

**Time is Ripe for Knowledge Synthesis:
Key Elements for a New Science-Practice Ecosystem**

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Acknowledgements: This is a summary note based on our discussions with Durand Ireland, Susan Jackson, Jim Walsh, and participants at the 2017 Academy of Management Symposium on “Time is ripe for knowledge synthesis: (Re)inventing technologies, outlets, and incentives”.

Time is Ripe for Knowledge Synthesis: Key Elements for a New Science-Practice Ecosystem

Let's start by imagining a future where academic researchers and practitioners are connected directly on a shared online platform. Both benefit in a timely fashion from each other's unique resources. On the one side, practitioners, through their internal IT platforms, learn how to measure variables, monitor indicators, and build predictive and process models for science-informed management. On the other side, the (re)testing results from practitioners' unique observations are fed back and meta-analyzed onto the platform, monitoring the replicability and reliability of academic knowledge. This feedback loop also tells researchers what new data are available from the practitioners and when they need to update academic knowledge.

But, how to make this happen has been a persistent question for the business school design from its inception. As Herbert Simon (1967: 2, 16) suggested a half century ago, b-schools carry a "continuing administrative responsibility" to synthesize two relatively isolated and contradictory knowledge bases: "world of practice" and "sciences". The world of practice calls for an integrative understanding of many inherent problems of real-life; whereas, sciences progress by simplifying a complex real-life problem into more readily studied fragments. Practitioners need integrated knowledge consolidated for ready-use while scientists are rewarded for granular specialization. The resulting disconnect is dramatically broadened by science's journal-centric system of rewarding theoretical coherence (or discipline-focus) and novelty. To top it off, thousands of new scientific publications each year can overwhelm researchers with information overload, making knowledge accumulation exceedingly difficult. The resultant poor communication between practitioners and scientists thus impedes the use of scientific evidence advocated by "evidence-based management."

After more than six decades of scientific research on management, our knowledge is at a volume that makes integration possible and at a degree of fragmentation that makes integration necessary. Time is ripe to (re)invent a *science-practice ecosystem* with mutually supportive components that gives rise to knowledge accumulation. We advocate developing an open community, distinct from formal institutions, engaged in globally coordinated efforts, whose collective goal is to integrate theories, models, constructs, and their relationships into a unified knowledge system. Such a system has numerous applications, which we briefly attempt to illustrate.

Five key elements of this proposed new ecosystem include: (1) establishing models and standards for integrative frameworks as a key knowledge product; (2) developing new technologies to assist human researchers for knowledge integration; (3) exploring new methods for sharing and consolidating knowledge based on open-sourced systematic reviews;

(4) hosting a new digital library of all systematic reviews and meta-analyses as a new media outlet; (5) incentivizing students, scholars, and administrators in a new “Yes and” mindset.

NEW GOAL: INTEGRATIVE FRAMEWORKS

“Without a common framework to organize findings, isolated knowledge does not cumulate.” ...Elinor Ostrom (2009: 419)

The current focus of management scholarship prizes new theory development over knowledge integration. It is a natural outgrowth of the research scholars have undertaken for legitimacy at early stages of the management field. While foundational disciplines like economics and psychology have a long history of theory and research, management research emerged in the 1930s in response to the need for policy interventions to stimulate a depressed economy and provide more effective social services. With the explosion of business schools in the late 1950s, the Porter and McKibbin (1988) report on the quality of management education (including research), management scholars came to prize the scientific development of theories and models, published in scientific journals. Efforts of integrative frameworks gave way to pursuit of novel research testing hypotheses of interest from a scientific (often reduced) view of complex management problems. Olian and Alutto (2007) report on the impact of management research further identified some problems with the research and its impact on practice. We are now 60 years post-the original studies, 30 years post the Porter and McKibbin report, and more than 10 years post the Olian and Alutto report; the time for integration has arrived in a way that responds to the prior criticisms and to prepare for the needs in the future.

To study complex phenomena, Ostrom (2010: 3) noted in her Nobel lecture: “Efforts to explain phenomena in the social world are organized at three levels of generality. Frameworks [...] are metatheoretical devices that help provide a general language for describing relationships at multiple levels and scales. Theories are efforts to build understanding by making core assumptions about specific working parts of frequently encountered phenomena and predicting general outcomes. Models are very specific working examples of a theory.” Containing the most general set of variables and relationships, a framework (or meta-framework) provides a general language to explain any single theory and to compare multiple theories.

