BUILDING THOUGHTFULNESS ONTOLOGY FOR SUSTAINABLE DECISION MAKING

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Abstract: Sustainable decision making depends on the level of thoughtfulness of decision makers. Thoughtfulness has received little attention in the domain of decision making referred to decision support systems; in an effort to quantify the knowledge and its effectiveness. This trend devalued the intangible input of thoughtfulness required for sustainable decision making. Based on this concern this paper focuses on developing prototype architecture of thoughtfulness ontology which rallies round sustainable decision making. The objective of this paper is to take on board the concepts of thoughtfulness, and develop a Thoughtful Decision Support System. The conceptual basis of thoughtfulness involves three abilities. It requires: 1) an ultimate sense of action and not of inaction, 2) super-relationship with human and natural resources, and 3) awareness of future effects of decisions in time and space.7 thoughtful Meta abilities are also chosen to establish the basis of this system. Thoughtfulness ontology may add a value of sustainability in decision making.

Keywords: Sustainable decision making, thoughtfulness

INTRODUCTION

"If you want to predict the future, go invent it." Steve Jobs, 2011

Sustainable decision making depends on the level of thoughtfulness of decision makers. Thoughtfulness has received little attention in the domain of decision making referred to decision support systems; in an effort to quantify the knowledge and its effectiveness.

This trend devalued the intangible input of thoughtfulness required for sustainable decision making. Based on this concern this paper focuses on developing prototype architecture of thoughtfulness ontology which rallies round sustainable decision making.

It is a long term interest to foster sustainable decision making. Sustainable decision making is delineated by the decision with positive dynamics and the decision which not only bears the thought process but thoughtfulness. Sustainable decision making is parametric in positive impact on human and natural resources in the two scales of time and space. The decisions are found unsustainable mainly due to the thinking capacity of decision makers dependent on self, social, organizational, political and power Decision Support Systems. In this paper, we propose to flash thoughtfulness ontology to build a super DSS of thoughtfulness.

Globalization has heightened the competition among entities: individuals, institutions, and states. The leaders are bound to adapt to new conditions (Huston, 2006). It is desirable that leaders should be vigilant to emerging situations (Gabriel, 2002). Established structures and systems hamper the way of extensive thinking (Huston, 2006). So thoughtfulness promises a new vista of power. The paper evolves through the understanding of thoughtfulness.

Thoughtfulness is the capacity of showing understanding of what impact any act or word have on other person and refraining from it if one feels the impact will be negative; or making an effort to do it if the impact is to be positive (Mustafa, 2011).

Thoughtfulness postulates thoughtful intelligence based on righteousness, assented to care for human and natural resources and norms creative thinking to manage the present and future. Thoughtfulness consists of specific capacity whereby the decision maker longs for sustainability of his/her decision in time and space, whether his/her leadership status continues or not.

THE ORIGINALITY OF THE CONCEPT

The author was inspired to devise the concept of thoughtfulness while teaching a course of "Business Ethics: A stakeholder and Issues Management Approach;" when she was asked a question that who will determine what is wrong and right in decision making. The hypothesis for this paper is; "Thoughtfulness is the foremost concept to interrogate righteousness; therefore it is desirable to be built in the decision makers." During teaching the course and focused group discussions in National University of Sciences and Technology (NUST) Business School the notion of thoughtfulness was born. As the faculty of the author is International Relations; so she descends upon political decision making. The author utilizes one of her earlier study, *"Management of Transnational Decision Making Via Education: A Case Study of Water Conflict between India and Pakistan"* (2008) published in Defense Journal, Karachi, and orally offered in International conference organized by the Center for Environment Education, Ahmedabad, India 18-20 January 2005.

