



## THE IMPACT OF INTERNET OF THINGS TECHNOLOGIES ON OPTIMIZING THE FINANCIAL REPORTING PROCESS

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### Abstract

In recent years, IoT has begun to play an increasingly significant role in accounting, changing the way companies collect, process and report financial information. In this article, we'll look at how IoT is impacting accounting and what benefits and challenges it poses for businesses. The use of IoT in accounting promises to revolutionize the way data on companies' financial performance is collected, analyzed and displayed.

**Keywords:** Internet of Things (IoT), financial reporting, intellectualization, automation, data collection, data analysis, increasing accuracy, process optimization, information security, financial accounting efficiency.

### Introduction

In the modern world, business processes are permeated with digital technologies, introducing new methods and methods of management. Internet of Things (IoT) technologies do not stand aside and find their application in various fields of activity, including accounting and corporate finance.

The Internet of Things is a technological revolution that is permeating various aspects of our daily lives, including business processes and the financial sector. The technological process of data processing using the Internet of Things (IoT) is a chain of operations, starting from collecting information from devices, transmitting data through the network, and ending with its analysis and use for decision making.





### **Analysis of literature on the research topic**

The article by Ilyasov I. “Application of the Internet of Things (IoT) in financial systems and its impact on digitalization” analyzes the main technologies underlying IoT, their advantages and potential applications in the financial sector. Examples of the use of IoT in various sectors of the economy are considered, as well as the possible impact on the efficiency and competitiveness of organizations. Karimov B. & Mirzaakhmedov D in their study IoT Based home assistant monitoring renewable energies provide examples of using MQTT (Message Queuing Telemetry Transport) technology for communication between various IoT-based components. Article Safarov F., Basak M., Nasimov R., Abdusalomov A.; Cho, Y.I. “Explainable Lightweight Block Attention Module Framework for Network-Based IoT Attack Detection” is dedicated to providing reliable cybersecurity measures in IoT-based systems. The model proposed by the authors can accurately identify and classify DoS and DDoS attacks, strengthening the cybersecurity protection of websites and servers. As a result, the system promises to strengthen cybersecurity measures in real-world scenarios, contributing to ongoing efforts to protect against cyber threats in an increasingly interconnected digital landscape.

### **Research Methodology**

Our research used methods such as a literature review and a case study from the company's practice. Current scientific articles and other research on the topic of IoT in finance were analyzed. This method helped to understand current trends, problems and prospects for the development of this field. In addition, one case study from industrial practice is presented. Studying the experience of a company in Uzbekistan that is already using IoT technologies in its financial activities. The case analysis allowed us to identify successful implementation strategies, advantages and limitations faced by enterprises.

### **Analysis and Results**

Let's consider one of the practices of using Internet of Things technology using the example of one industrial company in Uzbekistan. Dilight LLC is one of the leading lighting manufacturing companies in Uzbekistan, which uses IoT technologies to improve the accounting reporting process.

Case: Optimization of accounting and reporting using IoT in a manufacturing company.

Situation: A company specializing in the production of lighting fixtures faces a number of problems in accounting and reporting. Tracking inventory, energy costs, equipment





maintenance, and monitoring compliance with safety regulations are important aspects of financial accounting [4].

Figure 1 shows the areas of application of Internet of Things tools:

