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The B2B Knowledge Gap¹

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Roughly equal in terms of the economic value of transactions, B2B (Business-to-Business) marketing sees a small fraction of the academic research attention that B2C (Business-to-Consumer) marketing sees. In this article, I cite some of the reasons for that imbalance. I then highlight three specific areas--- B2B Innovation, B2B Buying and B2B Analytics---that have great potential for yielding academically significant research contributions that meet the needs of practitioners. In each area, I sketch the state of knowledge and then identify a few research questions. I then highlight a number of other areas of B2B that offer high potential. Next, I comment on the importance of crafting B2B academic research that is both rigorous and relevant and what we as a profession might do to encourage more such work. I then offer a few thoughts about how to increase the participation of practitioners in the B2B knowledge creation process.

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Keywords: B2B, B2B Innovation, B2B Buying, B2B Customer Analytics

¹ While the material in this article is drawn from many sources, the article relies most heavily on Grewal and Lilien (2012), Griffin, Josephson, Lilien et al (2013), Lilien (2014) and Grewal, Lilien et al (2015).

1. Introduction

According to the most recently published US Department of Commerce statistics (2010), B2B (Business-to-Business) transactions accounted for \$10.7 trillion or nearly 42% of the \$25.6 trillion in reported US revenues. The World Bank (http://en.wikipedia.org/wiki/World_Development_Indicators Retrieved 01 July 2015) reports that the US accounts for roughly 22% of the global economy, implying that in 2010, B2B Buying globally involved nearly \$50 trillion in transactions (\$10.7 trillion /0.22), an amount that should be significantly higher today. And of the \$4.13 trillion in ecommerce reported by the US Department of Commerce in 2010, nearly 90% (\$3.7 trillion) was B2B with only \$424 billion (just over 10%) B2C².

With similar economic weight of B2B and B2C transactions, one might expect similar levels of academic attention. That has not proven to be the case. Reid and Plank (2000) study the history of academic work in B2B marketing and show that it was not until the late 1960s (e.g. Webster 1965) and 1970s (e.g. Sheth 1973; Webster and Wind 1972) that the area began to attract attention, with prior academic work in marketing focusing on B2C marketing almost exclusively. Reid and Plank show that B2B publications in the top four marketing journals remained rare at of the turn of the 21st century, with only between one and five articles appearing each year in the *Journal of Marketing*, the *Journal of Marketing Research* and *Marketing Science* and with the *Journal of Consumer Research* completely focused on B2C issues. The bulk of B2B research appears in more specialized journals such as *Industrial Marketing Management*, *Journal of Business and Industrial Marketing* and *The Journal of Business-to-Business Marketing*. In an update LaPlaca and Katrichis (2009) report that in the decade following Reid and Plank's review, little has changed, with no articles appearing in the *Journal of Consumer Research* and only a sprinkling of B2B articles in the other three journals.

² See internetretailer.com/b2b-ecommerce/#/ and practicalecommerce.com/articles/85970-B2B-Ecommerce-Growing-Becoming-More-Like-B2C for some other sources describing both the surprisingly large size and hidden nature of the B2B Ecommerce marketplace.

And given the observation above about the preponderance of ecommerce being B2B, it is striking that a special issue of *Marketing Science* focusing on the early impact of the Internet (Hoffman 2000) contained no articles and barely a mention of B2B e-commerce. Shankar (2012) argues that not much has changed in the ecommerce domain since.

In addition to the lack of academic focus on traditional B2B ecommerce, there is virtually no academic work on sales to the military or to federal, state and local governments in the US or elsewhere, according to a recent keyword search of top journals. Yet such sales are of enormous financial importance and represent the predominant business for many firms. For example, the top five U.S. government contractors alone in 2013 (Lockheed Martin, Boeing, Raytheon, General Dynamics and Northrop Grumman) accounted for over \$100 billion in sales (see https://www.fpds.gov/fpdsng_cms/index.php/en/reports/62-top-100-contractors-report3.html)

I first discuss some of the causes of what appears to be a misallocation of academic resources on B2C versus B2B, noting both the challenges and overlooked opportunities. I then draw on Wiersema's (2013) B2B Agenda to focus attention on three areas, B2B Innovation, B2B Buying and B2B Analytics that deserve special attention by academic researchers. I then cite other problem domains that also merit academic focus. I conclude by noting that change in academic focus will not take place without changes in behavior and incentives both within the academic community and in the community of B2B practitioners.

2. B2B Marketing: Opportunities and Challenges

The predecessor of what we now call B2B marketing was industrial marketing (Webster 1978). Industrial marketing focused mainly on transactions of the raw materials like timber, petroleum and iron ore and the equipment and supplies that other business used in their operations. As the growth of the production sector has slowed and that of the service and technology sectors has grown, the term

industrial marketing has gradually been supplanted by the term B2B marketing. The latter, broader term addresses the full range of value-generating relationships between businesses, government agencies and not for profit organizations and the many individuals representing those organizations. B2B relationships include those between manufacturers and both wholesalers and retailers; between agribusiness firms and farmers; and between pharmaceutical firms and both hospitals and physicians. But they exclude relationships between firms (manufacturers who sell direct or retailers) and consumers, the domain of B2C.

A way to discriminate between B2B and B2C is to ask a simple question: Is the demand for a product or service derived (driven by the demand of some subsequent customers—B2B) or primary (driven by the specific tastes or preferences of the buyer—B2C)? Exhibit 1 elaborates: relative to B2C marketers, B2B marketers (a) operate in a culture driven by manufacturing or technology (rather than marketing); (b) aim at value chain intermediaries (not end consumers); (c) develop a technical or economic (rather than perceptual) value proposition; that (d) incorporates a major component of economic (versus brand) value; (e) face far fewer customers; but (f) see far larger individual transactions; (g) are often linked to buyers through interlocked production and delivery processes; (h) whose purchasing process can be highly complex; (i) involving a far wider range of stakeholders. Those stakeholders – financial analysts, purchasing agents, engineers, manufacturing managers, lawyers and others both inside and outside the firm—who are involved in purchasing processes of often great complexity have led to a field of study specific to B2B marketing called B2B Buying or *organizational buying behavior*

--Insert Exhibit 1 about here--

The B2b field offers some challenges for the aspiring B2B academic researcher; here a few.

