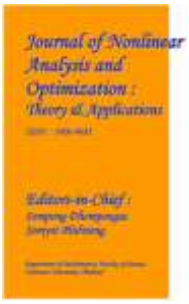
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BUSINESS INTELLIGENCE AS THE SUPPORT OF DECISION-MAKING PROCESSES IN E-COMMERCE SYSTEMS ENVIRONMENT

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ABSTRACT: Managers must find new approaches to boost economic growth given the global economy. Managers use traditional and new methods to achieve this. Effective decision-making requires accurate and updated information. Managers must find trends in old and new data to grow the organization. Managers should often express their needs, distribution channels, and reasons for requesting information. They can make informed decisions since they have exclusive access to all pertinent facts. Management should assist customers in making educated choices. Many organizations are using e-commerce platforms to streamline operations. The current condition and future improvements suggest international e-commerce growth. Firms need better tools to expedite this process and give management enough relevant data. Business intelligence platforms deliver multifaceted data. ERP systems often include Business Intelligence (BI) elements in addition to specialized solutions. Companies must weigh the pros and cons of BI software development vs purchase. Consider whether some ERP systems offer business intelligence elements that firms can leverage. Modern ERP systems may lack OLAP, ad hoc reporting, and managers' access to static and dynamic reports. In this post, we'll examine how Microsoft Dynamics NAV's comprehensive business intelligence features may aid international online shopping selections. This article leverages Microsoft Dynamics NAV's business intelligence (BI) technologies to help managers, clients, and authors make choices. This essay focuses on how e-commerce systems can store raw data in multidimensional data spaces.

Keywords: *Business Intelligence, decision-making, e-commerce system, cross-border online purchasing, multi- dimensional data, reporting, data visualization.*

1. INTRODUCTION

E-commerce platforms allow startups to quickly set up shop online, while also helping well-established businesses streamline their sales processes, increase their sales volume, and tap into international markets. An increase in e-commerce transactions from European consumers, spurred by the development of online shopping platforms, has contributed to the growth of this sector. Around the same time, foreign online purchases came to a halt, with just around 6-7% of EU customers engaging in such activities—much lower than the global average of 33%. Parfeni is the author. Buying things online from other countries only accounts for 30% of all transactions. The issues surrounding the commercial transactions of foreign online stores are illuminated by the research on cross-border e-commerce. According to studies, only about 40% of those who try to buy things online from foreign stores really end up buying them. Merchants may choose not to export to certain countries due to difficulties with certain payment methods.

Management decision-making and operational efficiency are both improved by BI tools. With the help of business intelligence (BI) tools, managers can minimise process supervision while increasing operational efficiency. With the world economy in its current shape, more international trade, particularly in the e-commerce sector, is likely to take place. Supporting worldwide sales efforts has never been easier than with the help of business intelligence (BI) systems, thanks to their improved ability to produce detailed reports with several functionalities. Numerous software solutions, both at home and abroad, make extensive use of business intelligence technologies. The business intelligence (BI) components of enterprise resource planning (ERP) systems are typically sold separately with its powerful multidimensional reporting features and direct support for e-commerce, Microsoft Dynamics NAV (MD NAV) software is a great choice. This post will go over the fundamentals of e-commerce system decision-making, the tools and solutions that are crucial for business intelligence, and the various data sources that are available in these systems. Modern enterprise resource planning (ERP) systems that include BI platforms and other specific business intelligence features are another source of concern.

2. E-COMMERCE SYSTEMS

The term "e-commerce" describes the trade of goods and services that takes place through digital networks such as the Internet.Bora (2009) is the work in question. The internet has completely altered the ways in which businesses, suppliers, and customers do business by facilitating communication, collaboration, and transactional processes. The Internet has opened up opportunities that were previously unavailable, and businesses of all sizes are reaping the benefits. Online shopping has several benefits for everyone involved, according to research by Brown (1999). A 2009 publication by Richardson is the source for this information. Nowadays, consumers may get a plethora of product details from a variety of international marketplaces, all thanks to the rise of e-commerce. As a result, comparing and assessing products becomes more efficient and faster. Online marketplaces that are well-planned and managed can significantly cut down on marketing, sales, and administrative costs.

