

A COLLECTION OF MODELS FOR BUSINESS SYSTEMS

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ABSTRACT

In this paper, a collection of models that enables the understanding of businesses and their underlying business systems is presented. These models provide systemic views of the logic of businesses and their evolution over time. They cover various facets of businesses like operations, offerings, knowledge processes, innovation, architecture, consulting, responsibility management, and so on. Given the penetration of information systems, these models were created for modelling businesses so that appropriate information systems can be designed to support businesses. Given that there may be gaps in adapting these models to other situations, the viability of these models for a specific situation, needs to be determined based on the value and impact required for the business.

Keywords: Businesses, Understanding Businesses, System Models, Business Models, Business Systems

INTRODUCTION

Every business has a purpose which is manifest in its vision, mission, and values. It evolves independently and the organization that facilitates the business is expected to be aligned with the evolution of the business. Businesses are organized as business units which provide the necessary functions that support businesses. Many of these functions are enabled by appropriate business systems. It is expected that the business systems somehow adapt, accommodate and evolve in correlation with the business with minimal latency. Current business system architecture and design processes are not clearly accounting for evolution in the sense that when businesses evolve, there are no provisions available in the business systems to accommodate this change.

Models are abstractions of real-world entities and the presence of all the essential parameters of the real-world entity is ensured in the model. Models can serve as the specifications of business systems. They can be used to structure, identify, analyse and synthesize business systems design. In such a case, model commutes with the business and relates to it. As the understanding of the business improves, its codification, interpretation and representation as Models evolves. Such models are approximations. The various entities in the model are manipulated to create a formal or logical structure. These structures serve as the basis for understanding, interpreting and manipulating the business systems underlying the businesses.

Businesses are multi-dimensional, complex and have multiple ideals. To represent the business, multiple models are necessary, with each model defining a set of properties corresponding to the respective concerns. It may also be necessary to define cross cutting models corresponding to the cross-cutting stakeholder concerns. Each model is understood, worked upon and then composed keeping in mind the constraints of the business, its underlying business systems and the conditions in which they exist. They can be either independent or dependent and dynamic. Each Model is a different perspective in representing the modelled entity and if semantically motivated explains how the business is understood, analysed and synthesized. The different models allow one to look at the business at different levels of detail.

Organizations and people involved in the business play their respective roles and

discharge their responsibilities so that the purpose of the business can be realized. Often, organizations and people are at a loss to characterize their business and find ways and means of enabling its non-linear growth. By taking a multi-model centric view of a business, it becomes possible to take a holistic perspective of the business and decide on the appropriate actions that can support the evolution of the business. Models provides for holism by being systemic in certain dimensions.

In this paper, an overview of a few models that the authors found useful has been provided. The objective of putting together these models is to engineer the design of a business and associated business systems that asserts the realization of an intended purpose. Modelling provides the foundations for this engineering in terms of providing multiple points of view of the business thereby serving as the building block for business systems architecting. These models were conceived for the purpose of designing and developing information systems that can aid businesses in their operations. Given that there may be gaps in adapting these models to other situations, the viability of these models for a specific situation, needs to be determined based on the value and impacts delivered by the way the businesses operate.

CURRENT LITERATURE

Beer's Viable System Model (VSM), 1985, is a functional systems model which has the viability property of being invariant in its character despite forces of evolutionary change. Per VSM, a business steadfastly holds on to its values, its character, whilst changing to survive. VSM has five subsystems that characterises it functionally: Operations, the function that produces; Co-ordination, that ensures scarce resources are best used for business advantage; Management, that ensures espoused goals are achieved; Intelligence, that ensures strategic investments are made, so as to be competitive and ahead of the pack of competitors in the market; and Policy, that formulates governance concerns. Sadly, VSM does not relate to organisation structure and its role in operations and the responsibility structure amongst role players in business. As a Systems Model, it is holistic with respect to functions in a business and expresses responsibilities of people in charge of various aspects of business operations. It is complete with respect to Viability, a property that asserts the character a business adheres to in transacting its business.

Fukuda's PO Matrix, 1997, and SEDAC, 1996, is a brilliant intervention: the two are

an Operating System that characterises the management of business processes that run as applications under this operating system. PO Matrix and SEDAC enables a company to thoroughly understand how much the improvements its project teams make will contribute to the overall business/profit plans. It is an effective tool for accurately and quickly communicating top management's policies and improvement intentions to the entire company. It also serves as a single reference point containing all the areas that are targeted for accumulating know-how and intrinsic management technology. A strong point of Fukuda's approach is that it is management-method-agnostic. Fukuda verbalises management activity as data that results from business processes.

Gharajedaghi, 2011, has a beautiful and evocative description of the evolutionary process of a business as a spiral of activities, which is referred as Function – Structure – Process – Context. Iterations of structure, function, and process in each context would examine assumptions and properties of each element, then in relationship with other members of the set. Subsequent iterations would establish validity of the assumptions and successively produce an integrated design of the system. This methodology is a holistic language of interaction and design developed to face the dilemma of systems where the whole is becoming more and more interdependent while the parts display choice and behave independently. Applied in the context of business, the organizational structure within the business evolves morphogenetically, delineating regimes of structural separation of concerns as well as responsibilities that go with the new functions. An evolving business is reflected both in the evolving structure and in the evolving responsibilities.

The concept of architecture as considered in ISO, 2019, goes beyond the conventional use and is applicable for different kinds of entities (system, software, product, service, enterprise, business and so on) being architected. Architecture as a concept has been found to be useful to manage the inherent complexity of these human-made entities. As a result, the core architecture processes, outlined by ISO, 2019, are applicable for architecting businesses and the underlying business systems as well. While the conceptualization process, can be used to characterize the problem space of businesses and determine suitable business systems, the evaluation process can be used to determine the extent to which the architecture is able to address the business objectives. The elaboration process can be used to describe or document the architecture in its entirety.