Challenge 1a: Complexity and Heterogeneity in the Problem Domain. The above discussion notes the contrast between B2C buying (where the most complex consumer behavior involves households of several individuals, normally spanning a generation or two) and B2B buying, where an organization may involve dozens of individuals with different backgrounds and incentives in the purchase process. And while it is safe to assume that consumers vary little in both the volume of dishwasher detergent they need or the attributes of the detergent they seek, the B2B domain is often far more heterogeneous, both in terms of customer size and performance needs. Titanium dioxide is an opacifying ingredient used in the manufacture of paper, plastic piping, paint and other materials. When the price of paper pulp goes up, titanium dioxide becomes more valuable to the paper industry (the more titanium dioxide, the less paper pulp is needed to make paper of a given grade). But there may be no effect on the demand of customers in the paint industry since titanium dioxide competes with different alternatives in those applications.

The purchase complexity and customer/prospect heterogeneity in the B2B domain demands research approaches that differ from those that have found success in B2C. The research challenges multiply when one considers the small number of significant customers in many markets. For example, according to Gartner, for suppliers of keyboards or other pc parts, only three potential customers, Lenovo, HP and Dell, account for over half the entire 2014 global production of pc's (<http://www.gartner.com/newsroom/id/2960125>).

Qualitative and case-based research methods (Griffin, 2012 and Woodside and Baxter, 2012) that have strong traditions in fields like anthropology and sociology, or that use extensive survey and secondary source data, are more appropriate to the B2B domain than are methods more commonly used in the B2C domain. And because the second B in B2B reflects the link between organizations, B2B research can be executed at several levels. Hence the unit of analysis can be an individual sales manager (sales research), a buying center (B2B buying research), a Strategic Business Unit (B2B strategy

research) a relationship between firms (distribution channels research) or even a network of firms (product development research). The focus on these different units of analysis will dictate the appropriate theoretic frameworks and methods in a particular B2B research study, ranging from psychological theories for sales managers to resource-based view for relationships between firms.

Challenge 1b: Lack of Easy Data Availability. A corollary to Challenge 1a is that data for B2B research are less voluminous and more difficult to collect than are data from consumer sources, be they experimental data used to test theories of consumer behavior or transactions data used to test models of consumer choice. Gathering comparable data in the B2B domain often requires the involvement of one or more cooperating organizations. To generate the relationship needed for such cooperation can be challenging for many academic researchers, particularly those early in their careers. This lack of data availability was one of the drivers for the development of Penn State's Institute for the Study of Business Markets (ISBM—see isbm.org), whose mission includes connecting B2B researchers with organizations that share an interest in their research problem, thus facilitating the collection of primary source data. (Lilien, 1990)

Challenge 2: Lack of Domain Knowledge by Researchers: Marketing academics, in their personal lives, are all consumers. Hence, all have personal experience choosing consumables and durables and have even faced the challenges of family decision-making. They also understand (mostly) what products and services are supposed to do for them, even a product as complex as a router. But suppose an academic wanted to study the routers that Cisco offers to her university's IT department.

Here is what the researcher is likely to see:

Cisco 4000 Series ISRs introduce new chassis, modules, and WAN services with a robust management framework and validated designs for the Cisco Intelligent WAN. Cisco 4000 platforms, together with Cisco UCS E-Series server modules, provide a flexible platform that can easily adapt to the changing application landscape. Use these routers to support all cloud applications on any device. Cisco 4000 Series ISRs are designed to meet Gigabit forwarding performance needs while running the broadest set of network and application services on a

single platform. (<http://www.cisco.com/c/en/us/products/routers/4000-series-integrated-services-routers-isr/index.html>)

What background does a researcher need to study the (potential) transaction and related business market environment associated with this router? A grounding in science, technology or engineering would seem helpful here. Work experience within a B2B organization, whether in sales, production or engineering, would provide an understanding of the nature of B2B selling and buying. Those without such educational or work background lack important attributes needed for top quality research in the B2B domain, and will likely need either to pursue research opportunities elsewhere or seek appropriate research partners.

But far from being only half empty, the B2B glass is at least half full. Here are three general opportunities; seasoned B2B scholars can no doubt add more:

Opportunity 1: Greater need for improved marketing sophistication in B2B vs. B2C.

Historically, B2B (industrial) marketing firms relied most heavily on their (superior) technology to compete, with firms like IBM and DuPont seemingly owning large portions of their markets for extended time periods. As those technological barriers to competition have lowered with more rapid innovation and more aggressive competition in recent decades, insight about customer needs and how best to satisfy them have become more central to firm success. Hence, the B2B domain is filled with firms and markets that are far earlier in their marketing sophistication, providing opportunities for research to provide insights of both academic and practical significance.

Opportunity 2: Less academic competition in B2B than in B2C. I began my career doing research in B2B marketing because I wanted to work on problems that I thought were important but that my peers seemed to be overlooking. Although my dissertation was in consumer choice models, I abandoned that field to the many highly qualified researchers working there. That opportunity still exists today—the ratio of important B2B problems to top quality academic researchers remains far

higher on the B2B side than on the B2C side. So why not work in areas where the opportunity for pioneering work is high?

Opportunity 3: The Global Nature of B2B Markets. Consumer tastes and preferences vary dramatically across borders and cultures, but a primary driver of transactions in B2B markets—derived demand—holds everywhere. Hence, the global B2B marketplace matches up well with the increasingly global academic market, meaning that multinational research partnerships have the potential to bring more efficiency to B2B research than to B2C research.

But what are the specific research domains that show the highest potential for academic researchers? To answer that question, note that company involvement is often vital to facilitate gathering the data needed for much high quality B2B research. Hence, we B2B academics will likely see the most success when we address problems that are of top (business) interest to B2B practitioners. To determine what those problem areas are, the ISBM, under the leadership of Fred Wiersema (2013), developed the B2B Agenda project. In the first phase of the project, Wiersema interviewed 30 leading B2B academics and 72 executives from 61 B2B firms. He content-analyzed the interviews and reviewed and deepened the findings with working sessions with a subset of the academics and practitioners.

The primary question Wiersema asked was: “Five years into the future, there will be B2B firms who have succeeded and are in the lead and others who have not. What, in your opinion, will leading edge firms have done that the others have not?”