THOUGHTFULNESS ONTOLOGY

Ontology: the metaphysical study of the nature of being and existence. Ontology can be defined as information in a specific domain, which helps acquire knowledge and share it (Gruber, 1993). Ontology has been used for several years in Engineering and artificial intelligence (A1) for structuring domain concepts (Gehrman et al, 2008). The concepts are gathered and are regarded as basic building blocks for expressing knowledge in the field it covers. Ontology is useful in organizing knowledge, sharing knowledge, building consensus, and building knowledge based systems.

Prima facie of thoughtfulness ontology concentrates on Decision Support Systems and Intelligence, to rim into Thoughtful Decision Support System, Thoughtful Intelligence and Thoughtful Meta Abilities. Thoughtfulness seems diverse entrant in the literature of decision making but certain literature review is cited to establish relation with in vogue knowledge. The paper has the provision to quantify the quality of decisions e-g decision making in energy sector of Pakistan.

The Concept of Decision Support ⟶ Systems Thoughtful Decision Support System

Typically the top decisions are influenced by five DSSs named Self DSS, Social DSS, Organizational DSS, Political DSS and Power DSS (See Table 1). DSS analysis describes the position of decision maker. Each DSS is viewed in terms of relations to sustainability with positive dynamics. The DSSs may contradict one another referred to a decision maker, they may also contradict while judged as what is done and what needs to be done. Thoughtfulness ontology may help to manage these contradictions. The intended users are top decision makers.

Specific argument of this paper is that thoughtfulness ontology can build consensus among the DSSs and efficiency in the hierarchy of DSSs; because thoughtfulness factors in decision making with sustainable intent and implications.

The Concept of Intelligence ⟶ Thoughtful Intelligence

What is "intelligence?" It is the ability comprised of brainpower and aptitude to comprehend; to understand and profit from thinking. Intelligence delineates the thinking/learning capacity of an individual (Kutz, 2008). Intelligence is the ability to assimilate the knowledge into practice.
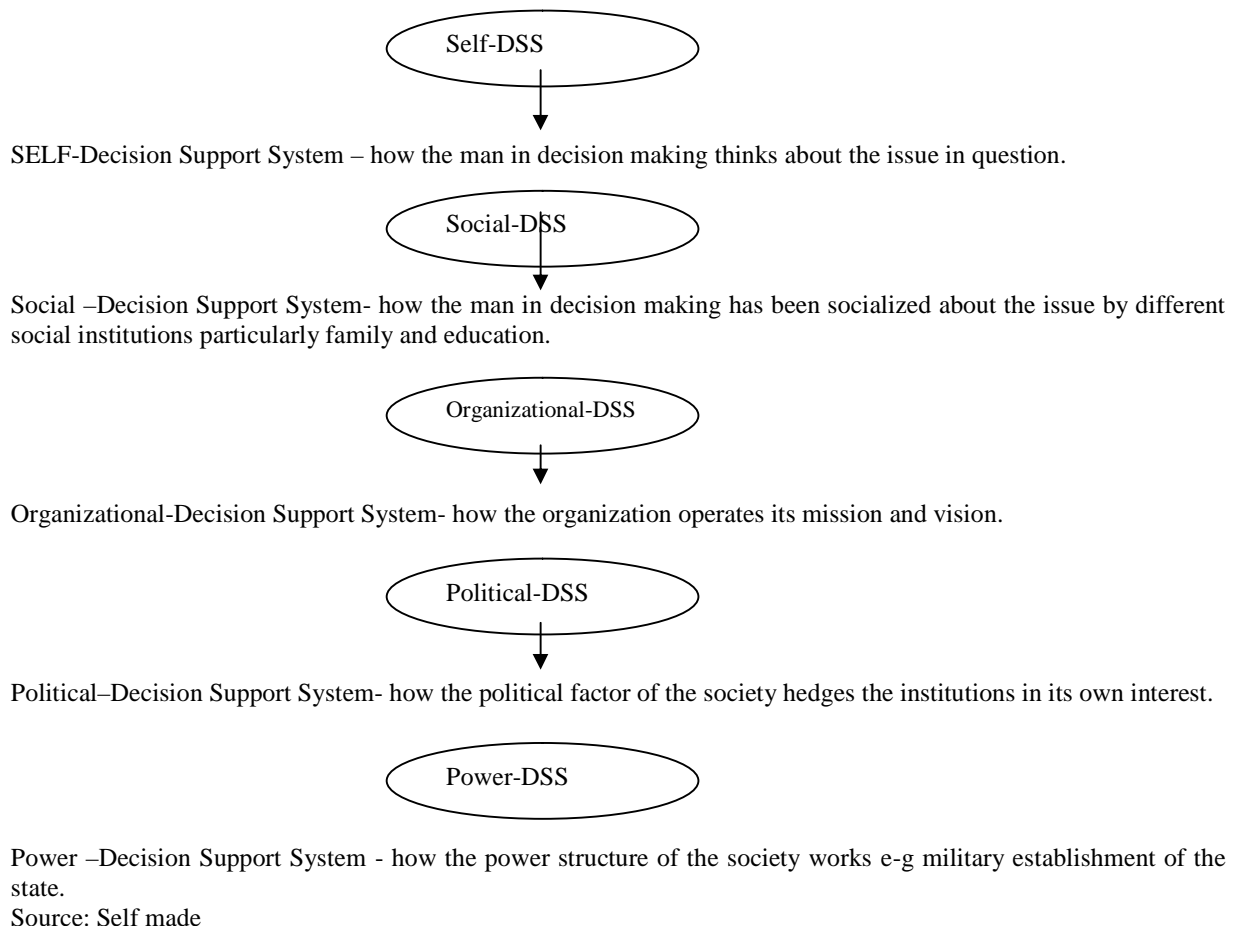In 1983Gardner introduced his theory of Multiple Intelligence in his book 'Frames of Mind, which is known as systematic, multidisciplinary and scientific depicted from Psychology, Biology, Sociology and the Arts and Humanities.