ToGAF, 2018, covers the development of four related types of architecture which are

often considered as subsets of an enterprise architecture. These architecture types are: a) business architecture, which covers the business strategy, governance, organization and key business processes; b) data architecture, which covers the structure of the data assets and data management resources of an enterprise; c) application architecture, which covers the structure and behaviour pertaining to an application that will be deployed to support the enterprise; and d) technology architecture, which covers the logical software and hardware capabilities required to support the business, data and application architectures. Central to ToGAF, 2018, is the architecture development method which is supported by a set of guidelines, principles, rules, and techniques. ToGAF, 2018, can be adopted to identify the key characteristic of the business by analysing the concerns what the business does, how it does it, how it is organized and how it realizes value. It can also be used to design structures, processes that can address the business objectives. However, ToGAF takes a limited view of enabling businesses by means of IT or other technologies and leaves the underlying business systems that involves people, business infrastructure, organizations, and resources to be outside its scope of influence.

NAF v4, 2018, is a standard for developing architectures and is designed to ensure that the architectures developed can be understood, analysed, and debated by many organizations by means of a common ontology, vocabulary, conventions, and practices. NAF v4, 2018, adopts a top-down approach for architecting, wherein the overall objectives of an organization determine the content and structure of the systems necessary for the organization to function. As a result, the underlying systems can be interconnected and are interoperable with each other. The NAF methodology should be tailored for different organizations based on the nature of their activities, methods, processes, and their domain of interest. According to NAF, 2018, architecting encompasses the creation, implementation, and management of one or more architectures. It involves addressing the problems and stakeholder expectations by means of solutions that comprises of a set of capabilities. NAF is generic in the sense that the subject of architecture can be any entity and NAF brings value to the table by means of a systemic approach towards architecting. As a result, NAF is a likely candidate for usage in architecting business systems.

THE DIFFERENT MODELS

In the subsequent sections, an overview of a few models that the authors developed and found useful in modelling business systems are discussed. These models exhibit

inbuilt consistency relationships that reflect systems principles and provide systemic views of the logic of businesses and their evolution over time. They cover various facets of businesses like operations, offerings, knowledge processes, innovation, architecting business offerings, consulting, sustainability, responsibility management, and so on. These models are synthesized keeping in mind the need to support businesses using information systems in addition to human-activity systems.

A Model for Business Operations

Information systems have important strategic impact on businesses. They provide a platform that enable organizations to integrate and coordinate their business processes and ensure that information is shared across all functional levels and management hierarchies in the organization. As businesses evolve, business plans, business decisions, and business processes evolve. If these changes to information systems are propagated with minimal latency, then it increases value delivered by a business.

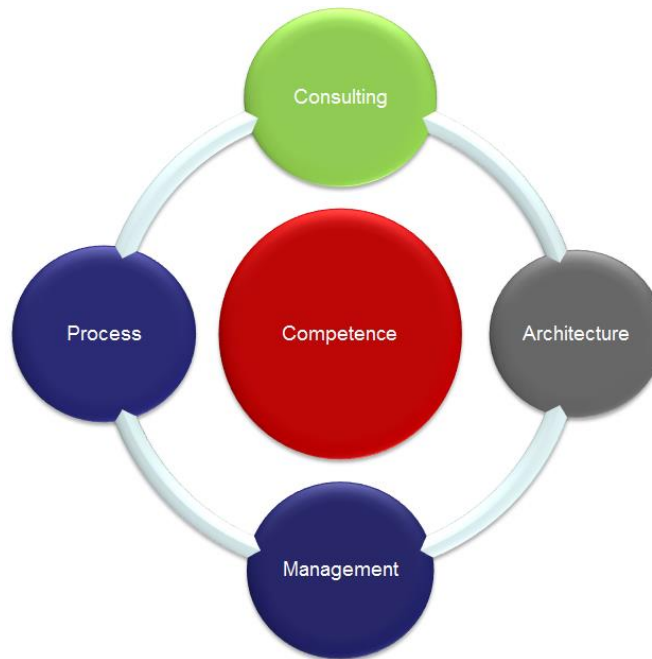


Figure 1: Model for Business Operations

For this to happen, it is necessary to structure businesses to accurately trace the link between requirements and their satisfaction through information systems and understand the alignment between businesses and information systems. Accordingly, there are 5 interdependent entities that need to be tackled with to achieve this alignment with minimal latency. The first entity is consulting and related technologies,

wherein the customers businesses and its subsequent evolution is understood, customers' value creation processes and value perceptions are studied, customers' problem situations studied and a systematic approach to create appropriate interventions in terms of offerings, business re-organization and management is suggested.

The next entity is architecture and related technologies, wherein the customer centric view of their business, corresponding business qualities, business drivers and resultant business value to customers' customers is studied to establish a systematic approach for enterprise and system architecting. The next entity is management and related technologies, wherein the work centric view of businesses, business systems, business operations and the quality of business offerings are studied, to establish a systematic approach to organizing and managing work that delivers quality.

The next entity is processes and related technologies, wherein process abstractions, semantics and structure provide the basis for reasoning about the process and assuring that the business progresses towards achieving its purpose while responsibilities in the process, derived from the overall businesses purpose, contain how process steps contribute towards achieving this purpose. Accordingly, processes are expressed, analysed, and executed to assert quality outcomes thru the notion of process step x product quality correlation which serves as the basis for assuring progress towards achieving overall business purpose. The final entity is competence and related technologies, wherein the ability to perform the activities/tasks defined in the process to achieve desired quality in the architected solution provides the basis for guaranteeing/warrantyng the business offering. The model for business operations can be summarized as given in figure 1.

