

Designing an Integrated Justice Information Sharing (IJS) Solution

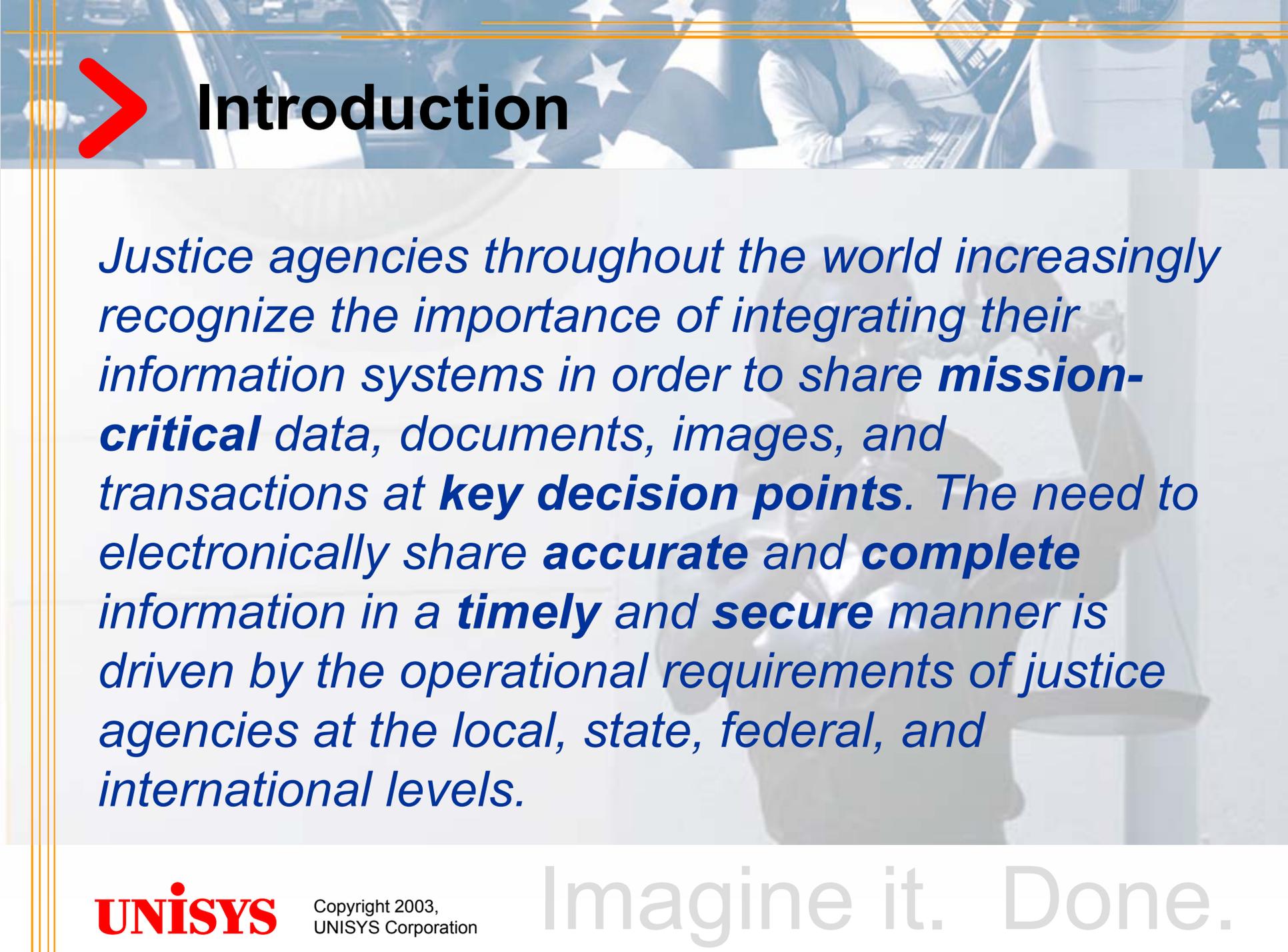
With Model Driven Architecture (MDA)

