Rhetoric, Prospect, and Expectation
Toward a Theory of Hype Cycles

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Abstract

Gartner's Hype Cycle Model is one of the most influential consulting tools for understanding the state of technological innovations. Despite its popularity in management practice and 20 years of substantial application history, there is a paucity of academic literature on the hype cycles. Specifically, the innovation diffusion literature is dominated by the adoption S-curve and has overlooked expectation of innovation that the hype cycles center upon. Drawing on the rhetorical and semiotic theories of institutionalization, we develop a typology of innovation rhetoric and apply the typology to propose a hype cycle theory by integrating some of the predictions of the prospect theory. We conclude this paper by suggesting several directions for future research.

Introduction

Introduced in 1995 by then Gartner analyst Jackie Fenn, the concept of hype cycle has evolved into one of the major consulting models for the leading global technology consultancy serving over 10,000 companies including many from the Global 500. The applications of the hype cycle model focus primarily on the dynamics of expectations in technological innovations to determine the state of development of technological fields in order to advise on strategic investment decisions [1,2]. As shown in Figure 1, the most significant parts of the hype curve predate the beginning of innovation diffusion as depicted in the diffusion S-curve [3]. And yet adoptions rather than expectations, along with the S-curve, have remained the dominant focus in academic literature on innovation diffusions [1]. A better understanding of the performative impact of expectations on innovation diffusion is needed.

Moreover, increased academic research on the hype cycles may help improve understanding beyond the technological innovation domain into areas such as corporate social responsibility [4,5]. In this paper we intend to take a small step to better understand the hype cycles by developing a theoretical model to explain the two most significant parts of a hype cycle: the path from innovation trigger to peak of inflated expectations and the path from the peak to trough of disillusionment (Figure 1). Our model is based on an integration of the rhetorical theory of diffusion [6], the semiotic theory of institutionalization [7], and the prospect theory [8], which suggests that expectations of an innovation are a function of the rhetorical types and the interaction between the rhetorical types and decision biases.

Figure 1: **Gartner's Hype Cycle**

Source: https://www.cleverism.com/everything-need-know-gartner-hype-cycle/

Theory Development

Maturity Models and the Curves

Thematically the S-curves and hype-cycles are used in contemporary practitioner literature to act as descriptors and predictors of both technological diffusion and more frequently technological maturity [3,9,10]. Although sometimes discussed in similar context they represent different measures of maturity, the S-curve depicting level of adoption and the hype-cycles expectations or visibility.

The technology S-curve is a description of innovations transitioning from the first stage innovators, through adopters to ultimately laggards; after which the point of diminishing returns is reached. The S-curve is a measure of cumulative adoption or diffusions of an idea or technology. Management literature for more than the last quarter of a century has utilized technological adoption curves to describe, predict, and measure the maturity and diffusion of technical innovations [3,11]. In contrast, the literature does not appear to have much to say on the use of S-curves in the understanding of the adoption, diffusion, and success or failure of management ideas, fashions, and practices.

Introduced in 1995 by Gartner, the concept of hype cycles has evolved into one of the major consulting models for the leading global technology consultancy. This view of technical maturity is complementary to that of the S-curve; the S-curve focusing on adoption and the hype cycles focusing on "expectations" of the technical innovation. Despite its popularity, the hype-

cycle model has little verification via empirical studies and is sparsely represented in relation to theoretical frameworks in research literature, several authors [1,12,13] recognize the scarcity of academic literature related to the hype cycles. Attempts to explain the hype cycles exist when the scant literature raises interesting issues such as "novelty attractiveness" or "heuristic decision making"[2,10]. Van Lente and others [1] indicate that the hype cycles lack an underpinning theory, and through a multi-case analysis they propose a framework which categorizes expectations at the levels of project, industry and society and with positive or negative connotations. The implications of the research are that when the multiple levels of expectations occur simultaneously the magnitude of peak of expectations or trough of disappointment is greater; in contrast, heterogeneity in the levels of expectations can be a moderator of the hype cycle. This approach identifies behaviors in the "peak" to "trough" and beyond phases of the cycle, complementing the work of Steinert and Leifer [2] whose empirical study illustrates the imprecision in the hype cycle model and proposes the possibility of secondary hype peaks [1], and resulting in a single curve with more than one hype cycle, akin to the S-curve discussed earlier.

