SE Concept	Ackroyd Definition	Semantic Dictionary r.6	UML for SE Requirements v0.2	EDOC definition*
Requirements	Specification of the context in which the system will operate, the purposes of the system, what operations the system must perform, and what quality of service the system must provide in achieving those purposes and rendering those services.	A statement of properties that a system shall exhibit or shall not exhibit when completed. Note: requirements are derived from requirements in a many-to-many relationship. (Needs) Stakeholders have needs, or uses for the system. These become expressed as requirements.	Specifies the desired behavior, structure, and/or properties of a system/element/component.	Requirements are captured as EDOC models. EDOC is a specification language compliant with ISO/IEC Standard 10746, Reference Model of Open Distributed Processing, RM-ODP. Requirements are captured in five viewpoints. The Enterprise, Information, and Computation viewpoints capture technology-independent (PIM) specifications using EDOC's Enterprise Collaboration Architecture. The Engineering and Technology viewpoints capture platform-specific (PSM) models.
Functional requirements	Specification of the functional areas in which the system must provide services, definition of what those services are, and what products are consumed and produced by those services.		A requirement which specifies the functions the system /element/ component performs, its inputs and outputs, and the temporal ordering of the functions.	System functional blocks are defined using EDOC Components. There are two kinds of EDOC Components, Process Components and Community Processes. Components can be nested to provide a functional decomposition of the system specification.
Non-functional requirements	Specification of the characterisitcs and qualities of the products provided by the system, performance characteristics for the services rendered, and applicable design constraints. Specification of what elements from the constituent disciplines (hardware, software, database, facilities, and operations) constitute the system and the relationships (interfaces) between these elements.		A requirement other than functional requirements, including performance and physical requirements, and design constraints.	Policy statements in the Enterprise viewpoint models. Includes Environment Contracts and Quality of Service specifications. Environment contracts relate to performance, throughput, reliability, etc.

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Behavior	Specification of how the elements that comprise the system interact with each other to provide the top-level system operations.	(System Behavior) What an SE_Thing is to do or is not to do in response to excitations it receives from the external SE_Things in its context. (System Behavior (2)) Behavior is built from Input/Output (I/O), Function, and Function Ordering	Defines how the system interacts with its environment, and how the elements and components of the system interact with one another. Typically defined in terms of functions the system performs, the function inputs and outputs, and the temporal ordering of those functions.	A Port owned by the Component specifies each interface supported by a Component.
Function	Specification of what each individual element of the system must do in order to provide the required overall system behavior.	The entity in the context of modeling that transforms an input set of SE_Things into a set of output SE_Things that may be the same or measurably different from the input set. (Function Ordering) Functions may be sequential, concurrent, traversed iteratively, or lie on separate alternative paths	A behavioral function represents a transformation of inputs into outputs that a system/element/component or the environment provides.	Functionality is associated with Components. A Component can be specified as a black box, or it can be specified as a composition of other interconnected Components.

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State	Specification of the application data properties of the elements of the system, as well as the operational health and status properties of the system that influence the execution patterns of the system. Specification of how sets of these properties participate in stipulating system behavior and the rules and criteria for predicating system behavior changes.		Represents how the system/element/ component responds to a transition (triggering event/conditions), Alternative definition of state is the value of the system/element/ component attributes.	The Information viewpoint model specifies system state variables (data elements), their associations, their constraints, and the allowed changes in state.
Data item/flow	Definition of the logical schema of information-bearing element of the system. Specification of how instances of those schema are shared among elements and how their productions serve as triggers for changes in system behavior.	(Input/Output) SE_Things consumed by a function are Inputs and those generated by a function are Outputs	Represents what a behavioral function consumes, modifies, or creates.	Links between Ports of interconnected Components. Links can be either "document" links, in which data values or references are communicated, or "protocol" links in which a specified pattern of interaction (process) is specified. Protocol links may abstract over Flows, which may be continuous as in analogue information flow, possibly modeling physical flows.
Hierarchy - components System, behavioral, physical	Hierarchy is the organization of system elements that separates high-level concerns from lower-level implementations such that beneficiaries of the high-level concerns are de-coupled from the lower-level implementations.	(System Static Structure) The decomposition and other static relationship among the components of the system.	Defines an entity in terms of its parts. This also includes cardinality/ multiplicity which specify the number of parts. (THIS IS DERIVED FROM THE SYSTEM COMPOSITION DEFINITION)	Hierarchy is modeled explicitly in EDOC through the use of nested Components. The outer containers represent high-level abstractions. The inner Components represent implementations.
Allocation of function	Specification of the specific features of the elements of the system. Apportionment of functionality to executable units. Assignment of units of executable functionality to features provided individual element interfaces.		Assignment of functions and associated behaviors to system elements/components.	Containing the executable units or interlinking them with the element models allocates the functionality of an element of the system to executable units.