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> Introduction

*Justice agencies throughout the world increasingly recognize the importance of integrating their information systems in order to share **mission-critical** data, documents, images, and transactions at **key decision points**. The need to electronically share **accurate** and **complete** information in a **timely** and **secure** manner is driven by the operational requirements of justice agencies at the local, state, federal, and international levels.*

> Scope of Justice and Public Safety

- **Historic scope addressing**
 - **Law Enforcement**
 - **Courts**
 - **Corrections**
 - **Prosecution**
- **Expanding scope to address Homeland Security**
 - **Intelligence and Warning**
 - **Border and Transportation Security**
 - **Counter-Terrorism**
 - **Protecting Critical Infrastructure and Key Assets**
 - **Emergency Preparedness and Response.**



The Justice Environment

- While justice systems operate as a (constitutional enterprise)—justice information systems do not operate in an enterprise manner
- Agencies and their functions are diverse and non-standard
- Adversarial by design
- Interactive environment with large networks
- Common business functions with high integration needs
- Highly visible and mission critical applications
- Aging IT base and receptive to new technology
- Political and risk averse



> IJIS Vision

- **Vision Statement – “...The ability to access and share critical information at key decision points throughout the justice enterprise.”**

David J. Roberts, “Integration in the Context of Justice Information Systems: A Common Understanding” A SEARCH Special Report, October 2001

- **Our Approach**

- Enable clients with both new and legacy systems to share information in a secure environment through a common user interface.
- Loosely coupled, Web service enabled components in a 6-layer architecture.
- Standards-based architecture that’s scalable both vertically and horizontally.

- **The Solution – An IJIS Solution Framework**

- Provides a solution framework that custom IJIS solutions can be built on.



Architectural Goals

- A solution framework that meet the unique needs of each customer
- Integration-centric EAI architecture that may be developed using either J2EE and Microsoft .NET architectures
- Developed using UML and the Rational Unified Process (RUP)—as well as the Unisys Blueprint process
- Standards-based (for example: XML (JXDD 3.0), SOAP, BPEL4WS, WSDL, and UDDI)
- COTS based
- Leverages open source technologies
- Access controlled by justice agency owning the data
- Browser-based User Interface



Universal Functions

- ❖ *Query* local, regional, statewide and national databases;
- ❖ *Push* information to another agency based on actions taken in the originating agency;
- ❖ *Pull* information from other systems for incorporation into the recipient agency system;
- ❖ *Publish* information regarding people, cases, events and agency action; and
- ❖ *Subscribe* to a notification service.



The IJIS Solution Framework

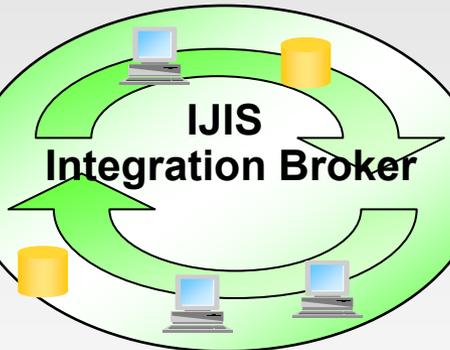
Business Process Management (BPM)

People
(Law Enforcement, Courts,
and Corrections)

Your Systems
(Applications, Databases,
Legacy Systems, etc.)



