

# Inductive Reasoning, Information Symmetry, and Power Asymmetry in Organizations

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## INTRODUCTION

A quiet revolution has occurred in the understanding and management of organizations. This revolution has been in the use of data, benchmarking and data systems to drive change and achieve the organizational goals. This change offers the promise of effectively solving a basic problem of management in complex hierarchical organizations. Organizations make bad decisions because of the inability of those in authority in an organization to accurately ascertain the “ground-truth” at various levels of the organization. Individuals at each level tend to distort or omit data to support their ends, leading to higher levels of distortion at each level of organization between the object of decision and the decision maker. This phenomenon is referred to as information distortion (Lee et al., 1997). Traditionally the most effective method for overcoming this problem has been to ensure that the organization shares a clear set of general guidelines for success and that well-trained managers at low and middle levels can exercise autonomy in immediate decision-making (Gellatly & Irving, 2001; Harrell & Alpert 1979; Van de Ven, 1986). The change which has occurred involves the application of broad webs of information systems to collect data on an unprecedented scale and at a greater level of detail than had previously been practical and funnel it to decision makers. This change is widespread and now evident in education, medicine and public services, which follow the areas of retail management, supply management and telecommunication services.

This change has seen a shift from the mid-level manager or professional acting essentially independently within an established framework to the rationalization of management decisions with direct oversight from high level manager mediated by information systems and

functionaries carrying out order which had previously been their own self-determined management decisions. Within these organizations, provided the results were improved, such arrangements may seem logical and even preferable. The key qualifier however is “provided results are improved.” This has not consistently been the case when the organizations are managing complex social processes or when the embedded leadership has failed to adjust decision-making to the new systems.

The reasons are complex but at their core is a failure to grasp that although this application of technology may seem an obvious extension of earlier attempts to rationalize work processes it is in fact a basic alteration in the manner by which problems may be solved. Although the approach that treats this change as enhanced rationalization may be effective within limited circumstances, it misses the power of new data systems. When combined with different power arrangements, the deployment of such technology has the potential to dramatically empower organizations in previously impossible ways. This is because at a fundamental level these vast new systems for capturing data can affect an epistemological revolution as much as a technical one within organizations. The shift is from approaching problems from a deductive process of working from an individual case towards general applicability to an inductive process of using the mass of data to move from the whole picture back to the management of specific cases. This alters the basic information symmetry of organizations by changing the individual in direct contact with an issue or problem from a node from which information flows to an actor with the full contextual picture of the organization and the problem. This change has potentially profound implications both positive and negative for a broad range of complex human activities.

In this article, I will outline the change in thinking that new data systems have created in organizational decision-making. I will discuss the basic processes of deduction and induction used in problem solving in organizations. I will outline where these new data systems originated and the limitations which are inherent in them, and a series of concepts that can help frame approaches to thinking about these systems. Finally, I will try to suggest how these systems integrate with thinking and decision-making in organizations, and discuss how new modes of thinking might be realized in organizational decision-making.

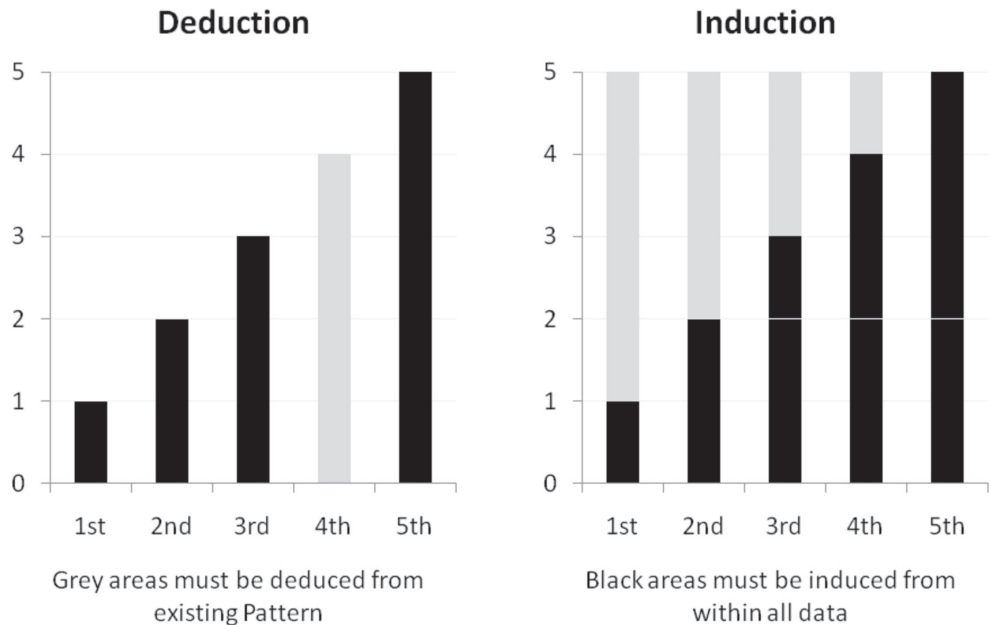
### BACKGROUND: INDUCTION AND DEDUCTION IN DECISION MAKING

What is revolutionary about these systems and the new environment they are creating is not a shift in degree (i.e. more information), but a more fundamental shift in how the data environment allows us to think about problems. All rational problem solving involves a combination of induction (from observation) and deduction (from reasoning). Generally, one is faced with a limited array of observations (both primary, or

personally observed, and secondary, or documented by others) and must deduce what is happening beyond the scope of those observations through a reasoned playing out of the observed factors in a mental construct. Using that construct we test our plans to determine the likely outcomes (with varying levels of accuracy). Ideally, this is a self-correcting process in that new observations can validate or invalidate strategies and directions.

Decision making today has moved from a data limited to data rich (and often data overwhelming) environment (see Gleick, 2011). The advent of vast sensor webs and analytics to organize data has shifted the preponderance of decision-making from largely the result of reason (deductive) to overwhelmingly based on observation (inductive). Where historically the best informed manager or worker had a handful of observations, they now potentially have a universe of observations from which they must discern a pattern. As the ability to capture the entirety of an organization's operation through data has grown the ability to solve problems by looking at every outcome that has flowed from every similar problem has grown. Why those decisions were taken is no longer important, merely that they were successful. This is decision driven by observation, or induction.. Figure 1 illus-

Figure 1. Induction/Deduction



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