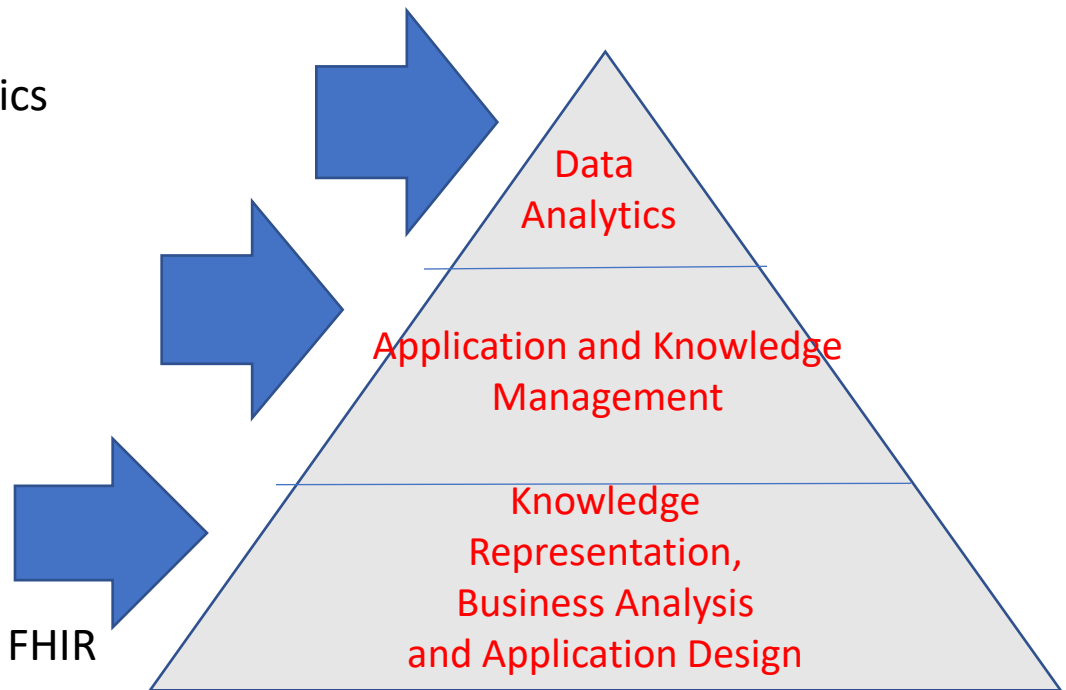
Headquarters: Boston, MA



Visible Systems Corporation

Key Commercial Offerings

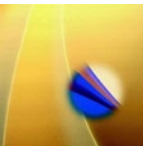
- Self Service Data Discovery - NEW
 - Cross-Platform Interactive Analytics
 - Ad-hoc, Interactive Queries
- Information Governance/Change Management
 - Metadata Management
 - Requirements Management
 - Documentation Management
- Enterprise Agile Frameworks
 - Model/Metadata Development
 - Zachman, BPMN, ERD, UML, IHE, FHIR



LIVE DEMONSTRATION

Business Cases

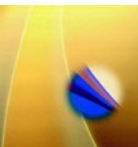
- Patient Registration*
- Immunization
- Diabetes



