Information Sharing for e-Government

Models of information sharing in government

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Models of information sharing in government

1. Model of Dawes
2. Model of Landsbergen and Wolken
3. Other related work
4. Summary
5. GISF model

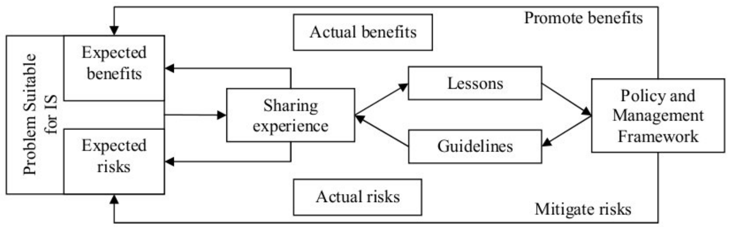
Theoretical background

- two most influential theoretical models of government information sharing were published several years ago. The first (Dawes, 1996) depicts a learning cycle of government agencies involved in the Information Sharing (IS) practice
- the model was based on the results of a survey conducted among public managers in the New York state, assessing the extent to which the IS-related benefits and barriers identified from literature were reflected in the IS practice
- the model depicts how a sharing experience is triggered by a pressing problem suitable for an IS-based solution

Theoretical background

- while the participants enter the experience with their own perceptions of potential benefits and risks, the sharing experience is shaped by the underlying policy and management frameworks of the organizational environment
- in turn, the sharing produces insights that help to improve the framework, promoting benefits and mitigating risks of future sharing experiences
- in addition to the model, information stewardship and use principles were proposed for driving the definition of IS policy frameworks

Model



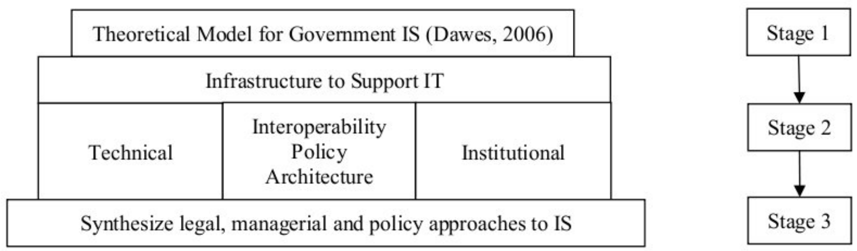
Landsbergen and Wolken

- while Dawes focuses on IS within one agency, (Landsbergen and Wolken, 2001) draws on the authors' work on interoperable systems in a networked environment
- the model puts forward an IS support infrastructure built upon Dawes, 1996 comprising three elements:
  1. technical element to ensure hardware and software compatibility, availability of standard processes and the integration of best practices into such processes;
  2. interoperability policy architecture to include meta-data infrastructure and inter-agency contracts; and
  3. a clearinghouse of best practices and a formbook of contracts to support IS

Landsbergen and Wolken

- in addition, the model identified five IS-enabling tools:
  1. meta-data to identify the presence, nature and quality of information;
  2. laws and policies to specify timing and conditions upon which government agencies should make their information available;
  3. economic and budgetary mechanisms to identify IS costs and benefits;
  4. the extent of shared information; and
  5. managerial tools to provide incentives and controls for IS processes

Model



Other related work (I)

- based on two policy principles identified by Dawes, The Insider's Guide to Using Information in Government (Center for Technology in Government, 2001) identified democratic principles as the foundation for information policies, classified into policies promoting information stewardship and policies promoting information use
- the stewardship principle recognizes information as a public good and is concerned with its accuracy, integrity, preservation and protection. The usefulness principle recognizes government information as an asset and potential benefits gained through its proper use. In upholding both principles, a government can play the roles of: regulator, collector, producer, provider and user

Other related work (II)

- (Pardo, Cresswell, Dawes and Burke, 2004), complementing theoretical models for government IS, focuses on identifying IS perspectives
- According to the technical and social processes involved in IS can be characterized according to four perspectives:
  - Technological standards, metadata, platform and application interoperability, ontologies, data quality attributes and others;
  - Organizational business and decision processes and their required adjustments;
  - Inter-organizational the creation and maintenance of inter-organizational relationships, negotiation processes, commitments, trust-building, risk-reductions, resource conflict resolution and others; and
  - Political legislations to enable collaboration and IS including economic models to help agencies identify IS costs and benefits

