Welcome to:

## Unit 1 – Introduction to IT applications and Open Standards

# Unit Objectives



After completing this unit, you should be able to:

- Understand Information Technology
- Explain shifts in computing paradigms
- Define application software

# Introduction



- Sharing of software for enhancements & reuse is not new, but it has been there from the days of sharing printed copies of programs along with the hardware.
- In the 1960's IBM distributed the source code of mainframe operating system, Airline Control Program (ACP). All the software available was usually supplied by IBM without additional charge.
- The origin of the software industry in fact lay in hardware manufacturers unbundling software and services. This propelled third party developers from creating software that worked on a given hardware.
- Going forward we will look into programs or software that make use of OS capabilities and instruct the computer to produce information.

# Categories of Software



- Software could be broadly divided into 3 sections:

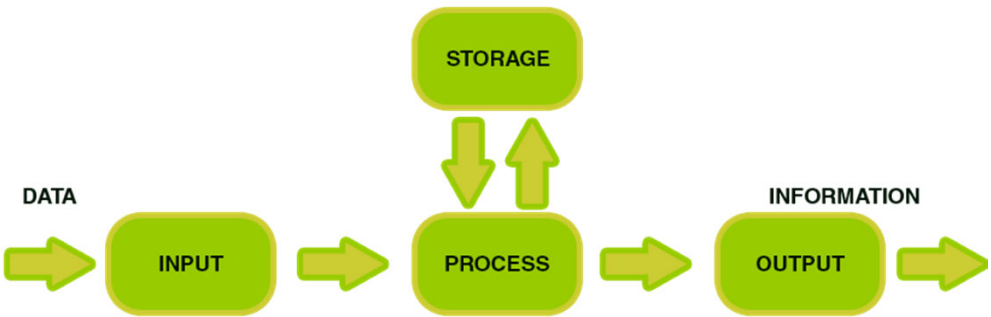
1. **Operating systems (OS) -** Communicates with the hardware. Acts as basis on which other software runs. The means by which other programs and the user interact. E.g. DOS, Linux, Windows, UNIX and Macintosh.

2. **Languages -** To write the software e.g., Smalltalk, C++, Java, JavaScript

3. **Applications -** Enables the user to carry out various activities e.g. Word, Photoshop

# What is Information Technology (IT)?






- As defined in Information Technology Association of America (ITAA) "**IT**" is study, design, development, implementation, support or management of computer based information system particularly software's applications & computer hardware.

- It deals with treatment of information, and is one of the corner stones of our economy while forging computer based society. (Others are Land, Labour, & Capital)

# Computing Paradigms – Host Centric



- For some, computing today is radically different from early experiences. In fact, we have seen three major waves of computing… host-centric, client/server and network-centric.

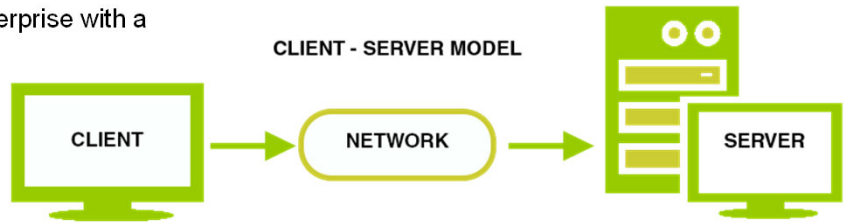
- Host-centric, or "tops-down" computing, dominated the environment for the past twenty years. The focus was on the physical enterprise, with a specific behavior pattern:

1. Buy a computer system
2. Write applications
3. Define the reports needed
4. Develop fixed screens to display the results
5. Operate over a private, wire network

# Computing Paradigms – Client/ Server Model



- Today a distributed client/server model is prevalent. The focus is the distributed enterprise with a different behavior pattern:




1. Buy individual "client" units
2. Purchase applications
3. Use windowing to view information
4. Operate over private wire local area networks or mixed private and public switched networks

- The client/server architecture has enabled organizations to do a great deal of "mixing and matching" to suit individual needs.
- An example of this pattern is in purchasing client machines. People are buying CPUs separate from memory. Specific hard drive sizes are ordered.

# Computing Paradigms – Network Centric Computing



- The next step is network-centric computing. The behavior pattern changes again:

1. Multi-source hardware platforms
2. Subscriptions for software rather than purchase
3. Human-centered, multi-form factors
4. Public switched infrastructure, both wired and wireless

- Hardware comes from many sources. The network contains your applications as well as the data.
- The network is, in fact, your application. Software need no longer be purchased and installed on your computer. When you connect to the network, you access the latest version of the software for which you have a subscription.

# New Models



- Advances in computing technologies, such as high-resolution displays, 3-D graphics and animation, handwriting and speech input, and natural language understanding will be used to improve the end-user interface, to facilitate personal interaction and customization with computers. This will enable new interaction models, including:

1. Intuitive, task-tailored interfaces
2. Virtual reality environments
3. Mobile, Hands-free, and Eyes-free use
4. Intelligent agents that will isolate users from the details of the infrastructure but will carry out tasks tailored by the user; and
5. Easier searching techniques

# Application Software




- Application software is a subclass of computer software that employs the capabilities of a computer directly and thoroughly to a task that the user wishes to perform.

- Typical examples of software applications are word processors, spread sheets, and media players. Multiple applications bundled together as a package are sometimes referred to as an application suite.

- The separate applications in a suite usually have a user interface that has some commonality making it easier for the user to learn and use each application. And often they may have some capability to interact with each other in ways beneficial to the user.

- Even email filters are a kind of user software. Users create this software themselves and often overlook how important it is.

# List of Common Applications



- **Word processing**
1. Microsoft Word
2. Lotus Word Pro

- **Spreadsheets**
1. Microsoft Excel
2. Lotus 123

- **Databases**
1. Microsoft Access
2. Lotus Approach

- **Presentation**
1. Microsoft PowerPoint

- **Accounts / Payroll**
1. Sage

- **Web browsing**
1. Microsoft Internet Explorer
2. Mozilla Firefox

- **Web authoring**
1. Microsoft FrontPage

- **CAD & CAM**
1. AutoCAD

- **System Management**
1. HP Open View
2. IBM System Director

# Unit summary



**Having completed this unit, you should be able to:**

- Understand Information Technology
- Explain shifts in computing paradigms
- Define application software

Welcome to:

## Unit 2 – Introduction to Governance

# Unit Objectives



After completing this unit, you should be able to:

- Define IT governance
- Explain the need for open source governance and its importance
- Describe the need for open standards and the need for governing open standards
- Understand governance processes, governance types and choosing levels of governance

# What is IT Governance?



- Governance is the set of organizational regulations and standards exercised by management to provide strategic direction and ensure that objectives are achieved, risks are managed appropriately, and resources are used responsibly**-- Department of Justice**

- Suffice to say, it's a defining structure around how organizations align IT strategy with business strategy, ensuring that companies stay on track to achieve their strategies and goals, and implementing good ways to measure IT's performance.

- It makes sure that all stakeholders' interests are taken into account and that processes provide measurable results.

- An IT governance framework should answer some key questions, such as how the IT department is functioning overall, what key metrics management needs and what return IT is giving back to the business from the investment it's making

# Open Source Governance




- Open source governance is the way an organization controls the use of Open Source Software within their products and services, supply chains and business management activities, and the associated business and legal processes.

- This system of management is used to ensure compliance, and is a closed-loop process that monitors the state of a system and reports if it's meeting its goals.

- Open source governance is part of the broader category of IT governance which, according to the IT Governance Institute, helps ensure that IT supports business goals, maximizes business investment in IT, and appropriately manages IT-related risks and opportunities.

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Cloud

Big Data

Internet of Things

Datacenters and infrastructure

Development technologies (languages and tools)

Network virtualization

network control and management; the very *heart* of telecoms

# Open Source Governance & its importance



- As the use of open source software has grown and matured, the need for open source governance has become an integral part of typical IT development.
- There are many frameworks and regulations related to IT, and hence open source governance.

1. COBIT (control objectives for information and related technologies) is one of the well know IT frameworks from ISACA (Information Systems Audit and Control Association).


2. One more framework is ITIL (IT Infrastructure Library), developed on behalf of the British government for best practices with IT service management.


- Both are useful in designing, planning and implementing open source governance.

# The importance of standards



- For organizations, having the means to exchange information efficiently with other organizations is becoming increasingly important.
- We can refer to this as interoperability, the ability of organizations to Cooperate, in particular by means of electronic information interchange.
- In order for interoperability to be achieved, agreements are needed, agreements about the content of the exchanged information, its meaning and the techniques to be used.
- In some cases, these are specific agreements between two organizations, but more frequently an agreement will apply to a whole industry or a specific general application.
- In the latter case, the agreement is a standard.

# What is a standard?



- It is a document, electronic or otherwise, which sets the specifications/ criteria for a product, service or method
- It is created in an organization, consortium or through a recognized standardization organization such as ISO or BIS
- It is generally a process upon which the standard is developed and managed.
- In the context of IT, standards are very important in connecting diverse organizations and their systems with each other:
- When all the organizations work according to the same standard, this has an important network-effect, since a single standard enables communication with a larger group of organizations. As an outcome, the overall value of the network increases considerably.
- This leads to economies of scale for developers and innovative applications for users. By using standards, the developers have direct access to a huge user base, which in turn, decreases the costs for users.

# What are open standards?



- The standard must be adopted and maintained by a not-for-profit organization.
- Additionally, it must be constantly developed on the basis of open decision making available to all interested parties by consensus or majority decision.
- The standard must be published and the standard specification document must be available free of charge or at a nominal fee.
- Copying, distribution and use of the specifications must be permitted free of charge or at a nominal fee to all parties.
- The IP rights and patents on the standards or parts thereof, must be granted permanently and free of charge
- There should not be any restrictions with respect to reuse of the standard.

# Benefits of open standards



- There are no restrictions on the standard's implementation in new systems, as the specifications are freely available and may be used without restriction.
- Although occasionally extra initial implementation costs need to be incurred due to the learning curve. When compared with existing closed standards, the usage costs for an open standard are low, since there are no royalties or license fees.
- There is lot of opportunity for innovation and improvements, as everybody involved can propose changes to the standard. These proposed changes are examined in an transparent way and, after approval, are made available to everyone.
- Since there are less obstacles concerning use of the standard, it can be adopted more easily in a large number of organizations. This creates a robust network between organizations that are able to exchange information.

# Governance of Open Standards



- Standards and standard setting are universal mechanisms of international governance. States and private entities create standards across a wide range of environments to promote their collective welfare by coordinating and limiting individual behavior.
- A broad definition of governance could be, “The formal and informal bundles of rules, roles and relationships that define and regulate the social practices of state and non-state actors in international affairs”.
- The standards and the institutions which create them, administer and enforce are part of governance.
- Many international standards emerge and operate within wholly private, market-based governance systems.
- Other standard setting processes involve formal institutions rather than market forces, but are still coordinated by private actors.
- Still in many cases, governments ratify and enforce privately created standards and in some scenarios, governments play a central role in setting and maintaining standards.

# Standards and Externalities



- Externalities are dealt with standards by actors. An *externality* occurs whenever *one actor's conduct affects the well-being of another*.
- Familiar examples could be a manufacturing firm that dumps pollutants in a river, decreasing water quality downstream, or factory smoke that fouls residential air that affects others.
- A technological externality may be a situation where the production function of one firm is favorably or unfavorably affected by the production function of other firms.
- In network externality situations, standards are typically produced by the (often private) actors who benefit from interconnectivity (Zacher 1996).
- Particularly, product standards are formulated by the companies that produce the relevant products and to some extent with contribution by firms that use them. This holds good for products extending from industrial fasteners to telecommunications switches, software, and for services, such as internet communications.

# Governance Processes



- There are two types of governance processes prevalent in generation of standards:

1. **Dispersed and Market Based Governance** – Here individual firms create their own standards by including/ expressing them in their products, and sometimes by publishing specifications, where other firms respond by adopting those standards, modifying them or creating competing standards.

2. **Common standards developed by formal organizations –** Here formal organizations which may be exclusively public, private or mixed public and private develop common standards to govern products and services.


- The best example is the International Organization for Standardization (whose very acronym is standardized in all languages as “ISO”).

# Differences in Standards



- Normally market standard setting favors large, influential producers. Since, those firms who own key technologies like the Windows operating system, because market strategies maximize their control.
- Also, the market approach favors those firms that are innovative, as it eliminates the need to obtain institutional approval for new technologies.
- On the other hand, the institutional approach benefits weak players, like firms that are small or lack in innovation.
- The difference between public and private standard setting can be hazy. Since, private producers often dominate public standard setting organizations.
- On the other hand, private standards organizations mimic public bodies in their structures and procedures, apparently to increase institutional legitimacy.

# Relationship between Governments & Private Standards



- Governments support and utilize private standard setting in many ways.
- As regulators, they incorporate private standards into building codes, telecommunication protocols and other rules as a low-cost way of ensuring interconnectivity.
- As consumers, governments incorporate private product standards into procurement specifications. As promoters of efficient international markets, they support transnational private standard setting.
- For example, the EU has relied on CEN standards in its program of internal market harmonization. The EU also helped create the producer-dominated European Telecommunications Standards Institute (ETSI) to facilitate harmonization on digital mobile telecom standards.


# Why Private Standards?



- Private enterprises and governments as well, prefer private standard setting in network externality settings for numerous reasons.

- The main advantage private actors have is better information regarding production processes, the effects and costs of particular standards, etc. Public bodies can normally have this information only by involving industry representatives.

- Another advantage is flexibility, when technology is dynamic. Private producers continuously monitor technological and market trends since they have every incentive to modify product standards rapidly in response to change.

- Also private firms are less hindered by political and procedural constraints. Finally, private producers are best able to ensure that agreed standards are implemented.

# The case for public intervention



- Sometimes public and private actors both find exclusive private governance inappropriate and seek public intervention, typically to redress institutional problems.
- Sometimes, private actors may be unable to create connectivity and interoperability standards because of conflicting interests, concerns of secrecy or negotiating problems.
- This type of failure in coordination retards innovation if firms are unwilling to introduce new products without a prevailing standard.
- Secondly, when there exist irregularities within an industry, private standard setting may lead to inferior outcomes.

# The choice among governance types



- We have seen that no single form of governance can handle all problems effectively, neither no single blend of governance forms is best for all situations. The best combination will vary with each issue that needs to be addressed.

- Private governance is effective when network externalities create a need for uniform technology or transaction standards. Since private actors are best positioned to develop and adapt such standards over time and, if standards are open, the network structure works for all. Nonconformities to the pure network externality may necessitate public intervention.

- For example, powerful actors may control standard setting, with undesirable effects. In such situations it is necessary to strengthen the position of less developed countries bargaining with multinational firms under privately-created standards. Public monitoring may be needed to safeguard broader representation when standards have significances beyond the immediate network.

# Choosing levels of governance (1 of 2)



- National, regional or global? The answer could be found by looking into the European Union principle of “subsidiarity.”
- In the current context, standards should be set and implemented at the lowest level, able to address them effectively, mainly because of concerns for representativeness.
- But the subsidiarity principle finds that action at higher levels is often applicable, depending on the scope or outcome of the problem or the proposed action.
- Further that subsidiarity should be interpreted broadly to focus on governance, including private governance and to recognize that effective governance may require the involvement of multiple levels.
- International governance can discipline national governance, without replacing it, by applying rules and procedures that serve as checks against the capture of national decision-making by narrow or provincial interests.

