Fast Moving Consumer Goods Retail: Business Intelligence Approach in Retail Information Systems

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Abstract

In recent years, the Fast-Moving Consumer Goods (FMCG) market has grown and become more complex. As a result of these trends, more complex retail information systems are needed, including integrated business intelligence, to capture the full range of specific business processes and retail transactions. This paper outlines opportunities for digitizing FMCG retailers, tasks, and processes, including the use of various basic retail information systems that automate their core business activities. The possible business intelligence (BI) approaches applicable in FMCG retail and specifically in managing orders to suppliers have been explored. The study highlights the relevance and the role of BI in the activity of retail companies and the applied technologies for BI (Data Warehouse, OLAP, Decision Support Systems, etc.) suitable for the retail sector are presented. The main outlines expressing the importance of business intelligence for companies operating in FMCG retail, and especially fast data processing, intelligent analysis of dependencies, multidimensional analysis, etc. are presented.

Keywords: *FMCG Retail, Retail Information Systems, Business Intelligence, Managing Orders to Suppliers.*

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1. Introduction

Modern information and communication technologies are used for digitization of trade processes of companies operating in the retail sector, including retail of Fast-moving consumer goods (FMCG), in the management of sales, marketing, orders to suppliers and others. The goal is to increase their productivity and, more importantly, improve their efficiency in an increasingly competitive market environment. Retail companies involved in FMCG retail offer products in large quantities. Generally, these products are cheap and have a relatively short shelf life. They are characterized by frequent purchases and are readily available to the end customer as well as designed for quick consumption. Profit margins on some products are low and, accordingly, large sales volumes are required for the business to succeed. These characteristics present a few challenges, but also many opportunities for all retail companies.

FMCG market is expanding and becoming more complex, which is why more and more complex information systems for retail trade are needed, including integrated intelligence to be able to capture the many specific business processes and trade transactions. With the growing globalization of retail, more effective control of data, information and market knowledge is key to maintaining the competitive advantage of trade companies. In this paper, the first section examines the possibilities for digitization inherent in the companies operating in FMCG retail trade, tasks, and processes, including the use of various basic trade information systems that automate their activities. The second section presents the possible business intelligence (BI) approaches applicable in the FMCG retail and in managing orders to suppliers. The relevance and the role of BI in the activity of the companies are considered, the applied technologies for BI, suitable for the trade sector are presented, as well as the directions in which the importance of BI for the work of the trade companies working with FMCG are highlighted. In the conclusion, a summary is made, presenting the directions in which future research efforts are focused.

2. Digitization of Tasks and Processes in the FMCG Retail

Retail trade, incl. with FMCG, is characterized by a variety of activities, diverse business processes, operations, trade transactions and related data. Summarizing them is a challenge that has attracted the research interest of several authors. In their publications, [1, 2] make a proposal to cover the tasks and sources of core data in retail information systems. They are presented in Figure 1.
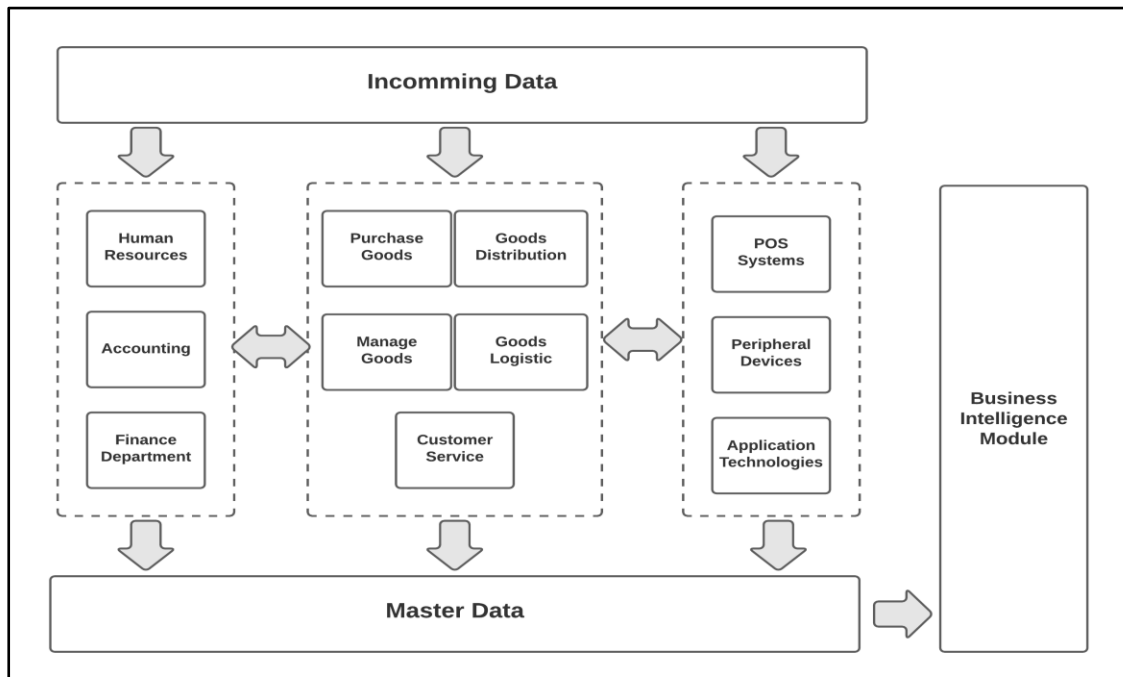
Figure 1. Tasks and related activities and data in retail