Other related work (III)

- (Gil Garcia et al., 2005) provides lessons learnt from studying inter-organizational information integration in the criminal justice enterprise including:
  - a classification of integration initiatives – focusing on meeting specific needs and on building capacity, while considering intra-organizational, inter-organizational and inter-governmental levels of the initiatives;
  - barriers for integration resistance to change, IT and data incompatibility, organizational diversity and multiple goals, and political complexities of the governance system; and
  - useful strategies for facilitating integration, such as retaining autonomy of the involved agencies, establishing and operating governance structures, ensuring strategic partnerships, building a comprehensive and long-range planning, building understanding of business processes, securing financial resources, and securing leadership and legislative support

Other related work (IV)

- (Gil-Garcia, Pardo, Burke, 2009) based on the study of social and technical aspects of inter-organizational information integration, identified four inter-related elements of IS: trusted social networks, shared information, integrated data and interoperable technical infrastructure
- a key requirement for trusted social networks is a clear definition of responsibilities of their members: exercise of authority, diversity of participating organizations and their goals, and experiences

Other related work (V)

- (Zheng, Yang, Pardo and Jiang, 2009) explored the meaning of organizational boundaries, identified two directions for IS – vertical and horizontal, and multiple dimensions - organization, geography, personal, development phase, and process
- combining both, they defined a theoretical framework for understanding the boundaries in IS initiatives

Other related work (VI)

- (Jing and Pengzhu, 2009) identified and classified various IS challenges in government, based on the case studies from China, resulting in a five-layered model:
  - Individual Expectations expected benefits and risks;
  - Organizational Readiness top management support, IT capacity, costs and security;
  - Inter-Agency Partnership trust and compatibility;
  - Upper-Level Managerial Agencies cross-agency collaboration and authority; and
  - External Environment laws, policies and political awareness about IS

Other related work (VII)

- finally, (Gil-Garcia, Chun, Janssen, 2009) recognizes the need for combining social and technical aspects of IS, with technical aspects including interoperability, data standards and specific technology applications, while social and organizational aspects including trust building, knowledge sharing and privacy
- the major knowledge areas for information integration include leadership, trust, perceptions and measures of success, inter-organizational relations, organizational change and governance structures (Pardo and Tayi, 2007)

Comparison

Authors	**Initiatives**	**Focus**	**Perspective**	**Tool**
Dawes	Intra-organizational IS	Principles, Benefits, Barriers	Technical, Organizational, Political	Inventories, Data definitions, Standards, Clearinghouse
Landsbergen, Wolken	Interoperable systems in networked environments	Benefits, Barriers, Infrastructure support, Legal, Policy, Managerial approaches	Technical interoperability, Policy architecture, Institutional elements	Metadata, Inter-agency contracts, Economic models, Best Practices, Contract formbook
Pardo, Cresswell, Dawes, Burke	Interorganizational IS, Technical and Social Processes	IS Dimensions, IS Components and their relationships	Technological, Organizational, Inter-organizational, Political	Metadata Inventory, Data Sharing, Agreement, Economic Model

Comparison

Authors	Initiatives	Focus	Perspective	Tool
Gil-Garcia et al.	Inter-Organizational IS, Social and Technical Aspects	Classification of IS Initiatives, Barriers, Strategies	Technical, Social	Trusted Social Networks, Interoperable technical infrastructure
Zheng et al.	Multi-organizational IS	Organizational Boundaries	Bi-directional, multi-dimensional	Theoretical frameworks for understanding IS boundaries

Comparison

Authors	Initiatives	Focus	Perspective	Tool
Jing, Pengzhu	Inter-organizational IS in China	Challenges, Five layered model	Individual, Organizational, Inter-agency, Managerial, External, Environment	IS Model
Gil-Garcia, Chun, Janssen	IS and Integration	Combination of technical and social aspects	Social, Technical	Data Standards, Trust Building, Knowledge Sharing, Privacy Regulations
Pardo, Tayi	Inter-organizational Information Integration	Knowledge areas	Organizational or Inter-organizational governance	Trust, Leadership, Success measures, Inter-agency relations, Organizational change