A Model for Value Articulation

Value is relative to the stakeholder to whom the endeavour is presented and their perception of value changes over time. It is a measure of worth of a specific solution by its stakeholders and is a function of (1) the solutions usefulness in satisfying a stakeholder need, (2) the relative importance of the need being satisfied, (3) the availability of the solution relative to when it is needed, and (4) the cost of ownership. All the things that contribute significantly to the stakeholder in terms of achieving their goals, plans, improvements, developments needed for growth, etc., is considered as appealing to a stakeholder serves as the perceived/possible value. According to Doji et al, 2011, to articulate value of a solution, it is necessary to deal with four different

dimensions and their inter-relationships. The first dimension is stakeholders who would appreciate the solution for the value that it creates to them.

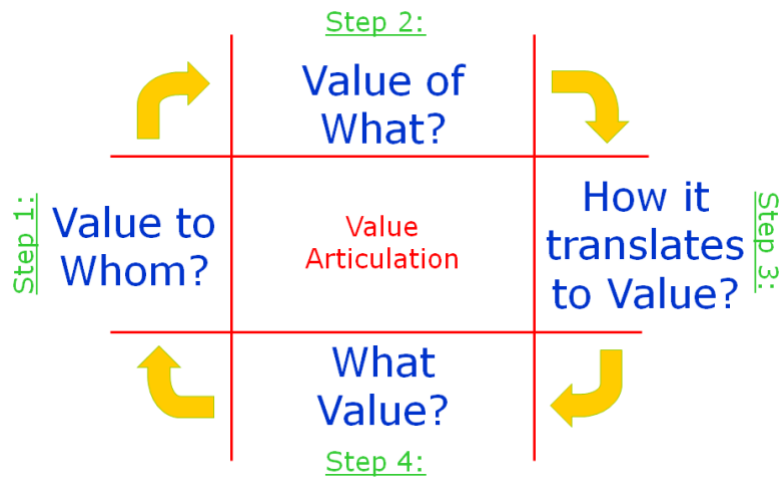


Figure 2: Model for Value Articulation (Doji et al, 2011)

The second dimension is characteristics of the solution offering in terms of its features, aspects, properties and characteristics which essentially results in stakeholders' value creation. The third dimension is enablement that causes the features, aspects, properties and characteristics of the solution to be realized so that the value is created to the stakeholders. The fourth dimension is the actual benefits that could possibly accrue to the stakeholders because of the solution enablement. The linkages between dimensions establish the correlation between them (Stakeholder x Benefits correlation, Stakeholder x Solution characteristics correlation, Solution characteristics x Solution enablement correlation and so on). The model for value articulation is presented in figure 2.

A Model for Consulting

Consulting involves analysing, understanding, structuring, and managing processes and approaches that impact the real world. The problem of cognition arises when the observer is part of the organization as they are influenced by the organization and it distorts their perspective of the problematic situation. As a result, for a consultant who is an external observer of the problematic situation, identification of the problem becomes a critical task as the very process of problem definition is a significant aspect of consulting. This is the Discovery process wherein a search is undertaken away from the vicinity of the problem to arrive at a description of the actual problem faced by the customers' business. Since every problem is live, dynamic, and evolving entity

with a distinct characteristic and inherent dynamic, it is the responsibility of the consultant to engage with the client continuously and understand the evolving nature of the problem. This is the Diagnosis process wherein a gradual discovery of the truth of the problem to introduce coherence, consistency and homogeneity to arrive at a concise definition of the real problem.

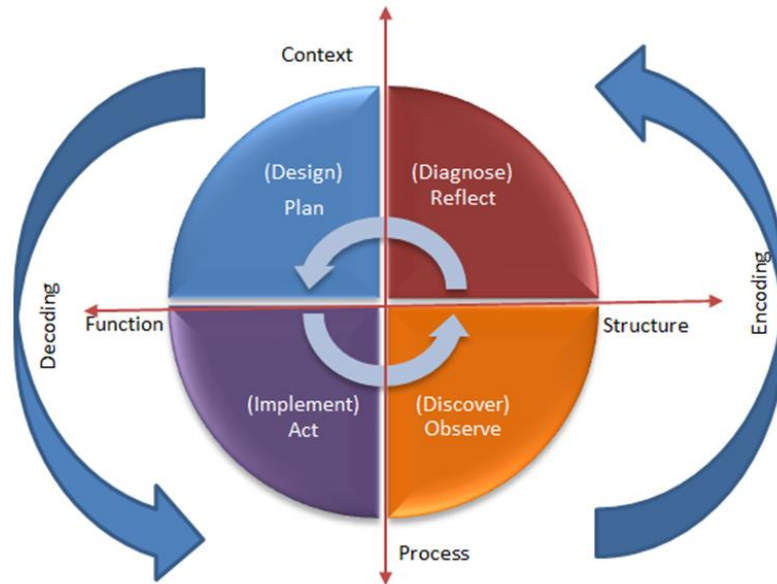


Figure 3: Model for Consulting

Here again, there is no one unique solution to a problem and it is always necessary to cover multiple dimensions and to create a solution, multiple models need to be defined with each model defining a set of properties corresponding to the respective concerns. This is the Design process wherein a structure is synthesized to perform a set of functions to achieve a purpose. Finally, once the multi-modelling exercise is complete, it is culminated by intervening in the problem situation by implementing the solution. This would often require careful planning, regulation and control of the implementation process to bring in the necessary transformation in the client's business. This is the implementation process wherein the design is realized in terms of configurations of elements. The model for consulting is presented in figure 3.