(the figure is created by the author based on [2])

2.1. Digitalization of the Tasks Performed by Retailers

Tasks performed by retailers, including FMCG, can be classified into **four main groups** [2]: 1) Technically engineered tasks; 2) Core tasks bringing added value; 3) Administrative tasks; 4) Decision-making tasks.

The tasks belonging to three of the mentioned groups — technically engineered, administrative and decision-making, are of general character and do not differ in relation to the different companies in the retail trade. Core tasks are of major research interest. These include the following subtasks: goods management; ordering goods; customer service; distribution of goods; goods logistic; financial and accounting tasks (invoicing of goods, liabilities / receivables, and audit). The brief description of these subtasks includes the following:

Management of goods refers to the scientific field of trade marketing, which covers analytical processes, formulation of goals, choice of strategy, as well as composition and control of the marketing mix in the trading company [3, 4, 5]. The four areas of the marketing mix introduced by Prof. McCartney and known as 4P: product, price, place, and promotion are essential for the decisions to be taken within trade marketing. From the perspective of a trade process, *the drawing up of an order for goods* includes all activities related to the planning of the product range, the replenishment of stocks in stores and the availability of sufficient goods in the outlets to meet customer demand. Also processes between central warehouses and stores, between suppliers and warehouses, and between suppliers and stores (in the case of direct deliveries) depending on the type of trading company are included. After a specific choice of supplier firm and type of delivery has been made, an order is placed by the retail store based on a specific contract. It includes and describes all the details of the order and its implementation. The drawing up and execution of the respective order for delivery of the goods depends on certain factors, such as: type of retail store, complexity of the product diversity, frequency of demand for the ordered goods, monetary value of the goods, etc. On the other hand, the listed characteristics can be considered as a starting point for creating an incoming data flow, which is the basis of retail information systems. At the heart of the system are the core tasks and related activities that bring added value. *Customer service* activities play a key role, as they include tasks that are an integral part of business processes. Examples of such types of tasks are competent consulting of consumers during the realization of the purchase intention, giving additional advice on a specific product and compliance with the brand and company policy of the cash registers in the store. *Operational tasks* also affect customer service, but the emphasis is on post-sales services. These include initiating, executing, and communicating, through various types of communication channels, to serve customers with provided warranty contracts, and to manage complaints. According to their nature, *logistics processes* are divided into three major groups: inbound, internal, and outbound. The incoming logistics processes are related to the movement of goods from suppliers to the respective trading company, including planning deliveries, reporting, and coordinating delivery schedules, creating a schedule for

deliveries, loading, and unloading activities (warehousing of goods), organizing transportation, etc. *Internal logistics* is carried out within the boundaries of the trading company and includes all operations related to the management of goods, such as: acceptance, processing, storage, control of inventories, in-warehouse, or in-store transport. It also covers the operational tasks between the central warehouses and the individual stores of the retail chain and the functional and efficient use of the places for storage of FMCG. *Outbound logistics* covers the movement of goods to the end point of sale and delivery of the product to the buyer, coordination of direct sales, order processing, transportation and more. After drawing up the order for delivery of goods, the execution of the order and *delivery of the ordered goods* follows, as the accompanying tasks include execution of the order according to the agreed quantity, quality and time, receipt, and acceptance of the goods. Receipt and acceptance of goods relate to the functional area of planning, acceptance, control, return and physical storage of goods. The differences in the operations performed upon receipt of the goods in the retail trade network are determined by the product specialization of the retail outlet and the characteristics of the offered range. The entire process of receiving and storing goods at the shelfs of the retail chain goes through several main stages, which are characterized by the following specifics. *Receipt of the goods* requires organization by the retailer related to the means of receiving the goods and coordination of the loading and unloading activities. *The acceptance of the goods* is carried out by a materially responsible person appointed at the place, checking for compliance of the received goods with the declared in the respective order and the current legal provisions for packaging and labeling of goods. According to their characteristics, some of the accepted goods are subject to *further processing*, such as marking and storage according to specific conditions (temperature, light, humidity, etc.). *Warehousing and storage operations* are involved in the delivery of goods but are part of the internal logistics processes. Another large group of tasks is related to the *financial and accounting services* of retailers. They cover all operational activities, such as entering an invoice, checking an invoice, controlling deviations, invoices with subsequent processing and subsequent settlement of payments, the so-called delayed payments. The next large group of tasks presents the main areas through which data is generated in commercial activities and processes, including POS systems, data transmission technologies and peripherals (Figure 1). Data from promotional campaigns, customer demographics, market research data, weather data, social media data and many other data sources can also be added to them. Another large group of tasks is related to administrative activities, which cover activities from financial accounting to cost accounting and human resource management.