Top B2B marketers and academics agreed on several issues: they reported that B2B marketplaces were in a state of flux never seen before and that business as usual was not sustainable. Some of the driving forces were (1) the need to focus on an increasingly global marketplace, (2) the need for organic growth (rather than growth through acquisitions), (3) dramatic increases in customer power, the latter due largely to advances in *digital information technologies (DIT)* and *digital*

manufacturing technologies (DMT), and (4) the need to harness the potential of B2B big data and analytics. These trends and driving forces were shifting the spotlight in B2B markets away from products and supplier technology (the historical stars of the B2B marketplace) and on to customer-facing functions.

Wiersema then explored the implications of these findings to determine the significant, unmet knowledge needs in the B2B marketplace. What emerged was the B2B Agenda, three research priority areas that both have the most relevance in the B2B marketplace and that have the highest potential for academic contributions. These three areas are (1) B2B Innovation (2) B2B Buying Behavior and (3) B2B Customer Analytics. While there are clear overlaps between these domains (e.g. a better understanding of B2B buying can lead to improved NPD performance and B2B Analytics can be used to support the other two domains) I discuss them separately.

3. Research Challenges in B2B Innovation

Based on the results of the B2B Agenda, Abbie Griffin (see Griffin et al, 2013) sought to identify a research agenda in the B2B Innovation domain. Using a Delphi approach, Griffin asked 15 leading innovation academics to provide an “empirical generalization” about one of the following two statements:

1. Customer engagement in B2B innovation: What do we and should we know?
2. B2B innovation and NPD: What drives innovation in the B2B space and how does innovation relate to NPD?

Griffin compiled the Delphi responses and sent them out to a select set of academics and research oriented practitioners who participated in a half-day workshop to develop research priorities.

Three themes emerged:

- Theme 1: Improving B2B customer needs understanding and customer involvement in developing new products;
- Theme 2: Innovating in B2B beyond the lab;
- Theme 3: The Role of Marketing in B2B Innovation and Deploying Research Results

3.1 Improving B2B Customer Needs Understanding and Customer Involvement in Developing New Products

Work by academics (see Day and Montgomery 1999, *Voice of the Customer*: Griffin and Hauser, 1993; *Customer Visits*: McQuarrie, 2008) and practitioners (*Outcome Driven Innovation*: Ulwick, 2005; *New Product Blueprinting*: Adams, 2008) provide compelling cases for the potential value of customer input into the B2B innovation process.

But the B2B Agenda project raised many questions about what specific approaches to use how to do so in both a timely and cost-effective manner. Specific concerns include: Which customers to engage? How to protect sensitive information (Noordhoff et al. 2011)? How to create a model of engagement that is cost effective and timely? How to measure the value of that engagement? How to use the information gathered effectively?

There has been work on a number of these topics. For example, Moorman et al. (1992, 1993) identify the factors that lead to increased use of market research. Hoffman et al. (2010) offer a scale to identify customers with an “emergent nature” who are likely to be good sources for such information. Fang (2008) provides a third perspectives on the most appropriate customers to involve in the innovation process.

The customer-selection and valuation issues are central and deserve more attention. Von Hippel (1986, 2005), has long argued that the most appropriate individuals to select are those for whom a problem is so critical that they have developed a solution of their own, what he has called the Lead User Approach. Lilien et al (2002) report on the effectiveness of the Lead User approach at 3M. That work (1) clearly demonstrated the effectiveness of the Lead User approach in generating breakthrough innovations, (2) had its effectiveness attested to by the firm’s senior leadership, yet (3) was abandoned when new top management took over, overhauling the firm’s innovation process³. In practice, for innovation input, most marketers go to good or safe customers, whose needs are typically well served

³ Eric von Hippel, private correspondence

by existing offerings and hence who offer little useful input.⁴

Griffin et al (2012) propose propositions on customer needs in B2B Innovation as follows⁵:

Proposition 1: Pertinent customer information, used diligently, improves innovation outcomes

Proposition 2: Inputs from some types of customers are better than inputs from others

Proposition 3: Involving customers in the innovation process improves innovation

3.2 Innovating in B2B Beyond the Lab

Chesbrough (2003) argues that the traditional paradigm for creating new products consists of a hierarchical structure internal to the firms that provides control over the entire development process; the bulk of academic research in this domain has sought to refine such internal processes. Yet B2B Agenda respondents cite the need for organic growth as a central challenge for their organizations and, as Barczak et al. (2009) and Griffin et al. (2012) note, such internal, controlled processes produce few breakthroughs. Rather such internal processes produce mostly incremental innovations, hampering firms' abilities to grow organically.

An alternative innovation model is to engage in socially-based or open innovation (Chesbrough 2003)—innovation outside the firm—where the risks and rewards of innovation are shared with outside constituents. As Bayus (2013) notes, firms' open innovation practices includes outsourcing the R&D function, posting technical problems on proprietary or open web sites as competitions, sponsoring design competitions, and hosting electronic suggestion boxes. However, many senior managers express concern that the costs and risks (making the firm's internal knowledge, capabilities and strategies visible to competitors, suppliers, and customers) of open innovation will outweigh the potential benefit, leading to the following proposition:

⁴ Abbie Griffin, private correspondence.

⁵ See Griffin et al (2012) for details on suggested specific research questions here and throughout this subsection of the paper.

Proposition 4: Innovating beyond the laboratory opens up rich avenues for B2B firms to create customer value.

3.3 The Role of Marketing in B2B Innovation and Deploying Research Results

The marketing function in many firms provides knowledge of the needs of current and future customers, (Griffin and Hauser 1993; Hoffman et al. 2010), knowledge that is critical to the success of innovation projects (Cooper 2004). However, significant barriers in B2B firms keep marketing from exerting control over innovation and NPD decisions. Workman (1993) found three such barriers that were particularly limiting to the marketing's ability to influence these decisions: (1) Functional power structures; (2) Limited marketing resources; and (3) Time-to-market pressures.

The major research question here is to determine what the optimal role of marketing in the innovation process of the firm should be, leading to the following proposition:

Proposition 5: Involving marketing in the innovation process improves innovation outcomes.

Griffin et al (2012) discuss the more general question of the lack of dissemination of academic research findings on innovation in firms and the roles academics should play in that dissemination. The academic literature has searched for why academic market research findings are not being better employed by practitioners (Jaworski 2011; Reibstein, Day, and Wind 2009; but see Midgley, 2015, for a more optimistic view): if academic research in marketing has something to bring to the table, then why are managers not utilizing those research findings? Scholars have noted (see Lilien 2011 for example) that the ability of marketing academics to disseminate knowledge beyond the academic community has been disappointing. Several of the recommendations I offer later in this article address these concerns.