**IJIS
Client Tier**



**IJIS
Process Tier**



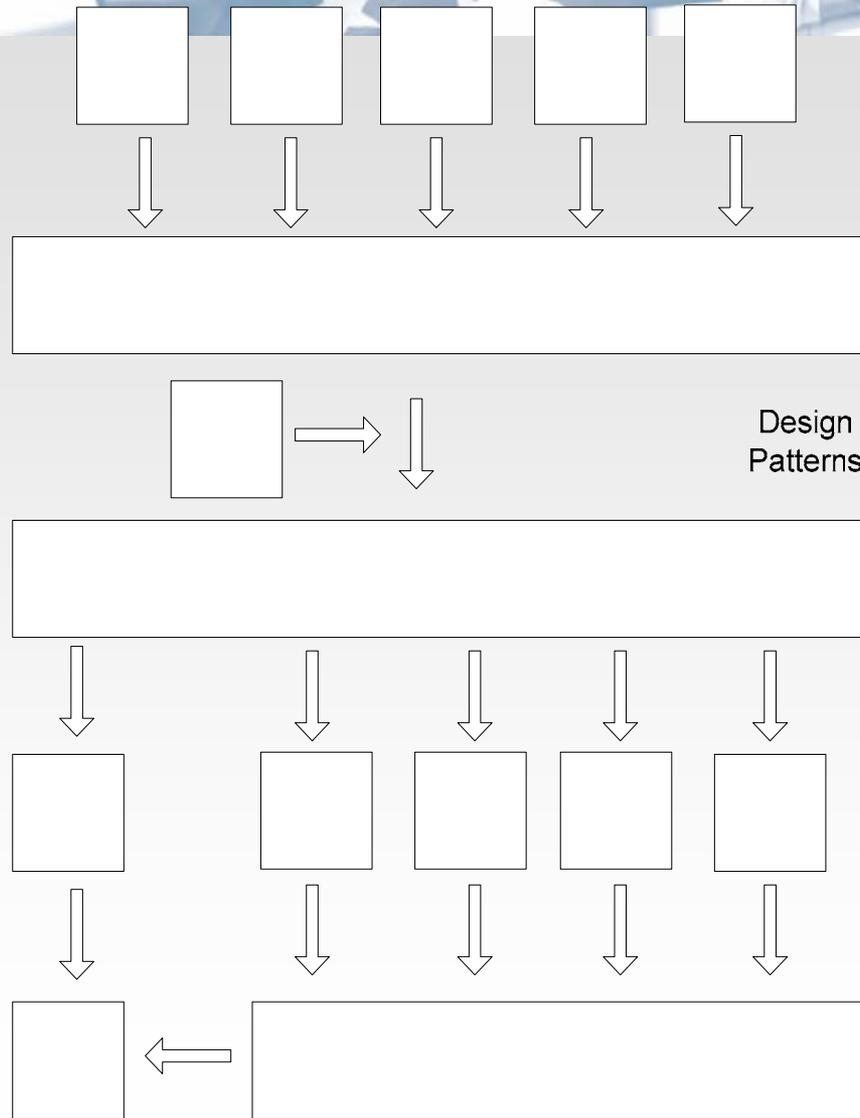
- Consistent Web-based view of system
- Query, Push, Pull, Publish/Subscribe
- Wireless

- Monitoring & Management
- Legacy Integration
- Web Services
- XML Infrastructure
- Java/J2EE/.NET Integration

Other Agencies
(Local, State,
Federal, and International.)



MDA Process



Design
Patterns

Use Case
Model and
Use Case
Specifications

Analysis
Model

Platform Independent

Platform
Specific



PIM/PSM

- Design constructs of architecturally critical components
- Directory Services, Security, Transactionality, Persistence etc
- PIM transforms to PSM by applying transformation rules
- PSM implements the design



MDA Addresses

- **Interoperability**
- **Portability**
- **Productivity**
- **Domain knowledge artifacts**