All the above tasks and activities are consolidated and form semantic modules, between which there is a constant exchange of data. After all commercial activities, as well as emerging and processed data, the possibility to apply approaches and tools of business intelligence stands out (Figure 1). [2] view business intelligence as a favorable factor for new opportunities for effective digitalization of commercial activities and processes. Positive assessments of the role of business intelligence in commercial business, incl. with FMCG, are also supported by other authors [7, 8]. and research companies such as [9]. This fact gives us additional reason to propose the use of BI approaches and tools to improve the processes of managing orders to suppliers by the FMCG retail chains.

2.2. Information Systems in Retail

The support of the activities, business processes and operations of the retail trading companies dealing with FMCG are separated and integrated into subsystems, which can be described as two major groups of systems: *Retail Information Systems* (RIS) and *Enterprise Systems* (Figure 2).

The **Retail Information Systems** are specific and closely specialized for the companies working in the retail trade and specifically with FMCG. They mainly support the work tasks of the management of the trading company, such as: decisions making related to FMCG, sales, defining a trading strategy, etc. The following types of RIS are included in this category: Electronic Point Of Sale systems (EPOS); Sales Force Automation; Category Management Systems; Product Information Management (PIM), etc.

Some of the features of the RIS, serving the work of retail FMCG companies, are the following:

EPOS systems are an advanced version of the classic POS systems, including not only opportunities for reporting sales from the FMCG sale but also provide opportunities such as: active connection to other external systems for reporting payments, increasing the flexibility and speed of the system thanks to a continuous data stream, possibilities for creating reports according to pre-defined criteria, integration into the inventory management system, etc. [6]. Usually, this type of systems are a combination of specialized hardware and software that adapts to the specifics of each business. EPOS systems are characterized by great flexibility, which allows integration with the Enterprise Resource Planning System (ERP system) and the Sales Management System. On the other hand, they are a large data set generator that is stored in the company database and serves indirectly as a reference point for Decision Management Systems in the trading company.
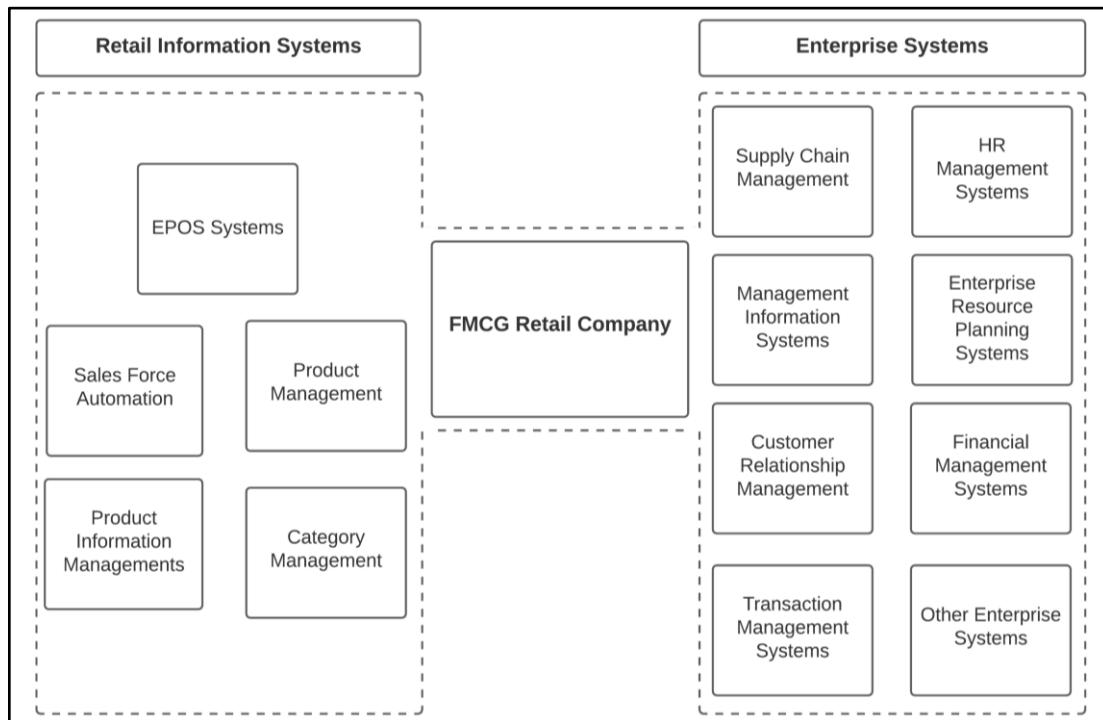
Figure 2. Information systems in the retail company

The concept of **Sales Force Automation systems** is defined by [10] as applicable to a wide range of information technologies that are used at the time of sales and support the completion of sales and after-sales processes. Part of the main functionality of this type of system is the effective management of information related to customers of the retail chain, and users of the system can manually add information to the customer profile, if necessary. Other authors [11] place business process automation systems at a key position in the customer relationship management system (CRM system) and the merchant's inventory management system due to the importance of the information they manage.