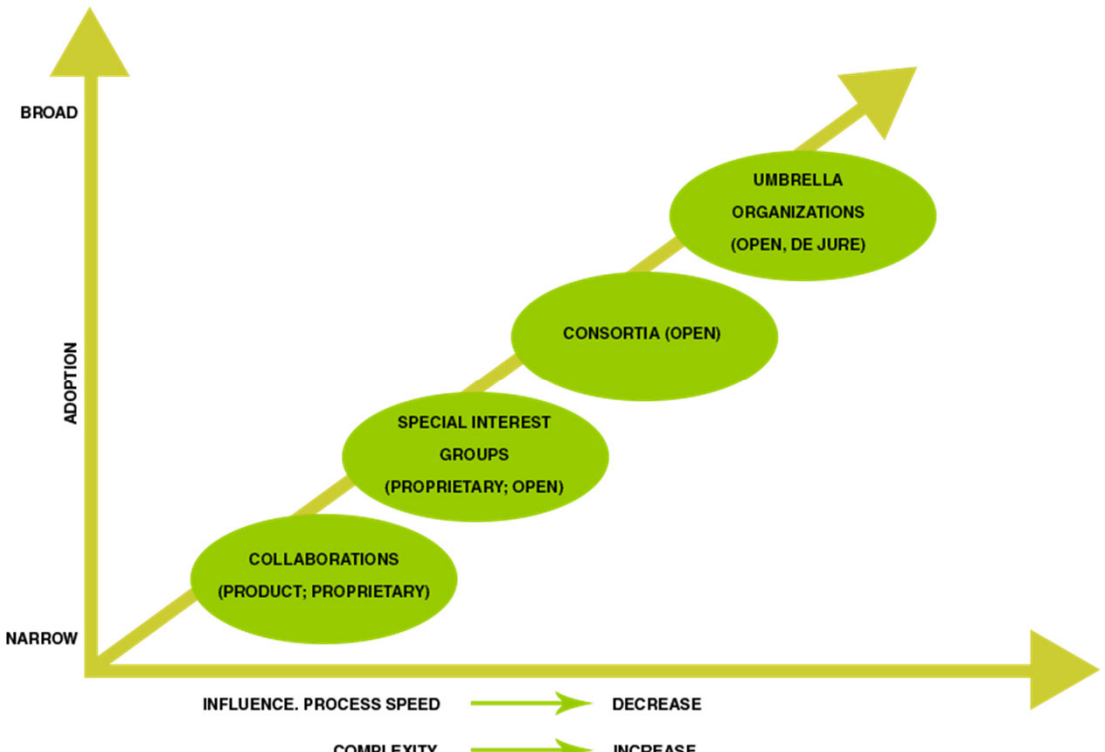
# Choosing levels of governance (2 of 2)



- A mix of international and national governance will be the optimal choice. National institutions have better local knowledge and usually better capacities for combining preferences.
- International governance institutions bring together transnational expertise and interests, and can force states to face their policy externalities.
- Each can serve as a check on the other, safeguarding that neither private nor national interests improperly frustrate public and global purposes.
- International governance, even as a supplement to national governance is not an easy choice since the underlying issues are often highly distributive and contentious.
- But standards are one of the important ways by which we organize our society, and that society increasingly transcends national boundaries. Some role for international governance is both inevitable and desirable.
- That role, however, is best filled by careful combinations of actors and institutions, public and private, national, regional and international, depending on the problem at hand.

# Adoption, Influence and Process Speed





# Characteristics of different standard setting organizations (1 of 2)



| Standards Organization & Number of Specifications | Organization Structure & Legal Representation | Characteristics |
|---|---|---|
| **Collaboration**<br><br>Usually focused on 1 | Bilateral or multi-party agreement<br><br>Parties | • Few parties involved make it easy & inexpensive to set up<br>• Informal & flexible procedures<br>• Easy to reach initial consensus and expedite work, very focused effort<br>• Several options once specs. are developed, effort is finite<br>• Minimal industry momentum |
| **Special Interest Group**<br><br>1 or a few closely related | Incorporated non-profit<br><br>Independent Counsel works with LWG | • Few parties make it relatively easy & inexpensive to set up<br>• Flexible operating procedures<br>• Easy to reach initial consensus and expedite work; also very focused effort<br>• Several levels of participation (Several options once specs are developed; life of effort is finite<br>• Increased industry momentum |

# Characteristics of different standard setting organizations (2 of 2)



| Standards Organization & Number of Specifications | Organization Structure & Legal Representation | Characteristics |
|---|---|---|
| **Consortium**<br><br>Multiple specs. closely related | Incorporated non-profit<br><br>Independent Counsel works with LWG | • Procedures dictated by bylaws and guidelines<br>• More parties make it costly & more involved to set up<br>• Effort is larger in scope and longer in duration<br>• Work is done in a technology area (IETF, W3C, Bluetooth)<br>• Increased industry momentum |
| **Umbrella Organization**<br><br>Many loosely related | Incorporated non-profit | • Very formal rules & procedures<br>• Effort is larger in scope and longer in duration<br>• Maximum industry momentum and acceptance |

# Governance Structure of ISO



- The three primary governance groups of ISO are:

1. The ISO General Assembly, which is the annual meeting of all ISO members, and its agenda typically, includes actions relating to the review of the ISO annual report, approval of ISO's multi-year strategic plan, and ISO's finances.

2. The ISO Council, which meets twice a year and is responsible for the development of ISO's multi-year strategic plan, the development of the ISO annual budget, ISO's relations with other external organizations, and other political/strategic decisions and the general operations of ISO. The ISO Council consists of the principal officers of ISO and eighteen elected member bodies, including ANSI for the USA. ANSI is one of five permanent members to the ISO Council.

3. The ISO Technical Management Board (ISO/TMB), which meets three times each year and reports to and advises the ISO Council on all matters concerning the organization, coordination, strategic planning, and programming of the technical work of ISO. The ISO/TMB consists of the ISO Vice President for Technical Management and twelve elected member bodies, including ANSI for the USA. ANSI is one of four permanent members of the ISO TMB.

# ISO Technical Committees and Sub-Committees



- ISO standards are developed by technical committees comprising experts from the industrial, technical and business sectors which have asked for the standards, and which subsequently put them to use.
- These experts may be joined by others with relevant knowledge, such as representatives of government agencies, testing laboratories, consumer associations, environmentalists, academic circles and so on.
- The experts participate as national delegations, chosen by the ISO national member institute for the country concerned.
- These delegations are required to represent not just the views of the organizations in which their participating experts work, but of other stakeholders too.
- According to ISO rules, the member institute is expected to take account of the views of the range of parties interested in the standard under development and to present a consolidated, national consensus position to the technical committee.

# Governance of technical work at ISO



- The technical work is carried out under the overall management of the Technical Management Board (TMB).
- The Technical Management Board reports to the ISO Council and its role is defined in the statutes of the organization.

# ISO TMB's Duties (1 of 2)



1. To report to and, when relevant, advise Council on all matters concerning the organization, coordination, strategic planning, and programming of the technical work of ISO.
2. To examine proposals for new fields of ISO technical activity, and to decide on all matters concerning the establishment and dissolution of technical committees.
3. On behalf of ISO, to keep the ISO/IEC Directives for the technical work under review, to examine and coordinate all proposals for amendments and to approve appropriate revisions.
4. To appoint registration authorities and maintenance agencies for the implementation of International Standards.
5. To establish (and dissolve) Technical Advisory Groups (TAG) in order to obtain expert advice, and to appoint their members and chairmen.
6. To establish (and dissolve) committees on general standardization principles and to appoint their chairmen.

# ISO TMB's Duties (2 of 2)



7. To act, within the framework of established policies relating to the technical work, on the following matters:

- Monitoring of the work of technical committees and project management requirements;
- Approval of titles, scopes and programs of work of individual technical committees;
- Allocation or reallocation of secretariats of technical committees and, in the case of there being more than one candidate, allocation or reallocation of secretariats of subcommittees;
- Appointment of chairmen of technical committees;
- Appeals against technical committee and subcommittee action or inaction;
- Resolution of technical coordination issues between ISO technical committees, and vis-à-vis IEC, other international organizations, and regional organizations;
- Advising the Secretary-General on technical interface questions between ISO and IEC, and with respect to technical collaboration with other international standardizing bodies.

# Joint Technical Committee 1 (JTC 1)



- ISO/IEC Information Technology Task Force (ITTF) is responsible for the day-to-day planning and coordination of the technical work of JTC 1 relative to IEC and ISO, and supervises the application of the ISO and IEC Statutes and Rules of procedure.
- The primary duty of a technical committee or subcommittee is the development and maintenance of International Standards, one such committee related to information & communication technologies is ISO/IEC JTC 1.
- ISO/IEC JTC 1 (JTC 1) is the standards development environment where experts come together to develop worldwide ICT standards for business and consumer applications.
- Additionally, JTC 1 provides the standards approval environment for integrating diverse and complex ICT technologies.
- These standards rely upon the core infrastructure technologies developed by JTC 1 centers of expertise complemented by specifications developed in other organizations.
- As a joint technical committee of ISO and IEC, JTC 1 has the qualities and strengths of ISO and IEC standardization.

# JTC 1 as System Integrator



- In addition to this well-established focus of work, JTC 1 positions itself as a system integrator to complement its current program of work, especially in areas of standardization where many consortia/fora are active.

1. Reach out to other standards setting organizations, including referencing of relevant standards
2. Share information with relevant standards setting organizations, for example about market requirements and inventories of relevant standards.
3. Establish relationships that facilitate collaboration with external organizations.
4. Encourage development of international standards that respond to market needs.
5. Provide a mechanism for standards developed outside JTC 1 to be quickly approved as international standards
6. Develop profiles as appropriate to cope with the needs of specific applications

# Governance of Open standards by Consortia



- While standard setting has been an important aspect of industrial society for over a hundred years, the formation of unofficial, fast-acting standard setting and promotional consortia (less formal, SSO's) is a more recent phenomenon.

- Most of the standards were developed by the formal standards developing organizations (SDOs) such as ANSI, IEEE, and ISO. SSO's range from small working groups representing a few market-leading companies cooperating to develop a specification to highly inclusive, process oriented consortia that resemble the formal SDOs.

- Their aims include developing voluntary standards that get to market quickly and provide the basis for interoperability among products in emerging technology markets.

- For potential members, standards consortia represent both an opportunity and a risk. On the positive side, they have an opportunity to help develop or accelerate an entire industry and maximize their ability to capitalize on it.

# Risks and Costs of Consortia

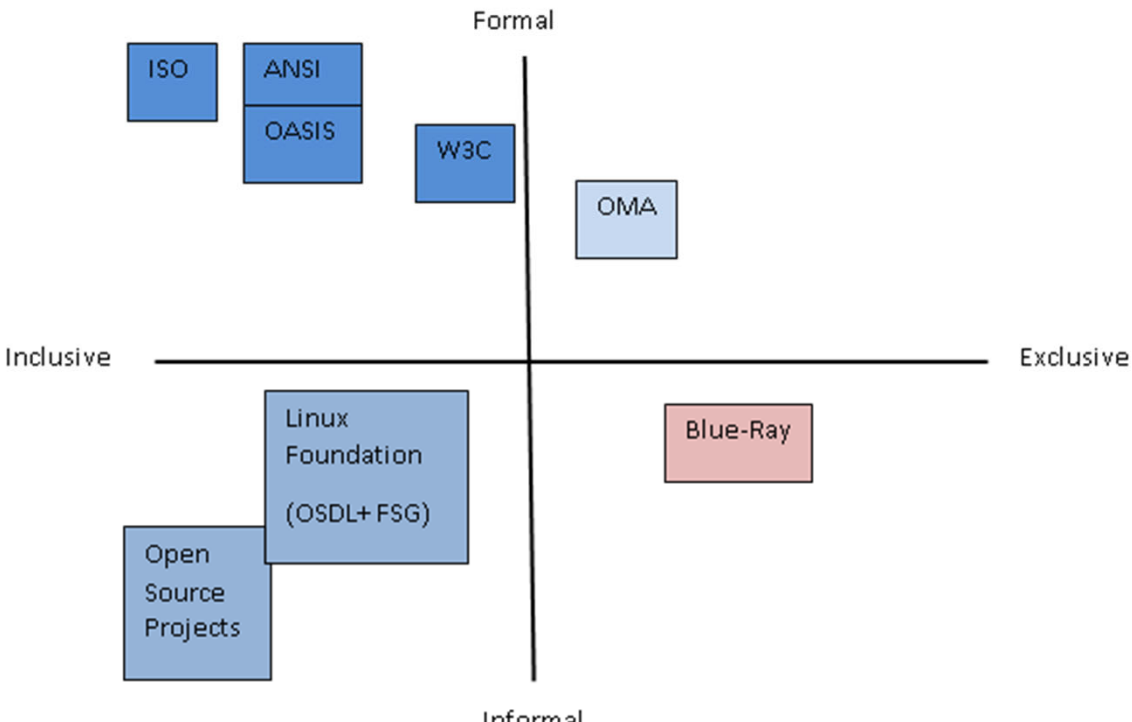


- Participation risks and costs of consortia include:

1. Consumption of key resources
2. Potential loss of control over IP or trade secrets
3. Implementation issues with evolving specifications and
4. Possible antitrust liabilities

# Understanding where existing standards organizations fit along the dual axes





# OASIS (Organization for the Advancement of Structured Information Standards)



- We shall look at **OASIS** (Organization for the Advancement of Structured Information Standards), which is a not-for-profit consortium that drives the development, convergence and adoption of open standards for the global information society.

- The consortium produces more Web services standards than any other organization along with standards for security, e-business, and standardization efforts in the public sector and for application-specific markets.

- Founded in 1993, OASIS has more than 5,000 participants representing over 600 organizations and individual members in 100 countries.

# The structure of OASIS governance



- The OASIS Board of Directors is comprised of executive-level officers, experienced in managing organizational growth, defining policies and dedicated to advancing open standards for interoperability.
- The OASIS Board is comprised of 11 elected directors, each serving two-year terms.
- The **OASIS Technical Advisory Board (TAB)** advises the OASIS Board of Directors, staff, and membership on matters related to the technical agenda of OASIS.
- TAB members are nominated in an open election process by the Sponsors and Contributors of the Consortium. Each TAB member serves a two-year term.
- The technical work related to standard's creation is carried out by the **Technical Committees (TC).** OASIS board of directors approves the request for creation of new TC on the request of members through majority voting on the advice of TAB. Also TC may create a sub-committee by resolution.

# Standards work products and approval



- **Standards work products progress as follows:**

1. Committee Specification Draft,
2. Committee Specification Public Review Draft,
3. Committee Specification,
4. Candidate OASIS Standard,
5. OASIS Standard,
6. Approved Errata.

- **Approval of an OASIS Standard is a three-step process:**

1. Submission of a Candidate OASIS Standard to the TC Administrator,
2. Completion of a public review lasting a minimum of 60 days, and
3. A membership-wide ballot.

# OASIS policy on Intellectual Property Rights (IPR)



- At the time a TC is chartered, the proposal to form the TC must specify the IPR Mode under which the Technical Committee will operate. This Policy describes the following IPR Modes:

1. RAND - requires all Obligated Parties to license their Essential Claims using the RAND licensing elements

2. RF on RAND Terms - requires all Obligated Parties to license their Essential Claims using the RF licensing elements

3. RF on Limited Terms - requires all Obligated Parties to license their Essential Claims using the RF licensing elements

4. Non-Assertion - requires all Obligated Parties to provide an OASIS Non-Assertion Covenant

# OASIS Open Document Format for Office Applications



- **OASIS Open Document Format for Office Applications (Open Document) Technical Committee**
- The purpose of this TC is to create an open, XML-based file format specification for office applications.
- This TC was chartered in 2002 and first draft was released in 2004.
- Open Document Format v1.0 was approved as an OASIS Standard on 1 May 2005 and has been approved by ISO/IEC JTC1 as an International Standard ISO/IEC 26300:2006. .

# Standards, Regulations and Sources of Information



- ISO and IEC standards can be used to support and simplify the process of development and application of technical regulations.
- ISO and IEC have published the document 'Using and referencing ISO and IEC standards for technical regulations.
- It includes practical advice for regulators on how to use international standards to achieve their objectives.
- ISO has just launched a new database that will make the benefits of using standards easier to achieve, provide users with new possibilities for achieving such benefits and cut the time necessary to develop and revise standards.

# ISO Concept Database



- Until now, no platform was available to bring together *in a single source* the content from more than 18 000 ISO standards developed to provide benefits to users in business, government and society.
- To tackle this challenge, the ISO Central Secretariat in Geneva, Switzerland, has developed a new application, the ISO Concept Database (ISO/CDB), which provides a harmonized platform for search, development and maintenance of concept content throughout the ISO standards portfolio.
- Most of the content of the ISO/CDB is publicly accessible at http://cdb.iso.org or from ISO's Web site www.iso.org. An online tour of the CDB is available under http://www.iso.org/iso/demo_ISO-CDB.html
- The ISO/CDB will allow standards users in companies and other organizations to easily access standardized reference data, with the possibility of re-using them in their own applications.