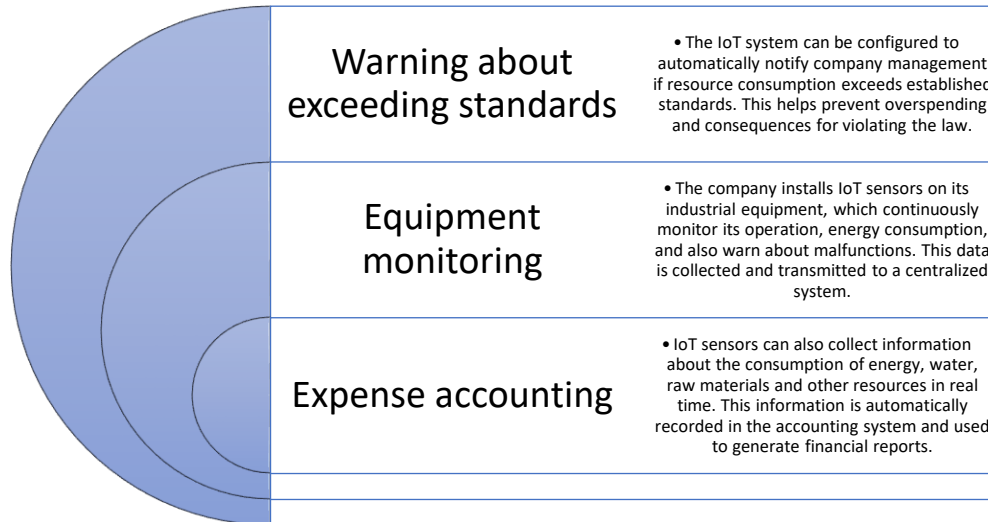


Fig. 1. Application of IoT in the company

- As a result of the use of Internet of Things technologies, as can be seen from Figure 1, the company achieves the following advantages:
- Automation of accounting and reporting processes reduces the human factor and the possibility of errors.
- More accurate tracking of expenses and resources allows the company to optimize its activities and reduce costs.
- Improved equipment monitoring helps prevent downtime and increase production efficiency.

Thus, the use of IoT technologies in accounting helps a company not only improve the efficiency of its operations, but also ensure more accurate and reliable financial management.

Let's analyze how information is processed in the system based on the use of IoT tools. The following Figure 2 shows a flow chart of data processing using IoT tools. Let's take a closer look at each stage.

