

Usefulness-Usability-Integrity (UUI) Paradigm

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Information Integrity/Integrity Information System/Management Information System

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Lecture # 47

Usefulness-Usability-Integrity
(UUI) Paradigm

DEVELOPING A STRUCTURE FOR INTEGRITY OBJECTIVE

- Recognizing criticality of I*I for effective and economic processing of information for competitive advantage (Reference Lecture # 5) brings forth the question of a structure for integrity objective.

MODELING A CORE IS

- When one is modeling data and information, it is useful to consider them as integral to a core information system (IS) wherein:
 - (a) “data” is seen as raw material,
 - (b) processing/ transformation/ conversion” as the system function,
 - (c) “information or data product” as processed data which is used to trigger certain action or in management or decision or to gain better understanding of what data implies (note: data and information are different), and
 - (d) the pre- and post- processing communication channels (comprising data communication and particularly distributed transaction processing network) are components of *IS*

[Reference Lecture # 5].

***IS* A DECISION PROCESS MODEL**

- This essentially is a decision process model of an *IS* in the sense as data *is* processed/ transformed/ converted to form information *for* use, choices are made among various alternatives and this fact is not limited to *IS* for management or policy decision but includes all the routine operating decisions that are made at all levels of the supply chain.
 - In fact, even in a very routine and everyday activity, when the information is transmitted without changing form, as might be the case in a telephone system, there *is* a decision to be made as to the objective of the transmission.

NEED TO RECOGNIZE REALITY OF ACQUISITION AND UTILIZATION CYCLES

- In the analysis of databases and the integrity objective, on the one hand, this *IS*- based visualization facilitates
 - a need to view databases along with their data acquisition cycle (AC) and information utilization cycle (UC) (Lecture # 21), while on the other hand
 - it requires information *always* to be identified in the context (i.e., environment) of its objective or goal.
- This is an “individual” decision situation based information processing under which traditional “collective” decision situation based database management system (DBMS) is *transformed* into an information base management system (IBMS).

BEYOND DATA INTEGRITY-

NEED FOR A SYSTEM'S VIEW OF I*I

- In other words, for the study of integrity objective,
 - firstly it becomes meaningful to necessarily take a system's view of Information Integrity (I*I) by going beyond data integrity and further covering the requirements of process integrity, medium integrity, people integrity, and the output integrity, all these requirements together ensuring the information system integrity; and,
 - secondly, data and information requirements - whatever may be the level at which the IS is considered (strategic, control or operational) – are required to be modeled in the context of their respective goal(s) [normative information requirements].

INFORMATIONAL REQUIREMENT OF *USEFULNESS*

- In search of a structure for integrity objective definition, the above then provides a basis for the Usefulness–Usability–Integrity paradigm.
- Specifically, *Usefulness*, implying the contribution of the information to task achievement, refers to the *relevance* attribute of the information for its intended purpose.
- For example, the recent history of a stock’s price may be useful in deciding whether to buy or sell a stock. However, the recent history of the price of corn or oil may not be useful at all in deciding whether to buy or sell the stock.

INFORMATIONAL REQUIREMENT OF *USABILITY*

- Against this, *Usability*, implying the presentation format and accessibility of information, refers to *feasibility* factors (attributes) such as availability, accessibility and understandability which help make it possible and easy to use the information.
- For example, information may be *usable* because it is available on the Internet, because it is presented in an intuitively obvious format or because it can easily be imported into a spreadsheet or database.

A STRUCTURE FOR DEFINING *INTEGRITY* OBJECTIVE – UUI PARADIGM-1

- Literature identifies an universe of information attributes; namely, accuracy, usability, reliability, independence, timeliness, precision, completeness, relevance, sufficiency, ease of understanding, freedom from bias, consistency, trustworthy, brief, etc (as many as twenty three of them).

