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Balanced Development using Ontology-Based Tantra Framework

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Abstract

The idea of *Balanced Development* is to ensure equitable distribution of necessities of life and creation of productive remunerative employment across society. Balanced development is a prerequisite for sustainable economic growth and shared prosperity. To facilitate this challenging task, we have proposed an *Ontology-based Tantra Social Information Management Framework* that can help set goals, design and evaluate interventions, define and monitor relevant metrics in an ongoing basis. Tantra Framework represents social information using ideas from *Zachman Framework* and concepts from *Unified Foundational Ontology.* Tantra Framework inter-operates with well-regarded models. *Balanced Scorecard* is used to define development objectives. *Bartels' Theory of Separations* is used to identify barriers to access, consumption and profitable participation. *Theory of Change* process is used to arrive at right intervention. *Distributed Ledgers* are proposed to handle *Change Management*. A *Social Information Management Process* is proposed to keep the framework populated, complete and current. Tantra Framework can lead to broader *Digital Governance Framework* with strong cognizance of Social dimension. The paper explains how Tantra Framework can be used to realize Economic Development in Indian context.

Keywords: Balanced Development, Balanced Scorecard, Ontology, Theory of Change, Zachman Framework

1. Introduction

Countries such as India and Pakistan after independence approached development 5-year plans the main thrust was on industrialization. However, in the last few decades, many countries have shifted their focus towards holistic development of all sectors, regions and people. To assess holistic development, the UN has adopted the Millennium Development Goals (MDG) Framework consisting of eight goals in September 2000. In 2015, UN replaced MDG Framework with Sustainable Development Goals (SDG) framework consisting of 17 goals, to be used for the period 2015 to 2030. These goals pertain to elimination of poverty and hunger, ensuring good health, quality education and gender equality, providing access to clean water and sanitation, affordable and clean energy, decent work and economic growth, etc

The notion of Balanced Development is proposed by Jehangir Khan in his paper (Khan, Faheem Jehangir, 2008) on Medium Term Development Framework (MTDF) for Pakistan. He described the goal of balanced development as providing employment with income generation, housing for all and good governance to rural, urban and less developed/ remote areas. He characterized Good Governance as key link between growth and reduction of poverty and inequality. Further, he listed the following issues, which act as impediments to balanced development:

- Poor management of resources; disparities in the pace and level of development across provinces and across districts,
- Denial of basic needs of food, water and shelter to a substantial proportion of the population,
- Lack of sensitivity, transparency and accountability in many facets of the State machinery, particularly those that have an interface with the public,
- Marginalization, exclusion or even persecution of people on account of social, religious, ethnic or even gender affiliations,
- Lack of credibility – the gap between the intent and the actions – of some institutions in society,

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- Inadequate application of rules, evasion of taxes and failure in getting timely justice,
- Existence of a significant number of the voiceless poor with little opportunities for participating, and
- Deterioration of physical environment in the urban and rural areas.

To achieve good governance, we need a way to manage information related to Governance and Society in a comprehensive and holistic manner, so that Governments can make informed choices. To that end, we have proposed Ontology-based Tantra Framework captures information on People, Addresses and Locations, Assets and Attributes, Events, Processes and Objectives as well as relationships and relators.

Rest of the paper is organized as follows. Section 2, Frameworks and Models dwells on approaches to manage information. Section 3, elaborates the proposed Ontology-based Tantra Framework. Section 4 describes Application of Tantra Framework for Balanced Development. Section 5, Discussions describes the proposed Social Information Management Process and how Tantra Framework can be evolved to a broader Digital Governance Framework. Section 6, Conclusions, concludes the paper and outlines future research opportunities.

2. Frameworks and Models

2.1 Defining Framework

From a researcher's view-point, "a framework is a way of representing the empirical relations between every aspect of inquiry. It describes the general direction and the constraints of the theory or research. It is an organized structure of ideas, concepts, and other things that are involved. A well-developed framework should be coherent and serve as a communication tool to stakeholders".

2.2 Zachman Framework

Zachman Framework (Zachman, 2003) has rows and columns that can capture information in a holistic and comprehensive manner. Zachman Framework is illustrated in Table 1.