GISF

- we now introduce the model Government Information Sharing Framework (GISF) introduced in (Estevez, Fillottrani, Janowski, 2010)
- the framework comprises two views:
  - the GISF Abstract View
  - the GISF Detailed View

GISF Abstract View

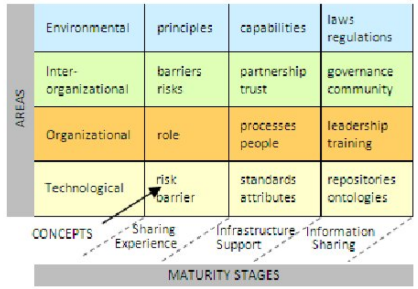
- the GISF Abstract View includes two perspectives
- one (vertical axis) represents four dimensions identified in (Pardo, Cresswell, Dawes and Burke, 2004), after renaming the political dimension into environmental dimension to extend its scope:
  - technological ICT-related concepts supporting or affecting IS;
  - organizational elements of an organization supporting or relevant to IS;
  - inter-organizational IS-related concepts concerning several organizations; and
  - environmental the environment affecting government IS, usually addressed at the political level

GISF Abstract View

- the second perspective (horizontal axis) identifies three maturity stages of government IS:
  - sharing experience the concepts that should be considered in early stages of government IS, serving to lay the foundations for government IS;
  - infrastructure support the concepts referring to the shared components accessible to the whole public administration, like infrastructure components, IS facilitation and promotion, etc.; and
  - information strategy the concepts defining the information sharing environment

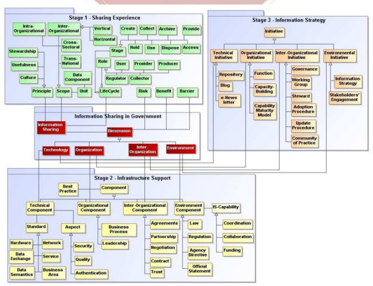
GISF Abstract View

- at the intersection of both perspectives (areas and stages), we have the relevant IS concepts

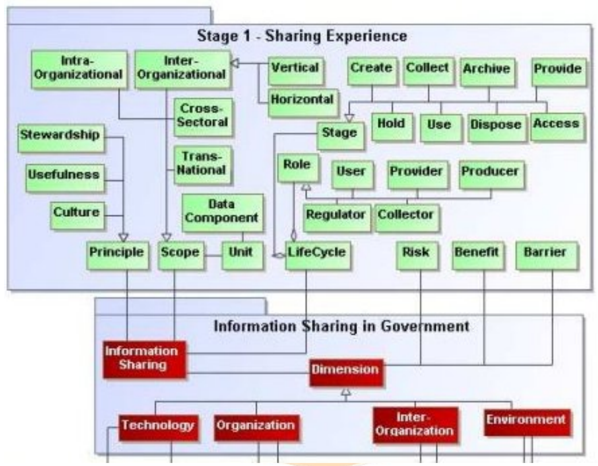


GISF Detailed View

- the GISF Detailed View identifies the concepts within IS dimensions and maturity stages
- the model is divided in four packages: one for each maturity stage (horizontal axis), and a global Information Sharing in Government package containing the dimensions (vertical axis)



Sharing Experience package



Sharing Experience package

- this package includes the concepts that should be considered in early stages of IS, constituting the foundations for IS
- some concepts, particularly Scope, Principle and Lifecycle are connected to the general Information Sharing concept, as they serve general purposes and cannot be analyzed from the IS dimension perspective
- the other concepts in this package, particularly Benefit, Barrier and Risk are related to the Dimension concept, providing a basis for the classification

Sharing Experience concepts: scope

- Scope determines the functional areas and organizations involved in and affected by an IS initiative, with four types identified as follows:
  - Intra-Organizational an initiative that affects all functional areas within an agency. For example, an IS initiative involving all departments of a government agency
  - Inter-Organizational an initiative involving different agencies at the same (horizontal) or different (vertical) government levels. For example, an IS initiative affecting federal, state and local government agencies (vertical)
  - Cross-Sectoral an initiative affecting different organizations from the public, private and third sectors. For example, an IS initiative involving a specific industry sector, including the government agency responsible for the sector and various private companies of this sector
  - Trans-National an initiative affecting different administrations