   Category Management Systems (CMS) have a key position in the TIS, because they provide a link between stakeholders engaged in commercial activities: directly between retail chains and manufacturers of FMCG and indirectly with consumers. CMS reflect the type of relationship (partnership or cooperation) between the retail chain and the manufacturers and are focused on product category management [12]. The product category is considered as an independent business unit, composed of consumer goods, with common features. Category management is a process that is primarily aimed at FMCG users with a focus on consumer needs and involves obtaining appropriate information and customizing the goods management processes according to the specific requirements of each retail chain. The main goals of CMS are to increase the FMCG sales and respectively the orders to the manufacturers and to develop an up-to-date merchandising[1] strategy, which reveals that these products have the highest consumer demand for the respective period or are in constant demand, are a priority and are offered actively in the retail chain.

   Product Information Systems are responsible for managing, systematizing, and centralizing all available information about products and digital assets available in the RIS, such as: product barcode, brief description, product photo, etc. [15, 16, 17]. This type of system is in constant communication with all systems involved in the RIS and supports the operation mainly of merchandise management systems and financial systems. The basic concept of product information management systems is that after the initial introduction in the RIS, goods information is stored in a single repository, and other systems in the RIS ecosystem have active access thanks to data transmission applications.

   Merchandise Management Systems can be considered as a **core part of a Retail Information System**. In addition to the already mentioned value-added tasks, the opinion of [18] can be highlighted, who in their publication "Retail Information Systems Based on SAP Products" take the position that at the highest level of

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[1] Merchandising, together with product management and price management, can be seen as three sides of the same process - the process of creating such a core of the trade proposal, so that consumers are attracted and predisposed to purchase the maximum possible total value. According to [13] merchandising encompasses a set of activities aimed at attracting the attention of consumers in order to make a purchase and its purpose is to sell and provoke impulsive purchases. From the marketing approach, merchandising is associated with planning that requires the right product or service in the right places, time, quantity, and price (American marketing association, cited in [14].

generalization a retail company must perform three main tasks - *supply*, *storage*, and *sale of goods*. They also emphasize the importance of merchandising, covering the tasks of *planning the quantities of goods, logistics tasks* and *invoicing tasks* to be performed by the trading company. The goods management system maintains and controls the goods-oriented *planning tasks*, the *logistics* and *invoicing tasks* of the retail company, using data for transactions of goods related to value and quantity. The main processes that are typical for it are presented in Figure 3 using Business Process Model and Notation (BPMN) standard.
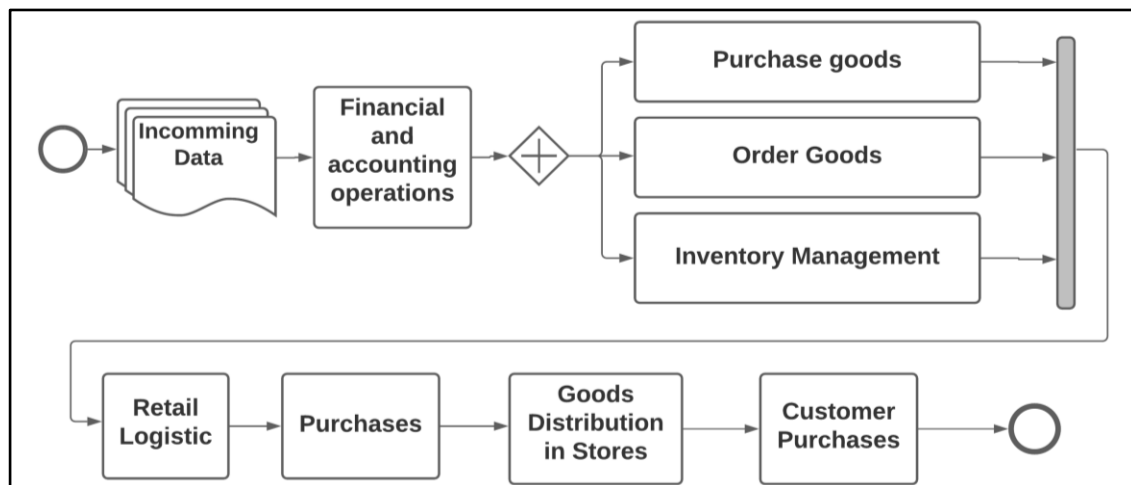

Figure 3. Core Merchandise Management System process presented by BPMN

The types of RIS considered are related to the digitalization of various aspects of retail process, with emphasis on the fact that each of these systems is related to the management and (or) implementation of sales of FMCG by retail companies, which directly affects the purchase of consumer goods from suppliers. As a result of the study, we can point out that the nature of the processes of order management to suppliers stands out with a high level of complexity.