Here the columns are primary interrogatives of English Language – who, what, when, where, how and why. The rows represent the perspectives of Planner, Owner, Designer, Builder, Implementer and Operator respectively (Zachman, 2007). The purpose of rows is given below.

Table 1. Zachman framework

	What	How	Where	Who	When	Why
Contextual	List of things important to business	List of core business processes	List of business locations	List of important organizations	List of Events	List of business goals Strategies
Conceptual	Conceptual data / object model	Business Process Model	Business Logistics System	Work Flow Model	Master Schedule	Business Plan
Logical	Logical Data Model	System Architecture Model	Distributed System Architecture	Human Interface Architecture	Processing Structure	Business Role Model
Physical	Physical data/ Class model	Technology Design Model	Technology Architecture	Presentation Architecture	Control Structure	Rule Design
Detailed	Data Definitions	Program	Network Architecture	Security Architecture	Timing Definition	Rule Specification
Functioning Enterprise	Usable Data	Working Function	Usable network	Functioning Organization	Implemented Schedule	Working Strategy

- The purpose of row 1 artifacts is to define the boundaries of the enterprise, which includes the scope of the enterprise,
- Row 2 artifacts' purpose is to conceptually define what the enterprise owners have in mind,
- Row 3 artifacts design how the concepts of the enterprise will be realized systematically,
- The purpose of row 4 is to define the enterprise implementation keeping in mind the technology constraints, and
- Row 5 artifacts' purpose is to specify the implementations to specific technology products being used for the implementation.

2.3 Unified Foundational Ontology (UFO)

Another important topic when building a generic framework is Ontology. UFO Ontology defines *Universals* which map to concepts that get instantiated as *Individuals*. The individuals can be *endurants* or *perdurants* (events). There are relationships which are more like attributes and other type of *relationships* which need an intermediary called *relator*. In (Santos Jr, Paulo et.al, 2013) *ARIS* method is developed that makes use of UFO ontology and applies it to organizations. The UFO constructs are explained in Table 2&3.

Table 2. UFO concepts

Level	1	2	3	4	4	5	5	6	7
Concept	Basic Elements	Universals	Individuals	Endurants	Perdurants	Substantial	Moment	Intrinsic Moment	Relational Moment (Relator)
Description	Universals or Individuals	Named level in Zachman	Instantiate Universals	Type of Individuals	Events that make up processes	Objects that exist independently	Exist only if bearer exists	Depend on Single Entity	Moments depend on other entities in addition to the bearer
Examples		People		House, Person, Moon, Enterprise	Business processes, Enrollment processes	Person, a house, a planet, and the rolling stones	John's weight, John and Mary's marriage	Colour of something Temperature of some object	Employment with employer Mary's marriage with John

Table 3. UFO relations

Concept	Independent Intrinsic Moments	Dependent Intrinsic Moments	Formal Relation	Material Relations / Domain Relation	Relator
Examples	Size and colour of an object	Colour and brightness of an object	Village belonging to a District. Paul's headache.	Working at, being enrolled at, and being the husband of. Medical treatment to Paul	An enrollment connects a student with an educational institution; A Government Department/policy/process connects a citizen with benefit or privilege.

2.4 Maes' Generic Information Management Framework

Rik Maes (1999) proposed a generic framework for investigating and inter-relating the different components of information management. The framework is represented in Figure 1. Here, the rightmost column represents technology such as systems and databases and leftmost column represents application that captures the business expertise the middle column represents the interpretation of information, communication and knowledge (sharing) processes. Maes then stressed on the importance of middle column of handling information and communication, by quoting several previous studies. Here a business in looked systemically.

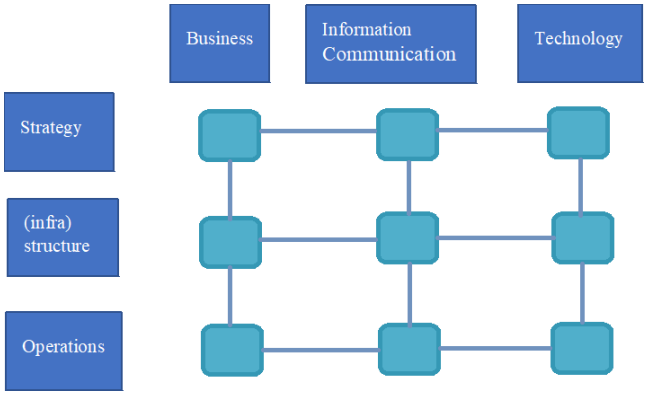

Figure 1. The generic framework for information management.