There are a variety of approaches to e-commerce system modeling. A web server linked to a business information system forms the backbone of an e-commerce system. According to both theoretical research and practical observations, a number of disturbances can substantially impact the efficiency, dependability, and operation of an online store. Most of the time, online shopping is unique and calls for a lot of quick thinking and action from businesses. In 2004, Rossi wrote the piece. These fundamental elements are what online retail platforms can't function without:

- The after-sale services, supply chain, internet, web servers, customer relationship management, enterprise resource planning, payment systems, and CRM all count as customers.
- Many factors make up a business's environment, including management (including SCM, FRM, HRM, MRP, CPM, etc.), software, hardware, suppliers with whom the company collaborates, laws, online services, and e-commerce platforms. Also included are humans.
- It is critical to incorporate a broad variety of services, particularly those associated with the contemporary digital landscape, in order to attain operational efficiency and deliver substantial advantages to customers through our e-commerce platform. Parts of the e-commerce infrastructure that make it all work are: Curry, in his book published in 2001.
- The mentioned systems encompass digital payment systems, payment gateways, wallets, as well as security systems like firewalls and intrusion detection.
- All the parts and interfaces of an e-commerce system are vulnerable to different kinds of disruptions. Users' experience with the usability, stability, performance, security, availability, functionality, and operation of an e-commerce system might be adversely affected by disturbances.
- A corporation might incur losses in revenue if any of the aforementioned e-commerce system characteristics experienced problems. An information system is e-commerce. The information system's performance-based

functionality should be prioritized. Interactive systems can also benefit from this method. In 2007, Bucki

3. DECISION- MAKING PROCESSES IN E-COMMERCE SYSTEM ENVIRONMENT

Decision making procedures necessitate a blend of skills, inventiveness, issue identification, clear judgment, resolve, and successful execution in operational strategies. In general, there are five steps to reaching a decision: The steps involved in making a good decision are as follows: defining the problem, gathering information (to find potential solutions), choosing the best option, putting it into action, and finally, evaluating the outcome (Harrison, 1998).

Managers need timely access to precise information if they are to make optimal decisions. There is an expansion to the basic system of the data set that pertains to electronic commerce, namely cross-border online sales. A number of factors must be considered in order to lessen the possibility of failure during online sales both domestically and, more specifically, internationally. Management information systems can draw from a wide variety of sources, including economic data, laws, cultural norms, customs, and so on. Figure 1

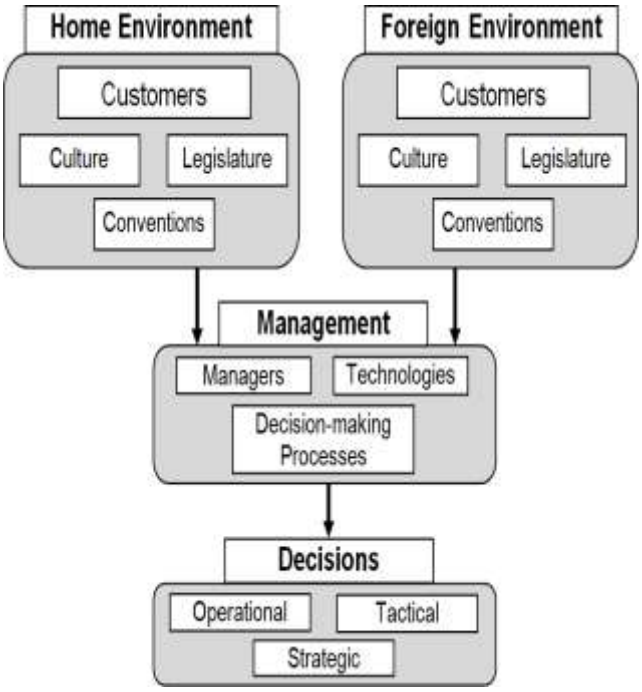


Figure1 : Online store administration and the areas that contain information about its sources**.**

Customers are welcome to take part in the decision-making as well. A customer's decision-making process includes every action they take prior to buying anything. Customers often go through five stages of decision-making before completing a purchase (Olsen, 2003). Recognizing the issue and its gravity is step one. Seeking information. 3. Investigating other possibilities. Choosing to buy anything is the fourth stage. 5. After the purchase is finished, assess it.