We identify no academic literature that describe the use of the hype-cycle model to explain the diffusion of management ideas, fashions, or practices. A somewhat remotely related study [14] on the dissemination of CSR practices suggests that the CSR adoptions are triggered by idealistic, ethical or religious reasons rather than economic or technological ones. This implies, according to Van Lente's and others' [1] framework, diffusion of CSR practices is driven by primarily positive societal expectations, which we regard incomplete.

Diffusion of Innovations in General
Many authors have discussed that the diffusion of innovations in both technological and management fields [3,15,16,17]. They highlight that the diffusion is only partly explained by the benefit of "efficiency" gains [3], and legitimacy as another driving force of innovations as they progress to maturity [17]. Furthermore, rhetoric [6,18] and network ties [17] also play a complex role in diffusion of innovation. Through a rhetorical lens, Green [6] describes the transition from reason to persuasion in the legitimization of value in a management idea being disseminated.

As the diffusion of a management idea increases and approaches "taken for grantedness" the need for rhetoric, measured through the number of justifications for the management idea, peaks and then declines, whilst the diffusion of the idea continues to move towards higher levels of institutionalization. In other words, the diffusion evolves from rhetoric to a more specified bandwagon effect that later adopters are compelled to join [1], which increases legitimacy at the cost of reduced diversity in rhetorical choices. It also implies that heterogeneity in the level of "taken for grantedness" of the rhetoric around a management idea may slow or even reverse the level of diffusion. Specifically, Green [6] constructs rhetorical justification with three types of appeal: *pathos appeal* (we refer in this paper as emotional appeal), *logos appeal* (logical or rational appeal); and *ethos appeal* (moral appeal). A rhetorical justification may be a combination of these appeals, since *"whereas pathos may initiate change, logos implement it, and ethos sustain it"[6:661]*.

The semiotic theory of institutionalization [7] suggests a different kind of linguistically driven dynamics in which the symbols (*signifiers*) an organizational actor uses may or may not

signify the meanings (*signified*) intended, or the actions and practical examples (*referents*) may or may not illustrate either the symbols or the meanings. The tight or loose coupling of the three correlates of a sign, a similar construct to Green's rhetoric [6], defines two distinctive types of institutionalization processes, denotational institutionalization and connotational institutionalization [7]. Connotational institutionalization yields a higher level of heterogeneity of symbols, meanings, and practical examples, while the coupling processes of denotational institutionalization homogenize the correlates of rhetoric. In addition, there are plenty of examples of "irrational exuberance" in technological innovations, which the prospect theory [8] may offer an explanation.

The Hype-cycle Model

Hype cycles draw attention to the elusive intangibles such as attitudes toward an innovation, knowledge about the innovation, and risks from investing in the innovation [2,19], which may motivate innovation adoptions represented in the S-curves. The hype cycles typically depict patterns of social behavior when little adoption of an innovation occurs in the marketplace or institutional domain, i.e. the very early stage of an innovation. Without anchoring innovation adoption as either a rational choice or a result of institutionalization in priori, the hype cycles provide a unique opportunity to examine institutionalization processes that link rhetoric to social actions [6,7,20].

Rhetorical Type, Risk Propensity, and Hype Cycle

The word *hype* in the hype cycle represents the gap between human expectations of an innovation and its proven engineering and economic potentials [2]. The critical popular perception of hype as misleading exaggeration and prediction of the future is countered by the more favorable but less popular view of hype as exciting magnification and prophecy that attract resources [1,2]. The hype cycles depict the dynamic changes between two extreme states the first, where positive expectations far exceed the proven potentials of an innovation and the contrary state where negative expectations of the innovation fall below its proven potentials [1]. We assume diffusion of an innovation [3] is an outcome of social learning of the scant though proven potentials of the innovation, and that social learning results in collective expectations. By studying the gap between the two aspects of social learning we intend to explain the hype cycles and discuss their link to the innovation diffusion S-curves.

