

Chapter 16

From “S” to “J”: A Theoretical Technology Adoption Rate Model

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ABSTRACT

This article proposes a hypothetical model for determining rate of diffusion of an innovation in a system. The model modifies Everett Rogers’ S-curve using an index created from Gartner’s hype cycle phases. Rogers’ model for technology innovation adoption demonstrates that cumulative technology diffusion in a system from zero through the late majority adopters’ phase forms a curve resembling the letter “S”. Hype cycles analyze the five emotional stages technology adopters go through from over-enthusiasm (hype) through disappointment until it plateaus (beginning of mainstream adoption). When numbers assigned to the phases of adoption from the hype cycle are used as multipliers and applied to the cumulative adoption data of an innovation (Rogers’ S-curve), the “S” becomes a “J”. With the J-curve you can determine the rate of innovation diffusion in an organization.

INTRODUCTION

Everett M. Rogers’ S-curve has been the vanguard as an innovation diffusion indicator for over 40 years. The S-curve is the foundation upon which the J-curve is built. The hypothesis of this article

is that creating an index by assigning values to the phases of Gartner’s hype cycle and applying this index to Rogers’ stages of innovation adoption reveals the adoption rate. In rapid adoption events, the product of applying this index to an S-curve data is a J-curve. The S-curve is the representation of innovation diffusion in an organization. The J-curve represents the rate of innovation diffusion

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in the same organization. The J-curve combines the two models, the S-curve and the hype cycle to help organizations determine the best adoption pace to maximize their return on investment. The aim of this article is to present the J-curve as an extension of the S-curve to assist organizations with innovation adoption planning and evaluation. The J-curve can be used to help organizations set reasonable innovation adoption timelines. After diffusion, the resulting J-curve can be analyzed to determine whether the anticipated adoption pace was met.

The next section of this article describes the S-curve innovation adoption model and presents the literature review for Rogers’ model. The third section describes the hype cycle model and presents the literature review for Gartner’s model. The fourth section, the J-curve, describes the hype cycle index, compares the S-curve and the hype cycle, details how to create an index from the hype cycle, and describes how to apply the hype cycle index to create a J-curve. The last section of the article is the conclusion and future work section. The research questions guiding this manuscript are:

- Is there a relationship between Rogers’ S-curve and Gartner’s hype cycle?
- If there is a relationship between Rogers’ S-curve and Gartner’s hype cycle, can this relationship be used to determine the pace of innovation adoption?

THE S-CURVE

This section describes innovation adoption within the context of Rogers’ S-curve. According to Rogers (2003), the rate innovations diffuse in an organization “usually follows a normal, bell-shaped curve when plotted over time on a frequency basis” (p. 272). Initially, a few innovators in an organization adopt the innovation, followed by early adopters, followed by the bulk of the

adopters, and finally by the few who lag behind the rest. Specifically, the bell is formed by 68 percent of the adopters - early and late majority. The leading tail is formed from data representing the innovators and early adopters. The lagging tail is formed from data representing laggard adoption (p. 282). It is the textbook model for creating frequency distribution classes. He states that a set of categories should be “exhaustive”, “mutually exclusive”, and “derived from a single classificatory principle” (p. 280). Rogers identified five types of innovation adopters (p. 280). His adopter type classifications meet these criteria. The five adopter categories defined by Rogers are Innovators [I], Early Adopters [EA], Early Majority [EM], Late Majority [LM], and Laggards [L]. The percentage of adoption by adopter type for new adopters forms a bell curve (2.5% for innovators, 13.5% for early adopters, 34% for early majority, 34% late majority, and 16% for laggards). Rogers’ classification is based on the adopter characteristic of innovativeness (p. 267). In *Diffusion of Innovations*, Rogers describes the process for standardizing adopter categories and his criteria. For innovators (I) the characteristic is venturesome. The other characteristics described by Rogers by adopter type are early adopters (EA) are respectful, early majority (EM) are deliberate, late majority (LM) are skeptical, and laggards (L) are traditional (pp. 282-285).

In Rogers’ model, the five adopter categories are created from the innovativeness variable by “laying off standard deviations from the average time of adoption” (Rogers, 2003, p. 281). The category delimiters from left to right (over time) are the mean minus two times the standard deviation (innovators/early adopters), the mean minus the standard deviation (early adopters/early majority), the mean (early majority/late majority), and the mean plus the standard deviation (laggards). Rogers felt that laggards are a homogenous group and did not require division (p. 281). The delimiters create the normal innovation diffusion category percentage boundaries (2.5%,

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