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I dedicate this book to my mother and father, my wife Rosmary Wubbel, and son Leslie Wubbel for all their love and support. I especially want to thank three strong ladies, sisters to me for their guidance, care, and constructive comments. Thanks to my best friend and son Leslie for his reviews and the many conversations and topic discussions that helped make this book possible. Thanks to my nieces, especially Catherine Mintmire, for producing the graphic art work. And finally, too numerous to mention the many business friends and mentors in software engineering and data science fields including Philip Douglas Brown for his insights and perspectives on making the connections in data for advancing analytical capabilities.
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Preface

JMP Pro® is the centerpiece software that is capable of saving your business in difficult economic times. JMP CONNECTIONS (herein referred to as “the Model Platform”)\(^1\) illustrates the technical means and financial variables that will leverage peak productivity. JMP CONNECTIONS provides a clear pathway toward quickly generating actionable intelligence from your organization’s raw data for optimal decision-making purposes. The prime reason for describing a CONNECTIONS platform is the fact that JMP Pro® enables computational in-memory statistical analytical capability second to none in the business, engineering, and scientific world. When a person is able to make a connection, what most often happens is a decision and this fact should generate broad discussion as well as potentially collective performance improvements for groups, teams, or large organizations.

More than ever before, metrics are playing the most important role in the conduct of a business on the competitive stage today. In typical fashion, software comes with a wealth of features, functions, and extensibility. In many cases several software packages may be required to satisfy or facilitate common business functions in support of the operation. Office suites come to mind as an example.

When business conditions are challenging or when strategic goals continually set the bar higher for better performance, innovation is a key factor toward contributing to results that exceed expectations. Consequently, the task of producing metrics must become an innovation as well. As a result, one must visualize a model of capability when it comes to designing, developing, generating, and reporting within your own company, division, or all the way down to the department level. Given the nature of today’s office suites, metrics tend to be produced once a week, once a month, or quarterly with

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\(^1\)The Model Platform describes a Capability Maturity Model supporting the development of Business Intelligence Competency Center for yielding knowledge from data for making optimal decisions in a business enterprise.
each having a cycle time to completion. JMP CONNECTIONS suggests a model, or innovation, that eliminates cycle time so that there is a reduction in full-time equivalents (FTEs) for metric production purposes whereby the metrics produced are real-time or, in other words, “metrics on-demand.”

The key to understanding how this type of innovation can lessen tough economic times is through improved business decision making. It is innovative by differentiating between cycle time methods versus metrics that are available with either the latest available data or real-time aggregate raw data material, transformed into usable knowledge.

JMP Pro® is the central hub and can become your command and control center for managing and executing a business operating system on many varied scales. The journey in building a real-time metric production system is simplified through a series of capability maturity steps. Pooling the data from disparate silos starts with data aggregation and integration forming a repository. Mining the repository for conducting statistical analysis, the journey transitions through three levels leading to a final maturity level of predictive modeling and analytic goals. The goals are supportive of the key performance indicators required by the strategic objectives set forth for proper performance management. This book will not only discuss the model but help an organization implement the model with their own people.
CHAPTER 1

Generalized Context for Decision Process Improvement
1.1 Situational Assessment (current state)
1.2 Problem Statement
1.3 Visualizing State Transition
1.4 Metrics On-Demand

DECISION PROCESS IMPROVEMENT FOR CORPORATE PERFORMANCE MANAGEMENT

Business is making clear that to stay competitive in the market we need to make decisions quickly and often with disparate data sets. JMP CONNECTIONS should be viewed as a business-oriented data discovery tool and is not an information technology (IT) or enterprise SAP\textsuperscript{1} Centric model because as is so often the case, data sets are not under the control of the IT department. Data may reside in silos, dozens of spreadsheets, or proprietary database applications. Thus, we can best describe this exercise as the "decision process improvement." If we can improve on the way metrics are produced, it can directly improve the timely implementation of actual decisions for corporate performance management.

The Holy Grail of the Information Age particularly in the information technology (IT) shop is the notion of data integration and interoperability. The Institute of Electrical and Electronics Engineers defines interoperability as:

The ability of two or more systems or components to exchange information and to use the information that has been exchanged.

Unfortunately, interoperability has never been entirely achieved across a large enterprise before.

However, in support of staying competitive, the popular business press and IT periodicals have been pushing “business intelligence” (BI). Business intelligence is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions.

\textsuperscript{1}SAP stands for Systeme, Anwendungen, Produkte in der Datenverarbeitung, which, translated to English, means Systems, Applications, Products in data processing.
As postulated in the Preface, a tough economy implies a propensity to cut back on expenditures across a wide cross section of the enterprise that may also include BI software acquisitions. Utilizing JMP Pro®, the following pages will show precisely how the development of state-of-the-art metrics can be facilitated without the need for a major capital expenditure (CAPEX) project.