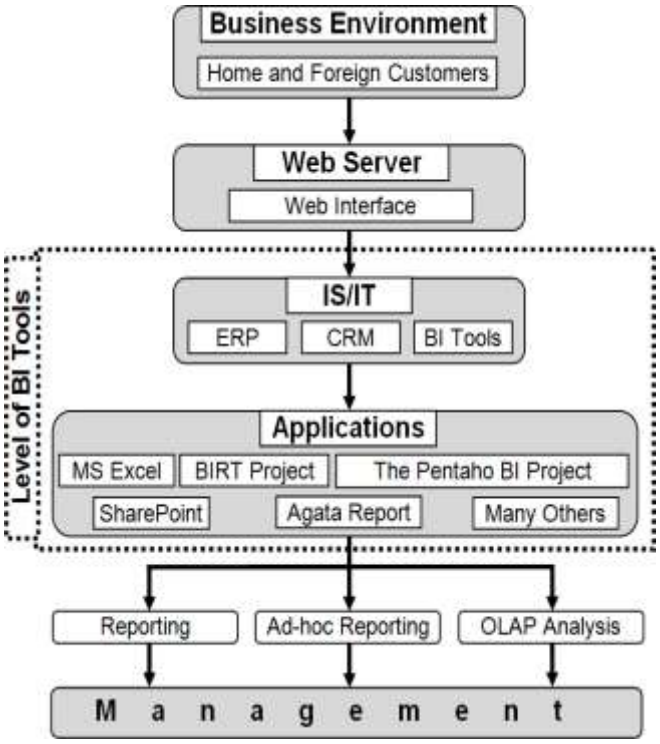
Clients ought to be able to exercise their own discretion in response to managerial decisions. Decisions should always be based on what is best for the customer and their unique requirements. Customers' preferences and needs vary from one country to another. This is the main reason why a lot of international online sales fall through. To lessen the frequency of unsuccessful cross-border online sales transactions, an effective management system is required that integrates all pertinent source data. For optimal decision-making, mathematical models of the allocation process are employed (Bucki, 2008). However, it is not the purpose of this piece. The processing of enormous amounts of data is inherent to the global character of e-commerce platforms, therefore managers are always on the lookout for new ways to strengthen their positions in local and international markets. This could only be accomplished with the help of state-of-the-art IT. The development and implementation of systems that utilize business intelligence (BI) technologies is now underway.

4. BUSINESS INTELLIGENCE SOLUTION

A company's performance can be improved with the use of an all-encompassing and highly effective business intelligence system by making decision-making processes easier. Leaders in a given market can benefit greatly from business analytics. This includes the ability to quickly respond to changes in the market, manage operations and expenses, thoroughly analyze data for future predictions, and make the most of available resources. Capacity to understand and meet customer needs, as well as improved client receptivity, are equally important. Information

was collected in 2008. A plethora of cutting-edge Business Intelligence (BI) solutions are now at your fingertips. In most cases, modern business intelligence tools provide immediate Agile decision-making, better program execution, multi-level analysis, graphical data visualization, time-based metric monitoring, and so on are all features.

Business intelligence (BI) solutions and related tools are increasingly crucial for data collecting and analysis.Web servers play a crucial role in



electronic commerce systems by mediating communication between customers and a company's information system (IS). In order to keep track of information, the company's IS makes use of BI tools, software programs, and hardware parts. Evidence 2.

Figure2 : The procedure for acquiring data using the common model of the BI solution.

When necessary, the reporting company prioritizes reporting. This alone should give you pause before making snap judgments. Ad hoc reports are made in response to requests rather than in advance. For 2009 data, Wikipedia was used. Fast-generating ad hoc report systems ease data collection.

Last-minute report information is best obtained through targeted requests or inquiries. The query returns the latest data in top management's format. Static and dynamic reporting are the most prevalent standardization methods. Under Completed Reports, you can locate data and fast-prepared static reports. Commerce Server Business Desk saves processing time by executing static SQL reports asynchronously. Editable reports are created while the application is running. The latest warehouse data is instantly refreshed when a dynamic report is run. There will always be one port definition in the database. The data was acquired by MSDN in 2009.

