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| Wide World Importers  Data Analysis |  |
| Sales Analysis and Logistic monitoring On Delivery Performance and Stock Movement  By Shevindi Basthian Koralalage – c3413510 |  |

**Table of Contents**

[Introduction 3](#_Toc172943087)

[Methodology 4](#_Toc172943088)

[Analysis and Results 8](#_Toc172943089)

[Insights and Recommendations 16](#_Toc172943090)

[Conclusion 18](#_Toc172943091)

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| **Executive Summary**  The following analysis of Wide World Importers provide comprehensive and important insights on the sales performance of the company against various criterias, order behaviour, delivery performance and stock movement. This report is targeted on helping to make decisions on the future strategies of the business through Wide World Importers Datawarehouse. It provide actionable insights through various BI tools. Introduction Wide World Importers (WWI) is a wholesale novelty good importer and distributor operating from the San Francisco bay area. Primary customers of WWI are the companies who resell item to individuals. WWI also sell to other wholesales through a network of agents.The company is focused on the United States, have planned to expand their network infuture.  Main objectives of this analysis are to gain insights on sales performance over the years from 2013 to 2016, top selling stock items, sales and order trends over the above period of time, evaluate delivery perfomance to optimize and maintain delivery quality and evaluate the stock flow in and out from the WWI warehouse to gain insights on the stock item demand.  The following analysis focuses only on sales, stock movements and delivery performance of the business. However, due to various technical limitation on the menthodology I have used, the report have opted basic analytical measures. |  |
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| Methodology Data Source  Data source is the WorldWideImporters (WWI) Datawarehouse (DW) sample database downloaded from the reference [1]. It is a full sample database for OLAP (OnLine Analytical Processing) provided by Microsoft. The WideWorldImportersDW database is used for data warehousing and analytical processing. The transactional data about sales and purchases is generated in the WideWorldImporters database and loaded into the WideWorldImportersDW database using a daily ETL process.  Data Description  WideWorldImportersDW has the following dimension tables.   |  |  | | --- | --- | | Table | Source tables | | City | Application.Cities, Application.StateProvinces, Application.Countries. | | Customer | Sales.Customers, Sales.BuyingGroups, Sales.CustomerCategories. | | Date |  | | Employee | Application.People. | | StockItem | Warehouse.StockItems, Warehouse.Colors, Warehouse.PackageType. | | Supplier | Purchasing.Suppliers, Purchasing.SupplierCategories. | | PaymentMethod | Application.PaymentMethods. | | TransactionType | Application.TransactionTypes. |   WideWorldImportersDW has the following fact tables   |  |  |  | | --- | --- | --- | | Table | Source tables | Sample Analytics | | Order | Sales.Orders and Sales.OrderLines | Salespeople, picker/packer productivity, and on time to pick orders. In addition, low stock situations leading to back orders. | | Sale | Sales.Invoices and Sales.InvoiceLines | Sales dates, delivery dates, profitability over time, profitability by salesperson. | | Purchase | Purchasing.PurchaseOrderLines | Expected vs actual lead times | | Transaction | Sales.CustomerTransactions and Purchasing.SupplierTransactions | Measuring issue dates vs finalization dates, and amounts. | | Movement | Warehouse.StockTransactions | Movements over time. | | Stock Holding | Warehouse.StockItemHoldings | On-hand stock levels and value. |   Analysis Procedure  The analysis of the above WideWorldImportersDW database involve few steps, where initially, necessary data marts were designed based on the subject areas selected for the analysis.  Subject areas selected were sales analysis for evaluating sales and order performance and logistic monitoring for evaluating delivery performance and stock movement.  Sales analysis based on, Sales and Order fact tables and City, Customer, Employee, Date and StockItem dimension tables. Given below the datamart design for sales which was designed using SQL server analysis service.  A computer screen shot of a computer screen  Description automatically generated  Logistic monitoring based on Sales, Movements, fact tables and City, StockItem, Date dimension tables. Given below the datamart design for logistic monitoring which was design in Power BI Desktop. Necessary fact and dimension tables were imported into the Power BI plateform from WideWorldImportersDW database via the server.  A screenshot of a computer  Description automatically generated  Next step involves the sales analysis of the data generated through mutidimensional cube which was created and deployed using SQL server analysis service. Given below is a how the SalesWWIDatamart cube deployed into SQL Server Analysis Service and how it was deployed in the server.    A screenshot of a computer  Description automatically generated  Using the Power BI data import functionality, data in the cube was accessed through live connection.Live connections to the data warehouse ensured up-to-date data retrieval.  Logistic monitoring was carried out by loading data directly into the Power BI platform through WideWorldImportersDW database.  Then the analysis on sales and logistic measures were carried out data aggregation, trend analysis, and KPI calculations.Visulizations were created using Power BI charts, graphs, plots, maps, reports and dashboards to effectively present findings and gain insights. Analysis and Results Given below are the key findings and results from the analysis of sales and logistic subject areas of the business.  Sales Analysis  This analysis included sales trends over different periods, top selling items, sales by region or state province, employee performance by sales, sales based on different buying categories of customers, order count over different periods, orders by region, top products within orders and   * Sales trends over different periods     Above visualization shows that there is peak in year 2015 which has been gradually increases since 2013. But however, there is a dramatical loss in sales amount in 2016. There is a noticeable and significant drop in both Sale Count and Total Sales Amount in 2016. Sales amount has decreased to $25.97M from $62.09M in 2015.  