# Ship Security analytics using DATA Intelligence

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and pictorial representation so that it is easy to identify the root cause of the problem. This will achieve to prevent and identify the precaution of each Human injury and Damage. By this it will help keeping a correct record about accidents, their cause and effect caused by it for improving the safety and security of the ship.

### B.About Pentaho

**Pentaho** is a Business Intelligence (BI) software that develop data integration, OLAP services, reporting, information dashboards, data mining and extract, transform, load (ETL) capabilities. Pentaho Data Integration is well known for its ease of use and quick learning curve. PDI implements a metadata-driven approach which means that the development is based on specifying what to do, not how to do it. Pentaho lets administrators and ETL developers create their own data manipulation jobs with a user-friendly graphical creator and developer. Pentaho offers an enterprise and community edition of the software. The enterprise software is obtained through an annual subscription and contains extra features and support not found in the community edition. Pentaho's core offering is frequently enhanced by add-on products, usually in the form of plug-ins, from the company and the broader community of users. It follows an open core business model.

## III. METHODOLOGY

As mentioned earlier the Pentaho uses various ETL techniques. These will include three modules of implementations which include Design, Database connection and Development. With this we would implement it for two parameters Human Injury and Damage Accident. The backend will use Microsoft SQL server which will deal with all database related operations and functions and the frontend will make use of our Pentaho software.

Using the design we can provide various features like Drill down and drill through by which we can accordingly view our final reports and then take further solutions for rectifying it accordingly even if the ship is operational or simply docked.

### Software Requirements

For implementing this project we require the following software requirements
  - ➢ PENTAHO
  - ➢ JAVA
  - ➢ TOMCAT SERVER
  - ➢ MS SQL

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*Abstract*— **Awareness of Safety Management and implementation of safety and security techniques have become a global concern over the past few decades. Moreover it has become mandatory for all the shipping companies to come under the ISM certification in order to run their businesses. ISM provides an international standard for the safe management and operation of ships and for pollution prevention. Its objectives are ensuring safety at sea, preventing human injury and fatalities and avoiding damage to the environment. It is applicable to all oceangoing ships over 500 Gross Tonnage and to the owner or management company that has assumed the ship operation responsibility. For this we'll be using BI tools such as Pentaho to analyse these problems and to provide a proper solution for such effects.**

*Keywords*— *ISM, BI, Pentaho.*

## I. INTRODUCTION

Business Analysis plays a major role in Small and Medium Sized Industries to help corporate executives , business managers and other operational workers make better and more informed business decisions. This platform makes use of data available in organizations to generate and deliver information used to support decision-making. This information is obtained by combining data interrogation and exploration with tools that enable reporting. (1) These platforms typically associate three technologies: Data Warehouses, On-Line Analytical Processing (OLAP) and Data Mining. (2) Data Warehouse is an integrated repository that stores information about the business. Organizations also use this to cut costs, identify new business opportunities and modify inefficient business processes. This enhances time consumption and can also provide them efficient workflow without any interruption.

## II. EASE OF USE

### A . Related works

With the general idea about analyzing the different business factors and the previous data and producing a report the same idea is used for analyzing the ships data and provide them the different reports so that suitable measures are taken to rectify any error which may occur and also based on the previous experiences the same can be provided to provide a solution accordingly. In this we would be considering two factors such as Injury and Damage accident. These observations would be represented by means of graphical

## IV. IMPLEMENTATION

Implementation for the following can be performed by the splitting up into different modules. As per our project we do it as following

i. Setting up the community version of Pentaho.
ii. The next step involves setting up of Jndi(Java naming and directory interface)
iii. Now the initial setup is completed and now we have to configure the inbuilt panel according to our requirement. The first involves layout panel wherein the programming and initial setup is carried out.
iv. Next involves configuring the components panel.
v. The most important requirement is the database connection on which the analysis is carried out And this connection is done using SQL server management studio.
vi. . SQL queries coded according to our outcome from DB is been set in Data source's panel.
vii. Finally we can preview our Dashboard where the output can be viewed.