Online analytical processing is a key outcome of IS-BI integration. OLAP handles complex, multidimensional analytical queries efficiently. Business intelligence includes OLAP, data mining, and relational reporting. "John" debuted in 2007. Data display and retrieval differ amongst the main OLAP formats. MOLAP's various benefits make it popular. MOLAP integration of relational sources like data warehouses creates data cubes. Relational Online Analytical Processing (ROLAP) follows OLAP. Relational databases provide OLAP, but multidimensional databases keep the cube form.

Larson published the book in 2008. The gold standard for OLAP systems is HOLAP, or Hybrid OLAP. Modelers can save data in ROLAP or MOLAP depending on their needs. All of this material comes from Wikipedia entries from 2009 or before. Multidimensional data models include dimensions, logical cubes, levels, hierarchies, and attributes. Oracle debuted José in 2004 and launched it again in 2009.

Cube Size: A data table column must be selected to calculate a cube's area. Common measurements are income, costs, and output.

Different layers of aggregation can reduce several dimensions into one for representation. Sales, territories, and locations are accounting dimensions. Customers, delivery methods, time, and items are dimensions.

For more, see dimensional characteristics. Each dimension table column represents a dimension property. Dimension hierarchies include attribute summary levels. The temporal dimension database stores product qualities including size, taste, and color. Order information include date, month code, quarter code, and year.

Each dimension requires a level, which represents

a person's organizational ranks. Time can be hierarchically structured by Year, Quarter, Month, and Week. Responsibility is shown via hierarchy.

Hierarchies aim to define power and responsibility at all organizational levels. Data mining models' hierarchies generally match their nodes' structures. Europe would be first in a "Continent," "Country," and "City" geographical order, followed by France and Paris. Europe is bigger than France and Paris. All information above obtained from MSDN in 2009.

Business intelligence (BI) solutions are becoming standard in data structures. Research shows that 20% of organizations will have complete BI solutions by 2010. This portfolio will offer industry-specific SaaS analytics.By 2012, business units should account for 40% of the business intelligence spend. Over 33% of the analytical capabilities needed to improve corporate operations will come from data-intensive application mashups. This information comes from a 2009 Gartner analysis.

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5. MULTI DIMENSIONAL DATA IN CROSS- BORDER E-COMMERCE SYSTEMS

Online markets are crucial in business nowadays. Online purchasing is likely to rise in the future months and years due to the global economy. It uses electronic commerce concepts. Online purchasing offers several advantages for businesses and consumers. The key benefits are lower pricing and easier access to domestic and international markets. International expansion can boost sales and customer base. Statistics show 60% of foreign online orders fail. Some corporations don't sell in every country for different reasons. You may not know what culture, business, and consumer tastes await you in the overseas market. Payment difficulties may also emerge. E-commerce platforms that are poorly designed can generate international internet purchasing issues. International internet trading relies on fast data processing infrastructure.

Specify all data generation needs. Multidimensional data informs e-commerce platform decisions. Multidimensional data can be used to build and manage complex systems like relational databases. One mental paradigm that directly integrates computations is the answer. This resource uses 2010 MSDN data. Like any business, an online store has its own traits.Sales analysis is a key indicator. Sales data over a period of time might show how well a sales team met their goals. This is from BusinessDictionary, 2010. Sales data can tell managers a lot about their company. Its many uses include identifying the most profitable customers, monitoring product sales and profitability, comparing department and individual sales performance, and forecasting sales based on market trends and regional purchasing patterns. Business Intelligence solutions give managers a wide range of analysis to satisfy their needs. Dimensionality analysis matters. Product, seller, customer, and everything in between can have dimensions. Pricing, purchasing, and sales statistics are common manager needs. All analyses should use dimensional analysis. Season, customer location, client type (small, medium, or large), dealer, and many other factors might be considered. The research measures product sales using profit, average margin, return on investment, and other criteria. In every case, managers who know what data to collect are essential.

The data analysis needs of CEOs, retail managers, product managers, marketing analysts, and suppliers of raw materials or completed goods vary greatly.

