Chapter 2
Business Plus Intelligence Plus Technology Equals Business Intelligence

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ABSTRACT

In this article the authors will show how the parallel developments of information technology at the operational business level and decision support concepts progressed through the decades of the twentieth century with only minimal success at strategic application. They will posit that the twin technological developments of the world-wide-web and very inexpensive mass storage provided the environment to facilitate the convergence of business operations and decision support into the strategic application of business intelligence.

INTRODUCTION

Over the last decade or so, we've witnessed the growth of a seemingly new discipline, "business intelligence", a discipline more prevalent in practice than in theory. While there are a number of professional and consulting organizations (e.g. TDWI, The Data Warehouse Institute) few universities have created or adapted their research, academic programs and their organizational structures to adapt to this change. There are many who say that business intelligence is just the latest incarnation of management information systems (MIS) but one could argue, as we will in this ar-

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ticle, that we are seeing a fundamental change in the organizational approach to the disciplines that have fed into contemporary business intelligence (BI). Despite years of mostly futile attempts at organizational change, there was little penetration of the "intelligence" into "business". One will probably react to the terms used in the previous sentence. We hope, however, to show how these terms represent two mostly parallel streams of activity, streams with only the random connection. It will take a number of technological developments to bring the Monongahela and Allegheny into confluence to become the Ohio.

For the purposes of this article we will consider "Business" to encompass all of the traditional functional activities in business such as marketing, manufacturing, accounting, finance, distribution and the support operations provided by the transaction processing systems and other basic technology. Whether it was the abacus, the punched card tabulator or the first few generations of the business computer, the technology played the role of number cruncher or automated record keeper.

The "Intelligence" component of the equation includes all of the mathematical and statistical tools developed to solve business "problems" over this same period. Applied mathematics, statistical quality control, operations research and the decision sciences flourished in academia with the occasional foray into the "real world" to address well-know problems. Consulting organizations and even research groups within the larger corporate enterprise made valiant attempts to "apply" their theories and algorithms to the business problems, usually with only marginal success.

Why had this been so for most of the twentieth century despite the best efforts of theoreticians and forward thinking business leaders? We hope to show in this article that the issues are based on concepts of efficiency versus effectiveness and why the needed technology had not penetrated far enough up the operational-tactical-strategic ladder to have the hoped-for impact. Through a series of time-lines and application examples we will show how the "Business" flow concentrated on "efficiency" while the "Intelligence" focus was more on "effectiveness". It took two major technological developments in the 1990s to bring these together.

Definitions and Assumptions

In this article we will examine the two flows and their ultimate confluence along two major dimensions: Efficiency-Effectiveness and Operational-Tactical-Strategic. Both dimensions are part the decision-making process. The decision-making process has been examined in many arenas from the psychological to the managerial. Some decisions are for small issues while others have enormous effect. The theoretical approaches have always tried to maximize or optimize some form of outcome through algorithms or formulae. The practical approaches have usually tried to find "satisfactory" answers through simulation and heuristics. In the end, there are cost-effectiveness tradeoffs that contribute to the selection of the appropriate (or even feasible) decision-making approach. These tradeoffs will be examined on these two dimensions.

Efficiency is the measurement of Output as a function of Input. The formula is simple: Efficiency = Output/Input (e.g. miles/gallon). We fine tune operations to make sure we wrest the most out of precious resources to accomplish a goal. The time-motion expert charts the operation with stopwatch and clipboard hoping to save precious seconds in highly repetitive operations, seconds which add up to dollars with the operation is repeat thousands or millions of times. On the other hand, *effectiveness* is not so easy to define. Traditional definitions like "successful in producing a desired or intended result" leave us searching for more definitions. What is the desired or intended result? How do we determine what we *should* be doing? Perhaps the simplified "Efficiency is doing things right and Effectiveness is doing the right things"