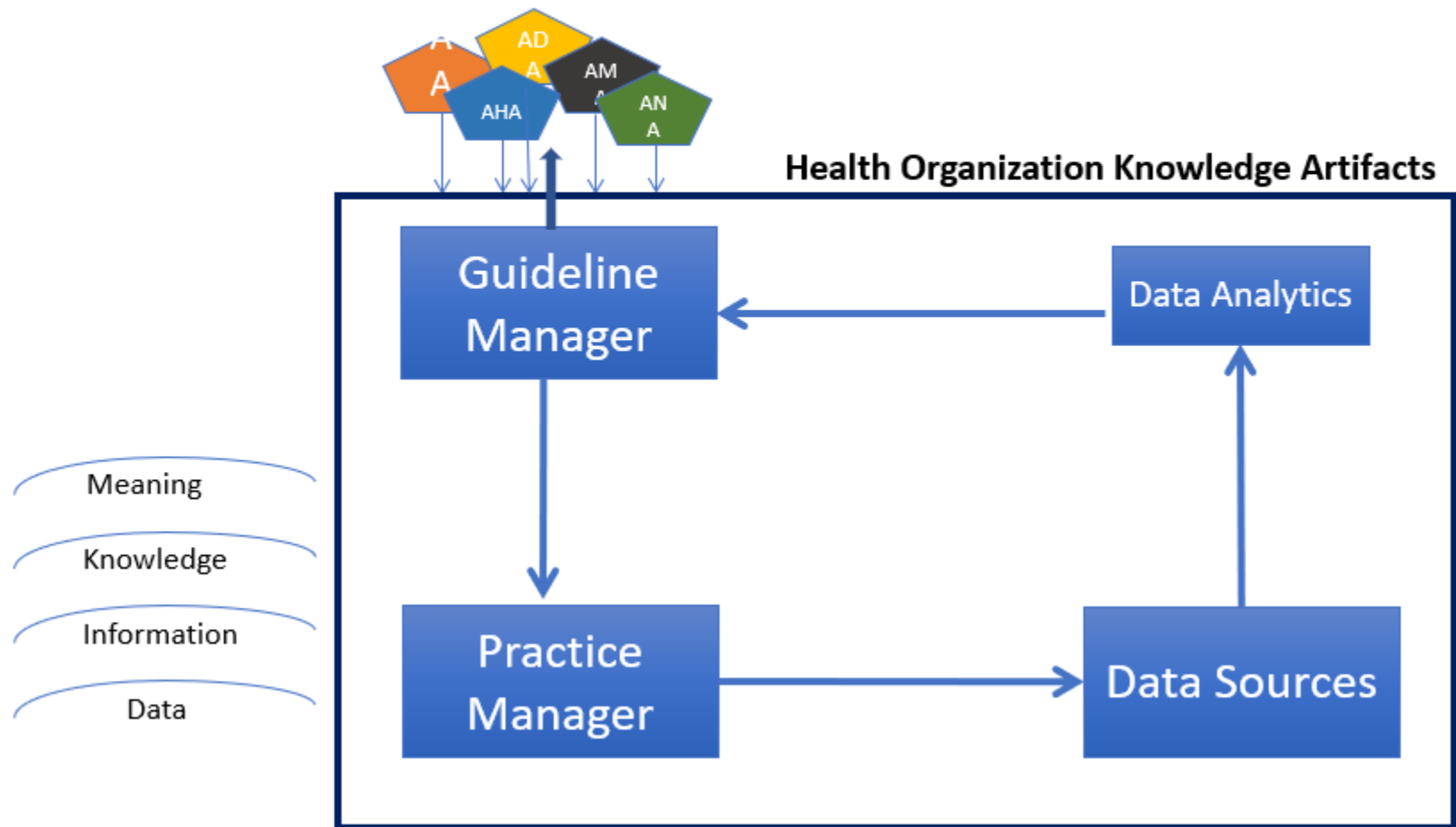
User Role in Information System Development Process: Requirement Elicitation

Information system development process is comprised of the following activities:

- **Requirements elicitation**
- Design
- Development
- Pilot testing
- Implementation
- Evaluation
- Deployment