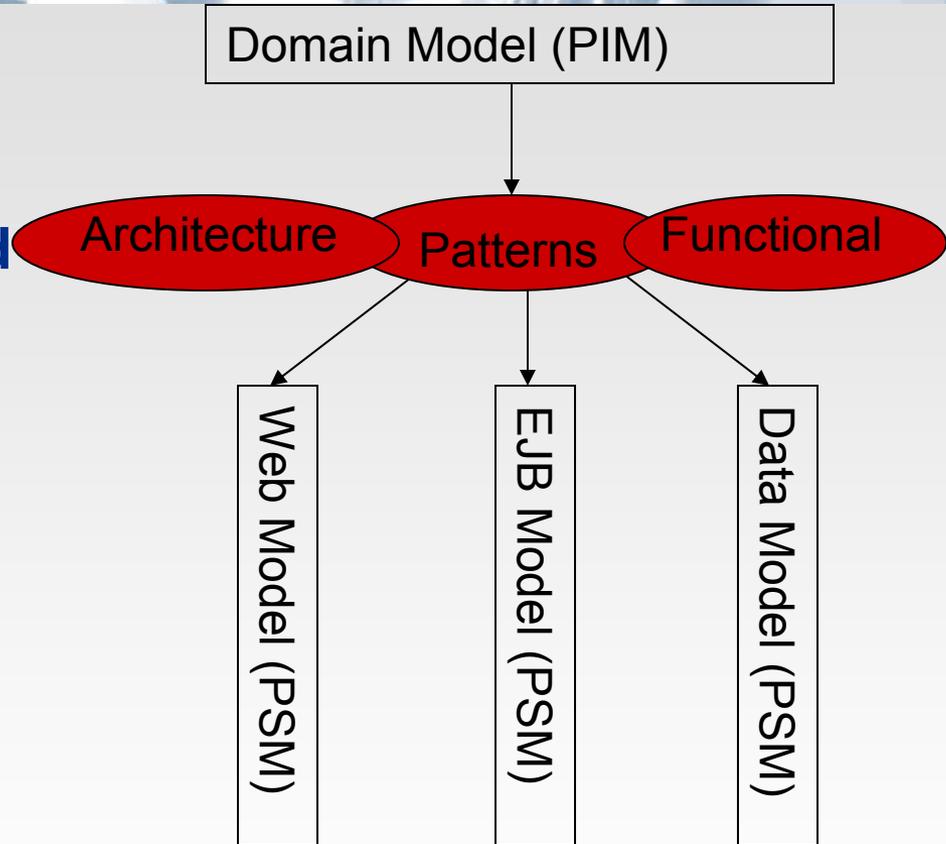
J2EE Addresses

- **Interoperability**
- **Portability**
- **Productivity**
- **Scalability**
- **Standards-based architecture**



Transformation Patterns

- Map the PIM to J2EE-specific PSM
- Identify objects targeted for the Web Model, EJB Model and Data Model