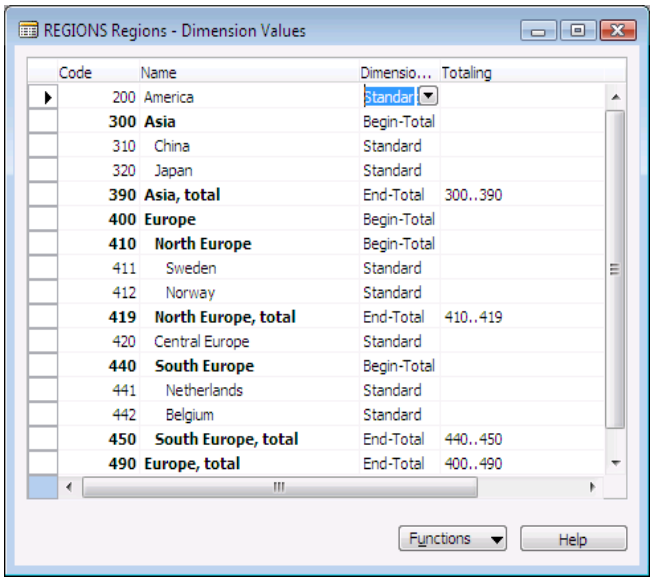
6. CASE STUDY OF BUSINESS INTELLIGENCE TOOLS IN MICRO SOFT DYNAMICS NAV

ERP platforms and standalone software applications provide business intelligence (BI) functions. Microsoft Dynamics NAV (MDNAV) is a complete ERP/CRM software. MDNAV offers money, personnel, and business analytics components. It helps with marketing, sales, service, supply chain, and project management. MDNAV offers Internet business solutions including commerce portals. Automating online order processes and computerized product catalogs were its main goals. The MDNAV platform uses Business Analytics to aggregate data from several sources and show it in an interactive dashboard for full analysis and insights. El-Assal 2008. MDNAV makes focused analytics utilizing pre-existing or new OLAP cubes easy. As designated recipients, managers can create value hierarchies that appropriately represent their reporting and accounting needs across product line, regional sales region, and time period.

You can make better tactical and strategic decisions with a bimodule. Strategic decision-

making prioritized individual and group goals. Access to current, consolidated data and analysis enables Business Intelligence (BI), which shows key business operations by role. Excel, a popular program, is coupled to this module for advanced analysis and manipulation. It also saves results as PDFs for easy sharing. Organizational intelligence tools include corporate performance perspectives, graphical reports and presentations, and multidimensional analysis simplify strategic decision-making. MDNAV can be integrated with SQL Server Analysis Services and SQL Server Reporting Services to improve reporting by employing data mining and OLAP analysis.

MDNAV meets analyst needs by allowing user-defined dimensions for thorough analysis. A two-dimensional analysis may examine sales by region. But MDNAV lets you add more than two dimensions for more complicated studies. The dimension can have infinite values. Dimensions help analysts find new trends and compare



features across several entries.

Figure3 : For example, consider regions as a dimension for definition.

The value specification for the Regions dimension is illustrated in Figure 3. The purpose of this dimension is to combine client-specific geographical data. It is possible for the values of the various dimensions to be hierarchically related. It becomes clear when looking at the European region that defined values can be thought of as subsets of values inside a distinct dimension.

The case study was organized into three sections according to the type of commercial transaction: Regions, CustomerType (which could be anything from a small business to a large corporation or even a non-profit organization), and Dealer (which could be any number of real dealers).

In order to facilitate the trading of furniture and the creation of suitable financial strategies, a made-up international organization was established. The company was established to demonstrate MDNAV's business intelligence (BI) capabilities through the use of a specialized OLAP cube for reporting and analysis across several dimensions. Sweden, Norway, China, the Netherlands, and Belgium were among the five made-up countries represented among the imaginary customers. The specifics of how businesses handle invoicing, payments, shipping, stock location, and international trade (including the languages and currencies used) might differ greatly from one another. Figure 4 shows how each customer is assigned the dimensions Regions, CustomerType, and Dealer.