Sharing Experience concepts: unit and principle

- Unit an organization involved in the IS initiatives, the lowest organizational structure involved in or affected by an IS initiative. A unit has IS-related authority and responsibilities.
- Principle a comprehensive guiding assumption for government IS. Examples include:
  - Stewardship a conservative principle ensuring that government agencies work to protect the accuracy and integrity of information they collect and disseminate, and promote the fiduciary responsibility of all government agencies in managing information
  - Usefulness an expansive principle that focuses on the value of information as a public asset, for instance publishing maps of a city at the local government portal highlighting public places with wireless access;
  - Culture the recognition that IS denotes behavior and not technology (UIC, 2008). This principle emphasizes the holistic and integrated approach required for IS

Sharing Experience concepts: life-cycle

- Life-cycle identifies different activities and responsibilities required for IS. Each activity is identified as a stage and the following stages are identified:
  - Create bringing to existence new information, for example registering a new company;
  - Collect gathering or assembling information maintained by others, for example the agency responsible for public health collecting data about common illnesses detected in public hospitals;
  - Hold keeping created or collected information, for example keeping citizen records;
  - Use making use of information for a given purpose, for instance using statistics on common illnesses for designing public health policies; (5)

Sharing Experience concepts: life-cycle

- Life-cycle identifies different activities and responsibilities required for IS. Each activity is identified as a stage and the following stages are identified:
  - Archive storing information for future use, for example archiving police, arrest and criminal records of citizens;
  - Dispose destroying information, for example removing information about common illnesses detected more than ten years ago;
  - Access allowing an entity to obtain access to information, for example allowing citizens to access information related to public tenders; and
  - Provide making information available, for instance broadcasting parliament sessions online

Sharing Experience concepts: life-cycle

- while executing different activities of the information lifecycle, units play different roles:
  - Regulator ensuring compliance with IS-related laws, regulations and established rules, for example the agency acting as a regulator of intellectual property rights;
  - Collector gathering information from other entities, for example Justice collecting information from Police;
  - User making use of information, for example Immigration Departments using information provided by Police;
  - Producer producing information, for example the Statistics department collecting information on costs of living; and
  - Provider supplying information, for example the local government disseminating tourism information to visitors

Sharing Experience concepts: data component and benefit

- Data Component data representing a physical or abstract concept from the real world. For example, citizen, industry, holiday, etc. Data components are the target of IS
- Benefit refers to useful consequences of an IS initiative. Different categories of benefits are:
  - Technical a benefit that improves the efficiency of providing ICT solutions, like adopting standards and metadata that enable heterogeneous applications to exchange data;
  - Organizational a benefit addressing an organizational issue, like increasing quality, quantity and availability of data. For example, one benefit of implementing the National Spatial Data Infrastructure (NSDI) reported by the Federal Geographic Data Committee is that the savings obtained from data sharing can be used for other vital areas and that the released resources can be reallocated to quality control, data management and collection of other data (FGDC, 2006);

Sharing Experience concepts: data component and benefit

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  - Inter-Organizational a benefit received by more than one organization, like improved professional relationships or broadened collaborative networks; and
  - Environmental assisting public administration in delivering better governance, for instance better understanding of economic and demographic trends by sharing data (Dawes, 1996)

Sharing Experience concepts: barrier

- Barrier identifies a typical types of obstacles for implementing IS, such as:
  - Technical hardware and software incompatibility;
  - Organizational lack of human and institutional capacity for IS;
  - Inter-Organizational any barrier that requires the involvement of several organizations to provide a solution, like inter-agency agreements for managing shared data; and
  - Environmental a barrier related to the overall environment or governance system, for example protecting the policy-making power of administrative agencies