2.5 Balanced Scorecard

A commercial enterprise can be managed and led using a balanced score-card framework (Kaplan, 2010). It is possible to apply the same approach to Government. The same five perspectives that apply to an enterprise may be applicable, namely

- Financial,
- Customer (Citizen/Community/Business),
- Internal Business (Process of Governance),
- Learning and Growth (Innovation and strategy), and
- Ethical.

The score card can be created and tracked in terms of Strategies, Objectives and metrics in line with mission and vision of an organization as illustrated in Figure 2.

Figure 2. Balanced scorecard pyramid (Kaplan and Norton 1996).

2.6 Theory of Change

Kurt Lewin famously said, "There is nothing more practical than good theory". Theory of Change (Weiss, 1995) is essentially a comprehensive description and illustration of how and why a desired change is expected to happen in a specific context. It does this by first identifying the desired long-term goals and then works back from these to identify all the conditions (outcomes) that must be in place (and how these related to one another causally) for the goals to occur. This leads to better planning, evaluation and monitoring of the initiatives.

2.7 Theory of Separations

Major objective of Governance is economic development. Here we would like to leverage ideas from Bartels theory of market separations (Bartels, 1968). Bartels identified four different separations that come in the way of market-development.

- *Spatial separation* or the physical distances between producers and consumers,
- *Temporal separation* or the time difference between production and consumption,
- *Informational separation* or the information asymmetry between producers and consumers related to products and market conditions, and
- *Financial separation* or the lack of consumers' purchasing power when they are willingness to fulfill their needs".

Certain researchers have added Knowledge/Capability based separation as the 5th separation (Tarafdar & Singh, 2011).

3. Ontology-Based Tantra Framework

Governance Systems can be considered as complex systems where large number of people and entities interact. Connectedness of a complex system comprises of two facets: one is at the level of structure of linkages, and another is at the level of behaviour. Every action by an actor will be responded by other actors. As such, a well-intentioned Government program in many cases results in unintended outcomes.

"Traditional Economic analysis looks at society either with Macro or Micro perspective. In reality much of the economic life takes place in the continuum

between the two. Sociology traditionally looks at smaller groups where data collection and analysis can be managed, as well as behaviour can be studied. But today social interactions span all over the globe in a digital and virtual manner. Today's technologies make it easy to manage large amounts of data; (iii) Today's computer platforms are largely social where people provide feedback, share knowledge, express opinions, provide suggestions for policy and get influenced by their communities. The social dimension has overtaken the technology dimension" (Easley & Kleinberg, 2010). Hence, we need a multi-pronged approach that synergizes these perspectives. To meet this challenging task, we propose Ontology-based Tantra Framework. Tantra Framework models the social information as a multi-modal social network.

The name Tantra Framework is chosen to reflect enormous connectivity of information through the framework. Etymologically in Sanskrit "tantram", literally means "loom, warp," hence, figuratively, "groundwork, system, doctrine".

Tantra Framework extends Zachman by adding two additional columns namely relators and relationships. The relationship column is used to represent any relationship which may correspond to a data-map or structured map, between framework columns. A relator column is added to represent any entity/concept that is integral part of any relationship. Yet another column namely separations is used to represent lack of relationship or the level of difficulty to access the relationship.

The aspects of Tantra Framework can be used to expresses social information as follows. In addition, under "Who" aspect, we can model communities, categories of people as well as businesses and institutions. The Table 4 gives the view of Tantra Framework.

- People (Who),
- Places/Addresses/Locations/Zones (Where),
- Assets/Attributes (What),
- Events (When),
- Processes (for enrolment, intervention) (How),
- Metrics to measure development (Why),
- Relators (enable relationships),
- Relationships (between aspects), and
- Separations (express lack of or difficulty of establishing a relationship).