Value Quadrant Model

The purpose of a system is to deliver value to stakeholders and architecture ensures that this purpose is achieved. Accordingly, it is the responsibility of the architect for defining what the system does to achieve this purpose and how the system achieves it in a specific situation. To create this definition, the architect arrives at a set of

desired quality characteristics that should exist in the system and creates an appropriate scheme/organization structure of components along with the set of usage processes which when realized and the system used in accordance with the defined processes will enable the achievement of its purpose.

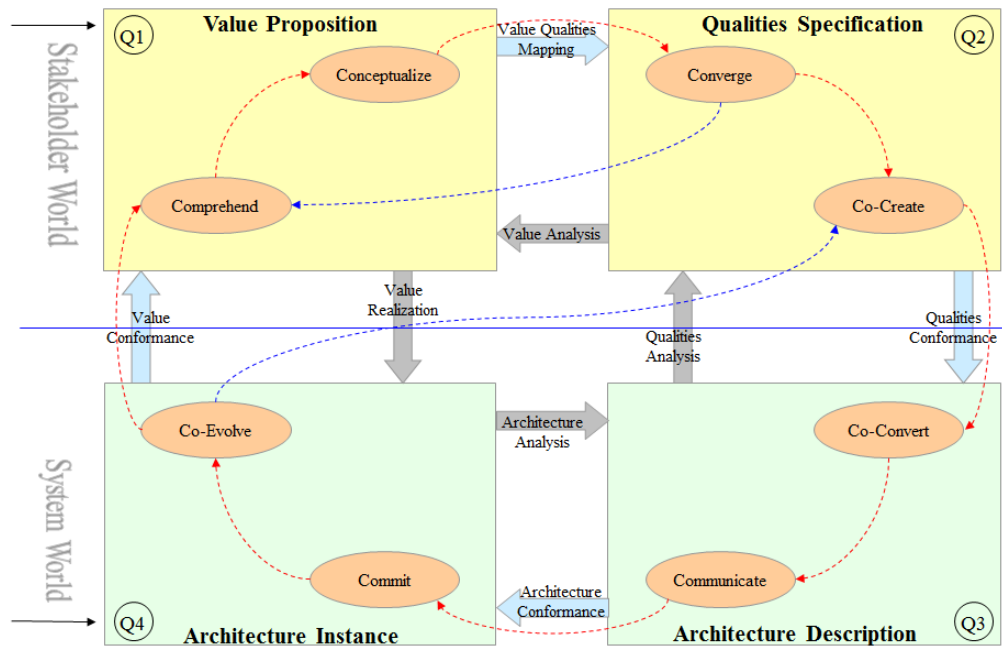


Figure 4. Value Quadrant Model (Kumar et al, 2014)

According to Kumar et al, 2014, there are four interdependent perspectives that the architect needs to deal with to comprehend the dynamics of value-based architecting. The first perspective is the value proposition perspective, wherein the architect works out how to discern value to stakeholders before the system is conceived. The outcome of this perspective is the creation of the value requirements for the system which when achieved will lead to stakeholders' satisfaction. The next perspective is the qualities specification perspective, wherein the architect constructively resolves the value requirements to arrive at a set of quality requirements for the system of interest. The outcome of this perspective is a set of solutions; its relevant components and quality characteristics; and segregation of these components and quality characteristics according to different knowledge domains involved. The next perspective is the specification perspective, wherein the architect expresses the architecture of the solution in terms of views, models, properties, guidelines, principles, constraints, and metaphors/heuristics.

The outcome of this perspective is an architecture description that defines the

structural and behavioural aspects of the system of interest. The last perspective is the realization perspective, wherein the architecture specification is instantiated for a specific situation. The outcome of this perspective is the transformation of the specified behaviours, components, component interactions, constraints, principles, into actions that create a system based on the selected implementation/construction technology. The value quadrant model for architecting systems is presented in figure 4.

Value Spiral Model

The value spiral model is an iterative approach to value-based architecting of any entity. It emphasizes the need to go back and reiterate earlier steps several times to continuously improve the system. Each cycle produces a system specification that is built upon the lessons learnt from the realization of the system implementation identified in the previous iteration. The basis for improvement of the architecture at each cycle is the change in the value that the system is expected to provide to its stakeholders. As shown in figure 5, each cycle iterates thru six perspectives (Context, Value, Quality, Purpose, Structure and Process).

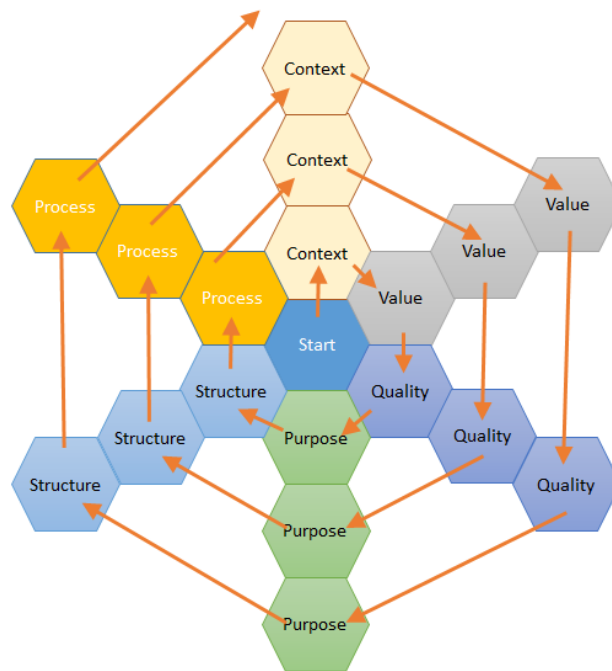


Figure 5. Value Spiral Model (Kumar et al, 2016)

According to Kumar et al, 2016, context perspective aids in the understanding of the situation and operative context based on cause-and-effect relationships that exist in

the situation. The value perspective aids in developing a set of value propositions that would lead to customer delight, satisfaction, and enhanced experience. The quality perspective aids in understanding the ways or means by which benefits can be delivered and aids in development of the concept of operations, which describes the characteristics of the system from the viewpoint of a consumer.