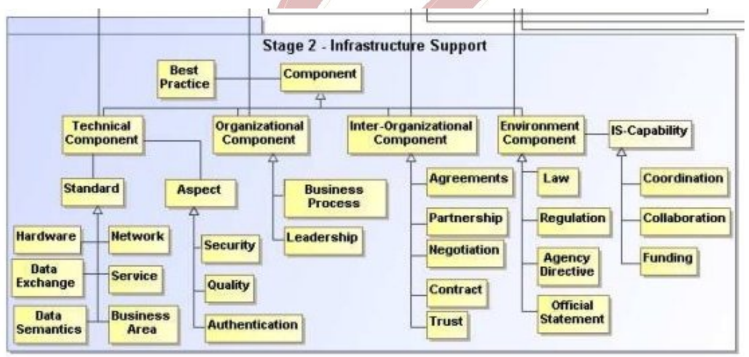
Sharing Experience concepts: risk

- Risk refers to possible threats affecting IS initiatives, classified into:
  - Technical unauthorized disclosure of sensitive or personal information managed by government, for instance the risk that a government agency discloses personal information to the spouse of a citizen without his or her permission;
  - Organizational competition for resources between agency-focused and whole-of-government demands (Dawes, 1996), for example an agency having all its IT human resources working on internal projects and not being able to allocate time for developing new joined IS projects;

Sharing Experience concepts: risk

- Risk refers to possible threats affecting IS initiatives, classified into:
  - Inter-Organizational difficulties to share values such as trust, for example an agency B duplicating processes for collecting and maintaining data that is already managed by agency A, because B has no trust in data provided by A;
  - Environmental societal consequences of not sharing government information. For example, in the USA the commission created for investigating the 9/11 attacks illustrated several examples where the lack of effective IS between Federal, State and local agencies resulted in the failure of authorities to intercept the attack (The 9/11 Commission, 2004)

Infrastucture Support package



Infrastucture Support package

- main concepts in this package are:
  - Component – an element that can be present in an infrastructure supporting IS; and
  - Best Practice a technique, methodology, practice, procedure or other element that through experience or research has been proven to reliably lead to good IS results.
  - although best practices could be relevant, their transfer requires customization to local conditions. As an example, the Federal Emergency Management Agency of the US Department of Homeland Security has created a national online network for sharing lessons learnt, best practices and innovative ideas for emergency response and homeland security. The initiative is called Lessons Learned Information Sharing (LLIS.gov)

Technical Components

- Components can be further classified following IS dimensions, with Best Practices orthogonal to all of them
  - Technical Component a solution to facilitate an ICT-related IS problem. Two types of Technical Components are Standards and Aspects
    - Standards refer to adopted conventions, protocols and rules necessary for infrastructure or software interoperability
    - Aspects refer to cross-cutting technical concerns relevant to standards, grouped into:

Technical Components: Standards

- Hardware Channel-specific standards for computers, digital TV, mobile phones, smart cards, etc. For example, the Minimum Hardware Configurations NASA Technical Standard specifying a minimum configuration to purchase software components: processors, memory, mass storage, displays, graphics cards, interfaces, sound, optical drives, network interfaces, removable storage, smart card readers, etc.;
- Network Communication and data transport protocols, for example the well-known File Transfer Protocol (FTP) standard;
- Data Exchange Standards for data representation, transformation and naming, for instance the ISO 3166 Codes (ISO, 1999) for representing the names of countries;

Technical Components: Standards

- Data Semantics Standards representing the meaning of data, for example the DoD Enterprise Architecture Data Reference Model providing definitions of 33 subject areas with definitions of the main data entities in each area;
- Service service and process description languages including access and presentation, for example BPEL4WS (IBM, 2003);
- Business Areas common business objects and standards for domain-specific transactions, for example the Business Reference Model of the U.S. Federal Enterprise Architecture (FEA) defining the lines of business (LoB) and all their supporting internal operations. Such LoBs help to focus on government functions instead of functional areas responsible for their execution, promoting collaboration across the government

Technical Components: Aspects

- Security refers to the elements supporting secure interoperation, for example security aspects considered in NZ e-GIF (NZ, 2008) to recommend Web Services Security (WSS) (WSS, 2002) as technical foundation for ensuring secure exchange of messages
- Quality ensures that the information is correct and complete, with indicators for measuring reliability and efficiency. For example, Guideline 32 of the Guidelines for Juvenile Information Sharing (OJJDP, 2006) issued by the U.S. Office of Juvenile Justice and Delinquency Prevention recommends designing procedures for ensuring that the information disclosed by the JIS participating agencies is accurate and complete