Tantra Framework as defined above can be converted into a normative framework by interoperating with models that can help achieve Good Governance. Here Goals can be set using Balanced Scorecard Framework and interventions can be modeled and managed through Theory of Change Framework. The Separations can be expressed by drawing on Bartels' Theory of Separations (Figure 3).

Table 4. Tantra framework

Perspectives	Aspects								
	Who	**Where**	**What**	**When**	**How**	**Why**	**Relationships**	**Relators**	**Separations**
Contextual (Named and Scoped)									
Conceptual (Defined)									
Logically Designed									
Physically Configured (Schema)									
Detailed/ Instantiated)									

Goals (Balanced Scorecard)
Interventions (Theory of Change)
Networks (Structured Maps) and Separations (Disconnects)
Relations (Aspects)
Domains/Roles/Entity Sets (Instances)
Discrete Information Space

Figure 3. Tantra framework with interoperating models.

In Tantra Framework as in Zachman Framework every aspect goes through the process of reification. Table 5 describes how People Domain is reified. Table 6 describes how the Addresses are reified. The addresses in turn are located in Zones or Geographic contexts which are uniquely identified. Table 7 covers asset perspectives. The assets belong to "what" Aspect. In the same manner Loans, Taxed and duties paid/payable can be modeled in the Tantra Framework under "What" aspect. This can help get a complete financial profile of borrowers. Table 8 covers the perspectives pertaining to Objectives. Table 9 covers the reification of relationships and relators and Table 10 covers separations with access to Formal Credit. Similarly, events that occur during life-time of a person can be reified and given a unique ID. These include birth, attaining maturity, migration, enrollment, emigration, immigration and death. The processes can similarly be covered.

Table 5. Reification of people domain

Perspective	All people	Citizens	Residents	Resident Aliens	Resident Citizens
Named (Identified & Contextua-lized)	All the people known and to be known to the framework.	People who t are citizens	People who are residents	People who are resident but alien	Resident Citizens
Defined (Conceptually Structured)	What makes one a member of this domain/role	What makes one a member of this domain/ role	What makes one a member of this domain/role	What makes one a member of this domain/role	What makes one a member of this domain/ role
Logically Designed	Related attributes that map to other aspects.	Related attributes that map to other aspects	Related attributes that map to other aspects.	Related attributes that map to other aspects.	Related attributes that map to other aspects.
Configured	Representation in Graph database as nodes and edges.	Representation in Graph database as nodes and edges.	Representation in Graph database as nodes and edges.	Representation in Graph database as nodes and edges.	Representation in Graph database as nodes and edges.
Instantiated	Instantiate with unique ID.	Instantiate with unique ID.	Instantiate with unique ID.	Instantiate with unique ID.	Instantiate with unique ID.

Table 6. Reification of addresses

	Residential address	General Address/ Location	Commercial Address	Institutional address	Address for public/ civic amenity
Named (Identified)	Idea named with context	Idea named with context	Idea named with context	Idea named with context	Idea named with context
Defined (Conceptually Structured)	Concept of Residential address. Membership criteria, entry and exit	Concept of Generic address or location	Concept of Commercial address. Entry and exit criteria.	Concept of Institutional Address Membership Criteria	Concept of utility/amenity – playground, park.

Logically Designed	Attributes of Residential addresses	Attributes of Generic addresses	Attributes of commercial addresses.	Attributes of Institutional addresses	Attributes of amenities.
Configured	Schema for Residential addresses	Schema for storing generic addresses	Schema for commercial address	Schema for institutional addresses	Schema for storing details about address
Instantiated	Instantiate with unique ID (Unique ID+ Address ID)	Instantiate with Unique ID (GPS IS?)	Instantiate with Unique ID	Instantiate with Unique ID	Instantiate with Unique ID