4. Research Challenges in B2B Buying⁶

The second area of focus identified in Wiersema's (2013) B2B Agenda is B2B Buying. Lilien (2014) traces the history of and trends in models of B2B Buying. Many of the foundational models,

⁶ See Grewal, Lilien et. al (2015) for details on research opportunities

which were developed decades ago, are static in nature and centered on the North American or European institutional structure. However, there are forces from evolving technologies and globalization that are dramatically affecting the nature of B2B buying and challenging the validity of these models and their underlying assumptions.

Grewal, Lilien et al (2015) conducted a Delphi-like process that identified four aspects of B2B Buying that were both of top concern to practitioners and had the potential for fruitful academic study: (1) the increasing importance and growth of emerging markets (2) the changing landscape of B2B buying (3) the increasing sophistication of sellers (4) the impact of changes in technology. I develop the emerging market trend in more detail here as I feel it holds the most promise for the increasingly-global supply of marketing academic talent

4.1 The increasing importance and growth of emerging markets

While the growth of emerging markets such as China and India has dramatically reshaped the global marketplace, academic research and managerial best-practice studies involving developed markets has generally been ported directly to emerging markets. Yet, the literature on standardization versus adaptation of marketing strategies suggests that the B2B buying frameworks developed primarily in established markets lead to mixed and misleading results when applied elsewhere. (Cavusgil, and Zou 1994; Palmatier, Stern, and El-Ansary 2014; Sheth 2011).

Grewal et al (2015) cite a number of key differences between existing and emerging markets; the challenge for B2B researchers is to identify those differences that can fundamentally alter B2B Buying. The key differences involve (i) the relative size and nature of government versus business buying, (ii) the under-developed legal system in emerging markets, (iii) the non-contractual and extensive webs of business relationships, and the extent to which those relationships affect the firm's

ability to perform in emerging markets, and (iv) the large influence of political ties on business processes in emerging markets.

To develop an agenda for future research agenda in this area, Grewal, Lilien et al (2015) classify B2B buying relationships into four categories on the basis of where each partner in the relationship is located. They refer to these as follows:

Informal Relationships Dominant relationships consists of firms located in emerging markets that buy from firms also in emerging markets. Little work has focused on how firms in emerging markets buy from other firms in emerging markets, including their own.

Brand-Cost Transitions relationships consists of firms in emerging markets that sell in developed markets. Such firms have traditionally relied on a cost advantage. However such advantages are disappearing as wages in emerging markets rise. Research in this area should focus on questions of how buyers and sellers in such marketplaces should adapt to the transition from cost-competition to value competition.

Contractual-Relationships Dominant relationships represent the developed market context where researchers have devoted the most effort. However, there are many significant trends underway that call for research even within this cell, dealing with increased centralization of buying, sophistication of sellers, and advances in technology and analytics, several of which I discuss below.

Relationships Transition concerns firms in developed markets selling to firms in emerging markets and is the domain likely to have the most research interest to the large base of researchers and selling organizations in developed countries. The overarching research questions here involve how do the differences between emerging and developed markets discussed above affect the nature of the (a) the buying process and (b) the adaptations that selling firms from developed markets must make to prosper in such markets.

This framework should be helpful in identifying the areas that are important and have seen only limited academic attention.

4.2 The Changing Landscape of B2B buying

The “Contractual-Relationship Dominant” condition above—developed market firms selling to other firms in developed markets—has been served by largely the same conceptual framework for nearly five decades. Either the BuyGrid model (Robinson, Faris and Wind 1967) or some close alternative has proven quite useful during that time, but macro trends have significantly changed the B2B buying process (Wind and Thomas 2010). Grewal, Lilien et al (2015) propose an update to the BuyGrid conceptualization based on the observation that as buyer-seller interdependence increases, the nature of buying relationships becomes more critical. Exhibit 2 summarizes three modes of B2B buying that differ in terms of the relationships between buyer and seller, the locus and nature of buying decisions and implementation, and other purchase-related factors.

--Insert Exhibit 2 about here--

As Exhibit 2 shows, these three modes of B2B buying: Routinized Exchange Relationships (RERs), Organic Buying Relationships (OBRs), and Transactional Buying Operations (TBOs), differ significantly on the nature of the buying process, the involvement of decision participants and the characteristics of the item of the offering at the core of the exchange process. (Grewal, Lilien et al 2015 provide details). I believe that Exhibit 2 (or some variant) can prove a worthy successor to BuyGrid and identify a variety of significant research questions.

4.3 Increasing Sophistication of Sellers: The Trend toward Solutions

With few exceptions, B2B marketers (suppliers) face increasing buyer power as buyers source on a global scale and attempt to reduce their buyer supply base (Senn, Thoma and Yip 2013). Suppliers are increasingly expected to co-create value with and for their buyers, thereby moving beyond standard

cost and quality improvements to provide unique collaborative solutions. The change in the B2B marketplace has been dramatic in recent years, with even traditional distributors and component suppliers seeking to understand and provide solutions to customer problems. For example, Kimberly Clark Professional which traditionally offers a wide range of safety and cleaning supplies, now focuses on a solution for improved worker productivity (<http://www.kcprofessional.com/solutions/healthier>) through a healthier workforce. Further research should provide a systematic validation and extension of the factors related to the increasing sophistication of sellers and solutions selling. And the lack of empirical research that explores the outcomes of a solution strategy provides an opportunity for research on metrics for solutions effectiveness and the need for organizational adaptation to solutions.

4.4 The Impact of Technology on B2B Buying Behavior

Two forms of emerging digital technologies are having disruptive effects on the nature of B2B buying: *digital information technologies (DIT)* and *digital manufacturing technologies (DMT)*.

DIT refers to the integration of telecommunications (e.g., smartphones and wireless technology) and computer systems (e.g., software, audio-visual systems) and data to better enable firms to access, store, transmit, and manipulate information pertinent to their daily business operations.

DMT refers to technologies such as digital design software, digital scanners, and 3D printers. These technologies enable firms to design, manufacture, and acquire objects independently rather than buying them from an external supplier. For example, automotive manufacturers such as Ford utilize 3D printing for rapid prototyping of light automotive components, thereby increasing fuel economy and speed to market (Chowdhry 2013).