1.1 SITUATIONAL ASSESSMENT (CURRENT STATE)

ADVANCEMENT IN METRICS FOR BUSINESS AUGMENTATION

Before describing the common state of affairs that may be typical from small to large businesses, a framework for visualizing capability maturity with regard to the development of metrics and their use is outlined in Figure 1.1.

0. The lowest level of capability maturity (Level 0) would be a business or organization that may not have an IT department. Most of the management and reporting of business data is done using spreadsheets and perhaps the facilities of software office suites/applications for presentations. Reporting may be ad hoc or sporadic due to such factors as data that is not readily in a form for use in conducting statistical analysis when required. Companies often have so much data that they realize knowledge is locked up; however, they have no practical, inexpensive way to develop and utilize it.

1. The first level of maturity (Level 1) is where companies produce dashboards, scorecards, and KPIs on a regular basis. Perhaps on an annual basis, metrics are reviewed for relevance as needs change over time. Metrics retained may be refined and presentation and timely delivery mechanisms are level set² depending on who is to be receiving them and at what levels of the enterprise they are to be receiving and using them. Publishing BI tools like dashboards (DBs) and scorecards (SCs) have measurable cycle times.

²A situation in which everyone in a group has a basic understanding of a situation.
2. The second level of maturity (Level 2) for an organization would be a realization that some subset of deliverable metrics could be converted to metrics “on-demand.” In identifying these on-demand metrics, the cycle time to generate or refresh a set of deliverable dashboards would be completely eliminated. (See Figure 1.2.)

3. The third and highest level of maturity (Level 3) is a two-part configuration. (See Figure 1.2.)

Level 3, Part 1

- Eliminate cycle time to create on-demand metrics resulting in reduction in FTEs.

Level 3, Part 2

- Human capital resource reallocation for:
  - Performing advanced statistical analysis
  - Predictive analytics and modeling

Level 3, Part 1, maturity level, focuses on reducing the time it takes (cycle time) to produce the metrics on a scheduled basis,
thus in turn reducing the number of FTEs required to produce those metrics. One FTE required to update a dashboard every week does not leave enough time for any other production tasks for metrics. The amount of time for an FTE is finite. As hours are freed up, other knowledge within the data sets can be developed and utilized. Achieving the second level of maturity leads into Level 3, Part 2 because now predictive analytics and the full power of JMP Pro can be leveraged perhaps without the addition of more FTEs. The graphic view in Figure 1.3 summarizes the reference model for maturity capability for business intelligence metrics.

The development of JMP CONNECTIONS is applicable to literally every type of business. All examples cited in this book are totally fictional and for illustrative purposes, which can be adapted to any business. The examples are generic in the sense that the common fuel crucial to business execution is the enterprise data, mature knowledge assets, and performance indicators across the spectrum of organizations that desire optimal results. In many circumstances, particularly in larger firms, one expects to find whatever data they need on the large enterprise database applications. In fact, the information is out there but its access is less than ideal. It may in no way be in a
format to provide any statistical analysis capability. It lacks a certain agility for manipulative processes for generating BI tools or data. It is a “what you see is what you get” due to the hard-coded requirements built into the application. Consequently, a query returned is often a table of data or records that do not necessarily communicate or impart knowledge to the recipient. Something extra needs to be done.

Additionally, one would think that, especially within technology firms or scientific and engineering firms, data management would be state of the art. For many and perhaps for a majority, business is
conducted using spreadsheets, small desktop database applications, web applications, text files, and sticky notes. In fact, the proliferation of spreadsheets from one year to the next with no sense of version control is prevalent where many sheets act as placeholders for data rather than actually doing any computations or analysis.

Given the standard corporate desktop environment, when a set of metrics are required, they are likely prepared using a combination of the office suite applications. These may include the word processor, spreadsheet, and presentation software applications. A chart or graph may be present with some annotation explaining the meaning of the numbers and is the bare minimum or Level 0 of maturity for making metrics. Thus, it is useful to point out here exactly what types of BI solutions exist.

1. Executive scorecards and dashboards
2. Online Analytical Processing (OLAP) analysis
3. Ad hoc reporting
4. Operational reporting
5. Forecasting
6. Data mining
7. Customer intelligence

Each of the BI solutions has a data analysis ingredient or function that derives the reported out metric for a particular BI solution. While features and functions may be alike, what sets these apart is how they are applied to support decision making.

To be more precise in thinking about analytic metrics, there are three areas of data analysis derived from data science, information technology, and business applications that can be categorized as follows:

* PREDICTIVE (Forecasting)
* DESCRIPTIVE (Business Intelligence and Data Mining)
* PRESCRIPTIVE (Modeling, Optimization, and Simulation)

Without efficient sharing of operational business intelligence, a company is going to suffer breakdowns from small to large, be