According to Gardner (1999a), intelligence is much more than IQ because a high IQ in the absence of productivity does not equate to intelligence. In this description, "Intelligence is a biopsychological potential to process information that can be activated in a cultural setting to solve problems or create products that are of value in a culture" (p. 34). Gardner (1999a) also favors gathering ethnographic data and cross-cultural information to see intelligence in action and in context. Following this description it can be assumed that the decision makers try to perform in relevance to their distinctive capacity and situation.

"-------------monopoly of those who believe in a single general intelligence has come to an end." (Gardner, 1999a, p.203).

Table 1: Decision Support Systems (DSSs)

The following factor variables are pertinent;

Self-DSS

SELF-Decision Support System – how the man in decision making thinks about the issue in question.

Social-DSS

Social –Decision Support System- how the man in decision making has been socialized about the issue by different social institutions particularly family and education.

Organizational-DSS

Organizational-Decision Support System- how the organization operates its mission and vision.

Political-DSS

Political–Decision Support System- how the political factor of the society hedges the institutions in its own interest.

Power-DSS

Power –Decision Support System - how the power structure of the society works e-g military establishment of the state.
Source: Self made

Cumulative intelligence; historical data and historical records are readily available to assist in many decision problems, the application of this information is called cumulative intelligence. Often historical data is incorrectly managed and due to over complication of their weighting and application in a decision making process they are ignored. The management and effective use of cumulative intelligence in the decision making process is critical (Articlesbase, 2011).

In shades of above content we move on *thoughtful intelligence*. Thoughtfulness is defined as the ability to think and act thoughtfully. Thoughtfulness is abstract and composed of attitudes, beliefs, values, and politics in retrospective-perspective-prospective vis-à-vis ethical capacity of an individual. Thoughtfulness has better relationship with

commitment to righteousness then with experience. It is implied that different people take different decisions in similar situation because of different level of thoughtfulness.

Thoughtfulness postulates thoughtful intelligence based on righteousness, assented to care for human & natural resources and norms creative thinking to manage the present and future. Thoughtfulness consists of specific capacity whereby the decision maker longs for sustainability of his/her decision in time and space, whether his/her leadership status continues or not.