In studying TQM adoptions by 2,700 U.S. hospitals, Westphal and others [17] find early adopters customized their quality practices to the unique problems and opportunities of the organizations for technical efficiency gains, rather than conforming to standard and accepted approaches to TQM for increased social legitimacy. Increasing conformity is found among hospitals that are late adopters of TQM. Conformity increases over time as motivation of innovation adoption along with the emergence of the normative pattern of innovative practices. This implies early adopters hold expectations that are specific to their organizational situations while the late adopters' expectations are being normalized. The successful early adopters that demonstrate minimal expectation-performance gaps create an isomorphic pressure among the non-adopters. But the multitudes of organization-specific expectations do not reduce the uncertainty, complexity, and ambiguity associated with an early-stage innovation for non-adopters who are caught between rock and hard place. On one hand, they are yet to receive proven potentials specific to their organizations. On the other hand, early-stage institutional field offers minimal social legitimacy from adoptions. This gives us reasons to shift our focus from

innovation adoption to non-adopter behaviors, specifically on the expectations of non-adopters in an early-stage innovation.

Rhetoric Types of Innovation

Following the paradigm shift from seeing organizing as an activity to focusing on the social psychology of organizing [21], Green [6] conceptualizes the diffusion of new managerial practices as taken-for-granted acceptance of discursive reasons. Green's rhetorical theory of diffusion proposes that managerial practices supported by different types of justifications have different rates of acceptance and rejection. Rhetorical justifications that appeal to individual emotions (emotional appeals) elicit fast adoption and rejection; those that appeal to the desire for rational actions (logical or rational appeals) require methodical calculation of means and ends thus engender slower adoption and rejection; and justifications with the appeals of socially accepted norms and mores (moral appeals) are even slower to be recognized and accepted because the required social cognitive processing is more complex than processing direct appeals to individual interests, although they become more difficult to abandon for the same reasons.

With a similar tradition, Li [7] introduces a semiotic theory to explain the heterogeneity in the institutionalization process. The theory breaks down the doing (*referents*), saying (*signifiers*), and meaning (*signified*) of a managerial practice and identifies two kinds of coevolution of the three correlates: connotational and denotational institutionalizations. Connotational institutionalization entails decoupling or encourages loose coupling among the words or symbols (*signifiers*) an actor uses to describe a new concept, the meanings (*signified*) the symbols signify, and the practical examples (*referents*) the actor uses to illustrate the meanings. In contrast, denotational institutionalization results from coupling of the three correlates. Lower level of denotational institutionalization is expected when multiple symbols are associated with the new concept or multiple meanings are attached to a symbol or a practical example.

Integrating the rhetorical theory of diffusion [6] and the semiotic theory of institutionalization [7], we propose a typology of innovation rhetoric in terms of the speed of their social acceptance and abandonment. Table 1 describes the rhetorical types and time effects with two dimensions: rhetorical appeal and institutional process. Taking the time effects suggested in the theories referred, we argue that an innovation's rhetoric with emotional appeal undergoing connotational institutionalization experiences fast social acceptance and

Table 1: Rhetorical Type and Speed of Acceptance/Abandonment

Rhetorical Appeals

		Emotional	*Rational*	*Moral*
Institutionalization	*Connotational*	Fast	Medium	Med. to Slow
	Denotational	Fast to Med.	Med. to Slow	Slow

abandonment, that the rhetoric with moral appeal undergoing denotational institutionalization experiences slow social acceptance and abandonment, and that the other types of innovation rhetoric experience varied speeds according to the various types of rhetorical appeals and types of institutionalization. Figure 2 is a visual representation of the two extreme types described.