Model of Dawes
Model of Landsbergen and Wolken
Other related work
Summary
GISF model
Introduction
Sharing Experience
Infrastucture Support
Information Strategy

Technical Components: Aspects

- Authentication includes specifications for digital signatures and digital rights. For example the International Standard ISO/IEC 9594-8 – ITU-T Recommendation X.509 (ITU-T, 2005) defining a framework for public-key certificates

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Organizational Components

- Organizational Component an element supporting organizational aspects of IS. Includes in particular the following issues
  - Business Process– comprises a set of coordinated tasks and activities executed by persons and software that enables the accomplishment of IS-related goals. IS requires that business processes of various organizations are understood and mutually adjusted, with common processes identified, reengineered and provided as part of the infrastructure. For example, one of the pillars of the interoperability approach adopted by the Government of Australia addresses the harmonization of common business processes for service delivery

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Organizational Components

- Organizational Component an element supporting organizational aspects of IS. Includes in particular the following issues
  - Leadership a functional role enforcing the organizational, process and cultural changes necessary for IS. For example, in USA the role is fulfilled by CIOs. The Clinger-Cohen Act created the Federal CIO position within the Office of Management and Budget (OMB) reporting directly to the OMB Director as well as the CIO function in every federal agency

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Inter-Organizational Components

- Inter-Organizational Component elements used for creating, supporting or maintaining relationships between organizations
  - Agreement an arrangement between organizations regarding a course of action related to IS. For instance, the Internal Revenue Service in the USA has written agreements with all 50 states for sharing information on the regular basis – monthly, quarterly or annually, usually called Fed/State Agreements

Inter-Organizational Components

- Inter-Organizational Component elements used for creating, supporting or maintaining relationships between organizations
  - Partnership a formalized agreement between public and non-public organizations specifying collaboration rules and precisely defining the roles and responsibilities of parties. For example the NIH Program on Public-Private Partnerships was established by the U.S. National Institutes of Health aimed at facilitating collaboration between public and private sectors to improve public health through biomedical research. The program is responsible for defining partnership policies related to data sharing, data access, intellectual property, participation, governance and decision-making processes, among others

Inter-Organizational Components

- Inter-Organizational Component elements used for creating, supporting or maintaining relationships between organizations
  - Negotiation a process by which organizations involved in a specific issue resolve matters of dispute by holding discussions and making commitments which are formalized in agreements. For example, the Statement on Information Sharing and Personal Data Protection between the European Union and the USA explicitly mentions the need for negotiation. Both parties agree that due to the conflict of laws, the processing of personal information in specific areas should be made according to specific conditions and considering safeguards for the protection of privacy, personal data and personal liberties. Such conditions would be defined through negotiation of an information sharing agreement (SISPDP, 2008)

Inter-Organizational Components

- Inter-Organizational Component elements used for creating, supporting or maintaining relationships between organizations
  - Contract a document formalizing an agreement between parties. Contracts can be modeled as a “formbook” similar to those used by lawyers to specify common practices. An example is the document “A Model Contract for Health Information Exchange” (Markle, 2006). A component of the Connecting for Health Common Framework provided by the Markle Foundation, it provides a model of the terms and conditions that collaborating entities use for IS within the network

Inter-Organizational Components

- Inter-Organizational Component elements used for creating, supporting or maintaining relationships between organizations
  - Trust refers to the confidence required by the parties for effectively sharing information. Creating inter-organizational relationships for IS between public and non-public organizations requires negotiation and development of commitments primarily relying on trust (Markle, 2006). For example, one of the goals of the Information Sharing Strategy of the US Intelligence Community (ISS, 2008) is to establish a common trust environment. The goal is to establish uniform identity management, information security standards, information access rules, user authorization, auditing, and access control to promote trust.

Environmental Components: IS Capabilities

- Environmental Component a component that exists or should be developed in the environment to facilitate, enforce or enable IS initiatives, including capabilities and legal instruments:
  - IS Capability refers to the capacity for executing IS initiatives in collaboration with others, including
    - Coordination is the act of ensuring harmonious functioning of parties for obtaining the most effective results related to IS. For example, the Interagency Threat Assessment and Coordination Group (ITACG) was established within the Information Sharing Environment (ISE). ISE is an initiative created by the US Congress and the President to facilitate the sharing of terrorist information among five communities: Intelligence, Law Enforcement, Defense, Homeland Security, and Foreign Affairs. Within the scope of ISE, the aim of ITACG is to improve the sharing of terrorist information with state, local, tribal, and private sector officials.