Enterprise systems are used in companies, regardless of the industry sector in which they are implemented. In the context of retail companies, they are considered as complex systems, covering all ongoing processes, regardless of their nature. Several authors characterize them as centralized systems that manage large volumes of data, while access to them is facilitated at any functional level or management hierarchy [19, 20]. These include Enterprise Resource Planning systems (ERP systems), Customer Relationship Management systems (CRM systems), Human Resource Management systems (HRM systems), Management Information Systems (MIS), Financial Activity Management systems, Supply Chain Management systems (SCM), Supplier Relationship Management systems (SRM), etc.

3. BI Approach for Managing Orders to Supplier in the Retail Chain

With the increase in the amount of data that trade companies operate and the frequent economic changes that accompany the FMCG retail sales, the need to use a variety of software tools and techniques for processing and extracting company commercial data increases. Business intelligence can be considered as a general term that covers company assets such as: company infrastructure, applications, data, practical experience, etc. in order to achieve optimal management decisions in a competitive business environment [21]. Some of the main factors determining the need to use BI include large amounts of data that companies have and the minimal usage of data in subsequent processes, as well as the need to improve and optimize existing company systems. Business intelligence can be used to describe the process that organizations execute to collect data and analyze it with the intention of gaining a competitive advantage [22]. Another interpretation of the concept aims at focusing the efforts of the company's management on effective management through the implementation of business intelligence [21]. The overall picture related to the state of the business can be presented through the applied technologies.

From the point of view of BI techniques, the scope of Business Intelligent Systems (BIS) is also important - they are a set of technologies, applications, and business practices for collecting, integrating, analyzing, and presenting business knowledge and potential business solutions [23]. Their goal is to help business managers make the right business decisions. BIS provide historical and current views, as well as views with forecasting of business operations and business processes. These systems and their service act as an interface between business managers and what is happening in the company and what could happen in the future. In addition to using their own data

stored in data warehouses, cloud storage or other types of storage, companies often use external data sources to get a better idea of the state of the microenvironment in which they are located and the economic situation. The results of this type of analysis can stimulate the development and improvement of commercial organizational strategies and provide them with a key strength regardless of the set time range - short-term, medium-term, or long-term. According to [23], data and knowledge are the main resources of BIS. They are two sides of the information. The data are the specific information about the objects and the environment and are considered as a necessary basis for the application of knowledge. They are the more dynamically changing piece of information. Knowledge sets the relationships and connections between objects and phenomena. They are the more general, relatively constant part of the information and are relatively independent of the specific representatives of certain classes, objects, phenomena, etc. Knowledge comes from experience and through its comprehension and understanding.

3.1. Relevance and role of BI in the activity of retail companies

The types of retail information systems and systems involved in the sales management of FMCG discussed in the previous section have their important role in maintaining the usual commercial activities, tasks, and the accompanying commercial transactions. In recent years, several authors and research companies [7, 24, 25] emphasize the importance of BI for the optimal functioning of the internal business environment of the company while taking into account its structure, processes, employees, systems and limitations in the available resources, as well as the possibility through the application of such technologies for the companies of trade in FMCG to differ from their competitors and to gain unique selling position over them.

In several publications, authors [24, 26, 27, 28] point out that the use of information technology and various corporate systems to support many business processes in companies, incl. in the field of retail, leads to an exponential increase in the amount of data that is processed and stored. Traditional Retail IT systems are effective in collecting data and processing it into information, but their ability to provide fast flexible functionality to generate reports and dashboards to better analyze information and its impact on business is limited [29]. BI is considered by authors [7] as a tool that is necessary for any business organization, regardless of the specific economic sector, to gain a competitive advantage and develop in a dynamic, complex, and competitive business environment, which is particularly characteristic of retail trade. BI provides significant opportunities for a strategic approach to achieve adaptability, a high level of dynamism and flexibility of management to achieve maximum profitability of the organization. Thanks to the application of BI approaches, businesses can initiate forecasting and anticipate the development of a competitive situation by visualizing data in a way that can help manage at a strategic level.

[27, 30] point out that the implementation of BIS or BI module allows retail companies to get a better idea of how effective the applied business strategy for the development of the commercial company is. As a result of the significant amount of data collected through corporate systems, one of the most appropriate strategies for trading companies is to take advantage of all this data that accumulates as a result of day-to-day trading operations in order to make appropriate forecasts for future events, incl. advertising campaigns, customer behavior, search for a specific product category, etc. Authors such as [31] argue that BI manifests itself as a process that allows employees at all levels in an organization to access, interact, and participate in data analysis to discover new opportunities for growth and perform work tasks efficiently.

