

Application Driven Theory: Rigorously Combining Applied and Basic Research Relevant to Accounting and Marketing

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Editorial

Many business and social science research programs have come under attack as not being relevant or worthwhile [1,2] expenditures of money in a research university. In times of financial difficulty, business school research has been viewed as either not impacting practice sufficiently, as insufficient in preparing students for business careers, or as too vocational (which some question as a goal of higher education). Pfeffer and Fong [2] gave an analysis of the criticisms and the facts related to these impressions, and the reality continues that the general perception of many is that much research in business is not relevant or cannot be generalized into practice. In this editorial we argue that accounting and marketing research can be both practically relevant and theoretically well-grounded, if a paradigm of application driven theory is adopted and rigorously applied.

We start with a brief description of the nature of research, simplifying it into two different dichotomies: 1) basic research and non-basic research on one continuum, and 2) applied research and pure research on the other. We then give illustrations from science, accounting and marketing to demonstrate each of the four possible combinations of research: pure-basic, pure-non basic, applied-basic and applied non basic when these terms are dichotomized. We discuss the lasting impact of basic research and argue for the importance of basic research as being both applied and practical when the theoretical constructs developed arise from a specific application and are then generalized. We call this research approach "Application Driven Theory" and give historical examples of impactful application driven theory in accounting and marketing. An application driven theory approach to research development insures that theories created are relevant to practice [3].

Basic research is research that is foundational in that it either opens new lines of research or cuts off existing lines of research. Basic research allows generalizations that can impact areas outside the original area for which it was invented. Examples of this from the history of science include the invention of probability theory by Pascal and Fermat, the development of the Arabic numeral system (taken from the Hindus) for recording numbers, and Pasteur's germ theory of disease. That which is not basic is deemed non-basic.

The dichotomy (or, conceptualized another way, possible continuum) between pure and applied research is more difficult, and comes from the motivation for the research rather than the impact of the research. Pure research is undertaken for greater understanding and applied research is undertaken to solve a particular problem or to be used in a specific practice. Another differentiating factor is that pure research is more generally disseminated (usually via publications) for the purpose of increasing the body of knowledge and application areas, whereas applied research often stops with the particular motivating application with little effort given to generalizations beyond the problem which gave rise to the investigation (e.g., industry consulting situations). We give illustrations of each combination in Table 1.

Consulting and general problem solving reflects non-basic applied research. In accounting, a specific audit, tax preparation or preparation

of annual statements falls into this category. In marketing, consulting, designing company specific marketing or advertising plans and product placements are non-basic and applied.

Application driven theory resides in the top right quadrant of Table 1. An example of this is Fibonacci's [4] book *Liber Abaci*, which introduced Arabic numbers to Europe in 1202 to solve the problems in calculation of mathematics.

Had he stopped there, it would have been of interest to mathematicians but little or no other disciplines. Instead he showed how to apply these results to construct a theory of bookkeeping, of doing interest calculations and other computations of importance to merchants. According to David [5], Paccioli [6] (who is sometimes referred to as the father of accounting) copied Fibonacci's [4] book almost in its entirety and popularized the applications (such as double entry bookkeeping), showing further its uses, and creating another example of application driven theory. Thus, Fibonacci's [4] book had its origination in an applied problem, but after solving this applied problem created generalizations, as motivated by Paccioli's [6] work, outside the specific application that initiated the research.

A similar development (the invention of probability theory in 1654 by Pierre de Fermat and Blaise Pascal) started as a solution to a particular gambling problem posed by an avid gambler (the Chevalier de Méré) trying to explain why he kept losing on a gambling bet that seemed to him to be in his favor. This began the widely known area of "probability theory". Probability theory has since spread to affect all areas of scientific thought, including accounting (e.g., how to take audit samples) and marketing (e.g., consumer decision-making modeling).

Another example from marketing research is illustrated by the development of the Golden Numerical Scale for questionnaire design [7]. A very practical applied problem (a consumer attitude survey for a restaurant) motivated the problem: The researchers needed many repeated scales for multiple different restaurants in a more concise, but still accurate, presentation format. The practical problem of creating survey instruments with repeated scales across multiple restaurants by existing methods would require numerous questionnaire pages. The solution was to create a new response scale format, which was done to evaluate multiple restaurants and characteristics on a single continuous graphical scale. This scale was then generalized to multi-object and multi-attribute questionnaires in general, and published with the statistical and measurement properties of the scale investigated for

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		Non-Basic	Basic
Applied	Physical and Natural Sciences	Consulting, engineering, software development for specific applications	Germ theory of disease (Pasteur), The periodic table of the elements, Newtonian mechanics
	Accounting	Routine income tax preparation, Compliance auditing	Fibonacci's [4] introduction of Arabic numerals to Europe (showing specific application bookkeeping and merchant calculations), Paccioli [6] introduction of double entry accounting
	Marketing	Consulting, Setting market advertising buying quantities, brand name testing,	Metrics for measuring social profit enterprises, Golden numerical scale for survey design, consumer marketing research as a statistical science (e.g. Arthur Nielsen with the founding of the ACNielsen Company in 1923)
Pure	Physical and Natural Sciences	Number theory (e.g., theorems on perfect integers, Fibonacci series, etc.), Magic Squares,	Godel's Incompleteness Theorem, some quantum physics research, Fermat's last theorem
	Accounting	Accounting standards, behavioral accounting	Balance sheet valuation of level 3 derivative assets (those with no observable market price) which are marked to a model rather than marked to market
	Marketing	Commercial eye-tracking research, neural marketing research (via fMRI or other techniques)	Utility theory based consumer decision models

Table 1: Dichotomies of Research Approaches Combined.

uses far afield from comparisons of consumer attitudes of different restaurants (e.g., a comparison of varying country images).

It can be argued that all research in business disciplines must begin with "Application Driven Theory". If accomplished rigorously and scientifically this approach generates research results that are useful for applied industry issues, as well as having theoretical construct properties commensurate with the goals of a solid academic contribution. Not only is Application Driven Theory (i.e., start with the applied problem and develop or utilize a solid theoretical structure in its solution approach) relevant for accounting and marketing, but it is relevant to many (if not all) disciplines in and outside of a business school.

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