Environmental Components: IS Capabilities

- IS Capability refers to the capacity for executing IS initiatives in collaboration with others, including
  - Collaboration refers to the act of working jointly with others. For example, the new IS model proposed by the IS Strategy of the Intelligence Community seeks greater collaboration between the Intelligence Community stakeholders. Moreover, one goal of the strategy is to enhance collaboration across the community
  - Funding is related to the mechanisms for ensuring financial resources for executing IS projects. For example, the US Office of Justice Programs provides information on several funding mechanisms for developing or improving IS. It explains that sources from both the Department of Justice and the Department of Homeland Security distribute funding that can be used for criminal justice IS projects. It also explains some mechanisms used for distributing the funds to the states, such as in block, formulas (e.g. taking into account population and other factors)

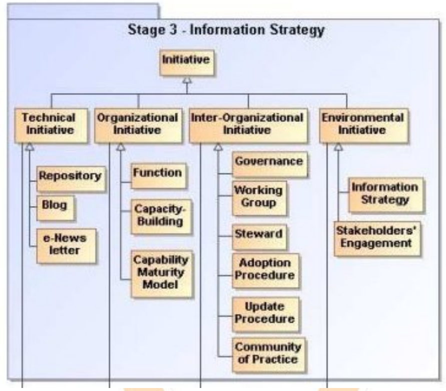
Environmental Components

- Environmental Component a component that exists or should be developed in the environment to facilitate, enforce or enable IS initiatives, including capabilities and legal instruments:
  - Laws comprise the body of rules and principles that govern IS in government, enforced by a political authority. For instance, the Data Protection Act of UK regulates the processing of information related to individuals, including obtaining, holding, using and disclosing such information. The Act was enforced by the Queen
  - Regulation is an official rule to control the behavior of those to whom it applies. For example, the regulation published by the U.S. Financial Crimes Enforcement Network (FinCEN) specifying agreements with foreign jurisdictions, such as those in the European Union. The regulation enables agencies of such jurisdictions to submit information requests concerning money or other terrorist finance investigations to financial institutions in the USA through FinCEN

Environmental Components

- Environmental Component a component that exists or should be developed in the environment to facilitate, enforce or enable IS initiatives, including capabilities and legal instruments:
  - Agency Directive is an order or instruction given by a government agency. For example, the directive number 501 of the Intelligence Community establishes policies for discovery, dissemination and retrieval of intelligence-related information collected or produced by the Intelligence Community
  - Official Statement

Information Strategy package



- this package contains Initiatives to enable IS among government agencies

Technical Initiatives

- Technical IS Initiative comprises any project delivering an ICT-related resource to support IS, like
  - Repository is a collection of electronic resources with services provided for adding new resources and for discovering and retrieving existing ones. Usually, repositories of standards and metadata are created by IS initiatives. For example, the e-GIF registry explained in Section 3.2. Repositories also include data components to be used by organizational units, activities in which the units are involved, and their roles

Technical Initiatives

- Technical IS Initiative comprises any project delivering an ICT-related resource to support IS, like
  - Blog is a specialized website that enables information exchange and sharing, as well as opinion- making on specific topics of interest to various government stakeholders. For example, the US Homeland Security Department implemented Blog@ HomelandSecurity, a blog for publishing daily activities of the Department and receiving citizen opinions. The Blog was implemented as part of the Open Government Initiative which aims at publishing and improving the quality of government information, creating and institutionalizing a culture of open government, and enabling policy frameworks for open government
  - e-Newsletter is an online medium for disseminating information, such as agency experiences with IS initiatives. For example, the e-Newsletter part of the National Information Exchange Model

Organizational Initiatives

- Organizational Initiative refers to any IS-related project that affects the organizational structure, functions, processes or responsibilities of a functional area
  - Function recognizing information as an asset that must be managed, IS initiatives of the Function type assign the responsibility for information management within agencies. For example, in Australia, the Queensland Government Enterprise Architecture (QGEA) Information Standard defines principles for implementing custodianship processes of information assets in government agencies. The standard defines custodians as the officers responsible for implementing and maintaining information assets to ensure their quality, security, integrity, correctness, consistency, privacy, confidentiality and accessibility. Custodians are also responsible for classifying and categorizing specific information assets (QGEA, 2009).