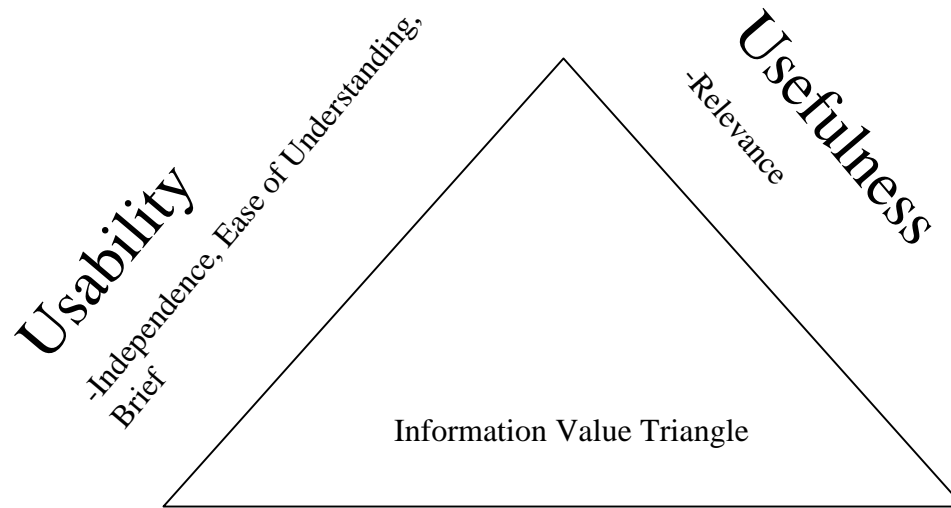
UUI PARADIGM-2

- Within the framework of the approach mentioned in the current lecture, appropriate information attributes from these (and such others) concerning context, goal, and nature of information use, i.e. relevance and feasibility of use, then can be categorized under the *Usefulness* and the *Usability* objectives.

UUI PARADIGM-3

- *Defining Integrity objective-A design basis:*
 - In such case then, with all relevance and feasibility related requirements categorized or separated under usefulness and usability objectives, drawing on integrity research investigations in security, auditing and quality arenas and in the information systems area, a basis emerges to design (identify) Integrity objective, i. e., the dependability and trustworthiness of information, in the form of **accuracy**, **consistency** and **reliability** attributes of information covering correctness (exactness included) and appropriateness aspects.

Usefulness–Usability–Integrity Paradigm



Integrity : Accuracy, Consistency, Reliability

(**Correctness and Exactness aspect of Information**

-effects of both distortion and noise)

EPILOGUE-1

- A plethora of ad hoc integrity mechanisms are suggested in the literature to achieve various combinations of information attributes (References: Lectures # 8,10).
- However, Lectures # 7, 24 qualitatively argue that *for competitive advantage it is fundamental that the information, which constitutes the bottleneck resource, is with integrity.*