Thoughtful Intelligence consists of three basic abilities (See Figure 1) and seven Meta abilities of Righteousness, Purposefulness, Understanding, Contemplation, Sincerity, Mindfulness and Nurturing.

Figure 1: Conceptual Framework of Thoughtfulness
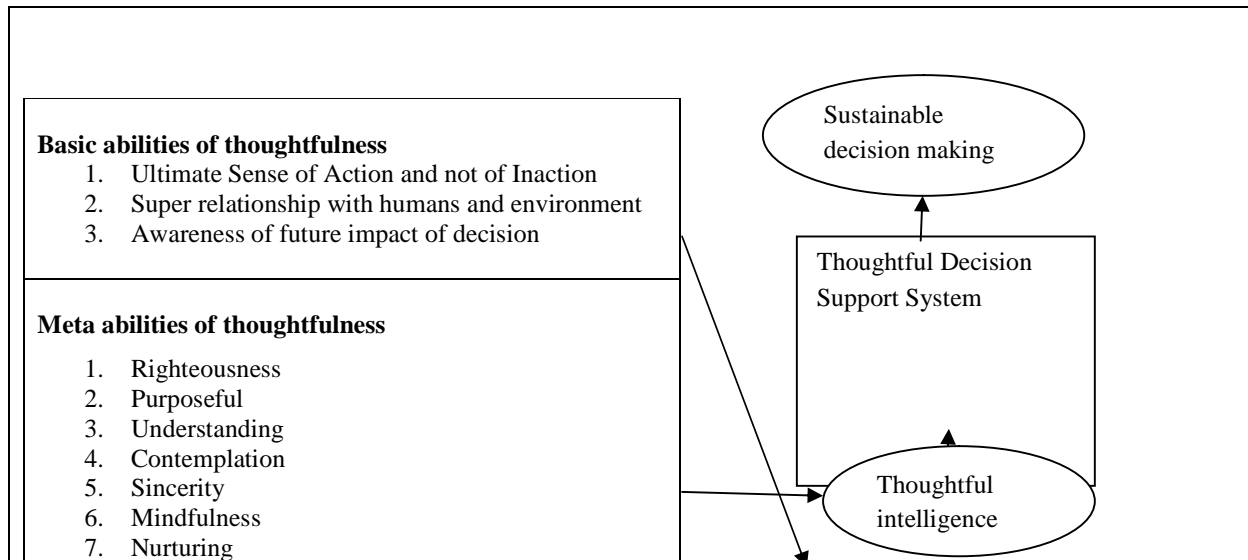
The thoughtful DSS includes the concepts referred to: 1) an ultimate sense of action and not of inaction, 2) super-relationship with humans and nature, and 3) awareness of future effects of decisions in time and space. These three dynamic abilities converge to 7 Meta abilities to build the ontology of thoughtfulness. The existence of all or some of these abilities in a decision maker may indicate the level of thoughtfulness. (1) Righteousness: adhering to moral principles (2) Purposeful: serving as or indicating the existence of purpose or goal; e-g Man is endowed with reason and capable of distinguishing good and evil (Wordnet, 2011). Instincts like hunger thirst and several others are the same both in man and animal, it's the aim of life that makes the two kingdoms distinct. Animals satisfy only the instinctive requirements while man sacrifices his instincts for achieving the aim. It is the right aim not the material gain that is superior (Sabir, 2011). (3) Understanding: the capacity for rational thought or inference or discrimination e-g "We are told that man is endowed with reason and capable of distinguishing good from evil", perceptive, appreciative, and kind. (4) Contemplation: to think about something seriously and at length, especially in order to understand it more fully. (5) Sincerity: the quality of being open and truthful; not deceitful or hypocritical (6) Mindfulness: of surroundings; the trait of staying aware of paying close attention to ones responsibilities (7) Nurturing: helping someone grow up to be an accepted member of the community, care for, look after, Cultivate.