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Allocation of requirement	Mapping of requirement entries to the features provided by the elements that comprise the system.		Relationship between a requirement and the design elements, which are responsible for implementing it.	Requirements allocation is achieved through the use of links between Ports of Components representing logical functionality to Components representing executable units. Such links may be to either contained units or to uncontained units.
Physical interface	Specification of the details of how features of an element's interface will be topologically connected to other elements along with the protocols for interaction.	(Interfaces) An interface is the port to port interconnection between two systems. Examples: Parts interact physically through direct physical contact, exchange of SE_Things, and through forces they exert such as gravity. Thus I/O is bound to ports and interfaces. The interface may consist of more than the two ports and may involve an assembly of parts as in the case of two flanges that are assembled with six bolts and an O-ring. The interface may also require detailed description to define what occurs there or how it is maintained. (Port) A port is a connection point on a system in the system decomposition hierarchy, Explanation: systems interconnect with one another port-to-port.	Represents the physical connectivity between system/element/components, and includes the physical connection, the transport mechanism, and the physical input/ouput flow. Also called interconnection.	The Ports and Links of the Engineering and Technology viewpoint models represent physical interfaces.
Functional interface	Specification of what services an element will provide.		Logical description of the I/O.	The Ports and Links of the Enterprise, Information, and Computation viewpoint models represent functional interfaces
System context	Identification of what entities will interact with the system and the nature or purposes for those interactions.		A static model, which depict the relationships between the system and its environment.	EDOC Community Processes provide the top-level Component that define interactions of the system with its environment.

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Problem/solution segregation	The problem space is the set of concepts that the system has to deal with and the particular needs that the system will attend to. The solution space is the set of elements that are designed to form into an solution architecture that satisfies the needs of the problems space in its context.		Problem defined as an inadequacy associated with a system / element / component. Requirement defined per above. Solution defined as the design elements which addresses the inadequacy and associated requirements.	EDOC's Enterprise Collaboration Architecture, with its Enterprise, Information, and Computation viewpoints, describes the problem space. The solution space is described by the Engineering and Technology viewpoints.
Architecture	An organization of solution elements that provides an execution context for producing system behaviors and for delivering the resulting services to the system context.		The system elements / components and their inter-relationships needed to characterize the system. (Definition not currently included).	EDOC's Enterprise Collaboration Architecture and Component Collaboration Architecture define the structure for specifying system requirements.
System		An assembly of interacting, active SE_Things with a well defined interface, both static and dynamic, with respect to the universe. Explanation: A system is composed of interacting components and the emergent behaviors and properties of the system are the result of the properties and behaviors of the components and their interactions. these interactions may be highly nonlinear. Note systems decompose hierarchically; they are systems of systems. (System Boundary) The static and dynamic interface that separates what parts of the universe are within System and what parts are outside of System	An entity made up of hardware, software, workers, data, etc, that has behavior and provides services that enable it to collaborate with other entities to meet a business purpose or mission need (Rational RFI response definition)	