The rapid advances in DIT and DMT are leading to numerous research opportunities surrounding the disruptions in buying processes and value creation that they have caused.

5. Research Challenges in B2B Customer Analytics

To supplement the findings from the B2B Agenda interviews, Hari Sridhar, Fred Wiersema and I conducted nearly a dozen in-depth interviews with top-level executives of ISBM member companies to learn about the need for analytics and the state of practice. Three main conclusions emerged.

1. *Data Are Everywhere But What to Do With Them?:* The recent customer data explosion has affected B2B firms as well as B2C firms: B2B firms are beginning to recognize that they now have access to far richer sources of data specific to B2B customer needs, information gathering, interaction and other behavior than ever before and are investing heavily in internal databases to link marketing efforts to financial outcomes. Yet firms don't know what data to collect and what to do with the data they have.
2. *Who Can Manage Customer Analytics?* Firms report a severe lack of B2B Customer Data Scientists, indicating that they are undersupplied with analytics human resources.
3. *B2B Analytics is not B2C Analytics:* Most marketplace customer analytics applications were designed to serve B2C firms. Firms report difficulty in attempting to apply such existing customer analytics tools and applications, finding that B2B markets have distinctive characteristics in terms of customers, products and marketing environments that current approaches do not readily address.

B2B practitioners see a large potential in tapping into B2B Customer Analytics to address business problems, but have neither the tools nor the guidance to realize that potential. To old line "industrial" marketers that conclusion may seem odd: B2B has been traditionally viewed as that part of marketing with little or no customer data. But times have changed and B2B selling firms are taking action. They are hiring cloud based predictive analytics providers (such as [Lattice](#) and [Mintigo](#)) to draw on both inside data sources (internal CRM and marketing automation data) and outside data sources (public data of company financial performance, company events, executive changes, social media

activity, press releases, job posting, patents) to identify new leads. Firms are also using these data to generate model-driven conversion rates using existing client “look-alike” traits.

In addition, most B2B sellers’ websites require searchers to register to gain access to detailed product performance and specification data. Hence, the identity of most serious information-seekers can be linked to their browsing behavior. Analytics are increasingly being used by sellers monitoring buyers’ browsing behaviors on websites, which enable sellers to understand buyer readiness to purchase, transforming cold sales calls to warm sales calls, and thus lowering the cost of sales.

Unlike B2B Innovation and B2B Buying, B2B Customer Analytics is not tied to a specific business problem; rather B2B Customer Analytics refers to a domain of current high potential, both for academics and practitioners.

Much in the same way that Wharton’s Customer Analytics Initiative (<http://wcai.wharton.upenn.edu/>) was developed to link academics with industry to exploit the research and business potential of large (mainly consumer) customer data sets, I believe that a similar institutional arrangement will be needed in the domain of B2B Customer Analytics. The statistic I noted earlier that nearly 90% of all ecommerce is B2B suggests that there must be many rich sources of B2B ecommerce data that have yet to be tapped for academic purposes.

The ISBM is testing such an initiative, ISBM-CAP (Customer Analytics Program). The objective of CAP is to foster research and interchange between B2B marketers and academic researchers around problems arising from day-to-day B2B practice. Those projects are aimed at exploiting large data sets that B2B firms generate in the course of business and potentially enhancing those data sets with other data sources to address business problems. Here are two early examples:

Example 1: The economic impact of online apps in B2B markets. Sridhar and Gill (2015) describe a situation facing Kennametal, a major supplier of tooling and industrial products in the US with about \$3billion in annual sales. Historically, the company had provided print catalogs to potential buyers but provided limited assistance on tool selection and process planning. Kennametal launched a free online manufacturing app called NOVO in September 2013, with the primary goal of improving buyers’ productivity and process knowledge. The app also

highlights Kennametal's products that the buyer might consider purchasing to assist in each process. Kennametal's marketing team hoped to quantify the exact business benefits of developing and offering this free tool.

Sridhar and Gill developed a model that provided two key insights to Kennametal. First, they compared historical sales data from customers who adopted NOVO to those who did not adopt NOVO, creating an estimate of the incremental sales generated due to NOVO. Second, they used data on existing users of NOVO to identify high potential prospects, customers whose profiles were similar to those who used NOVO. Such insights were oriented to support Kennametal's future outreach efforts.

The research showed that the introduction of NOVO led to a 14.1% increase in annual sales for Kennametal. The research also revealed that increased buyer engagement (use of the app to create projects and not just as a tool selector) drove the additional sales. As a result of the specific analysis, Kennametal's CMO authorized funds for the further development of NOVO. And the work has led to a research paper on hybrid offerings.

Example 2: Replacing an existing salesperson: clone, new hire or star? Shi, Sridhar, et al (2015) describe a situation affecting Wesco Distribution, a leading supplier of electrical component products with about \$8 billion in annual sales. The firm's salespeople play a key role in building customer relationships through consultative selling and serve as Wesco's key drivers of business growth by helping customers lower purchase costs and improve operational efficiencies.

Wesco's annual salesperson turnover rate has been 15%-20% over the past five years, close to the industry average rate. When salespeople depart, Wesco incurs direct costs for recruiting and training and suffers losses in sales as the relationship is disrupted. Sales managers assign replacement salespersons to sustain the relationships with customers, but were uncertain as to the kind of replacement salesperson that would best nullify sales losses due to the departing salesperson.

Shi, Sridhar, et al (2015) used both qualitative tools (e.g., interviews with sales managers) and leading edge analytics to develop an implementable model for Wesco to guide replacement strategies. The model used historical data to forecast customer sales loss due to the departure of key salespersons and to estimate how customer sales losses could be mitigated as a function of the replacement strategy that was implemented.

Given estimates of likely turnover, the recommended replacement strategy should mitigate 70% of the sales losses that Wesco currently incurs. And as with the prior example, the work has led to an academic research paper describing and model and implementable methodology to minimize the cost of salesperson turnover.

Other CAP projects on B2B Customer Analytic are in various stages of development, including one on how to segment and target customers based on their (latent) stage in the buying decision process based on website search behavior and how to determine which (ex) customers to target in

which way (winback campaign design). Each project involves a partnership between one or more academics and a client firm. The projects become all-win when the firm gets business benefit from the work and the academics get access to scarce data and unique contexts to support their academic research. Versions of this model have seen both academic and practical success elsewhere: see, for example Hutt and Walker (2015) and the approach taken by Georgia State's Institute for Excellence in Brand and Customer Management (<http://cebcm.robinson.gsu.edu/about-us/pillars/>).