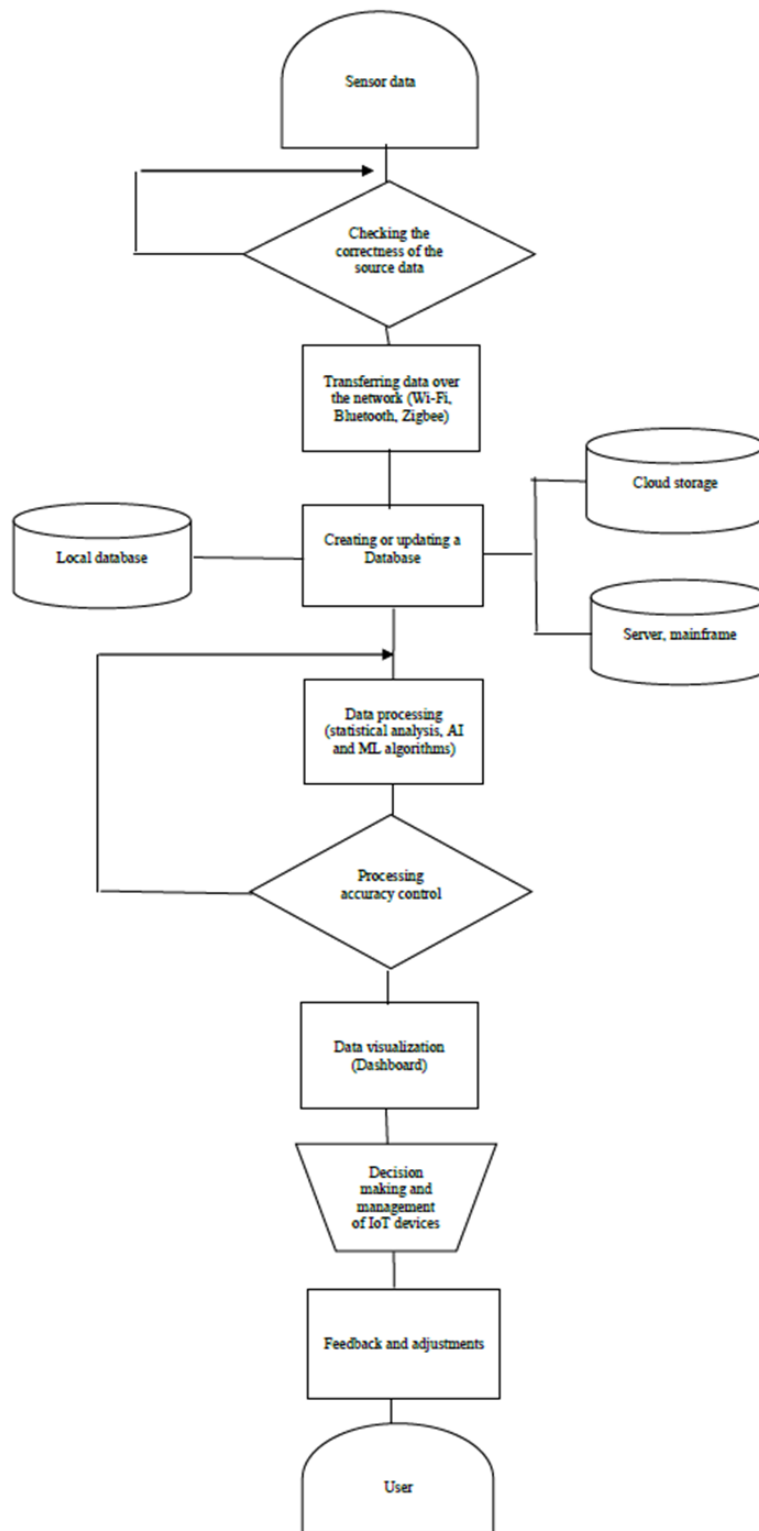


Fig.2. Data processing flow diagram



### **Data Collection:**

One of the key benefits of IoT for accounting is the ability to collect data automatically. With the help of sensors, readers, and other IoT technologies, companies can continuously monitor various aspects of their operations, such as inventory, equipment, transportation, etc.

Devices connected to the Internet of Things collect data from the environment or from their sensors. This data may include information about temperature, humidity, light, position, movement and more, depending on the type of device and its purpose.

**Control of the correctness of the source data:** Control operations are aimed at detecting and preventing errors in the source data. Control of primary information can be performed by comparing the details being checked with a range of specified values, for compliance with the specified bit depth of the details, etc.

The collected and recorded information is transferred to the next stage for processing and storage.

**Data transmission:** Collected data is transmitted via the Internet or local wireless network (Wi-Fi, Bluetooth, Zigbee) to servers for further processing and analysis.

The transmission of information is due to the multicast need for it. Data also has to be transmitted due to the fact that different, interconnected information procedures are carried out in different places [3]. Data has to be transmitted due to the remoteness of control objects from the means of issuing and displaying the resultant information, therefore the use of the Internet of Things is the most effective use.

**Data Storage:** Scalable databases are required to efficiently store and process the volume of data collected from IoT devices. Such data often includes telemetry from sensors, equipment logs, performance metrics, fault data, and more. They are characterized by large volume and high flow rate.

To solve this problem, NoSQL databases or time series databases are excellent choices. NoSQL databases provide a flexible data model and horizontal scalability that allows you to efficiently process large data. Time series databases, on the other hand, specialize in storing and processing temporal data, which is ideal for manufacturing IoT data.

Cloud platforms now offer virtually unlimited, scalable storage for IoT data, including the ability to process streaming data in real time. Cloud solutions provide convenient tools for pre-processing, storing and analyzing IoT data, allowing professional writers to focus on the creative process and effectively use this data in their work.





The resulting data can be stored on remote servers, in the cloud or in local storage, depending on security, availability and scalability requirements. To understand how to properly store data, you need to determine how the data will be used. Do you need online access? How long is needed to store this data? Those. The location and method of data storage will be determined by the scale of the system.

**Data Processing and Analysis:** Various processing techniques are used to analyze and interpret data, including statistical analyses, machine learning, artificial intelligence and other algorithms [7]. IoT platforms process and analyze data and manage connected devices in real time. Data processing and analysis is only part of what platforms can do. In addition, the IoT platform integrates data collected from various IoT networks with data from production systems and enterprise applications in a centralized repository.