# World Standards Services Network (WSSN)



- The most reliable sources of information on standards are the organizations which developed these standards.
- The **World Standards Services Network (WSSN)** is the most comprehensive portal of links to the Web sites of international, regional and national standards developing organizations including ISO and IEC Web sites.
- http://www.wssn.net/WSSN/index.html

# Open Group Standards Information Base



- The Open Group is a global consortium that enables the achievement of business objectives through IT standards.

- With more than 400 member organizations, we have a diverse membership that spans all sectors of the IT community — customers, systems and solutions suppliers, tool vendors, integrators and consultants, as well as academics and researchers to:

1. Capture, understand and address current and emerging requirements, and establish policies and share best practices

2. Facilitate interoperability, develop consensus, and evolve and integrate specifications and open source technologies

3. Offer a comprehensive set of services to enhance the operational efficiency of consortia

4. Operate the industry's premier certification service

# NSSN



- Another database for standards maintained by ANSI is, the NSSN, a National Resource for Global Standards is a search engine that provides users with standards related information from a wide range of developers, including organizations accredited by ANSI, other U.S. private sector standards bodies, government agencies and international organizations.

- Provides easy links to obtain standards and related technical documents and contact information for standards-setting organizations and is a tool for standards users as well. http://www.nssn.org/

# Using Open Standards



- Ensuring the use of open standards in practice is easier said than done, and requires more than a choice of policy alone. The consideration of such a step will give rise to many questions:

1. Closed or other standards are already in use for an application, when and how should the transition be made?

2. There are sometimes multiple open standards for a particular application; which should we choose?

3. A technology or other supplier will propose a standard; will adoption of such a standard result in a dependency on the supplier?

4. What if no open standard is available for a certain application? Is it advisable to personally develop a new open standard?

5. In a new project which open standard could be applied?

# Phases of transition to Open Standards



- Use of open standards in practice can be divided into a number of phases. Foremost people must be convinced of the importance of embracing open standards. The three phases are as follows:

1. **Adoption:** Involves investigation, research, consideration and decision making for the selection of one or more open standards for use. At the end of this phase, the organization would have fully embedded open standards in its policy and procedures.

2. **Implementation:** Involves the implementation of the decision regarding adoption, and giving direction to the users.

3. **Use:** Practical deployment of the standard by the organization.

# Governing open standards via IT governance in organizations



- By now we have understood governance as a stepwise process of working towards more efficient adoption, implementation and use of open standards
- The guidelines/policies concerning open standards is in place and the benefits of its use are already evident in actual practice, namely enhanced interoperability and reduced dependencies on suppliers. Many organizations are therefore keen to adopt open standards.
- Adopting open standards means including them in the selection and decision-making processes for IT needs. This means that the IT governance processes take into account the importance of open standards and need to contain mechanisms which promote their adoption.
- IT governance processes give direction to IT activities and projects. If these processes promote the application of open standards, their implementation and actual use in those activities and projects will increase.
- Embedding open standards in IT governance processes is therefore crucial.

# Governance Processes & Compliance Management



- **Governance Process**

- IT governance is the leadership and the organizational structures and processes necessary in order to develop information technology which is in line with the needs and objectives of the organizations.

- **Compliance management**

- Compliance management for open standards comprises of periodic checking of requirements relating to open standards, such as the list of open standards and standards in legislation and regulations. Assessments are then performed to establish how these requirements can and must be fulfilled.

# IT Policy



- The IT Policy includes:

1. Strategic orientation of IT in relation to operations (e.g. ‘By 2015 we need to be able to conduct 80% of our customer contact over the internet’),

2. Principles concerning information sharing (e.g. ‘Our data is publicly available’ or, conversely, ‘Our information is crucial for our organization and must be kept strictly secure’).

3. Principles concerning utilized technology (e.g. ‘We utilize shared service centers owned by our parent company’ or ‘We use only standard products’).

4. Policy concerning suppliers (e.g. ‘We design our own software, but outsource building and administration’).

5. IT project funding.

# Architecture Management



- Architecture management transforms the IT policy into specific structural and organizational principles.
- The strategy for information management and systems and standards which are to be used is determined by means of architecture.
- In architecture, specific decisions are made concerning the open standards to be used in an organization.

# Procurement and Supplier Management



- The final governance process is procurement, which involves the actual acquisition of IT resources and support, as well as the control of suppliers.
- Procurement involves hardware and software, both standard and customized, and the insourcing of consultancy and expertise.
- The governance process of procurement also focuses on the supplier market, the strategic position of the organization in relation to suppliers, the operational side of procurement (specification documents, tenders, etc.) and the assessment of suppliers.
- Requirements for suppliers are highly specified. In this way, the governance process ensures continuously improving cooperation with suppliers as partners in the value chain.
- In the process, the products and suppliers utilizing open standards can be given priority. Furthermore, in a number of cases, use of open standards can be specified as a requirement.

# Unit summary



**Having completed this unit, you should be able to:**

- Define IT governance
- Explain the need for open source governance and its importance
- Describe the need for open standards and the need for governing open standards
- Understand governance processes, governance types and choosing levels of governance

Welcome to:

## Unit 3 – Introduction to Enterprise Applications

# Unit Objectives



After completing this unit, you should be able to:

- Define an enterprise
- Explain what enterprise application software is and what it does
- Describe the relationship between open standards and enterprise applications
- Understand the process of enterprise application integration (EAI)
- List out the approaches in leveraging open standards
- Understand web services and emerging trends in that field

# What is an Enterprise?



- In the IT (Information Technology) world, the term "enterprise" has a different meaning, and the meaning, is often fuzzy. An enterprise is any organization — commercial or not — that has the following four characteristics:

1. **Size and Location** - An enterprise is a very large organization, often widely distributed with hundreds to tens of thousands of locations.

2. **Management** - An enterprise is organized into divisions or departments, and managed by a large hierarchy, not by a single person or group of people.

3. **Software** - All businesses require the software necessary to administer an organization: accounting, payroll, email, office tools, Web services, backups, and so on.

4. **Hardware** - An enterprise requires large, complicated, inter-connected computing systems that will not fail, degrade or interfere with one another.

# Enterprise Application Software (1 of 2)



- Enterprise software, also known as enterprise application software (EAS), is software used in organizations, such as in a business or government, contrary to software chosen by individuals (for example, retail software).
- Enterprise software is an integral part of a (computer based) Information System.
- Services provided by enterprise software are typically business-oriented tools such as those listed in the next column.

1. Online shopping and online payment processing
2. Interactive product catalogue
3. Automated billing systems
4. Security
5. Enterprise content management
6. IT service management
7. Customer relationship management
8. Enterprise resource planning
9. Business intelligence
10. Human resource management
11. Manufacturing
12. Enterprise application integration
13. Enterprise forms automation

# Enterprise Application Software (2 of 2)



# Enterprise Application Software Business Functions



- Enterprise application software performs business functions such as order processing, procurement, production scheduling, customer information management, energy management, and accounting.
- It is typically hosted on servers and provides simultaneous services to a large number of users, typically over a computer network.
- This is in contrast to a single-user application that is executed on a user's personal computer and serves only one user at a time.
- Enterprise software is often categorized by the business function that it automates, such as accounting software or sales force automation software.
- Similarly for industries, there are enterprise systems devised for the health care and insurance industry, retail industry, or for manufacturing enterprises.

# Open standards and Enterprise Applications



- Enterprise applications are not developed in tandem, and have different data structures designed to meet different business needs.
- Integration is required for tying together separate enterprise applications and lot of work may be required for two enterprise applications to integrate successfully.
- The software and data have to be made to work together without any slippage or miscommunication. To accomplish this we require an agreement about how the transaction or data exchange will be accomplished.
- The answer is Open standard, to ensure that competing products work together. It becomes easier as more companies adopt an open industry standard, to communicate, without the need for costly customized data interchanges.

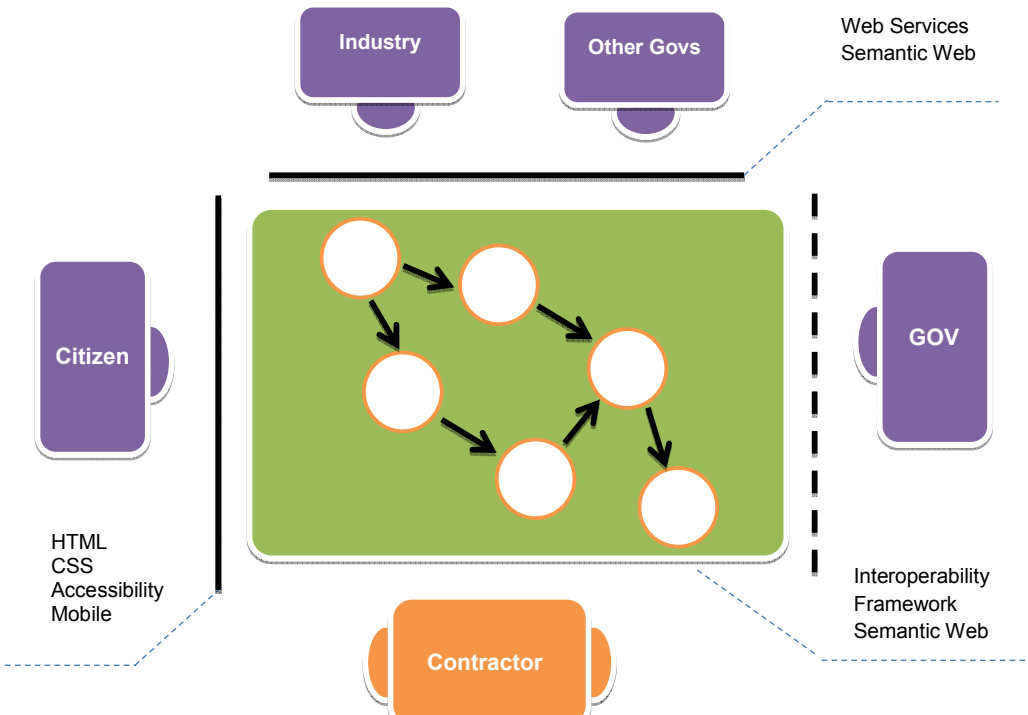
# Advantages of Open Standards in Enterprise Applications



- Open standards enable different software systems to share data with relative ease.
- Data migration no longer needs to be the key driver for decisions on system choices.
- Single vendor solutions no longer keep their corporate customers tied to them because of apprehension about proprietary data formats, data transfer and integration.
- The viable options include large vendors alongside specialized offerings from best-of-breed solution providers. The true decision can then be made on benefits coming from functionalities and not from fear of heterogeneous dataflow.

# Open Information System





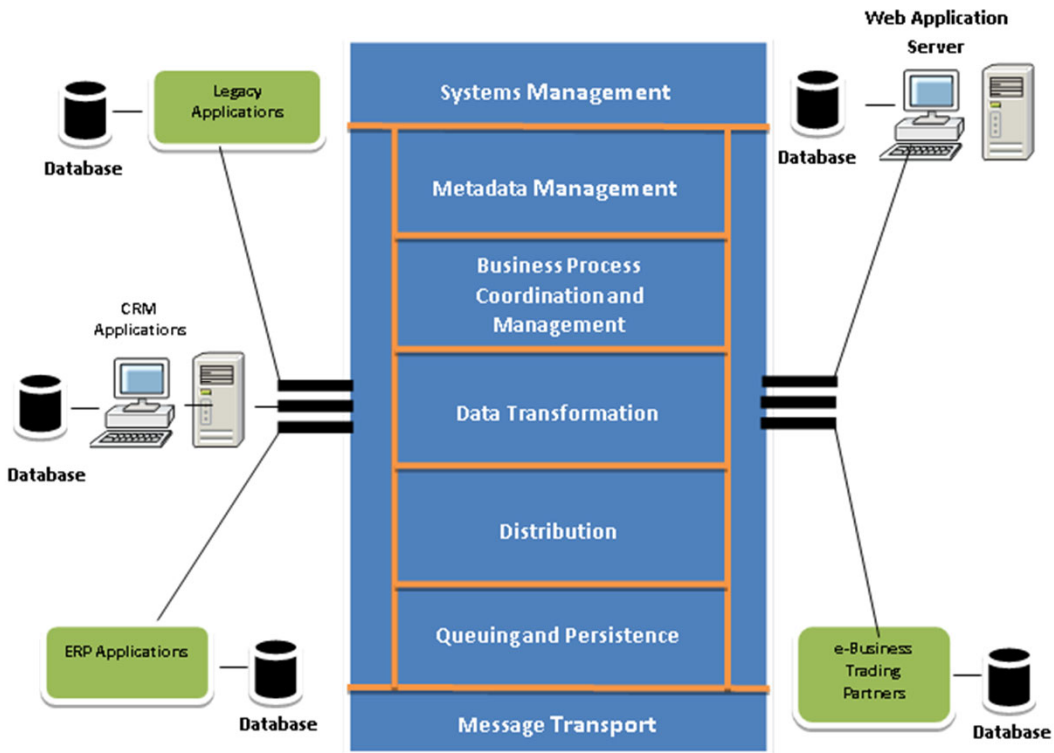
# Enterprise Application Integration [EAI] (1 of 2)



- EAI is defined as the use of software and computer systems architectural principles to integrate a set of enterprise computer applications.
- Enterprise application integration (EAI) is the process of linking applications such as HCM, CRM, ERP etc. within a single organization together in order to simplify and automate business processes to the greatest extent possible, while at the same time avoiding having to make sweeping changes to the existing applications or data structures.
- In the words of the Gartner Group, EAI is the “unrestricted sharing of data and business processes among any connected application or data sources in the enterprise.

# Enterprise Application Integration [EAI] (2 of 2)





# Critical features a distributed architecture must possess



- To gain the benefits of this kind of distributed, modular system, an organization must implement technologies that deal with the problems presented by this architecture:

1. **Interoperability:** the various components of the infrastructure may use different operating systems, data formats, and languages, preventing connection via a standard interface.

2. **Data integration:** in order for a modular, distributed system to be functional, a standard method of handling the flow of data between applications and systems to enforce consistency across the database is crucial.

3. **Robustness, Stability, and Scalability:** Because they are the glue that holds together a modular infrastructure, integration solutions must be highly robust, stable, and scalable.

# Open Standards and Application Integration



- Open standards and application integration are natural allies since open standards support in solving the application integration problem, due to the differences in formats and interfaces through common mechanisms that everyone can understand.

- However, those working to resolve the application integration problem should understand the objectives and evolution of open standards.

- Standards could be divided into 3 categories in the area of application integration:

1. Service standards
2. Format standards
3. Orchestration standards

# Service Standards



- Service standards, including Web services, seem new but in fact are very old.
- Early attempts at standardizing service-oriented interfaces, such as OMG's CORBA and Microsoft's COM, have a long history in the world of IT.
- By leveraging common Web protocols, Web services seem to be getting more traction than their predecessors.
- Web services also deliver a lot to the application integration world as well, providing common interfaces and protocols which allow standard-based communication and service invocation from machine to machine, either local or over the Internet.

# Format Standards



- Format standards are those standards that define a common way of formatting information so that it is understood as it is being shipped from application to application.
- EDI, XML and SOAP (messaging) are examples of format standard with XML leading the charge as the dial tone for application integration in many problem domains.
- Format standards are not as complex as service standards; the only requirement is that both the source application and target application are able to understand each other. XML is particularly helpful.

# Orchestration Standards

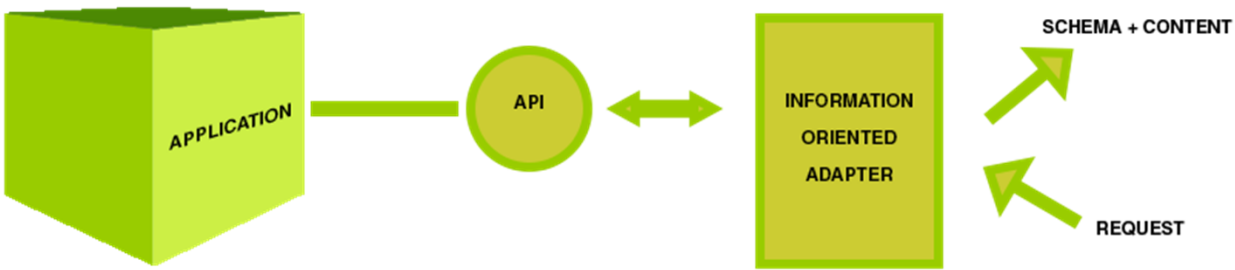


- Orchestration standards, such as BPEL4WS, layer a set of easily defined and centrally managed processes on top of existing sets of processes/services contained within a set of enterprise applications, intra- or inter-organization.
- We can think of orchestration as the science and mechanism of managing the movement of data and the invocation of services in the correct and proper order to support the management and execution of common processes that exist in and between applications.
- Orchestration provides another layer of easily defined and centrally managed processes that exist on top of an existing set of processes and data contained within a set of applications.
- The goal is to bring together relevant processes found in an enterprise or trading community to obtain the maximum amount of value, while supporting the flow of information and control logic between these processes.
- These products view the middleware, or the plumbing, as a commodity and provide easy-to-use visual interfaces for binding these processes together.