What I find particularly promising about the CAP approach is that it addresses the Challenges to B2B research that I noted at the outset. The partnership with a specific company provides focus, addressing Challenge 1a, while providing data (Challenge 1b) and domain knowledge (Challenge 2). While not the only way to close the B2B Knowledge Gap, I see the CAP approach as one that deserves serious attention by many B2B scholars.

6. Research Challenges Beyond the B2B Agenda

I have focused on the topics above as they are the ones that have emerged from the B2B Agenda as being both of key importance to practitioners and that offer research opportunities for academics.

However, there are many other sources for research topics that B2B academics should consider. One source to consider is Lilien and Grewal (2012), which provides perspectives from over 30 top B2B researchers on the state of the art in a specific domain, the implications of what is known there for practitioners and what some key researchable topics there are. Those perspectives are organized as follows: (1) **Perspectives on B2B Marketing**, which suggests several lenses through which to study B2B marketing, including agency theory, governance value analysis, network governance, a marketing capabilities framework, service-dominant logic and competitive intelligence; (2) **B2B Marketing Mix and Strategy**, which covers marketing communications, segmentation, B2B branding, trade shows and value-pricing; (3) **Interfirm Relationships**—a central topic in the B2B domain—which provides a range of

perspectives on those relationships including the categorization and evolution of such relationships, multi-level perspectives on relationships, the application of Customer Relationship Management to B2B firms, the role of trust in B2B relationships, the role of joint learning in cooperative relationships—relationships with competitors, the evolution of B2B buying and the role outsourcing of inter-firm relationships in global marketing; (4) **Personal Selling**, which covers the several roles salespeople play and their effectiveness in those roles, how salespeople can provide a competitive advantage, the importance of and research issues associated with Key Account Management in B2B, the challenges and research issues associated with salesforce compensation, approaches to assess salesforce performance, how to implement a successful salesforce and the impact of the internet on the size and structure of salesforces; (5) **Technology in B2B Markets**, which covers approaches to market high tech B2B products, several views of the B2B innovation process, the role of ecommerce in B2B markets and the design and execution of dynamic pricing mechanisms in B2B markets; and (6) **Methodological Issues**, which, as I have noted earlier, provide some unique challenges for B2B researchers, including the role of qualitative research, the role of case-based research, the challenges of survey research in B2B and the development of metrics specific to B2B.

In addition to the B2B Agenda, the ISBM has, over the years, developed and curated an agenda. (see <http://isbm.smeal.psu.edu/research/traditional-research-priorities>) that includes a range of questions under the topics of Product Policy, Marketing Strategies and Operations, Buying Strategies and Operations, Customer Value, Business Relationships, Market Channels, Exchange Design and Analysis, Market Communications, Business Marketing Information Systems and Electronic Markets, Business Market Research, Marketing Engineering as well as a range of other topics including Global business marketing issues, the role of design in the business marketing mix, modeling and managing the value chain and more.

Clearly there are many rich opportunities for B2B research that are relevant to practitioners and amenable to rigorous research scrutiny. So if the existence and identification of important problems are not in question, what needs to be done to bridge the B2B Knowledge Gap?

7. Implications for B2B Marketing Academia

Daneels and Lilien (1998) document the history of business schools from a global perspective, focusing on the B2B domain. They conclude (P. 28) that ... [business school faculty] are being asked to be all things to all constituents.... [they] are being asked to do high quality research that is both rigorous and relevant, to be excellent teachers as well as to carry a substantial service load." If anything, the situation is even more challenging today.

I have argued that B2B marketing is highly relevant and important, but is underrepresented in academia. Nearly two decades ago, Daneels and Lilien (1998) speculated about why. They noted that the operations of business markets are not overt, mostly taking place out of sight of casual observers. Without some industry job experience they argued that it is difficult for a researcher to have a sufficient understanding of those markets to conceptualize problems appropriately. In addition, academics often have an insufficient understanding of the relevant technology to understand how value is created and captured in those markets. Little seems to have changed in the past two decades.

There are at least three sets of academic stakeholders whose behaviors and values should be revised for the B2B Knowledge Gap to be bridged: PhD students, current academic faculty and Business Schools. Here are some thoughts for each:

7.1 For PhD Students

A success metric for this article will be a significant increase in the number of marketing PhD students who choose B2B as a domain of focus. But the hurdles I noted earlier are apparent to

prospective students. Here are three recommendations for students to overcome those hurdles and better prepare themselves for B2B research:

Recommendation 1 (R1) Invest in gathering domain knowledge. Unlike in the B2C marketplace, where the researcher can (rightfully) assume knowledge of the forces driving purchase, the B2B marketplace demands study of the driving forces of exchange. What customer benefits does a transformer from a particular manufacturer to be used in a subassembly offer that one from another does not? Who sees those benefits? (Does the transformer provide the subassembly manufacturer with reduced production costs or does it provide the downstream customer improved performance?) Ability to understand the context in which such issues arise is essential for academic success in the B2B domain.

R2: Focus on real problems. The important B2B problems, those worth working on, are the ones that are burning issues for practitioners. And those issues are often ill defined, messy and hard to solve. A desire to work on such real problems is essential for making an impact in the B2B domain.

R3: Develop Breadth in Knowledge of Methodological Approaches. Real B2B problems may need to be addressed with a range of different research methods, including econometric models of existing data, survey-based research, network analysis, agent-based modeling, qualitative research, experimental approaches and more. While it is impossible to have deep expertise in all these methodological domains, a good B2B researcher, like a good GP (general practitioner physician), should be sufficiently grounded in all of these approaches to know what to apply to address a specific problem and when to engage a (methodological) specialist.

7.2 For Academics

R1: Partner early and often. The mixture of conceptual, methodological and substantive skills needed for B2B scholarship are difficult to find in a single individual. Hence, partnerships are more than

useful, they are essential for many individuals to produce top quality B2b research. Industry internships can identify possible collaborators with domain knowledge. Developing academic relationships with colleagues in engineering, the sciences as well as statistics and economics can be fruitful as well as joining with colleagues in operations, logistics and management in the research process.