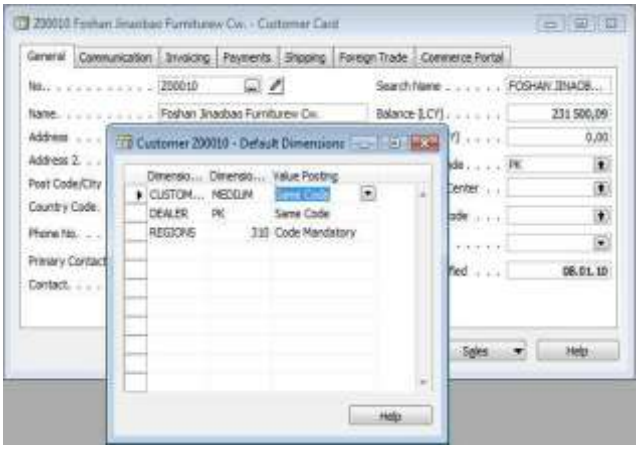


Figure4 Establishing Customer Dimensions: A Review.

The case study aimed to achieve its goals by selling four different kinds of office chairs to specific clientele between 2009 and 2010. For every item, there is a link to the general ledger and parameters for invoicing (including costs, VAT, and cost method), replenishment, and planning.

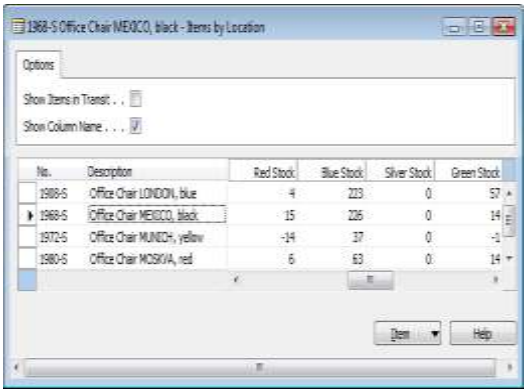


Figure 5 shows that the made-up company has a data warehouse with all of its inventory items arranged by stock location. This data can be used as an extra variable in future sales studies.

Figure 5 Items in the warehouse organized by location.

Prepared using fulfilled sales orders from predetermined clients, the Sale Analysis Report for furniture sales details the transaction. Figure 6 is for your reference.



Figure6 Report on Sales Analysis - Analysis of Prices.

The paper provides a comprehensive analysis of the pricing of various products in 2010. The MDNAV meets the requirements of analysts by allowing an unlimited amount of user-defined rows and columns in reports. Utilizing pre-existing report templates simplifies and expedites the process of creating reports. This report facilitates fast data filtering by utilizing chosen dimensions and conducting additional analysis. Figure 7 displays a sales analysis report that has been filtered based on the client.



Figure7 How can one apply a filtering process to a sales analysis report

MDNAV's analysis view reports, filters, and account schedules facilitate the production of informative dimension studies, especially for multidimensional applications. Analysts have the ability to construct several analytical perspectives, where they can establish specific criteria for things, dates, and locations. Each view can have a maximum of three dimensions. Within the item analysis view card, you have the ability to define filters according to dimensions that are not displayed in the analysis view. Refer to Figure 8 for a graphical depiction of perspective analysis, encompassing dimension configuration and additional filtration.

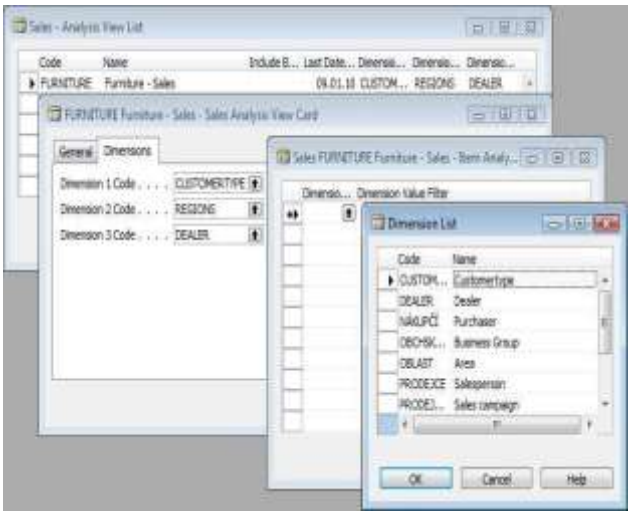


Figure8 Examine the organization of the dimensions next to the definition of the analysis.