Because most management phenomena or problems are multilevel, multifaceted, and complex (Hitt, Beamish, Jackson & Mathieu, 2007), we need frameworks to enable an integrative understanding. The purpose of a framework is not (only) to offer new insights, but primarily to synthesize a fragmented literature of theories and findings into an unbiased and complete understanding of an indispensable problem. We suggest it should have four components: (a) Meta-theorization: discussing and comparing multiple alternative theories of a phenomenon/problem; (b) Synthesis: organizing all concepts and their relations in a unified network, identifying similarities, reducing redundancies, contrasting differences, and reconciling conflicts; (c) Mapping: listing the most generous set of variables and relationships in a unified structural equation model (SEM) for big data analytics; (d) Extendibility: explicating its flexibility in the face of new contexts or new evidence.

NEW TECNOLOGY: HUMAN-MACHINE COOPERATION

“Over time we will probably see a closer merger of biological intelligence and digital intelligence.” –Elon Musk

We envision a future where existing knowledge is organized in a unified network of frameworks linking different phenomena. These frameworks can be digitalized and connected online, providing new ways to more effectively integrate human- and artificial intelligence for purposes of knowledge creation and management. An effort we can build on is metaBUS.org – a cloud-based platform where researchers code, upload, and curate social-science correlates. However, we suggest a more digitalized and automated approach.

We suggest the digitalization of frameworks on a web-based platform for conducting artificial literature reviews. With the concepts, logics, and relationships organized and digitalized in frameworks, a text-analysis technique can be designed to automate the text recognition, group the similar concepts, compare findings of relationships among these concepts, identify inconsistencies of the underlying logics, meta-analyze the empirical evidence of these relationships and their context boundaries to resolve these inconsistencies, and to (re)test all relationships and discover overlooked nonlinear relations, mediators, and moderators in a unified SEM using big data analytics.

NEW METHOD: OPEN-SOURCED SYSTEMATIC REVIEWS

“[Those] who learned to collaborate and improvise most effectively have prevailed” ...Charles Darwin

Our approach to human-computer cooperation can make it easier to conduct quality systematic reviews of management research literature. An effort we can learn from is Meta.com –a tool to automate literature reviews of biomedicine. Systematic reviews, often accompanied by meta-analyses, are methodical and comprehensive literature compilations and summaries. They help organize the state-of-the-art knowledge into more inclusive frameworks. They adopt “a replicable, scientific and transparent process” to “minimize bias through exhaustive literature searches of published and unpublished studies” (Tranfield, Denyer & Smart, 2003: 209). We note that in 2018 *Campbell Library of Systematic Reviews* launched its Management arm, publishing systematic reviews of management research relevant to practice.

The traditional “by hand” approaches to systematic reviews are fraught with limitations. First, it is difficult to ensure that human searchers have identified all relevant published and unpublished research on a topic. Second, searches can take a year or more to conduct, consuming valuable professional time and research funding in a routine activity. Third, it is difficult to synchronize updates across reviews, because the complex linkages among different literatures and their roots are often implicit and ambiguous in these reviews. For instance, a systematic review on corporate governance may be disconnected from a newer systematic review on the fundamental human behavioral models underlying the agency theory, which may augment some of the predictions of agency theory, which in turn will affect the implications of corporate governance. It is difficult to synchronize all three literatures simultaneously because the entire chain of relationships among human behaviors,

agency theory, and corporate governance is often not clearly or fully identified in these reviews.

A key problem that our approach seeks to overcome is the cognitive and training limits of researchers. Consider for example an exact keyword search of “organizational performance” in the Web of Science. It yields 6,000+ publications covering 139 disciplines. No researchers or teams can take on the holistic knowledge consolidation of all these publications. Traditional systematic reviews are confined by the expertise of the research team and may be disconnected or only loosely connected to a complete understanding of this construct.

Given the wide range of areas and disciplines related to many management phenomena, creating the integrative frameworks described above requires a large-scale scholarly community to work together as a team. A potential solution is open-sourced systematic reviews through a Wikipedia-like digital community (Rousseau, 2007). Through their open access, a large crowd of qualified researchers can publish, edit (under a qualified integrative scholar as a moderator), and link together all the systematic reviews. The integrative frameworks mentioned earlier can help to organize these systematic reviews and to synchronize their updates. For an illustration, if a new kind of CEO behavior is identified and replicated in scholarly research, then any systematic reviews on CEO behavior published in the web platform would be updated, along with all reviews focused on the antecedents and/or consequences of that CEO behavior.