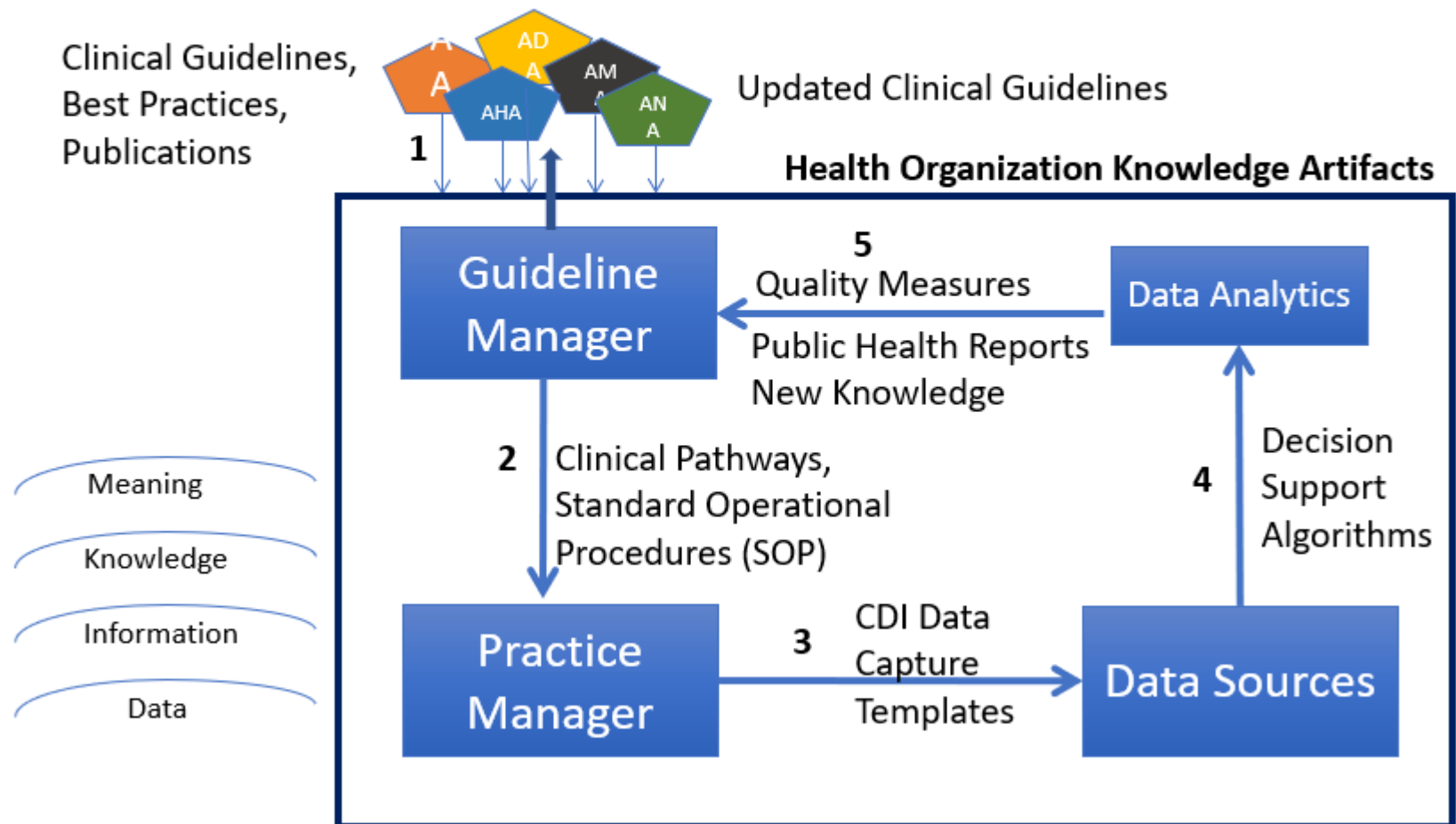
Data, Information & Knowledge Sharing in Healthcare



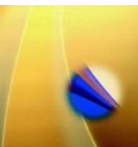
Integrating the Healthcare Enterprise (IHE). Patient Care Coordination Technical Framework. URL: www.ihe.net



Data, Information & Knowledge Sharing in Healthcare



Integrating the Healthcare Enterprise (IHE). Patient Care Coordination Technical Framework. URL: www.ihe.net



Visible Analyst: User Interface

Visible Visualize. Align. Transform. Hello Michael | Home | Create | Request | Submit | Sign Out

Views

- Business Rules
- Planning Statement Hierarchy
- Planning Statement Outline
- Association Matrix - Planning Statements vs. Entities
- Sensitive Data Check