Business intelligent tools have mechanisms for visualization and presentation of company data in various aspects and can be integrated with external monitoring and control applications to allow managers to view the report according to the current situation. They are usually developed with an adaptive dashboard and configurable functionality to ensure that users see the information they need in the way they need it. Automation or planned reporting of activities performed is also a common feature. Through it, the management staff can process their data correctly in order to get an accurate idea and then proceed to make more informed decisions.

3.2. Applied technologies for BI

The applied **BI technologies** in the retail sale of FMCG are based on the use of decision support tools such as questionnaires, reports, and multidimensional analysis. The information obtained is presented to the user with detailed or summary reports [32]. Varieties of reports range from spreadsheets to a wide variety of charts [33]. BI can be considered as a combination of processes, products, and technological aspects. Important stages that are part of the application of the BI approach in business include the following: collection and storage of data from various sources, their processing and transformation into information and knowledge, analysis, interpretation of generated knowledge to achieve improved solutions. All steps involved in the process are supported and activated by relevant technologies, incl. data warehouses, Online Analytical Processing (OLAP), Knowledge Management Systems (KMS), Decision Support Systems (DSS). The main aspects and stages of BI are presented in Figure 4.
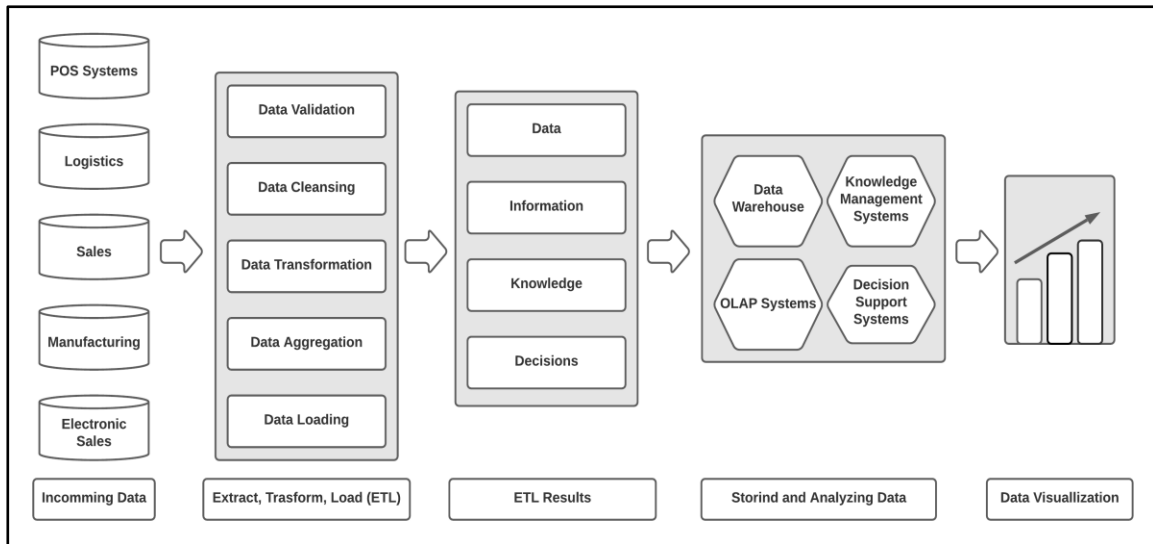
Figure 4. Main aspects and phases determining the BI approach in context of retail [24, 34]

The **key technologies** (shown in Figure 5), on which business intelligence is based, include the following [26]:

The **Data Warehouse** is defined as a repository of electronically stored company data, in which a strict hierarchy is defined, while it is designed to facilitate the creation of reports and analysis. Stored business data is used as a basis for subsequent business intelligent processes. In the context of BI, this also means that data from the data warehouse needs to be involved in operations such as: retrieving, transforming, loading data, creating a business dictionary, etc.
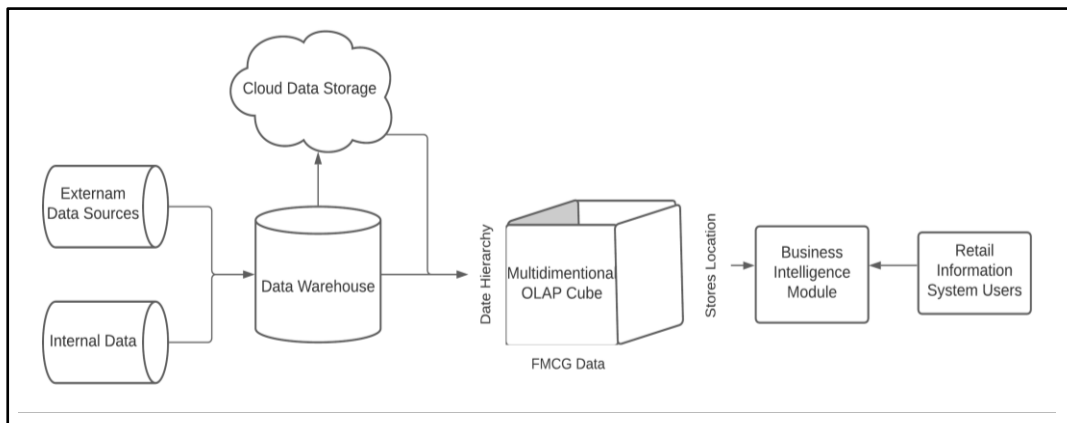