# Approaches in Leveraging Open Standards (1 of 3)



**Information-oriented application integration**




- Applications can no longer exist as standalone entities, but instead must share information with other information systems, inside and outside the corporations.
- Indeed, we've been moving closer to a well-integrated enterprise and (in some instances) supply chain that provides most information systems with access to information from other applications when needed, and in real time.
- We can call this information-oriented application integration. This is the most popular way of doing application integration today, and it leverages format standards such as the ones listed above.

# Approaches in Leveraging Open Standards (2 of 3)



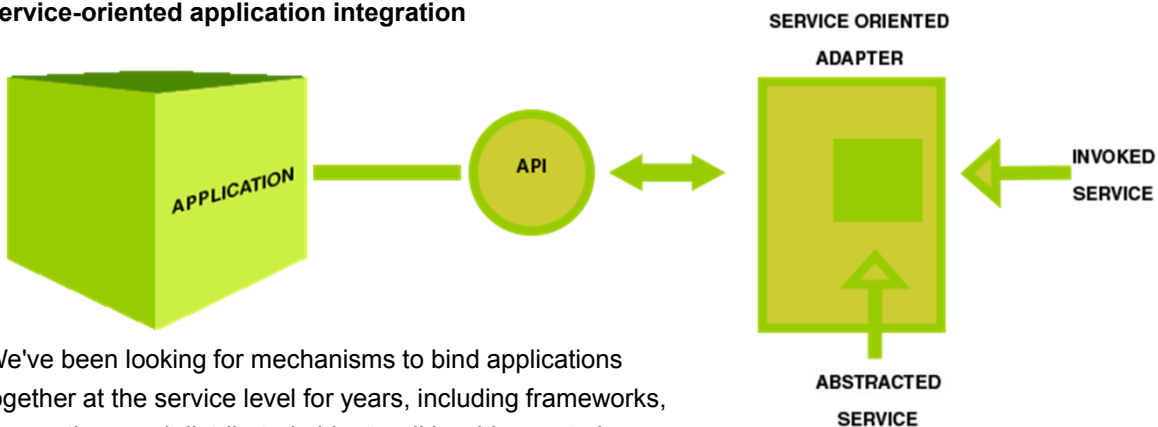
**Orchestration-oriented application integration**

- As we're getting better at real time information exchange between systems, the trend has been to view application integration at a higher level of abstraction, or through business processes or services.
- This approach allows those exchanging information between various applications to view the information flow in the context of a business model, or business processes that define business logic, sequence, sub-processes, hierarchies of processes, etc.
- In other words, the ability to control application integration through abstract business process automation abstractions that also accounts for lower level mechanisms such as transformation and intelligent routing.
- We can call this orchestration-oriented application integration.

# Approaches in Leveraging Open Standards (3 of 3)



**Service-oriented application integration**




- We've been looking for mechanisms to bind applications together at the service level for years, including frameworks, transactions and distributed objects, all in wide use today.
- However, the new notion of Web services, such as Microsoft's .NET strategy, is picking up steam.
- We're attempting to identify a new mechanism that can better leverage the power of the Internet to provide access to remote application services through a well-defined interface and directory services.
- We can call this services-oriented application integration.

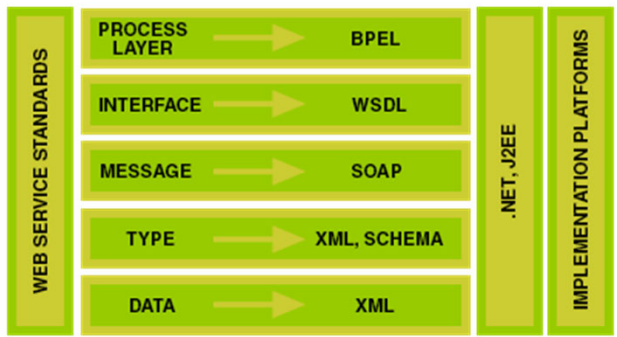
# Web Services and Enterprise Application Integration



- A Web service is a method of communication between two electronic devices over the Web (Internet).
- The W3C defines a "Web service" as "a software system designed to support interoperable machine-to-machine interaction over a network".
- Used primarily as a means for businesses to communicate with each other and with clients, Web services allow organizations to communicate data without intimate knowledge of each other's IT systems behind the firewall.
- The applications interface, not the users. Developers can then add the Web service to a GUI (such as a Web page or an executable program) to offer specific functionality to users.
- Web services allow different applications from different sources to communicate with each other without time-consuming custom coding, and because all communication is in XML, Web services are not tied to any one operating system or programming language.
- For example, Java can talk with Perl, Windows applications can talk with UNIX applications.

# Web Services Technology






- Web services are built on several technologies that work in conjunction with emerging standards to ensure security and manageability, and to make certain that Web services can be combined to work independent of a vendor.

- The term Web service describes a standardized way of integrating Web-based applications using the XML, SOAP, WSDL and UDDI open standards over an Internet protocol backbone.

# XML



- Short for Extensible Markup Language, a specification developed by the W3C.
- XML is a pared-down version of SGML, designed especially for Web documents.
- It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

# Other Open Standards for Web Services



- **SOAP** - Short for Simple Object Access Protocol, a lightweight XML-based messaging protocol used to encode the information in Web service request and response messages before sending them over a network. SOAP messages are independent of any operating system or protocol and may be transported using a variety of Internet protocols, including SMTP, MIME, and HTTP.

- **WSDL -** Short for Web Services Description Language, an XML-formatted language used to describe a Web service's capabilities as collections of communication endpoints capable of exchanging messages. WSDL is an integral part of UDDI, an XML-based worldwide business registry. WSDL is the language that UDDI uses. WSDL was developed jointly by Microsoft and IBM.

- **UDDI -** Universal Description, Discovery and Integration. It is a Web-based distributed directory that enables businesses to list themselves on the Internet and discover each other, similar to a traditional phone book's yellow and white pages

# Who is using web services?



- Perhaps the best example of the growth of Web services is eBay. The online auction king has been aggressively developing its Web services platform by extending application programming interfaces that essentially turn its Web site into a platform.

- The auction site's developer section gives soup-to-nuts information about deploying its eBay API.

- Online retailing giant Amazon.com is another example. Companies such as Microsoft and Sun Microsystems have been helping developers build and deploy Web Services and clients for close to four years now.

- Sun's J2EE platform, for example, is where developers build on the building blocks in order to access amazon.com's selling platform.

# Emerging trends in web services



**Mash-ups**

- A breed of Web-based applications called mash-ups. Mash-ups mix at least two different services from disparate, and even competing, Web sites.
- A mash-up, for example, could overlay traffic data from one source on the Internet over maps from Yahoo, Microsoft, Google or any content provider.
- This capability to mix and match data and applications from multiple sources into one dynamic entity is considered by many to represent the promise of the Web service standard.

**Web 2.0**

- With so many businesses and software companies building services on top of platforms, many expect to see the World Wide Web of today (called Web 1.0) transform into a full-fledged computing platform serving Web applications.
- The term being used to refer to the World Wide Web as a platform is Web 2.0, where the term refers to the "next version" of the World Wide Web.
- The difference between Web 1.0 and Web 2.0 can really be defined by Web application services.

# IBM Websphere Application Server



- What does IBM “Websphere Application Server (WAS)” Java™ 2 platform, Enterprise Edition (or J2EE) compliance mean?
- Open standards are the key to the IBM WebSphere strategy of creating a flexible, portable, easy-to-use application server.
- The J2EE standard streamlines application development, and enables to create reusable, platform independent modules.
- J2EE applications could be developed independently, and can be deployed on any of the 30 platforms supported by Websphere Application Server including IBM z/OS, Microsoft NT, Windows 2000, Sun Solaris, IBM AIX, HP-UX, and Linux operating systems.

# Unit summary



**Having completed this unit, you should be able to:**

- Define an enterprise
- Explain what enterprise application software is and what it does
- Describe the relationship between open standards and enterprise applications
- Understand the process of enterprise application integration (EAI)
- List out the approaches in leveraging open standards
- Understand web services and emerging trends in that field

Welcome to:

## Unit 4 – Introduction to Vertical Open Standards

# Unit Objectives



After completing this unit, you should be able to:

- Define vertical open standards within the context of specific industry
- Describe the characteristics of the Health Care vertical
- List out the various functions and processes of IT within Health Care
- Understand the role of Health Care Standards
- Explain HL7 standards and list out the types of HL7 standards

# What are Vertical Standards?



- Broadly two types of standards are notable

1. Generic Standards

2. Specific Standards

- Generic also called horizontal or technical standards apply to almost all organizations, because they do not give any information on underlying business processes.

- In contrast to horizontal IT standards, which is concerned with the characteristics of IT products and applies to users in many industries, Vertical IT standards focus on data structures & definitions, document formats, business processes and addresses business problems unique to a particular industry.

- Vertical IT standards (also called specific or Semantic) are designed to promote communication and coordination among the organizations comprising a particular industry sector and to promote interoperability.

# Specific Standards



- Vertical industry standards guide the integration of common systems components with industry-specific components, and guide the creation of industry solutions for targeted customer problems within a particular industry.
- They should be developed and owned by the users and not by vendors. Standardization in this area is necessary on a semantic level as well.
- Not all standards are applicable to many industries; vertical standards are needed to address business problems unique to particular industries.

# Development and Adoption of Vertical Standards



- The development and adoption of vertical standards exhibits very different characteristics than those of horizontal IT standards.
- Normally technology firms and governments are the leaders in horizontal standardization; their role in vertical standardization efforts is likely to depend on such things as, degree of adoption of IT in a particular sector and the extent of regulation in the industry.
- Vertically orientated standards development consortia are rapidly making their mark in the ICT standards setting landscape.
- Employing a minimalist approach towards the standards setting process (develop a little, test a little), they can quickly respond to technological innovations, market dynamics and changing world events.
- Utilizing a not-for-profit, voluntary-consensus and vendor-neutral approach, they are experiencing sharp increases in membership levels and achieving highly productive standards.

# Vertical Industry-Based Standards Development Consortia

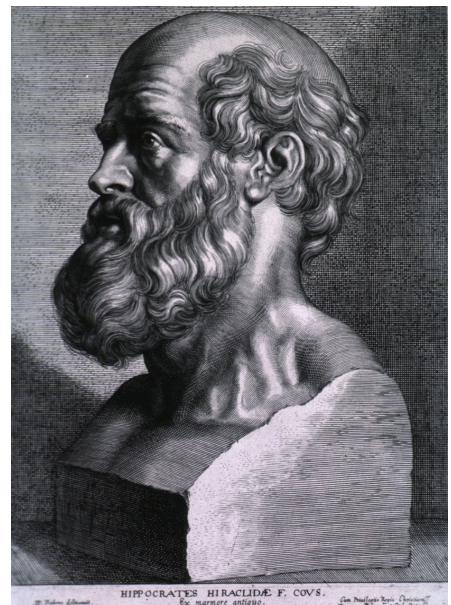


| Vertical Consortia | HR-XML | PapiNet | OGC | PIDX | STARS |
|---|---|---|---|---|---|
| Industrial Group | Human Resources | Paper | Geo Spatial | Petroleum & Oil | Automotive |
| URL | www.hr-xml.org | www.papinet.org | www.opengeospatial.org | www.pidx.org | http://www.starstandard.org/ |
| Standards Availability | Freely available to the public | *Freely available to the public* | *Freely available to the public* | *Freely available to the public* | *Freely available to the public* |

# History of Data in Health Care



- Hippocrates started a revolution in healthcare, by calling for the cautious collection and recording of evidence about patients and their illnesses.
- This introduced sharing of data among physicians to provide the best possible care for patients and established a foundation for the evolution of modern healthcare.
- Although 25 centuries have passed since Hippocrates suggestion, we have not yet attained true evidence-based healthcare.
- We now stand at the threshold of a potential revolution in data-centric healthcare, aided by advances in information & communication technology.



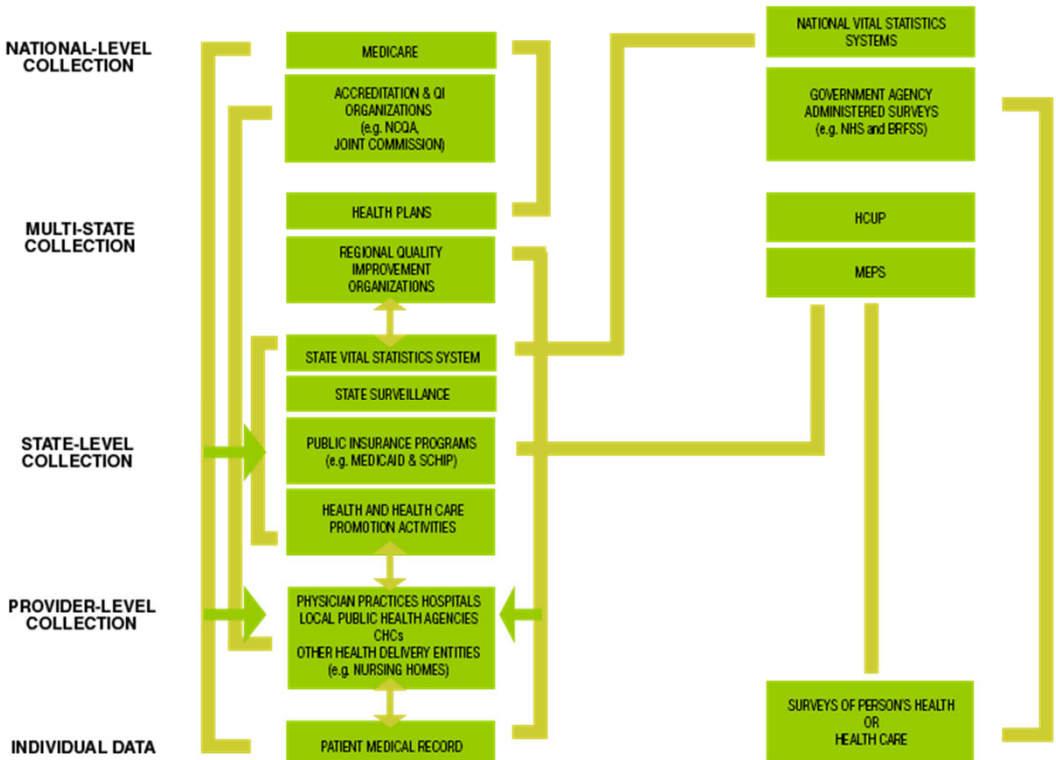
# IT in Health Care



- Today, the health care industry is one of the world's largest and fastest-growing industries consuming over 10 percent of gross domestic product (GDP) of most developed nations, health care can form an enormous part of a country's economy.
- Also health care is becoming the fastest growing Vertical in IT.
- The need for health care IT gets more urgent as the population of people aged 55 and over grows and records move from paper to electronic.
- Meanwhile, spending on wireless connectivity by health care enterprises will increase by about 12 percent.
- Also spending on wireless will be fueled by a large market for wireless health-monitoring devices, according to a recent study.