Models

- Business Process**
 - Insurance Verification
 - Patient Registration - Walk in
- Entity Relationship**
 - Appointment Request
 - Care Plan and Services
 - Consent for Treatment
 - Eligibility for Coverage
 - Episode of Care
 - Insurance Claim
 - Participating Organization
 - Participating Party
 - Payment Arrangements
- Sequence**
 - Patient Registration - Sequence of Steps
- Use Case**
 - Patient Registration - Walk in
- Objects**
- References**
 - Documents
 - Exchange graphic
 - https
 - IHE

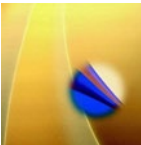
	What Data	How Function	Where Network	Who People	When Time	Why Motivation
Scope Planner	List of Things ENTITY = Class of Business Entities	List of Processes PROCESS = Class of Business Processes	List of Locations NODE = Class of Business Locations	List of Organizations PEOPLE = Class of Business Organizations	List of Cycles CYCLE = Class of Business Cycles	List of Motives MOTIVATION = Class of Business Motives
Business Model (Conceptual) Owner	e.g., Semantic Model ENTITY = Business Entity RELATION = Business Relationship	e.g., Business Process Model UID = Business Resource PROCESS = Business Process	e.g., Logistics Network NODE = Business Location LINK = Business Linkage	e.g., Work Flow Model PEOPLE = Organization Unit WORK = Work Product	e.g., Master Schedule TIME = Business Event CYCLE = Business Cycle	e.g., Business Motive MOTIVATION = Business Motive
System Model (Logical) Designer	e.g., Logical Data Model ENTITY = Data Entity RELATION = Data Relationship	e.g., Application Architecture UID = User Views PROCESS = Application Function	e.g., Distributed System Architecture NODE = IS Function LINK = Link Characteristics	e.g., Human Interface Architecture PEOPLE = Role WORK = Deliverable	e.g., Processing Structure TIME = System Event CYCLE = Processing Cycle	e.g., Business Motive MOTIVATION = Business Motive
Technology Model (Physical) Builder	e.g., Data Design ENTITY = Table/Argument/Info RELATION = Key/ForeignKey	e.g., System Design UID = Data Element/Info PROCESS = Computer Function	e.g., Technology Architecture NODE = Hardware/System Software LINK = Link Specifications	e.g., Presentation Architecture PEOPLE = User WORK = Screen/Device Format	e.g., Control Structure TIME = Event CYCLE = Component Cycle	e.g., Business Motive MOTIVATION = Business Motive
Detailed Representations	e.g., Data Definition	e.g., Program	e.g., Network Architecture	e.g., Security Architecture	e.g., Timing Definition	e.g., Role Definition

Discussion

type your message here

Send

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Visible Analyst: Modeling Components