Figure 2: Rhetorical and Prospect Evolutions Through the Hype Cycle
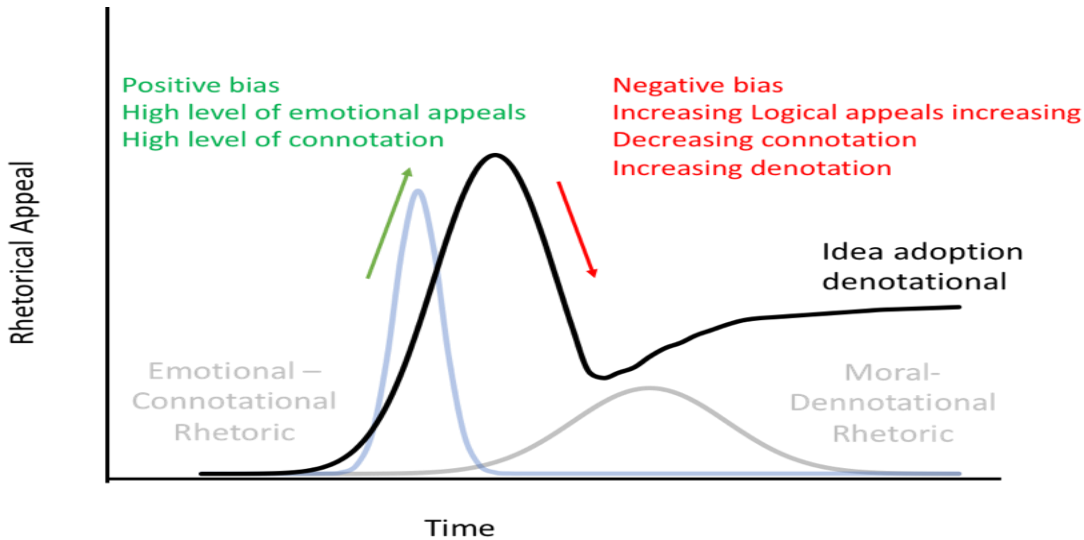
Expectation and Risk Propensity

Prospect theory [8] portends that people evaluate the potential value of losses and gains using certain heuristics that often lead to deviations from optimal decisions. It predicts risk-seeking behaviors when the probabilities of gains are low, and risk-averse behaviors when the probabilities of losses are low. The initial phase of a hype cycle can be characterized with high probabilities of losses in which an innovation just begins to materialize from its initial R&D phase and few investors are interested except for the most risk tolerant early-stage venture capitalists [19]. The expectations for the potential gains are high but most would regard the gains as low probability events. This is the situation to trigger the risk-seeking heuristics. And a gap between expectations and proven potentials is more likely to be perceived with positive biases. As the innovation matures, subsequent rounds of venture capital needs attract investors with lower risk-reward inclinations. At least some potential gains have higher probabilities to materialize than during the initial phase while the probabilities of losing everything are decreasing. Consequently, decision biases veer toward risk aversion and a higher threshold for adoption of rhetoric's with positive, emotional appeals.

Innovation Hype Cycles

Quattrone [20] advances the concept of unfolding rationality which describes the purposeful procedural logics in rhetorical practices that invent, recall, classify and connect justifications to improve the relationships between behavioral means and ends. Unfolding rationality encompasses not only analytic method of knowledge ordering but also composition of

imageries, motivating ritual, and means of moral scrutiny [20:422]. We argue further that unfolding rationality is time dependent in which different rhetorical types take priority and human risk behaviors introduce biased selections of rhetoric over time. The first part of this argument considers the creation and adoption of rhetorical appeals of a new concept, managerial practice or innovation in general. The connotational process which does not demand tight coupling of the correlates of rhetoric is conducive to the creation of multiple rhetorical justifications especially early in the introduction of an innovation. The emotional appeals of rhetorical justifications are recognized first. Moreover, the presence of multiple connotational rhetorical justifications may delay denotational institutionalization, allowing existing connotations to persist and new ones to proliferate. Together an institutional environment emerges first to favor the creation and adoption of connotational rhetoric with higher proportion of emotional appeals. The second part of the argument is that the risk-seeking biases of actors (non-adopters) prompt them to select rhetorical justifications leading to positive expectations. In other words, unfolding rationality as an institutional logic for organizing early-stage innovation favors multitudes of rhetoric, especially those with connotations that have emotional appeals and stimulate positive expectations.