Table 7. Reification of assets

Assets	Owned House	Vehicles	Land
Named (Identified)	Idea Named with context	Idea Named with context	Idea Named with context
Defined (Conceptually Structured)	Concept, how this comes about, through allotment, transfer, inheritance. Part-ownership	Concept, how this comes about, through allotment, transfer, inheritance.	Concept, how this comes about, through allotment, transfer, inheritance. Part-ownership
Logically Designed	Attributes like location, size, related events	Attributes like Type, Related events	Attributes like location, size, related events
Configured	Schema with nodes, labels, ids and relationships	Schema with nodes, labels, ids and relationships	Schema with nodes, labels, ids and relationships
Instantiated	Instantiate asset with unique ID	Instantiate asset with unique ID	Instantiate asset with unique ID

Table 8. Relationships and relators

	Banking (Savings)		Loans	
Named (Identified)	Name of the idea and context for relationship (Savings account)	Name of the idea and context for relator (Bank)	Name of the idea and context for relationship	Name of the idea and context for relator (Housing Finance Company)
Defined (Conceptually Structured)	Concept of Relationship	Concept of Role of relator	Concept of Relationship	Concept of Role of relator,
Logically Designed	Related Attributes	Related Attributes	Related Attributes	Related Attributes
Configured	Network Schema	Network Schema	Network Schema	Network Schema
Instantiated	Account No.	Instantiate with unique ID	Account No.	Instantiate with unique ID

Table 9. Separations that come in the way of formal credit

Informational	Capability	Spatial	Temporal	Financial	Social
From borrower's view-point information on processes may be hard to access and understand.	Capability to utilize funds may not be there. For example, starting a small business requires lot more than mere access to funds.	Not all bank branches lend. Getting a loan may need multiple trips to remote locations	Banks may take rather long to disburse loans. The people may need to work with Micro-finance companies who may charge higher.	People may not have access to collateral. Only some banks may accept gold as collateral. If they pledge land, they may lose their source of livelihood.	Communities that are not considered as trust-worthy end up getting less loans.

Table 10. Perspectives on metric

Perspectives on Metric	Remarks
Contextual	This pertains to name of the metric and context of the metric. For example, the metric may pertain to an area or category or class of people. The metrics get aggregated at higher and higher levels of granularity.
Conceptual	This gives the idea behind any metric. Typically, a metric is a ratio between two measures. The metrics are defined using different perspectives of Balanced Score Card: Financial, Customer (Citizen, Community and Business), Process (Governance and Social Processes) and Learning and Growth.
Logical	Gives details of the schema to compute a metric
Physical	Nodes: Corresponding to the Schema
Detailed	Each instance of measurement is given a unique number and linked to other dimensions

Table 11 describes how a metric is reified in Tantra Framework through perspectives (should not be confused with balanced scorecard perspectives). Table 12 covers typical metrics pertaining to Governance context that can be tracked at individual level and aggregated. Table 13 covers indices aligned with Balanced Scorecard Perspectives. Tantra Framework is implemented using Neo4j graph database which gives it power of visualization.

Tantra Framework can be a great resource to Social Scientists supporting research methods such as *Action Research, Ethnography, Case Study and Grounded Theory Methods* (Myers, 1997). It is particularly suited to Grounded Theory Method. According to Martin and Turner (Martian & Turner, 1986), grounded theory is "an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or data." The grounded theory suggests that there should be a continuous interplay between data collection and analysis.

Table 11. Typical metrics that can be measured for people and their description

Poverty Level	Inequality	Unemployment	Productivity	Access Metric	Separation Metric
Number of Poor who have income below poverty line (income level) per thousand.	Gini Index is used to measure inequality.	Number of people who are not employed per thousand as well as under-employed.	Standard measurements.	The number of people per thousand in a given context who have access to a particular service maybe through relator.	This metric can be done per thousand people and aggregated upwards.

Table 12. Operationalizing tantra framework for balanced development

Sl. No.	Topic	Remarks
1.	Issues in the current system	Poor management of resources; disparities in the pace and level of development across provinces and across districts. Denial of basic needs of food, water and shelter to a substantial proportion of the population. Lack of sensitivity, transparency and accountability in many facets of the State machinery, particularly those that have an interface with the public. Lack of credibility – the gap between the intent and the actions – of some institutions in society. Inadequate application of rules, evasion of taxes and failure in getting timely justice. Existence of a significant number of the voiceless poor with little opportunities for participating. Deterioration of physical environment in the urban and rural areas.
2.	Change Agents	Government bodies and service providers that handle policy, legal aspects, execution all the way to last mile.