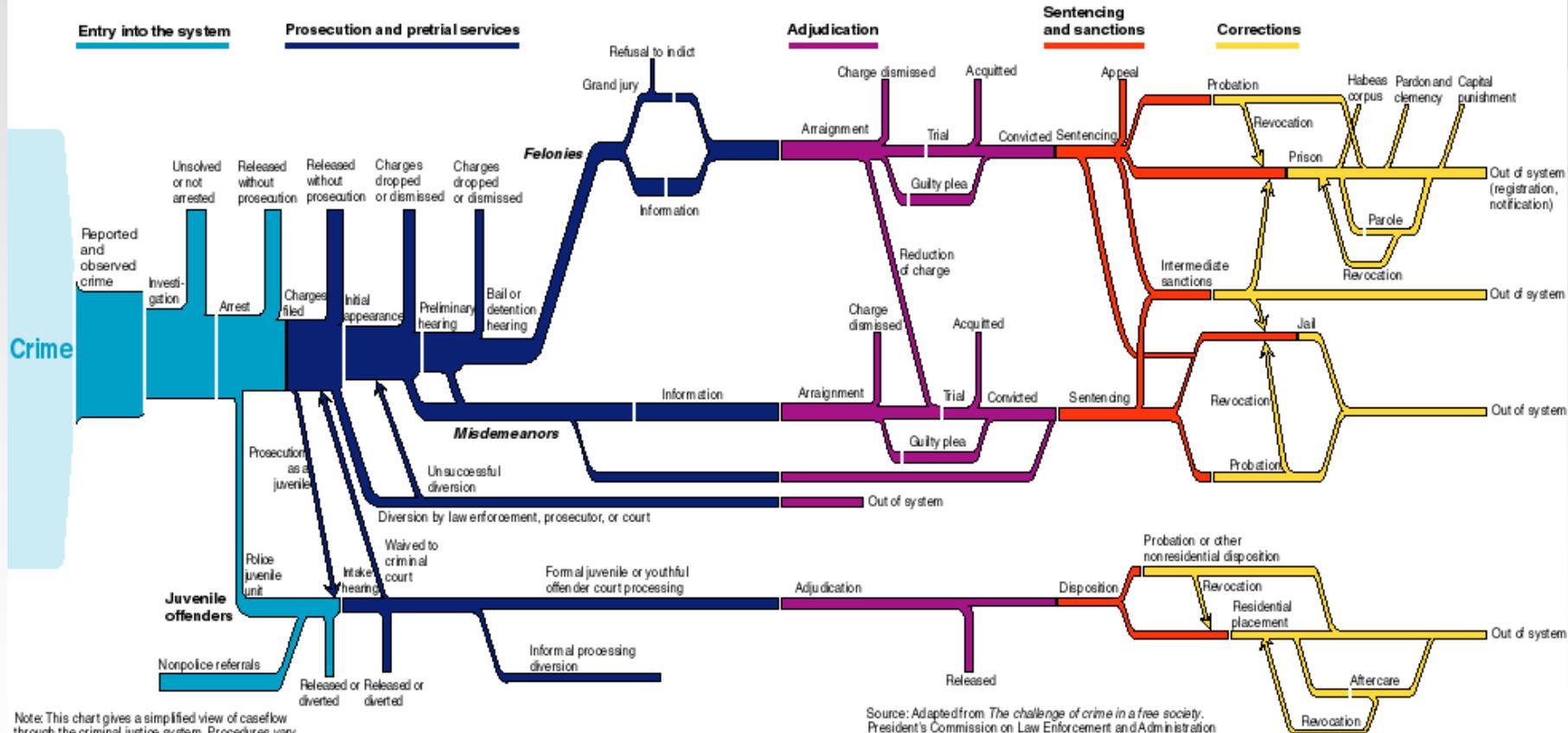
IJIS PIM

- Independent of J2EE or .NET
- Architectural elements mapped to a 6-layer architectural model
- Stereotypes are used in transformations from PIM to PSM
- Design Patterns are used in both PIM and PSM
- Sequence diagrams were developed for the business object model, analysis model, PIM, and PSM.



Criminal Justice System Flowchart

What is the sequence of events in the criminal justice system?