Organizational Initiatives

- Organizational Initiative
  - Capacity-Building such initiatives aim at building human and institutional capacity to ensure that the responsibility for information management is performed effectively. Building capability for inter-organizational and cross-sectoral collaboration and for interoperable systems and procedures is essential. For example, a capacity-building initiative introducing participants to the U.S. National Information Exchange Model (NIEM). The initiative includes an online course that teaches XML-related concepts required for understanding NIEM, implementation concepts, and steps enabling information exchange with NIEM
  - Capability Maturity Model it refers to a model for assessing the state of practice related to IS of an organizational unit. For example, the UK Cabinet Office created an Information Assurance Maturity Model (IAMM) to improve the information risk management, identifying five maturity levels

Inter-Organizational Initiatives

- Inter-Organizational Initiative it refers to any project affecting collaboration between or producing deliverables used by government units like
  - Governance refers to the system for managing and leading IS initiatives. For instance, the U.S. Department of Homeland Security established the information sharing governance framework comprising: (1) the Information Sharing Governance Board (ISGB) as the higher-level decision- making body for all IS and collaboration issues related to the Department, (2) the Information Sharing Coordination Council (ISCC) as the implementing body on IS issues, and (3) the Shared Mission Communities (SMC) comprising members of a shared mission that support ISCC and ISGB in gathering IS requirements and implementing solutions

Inter-Organizational Initiatives

- Inter-Organizational Initiative it refers to any project affecting collaboration between or producing deliverables used by government units like
  - Working Groups comprise expert groups responsible for IS-related issues, such as standards, metadata and other resources adopted by agencies. For example, the Global Justice Information Sharing Initiative that advises the US Attorney General on justice, IS and integration initiatives has defined the following working groups: (1) Global Infrastructure and Standards Working Group - GISWG, (2) Global Intelligence Working Group - GIWG, (3) Global Outreach Working Group - GOWG, (4) Global Privacy and Information Quality Working Group - GIPQWG, and (5) Global Security Working Group. In particular, GPIQWG assists government agencies, institutions and justice entities in ensuring that personal information is appropriately collected, used and disseminated within the justice information systems

Inter-Organizational Initiatives

- Inter-Organizational Initiative it refers to any project affecting collaboration between or producing deliverables used by government units like
  - Stewards are persons responsible for managing and coordinating IS initiatives across government. For example, ISCC, part of the governance structure of the U.S. Department of Homeland Security (DHS) comprises IS officers representing 22 offices and components of DHS. Such officers, responsible for IS actions in their own units, represent IS stewards.
  - Adoption Procedures are required for adopting government-wide practices by agencies. For example, the procedure defined by the police of Hertfordshire aims at raising awareness about the need for IS and providing a uniform approach and general guidance for IS

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  - Update Procedures keep standards and practices up-to-date with innovations introduced by new technologies. For instance, the Policy document of NZ e-GIF (NZ, 2008) outlines procedures for extending the framework by submitting new standards. Communities of Practice are groups of experts that share interests in government IS initiatives. For example, the Shared Mission Communities (ISMIHS, 2009), part of the governance framework defined by the U.S. Department of Homeland Security

Environmental Initiatives

- Environmental Initiative refers to any project introducing a new IS or IS-supporting practice. Such projects are usually promoted by senior government officials since they require strong political support
  - Information Strategy comprises a plan for implementing IS or information-related policies. An example is the Information Sharing Strategy defined by the United States Intelligence Community. IS strategy includes the IS vision, IS model, goals and objectives, implementation plan and the governance system
  - Stakeholder Engagement refers to a process that identifies and involves stakeholders, e.g. through a consultation process, in providing feedback about IS-related government policies. For example, the Stakeholder Engagement Policy by the Department of Local Government, Sport and Recreation of the Queensland Government specifies six principles for stakeholder engagement: inclusiveness, reach-out, mutual respect, integrity, affirming