3..	Desired Change	Shelter, gainful employment for all and balanced development of regions irrespective of rural, urban or remote.
4.	List of Services to be built using Tantra Framework	Relevant metrics can be computed to asses the status of development.
5.	Strategic Alignment between Objectives and services (How these services meet the objectives)	Based on the above metrics, action plan with priorities, timelines and resources required can be established.
6.	Design of change Process with Purpose	Using Tantra Framework broad social data from formal and informal sources is collected and this can help design interventions that need to be attempted.
7.	Transition Process	Current processes should give way to services that are built on the framework with ability to seed and validate data about people and build the eco-system that includes all stakeholders.
8.	Operational aspects and organizing actors/ Institutions	Existing Government organizations can be tasked as nodal org.
9.	Process for collecting feedback	Feedback from all stakeholders can be collected and shared as appropriate. Feedback should be used to achieve continuous service improvement.
10.	Training Plan	The officials and people need to be trained with online material as well as off-line programs.
11.	Future Roadmap	The scope of Balanced Development can be enhanced to cover additional goals in line with the UN SDG goals.

Table 13. Skill development using theory of change process

Summary Statement	If more people are skilled unemployment can be reduced. If people have better skills then they can get better jobs and augment their incomes. If employment increases poverty levels can be reduced and in turn GDP growth increases.
Problem Statement	People are not able to get jobs as they lack skills. There are jobs which are not getting filled due to lack of skills.
Overall Goal	The growth in GDP attributed due to higher employment levels, reduction in poverty levels and reduction in inequalities.
Change Process	Imparting training on hands-on-skills, knowledge about the field to attain proficiency level and orientation to do work professionally and ethically.
Change Markers	Demonstration of proficiency through some form of output.. Feedback from potential customers or experts in the field as far as employability is concerned.
Meta-Theory	Formal, holistic training can help people compared to learning on the job opportunistically.
Inputs	Publicizing the programme. Incentive to people to attend the program.
Actors	End-user/Beneficiaries: Students/workers looking to upgrade skills, potential employers, industry at large that needs skills; Implementing actors: Service Providers, Curriculum owners, teachers, Program Owners (Skills Ministries); Spoilers: Middle-men who may be dishonest; Points of collaboration: Industry association, sponsors, NGOs, other Ministries, State and District Administration.
Domains of Change	Soft skills, Professionalism, Ethics, Culture of accomplishment, Sectoral skills
Internal Risks	Flooding of only one type of skills may disrupt current wage levels. Skilling with low achievement may bring disrepute to agencies and employers.

Assumptions	People want to improve themselves;, Employers are open to hire skilled workers; Employers willing to pay reasonable wages; Teachers focused on delivering learning outcomes; Availability of facilities to deliver training; People do not drop out from the programmes; People are committed to complete the programme; People are committed to use the skills in a future job; Reasonable possibility of getting a job within reasonable time of skilling; Employers will commit to address any further skill gaps.
External Risks	Market dynamic changing that reduces demand. This needs to be constantly monitored. The programme should have variety, breadth along with specialization. Budget cuts. Careful use of allocated resources. Continuous monitoring, sharing of success stories and collecting feedback from employers. Looking for additional sponsorships.
Obstacles to Success	Any diversion of funds, corruption and performance issues of service providers, teachers and students. Backup plan in each of the cases.
Knock-On Effects	Positive: People may move away from alcoholism. May lead to reduction in domestic violence. Improvement in mental health. Negative: Other missions may have reduced allocations.