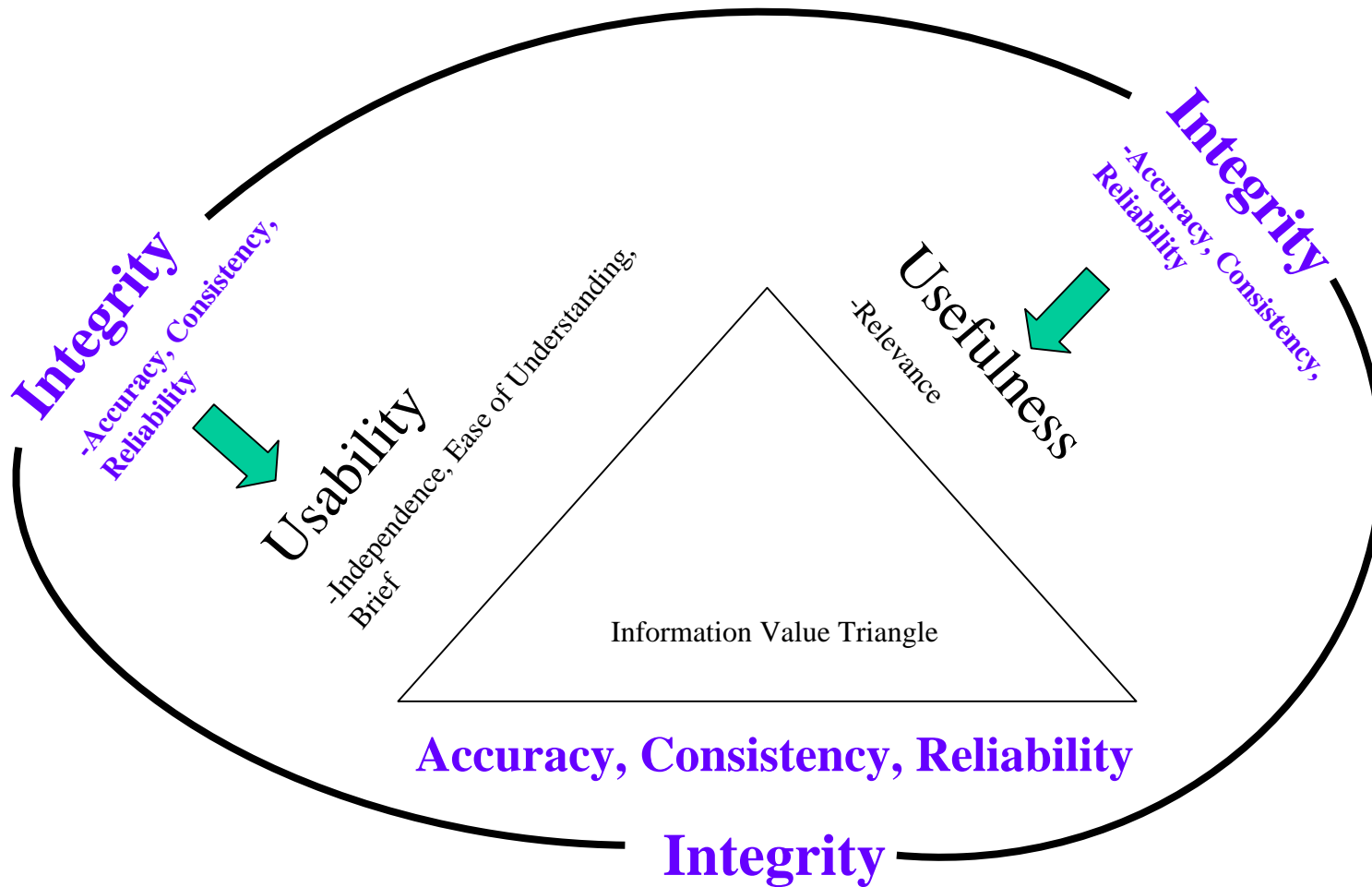
EPILOGUE-2

- Further, integrity is defined as the inverse amount of distortion and noise present.
- Information Integrity is thus concerned with the *correctness* and *exactness* aspects of the information (Ref.: Lectures # 7, 24).
- The question, however, unanswered is what exactly are the attributes of Information Integrity.

EPILOGUE-3

- Usefulness-Usability-Integrity paradigm provides this all important answer by suggesting **Accuracy**, **Consistency**, **Reliability** as the attributes of I*I and thereby removing the ambiguity in the definition of integrity attributes, which characterizes the literature.
- There is one more thing. Usefulness and Usability objectives *also* indicate information requirements. As a result, given that Integrity objective is fundamental to competitive advantage, it follows that Usefulness and Usability information requirements *must* also have **integrity**.
- This recognition upgrades UUI paradigm representation given earlier and the same is given in the next slide.

EPILOGUE-4: UUI PARADIGM



(Correctness and Exactness aspect of Information –
Effects of both distortion and noise by way of their
inverse amounts present respectively)

EPILOGUE-5

- While on one hand the emerging UUI paradigm presents **Information Integrity** as all pervasive information requirement, on the other hand it offers a basis for analytical treatment of information value and of improvement in value of I^*I for increased *information use* (IU) for achieving competitive advantage.
- Lectures # 26 and 27 address this analytical treatment of I^*I .

THANK YOU