Planning Statements

- Specify Policies, Procedures, Goals and Objectives



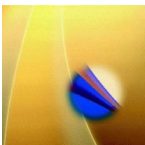
Business Processes

- Implement Procedures as Clinical Pathways

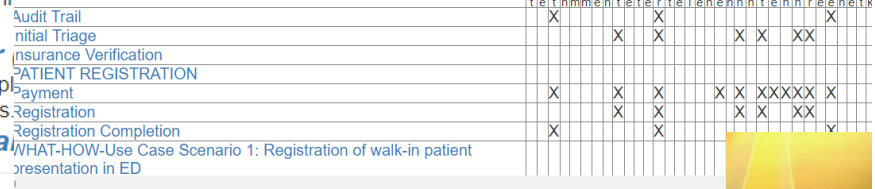


Data Entities and Relationships

- Derive Data Rules from Clinical Pathways



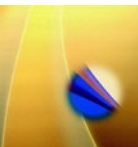
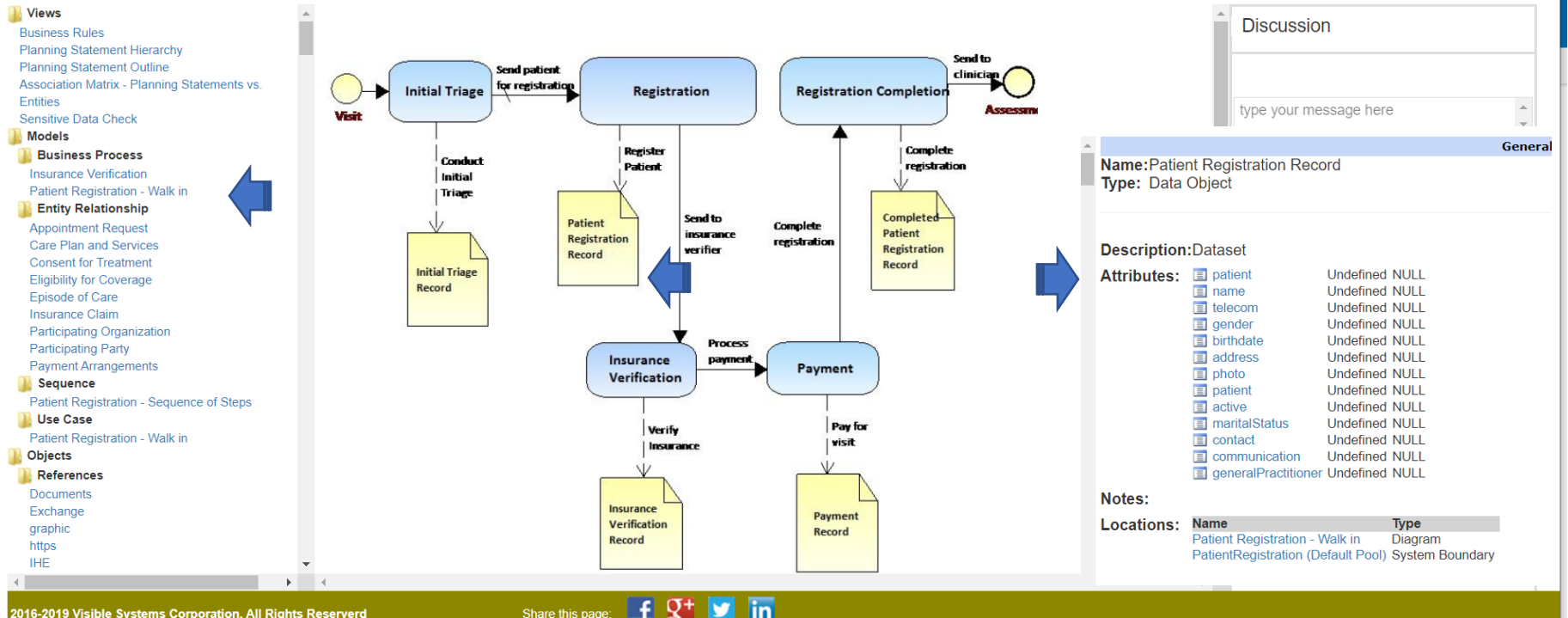
Visible® Visualize. Align. Transform. [Help](#)



Visible Analyst: Business Process Diagram

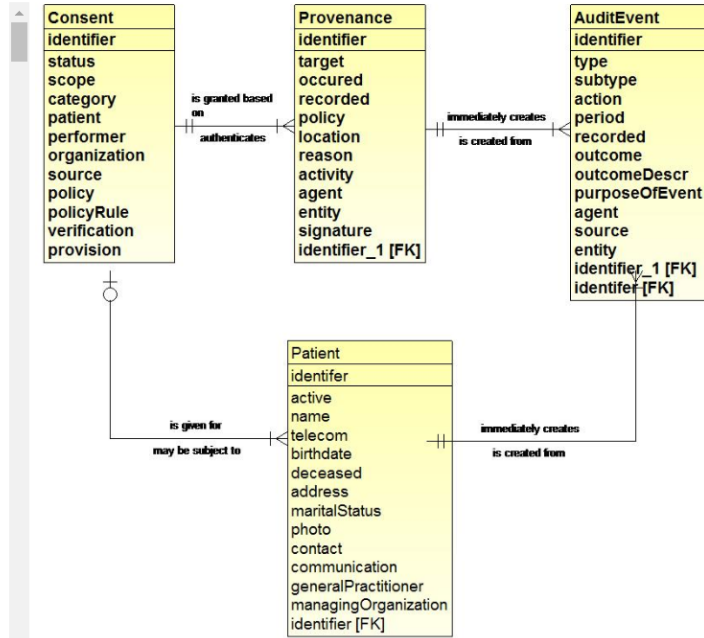
Visible Visualize. Align. Transform.