R2: Focus on real problems. To elaborate on my recommendation for PhD students, neither the academic nor the practitioner communities in B2B are tolerant of work on toy problems. Convenience samples of purchasing agents and laboratory studies with undergraduates or MBAs acting as surrogate B2B buyers have little credibility. Researchers need to ask good research questions and do the research the right way, which is rarely the easy or quick way. The reward will come in the long run.

R3: Apply appropriate review standards to B2B research. The small sample, highly heterogeneous nature of the players in many B2B markets matches up poorly with the large sample/statistical/econometric research approach that dominates what is published in most top marketing journals. (Woodside, 2015, for example, discusses the limitations in variable-based and case-based research in the B2B marketplace and how best to transcend those limitations.) And while journal editors and reviewers often pay lip service to the need to embrace the most appropriate research paradigm for the business problem at hand, there is much anecdotal evidence in the B2B academic community that top journals seem hostile to their type of research.⁷ Editors and reviewers need a better understanding of the constraints the B2B marketplace puts on researchers and apply appropriate rigor-relevance tradeoff in making editorial judgments.

⁷ I once wrote a paper on the ROI of trade shows where, with the cooperation of a cooperating firm. I was able to track the purchase behavior of industry executives who either did or did not attend a specific trade show where the firm was planning to launch a new product line. My co-authors and I framed the trade show vs. no trade show samples as a quasi-experimental design, and weighted the two groups so that they matched on all other observable characteristics. One reviewer found that our work was fatally flawed since we did not “randomly assign” these industry executives to the “trade show” vs. “no trade show” condition. The journal editor requested that we “address the concerns of this reviewer.” I wrote back that the reviewer showed no understanding or appreciation of field research with real executives and that this reviewer’s concern (how can you assign business executives in a field setting to a test or a control group?) should be ignored. The paper did get published, but the experience underlines the need for reviewer education to foster B2B research on real problems.

7.3 For Business Schools

R1: Recruit non-traditionally. The types of individuals able to address the kinds of problems discussed here may not be inclined toward the field. Therefore, active recruitment will be needed. Sociologists and anthropologists are ideal candidates to do qualitative work in B2B marketing. Engineers and those specializing in the hard sciences can bring technical and methodological skills to the table. Many of these people will have to be courted to get them to consider entering the field. And joint PhD programs with technical departments might be an exciting and viable option for some.

R2: Encourage industry internships, sabbaticals and post-docs. Industry internships, sabbaticals and post-docs may help aspiring scholars become knowledgeable about B2B in general and about specific industries in particular (addressing the lack of domain-knowledge hurdle). Schools should be encouraged to view industry internships during PhD programs as well as post-doctoral appointments and sabbatical leaves in industry for faculty as legitimate routes to career enhancement.

R3: Rethink reward systems. Too many schools count publications, A-publications in particular, as surrogates for research quality. Schools must signal to junior scholars that they will reward small sample studies with the long lead time that primary data collection in B2B environments entail. Researchers navigating the rigor-relevance frontier need metrics that are appropriate for the B2B domain. Some academic departments have enacted practitioner advisory boards. Schools that include relevance and impact outside academia as metrics for promotion and tenure might involve such boards in the faculty review process, even if only on an advisory basis. A changed reward system should evaluate research on its merit and not on its volume.

R4: Consider the Medical School model. A radical idea is to embrace some form of the medical school model, where both faculty and students (MBAs and PhD students in our case) would be involved in ongoing work that involves real problems in real organizations. Schools of Education do this, running their own preschools. The potential for B2B researchers for such an institutional arrangement would be

far higher than for B2C researchers, since such cooperation is so much more important in the B2B domain than in the B2C domain. The late Gene Woolsey did exactly this at the Colorado School of Mines for decades. In order to graduate from the OR/MS program there, a student had to do a Pro Bono Publico project for a company or agency that at least got implemented and, preferably, saved money. Any student, before or after graduation, who had, in one year on one project, saved his or her company or agency \$1 million at present worth was given a diamond stickpin. Verified savings from this plan amounted to nearly \$1 Billion at the time of Woolsey's passing. (<http://speakers.informs.org/bios/Woolsey.htm>).

8. Implications for B2B Practitioners

Journal articles such as this are targeted mainly at academics. Yet most of our articles include a section on "managerial implications," with the idea that at least some managerial practitioners will read the article. With that secondary audience in mind, I offer a few comments and suggestions.

I have commented elsewhere (Lilien, 2011) on the gap between academics and practitioners in the domain of marketing decision models. My comments there largely apply here as well. I distinguish in that article two classes of practitioners---direct practitioners who are managers in B2B businesses and intermediaries, those working in consultancies, agencies or market research organizations that serve the B2B marketplace.

8.1 B2B Manager-Practitioners

Practitioners are the ultimate audience for B2B academic research. To my mind, academic research that has neither direct nor indirect implication for practice in some way is hard to justify. Just as academic research on customer involvement in new product development demonstrates the benefit of that involvement in terms of better innovation outcomes, the same argument should hold for managerial involvement in B2B academic research.

I have discussed some of the things that academics can and should do above. But why should B2B managers get engaged with academics?

The default condition is for managers not to get involved. Involvement in research requires (a) a commitment of personal and organizational resources with (b) uncertain benefits and (c) the risk of revealing corporate intellectual property when one's academic partner seeks to publish the results. Let me address these objections.

The first objection is that the involvement will be time consuming and costly. That is correct. But if the involvement provides both educational benefits (academics, for professional reasons, have state of the art knowledge of their domain that they are keen to share) as well as direct business benefits, the engagement can be framed as an investment. A way to ensure such framing is to view it as "just in time learning." Most of our executive education is what I call "just in case" education (what we do in MBA and Exec MBA programs—giving managers concepts and tools "just in case" they need them). The CAP program described earlier is "just in time learning" (what some call action learning), where education, research and business problem solving are merged. Managers willing to construct such "just-in-time-learning" arrangements with academic researchers can expect to see measurable personal and business benefits.

The second objection deals with uncertain benefits. People tend to want to write contracts to ensure that there are clear "deliverables" when working with, say, consultancies. That way it appears that the benefit uncertainty will be reduced or eliminated. I believe that that is the wrong model here. A firm does not write a contract with its R&D department to produce a breakthrough of a specific magnitude at a specific time. Rather it allocates resources because the expected but uncertain benefits appear to merit that investment. The benefits of getting top intellectual talent (academic researchers) both to work on a business problem and provide education along the way normally provides returns well in excess of the cost.