# Data Collection in Health Care

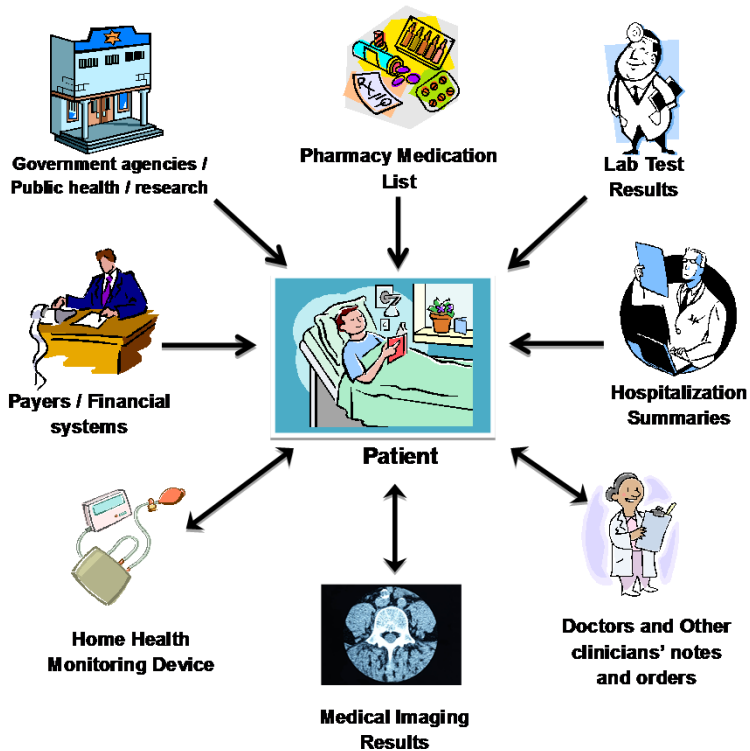




# Health Information Technology (HIT)



- HIT consists of diverse set of technologies for transmitting and managing health information for use by consumers, providers, payers, insurers, and other groups with an interest in health and health care.
- In general it includes the capture, storage, use and transmission of health information through electronic processes.



# Components of HIT



- The health information technology vertical comprises the following components:

1. Applications
2. Communications Standards
3. Processes
4. Security/ Privacy
5. Devices

# Applications



- These are the “programs” that are used to perform HIT functions.
- Some of the applications are:

1. Patient Registries
2. Accounting/Practice Management Systems (PMS)
3. CPOE/CDS (Computerized Physician Order Entry with Clinical Decision Support)
4. ePrescribing, Electronic Medical Records (EMRs)
5. Electronic Health Records (EHRs)
6. Patient Health Records (PHRs)
7. Results Reporting
8. Electronic Documentation
9. Appointment Scheduling
10. Patient Kiosks
11. Telemedicine
12. Interface Engines.

# Some important applications related definitions (1 of 2)



- **Electronic Medical Record** - An electronic record of health-related information on an individual that can be created, gathered, managed, and consulted by authorized clinicians and staff within one health care organization.
- **Electronic Health Record** - An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization.
- **Personal Health Record** - An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.
- **Health Information Exchange** – The movement of health-related information among organizations according to nationally recognized standards.
- **Health Information Organization -** An organization that governs the exchange of health-related information among organizations according to nationally recognized standards.
- **Regional Health Information Organization** - A health information organization that brings together health care stakeholders within a defined geographic area and governs health information exchange among them for the purpose of improving health and care in that community.

# Some important applications related definitions (2 of 2)



- **Computerized provider order entry (CPOE)** - CPOE in its basic form is typically a medication ordering and fulfillment system. More advanced CPOE will also include lab orders, radiology studies, procedures, discharges, transfers, and referrals.

- **Clinical decision support system (CDSS)** - CDSS provides physicians and nurses with real-time diagnostic and treatment recommendations. The term covers a variety of technologies ranging from simple alerts and prescription drug interaction warnings to full clinical pathways and protocols. CDSS may be used as part of CPOE and EHR.

- **Picture archiving and communications system (PACS)** - This technology captures and integrates diagnostic and radiological images from various devices (e.g., x-ray, MRI, computed tomography scan), stores them, and disseminates them to a medical record, a clinical data repository, or other points of care.

# Communications Standards



- These are the various sets of standards that are necessary in order for HIT systems to communicate with each other in a uniform manner. These standards encompass:

1. Messaging Standards

2. HL7, ADT, NCPDP, X12, DICOM, UB92, HCFA, ASTM, EDIFACT, etc.

- Messaging standards are the form and structure that is required for the information to move and be tracked from one system to another;

1. Coding Standards

2. LOINC, ICD-9, CPT, NDC, RxNorm, Snomed CT, etc.

- Coding standards are the form and structure of the procedure codes that are necessary to communicate what procedure was performed for a particular patient during a visit.

# Processes



- These are the actual steps necessary to obtain, retrieve, send, and receive data from one computer to another, from one system to another and from many systems in an integrated fashion.

- **MPI (Message Passing Interface)** - These interfaces guide the transfer of the message from one system to another.

- **HIE (Health Information Exchanges)** - There has been recent debate as to whether HIE is a verb or a noun i.e. is it a process or an entity? There are organizations that are called health information exchanges at the present time who provide the backbone systems and hardware that allows and facilitates the process of health information exchange, however, as per current definitions as referenced above HIE is a process

- **RHIOs (Regional Health Information Organizations)** – although RHIOs are indeed entities that provide similar functions to the HIE a RHIO usually has a much larger governance role in a specific area than does an HIE.

# Security/ Privacy



- This plays an important role in all exchange of health information using HIT.
- Healthcare providers, institutions and vendors must comply with HIPAA (Health Insurance Portability and Accountability Act, USA) in any and all exchange of personal health information (PHI).
- There is need to develop a balance that allows for health care information to be exchanged in order to provide improved quality of care for the patient and still maintain his/her confidentiality.

# Devices



- These are the various hardware components that make HIT work and include such things as Desktops, Laptops, Tablet PCs, Servers, Mice, Pens, Bar Coding devices and more.

- As HIT continues to develop and we continue to exchange information with our providers we will see in-home devices such as blood pressure monitors and scales have the ability to transmit data directly to our provider for him/her to review and monitor our care.

# Health Care Standards



- Health IT standards provide the necessary foundation for institutional data sharing and integration of this data with home care.
- Security, privacy and regulatory issues need to be addressed while ensuring end to end delivery and accessibility.
- Healthcare is an information intensive industry and persistent information losses are costly, economically, as well, in terms of human life.
- The purpose of using standards in health information systems is to facilitate the integration of component parts and support interoperability, for example, by making data generated in one part of a system accessible, meaningful and reusable where different technology may be in use.
- In health informatics, standards development is concentrated in such areas as data exchange, medical terminologies, documents, architectures.

# Levels of interoperability



- The US National Committee on Vital and Health Statistics describes three levels of interoperability:

1. **Basic interoperability** - allowing a message from one computer to be received by another, but not requiring the receiving computer to be able to interpret the data.

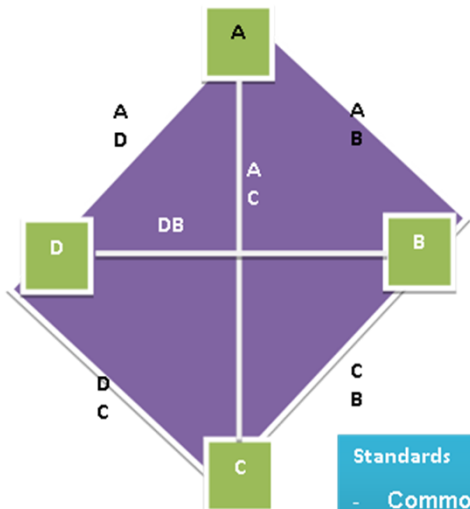
2. **Functional interoperability -** an intermediate level defining the format of messages. This ensures messages between computers can be interpreted at the level of data fields, so that data can pass from a structured field in one system to a comparably structured field in another. Neither system, however, has understanding of the meaning of the data within the field(s).

3. **Semantic interoperability** - provides common interpretability, that is, information within the data fields can be used intelligently.

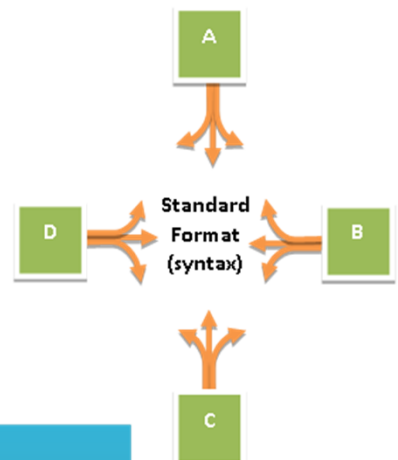
# Before Standards -After Standards Scenario



- **Before – Custom Interface**




- **After - Standards**

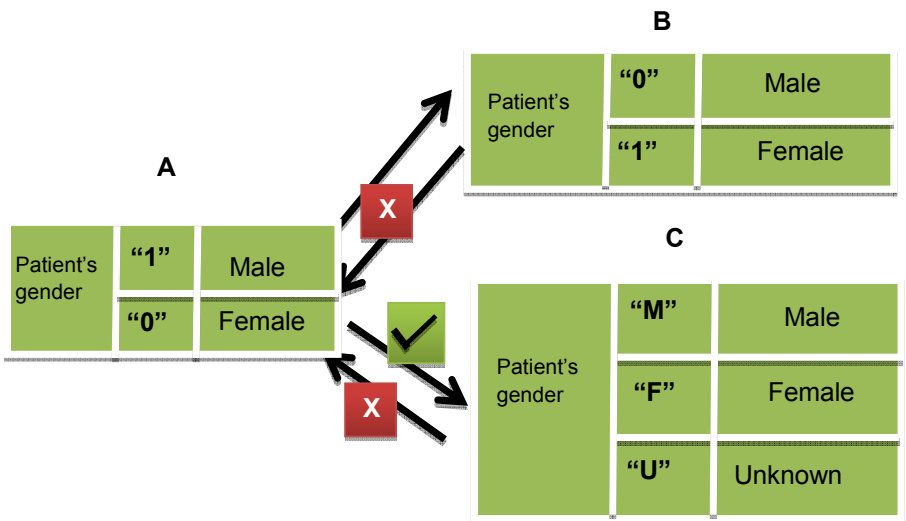



**Standards**

- Common denominator
- Saves time and money
- Enables

# Semantic Interoperability






A and B differ syntactically and cannot interoperate without translation

A and C differ semantically

# Standards and Information (1 of 2)



- To address the standards in health IT, today there are various SDO's and SIG's already in existence.

| Source of standard | Type of information |
|---|---|
| Health Level 7 | Order entry, scheduling, admitting, discharge, and transfer |
| Joint Committee of the ACR (American College of Radiology) and NEMA (National Electrical Manufacturers Association) | Imaging information (DICOM) |
| National Council on Prescription Drug Programs | Drug ordering between retail pharmacies and health care providers |
| Institute of Electrical and Electronics Engineers | Information exchange between medical devices and the computer systems that receive the information (IEEE 1073) |
| Regenstrief Institute | Lab test result names (LOINC) (Logical Observation Identifiers Names and Codes) |

# Standards and Information (2 of 2)



| Source of standard | Type of information |
|---|---|
| IHTSDO (International Health Terminology Standards Development Organization) | A systematically organized computer processable collection of medical terms providing codes, terms, synonyms and definitions covering diseases, findings, procedures, microorganisms, substances, etc. It allows a consistent way to index, store, retrieve, and aggregate clinical data across specialties and sites of care. SNOMED CT (Systematized Nomenclature of Medicine -- Clinical Terms) |
| Clinical Data Interchange Standards Consortium (CDISC) | Laboratory Data Model (LAB) |
| National Center for Health Statistics (NCHS) | ICD-9 – CM used in assigning diagnostic and procedure codes associated with inpatient, outpatient, and physician office utilization in the United States |
| Unified Medical Language System - U.S. National Library of Medicine | RxNorm provides normalized names for clinical drugs and links its names to many of the drug vocabularies commonly used in pharmacy management and drug interaction software |

# Health Level 7



- Health Level 7 (HL7) is a large part of the solution that creates healthcare IT standards around the world.
- Applications used by healthcare organizations that have adopted the HL7 messaging standard can communicate with one another even when they speak different languages.
- Founded in 1987, Health Level Seven International (HL7) is a standards developing organization accredited by the American National Standards Institute (ANSI) to author consensus-based standards representing a broad view from healthcare system stakeholders.
- "Level Seven" refers to the seventh level of the International Organization for Standardization (ISO) seven-layer communications model for Open Systems Interconnection (OSI) - the application level.
- Generically HL7 is a messaging standard that enable interoperability of clinical applications to exchange patient data.

# HL7 Standards



- HL7 develops conceptual standards (e.g., HL7 RIM), document standards (e.g., HL7 CDA), application standards (e.g., HL7 CCOW), and messaging standards (e.g., HL7 v2.x and v3.0).
- Messaging standards are particularly important because they define how information is packaged and communicated from one party to another.
- Such standards set the language, structure and data types required for seamless integration from one system to another.
- Information sent using the HL7 standard is sent as a collection of one or more messages, each of which transmits one record or item of health-related information.
- Examples of HL7 messages include patient records, laboratory records and billing information.

# Types of HL7 standards (1 of 3)



- **Version 2.X Messaging Standard -** Has the aim to support hospital workflows. The HL7 V2.x mostly uses a textual, non-XML encoding syntax based on delimiters.
- **Version 3 Messaging Standard -** Has the aim to support any and all the healthcare workflows. HL7 V3 messages are based on XML encoding syntax.
- **Version 3 Rules /GELLO** - GELLO is a standard expression language for clinical decision support. The syntax of GELLO language is based on the Object Constraint Language (OCL) and can be used with any object-oriented data model. OCL was developed by the Object Management Group (OMG) as a constraint and query language for UML class models.
- **Arden Syntax -** The Arden syntax is a language for encoding medical knowledge. It is used to deliver reminders or hints to clinicians regarding patient treatment recommendations like, the next clinic appointment, based on rules applied to the digitized notes and pertinent patient data stored in the system.
- **Claims Attachment** - Claims Attachments goal is to support the implementation of Health Insurance Portability and Accountability Act (HIPAA) requirements for submitting additional information required for processing a healthcare claim.
- **Electronic Health Record/Personal Health Record -** The HL7 EHR system functional model provides a reference list of functions that can be present in an EHR-S.

# Types of HL7 standards (2 of 3)



- **CCOW (Clinical Context Object Workgroup)/ Visual Integration -** Visual integration messages are an interoperability specification for visual integration of applications that allow users to experience an integrated computer-user session on the desktop. CCOW is the primary standard protocol in healthcare to facilitate a process called "Context Management." Context Management is the process of using particular "subjects" of interest (e.g., user, patient, clinical encounter, charge item, etc.) to 'virtually' link disparate applications so that the end-user sees them operate in a unified, cohesive way.

- **Clinical Document Architecture (Version 3 based standard) -** CDA provides an exchange model for clinical documents (such as discharge summaries and progress notes) and brings the health care industry closer to the realization of an electronic medical record. A CDA can contain any type of clinical content -- typical CDA documents would be a Discharge Summary, Imaging Report, Admission & Physical, Pathology Report and more. The most popular use is for inter-enterprise information exchange, such as is envisioned for a US Health Information Exchange (HIE).

- **Structured Product Labelling (V3 based standard) -** The Structured Product Labelling (SPL) specification is a document mark-up standard that specifies the structure and semantics for the regulatory requirements and content of product labelling.