Using the dimensions identified during the study, analysts construct the dimensions for each axis in the matrix, specifically the rows and columns. Several factors, including the quantity of things, the specific location, and the designated time period, are considered. The ultimate evaluation is greatly reliant on these dimensions. Figure 9 presents a comprehensive sales analysis for the years 2009 and 2010, categorized by dimensions, geographies, and customer type.

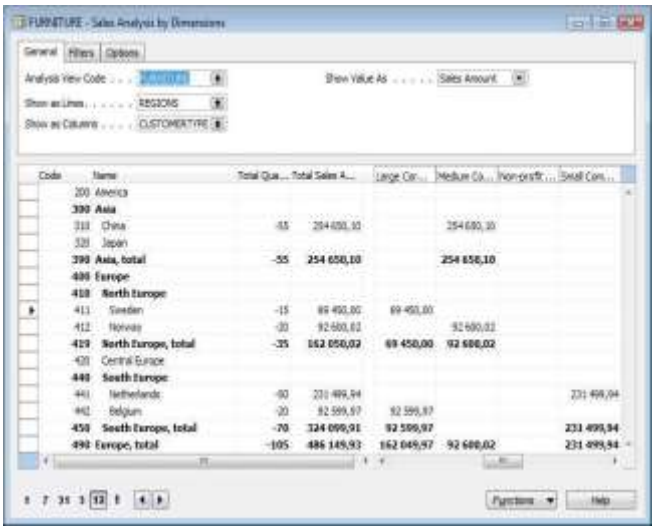


Figure9 An analysis of sales data based on

dimensions such as customer type and dealer is presented in the detailed view.

The Item Analysis View presents a unique combination of the posting date, item number, and dimension values specified in the Analysis By Dimensions. This enables us to examine precise details about the relevant items in the matrix. Figure 10 displays a sales analysis that examines dealer type and customer type, with a specific focus on factors relevant to small businesses.

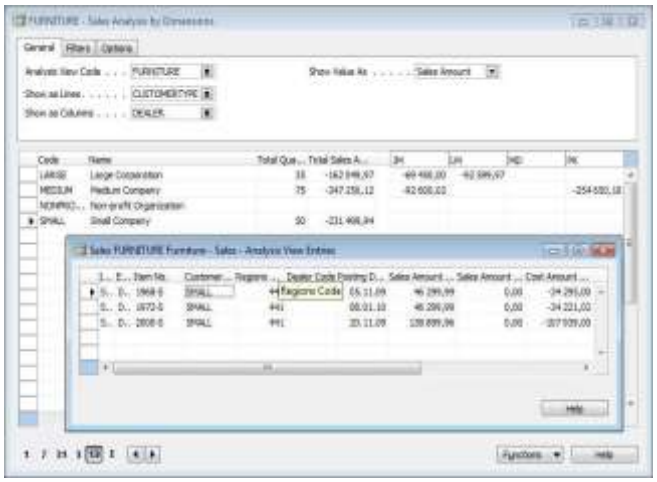


Figure10 Analysis of sales based on dimensions, regions, and customer types.

It is possible to filter data produced by analysis by dimensions using other parameters, such as posting date, item number, and location. With the CustomerType dimension applied, Figure 11 displays the Sales Analysis by Regions and Location dimensions.

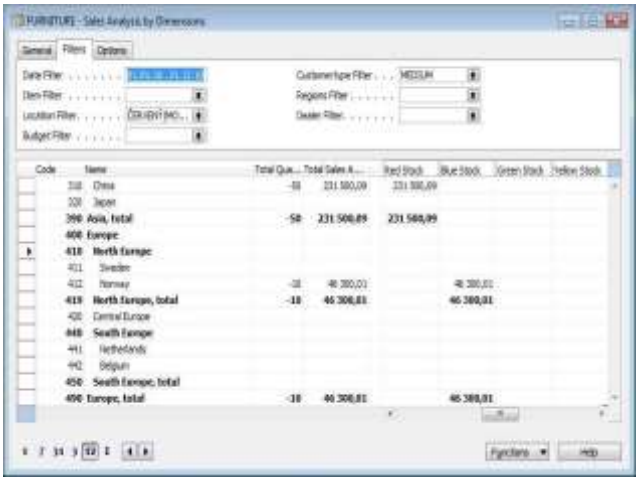


Figure11 Sales analysis is conducted by examining dimensions such as regions and location, with the application of filters.