The purpose perspective aids in defining the statement of purpose of the system. The statement of purpose is the vehicle thru which superior customer experience can be achieved. The structure perspective aids in defining how the different components and their interfaces are organized and composed to provide the necessary resources for achieving the purpose. The process perspective aids in defining how the different components are utilized to enable the purpose. It also defines the requirements for these processes in terms of the different resources that are necessary for its execution.

A Model for Responsibility Management

The purpose of a process is to fulfil responsibilities towards achievement of purpose of the system as a whole. Responsibility in general is accountability for achieving outcomes through pre-defined structures or processes. The act of responsibility management deals with the ability to cope with the life cycle process of responsibility management concerns: discovering management problems, experimenting with solutions, modelling them, bringing them under control and then delegating them to the next level of responsibility management. Accordingly, there are four different dimensions for classifying responsibilities. The Governance dimension is about values and direction of the system. Every socio-cultural system is governed by its values and its purpose. Governance exists for all processes at all levels of abstractions. There are processes which might be dedicated to governance in a system and at the same time, governance exists in all other processes through implicit or explicit constraints. Governance has a parallel structure throughout the organization at all levels. The corresponding model is presented in figure 6.

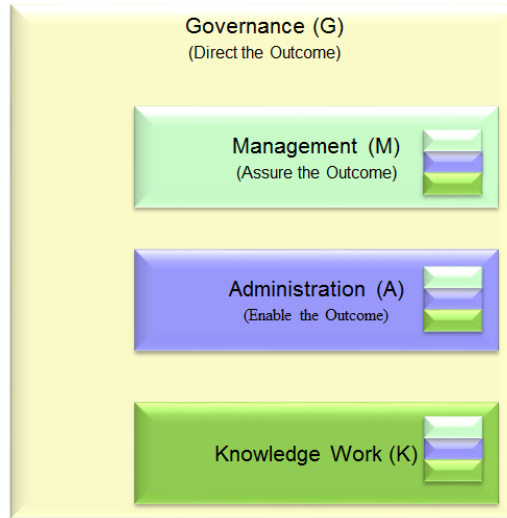


Figure 6. Model for Responsibility Management

The Management dimension is about setting goals, tracking them, and suggesting corrective actions. Management decides objectives at various levels within organization and within what constraints these objectives must be achieved. Management not only sets the objectives but also goes through the complete cycle of timely verification of achievement of objectives and suggesting corrective actions. The Administration dimension is about coordination. It is about providing resources at right time at right place. Finally, the Knowledge work dimension is about the domains of knowledge and how they are used to realize the purpose. It involves measuring efforts required in applying the knowledge work to realize the purpose. Knowledge work is carried out by people and what is atomic activity depends on the competence of the person. Knowledge work results in the deliverable of the process and forms the core of a process to deliver a purpose.

A Model for Service Innovation

Much of the future growth that leads to economic prosperity will come from services innovation. Service innovation in vertical markets deals with complex combinations of domain knowledge leading to an increasingly knowledge-based economy. As a result, the ability to address service innovation is becoming an important source of value to service providers. The increasing complexity of service innovation is driven by the necessity to incorporate and deal with variety of aspects. Accordingly, there are seven different interdependent aspects that need to be addressed for a successful service innovation.

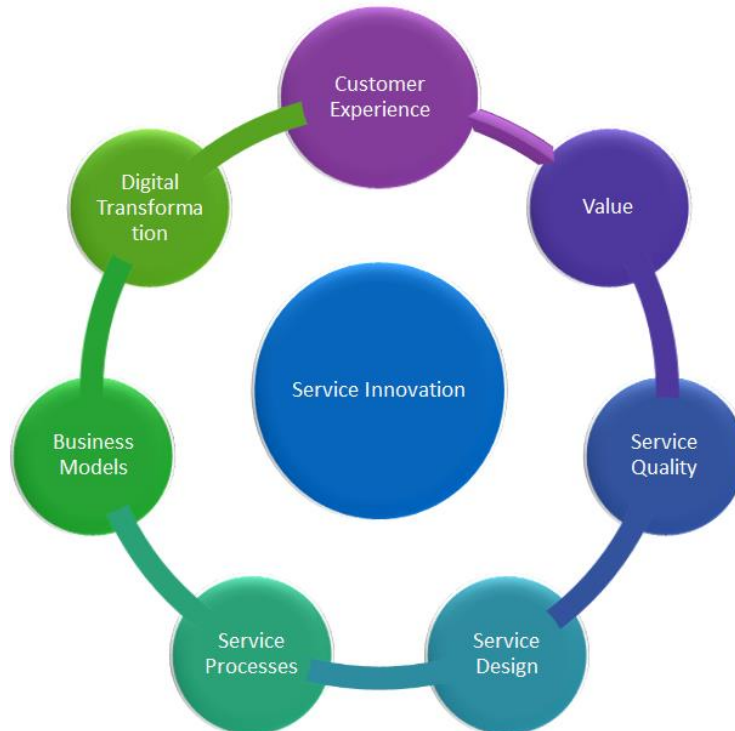


Figure 7. Model for Service Innovation

The first aspect is customer experience, wherein a subjective evaluation of the experience of the customer of their interactions with the service provider aggregated over the entire relationship duration is performed to ascertain customer delight. This is an essential ingredient for service providers to sustain customer relationships. Continuous participation of customer during the service delivery process is one of the highlights of services. In value co-creation aspect, service provider involves customer even more creating opportunities where customer can seek what adds more value to him/her.