# Types of HL7 standards (3 of 3)

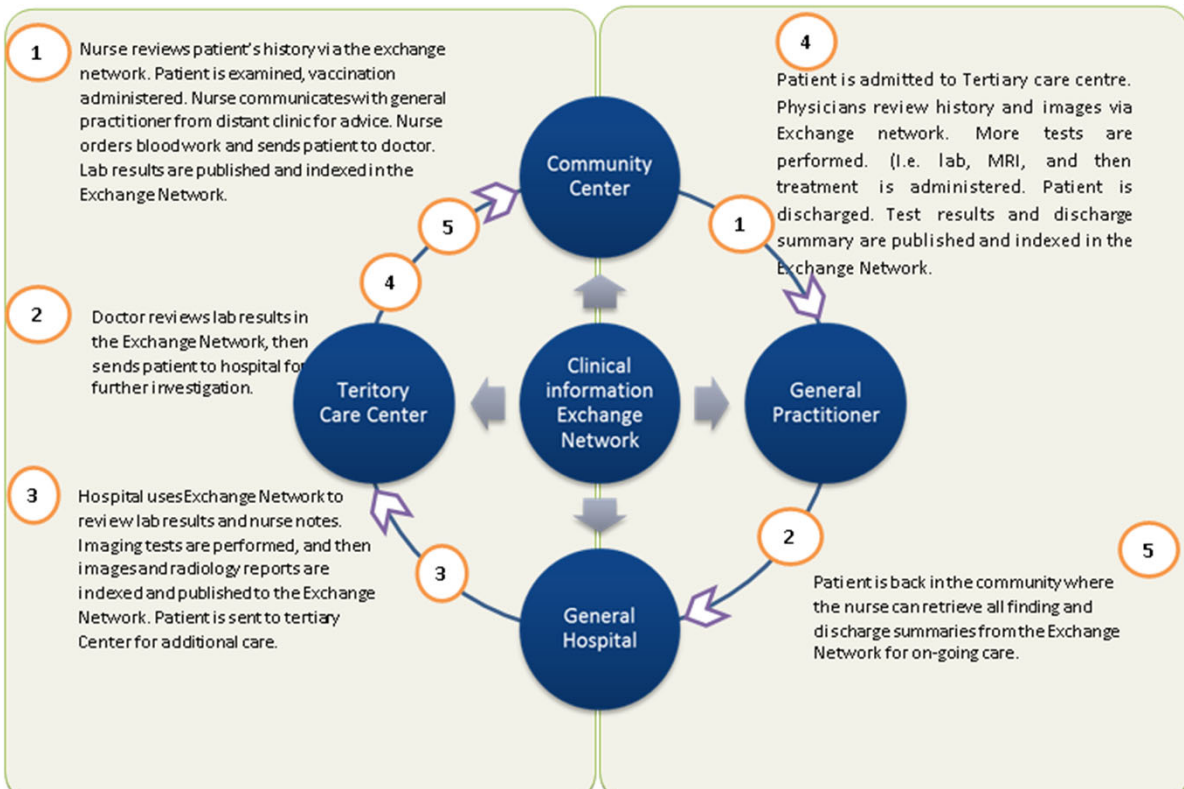


- **Reference Informational Model (RIM)** - The RIM is the cornerstone of the HL7 Version 3 development process. An object model created as part of the Version 3 methodology, the RIM is a large, pictorial representation of the HL7 clinical data (domains) and identifies the life cycle that a message or groups of related messages will carry. It is a shared model between all domains and, as such, is the model from which all domains create their messages.

- **Minimal Lower Layer Protocol (MLLP)** - A large portion of HL7 messaging is transported by Minimal Lower Layer Protocol (MLLP), also known as Lower Layer Protocol (LLP). For transmitting via TCP/IP, header and trailer characters are added to the message to identify the beginning and ending of the message because TCP/IP is a continuous stream of bytes.

# Information Exchange Network





# Unit summary



**Having completed this unit, you should be able to:**

- Define vertical open standards within the context of specific industry
- Describe the characteristics of the Health Care vertical
- List out the various functions and processes of IT within Health Care
- Understand the role of Health Care Standards
- Explain HL7 standards and list out the types of HL7 standards

Welcome to:

## Unit 5 – Introduction to Retail Vertical

# Unit Objectives



After completing this unit, you should be able to:

- Define retail
- Describe the application of IT in the retail industry
- Understand the need for standards in retail information technology
- List out the standards in the retail industry

# Introduction to Retail



- Retail is the sale of goods and services from individuals or businesses to the end-user.
- Retailers are part of an integrated system called the supply chain. A retailer purchases goods or products in large quantities from manufacturers or directly through a wholesaler, and then sells smaller quantities to the consumer for a profit.
- Retailing can be done in either fixed locations or online. Online retailing, a type of electronic commerce used for business-to-consumer (B2C) transactions and mail order, are forms of non-shop retailing.

# Information requirements in retail (1 of 2)

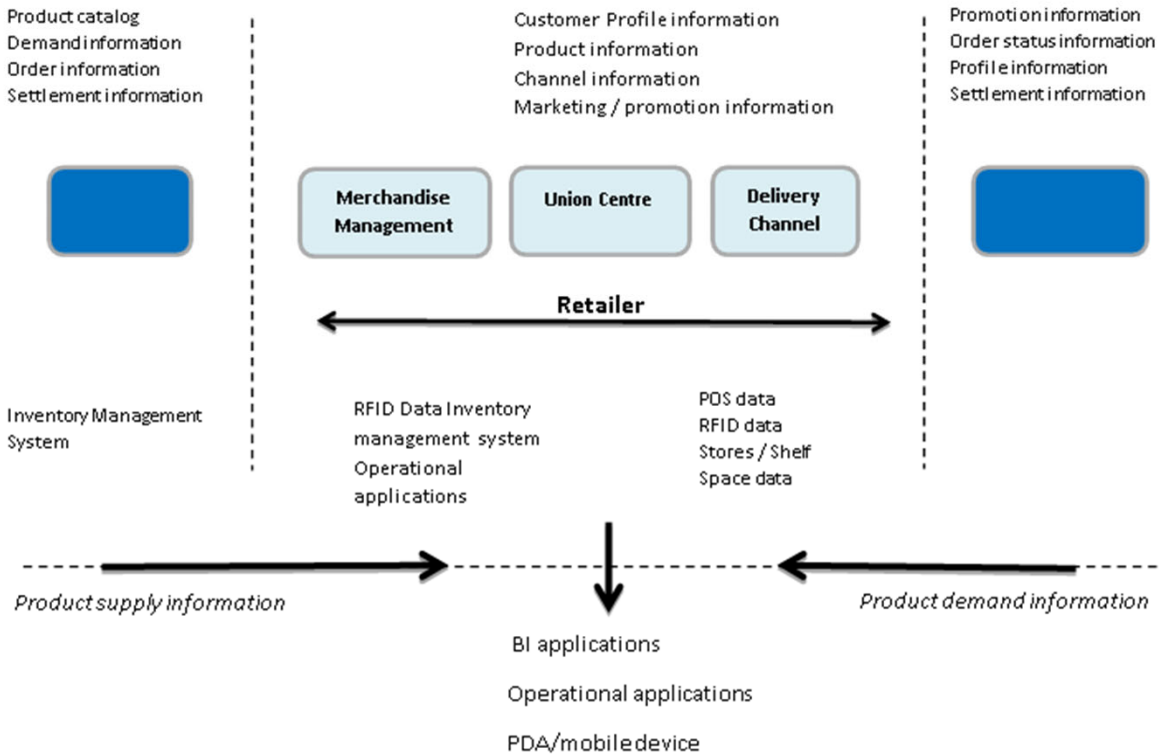


- The important information needs of the retail organization also form the basis for success factors in the retail business. Some of the key information items for the retail organization are:

1. Product information – catalog, availability, new releases, promotion, supply and demand etc.
2. Customer information – profile, behavior, activities, preferences, distribution etc.
3. Operations information – logistics, allocation, procurement, schedule, inventory, shelf space etc.

# Information requirements in retail (2 of 2)





# Application of IT in the retail industry



- Though not a leading adopter, retail industry has been steady in its acceptance of emerging technologies, chiefly because of critical business benefits.

- Generally, the areas of technology innovations for achieving competitive advantage in the retail industry are supply chain and customer interactions.

- Supply chain competences enable retail organizations to lower costs and provide better responses to customers, ensuring profitability of the business.

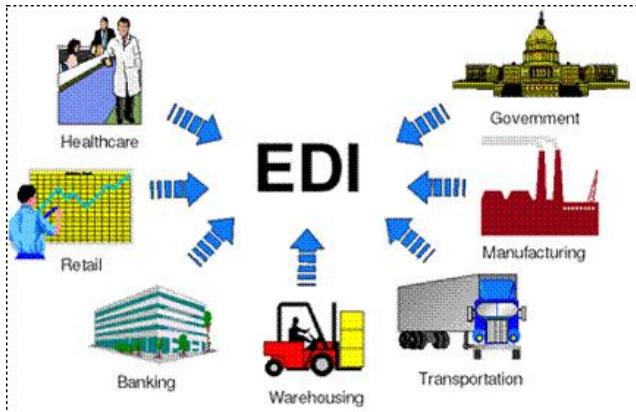
- The possibility of linking the suppliers to the end consumers with a strong chain of information can lead to optimizations and better response times in the entire retail business (collaborative planning, forecasting and replenishment.

# EDI in Retail



- Historically, the adoption of technology in the retail industry for supply chain integration started with EDI (electronic data exchange).

- EDI over proprietary and expensive VAN (value added networks) was the revolutionary efforts 20 years back, in achieving automation of supply chain interactions with the suppliers and the distributors, stores and customers, which was the birth of B2B e-commerce.




- Emergence of the internet with its unique features like user friendliness, open connectivity, global presence and economic value provided a superior alternative to VANs.

- Multiple channels like fax, telephone, mail orders, catalogs, etc. provided superior customer interaction and response.

# Emergence of e-commerce

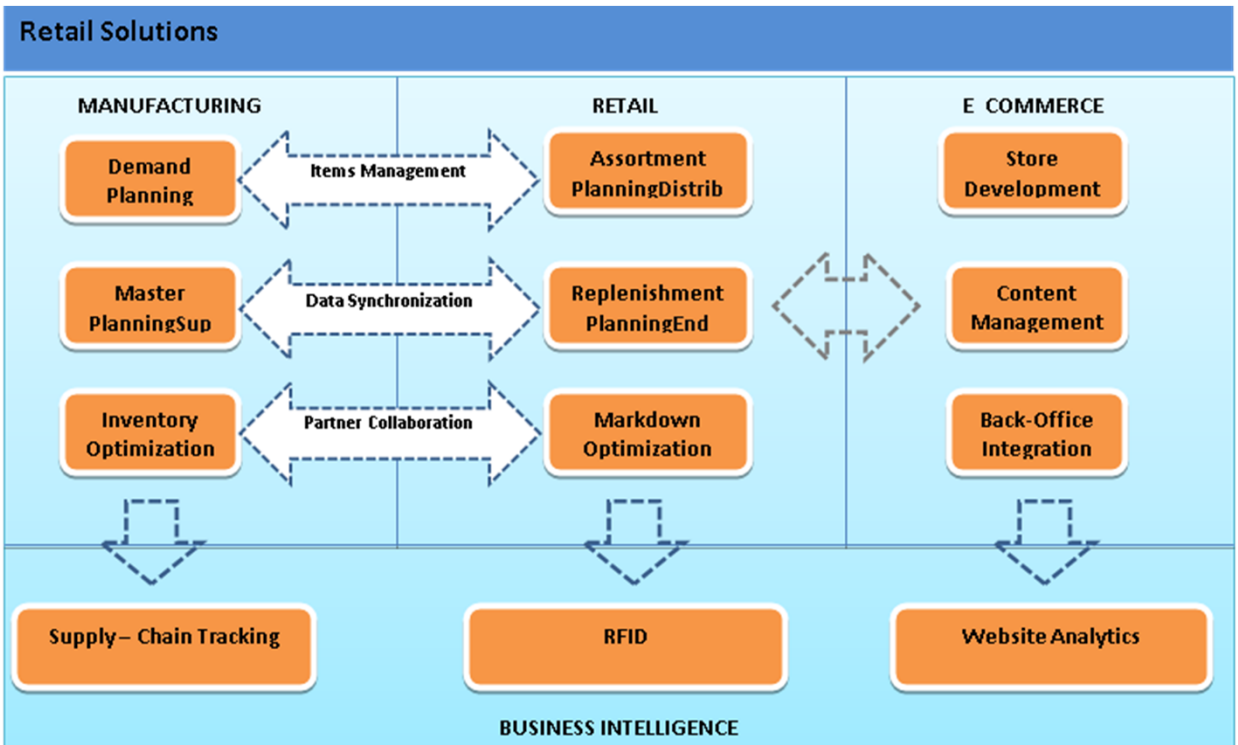


- Internet became another channel of delivery in terms of information and business transactions and it led to B2C e-commerce.

- Emergence of the Internet as a delivery channel (more choice, unique experience, real time response, enhanced post sales service, convenience, customized service etc.) combined with other factors like changing demographic compositions and new types of products (digital products – airline tickets, hotel reservation, etc.) and markets (virtual communities) led to the consolidation of e-commerce and a supportive infrastructure across the entire supply chain. This led to the emergence of e-business.

# Data in Retail





# Need for Standards in Retail IT



- The retail industry could also flourish since standards enable customer satisfaction and cost reduction which is an inherent requirement in retailing.
- But typically retailers have complex legacy IT environment which inhibits easy flow of business critical data across the organization.
- However adoption of interoperable standards for diverse applications can ensure effective and efficient communication of retail data and can also affect bottom line positively.
- Using standards based solutions means technology independent application of hardware and software which does not have a lock-in to a particular vendor and best of breed solution could be utilized to improve customer service and satisfaction.

# Standards for Retail Industry



- There are a number of standards that are becoming increasingly common in the retail industry.
- A few standards organizations that are dedicated to Retail industry are:
- ARTS
- OAGI
- GS1
- ROSETTANET
- SCOR

# ARTS (Association for Retail Technology Standards)



- The Association for Retail Technology Standards (ARTS) of the National Retail Federation (NRF) is an international membership organization dedicated to reducing the costs of technology through standards.
- It's the only organization dedicated to standards for retail. Their focus is on standards for SOA, and has made a lot of progress with standards adoption across the globe.
- Since 1993, ARTS has been delivering application standards exclusively to the retail industry. ARTS offer four standards to retailers:

1. The Standard Relational Data Model
2. UnifiedPOS
3. ARTS XML
4. Standard RFPs (in partnership with NRF)

# ARTS Data Model

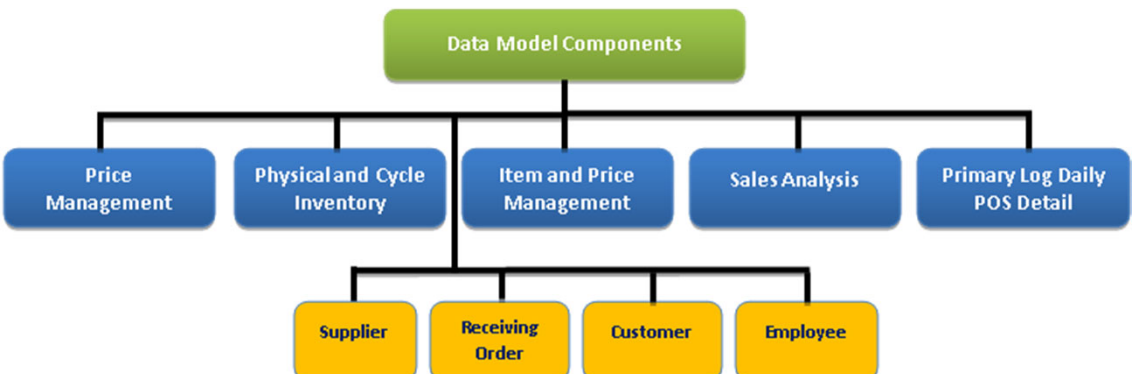


- The ARTS Operational Data Model and the ARTS Data Warehouse Model provide retailers and vendors with mature data architecture for developing retail business solutions.
- The *ARTS Operational Data Model* represents a relational transaction-oriented view of retail enterprise data.
- It is normalized and designed to support the day-to-day transactional functions performed by a retail enterprise. This model is referred to the Operational Data Model.
- The ARTS Data Model contains 650 tables with more than 4,500 fully defined data elements.
- The Model encompasses all key segments of retail providing the data architecture to organize the entire retail enterprise:

1. Merchandising
2. Inventory
3. Ordering
4. Reports
5. Workforce
6. CRM
7. POS

# ARTS Operational Data Model





# ARTS Data Warehouse Model (DWM)



- ARTS Data Warehouse Model (DWM), complements the ARTS Operational Data Model, supports reporting for decision making and analysis.
- The creation of ARTS Data Warehouse model reflects the separation of transactional databases from reporting/analytic databases.
- Both ARTS Operation Data Model and ARTS Data Warehouse Model provide retailers with a comprehensive, mature basis for:

1. Building integrated retail business applications
2. Developing specifications for acquiring retail applications and retail-oriented enterprise resource packages
3. Helping application developer and analysts understand basic retail business principles and terminology
4. Providing guidance for developing retail business policies by providing formal rules and definitions
5. Creating a canonical data model for integrating legacy application data that may reside in many different databases and formats
6. Selecting commercial off-the-shelf retail solutions
7. Designing a strategy to map operational data to a data warehouse structure

# ARTS XML and UnifiedPOS



- **ARTS XML -** ARTS XML (Formerly IXRetail) has developed numerous standard XML schemas.
- ARTS XML builds on the ARTS Data Model to develop standard XML schemas and message sets to ease Application to Application (A to A) integration within a retail enterprise.

