

Forecasting the Demand of Agricultural Crops/Commodity Using Business Intelligence Framework

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INTRODUCTION

Business Intelligence (BI) has been around for more than a decade and is being used in various application domains. BI is about creating value for organizations based on data or, more precisely, facts. While it seems like another buzzword to describe what successful entrepreneurs have been doing for years, if not centuries, that is, using business common sense? From a modern business-value perspective, corporations use BI (Sherman, 2014; Prasad & Acharya, 2011) to enhance decision-making capabilities for managerial processes (e.g., planning, budgeting, controlling, assessing, measuring, forecasting and monitoring) and to ensure critical information is exploited in a timely manner. And computer systems are the tools that help us do that better, faster, and with more reliability. BI is a broad category of application programs and technologies for gathering, storing, analyzing and providing access to data to help enterprise users make better business decisions. BI (Sherman, 2014; Prasad & Acharya, 2011) applications support the activities of decision support, query and reporting, online analytical processing, statistical analysis, forecasting, and data mining. BI includes a set of concepts and methods to improve business decision making by

using fact-based support systems. BI has become synonymous with historical query and reporting tools for many years, the definition of BI in recent years has evolved to include technology that addresses data integration, predictive analytics and information deployment (Shmueli, Patel, & Bruce, 2010; Sherman, 2014; Prasad & Acharya, 2011). Predictive analytics often help companies address their most difficult business issues and achieve a competitive advantage in their respective markets. Forecasting is a discipline of analytics that provides the foundation for planning processes across organizations. Good forecasting provides a more accurate view of the future, helping an organization save time and reduce costs, while better serving its customers and managing its resources. When used with data integration and information deployment capabilities, forecasting becomes even more powerful by pulling from multiple data sources and disseminating forecast results consistently. Information technology for agricultural (Shmueli et al., 2010) use can be broadly classified for:

1. Tools which might be used to improve productivity
2. Tools which empower farmers to take informed and quality decisions

At present the information available for farmers is through conventional sources, which are slow and unreliable. As a result of the information not reaching in time to the farmers, there is lot of wastage in terms of crops getting spoiled, some crop getting excess production and some crops not getting produced at all. These factors ultimately result in controlling the prices of the commodities dependent upon a particular crop. Thus the Farmers would be in a position to take the benefit of the technology used in the proposed approach. BI allows the decision maker to understand their business environment in order to make informed decision. Decision-making requires evaluating performance (what happened), testing hypotheses (why and how things happened) and predicting future events (what may happen). Stated simply management needs to know if their strategies are sound if they are being carried out. Most formally a business intelligence system allows users to answer above-mentioned decisions. Forecasting involves predicting and analysis of the given data, which can be achieved by BI.

- **Predictive Analytics:** Predictive analytics represent any solution that supports the identification of meaningful patterns and correlations among variables in complex, structured, unstructured, historical, and potential future data sets for the purposes of predicting events and assessing the attractiveness of various courses of action.
- **Planning Decisions:** This includes analytical reporting based on a data warehouse (DW) (Shmueli et al., 2010) or data mart and operational reporting based on an operational database management system. Reporting tools often include pixel-perfect positioning of data and graphics, a scripting language equal in power to a full program programming language, and the ability to handle complex headers, footers, nested subtotals, and multiple report bands on a single page.

BACKGROUND

Over the next thirty-five years, global population is expected to reach nine billion people. This will increase collective expectation of economic growth, nutritional demand and the resources used for food production. In order to meet expected worldwide nutritional demand and global food needs the agricultural industries and farmers should maintain good agricultural practices. Many previous studies have put together projections of global food demand. These studies tend to make large commodity groupings such as cereals, oil-seeds, meats, etc. (Kruse, 2010)

Business intelligence (Sherman, 2014; Prasad & Acharya, 2011; Legorreta & Valentine, 2014) means different things to different people. In its simplest form, business intelligence is getting the right information to the right people at the right time so they can make decisions that ultimately improve performance. A more technical view of business intelligence usually centers on the process of, or applications and technologies for, gathering, forecasting, and storing, analyzing and providing access to data to help make better business decisions. Regardless of how you define it, business intelligence is proliferating and reaching more and more constituents inside and outside of your organization. Information demand, data volumes and audience populations are growing and will continue to grow exponentially. The increase in available information also affects forecasting because there are more inputs to consider in both volume and type.

BI evolves different types of platforms and tools with respect to different categories. Precisely those are defined as (Sherman, 2014; Prasad & Acharya, 2011; Esri's, 2014):

1. Enterprise BI platform,
2. Visual data and discovery tool,
3. Pure OLAP (online analytical processing) tool,
4. Database or packaged BI, and
5. Dashboard tool.

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