In such situation both parties can benefit as customer needs are met with better accuracy while service provider has happy customer who will come back or bring more customers in. This is an essential ingredient for services as a service is a value exchange between the service provider and the service consumer. The next aspect is service quality, service provider can evaluate and ensure the satisfaction of all the parameters that are within control of service provider that result in meeting of customer needs, customer experience and customer satisfaction. This is an essential ingredient to the service providers as it enables them to distinguish one service from another.

The next aspect is service design, wherein a representation of an unknown service along with its properties is synthesized from an understanding of the serviceable situation and the value to stakeholders. This is an essential ingredient for service providers as it aids in creating and specifying the service in a form suitable enough for delivering successful customer outcomes. The next aspect is service processes, wherein how designed service is delivered to the customer with intended service qualities resulting in satisfaction of customer needs and customer experience is brought out in operational terms.

Service processes aids provider and customer stakeholders in managing the service using a network of processes and their interactions thus creating a better understanding of delivered value. The next aspect is business models, wherein the core-logic of the organization for creating value for its customers and other stakeholders are innovated, defined, and specified. It is an essential ingredient for service providers who conceptualize the business model as a set of factors like core logic, belief systems, cognitive environments, and competencies that effectively interact, leading to differentiating value creation for customers and other stakeholders.

The next aspect is digital transformation, wherein digital forces and business models are utilized by service providers to transform social interactions and customer relationships thereby reshaping the ability to access and leverage information to provide better services. This is an essential ingredient for service providers, as it facilitates design of services that are useful, usable, and desirable from the consumer perspective, and efficient, effective and different from the provider perspective. The model for service innovation can be summarized as given in figure 7.

A Model for Excellence

To deliver more value to customers at lesser cost while improving productivity without compromising on quality, it is necessary for organizations to understand what it means to sustain operational excellence. Processes hold the key to achieving sustained operational excellence. Accordingly, the first element that should achieve excellence is the product or the offering that the organization is providing to its customers. This means that excellence translates to benchmark products/offerings, which would mean that the product/offering is of high quality and provides superior customer delight.

The next element is the process that delivers the offering. Accordingly, it is necessary that process is the benchmark process and the practices adopted in the organizations

are the best practices. The next element that should achieve excellence is how responsibilities defined in the process to different role players are managed with focus on the life cycle of problems that come under management purview. Accordingly, it is possible to guarantee an offering by achieving management excellence. The final element that should achieve excellence is the notion of continuous improvement or Kaizen. Accordingly, it should be possible to improve and change the process while it's executed to achieve sustainability excellence. Therefore, if excellence cannot be achieved by an organization for these 4 different entities then it is not possible to sustain operational excellence. The model of sustainable operational excellence is presented in figure 8.



Figure 8. Model for Sustaining Excellence

A Model for Body – Mind – Spirit

Business is a purposive cybernetic system. Organizations are designed and organized as business units to attain this purpose. Each business unit has responsibilities with respect to the business. Information systems are designed to support the functionality needed by business units so that they can meet their responsibilities. To design information systems that encode business, capture the knowledge in a business, run the business and capture the environment of the business, it is necessary to look at information processing in the context of knowledge management.

To support this, Nori et al, 2014, propose the Body – Mind – Spirit model. In this model, the systems of the body are organized by major business units and their individual functions. It is imbedded in mechanisms necessary for organizations to work to achieve business' purpose. The systems of the mind are organized by what has

been learnt in terms of operative and actionable body of knowledge. It is imbibed in the mechanisms and competencies necessary for the organization to accomplish what the business must realize. The systems of the spirit are organized by vision, mission, and objectives of the business that in turn dictate the goals of the organization. It is imbibed in the form of constraints, capabilities, and value chain of the business.

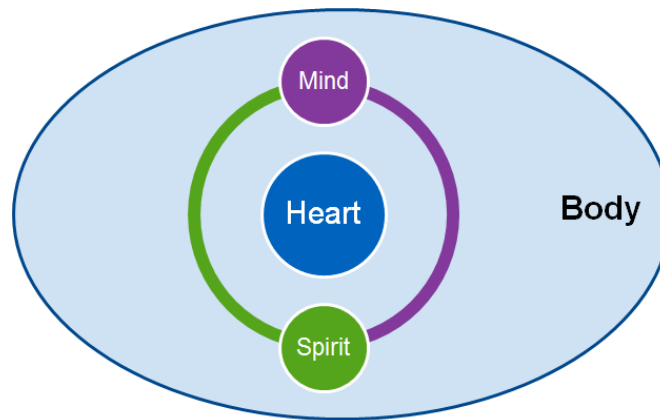


Figure 9. The Body-Mind-Spirit Model (Nori et al, 2014)

As shown in figure 9, this model is essentially a layered model that separates roles, such that each can handle some types of change in the nature or context of the business, and each can adapt itself as needed to change elsewhere. Using this model to localize change in knowledge systems would involve being able to identify corresponding layering in the business systems architecture, such that each layer is responsible for handling change, and adapt to changes in other layers. A business can be understood as a hierarchical layering of interdependent systems of Spirit, Mind and Body.