- **UnifiedPOS -** UnifiedPOS is the acronym for Unified Point of Service.
- It is an architectural specification for application interfaces (API's) to point-of-service devices that are used in the retail environment.
- This standard is both operating system independent and language neutral and defines:

1. An architecture for application interface to retail devices
2. A set of retail device behaviors sufficient to support a range of POS solutions

# Standard Requests for Proposals (RFPs)



- The retailer members of ARTS decided that standardizing request for price quotations (RFPs) would be a way to save the retailer community time and effort, by providing a starting place for the development of individual RFP documents.
- Although not an IT standard in the traditional sense, this effort has become very popular, and retailers have contributed RFPs that they have published in the past, as input to these standard documents.

- RFPs are currently available in the following areas:

1. Business Intelligence (BI)
2. Cloud Computing Solutions Standard
3. LP Exception Reporting
4. Master Data Management
5. POS v2.0
6. Signature Capture and Online/Offline Debit Solutions
7. Warehouse Management Systems
8. Workforce Management Systems version 2.0

# Some RFP Areas



- **Business Intelligence (BI) -** Business Intelligence (BI) is the process of transforming raw data into useful information that improves decision-making. This RFP is intended for Retail general use, business intelligence applications that are adaptable to dynamic business environments.

- **Cloud Computing Solutions Standard -** This RFP presents a comprehensive list of features and functions that retailers, based on experience, have found valuable in Cloud Computing solutions.

- **LP Exception Reporting -** Loss Prevention is the third in a series of standard RFP's being created by NRF and ARTS to provide retailers a guide for selecting computerized applications and to provide vendors a develop guide for creating applications that meet retailer requirements. NRF and ARTS RFP's are provided in a form and format to allow retailers to easily tailor the standard RFP to their specific business requirements.

- **Master Data Management –** It is a process that spans all organizational business processes and application systems. It provides the ability to create a consistent, accurate, and timely "system of record" for the core master data elements. It also can provide the ability to more efficiently make and manage changes to master data as the needs of the business change.

# Other Retail Standards



- **OAGi - Open Application Group Integration** – works across industries on XML standards for B2B and A2A integration. As part of that work, the retail adoption of relevant standards globally becomes critical and contributes to the common object model for SOA in retail.
- **GS1 -** GS1 organizations focuses on barcode standards (e.g. UPC code), obviously an important requirement for retailers. They also work on GDSN - supply chain item synchronization - and have found success with their standards adopted by retailers globally.
- **RosettaNet -** Rosetta Net is a subsidiary of GS1 since 2002, focuses on process based supply chain messaging.
- **SCOR -** Supply Chain Operations Reference-Model, is a cross industry process reference model.
- It is a product of Supply Chain Council (SCC), an independent, non-profit, global corporation with membership open to all companies and organizations, interested in applying and advancing the state-of-the-art in supply chain management systems and practices.
- It enables users to address, improve and communicate supply chain management practices.

# Conclusion



- Information technology architecture built on established standards provides the flexibility and speed, required to implement new applications or review existing ones to support new retail requirements and innovations.
- Implementing standards reduces risk, increases choices, accelerates development and saves money.
- Retail Solution Providers choose the ARTS Data Model as a Standard, because it allows them to:

1. Provide a defined structure of 650 tables with more than 4,500 data elements
2. Develop proven and established best-of-breed solutions
3. Integrate a solution easily with other software conformant applications and hardware platforms.
4. Respond quickly to evolving priorities of retailers
5. Focus more resources on developing easy-to-use, intuitive user interfaces

# Unit summary



**Having completed this unit, you should be able to:**

- Define retail
- Describe the application of IT in the retail industry
- Understand the need for standards in retail information technology
- List out the standards in the retail industry

Welcome to:

## Unit 6 – Introduction to Insurance Vertical

# Unit Objectives



After completing this unit, you should be able to:

- Define Insurance and its types
- Describe the information requirements in the Insurance Business
- Explain the application of IT in the Insurance Vertical
- List some of the IT applications used in the Insurance industry
- Understand the need for standards in insurance industry
- List some of the standards of the Insurance Industry

# What is Insurance?



- Insurance is a form of risk management primarily used to hedge against the risk of a contingent, uncertain loss.
- Insurance is defined as the equitable transfer of the risk of a loss, from one entity to another, in exchange for payment.
- An insurer is a company selling the insurance; the insured, or policyholder, is the person or entity buying the insurance policy.
- The amount to be charged for a certain amount of insurance coverage is called the premium.
- Risk management, the practice of appraising and controlling risk, has evolved as a discrete field of study and practice.

# Insurance as a business



- Insurance is a commercial enterprise and a major part of the financial services industry, but individual entities can also self-insure through saving money for possible future losses.

- The business model is to collect more in premium and investment income than is paid out in losses, and to also offer a competitive price which consumers will accept. Profit can be reduced to a simple equation:

**PROFIT = EARNED PREMIUM + INVESTMENT INCOME - INCURRED LOSSES - UNDERWRITING EXPENSES**

- Insurers make money in two ways:

1. Through underwriting, the process by which insurers select the risks to insure and decide how much in premiums to charge for accepting those risks;

2. By investing the premiums they collect from insured parties.

# Types of Insurance



1. Life insurance
2. General insurance
3. Health insurance
4. Automobile/Vehicle insurance
5. Property insurance
6. Fire insurance

# Regulation of Insurance



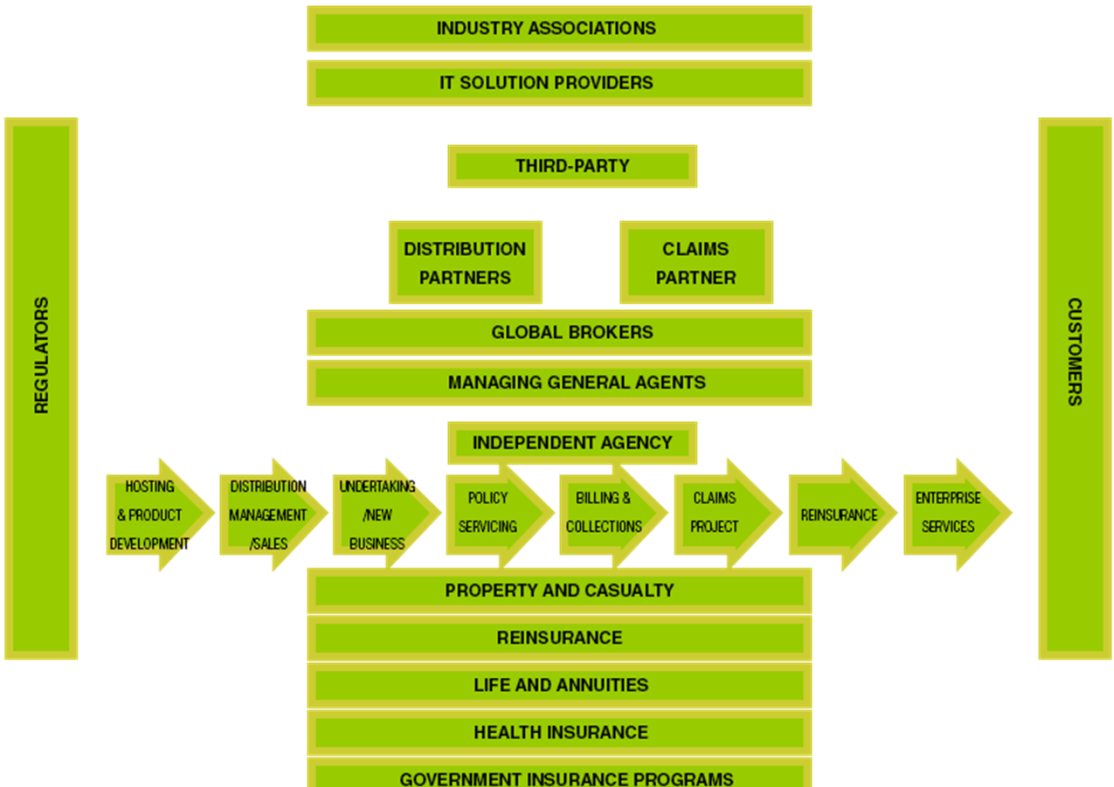
- In the United States, insurance is regulated by the states and a nonprofit coalition of state insurance agencies called the National Association of Insurance Commissioners works to harmonize the country's different laws and regulations.

- In the European Union, the Third Non-Life Directive and the Third Life Directive, both passed in 1992 and effective 1994, created a single insurance market in Europe and allowed insurance companies to offer insurance anywhere in the EU (subject to permission from authority in the head office) and allowed insurance consumers to purchase insurance from any insurer in the EU.

- In India, IRDA is the insurance regulatory authority. As per the section 4 of IRDA Act' 1999, Insurance Regulatory and Development Authority (IRDA), was constituted by an act of parliament.

# Participants in the Insurance Industry





# Information requirements in Insurance Business (1 of 2)

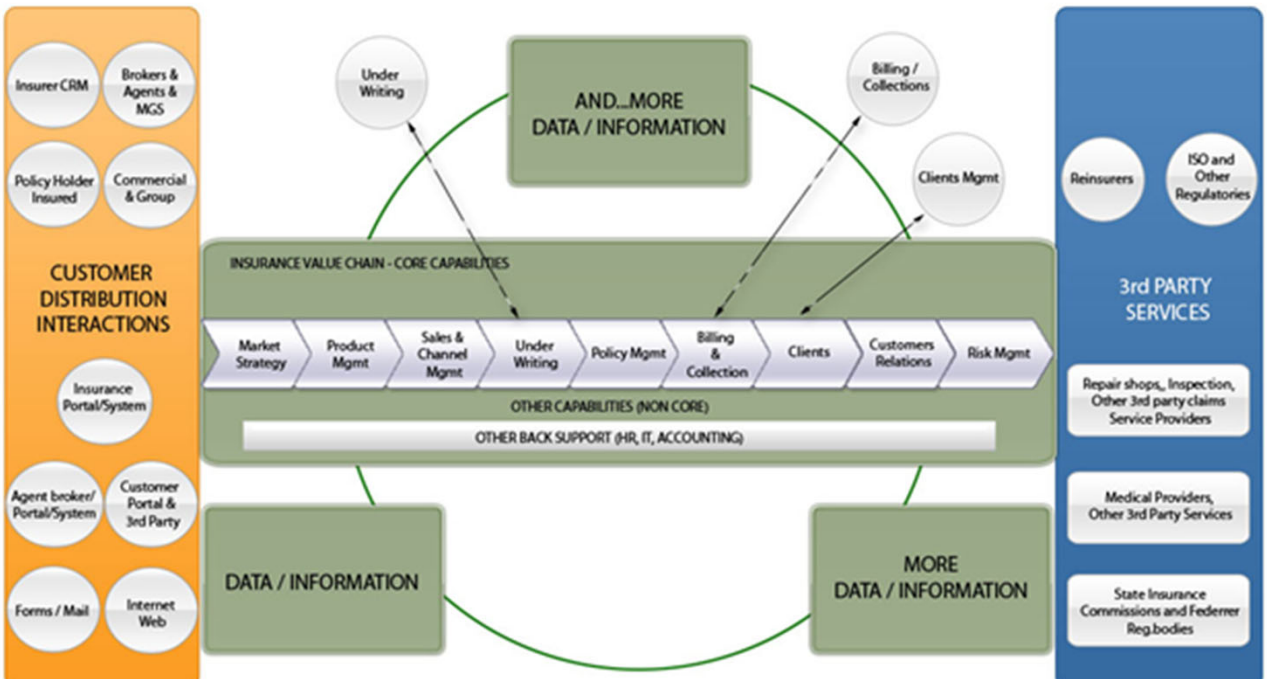


- Some of the key information items for the insurance company's are,

1. Client/customer data
2. Policy/Product details
3. Actuarial data
4. Underwriting & rating information
5. Claims details
6. Beneficiary data
7. Payment information
8. Regulatory information

# Information requirements in Insurance Business (2 of 2)





# Application of IT in Insurance Vertical



- There was a time when the insurance industry was a pioneer in the use of information technology.
- Insurers were early adopters of computer technology principally because their work requires collecting large amounts of data and processing it according to the rules associated with an insurance policy.
- The industry since has lived with a “technology idler" tag in the intervening years.
- But the latest focus of insurance company spending, suggests that not only the insurance industry shaking off its laziness reputation through the adoption of emerging technologies, but that the data-intensive character of the industry may encourage future leadership in data management and analysis.

# How does IT help?



- Information technology could help insurance firms to:

1. Ensure consistency across all product, policy, distribution, and other data systems
2. Improve service delivery by unifying, validating, and enhancing customer details across multiple product lines
3. Increase the accuracy of risk assessment for more profitable policy rating and pricing
4. Optimize loss prevention through better detection of fraudulent and suspicious claim activity
5. Define and enforce data handling and management standards throughout the organization
6. Increase customer acquisition, retention, and value through greater visibility into prospect and client demographics, behaviors, and activities

# Applications of IT in Insurance Sector (1 of 2)



- **Database management systems** - For the insurance industry, data and documents are important, as the industry significantly depends on the promises made on paper that are ultimately recorded into the databases.
- **Data Warehousing** - In insurance sector, a data warehouse can produce a composite customer view by linking customer information across lines of business.
- Relative analysis and profiling can generate symbolic portfolios of insurance coverage.
- Gap analysis helps in identifying customers who have potential needs.
- **Business Intelligence reporting tools -** Insurance companies need to utilize de BI, by implementing data warehouses that pull information from existing legacy systems into a customer information database.
- Such BI will equip the insurance managers with the ability to allow for customized products and services that are in line with customers requirement.

# Applications of IT in Insurance Sector (2 of 2)



- **Mapping** - Mapping helps to meet different needs, such as identifying loss prone areas or geographic claim analysis can use mapping technology.
- It helps the insurers to analyze the extent of the mapping network, and the insurer can determine the extent of agency force present in a particular area.
- Mapping technology further helps in designing the improved societal and governmental support, by understanding the major gaps in the form of policy.
- **Catastrophe models -** Computer-aided calculations to approximate the losses sustained due to a catastrophe like hurricane or earthquake.
- Cat modeling is particularly applicable to analyze risks in the insurance industry.
- **Actuarial investigation -** Insurers depend on the rates of actuarial models to decide the quantity of risks which create loss.
- Insurance organizations can use new technologies, to analyze the claims and policyholder's data for providing connection between risk characteristics and claims.

# Data quality and consistency



- In addition to customer wants and needs, business strategies, marketplace demands, and regulatory requirements have further increased the importance of business process management, data quality, and consistency. Consistent data and information are also needed to support a diverse set of business goals that include:

1. Mergers and acquisitions
2. Consistency in cross-channel marketing campaigns
3. Shortened product development cycles required by changing market demands
4. Real-time product/price comparisons to improve closure rates and to adapt to demographic shifts
5. The use of external and internal data to improve risk selection, segmentation, and exposure analysis
6. An increase in the number of closed-book outsourcing deals
7. More accurate settlement of claims, including subrogation and recovery
8. A continued single view of the customer, independent of customer touch point
9. Easier compliance with changing regulatory requirements for all insurance parties

# Need for Standards in Insurance Vertical



- The insurance industry as a whole faces numerous challenges. As an industry based upon data, the way that we communicate that information can be crucial to solving these business challenges.

- One of the primary ways to facilitate data flow is through standards. Gaining a thorough understanding of what standards are and how they impact the business is essential. One needs to know how they address specific needs and support initiatives.

1. Data standards provide the lifeblood of the industry to each player - reliable data

2. Quality data helps to address the majority of the industry's concerns

3. Standards make data management simpler and more reliable

4. A reliable data standard allows all companies to focus on their core concerns

# Challenges in Insurance Industry



- The Insurance industry faces specific challenges and standards can help ease those pain points and
  support efforts.

1. Insurance is about assessing and pricing risk. Standards help to minimize the errors in estimation.

2. The industry is facing increasing levels of regulation. Standards help to make regulatory reporting more accurate and less burdensome.