### A. Functionality of different panels in Pentaho

Pentaho provides three different panels which provide different functions such as layout design, database connection and displaying the output accordingly.
The panels provided are
    i. Layout panel
    ii. Component panel
    iii. Data sources panel

i. Layout panel:
We can add resource in the form of CSS and JavaScript. By adding a row and column a table can be created and the values can be given in the form of HTML. In this HTML that has been created the CSS and JavaScript that has been created in the resource can be used and implemented.

ii. Component panel:
The various chart formats in which the tables are populated is being set and initiated. The major linkage and connection between the layout panel and data sources panel is done here.
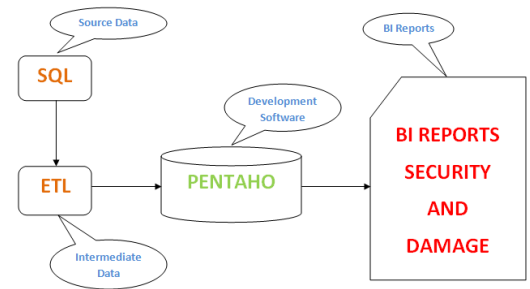
iii. Data sources panel:
SQL queries that have been coded on SQL server management studio is been set over here after successful implementation.
Based on our requirement the features like :
    Drill down
    Drill through

### B. Flowchart



This gives a clear idea about how our end product would yield the respective result. The SQL is considered the source data and that is accordingly processed using ETL for obtaining only the required information which is considered to be the intermediate data. Now, this intermediate data will be passed through our development software to develop all the security and damage related reports according to which the solutions are provided and also prevent it happening in the future.

### C. ADVANTAGES

➢ To enhance a low integration time and infrastructural cost as compared to other BI tools in the market, like SAP, BIA, SAS BIA, and IBA.
➢ More insights to improve.
➢ Streaming engine architecture provides the ability to work with extremely large data volumes.
➢ Increased awareness of risk, enabling the implementation of preventative measures.
➢ Compare past data to enhance efficiency to Make targeted and better-informed decisions for optimizing profits.

### D. Architecture Diagram
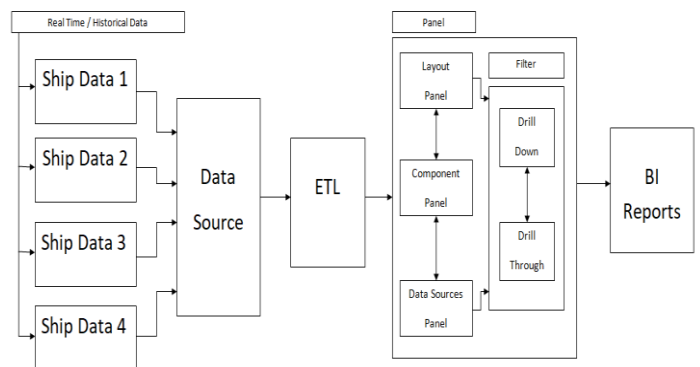
### REFERENCES

[1] Tânia Ferreira , Isabel Pedrosa, Jorge Bernardino "Integration of Business Intelligence with e-commerce" June 2019.
[2] Abba Suganda Girsang, Sani Muhamad Isa, Herry Saputra, M. Apriadin Nuriawan, Reginald Putra Ghozali, Emil Robert Kaburuan "Business Intelligence for Construction Company Acknowledgement Reporting System" Sep 2018.
[3] Josip Nađ , Mario Vražić "Decision making in transformer manufacturing companies with help of ERP business software" Jun 2017.
[4] Hadeel A. Al-Essa ,Ahmad H. Al-Sharidah "An Approach to Automate Business Impact Analysis" Apr 2018.
[5] I. I. Kholod, M. S. Efimova " Smart Collection of Data for Financial Instruments " May 2017