Figure 5. Core technologies involved in BI in RIS

Online Analytical Processing (OLAP) it is an approach for timely delivery of results of analytical queries that are multidimensional in nature. Typical applications of OLAP technologies are in the field of business reporting, related to sales, marketing, report management, business process management, budgeting and forecasting, financial reporting, etc. At the heart of any OLAP system is the concept of an OLAP cube (also called a multidimensional cube or hypercube), which presents various aspects of information related to user FMCG. The cube consists of numerical values called metrics, which are categorized by the given dimensions. Cube metadata is usually created by a star or snowflake scheme in the data warehouse. Metrics are derived from the records in the fact table, and their characteristics are derived from the dimension tables.

Data mining is defined as the process of processing large amounts of data in order to extract hidden +patterns, unknown and potentially useful information from data [35]. BI-related knowledge acquisition is a statistical and logical analysis of large data sets related to transactions in search of patterns and models that can aid decision-making. On Figure. 5 are shown the processes of knowledge extraction that are part of the business intelligent module.

Release и Express Technology is based on a combination of cloud, web, and BI technologies. With the popularity of web applications, business intelligent systems provide web-based services for the transfer of information

and its storage in the cloud space (release). The single repository allows query and reporting tools, especially multidimensional data display tools, to provide a result of user analysis by visualizing the data according to specified criteria (express).

3.3. Importance of BI for the activity of retail trade companies

The importance of BI for sales support in retail is the subject of research by several authors. Emphasis on its contribution to improving the activities and processes of retail trade companies is placed by [8] in the publication "Business Intelligence and Data Mining to Support Sales in Retail", incl. with reference to authors such as [36, 37] in the following 4 areas:

Fast data processing - business intelligent tools can access company data at any time or from any department, perform the function of a data set, participate in the selection of data and their transformation according to specific requirements. At the same time, the speed and data processing capacity are high, and the system is completely protected.

Intelligent analysis of interdependencies - BI technologies use as a basis the mathematical and statistical models implemented in the system and proactively detect and recognize hidden patterns that are used in the development of business rules and provide a ground for future business decisions.

Multidimensional analysis - business intelligence provides opportunities for the preparation of a more complex, combined analysis, which includes the following data characterizing FMCG: goods, brands, manufacturers, suppliers, product category, prices, etc., which creates the basis for construction of a multidimensional data structure.

Results of progressive analysis - in practical terms, through business intelligence it is possible to process and analyze data that are strictly specific to the retail company and also to support the decision-making processes of management. This type of analysis is performed in several automated sequential steps that select a specific area of data. Further enrichment of the results obtained can be achieved by using BI-specific indicators, called: Key Performance Indicators (KPI). They provide an opportunity to assess the current state of the business and to suggest a relevant course of action.

These BI features and related software tools can be very useful for FMCG retail. It is a highly competitive sector and requires the application of business intelligence to develop in the most efficient way possible. The **importance of BI approaches and tools** in the FMCG retail sale can be considered in the following aspects:

- **Improving the efficiency of supply networks for FMCG**

The delivery of goods is a key element of the FMCG supply chain network and by integrating business intelligence the retail business can use additional functionalities such as geo-analysis to unify the supply networks and streamline the process. Among the expected positive results is the reduction of delivery delays, while improving the accuracy of the service provided - the goods are delivered to retail outlets on time.

- **Improving warehouse management**

BI technologies allow for analysis of ongoing retail processes in real time, incl. deliveries of goods and checking the levels of inventories, which facilitates the monitoring of the effectiveness of orders placed with suppliers. This information can be used to improve the overall management of the warehouse.

- **Faster processes in the units involved in the supply chain**

The supply chain is crucial to FMCG's sales management and inventory management processes and is a strong determinant of trade stakeholders. Possible implementation of BI techniques is their integration with inventory tracking systems. To ensure that a product is in stock, its movement and current quantity can be tracked at any stage, and as a result, accurate analysis of FMCG data and subsequent trade decisions can be provided to stakeholders to be based on conclusions, not assumptions.

- **Accumulation of more information for customers**

The analysis of the big data sets related to the users of the FMCG retail chains gives the retailers a detailed picture of their customers and their behavior. Thanks to the trend of creating mobile applications for retail chains and (or) a virtual supermarket for online purchases, tracking purchased products and related information in real time is a completely feasible task. With such valuable data, FMCG companies can customize their approach to marketing campaigns and advertising.

- **Target promotions for customers**

The customer information, summarized and presented by BI, allows to prepare more relevant promotions to the users of the FMCG chain according to their actual wishes, needs and expectations. Customer individual purchase data allows retailers to develop personalized promotional campaigns or discount coupons, resulting in an improved customer experience and expected customer brand loyalty.