The Body layer is the embodiment of the mechanism that effect the change. It provides capabilities to perform actions, to obtain inputs, perform analysis and so on. At a higher level of abstraction, it captures the essence in a model for the mechanism, in terms of chosen representations for the world around it, to realise the objective of the mechanism, also so represented. The Mind layer is the embodiment of reasoned action. It can reason the circumstances in which the action should take place. It is responsible for the logic of how to achieve desired outcomes using available capabilities. It reflects experiential learning that accrues from second-order cybernetics.

The Spirit layer drives the business, to realise possibly emancipating goals. It defines

the set of goals to be achieved and provide the driving force to achieve them. A goal is expressed as a list of conjunction of predicates. Goals are a conjunction of such lists. The goals are expected to be emancipating, continuously evolving, and improving. The Heart layer empathises with the environment and wishes that some values be true and sets some goals to this end. It is concerned with the relationships between the business and the environment. It tracks the history and nature of these relationships, and when these relationships are uncomfortable, triggers systems of the spirit to change behaviour, attempting to move the relationships to a comfortable zone.

A Model for Knowledge Processes

All business decisions are driven by knowledge. Business activities contribute significantly to the generation, refinement, and utilization of knowledge. A model of knowledge processes helps in the management and generation of knowledge necessary for businesses to function. Such models can be used to drive business decisions, achieve business goals and to predict business outcomes. Any unexpected variation in outcomes drives refinement of practice, and eventually refinement of the underlying knowledge. Nori et al, 2017, proposes the Aditi model for knowledge processes, as illustrated in figure 10. This model is a simple approach to integrate the different knowledge processes by means of a collection of reinforcing loops. It depicts the collection of processes involving a set of observers for formulating models of a business and how these models can be used to drive business systems. The objective of this model is to enable clear understanding and reasoning about the dynamics of how knowledge evolves over time.

The Internal Regulation Loop is focused on the business systems design, and the Adaptation Loop is a result of Maslow's hierarchy at work on refining the characteristics of the business system for human use. The Systems Thinking loop and the Observation loop happen in parallel amongst many observers leading to the need for a Social Agreement loop, wherein facts are gathered and weeded through a socializing process. Repeatability of experiments leads to social agreement among the empirical models which is also based on specific forms of feedback. Each empirical model is an attempt to study a desirable property of the business. The Holism loop reconciles conflicts, prioritizes properties, and where necessary, does simultaneous studies of mutually dependent properties. This resultant knowledge processes model is now fit for scientific, analytical study with respect to formulated goals, and observing various available physical and societal laws.

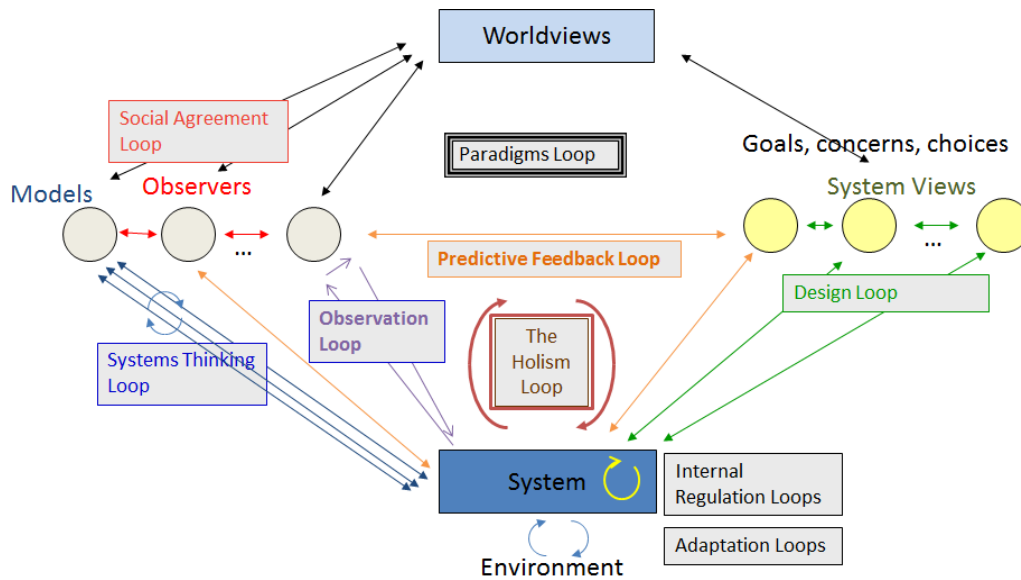


Figure 10. The Aditi Model for Knowledge Processes (Nori et al, 2017)

A Model for Digital Disruption

Businesses have realized the need for differentiation across different customer segments to stay competitive and relevant in their respective areas of business. Experience with digital in different business endeavours has shown that introducing digital into businesses has transformed social interactions, customer relationships, as well as reshaped the ability to access and leverage information to provide better solutions. Digital facilitates design of business systems that are useful, usable and desirable from customer perspective, and efficient, effective and different from producer perspective. Businesses have also realized the importance of digital as a disruptor in their engagements to stay competitive and relevant in their offerings. Kumar et al, 2018, proposes the digital disruption model, as illustrated in figure 11, as a basis for enabling digital businesses.