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Visible Analyst: Data Entity Relationship Diagram

- Views
 - Business Rules
 - Planning Statement Hierarchy
 - Planning Statement Outline
 - Association Matrix - Planning Statements vs. Entities
 - Sensitive Data Check
- Models
 - Business Process
 - Insurance Verification
 - Patient Registration - Walk in
 - Entity Relationship
 - Appointment Request
 - Care Plan and Services
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 - IHE



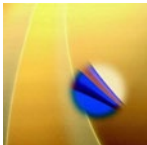
Discussion

type your message here

Send

Business Rules

ch Instance Of	Relationship Name	Maximum Cardinality	Instances Of
pointment	request is made	One Or Many	AppointmentResponse
pointmentResponse	Acceptance creates a	Zero Or Many	Schedule
pointmentResponse	response back to	Only One	Appointment
ditEvent	is created from	Only One	Patient
ditEvent	is created from	Only One	Provenance
rePlan	may eventually be assigned a	Zero Or One	CareTeam
rePlan	may eventually create	Zero Or Many	ServiceRequest
reTeam	is assigned to	One Or Many	ServiceRequest
reTeam	is assigned to	One Or Many	CarePlan
im	may eventually result in	Zero Or Many	Invoice
im	is reviewed and requires a	One Or Many	ClaimResponse
imResponse	may eventually result in	Zero Or One	Invoice
imResponse	is provided for a	Only One	Claim
ndition	is acknowledged by	Only One	Organization
ndition	is a direct result of	Only One	Encounter
nsent	is given for	One Or Many	Patient
nsent	is granted based on	One Or Many	Provenance
verage	determines whether to generate	Zero Or One	Invoice
verage	is derived from an	Only One	InsurancePlan
verage	is a direct result from	Only One	CoverageEligibilityResponse
verage	is a direct result from	Only One	CoverageEligibilityRequest
verageEligibilityRequest	represents an inquiry for	Zero Or One	CoverageEligibilityResponse
verageEligibilityRequest	may result in	Zero Or One	Coverage
verageEligibilityResponse	may result in	Zero Or One	Coverage
verageEligibilityResponse	responds back to	Only One	CoverageEligibilityRequest
counter	is recorded by	Only One	Organization



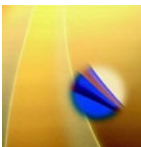
Visible Analyst: Publishing

The screenshot displays the Visible Analyst software interface. The title bar reads "Visible Analyst - [Strategic Planning]". The menu bar includes "File", "Edit", "View", "Options", "Repository", "Diagram", "Tools", "Window", "Resources", and "Help". The "Tools" menu is open, showing options: "Backup", "Restore...", "Copy Project...", "Delete Project", "Rename/Move...", "Export...", "Import...", "Download UDM Project...", "Publish Model..." (highlighted with a blue circle and a blue arrow), "Upload project to Dropbox...", "Download project from Dropbox...", "Rebuild", "Enterprise Copy...", "Enterprise Tag Maintenance...", "Copy Diagram...", "Delete Diagram...", "Users...", "Assignments", and "Prototyper".