Below is a bar graph that shows how the sales have been deviating monthly.  A screenshot of a graph  Description automatically generated   * Sales performance in different state provinces     The above map shows how the sales have been distributed state province wise. The size of each bubble represents the sales count. Larger bubbles indicate higher sales count, while smaller bubbles indicate lower sales count.  The color of each bubble represents the sale amount. The color gradient (typically from light to dark) shows the total sales amount. Dark red colors indicate higher sale amount magenta colors indicate medium sale amount, while blue colors indicate lower sales amount.  Texas, Pennsylvania, California, New York and Florida are the top 5 states which show higher sales amount as well as highest sales count.   * Top 10 selling items   A screenshot of a computer  Description automatically generated  A screenshot of a computer  Description automatically generated  Above visualization depicts on top 10 selling items in the Wide World Importers company. Out of the above top 10, ‘Air cushion machine (Blue)’ has the highest demand with 12.773 million compared to others. ‘Air cushion machine (Blue) is the major contributor of the Wide World Importers company revenue. Products related to bubble wrap, specifically anti-static and double-sided variations, dominate the top 10 list.   * A computer screen shot of a pie chart    Description automatically generatedSales by Customer buying categories   A computer screen shot of a pie chart  Description automatically generatedThe majority of the sales are from customers who are uncategorized or customers who are not toy sellers, which is about 73M. Tailspin toys and Wingtip toys equally contributed to the revenue, which is 62,654,262M and 62,352,133M respectively. These two buying groups together contribute over $125M to the total revenue.   * Sales performance by employeesA screenshot of a computer    Description automatically generated   A screenshot of a computer  Description automatically generated  This visualization conveys that among the salespersons in the Wide World Importers company, Archer performs best by increasing the revenue of the business. Archer Lamble has earned about 20.6 M for the company by sales. Other salespersons have performed slightly less compared to Archer. However, the sales performance of all employees listed is relatively balanced, with each contributing around $19M to $20M.   * Order count and total sales amount over time period   A screenshot of a computer  Description automatically generated  The above graph shows that order count and total amount earned by orders show similar trends compared to sales. Earnings have decreased from 64M to 27M in 2016.   * A screen shot of a graph    Description automatically generatedOrder quantity by stock item   A screen shot of a computer  Description automatically generated  The Black and orange fragile despatch tape 48mmx75m is the top-selling item with a quantity of 207,324. It can be observed that there is a high demand for packaging materials such as despatch tape, shipping carton, courier post bags etc.   * Dashboards   A screenshot of a computer  Description automatically generated  A screenshot of a computer  Description automatically generated  Apart from the above results analysis says total of 198.04M total sales were earned from 2013 to 2016 time period and the profit earn by them is about 85.73M  Total amount of orders is about 204.22M while there were 231.41K orders dispatched from the warehouse from 2013 till 2016.  Logistic Analysis  This analysis involves delivery performance of the items, stock movement frequency, stock movement by items and stock in and out flow over different time periods.   * A screenshot of a computer    Description automatically generatedStock movement by stock item   The Black and orange fragile despatch tape 48mmx75m has the highest movement, indicating it is in high demand. Various sizes and colors of "The Grrr" red shirt XML tag t-shirts also show significant movement, highlighting their popularity.   * Stock in and out flow over the years from 2013 to 2016  A screenshot of a computer  Description automatically generatedThere was a significant increase in stock movements from 2013 to 2015, peaking in 2015. A noticeable decline is observed in 2016. However, the cause of this decline needs further analysis.  * A screenshot of a computer    Description automatically generatedDashboard  The average delivery time is low at 1 day, indicating highly efficient logistics and delivery processes.A total of 30,524 stock movements suggests a very active inventory with frequent transactions.Recommendations From the analysis it can be seen that there is a considerable downfall in total sales orders as well as stock movements which need further investigation. This could be due to an internal issue of the company such as strategic and operational issues, changes in the market etc. Thus, conducting an analysis to identify the cause for this decline is needed. By analyzing the market trends, customer feedback and internal operations during that period, we can get insights into this issue. The maps show wide expand of the sales and market around United States. It is recommended to think about the expansion of the business in Europe to make more profits.  Furthermore, ensure that high-demand products like the Air cushion machine, bubble wraps, Black and orange fragile despatch tape are always in stock and ensure to have continuous supply of these items to meet customer demand. And also, it is needed to analyze sales trends to predict future demand and manage inventory stock levels effectively.  In order to ensure and enhance the WWI sales performance it is also recommended to have regular performance analysis of employees, to identify factors contributing to higher performance and their weak areas. Using the analysis, gives rewards to top performers and encourages others to perform best with targeted training programs.  By considering the above recommendation WWI will be able to increase its overall sales performance and ensure continuous improvement across the sales team.   Conclusion This report provides a comprehensive analysis of the WWI Data Warehouse using Power BI and SQL server analysis service, highlighting key areas for improvements. Implementing these recommendations will help WWI enhance sales performance, optimize inventory management, and improve supplier relations. . |  |
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