MDNAV enables users to export findings to several formats, such as Microsoft Excel for further analysis and editing, as well as PDF for the purpose of sharing results. Pivot tables can be exported as a report type to facilitate analysis based on dimensions.

7. DATA VISUALISATION

Tables are great for displaying numerical data in a compact way, but most managers prefer visual representations. Since the turn of the century, data visualization has grown into an active field of study, teaching, and innovation. A 2002 study was published by Post, Nielson, and Bonneau.

An interactive bar chart is included in MSDNAV for the purpose of visually representing analysis reports. You can use analysis line bar charts to look at single lines or compare two or three lines at once, making it easier to analyze. Bars of varied colors represent the values in each column. When it comes to analysis, you can work with line charts. With the analysis report window as a starting point, the filters are directly derived from there. The filter settings can be adjusted by analysts to access the specific data they need.



Figure12 Conducting a price analysis is the main objective of the Analysis Line Bar Chart.

An analysis line bar chart depicting furniture pricing data is shown in Figure 12 of the Sales Analysis Report. For a more comprehensive look at the study, go to Figure 6. In the Sale Analysis Report, items were represented as rows; nevertheless, a line bar chart was generated for three distinct chair types, each of which is represented by a different color. The results show that the quantities in each column of the Analysis Report were converted to their corresponding bar colors. You may quickly characterize the type of data you need by changing the default values of the filters in the Analysis Line Bar Chart, which

were established from the Analysis Report.

Nonetheless, additional visual tools for data visualization are available in MDNAV. Gantt charts are useful for planning resources or capacity, and a similar kind of chart may be created for a set account schedule (the Account ScheduleLine Bar Chart).



Figure13 Visualization of data through graphical representations in an enterprise solution. Source: Interprise Solutions, 2008

Reports produced by any current ERP or BI system may be seen graphically, and data visualization capabilities are an integral part of these systems. Figure 13 shows a visual depiction of the report display that The Interprise Solution provides. In the United Kingdom, many small and medium-sized businesses use Interprise Solution, a business software solution. With this system, accounting, ERP, and CRM applications come together in a complete package. From 2008 onwards, Enterprise Solutions

There are a plethora of business intelligence (BI) and enterprise resource planning (ERP) programs available today. Business Intelligence (BI) solutions are being more and more linked with Enterprise Resource Planning (ERP) systems. It is always important to carefully consider all of the needs and objectives that need to be met. Return on investment analysis necessitates extensive discussion. Business intelligence (BI) systems and enterprise resource planning (ERP) systems with BI capabilities are vital in international e-commerce systems because they give managers reliable information on which to base their decisions.

8. CONCLUSIONS

Online buying is easy to reach worldwide due to the global economy. In recent years, Europe's e-commerce business has grown rapidly due to an explosion in online stores and online sales. Businesses should review their procurement and decision-making processes to adapt to client feedback. The data set's source system is improved for worldwide e-commerce. You should consider several factors if you wish to sell products online (locally or internationally) and avoid failure. Laws, conventions, and culture are as important as economic criteria in management system design. Customers are crucial to decision-making. Managers should make choices that simplify consumer choice. An improved dataset on global e-commerce platforms emphasizes the necessity for information systems with the correct tools. Currently, these platforms are BI tools. Business intelligence systems include reporting, OLAP, and data mining tools. Managers have many software options. Various specialist software offers business intelligence (BI) features. This works in several ERP systems, though. Microsoft Dynamics NAV HR and ERP software is one example. This article showed and tested how Microsoft Dynamics NAV's business intelligence tools improve international online purchasing decision-making. The article shows how Analysis by Dimensions evolved. Enterprise resource planning (ERP) systems with integrated business intelligence capabilities may generate reports fast and easily, among other benefits. It depends on management's needs. Always evaluate all needs and goals. ROI must be carefully analyzed. Managers should know what they need, how, and why. Only in this situation could they receive the knowledge they needed to decide. Business managers should invest in or construct comprehensive information systems or modules that cover all processes and provide critical resources (beyond business intelligence tools). International commercial transactions require business intelligence solutions to reduce risk.

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