NEW OUTLET: A WEB-BASED, CURATED OPEN LIBRARY

“Collective intelligence... We’re entering an era in which software learns from its users and all of the users are connected.” ...Tim O’Reilly

When it comes to hosting integrative frameworks to enable open-sourced systematic reviews, the traditional media are of little value. They are constrained by space (e.g., page size, page limit, static information), time (e.g., periodicals rather than constant updates and synchronization), and cognitive bounds (e.g., knowledge limits of human editors and researchers). A web-based, curated open library is a potential answer. Combined with integrative frameworks and open-sourced systematic reviews, a web-based, curated open library can enable the uploading, sharing, updating, linkage, and synchronization of all knowledge onto a unified platform.

This new library differs from typical digital libraries like Web of Science and Google Scholar or interactive platforms like ResearchGate and SSRN. First, the proposed new library not only hosts and indexes papers but also decomposes a paper into highly particulate components (e.g., a construct, its augmentation, its measure, logic relationships among constructs, competing or complementary theories underlying these logics, and empirical evidence of these relationships, etc.) and presents all these components in a unified chain of causes-and-effects. Second, this library through the work of curators, like Wikipedia, allows readers to review, comment, and request research updates, and synchronizes prior research if a new update is made.

NEW MINDSET: “YES AND” WISDOM

“Judgment is not simply about how to promote a single given end, but about how to promote ends that are revisable and defeasible in light of other ends.” ...Nancy Sherman

Focus, specialization, and coherence characterize how we train scholars, conduct research, and certify publications. Under these principles, knowledge is divided into separate territories, each of which sets an “either/or” boundary for what is considered true, right, favorable, or relevant. In turn each territory is defended by a community of scholars as territory authorities. This mindset, however welcomed for its tractability, narrows the sight, logics, and values of our scholars. Setting aside the “either/or”, physicists such as Bohr and many others embrace the “both/and” approach. They see paradox, built on different implicit foundations, where others see contest on the surface. Many see the embrace of a non-dualistic and global point of view as the hallmark of wisdom. And so, a mark of our wisdom as management scholars may be to say “Yes and” to the quest for knowledge synthesis. We must learn how to live in a non-dualistic world and this requires quality connections among scientists and practitioners from all domains to broaden our conversations and capacity (Rousseau, 2007).

Integrative studies that seek to unfold a holistic point of view and try to resolve tensions among different theoretical and disciplinary roots are typically less publishable or subject to more critical reviews, often by specialists from different fields who defend their own beliefs and may not agree with each other’s assumptions. Therefore, to build or encourage the emergence of a new ecosystem for knowledge synthesis and accumulation, we first need to incentivize an integrative mindset of “Yes and” wisdom underlying our doctoral training, research, and editorial processes. In turn, we also need to redesign our research incentives, from rewarding only depth to also encouraging breadth. Instead of seeing their territory of knowledge as a fenced area, students and scholars should be encouraged to see it as an entry point into a larger more holistic world.

CONCLUSION

We understand change takes time, even at the most optimistic times. We hope our ideas in this essay can generate a series of new dialogues on the (re)design of our research infrastructures and incentives. This essay is a product of series of conversations in the past few years with colleagues, scholars, and practitioners, which we hope to continue as our ideas materialize in the future.

REFERENCE

- Hitt, M. A., Beamish, P. W., Jackson, S. E., & Mathieu, J. E. 2007. Building theoretical and empirical bridges across levels: Multilevel research in management. *Academy of Management Journal*, 50(6): 1385-1399.
- Olian, J. D. & Alutto, J. A. 2007. *Impact of Rewards*. Report of the AACSB International.
- Ostrom, E. 2009. A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939): 419-422.
- Ostrom, E. 2010. Beyond markets and states: Polycentric governance of complex economic systems. *Transnational Corporations Review*, 2(2): 1-12.
- Porter, L. W & McKibbin, L. E. 1988. *Management Education and Development: Drift or Thrust into the 21st Century?*. New York: McGraw-Hill.

- Rousseau, D. M. 2007. A sticky, leveraging, and scalable strategy for high-quality connections between organizational practice and science. *Academy of Management Journal*, 50(5): 1037-1042.
- Tranfield, D., Denyer, D., & Smart, P. 2003. Towards a methodology for developing evidence-informed management knowledge by means of systematic review. *British Journal of Management*, 14(3): 207-222.