METHODOLOGY

Thoughtfulness capacity of decision makers was validated in three phases of investigation for this study. The first phase was focused group discussion. There were six discussions each of 8-12 participants comprised of faculty, students, employees in local-provincial- national legislatures and civil-military bureaucracy. On the bases of results the five Decision Making Support Systems were developed: Self Decision Support System, Social-Decision Support System, Organizational- Decision Support System, Political- Decision Support System and Power-Decision Support System (See Table 1). This phase was concluded to look for thoughtful decision support system.

In second phase the Delphi Technique was used, 15 experts (See Table 2) with decision knowledge judged the list of thoughtful abilities. 7 thoughtful Meta abilities were chosen out of 12 to establish the bases of Thoughtful DSS.

The third phase was specific (Energy Sector) survey consisting of a stratified sample of 130 decision makers and delegates from science & technology, academia, civil society and media. 93% of respondents verified the 3 basic and 7 Meta abilities of thoughtfulness as paramount for sustainable decision making. This phase was pertinent to establish the validity of thoughtful DSS based on thoughtfulness ontology. Thoughtful Decision Support system had the highest mean rating (M = 2.23, scale 0-3). This indicated that thoughtfulness was perceived to the most important of sustainable decision making.

No of experts	Domain	Cognate	Slot
5	Sciences and Technology	Sustainable Development	Decision making
5	Management	-	-
5	Social Sciences	-	-

The study has certain limitations because of small sample size. The Thoughtfulness Decision Support System was validated by targeting sustainable development discipline/Energy. So the study may be replicated for other areas of sustainable development. Thoughtfulness is not something explicit as it varies in different contexts and references to which the decision makers belong.

IMPACT

The impact is that a thoughtful decision maker can make his/her presence in future regardless of his existing status. A thoughtful decision maker is wise enough to know what to do. Knowing what to do? keeps one in the place of influence. A leader can be successful with higher capacity of thoughtfulness.

By using thoughtfulness ontology suitable solutions can be reached to solve the uncertainty and reasoning problems in decision making.

Thoughtfulness ontology may bring decision makers to realize the impact of their actions and inactions. Therefore, understanding thoughtfulness may be promoted through specific education programmed for managers, consultants, academia and political decision makers.

Thoughtfulness rejects normative practices of inaction, neglect of human and natural resources, and negative impact of decisions. It will be value addition for sustainable decision making.

CONCLUSION

"By unrighteousness man prospers, gains what appears desirable, conquers enemies, but perishes at the root."
(Allama Iqbal, poet and thinker, 1877-1938)

Thoughtfulness is attainable but less likely to exist in normative planning and execution. Thoughtfulness is a conscious effort. It is found that mostly the decision makers from business, bureaucracy/military-civilian and politics are not equipped with thoughtfulness.

The concept developed in this study insinuates the paramount of thoughtfulness for sustainable decision making. Thoughtfulness is the ability to synthesize retrospective, perspective and prospective of certain realms. Thoughtful decision makers think and then act. They critically establish value questions, fact questions. Thoughtful decision makers consolidate routinely attained knowledge about the multi realms they live in. Thoughtfulness is not only to use the available information but to realize more information resources---not only to allocate but to locate resources. Thoughtfulness DSS has become desirable due to globalization; wherein monetary valuation of decisions is over whelming. Thoughtfulness uploads compassion and restrain to manage human and natural resources.

FUTURE THIRST

Thoughtfulness Decision Support System seems diverse in the existing literature of decision making. It would have to go through investigations to establish its validity. The thoughtfulness ontology developed through this study should be indexed to benchmark the sustainability of decisions in time and space. The factors constructing and destructing thoughtfulness should be determined and then composed and decomposed. The 7 Meta abilities should continue to be validated in decision processes; which may promote thoughtfulness for sustainable decision making.

"Chance favors only the prepared mind." Louis Pasteur

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