

A Summary of Flexibility Concepts Gregory R. Heim

Definitions of Flexibility

The importance of e-Service flexibility to managers' strategic and operational decision making can be demonstrated easily enough through the search engines of many e-Business and IT/MIS magazines' web sites. However, such practitioner articles seldom describe what they mean by flexibility. In contrast, flexibility has been defined in several ways in the academic literature. For example, Upton (1994) defined flexibility as "the ability to change or react with little penalty in time, effort, cost or performance" (p. 73).

Unfortunately, even academics often aren't sure about what they mean when they mention flexibility. Researchers are fairly unanimous in stating that flexibility is a strategic objective, and is a method of hedging against strategic uncertainties. However, much of the academic literature has defined flexibility and individual dimensions of flexibility in different manners, and some authors have confused the concept of flexibility with related concepts (Bordoloi et al. 1999). Bordoloi et al. (1999, p. 135) cautioned that one must be careful to view *flexibility* as "the ability to change "states"" dynamically over the short-run. In contrast, they viewed *adaptability* as the "ability to change ... within a given state" based on improvements from organizational learning over the long run, and *efficiency* as the cost differences from changes within or between process states.

I have tried to define *flexibility* in a manner that hopefully takes into account each of these considerations. The concept of "state" (Bordeloi et al. 1999) – whether for product (design side) or process (delivery side) – builds the idea of flexibility as instantaneous movements across potentially discontinuous spaces of consumer contexts

and needs or of process technologies, rather than marginal shifts across continuous paths. The “state” concept also helps to differentiate flexibility from the related concepts of adaptability and efficiency. The definition I use is as follows:

***Flexibility** is [a measure of] the range or set of dynamically actionable abilities, available for hedging against strategic uncertainties prior to the occurrence of an uncertainty, that allow operations to change product or process states dynamically over the short run without negatively affecting cost or other organizational performance variables of interest.*

The key to building models of flexibility, and defining individual measures for flexibility, then, is that the items must represent the extent of a response to a strategic uncertainty, must exist prior to such an uncertainty, must be able to change states, and must be theoretically related to organizational performance. The definition defines flexibility as a strategic construct that companies must incorporate into processes prior to a change in the operational environment. As a strategic construct of hedging against uncertainty, it can be abstract in nature. As a process implementation, it can be concrete in nature. Thus, in measuring flexibility, as with quality (Zeithaml 1988), the researcher or manager can choose from a variety of measures that range from abstract to concrete.

What are these strategic uncertainties in e-Services, for which one must build flexibility? Strategic uncertainties might include many organizational uncertainties, and can be defined at many different levels or stages of an organizations’ hierarchy or structure, as long as the uncertainty can be considered organizationally “strategic.” One might use Porter’s Five Forces model as a starting point for understanding elements contributing to strategic uncertainty. In e-Services, the “service-product” consists of both “new” attributes based on digital content as well as “old” attributes of goods and services, and thus e-Service uncertainties might include uncertainties of (a) manufacturing

contexts, (b) person-to-person service contexts, and (c) person-to-technology interactions. However, some authors have suggested that certain sources of strategic uncertainty are most relevant in an electronic environment. For example, Clemons and Bradley (1998) suggested the following six sources of uncertainty in e-Retailing:

Six Sources of Uncertainty in e-Retailing

- How will online consumer interaction evolve, and which market segments will be affected first?
- What will be the role of the brand name in an online market?
- What role will consumer confidence play in cybermarketing?
- What use will be made of detailed information on individual consumers and their transactions with specific manufacturers and service providers?
- Who will own and control and benefit from information on consumers?
- Who will the channel members be in online consumer interaction?

Source: Clemons and Bradley, 1998.

In general, one might envision points in e-Services at which components (consumer, technologies, product attributes, etc.) of an e-Service have interfaces, since the interactions at those interfaces provide uncertainty related to whether and how well one component can serve another, whether the integration at the interface is reliable, and whether there may be some issues of "opportunism" or a "power structure" that one party may "leverage" without the other parties' knowledge.

Bibliography

Clemons, E.K., and S.P. Bradley (1998), "Strategic Uncertainty and the Future of Online Consumer Interaction," *Sense and Respond: Capturing Value in the Network Era*, Harvard Business School Press, Cambridge, MA.

Bordoloi, S.K., W.W. Cooper, and H. Matsuo (1999), "Flexibility, adaptability, and efficiency in manufacturing systems," *Production and Operations Management*, 8, p. 133-149.

Upton, D.M. (1994), "The Management of Manufacturing Flexibility," *California Management Review*, Winter.

Zeithaml, V. A. (1988), "Consumer Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence," *Journal of Marketing*, 52 (July), 2-22.