AUDIENCE:

Managers and executives. Responsible for strategies and budgets. Want to know how interoperability can support both strategic and tactical objectives. Are not generally concerned with technical details. Solutions are affordability. Availability of qualified personnel. Customer expectations are met. Risk. Profits and revenue targets are achieved.

WHAT IS INTEROPERABILITY?

"Interoperability is a feature of software and hardware components that allows them to collaborate to solve problems." It permits quick and efficient assembly of customer-specific solutions from a library of components.

Whereas traditional IT delivery ranges from using COTS solutions to custom development of integrated and system-specific solutions, interoperable solutions adds a third type of delivery that uses standardized components in libraries to assemble customer-specific solutions. This Lego-block like approach to forming customer-specific solutions promotes the ability to react-more guickly and efficiently to changes in the business/mission environment or strategic plan. This library of standardized components can be constructed, and often is, by a community of developers from inside and outside an organization.

And by assembling the components in different ways, different types-of interoperability can be delivered. Types-of Interoperability range from simple file sharing to using autonomously deployed software components that discover each other during execution. Selection of one type-of interoperability to use over another is based upon alignment of strategic and operational plan objectives along with the desired and measurable outcomes of a system/project. Choosing a type of interoperability results in the selection of already created components from the library of components thereby minimizing new component development that which is truly new. These decisions drive which components are to be selected from the library and used as well as how they are configured. And if pre-existing components have been designed/ delivered to be interoperable they can be used to assemble different solutions. The result: less costly and higher quality solutions that are better aligned to



 Largest pool of engineers Least expensive Personnel Requires least experience and training

Pick-and-choose assemblers Outcome and results oriented

Assemble, re-assemble, re-re-assemble: value on quick time to delivery of a solution not first time correctness Moderately Expensive because of required experience

and training Add and Revise Reusable Services and Interfaces to Interoperability Framework · Abides by framework registration rules

Most expensive resource because of required experience, training, and concept familiarity

Small pool of engineers

 Architecture, core services,
 Enables autonomy, concurrency, a
 Relatively small number required nables autonomy, concurrency, and composition

business plans and to customer needs. And as is depicted below, Interoperability permits (1) better classification of staff. This will help (2) control the cost of delivery and maintenance by (3) optimizing what skills need to be available for kinds of work to be performed.

(1) Personnel Classification: There are three classes of IT personnel required: Solution Assemblers, Service Builders, and Framework Builders. See the call-out boxes in the diagram for a brief overview of each classification.

(2) Resource Cost Management: Framework Builders tend to be more expensive than Solution Assemblers, for example.

(3) Improve Personnel Availability: A limited need for Framework Builders is required, but more Service Builders. The largest personnel requirement is for the Solution Assemblers.

VALUE PROPOSITION FOR DECISION MAKERS

Value Proposition	How Addressed by Interoperability
Reduced Delivery Risk	Minimized custom delivery; reuse of components; customize as-required; generated solutions; standardized plans.
Support for Strategic Plan	Reuse proven services and then customize to strategic plan desired outcomes.
Improved Time to Market	Pre-constructed solution frameworks that can adopted as is, or adopted and modified.
Cost of Labor	Generally available skills help control cost of labor. Required engineering skills taught in community colleges and universities.
No "Proprietary Skills"	Usage of UML [®] and SysML [®] for engineering improves access to labor and reduce risk.
Common Interoperability Descriptions	Multiple Standards-based Interoperability Frameworks (see uml.standardscoordination.org
Reduced Cost of Rework	Reuse of proven services; UML-enforced model integrity; Model based Animation/ Checking/ Simulation before code generation.
Reuse of components	Pattern-based description of interoperability at each level enables evaluation and delivery.
Standard Delivery Methods	Building Block like solution formation from a catalog of components. Also customizable.
Enables Security	Model-based threats and weaknesses; security patterns; standards based.
Delivery Assurance	Pre-tested components; standardized, reusable, and pretested assembly; Common Architecture Pattern used; Builds upon lessons learned with other frameworks.

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OTHER INTEROPERABILITY STAKEHOLDERS

Project Managers. Usually PMBOK trained and PMP certified. Manages execution details and plans. Constrained by availability of personnel to participate and deliver interoperability. Driven to reduce risk and confirm validation and verification. Has overall responsibility for cost management of solutions.

Architects and Engineers. Ease of design and delivery. What patterns, principles, and existing software can be used. UML/SysML trained. Delivery oriented. Time reduction and Quality oriented. Viability of solution oriented. Testable. Code and recode oriented. Maintainability. Continuous delivery desirable. Code generation as much as possible.

TRANSLATING STRATEGIC PLANS INTO PROJECTS INTO EFFICIENT TEAMS THAT DELIVER SERVICES



Decision Makers

(1) **Projects:** Decision Makers identify projects, timeframes, priorities, and initial budgets;

(2) Classify: HR established job descriptions, salary ranges, and the like for the three classes of personnel delivering interoperable solutions.
(3) Hire Personnel: Personnel are hired or contracted for to fill all three roles. The organization decides whether a corporate team or unit-based team is put in place.

Project Managers

 Receives **Pipeline** entry and classifies it: New Development or Project Review. Perform desirable outcomes. Customer expectation analysis.
 (2) Analysis team formed. Analysis Occurs.

- (3) Select Interoperability level and Framework of characteristics.
- Project Plan type selected and initialized per level and type.

(4) Project Plan for new project created from Interoperability template.
(5) Form Team to execute the project utilizing the (3) Personnel hired. Build Organization Chart. Do project startup planning
(6) Delivery starts.

WANT TO LEARN MORE?

Contact us at info@omg.org or go to uml.standardscoordination.org and click on 'Interoperability'.

ABOUT OMG

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