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Subsystem		(System Assembly) A whole System is built from, assembled from its constituent components or sub-systems and the part list is complete.	A partitioning of system functionality, which may be associated with one or more system elements and/or components (e.g. the navigation subsystem represents the partitioning of system functionality associated with navigation)	
System Element			A logical or physical partition of a system. Elements may be defined at multiple levels of a system hierarchy. An element may be composed of lower level elements or components.	
System Component			A physical replaceable part of a system, which is implemented by Hardware, Software, Data, Personnel, Procedures, or Facilities.	
System Store			Entities, which are stored by a system, which may include information, mass, energy. (*)	
External Environment		(Environment) This is the universe minus the system. It is often possible to limit the parts of the environment needed for development purposes to those external systems that are neighbors to the system. Note that the environment includes not only the external systems that couple with it for useful purposes, but they also include all external systems that may interact in a manner that causes failure.	Includes external users, systems, and the physical environment, external to the system boundary, which directly or indirectly interact with the system. (*)	

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Host			A system/element/component, which provides a platform to execute an executable system /element / component and/or store a system store respectively. (e.g. hardware hosts software).	
Geometry			Spatial relationships between and within system elements and components.	
Event			Instance of an input, which may be accompanied by a set of conditions, to trigger a function or state.	
Failure			A state of a system/element/ component which represents a degradation in expected performance.	
Functional decomposition			This is a special type of decomposition, which represents how a top level function is defined in terms of lower level functions (e.g. a composite function).	

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Property		What an SE_Thing exhibits or does not exhibit in response to excitation and stimulation from auxiliary measurement entities that are not part of its context. (Property Measurement) A quantified value with units and variance resulting from measurement of the property of an SE_Thing or a set of SE_Things using measurement infrastructure (Physical Property and its Attributes) Physical Properties are measured characteristics of SE_things that require auxiliary infrastructure for the measurement because they cannot be observed based on response to excitation or as components. Physical Property has attributes of measured mean value, variance, and probability distribution using particular infrastructure and specified measurement method.	Measurable characteristics of a system, element, component, inputs/output or the environment.	
Measure of effectiveness			Represents a type of property which characterizes the overall merit of the system, which is defined in terms of other properties.	
Property relationship			Defines relationship between performance, physical, and non-functional parameters in terms of mathematical equations, and are often represented in analysis models.	

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Verification Result		(Verification) Confirmation and provision of objective evidence that the requirements for a specific intended use or application have been fulfilled by comparison against properties (Validation) Confirmation and provision of objective evidence that the requirements met the needs of stakeholders (Validation Status) Data that defines the status of a requirement with regard validation/Verification	A comparison between the measured value of a property and the required value of a property.	
System stakeholder		These are the people and institutions that have an interest in the system. They include, for example, the producers, owners, operators, users, and maintainers of the system	A role with an need in some aspect of the system life cycle.	
Decision Tree			Expresses alternative decision paths and associated parameters (e.g. probability) to support tradeoff analysis.	
System View		A collection of information SE_Things about the system that are useful and defined for a particular purpose in a particular context. (Subclasses of System View) There are an extremely large number of possible views of a system for particular development or use reasons. Systems engineering recognizes views associated with specification, design, manufacture, and maintenance as a minimum representative set. This corresponds to a life cycle viewpoint.	A representation of a subset of model elements for a particular domain of interest.	

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Ontological Axioms		(Universe) Everything that exists and that may be conceived of (SE Thing)That which is discernable by reproducible measurement of its characteristics. Includes matter, energy, and information. (Personally Experienced Stuff) All that is not yet discernable by reproducible measurement (Time) The succession of events measured with repetitive phenomena from a sand glass to a cesium clock		
Categories		The grouping of SE_Things into a set based on defined properties that serve as selection criteria for which SE_Things of all those in the universe belong in that set.		

* EDOC References:

ISO/IEC Standard 10746, Reference Model of Open Distributed Processing. http://www.community-ml.org/RM-ODP/ . See especially 10746-2, RM-ODP: Foundations for concept definitions. ISO/IEC Standard 10746-3, RM-ODP: Architecture describes the viewpoints, viewpoint languages, and functions of ODP.

UML Profile for Enterprise Distributed Object Computing Specification http://www.omg.org/cgi-bin/doc?ptc/2002-02-05 .

Component-X, a tool from Data Access Technologies that implements much (but not all) of the EDOC metamodel. http://www.enterprise-component.com/download/