3. The industry is facing shareholder pressure to find greater efficiencies and increasing pressure from customers for faster turnaround of contracts and payments.

- This leads to a demand for electronic trading for which data, messaging and process standards are essential.

- Standards enable straight-through-processing (STP - enables the entire trade process for capital markets and payment transactions to be conducted electronically without the need for re-keying or manual intervention, subject to legal and regulatory restrictions ) which reduce manual intervention, human error and lag times.

4. The industry is facing increasing competition from the capital markets in terms of Calamity Bonds and from a shrinking market brought about by self-insurance. Standards deliver better data which itself can be the basis of capital risk transfer.

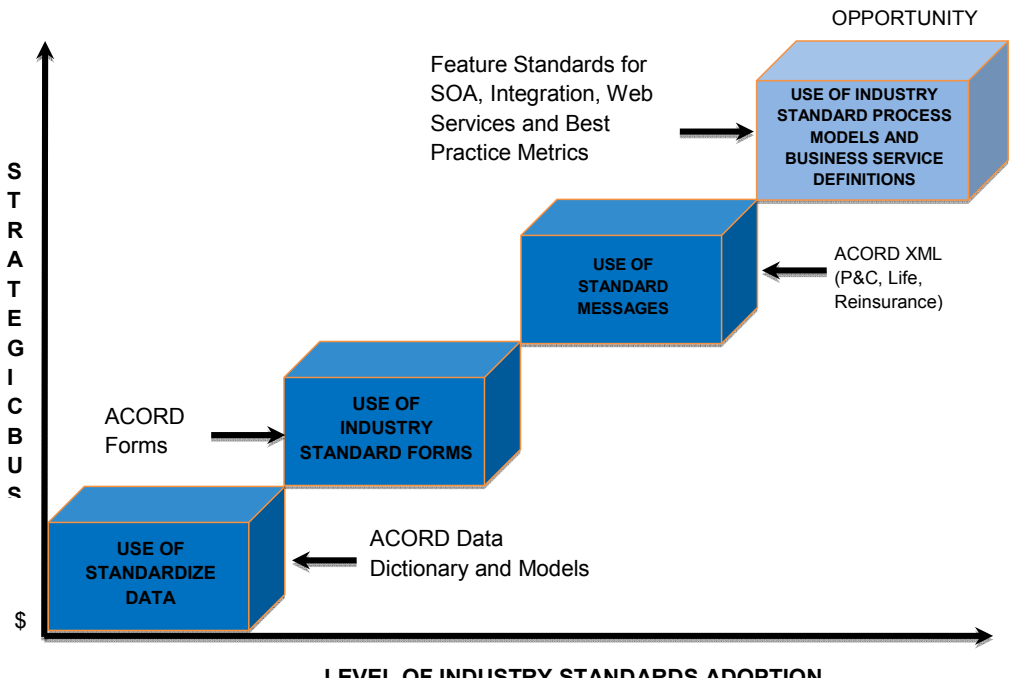
# Standards for Insurance Industry



- ACORD (Association for Cooperative Operations Research and Development) is a global, nonprofit standards development organization established in 1970, serving the insurance industry and related financial services industries.
- ACORD's mission is to facilitate the development of open consensus data standards and standard forms.
- ACORD is the recognized international authority on Insurance data standards and operates in three areas of the global Industry: personal lines and small commercial; large commercial and reinsurance; and life insurance and reinsurance.
- ACORD also works with domestic standards bodies where they exist.
- Aim of ACCORD is to improve industry efficiency by developing, maintaining and encouraging implementation of standards (such as standard electronic messages and standard paper forms).
- ACORD splits its activities into three programs; Reinsurance and Large Commercial Insurance (RLC), Property, Casualty and Surety (PCS) and Life, Annuity and Health (LAH).

# ACORD Standards





# ACORD Forms (1 of 2)



- ACORD Forms are used by agents, distributors and brokers, and solution providers. They are supported by insurers, reinsurers and regulatory bodies. Standardized ACORD Forms streamline workflows, reduce errors and increase efficiency.

- There are currently more than 800 ACORD Forms for Property, Casualty and Surety and for Life, Annuity, and Health lines. In the U.S. ACORD monitors state and federal insurance regulatory activity and updates the forms to ensure compliance.

- **Formats**

1. Static PDF
2. Fillable IBM or Adobe
3. eForms

- ACORD Forms are available as static forms and in fillable formats to integrate with your systems. ACORD eForms allow data to be extracted from the forms for re-use including repopulating other forms.

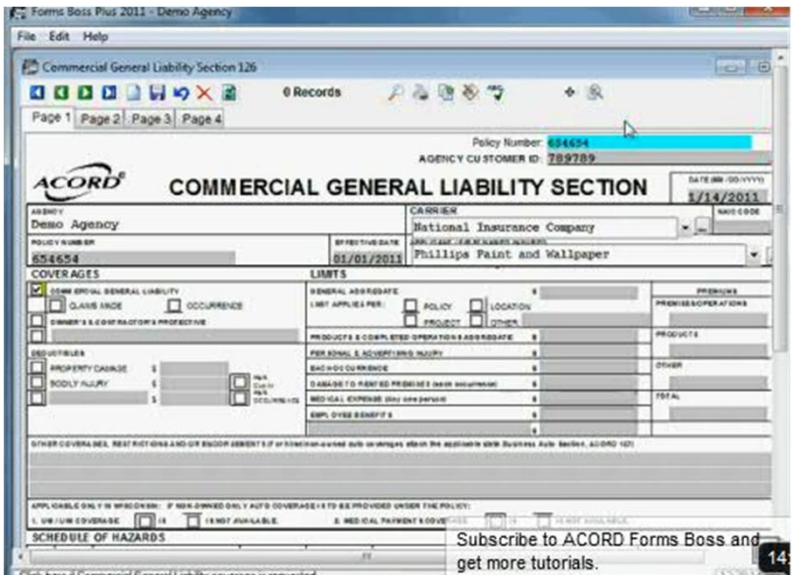
# ACORD Forms (2 of 2)



- **Viewers**

1. IBM
2. Adobe

- To use ACORD fillable forms, it is necessary to download and install the free viewer in the appropriate format



# ACORD P&C XML



- XML data message standards for personal and commercial U.S. Property & Casualty insurance lines for all market participants. The Standard provides a comprehensive P&C insurance vocabulary for industry workflows.

1. Schema for machine use

2. Business specifications for human use

- The P&C Standard supports hundreds of XML messages including the following primary categories: Accounting, Claims and Commercial and Surety.

# ACORD P&C AL3 & ACORD L&A XML



- **ACORD P&C AL3 -** A classic Electronic Data Interchange (EDI) format, that provides carrier-to-agency insurance policy activity information for personal and commercial U.S. Property & Casualty insurance data.

1. AL3 Specification database for machine use
2. Data dictionary for human use

- **ACORD L&A XML -** XML global data model and message standards for life, disability, long term care protection insurance and insured annuity and retirement income products for all market participants. The Standard provides a consistent means for insurers, distributors, vendors and regulators to share and exchange product, policy and participant information for all industry workflows.

1. Schema for machine use
2. Business specifications for human use
3. The L&A Standard supports the entire Life value chain for all forms of mortality and morbidity products for insurer, distributor/broker and solution provider needs

# ACORD Reinsurance XML



- An XML structured representation of global reinsurance data, including placing through to claim, for cedants and reinsurers.
- Schema for machine use
- Business specifications for human use
- The Reinsurance Standard supports XML messages in the following areas:

1. Account Settlement
2. Catastrophic Exposure
3. Placing

- ACORD XML for Reinsurance addresses real-time requirements by defining business transactions that include both request and response messages for Personal Lines, Commercial Lines, Surety, Claims, and accounting transactions.

# ACORD Reinsurance XSL



- A formalized spreadsheet (XSL) representation of reinsurance data

1. Catastrophic Exposure
2. Delegated Authorities Exposure

- Spread-sheets are a common way of communicating data among companies. However, inconsistencies between companies and formats make the data sharing more difficult and time consuming than necessary.
- These spread-sheets provide the insurance industry with easy to implement and standardized vehicle to move exposure data in a consistent, reliable manner.
- They provide standardized data definitions, column headings, codesets, and completion guidance.

# ACORD Reinsurance EDI & ACORD Workers Compensation Reporting XML



## ACORD Reinsurance EDI

- A classic Electronic Data Interchange (EDI) format defining numerous specific business processes for all lines of reinsurance products for cedants and reinsurers.
- The Reinsurance EDI standard is retired, and changes are no longer being accepted.
- However, ACORD continues to maintain and support implementations of the standard.

## ACORD Workers Compensation Reporting XML

- ACORD has been engaged by the Workers' Compensation Insurance Organizations (WCIO) and International Association of Industrial Accident Boards and Commissions (IAIABC) at their request to help them and other interested parties to expand upon and modernize their current limited fixed length, flat file format data standards.
- ACORD, in this case, is providing an XML alternative to the EDI messages managed by both IAIABC and WCIO.

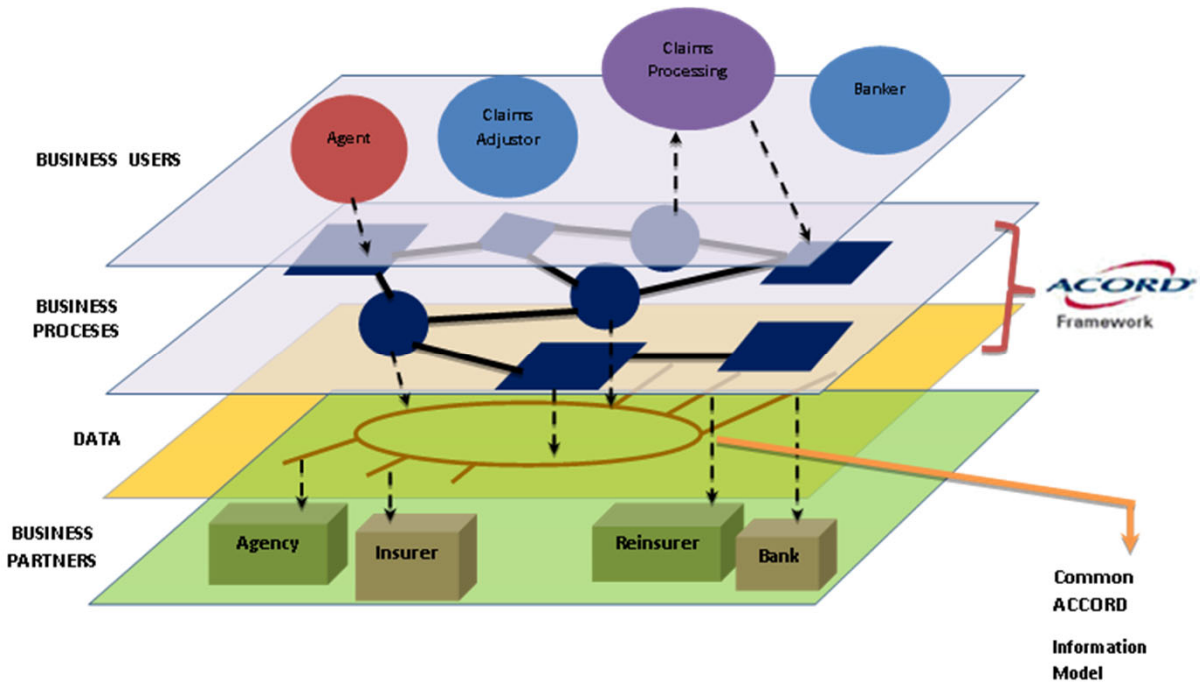
# ACORD Framework (1 of 2)



- The ACORD Framework is group of five interrelated models that collectively define the nature of the insurance industry from different perspectives.
- It covers all lines of insurance across all business processes and geographic borders and provides a comprehensive, holistic, view of insurance information.
- The ACORD Framework is available to ACORD members only.\

# ACORD Framework (2 of 2)





# ACORD Models (1 of 2)



- **Business Glossary v 1.0** - Provides business focused glossary of terms and definitions for the entire insurance industry. It provides a common language for both business and technology stakeholders and aligns with definitions found across the various data standards

- **Capability Model v 2.1** - Defines the common business activities and business processes insurance companies do. Used by companies to baseline their business process modeling and determine areas of innovation.

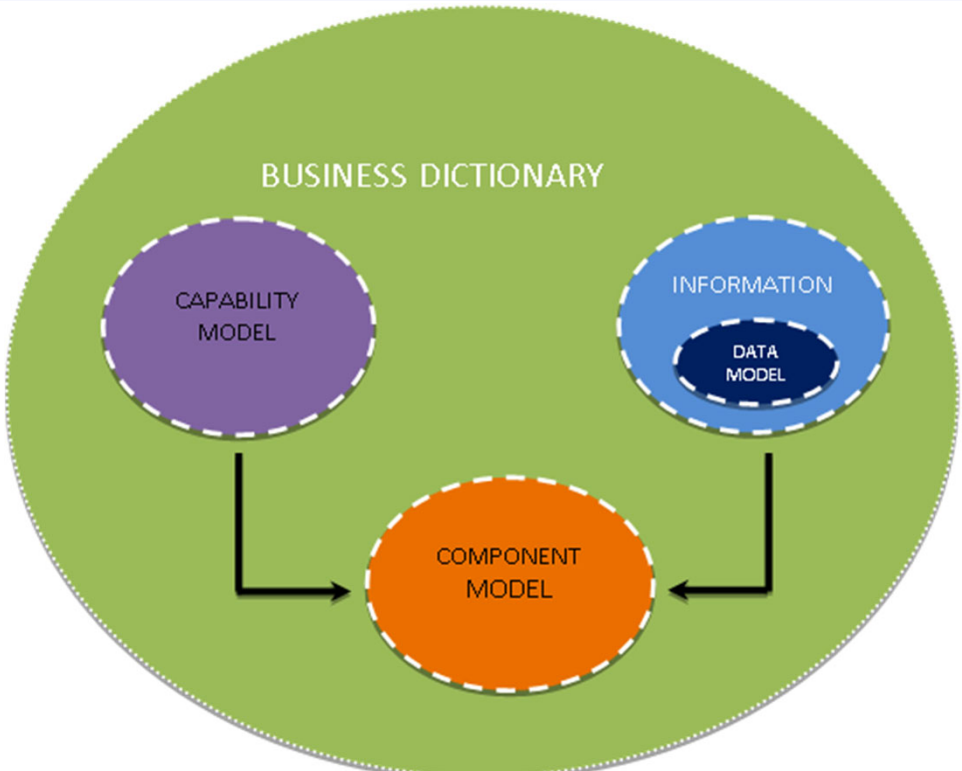
- **Information Model v 2.1 (plus standards mappings) -** Provides definitions of core insurance concepts such as Policy, Product, Party, and Claims and how these concepts relate. Used in a variety of ways, most notably as a common reference model that links various core business data areas.

- **Data Model v 1.3** - Used to validate and baseline persistence models, both operational data stores and data warehouses, across the enterprise. It gives a different view of the information Model.

- **Component Model v 1.0 -** A set of reusable component definitions and data services bridging the gap between business process and data. It provides a set of application building blocks and common service definitions; that links the data found in the Information Model and data standards.

# ACORD Models (2 of 2)





# Government Affairs



- ACORD has relationships with insurance regulators across the world.
- In the United States, ACORD works with the National Association of Insurance Commissioners (NAIC), and reaches out to the specific insurance regulators in each of the states who approve ACORD forms as required by law.
- A number of ACORD's U.S. members are using ACORD XML messages to submit data on insured and uninsured motorists to specific state Departments of Motor Vehicles.
- When new information is needed for regulatory reports, ACORD coordinates with its partners to suggest ways to leverage the efficiencies of using data standards or forms.
- ACORD is an observer to the International Association of Insurance Supervisors (IAIS), and continues to develop efficient and standardized ways for regulators to view insurance data wherever need arises
- **Today ACORD standards are widely used by brokers and underwriters for Accounting, Settlement and Claims processing.**

# Unit summary



**Having completed this unit, you should be able to:**

- Define Insurance and its types
- Describe the information requirements in the Insurance Business
- Explain the application of IT in the Insurance Vertical
- List some of the IT applications used in the Insurance industry
- Understand the need for standards in insurance industry
- List some of the standards of the Insurance Industry