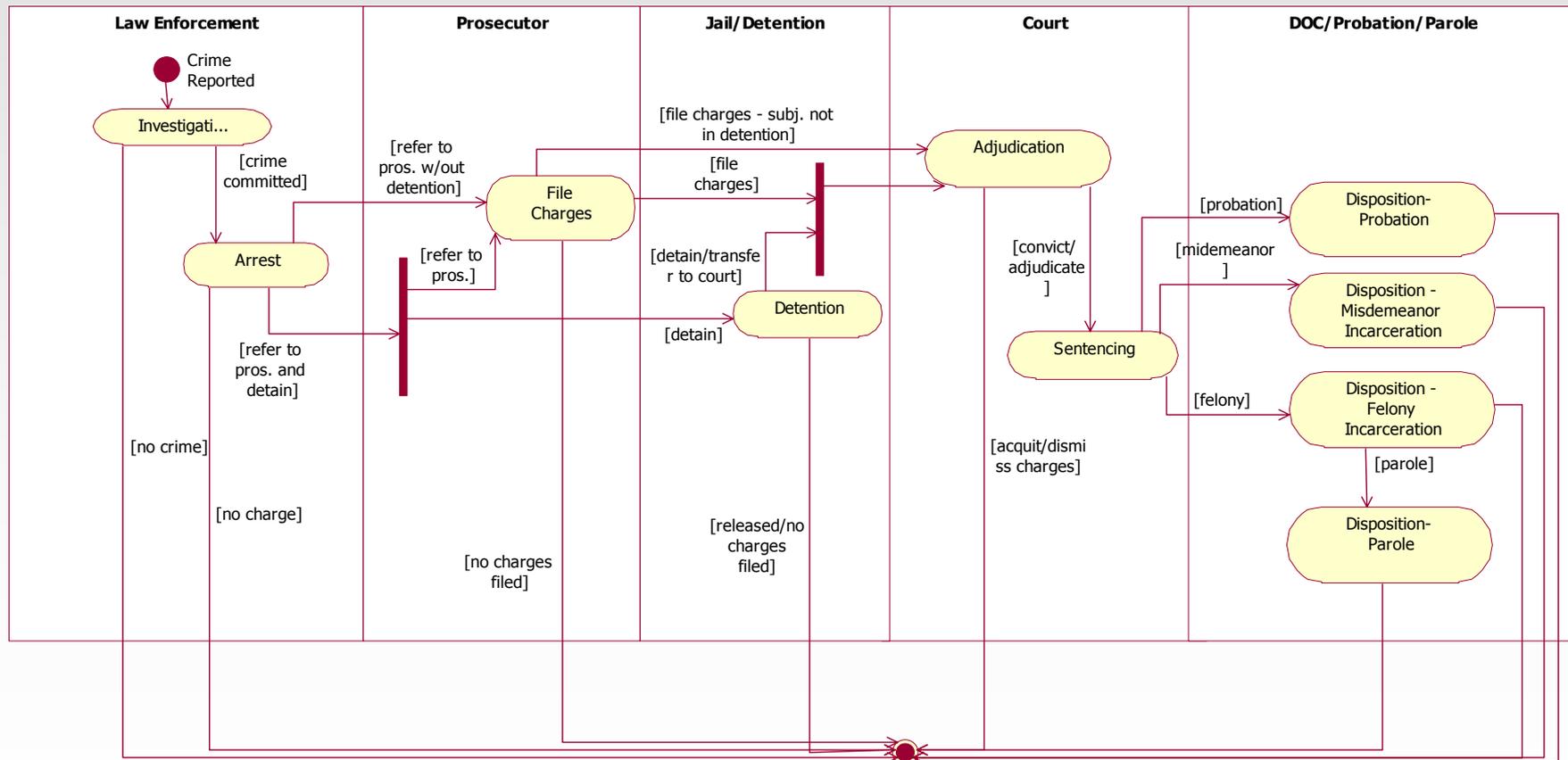


Note: This chart gives a simplified view of caseload through the criminal justice system. Procedures vary among jurisdictions. The weights of the lines are not intended to show actual size of caseloads.

Source: Adapted from *The challenge of crime in a free society*. President's Commission on Law Enforcement and Administration of Justice, 1967. This revision, a result of the Symposium on the 30th Anniversary of the President's Commission, was prepared by the Bureau of Justice Statistics in 1997.