On the left, a tree view shows a hierarchy: "PERFORMANCE" > "PERIOD" > "PERSON" > "person id", "business party id", "person birth date", "person number of dependents", "person age", "gender code", "lifestyle code", "person income", "head of household", "race label", "religion label", "person ethnicity", "personality type", "person weight", "person height", "PERSON_CHARACTERISTIC" > "person_characteristic_type_code", "person_characteristic_value", "person_characteristic_effective_date", "person_id", "PERSON_CHARACTERISTIC_TYPE", "PERSON_DISABILITY", "PERSON_DISABILITY_TYPE".

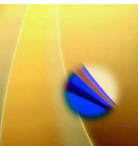
The main workspace displays a "Visible Visualize. Align. Transform." header. Below it, a grid of model thumbnails is visible, including "Scope Planner", "Business Model Owner", "System Model Designer", "Technology Model Builder", "Detailed Representations", "What Data", "How Function", "Where Network", "Who People", "When Time", and "What Motive". A "Discussion" panel on the right contains a text input field and a "Send" button.

At the bottom, a status bar shows "Publish the current model in the cloud", "80%", and "UDM_TEMPLA...".



Demonstration: Patient Registration

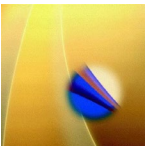
[http://visibleanalyst.visible-systems.com/
Dashboard.aspx](http://visibleanalyst.visible-systems.com/Dashboard.aspx)



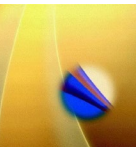
Invitation to Everyone:

Discussion on Patient Registration

[http://visibleanalyst.visible-systems.com/
NewUser.aspx](http://visibleanalyst.visible-systems.com/NewUser.aspx)



Additional Resources



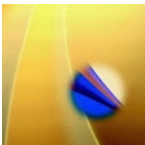
Visible Educational Software

Visible has been the market leader in providing educational tools for Information systems classes at over **3,000 colleges and universities** for more than 17 years. During that time, we have partnered with many of the premier college publishers and bundled Visible Analyst with more than thirty [30] college textbooks and workbooks.

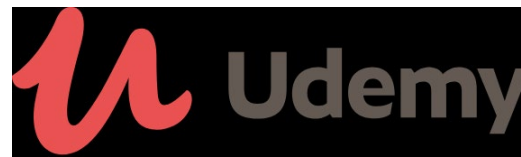
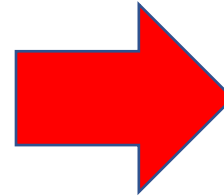
Professor comments...

"By concurrently teaching and coaching structured analysis techniques using Visible Analyst and developing an actual project at the same time, the whole process is more relevant and cost effective."

"Without a tool like Visible Analyst, students could spend an enormous amount of time trying to define their system. This is because the complexity just isn't obvious."



Visible eLearning metrics over the last 2 years



Udemy.com is an online learning platform aimed at professional on-demand on-line education.

2,245

New Students Enrolled

113

Countries Taught

94

New Reviews

11

New Courses Published

56,588

Minutes Consumed

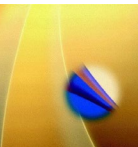
Visible Analyst – New Capabilities

Data Discovery and Data Analytics

Dr. Ernest Hughes:

“Could use it in my business classes on Information Management & Analysis and possibly my capstone course, Strategic Management”.

“Would use it for high level planning statements which ties in nicely with work already done in Visible Analyst”.