> *Proposition 1: Increase of positive expectation of an innovation during its early stage is associated with multitudes of rhetorical connotations, with increasing rhetorical connotations, and with rhetorical connotations that have positive emotional appeals and some positive rational appeals.*

The above propositions explain the part of the hype cycles from the initial innovation trigger toward the peak of inflated expectations [10]. They point out the individual and institutional processes for the social creation and selection of the types of rhetorical justifications that help push the positive expectations in the left half of a hype cycle.

Similar processes also explain the right half of a hype cycle from the peak of inflated expectations toward the trough of disillusionment [10]. Given time, the rhetorical justifications with rational and moral appeals emerge, as denotational institutionalization taking hold of collective sense-making [21]. The denotational efforts are bound to narrow the rhetorical justifications to those with tight linkages among the symbols, practical examples and their meanings. This will reduce the number of rhetorical justifications by abandoning those that have failed to demonstrate tight coupling of their three correlates, along with the abandonment of the expectations associated with the rhetoric. These abandoned rhetorics may be perceived as failures and invoke negative expectations. On the other hand, the convergence or retention of fewer rhetorical justifications with tight coupling of their correlates and with a higher proportion of which possessing rational and moral appeals introduces the initial proven potentials or fulfilled expectations that may start the isomorphic institutionalization [17,22] and trigger risk aversion decision biases as certainties of some gains increase and possibilities of total losses decrease.

> *Proposition 2: Decrease of positive expectation and increase of negative expectation in an innovation hype cycle is associated with decrease in the number of rhetorical justifications and increasing proportion of denotational rhetoric, as well as abandonment of rhetorical connotations that have emotional and some rational or moral appeals.*

Conclusion and Discussion

The notion of hype is mentioned in technological innovation as well as business and management domains [23,24,16]. The particular words commonly used in the latter are fad and fashion. Few conceptual or empirical studies exist across the various domains. All of them follow the sociological perspective of instrumental rationality, assuming managers and organizations want to rationally acquire a competitive advantage through adopting a new technology or management practice [24]. They report similar phenomena visually captured by the hype cycles in different shapes and forms, as well as use similar approaches to comparing different hype cycles for theory development [1,16].

We propose a theory of the hype cycles that do not rely on idiosyncratic organizational factors such as difficulty in implementation or burden on management [16]. Nor does it take a complete endogenous approach to studying the characteristics of expectations to inform the magnitude of expectations over time [1]. The proposed theory is developed based on a body of established social psychological, institutional and behavioral theories. We believe it is useful in explaining not only hype curves with a single or multiple cycles but also the similarities and differences across different hype curves. Given the consulting origin of the hype cycle model, it has not drawn systematic academic attention regardless of its diffusion, application, and influence in industry [2]. In contrast, innovation diffusion in the form of the adoption S-curve can be traced back with a long and broad academic research path. The fact that the S-curve is different from the hype curve and the common sense that social action like innovation adoption and social learning like collective expectation do and should seriously influence each other somehow make one wonder why such disparity should persist. We hope our effort in explaining the hype cycles would stoke research interests among our peers in order to bridge the gap.

For one direction to continue this effort, we would like to use the proposed theory to form a baseline hype curve with a single cycle to further study conditions upon which multiple cycles may occur and the factors that may shape the curve with different magnitudes of expectations, the rates of change leading to a faster or slower cycle, and the effect of a cycle on the subsequent ones. For example, van Lente and his colleagues [1] discover dramatically different hype curves across Internet telephony, gene therapy, and high-temperature superconductivity, using number of articles in the New York Times as the hype measure. Similarly, Carson and her colleagues [16] found significant differences in the hype curves among management fashions such as program evaluation and review techniques, quality circles, and reengineering. We believe these studies are good starting point to test the proposed theory through a more granular examination of the articles. Although hype cycles typically occur during the very early stage of an innovation when little adoptions actually occur, the effects of hypes may linger much later into the adoption of innovation.