IJIS Business Vision



out of system

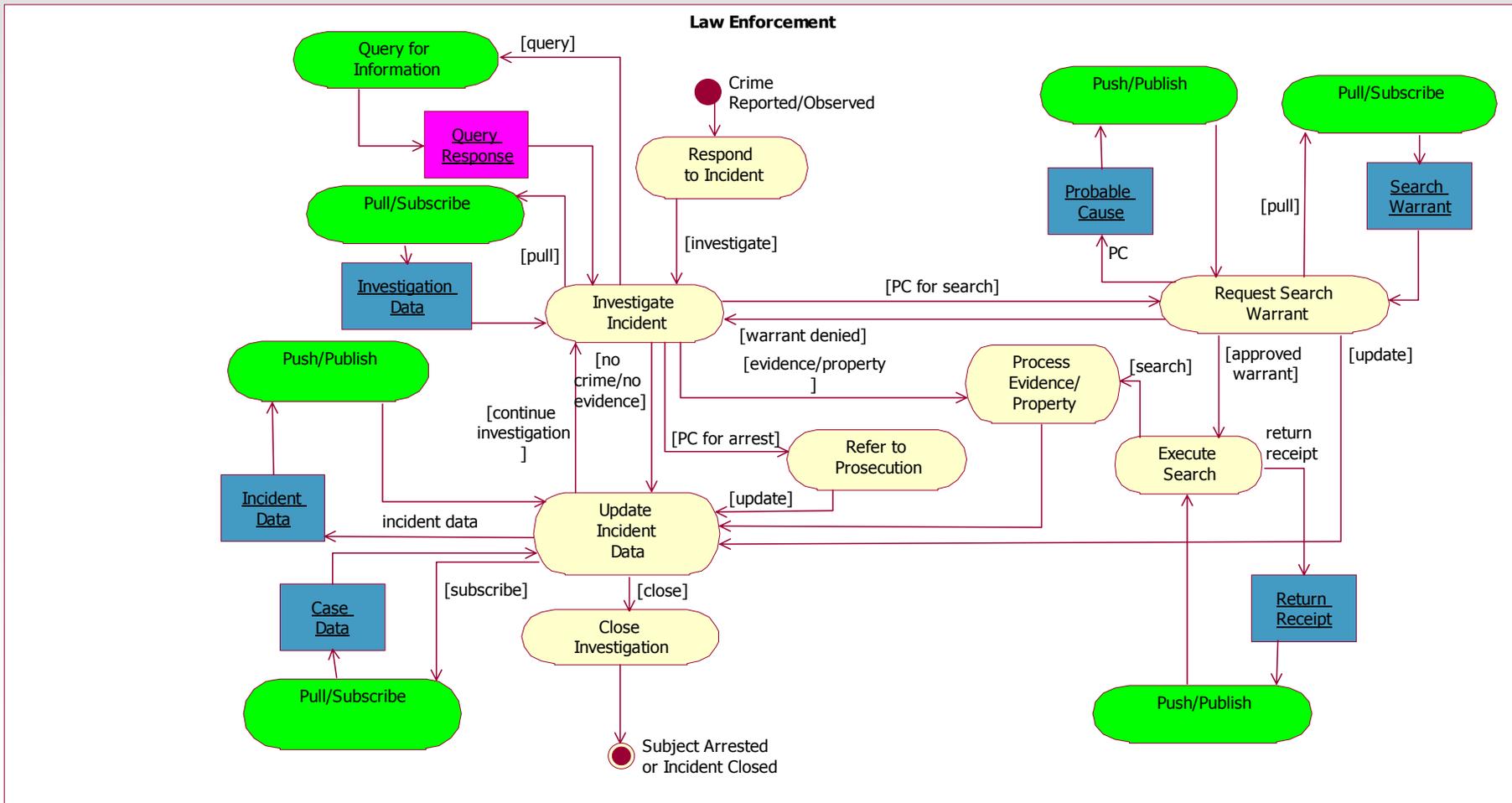


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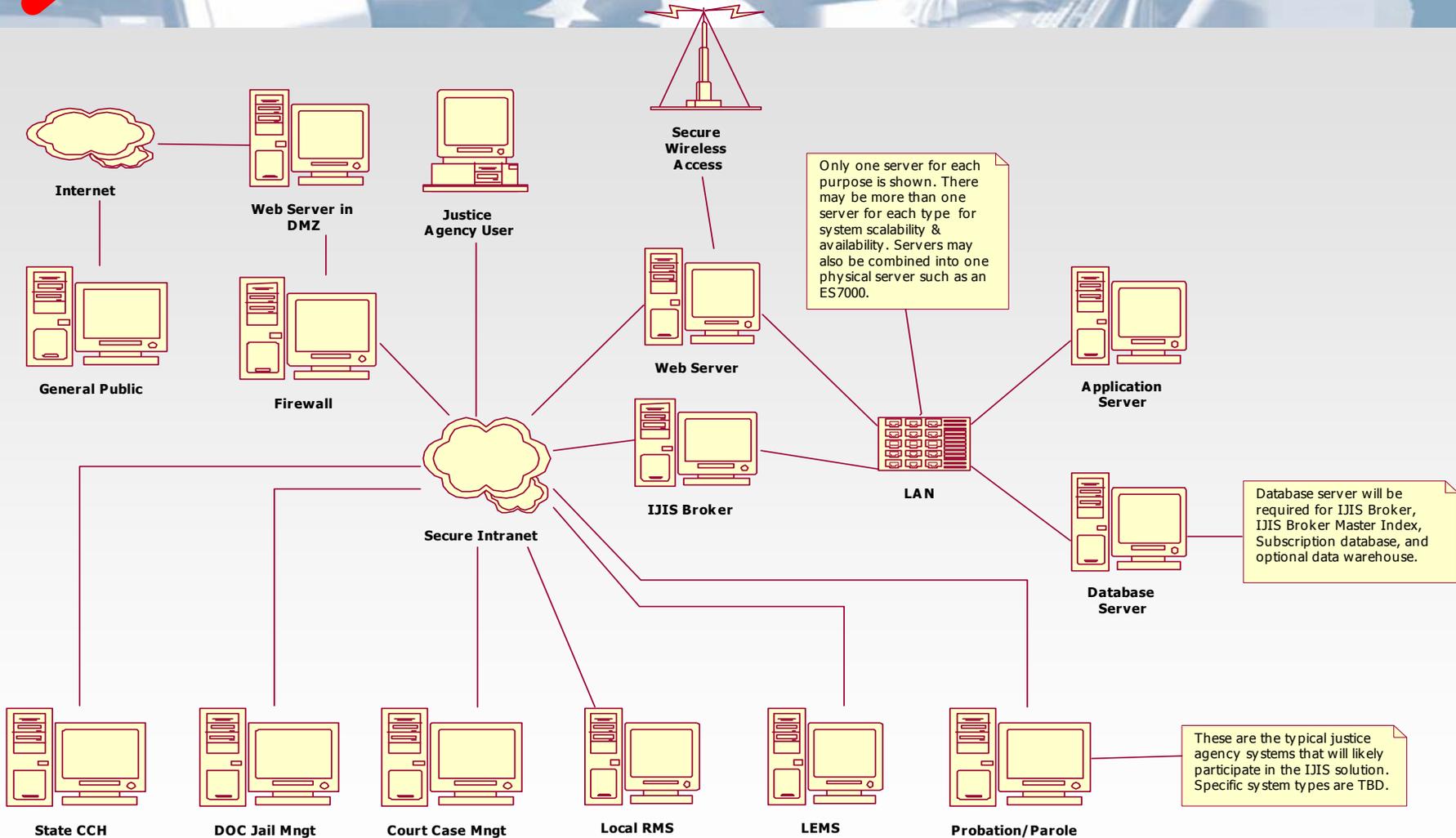


IJS Investigation Business Process





IJIS Infrastructure Model





IJIS Toolkit

- Rational Suite Enterprise 2003
- Rational XDE 2003
- IBM WebSphere Application Server: J2EE Application Server
- IBM WebSphere MQ: Message Queuing Server
- IBM WebSphere MQ Integrator: Message Transformation Services
- IBM WebSphere Business Integration Workbench: Workflow and Rules Engine
- IBM WebSphere Application Developer Studio: Integrated development environment
- Java open source tools



Lessons Learned

- **Our software development process is iterative**
- **MDA standard is still evolving**
- **Rational MDA tools need to mature**
- **Reusability has a cost**
- **Traceability needs to be better automated**



Leveraging Blueprints & MDA

1. **Industry Standard Component Frameworks**

Modeling, MDA, and industry standard component frameworks (J2EE, .NET) are the foundation of our solutions

2. **Blueprints represent intellectual capital**

Blueprints are our model based designs that will allow us to rapidly customize and extend our solutions and electronically represent our important intellectual capital

3. **Knowledge repository provides competitive advantage**

Our Competitive Advantage will be derived from the growing body of UML artifacts and solution assemblies in our common repository, leading to a variety of potential Blueprints

4. **Standardization provides future-proof solutions and intellectual property**

Over time, MDA will increase the speed, efficiency, and flexibility of the solution development, and customization process, and “Future-Proof” our key solutions and their IP

5. **Web services approach allows interoperability**

Our Web Services integration approach will allow our new framework to interoperate with existing solutions infrastructure



In Summary

*It's all about the ability to **share information** across inter agency and multi jurisdictional information systems in a **mission critical** environment.....*

*Information to the **decision makers** who need it, i.e., to the field, first responders, command, courts, and governmental executives.....The right information, to the right people, **all** of the time....*

*Information that is **accurate, reliable, timely, complete, and easy to use**.....*

*The information system should be a product of the **business** drivers and operational systems of the participating agencies.....its not the technology, it's the justice!*