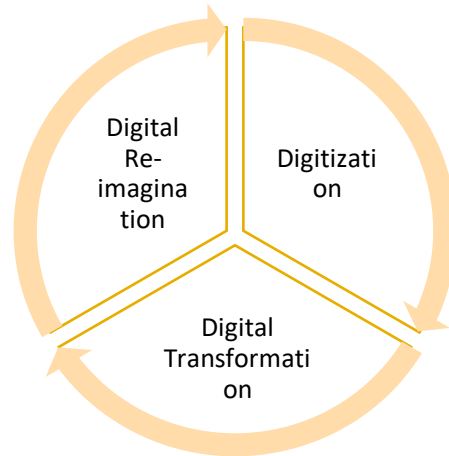


Figure 11. Digital Disruption Model (Kumar et al, 2018)

In the digitization layer, organizations introduce digital technologies (like Mobile, Big Data, Robotics, Social Media, Internet of Things and so on) into their existing products and services. Here, the existing hierarchies, relationships, information flows, workflows, role players, responsibilities, dynamics and interactions are preserved. In the Digital Transformation layer, organizations transform the experiences of their products and services by utilizing digital technologies. This may involve changing the underlying design or changing the underlying perspective. Here, the focus shifts from products/services and its capabilities to stakeholders and as a result the focus is on the stakeholder’s purpose. In the Digital Reimagination layer, a fundamental change in the way the business is conducted by bringing in a new business model into the market with appropriate digital product-service offerings. The focus is not on incremental change but creating something that is fundamentally different in terms of traditional wisdom. In this process, technologies, products, services, business acumen, technical acumen and information pertaining to customers are exploited so order to create the disruption.

A Model of an Enterprise

A model of an enterprise is presented in figure 12. Businesses have vision, mission and values which helps define their purposes. Business functions enable achievement of these purposes. Each of the business functions has responsibilities with respect to the business. Businesses have its tangible goals, such as production targets, market share, profits, etc., and intangible goals, such as customer relationships, satisfaction, societal well-being, etc. The various business functions facilitate realization of these goals. People, Resources, Information and Technology

are the basic elements of the enterprise and serve as the business systems structure.

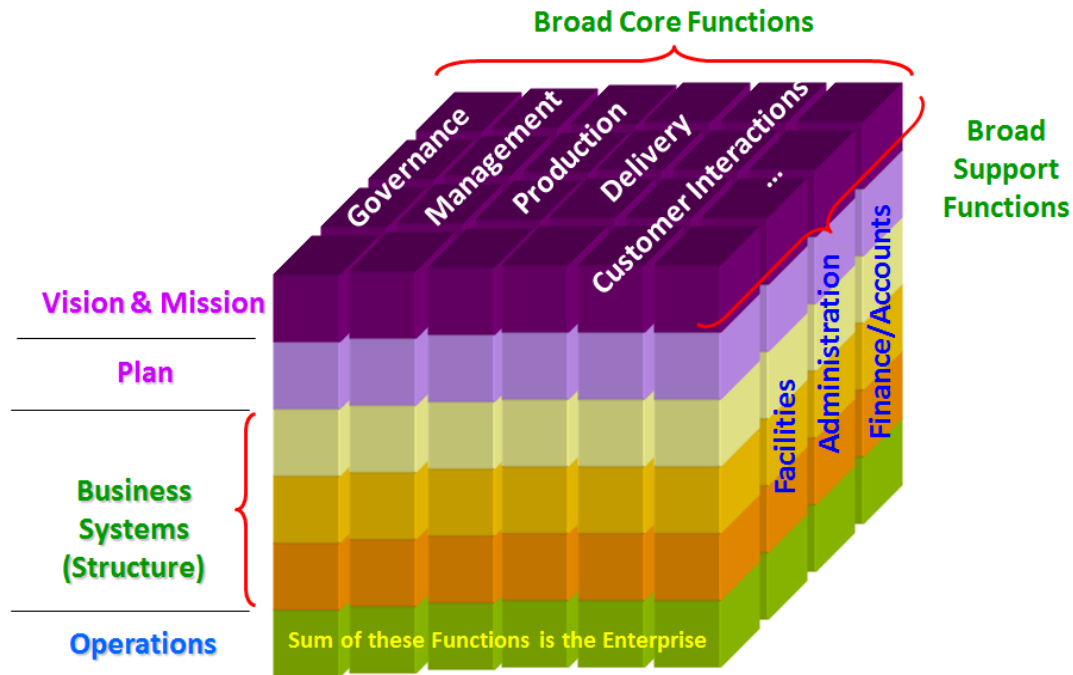


Figure 12. Model of an Enterprise

Business systems are the entities of enterprises that aids in extracting out the inherent value to stakeholders. They are the expression of how the underlying system elements, work together thereby enabling customers to realize value from the enterprise. Business systems deals with how to utilize the different elements in bringing in the necessary business transformation in an enterprise. They support business processes which are performed by role playing people to perform the operations of the enterprise. People play roles in business processes fulfilling their responsibilities in them with aide of resources, information and technology. The purpose of these business processes is to deliver offerings to customers that help them fulfil their needs. The purpose of the enterprise decides the nature of offerings to produce along with appropriate customer segments to serve. This forms part of the strategy of the organization. However, all the operations of the organization are constrained and enhanced by its interactions with its environment.

Summary

In this paper, a brief overview of models that were found to be useful in enabling businesses is discussed. While some of the models are covered in detail in separate publications, the objective of this overview is to provide a holistic view of how different

kinds of models can be used to model businesses and enable the underlying business systems. Many of these models were found to be useful in understanding, analysing, and synthesizing the customer businesses and the underlying business systems of a large service provider organization. Since these models were created with the objective of creating information systems that can support businesses and business systems, it is quite possible that these models need to be tailored for usage in different situations.

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