References

[1] Van Lente, H., Spitters, C. and Peine, A. (2013). Comparing technological hype cycles: Towards a theory. *Technological Forecasting & Social Change*, 80(8), 1615-1628

[2] Steinert, M.; Leifer, L. (2010). *Scrutinizing Gartner's Hype Cycle Approach*. *PICMET Proceedings*, July 18-22, 2010, Phuket, Thailand

[3] Rogers, E. (2003). *Diffusion of Innovations*. 5th Edition. Simon and Schuster. ISBN 978-0-7432-5823-4

[4] Bakker, F.G.A, Groenewegen, P. and Den Hond, F. (2005). A Bibliometric Analysis of 30 Years of Research and Theory on Corporate Social Responsibility and Corporate Social Performance. *Business and Society*, 44 (3), 283-317

[5] Carroll, A.B. (1999) 'Corporate Social Responsibility: Evolution of a Definitional Construct'. *Business & Society*, 38(3), 268–295.

[6] Green, S.E. (2004). A Rhetorical Theory of Diffusion. *The Academy of Management Review*, 29(4), 653–669.

[7] Li, Y. (2017). A Semiotic Theory of Institutionalization. *Academy of Management Review*, 42(3), 520-547

[8] Kahneman, D.; Tversky, A. (1979). Prospect Theory: An Analysis of Decision under Risk, *Econometrica*, 47 (2), 263-291

[9] Sasaki, H. (2014). Time Lags Related to Past and Current IT Innovations in Japan: An Analysis of ERP, SCM, CRM, and Big Data Trends. *International Journal of Business Analytics*, 1(1), 29-42.

[10] Fenn, J. and Raskino, M. (2009). *Understanding Gartner's Hype Cycles*, Gartner, October 2009

[11] Brown, R. (1991). Managing the "s" curves of innovation. *Journal of Marketing Management*, 7(2), 189–202.

[12] O'Leary, D.E. (2009). The Impact of Gartner's Maturity Curve, Adoption Curve, Strategic Technologies on Information Systems Research, with Applications to Artificial Intelligence, ERP, BPM, and RFID. *Journal of Emerging Technologies in Accounting*, 6(1), 45–66

[13] Jarvenpaa, H and Makinen, S.J. (2008). **Empirically Detecting the Hype Cycle with the Life Cycle Indicators: An Exploratory Analysis of Three Technologies**. Presented at IEEM 2008 Industrial Engineering and Engineering Management, 2008

[14] Haberberg, A. (2002). *Patterns in the Adoption of Corporate Social Responsibility practices*. Available at: https://www.researchgate.net/publication/228646922 (Accessed: 10 December 2017).

[15] Newell, S., Swan, J. and Kautz, K. (2001). The Role of Funding Bodies in the Creation and Diffusion of Management Fads and Fashions. *Organization*, 8(1), 97–120.

[16] Carson, P., Lanier, P.A., Carson, K.D. and Guidry, B.N. (2000). Clearing a Path through the Management Fashion Jungle: Some Preliminary Trailblazing. *Academy of Management Journal*, 43(6), 1143-1158

[17] Westphal, J.D., Gulati, R. and Shortell, S.M. (1997). Customization or Conformity? An Institutional and Network Perspective on the Content and Consequences of TQM Adoption, *Administrative Science Quarterly*, 42(2), 366-394

[18] Fineman, S. (2001). Fashioning the environment. *Organization*, 8(1), 17–31.

[19] Linden, A and Fenn, J. (2003). Understanding Gartner's Hype Cycles. *Strategic Analysis Report*, R-20-1971, Gartner, 30 May 2003

[20] Quattrone, P. (2015). Governing Social Orders, Unfolding Rationality, and Jesuit Accounting Practices: A Procedural Approach to Institutional Logics. *Administrative Science Quarterly,* 60(3), 411-445

[21] Weick, K. (1979). *The Social Psychology of Organizing*. New York: McGraw-Hill

[22] DiMaggio, P.J. and Powell, W.W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Journal of Sociology*, 97, 1531-1577.

[23] Gibson, J.W. and Tesone, D.V. (2001). Management Fads: Emergence, Evolution, and Implications for Managers. *Academy of Management Executive*, 15(4),122-133

[24] Abrahamson, E. (1996). Management Fashion. *Academy of Management Review*, 21(1), 254-285