The third objection deals with the risk of revealing intellectual property. When I was editor of the journal *Interfaces* in the 1980's, I referred to this issue as the "zero sum mentality." (Lilien, 1982). A way to think about this is as follows. The zero sum mentality assumes that there is a fixed pie of business, and anytime I reveal anything about my business, competitors will use it to my disadvantage. To see the flaw in this argument, imagine an industry in which all competitors are overspending in advertising. One day a report comes out about advertising effectiveness at one of the companies, revealing this fact. At once, all smart firms will reduce advertising and industry profitability will rise. The takeaway here is that firms who are at the leading edge of both creating and disseminating new knowledge on how to better manage their businesses are likely to see better performance (in spite of the fears of their lawyers).

So my plea here is for more B2B practitioners to give deep academic engagement a chance. Yes, there are costs and the gains are uncertain. But the personal and organizational benefits make that investment a prudent one.

8.2 Intermediaries

Consultants, agencies and market research firms are in business to make money; we are not going to induce major changes in the fundamental intermediary reward system. If we (academics) partner with them, co-present with them at conferences and co-author papers with them, intermediaries will generate the reputational capital that gets them a closer listen from their clients about the benefits of the leading edge approaches and methods that their more forward thinking clients value. But there are at least two barriers: (a) intermediaries see little incentive to write in our journals and (b) they, like manager-practitioners, fear loss of intellectual property through such disclosure.

We (academics) can provide an answer to the former concern through our co-authoring process, which would be facilitated through an internship and industry sabbatical process that I noted above. The latter concern can also be addressed as I discussed above—it is another manifestation of the "zero

sum mentality.” Intermediaries who share their methodology normally do not lose business to their rivals; rather, on net, they increase the size of the market, making all better off.

Intermediaries often collect a great deal of data. Some of that data is of little commercial value once it is out of date, but such data may retain academic value. Given the paucity of data in the B2B domain, such data could be a tremendous asset. Proactively publicizing the availability of such data for academic purposes can provide a strong motivation for high quality research. The PIMS data base, made available to academics by the Strategic Planning Institute (http://www.pimsonline.com/about_pims_db.htm) spawned quite a bit of high quality academic research (See Boulding and Staelin, 1990 for example). I hope to see more B2B intermediaries replicate that initiative. I would be even more delighted if one or more intermediaries stepped forward to embrace the medical school model discussed above.

9. Conclusion

I have argued that B2B markets receive far less than their proportional share of research attention that do B2C markets and have speculated on some of the reasons for that imbalance. I then highlighted three specific areas---B2B Innovation, B2B Buying and B2B Analytics---that I feel have the greatest potential for yielding academically important research contributions that both meet the needs of practitioners and that are on the Pareto frontier of B2B rigor vs. relevance. In each area I have both identified key research questions and suggested research processes for addressing those questions, some of which are beyond the traditional academic research model.

I have included some specific recommendations that individual academics and their institutions might consider embracing to help bridge the B2B Knowledge Gap. I have also included some remarks aimed at practitioners and intermediaries, needed partners in making that research come to fruition.

Some of my recommendations are extreme. But I will consider myself successful if my recommendations cause some serious reflection and perhaps even some action in the directions I have suggested.

I hope B2B academics and academics in general in all stages of their professional life-cycles will consider taking up some of the research challenges I have posed here. And I hope that the upcoming generation of academic researchers finds fruitful mechanisms to find B2B practitioner partners in the research process. If both these hopes come to pass, the marketing profession as whole will have a better balance between the most important marketing problems and the resources allocated to addressing them.

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Exhibit 1: Some Key Differences Between B2B and B2C Markets. (Source, Grewal and Lilien, 2012, p4)

Business-to-Consumer	Business-to-Business
Marketing culture	Manufacturing/Tech culture
Market to end of chain	Market to value chain
Perceptual proposition	Technical proposition
Value in brand relationship	Value in use, quantifiable
Large customer segments	Small number of customers
Smaller-unit transactions	Large-unit transactions
Transaction linkage	Process linkage
More direct purchase	Complex buying sequences
Consumer decides	Web of decision participants

Exhibit 2 Modes of B2B Buying (Source: Grewal, Lilien et al, 2015, P 197)

		Routinized Exchange Relationships (RERs)	Transactional Buying Operations (TBOs)	Organic Buying Relationships (OBRs)
Buying Processes	Buying Decision Confirmation	Strategic partner selection & Setting parameter for operations	Tactical selection of vendor & Negotiating terms of deal	Strategic partner selection & Selection of initial buyer representatives
	Buying Activities Implementation	Minimal or no variation in buying elements	Range from no to extensive variation in buying elements	Extensive evolution in buying elements and buyer representatives as needed
	Buying Activities Evaluation	Parties usually differ from entity implementing buying	Evaluation occurs periodically by different party	Ongoing evaluation by buyer representatives & oversight managers
	Buying Decision Reassessment	High relationship-specific assets & interdependence motivate modifying rather than replacing RER	Determination if extant conditions reveal increasing criticality of focal products or specific supplier	Despite high relationship-specific assets, uncertainty of goal achievement may require pursuit of other options
Locus of Participants	Locus of Purchasing Decisions	Centralized: Complex decisions regarding resources to be acquired, authorized sources, and parameters of standard buying procedures or automated processes.	Centralized for high-volume products, Local for low-volume products: Spot markets, auction purchases, simple product supply bids, ad hoc buying activities, etc.	Centralized for corporate-level supply partnerships; Local for regional supply relationships: Solutions, co-development, key supplier-customer partnerships, etc.
	Locus of Purchasing Activities and Implementation	Centralized: Enact buying activities within established parameter; monitor ongoing processes, investigate exceptions. Limited number of supplier-buyer interface points.	Centralized for high-volume products; Local for other products: Direct buying, reception of acquired resources for inventory or use, and evaluation of acquisition cost and supplier.	Multiple supplier-buyer boundary spanner interface points: Ongoing activities to enact solutions, fulfill contracts, co-create value for downstream customers, etc.
Buy Charact	Complexity	High	Low to Moderate	Moderate to High
	Novelty	Low	Moderate	High

	Importance	High	Low	Moderate to High
	Uncertainty	Low	Low to Moderate	Moderate to High
	Time Pressure	Moderate to High	Low	Low to Moderate

ACCEPTED MANUSCRIPT