IS DQ/IQ THE QUALITY OF INFORMATION? TWO VIEWS

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Abstract: This is an inquiry into quality dimensions commonly attributed to information based on three cases. Operations management and survey-based consumer views are contrasted. The majority of IQ dimensions address use-related aspects of operation factors that are determined by situation-specific users' needs and expectations. Thus, IQ is a short name for a broader meaning than the term implies. It misguides researchers in articulating research questions or hypotheses about IQ, tempting them into using aggregates of no-covariant dimensions as substitutes for elementary dimensions. The question is, which quality aspects are actual attributes of the value and format of information, and which pertain to the circumstances of its use? Then different questions need to be asked and different relationships examined.

INTRODUCTION: The poster contrasts empirical survey-based customer views of data quality [5] with the views of those who manage operations for a defined purpose when the results of operations depend on factors in form, such as information, data, or other elements of knowledge while viewed through the lens of decision making [1]. Paraphrasing Wikipedia, consumers' ***quality of operations*** is an aggregate of their entire experience with **all the touch points related to use** of factors in operations.

In literature, references to IQ are arbitrary and piecemeal. The broadest study [5] of initially 179 attributes later reduced them to a parsimonious 15 dimensions divided into four categories: **intrinsic, contextual, representational,** and **accessibility**. The PSP/IQ Model [3] compressed them further into only **four** broad aggregates: **sound**, **useful**, **dependable**, and **usable** information. This model tempts researchers into testing how IQ affects organizational outcomes. In all three cases, the studies yielded inconclusive results.

Most quality dimensions address task and situation-specific use requirements of information—not its content— that is barely affected by only a few requirements such as definition, variability, objectivity, accuracy, precision, currency, and form of representation. This blurs researchers' vision with regard to questions that can and should be asked. Depending on the adopted view, different survey instruments would be developed with different research results. To define requirements, we need a structured perspective with a clear point and frame of reference, an evaluation criterion, and a yardstick to measure the results. The postulate of teleological perspectivism and relativity of assessments of factors in operations [1] offers the key. It identifies the necessary primary and secondary requirements that define usability and usefulness of information and distinguish those dimensions that qualitatively and quantitatively directly affect the model, the way decisions are implemented, and/or the results of operations. Necessary requirements should always be tested first. Researchers select the scope of their research, but those who ignore necessities do it at their own peril. Three studies presented at ICIQ-06 produced inconclusive, even contradictory results. Ignoring the difference between necessary or desirable, what affects operations directly or only indirectly, and, finally, whether it depends on the value and format of information or on the task and the situation produces research results of no general validity. A fuller analysis of the studies is in [2].

CASE 1 [X] had two objectives: "*One is to empirically validate (face/content validity) the three constructs proposed by DeLone & McLean through a qualitative research process. The second is to translate these constructs into an overall measure of system quality to be used in practice.*" Researchers should have selected the eight necessary primary requirements first and then the four necessary secondary ones, which, being mandatory, are binary. Asking users to rank them by importance confuses users. The operations-management approach in [5] suggests the following questions: Based on your best judgment, what

percentage of all elementary tasks that required informational support could not be performed by you, or were performed without it, because the supporting data/information was

1. not operationally recognized, hence could not be used? …….. P1%
2. recognized but not operationally relevant (pertaining to a task)? ……..…… P2%
3. relevant but of no operational meaning (making a difference in operations)? …….……. P3%
4. meaningful but not significantly material (the difference in the results of operations)?.....P4%
5. significant but not available on-time? ……. P5%
6. available on time, but not on-site?...…….. P6%
7. available on-site, but not actionably credible? ……..… P7%
8. credible but does not meet the other situation-specific necessary use requirements (URs)?……. P8%
9. usable (meets URs 1 – 8) but is incomplete to be engaged in operations? ….……..... P9%
10. Do you agree that, percentage wise, only 100% (P1% + P2% + P3% + P4% + P5% + P6% + P7% + P8% + P9%) of the total number of the elementary tasks or transactions were performed with the necessary informational support? (If not, revise your estimates of meeting requirements 1–9 until they reflect your experience to the best of your knowledge.) …..……...…. Yes/No
11. (Now, necessary secondary URs must be tested and only later the desirable and gradable ones.)

This approach asks discrete razor-sharp questions; focuses respondents on task- and situation-specific context, first on the necessary primary and then on the necessary secondary URs; and, finally, on the gradable desirable ones. It stimulates reflection and reminds about the consequences of not meeting them.

CASE 2 [Y] asked users "*to identify and analyze the importance of characteristics for consideration when measuring IQ in manufacturing planning and control (MPC) processes*." It defines ten quality dimensions, ignoring the necessary ones. Comments to Case 1 equally apply to Case 2. In addition, "completeness" (always task specific) was tested without prior testing, whether the necessary factors are usable at all; only at the end, they asked whether they were "understandable," "interpretable," and "relevant."

CASE 3 [Z] set out to present "contextual *and conceptual models of quality strategy" and "to predict organizational outcomes based on information quality measurements*" [p. 249] with three models: contextual, conceptual, and research. The actual research model, however, departs from the conceptual one; instead of testing single quality aspects, it uses IQ aggregates—the four quadrants from the PSP/IQ model in [2]. Questions about five broad aggregates—soundness, usefulness, reliability, usability, and overall quality of information (with no covariance)—blurred the results. They acknowledge that "*the results raise questions concerning the practice of aggregating measurements to produce a simpler set of information quality metrics*" [Z, p. 259]. From the operations viewpoint, the reasons are obvious.

CONCLUSIONS: The operations-management view of IQ dimensions [1] offers a contrasting perspective of their contextuality; it reaches beyond the quality of mapping and quality of data in databases [4]. The one in [3] may contribute to practical IQ improvements but is inadequate for testing hypotheses.

REFERENCES

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[X, Y, Z] Blinded sources for the three corresponding cases: CASE 1, CASE 2, and CASE 3.