4. Application of Tantra Framework for Balanced Development

Table 14. Modeling tantra framework to facilitate balanced development

Sl. No.	Aspect	Remarks
1.	People	Here the data on access to shelter, gainful employment and basic needs is checked.
2.	Locations, Zones	The geographic dimension cane be modeled into Zones with certain characteristics such as rural, urban and remote.
3.	Events	Events tracked can be life-cycle events for individuals as well as events pertaining to processes of Governance.
4.	Assets	Assets of citizens can be modeled here
5.	Process	Intervention processes as well as routine operational processes can be tracked here.
6.	Objective	% Gainfully employed, % with access to shelter and other appropriate metrics can be tracked here.
7.	Relator	All Government Departments, Employers as well as those who lease/rent out houses can be considered relators.
8.	Relationships	The relationships between different aspects
9.	Separations	The Financial, Spatial, Informational, Temporal, Social and Capability Separation of people are modeled here.

The goals of balanced development are shelter, gainful employment for all using Good Governance. Here we explain how Tantra Framework can be used to model and analyze the status of development and operationalize any changes needed. Table 14 details the high-level plan to operationalize Tantra Framework for Balanced Development. This uses ITIL change management methodology (BMC Software). Table 15, explains how an intervention such as training people for better skills can help balanced development. Skill is a great leveler especially in today's economy. Table 16 details how Tantra Framework can be modeled to facilitate Balanced Development. Table 17 contains the analysis enabled by Tantra Framework.

Table 15. Analyzing balanced development using tantra framework

#	Aspect	Remarks
1.	People	Analysis can be made as far as access gaps are concerned and whether the benefits of Government schemes are reaching the people in a fair and equitable manner. For example, who can benefit with what skill can be analyzed and check if existing interventions help.
2.	Locations, Zones	Analysis based on relator zones, backward and forward districts can be done. This can be used to target the interventions better.
3.	Events	Events can be analyzed to understand acceptance of new scheme as well as timeliness of process.
4.	Assets	Asset ownership can be analyzed here.

5.	Process	Analysis may be made on blockers to implementing Government Schemes on. Fairness in getting access to job opportunity can be tracked to see if any specific groups of people get excluded.
6.	Objective	Objectives at various levels can be analyzed to assess the effectiveness of the changed process. Effectiveness of targeting and impact on the overall economy can be analyzed.
7.	Relator	Analysis of how well relators perform. This includes Government Offices, officials, online portals, process documents and so on.
8.	Relationships	Every new 'fact" can be stored as relationships among different aspects. Each relationship in turn may make use of other relationships.
9.	Separations	All the different separations – spatial, temporal, financial, informational and capability can be analyzed that come in the way of Balanced Development. Some plans may need to be crafted for specific areas and geographies or sections of people.

5. Discussions

Tantra Framework needs to have a process to get the information from concerned departments as well as people periodically and on demand. To facilitate collection of information periodically, K***now-your-Citizen*** process should be unveiled where each citizen provides information about him to Government annually, with option to update if need be. Tantra Information Framework should evolve into *Tantra Digital Governance Framework* where multiple institutions participate through information champions/agents. Figure 3 is modeled after TM Forum's Frameworx (TM Forum).

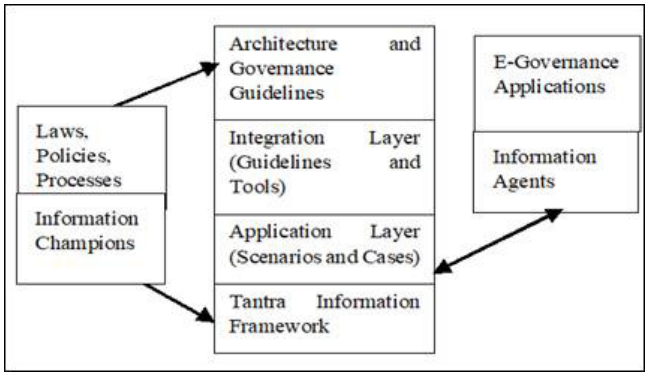

Figure 4. Tantra digital governance framework.

6. Conclusions

Many decades ago Zachman suggested that IT systems needed to be architected by keeping the whole Enterprise in mind, as Enterprises outlive IT systems. We have applied the same line of thinking at the level of society and have proposed highly generic Tantra framework that can manage the entire information pertaining to society in one place. In this paper, we have looked at using Tantra Framework to realize balanced development of Economy in Indian context. There are opportunities to apply Tantra Framework to validate other development theories such as Balanced Growth.

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