The management of FMCG retail can be supported by BI technologies **in the following four aspects**, set out in a report on best practices of The Data Warehousing Institute (TDWI) [38]:

A. Easy access to report and analysis results

A common reason for inaccuracies in company reports is the lack of values or incorrectly filled in or invalid data. Without in-depth knowledge of working with the BI analysis tool, it is possible for system users to direct the problem to IT. This type of action would take a long time, and with it the chance of the report containing inaccurate or distorted data increases. To avoid this, BI provides users with the ability to apply data from external sources when creating reports to allow managers to create the desired reports when needed. This may include the use of unstructured data from various sources, such as emails or social media data. A mechanism is needed to extract and integrate this type of external data and to bring it into a structured and readable form for use in preparing the analysis. The importance of BI can be assessed by the management of the trading company by providing opportunities for efficient, flexible, and interactive reporting and detailed or summarized data visualizations.

B. Easy to use and improved data analysis support

One of the important features of business intelligence tools that can encourage their use by the management of the retail company is their accessible interface. It is not uncommon for managers to lack the technological skills to manage complex software tools, which leads them to use the systems prudently and therefore not take full advantage of their functionality and benefits. Next, it is crucial for BI to have an intuitive layout, functional interface, and easy-to-use options. Among the good practices are simplification of complex processes and their distribution into subtasks. Simplicity accelerates the speed of reporting and analysis, increases efficiency, and enables managers to obtain reliable information from the selected input data.

C. Speed of realization of the reports and ease of their management

Reporting speed and access to reports is also key for BI users. Possible delays in obtaining or compiling the data may lead to a reduction in the quality and accuracy of the report, and ultimately the need for it may be eliminated. To ensure efficient reporting, the business intelligence tool must have a high level of speed and scalability - to support both more common and more complex analytical queries that would use more processing power to process data. large amount of data. It can be implemented in various ways, such as cloud software as a service or Database Management System for analysis. Speed in reporting and analysis increases efficiency by helping to make decisions faster and in a timely manner.

D. Displaying easy to use reports

Reporting is the most important component of BI, as users must be able to read and understand a report to derive added value from it. Without a clear presentation of the data set, it is possible for sales managers to reach the wrong conclusion, as well as to recommend activities that have an adverse impact on the business. For this reason, it is good that the data is presented unambiguously, with appropriate graphics, correct color scheme such as traffic lights (red, yellow, green), buttons for filtering data, using interactive maps to represent different locations, using charts for comparison of current with past periods.

Along with all the strengths of BI, there are possible risks that make companies wary of this type of implementation. First, the possible security vulnerabilities and the leakage of company data can be pointed out. For this reason, BI supplier companies are working to increase the level of protection and security. It is possible that the analysis of different data sources may indicate a challenge for BI due to their different structure and poor data quality. To avoid such inconveniences, BI software companies are developing products by offering new functionalities to incorporate different types of data sources and improve their quality.

4. Conclusion and Future Work

Main feature of retail trade, including with FMCG, represents the variety of activities, diverse business processes, operations, trade transactions and related data. Retail companies perform many tasks, divided into several areas, among which the main research emphasis is placed on value-added tasks. These include goods management, goods ordering, customer service, goods logistic, goods transportation, financial and accounting tasks. Their digitalization is performed with the help of two large groups of systems - Retail Information Systems and Enterprise systems.

RIS are a specific type of systems that can be defined as basic for retail companies and specifically with FMCG. In recent years, in connection with the intensive changes in both business processes and the volume of data with which retail companies work, the possibilities for application of the BI approach stand out in addition to the active application of ICT and digitalization in the retail sector. The current study outlined the stages that are part of the application of BI approaches, including the accumulation and storage of data from various sources, their processing and transformation into information, knowledge, analysis, interpretation of generated knowledge to make advanced decisions. Applied BI technologies include Data Warehouse, OLAP, KMS, DSS, etc. The main aspects for improving retail companies' internal activities and related processes are described, based on the presented BI techniques including accelerated data processing, intelligent interdependence analysis, multidimensional analysis, and others.

Summarizing the considered aspects for the application of business intelligent technologies in the FMCG retail trade we can point out that their importance as a key element for improving the commercial business processes and the efficiency of the companies is perceived as a real opportunity and priority by the trade representative's business. Evidence of this is the survey of IT directors of the leading business analysis company Gartner for 2021 (2021 Gartner CIO Survey) [5], showing that 63% of retailers are expected to invest in the following years in the application of BI technologies and data analysis in order to detect hidden dependencies.

The scope of future research interests includes the development of a graphical model of a business intelligent module for managing orders to suppliers. It is planned to use visual methods, using the Unified Modeling Language (UML) standard, to create various diagrams, graphically reproducing many aspects of the functionality of Retail Information Systems, as well as to develop a number of submodules involved in the model of business intelligent module for managing suppliers' orders in a retail chain.

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