Lesson	Topic	Lesson Descriptions and Case Study Tasks
1	Getting to Know Visible Analyst	Learn how Visible Analyst uses a Model Driven Approach (MDA) to help you define, design, build, test, document, and support information systems. The lesson covers the user interface and the basic menu structure. During Lessons 1 – 4, students will
2	The Zachman Framework	Work with the Zachman Framework, which provides a common vocabulary and cell-like structure for complex enterprise systems. The lesson shows you how the Zachman Framework can help you model, manage, and view key system components.
3	Business Planning Techniques	Use business rules and precise logic to describe processes, procedures, and systems. The lesson shows you how to create strategic planning statements that support a model driven approach and document the design's assumptions and constraints.
4	Structured Modeling Techniques	Apply basic modeling techniques to assure correct and consistent diagrams and documentation. The lesson covers both structured and object techniques, including planning, process modeling, data modeling, object modeling, state transition modeling, and structured design.
5	Diagramming and Repository Basics	Learn basic techniques for creating and modifying any type of diagram in Visible Analyst. The lesson shows you how to create new projects and diagrams, and how to edit a diagram, using symbols, lines, and text. At the end of this lesson, you will begin work on the Rent-Rite case study, which you will in future lessons.
6	Planning and Using Functional Decomposition Diagrams	Create functional decomposition diagrams (FDDs) that describe business functions and relationships, and can translate into data repository entries. In the Rent-Rite Case study, you will develop a data model, and work with entities, symbol, and relationship lines. You also will learn how to analyze a diagram and automatically generate a view of the data model.
7	Entity Relationship Diagrams	Draw an entity relationship diagram (ERD) that shows the major entities and how they relate to one another. You will work with fundamental, associative, and attributive entities. In the Rent-Rite Case study, you will work with entities, symbols, relationship lines and cardinality notation.

Important to note that each one of these Learning Outcomes comply with the Modeling Notation Standards as prescribed by the Object Management Group (OMG) of which Visible Systems Corporation is a member.

Why is this important? Student skills learned on Visible Analyst are transferable to other modeling toolsets of other vendors.

8	Data Flow Diagrams	Develop a data flow diagram (DFD) that shows how data is transformed by system processes. You will start with a top-level context diagram that shows the major entities, inputs, and outputs. You will learn how to create lower-level diagrams that show more detail. In the Rent-Rite Case study, you will work with entities, processes, data stores, and data flows.
9	Structured Design and Structure Charts	Use structured design and structure charts to produce a top-down plan of how the new system will be built, tested and operated. You will create reusable modules that are easier to maintain and edit. In the Rent-Rite Case study, you will work with modules, invocation sequences, control architectures, calling and return flows, decision logic, and looping.
10	Class Diagramming	Use object-oriented modeling techniques to describe objects and their relationships. In the Rent-Rite Case study, you will work with classes, instances, cardinality, attributes, association, inheritance, aggregation, operations, and methods.
11	State Transition Diagramming	Draw a state transition diagram that describes real-world dynamic changes that occur in the life history of an object, and the events that

		cause the changes. In the Rent-Rite Case study, you will work with states, triggers, and transitions from one state to another.
12	Activity Diagramming	Create an activity diagram that describes the sequence of activities and focuses on driven by internal processing flows. In the Rent-Rite Case study, you will work with activities, decisions, synchronization, swim lanes, and transitions.
13	Use Case Diagramming	Draw a use case diagram that shows how a user interacts with a business system to achieve are performed to support user needs. In the Rent-Rite Case study, you will work with use cases, system boundaries, actors, and other object-oriented elements.
14	Sequence Diagramming	Create sequence diagrams that show how a set of objects interact, and the messages they send and receive. In the Rent-Rite Case study, you will work with objects, classes, lifelines, activation, and messages.
15	Collaboration Diagramming	Draw collaboration diagrams that show objects participating in a business scenario and the messages they send and receive. In the Rent-Rite Case study, you will work with a set of objects, a scenario, object links, and messages.
16	Business Process Diagramming with BPMN	Use IT industry-standard Business Process Modeling Notation (BPMN) to create diagrams that support users, business analysts who develop models and technical specialists who implement the models. In the Rent-Rite Case study, you will work with events, gateways, triggers, messages, and flow object.
17	Working with the Repository Functions	Learn how to use the Visible Analyst repository as an interactive database. In the Rent-Rite Case study, you will use your TEST project as the basis for your exercises. You will manage the data, define your graphical entries, enter notes, and generate reports.
18	Where To Go From Here	Review your work. You learned many systems development skills that you can use in the IT workplace, and you have a sample model-driven project to prove it. This lesson suggests many ways you can leverage your skills and knowledge in your career and professional development.