Growing the Internet of Things beyond basic network connectivity requires the use of analytics to make better decisions, increase efficiency, reduce costs, and create innovative products and services with advanced data collection capabilities. Describing, diagnosing, and predicting with analytics can reveal important patterns and trends that would otherwise remain invisible. This allows organizations to optimize their operations, increase productivity, proactively predict problems, minimize downtime and meet customer needs. As a result, the presence of a strong analytical base transforms the Internet of Things from a reactive system into a predictive one, allowing management decisions to be made based on data across all functions. Thus, investing in the development of scalable analytics and skilled people to analyze IoT data can give a business a significant competitive advantage.

Integrating remote monitoring capabilities into IoT data analytics provides organizations with the ability to effectively extract actionable insights from their data streams and gain maximum value. Processed IoT data can be analyzed to provide actionable insights that will help organizations make informed decisions and improve their business processes. Remote monitoring capabilities enable organizations to monitor equipment health, monitor production quality, optimize energy consumption, and anticipate and prevent potential problems, increasing operational efficiency and reducing costs. In addition, the remote monitoring process allows you to receive data in real time, which ensures a quick response to changes and the ability to make relevant decisions. Combined with IoT data analytics, remote monitoring enables organizations to more effectively manage their resources, improve energy efficiency and product quality, and improve customer interactions.





**Data visualization:** The results of data analysis can be presented in an easy-to-read form. Data from IoT sensors can be presented in the form of graphs or charts, making it easy to perceive changes over time or in various parameters. Heat maps can be used to visualize the spatial distribution of data. Interactive dashboards can be created to display various parameters and allow users to interact with the data, such as changing the time interval, filtering data by certain criteria, or viewing detailed information. Creating dashboards and reports allows the user to quickly get an overview of the state of a system or process based on IoT data. Dashboards can contain multiple graphs, charts, and other visual elements to summarize key information. Sometimes IoT data visualization can be enhanced with animation and visual effects to make the information more engaging and understandable.

Using various IoT data visualization tools allows you to not only better understand the data collected, but also make more informed decisions based on that data.

**Decision making and management:** Based on data analysis, decisions are made and management of IoT devices is carried out. IoT devices can be used to continuously monitor the health of equipment and environments. For example, sensors on industrial machines can collect data about manufacturing processes and equipment health, allowing operators to make decisions about preventing failures and optimizing production efficiency, and can also include automatic regulation of heating and air conditioning systems, optimization of manufacturing processes, and much more.

Decision making and management rely on analyzing data from IoT devices and using machine learning, artificial intelligence, and other technologies to identify patterns, predict events, and take appropriate action.

**Feedback and adjustment:** The results of decisions made can influence future data collection and analysis, allowing the system to improve its efficiency and accuracy over time.

Operators or systems can make decisions based on feedback received from notifications and alerts, as well as analysis of the current situation. In response to feedback data, systems can automatically adjust operating parameters, including IoT device settings, to prevent problems or optimize processes. Feedback data can be used to improve algorithms and models used to analyze IoT data, allowing systems to become more efficient and accurate in the future.

The process of feedback and adjustment of data processing using IoT technologies will allow systems to quickly respond to changes in the environment and operating





conditions, prevent problems and improve overall efficiency. This is especially important in the context of critical systems such as production lines.

### **Conclusion and prospects for using Internet of Things technologies**

The use of IoT in accounting also improves the accuracy and reliability of data. Unlike manual information entry, which is prone to errors and delays, data collected through IoT devices is typically more accurate and available in real time. IoT sensors installed on production equipment can automatically transmit data about its operation, including the quantity of products produced, time delays and resource costs. This allows finance staff to receive up-to-date information to prepare financial reports and analyze business processes.

The implementation of IoT opens up new opportunities for data analysis and forecasting in accounting and financial reporting. By collecting information about production processes, energy costs, resource use, and customer behavior, companies can use analytics to identify trends, determine operational efficiency, and make strategic decisions.

However, the introduction of IoT into accounting also poses some threats in the area of data security and privacy. Since a large amount of information is transmitted over the network, there is a risk of confidential data leakage or cyber-attacks.

Therefore, companies must pay special attention to protecting their systems and data by using modern encryption methods, authentication mechanisms and security monitoring systems.

The Internet of Things is playing an increasingly important role in accounting reporting, providing companies with new opportunities to automate processes, improve data accuracy and enhance analytical capabilities. The development and application of IoT will continue to change paradigms in the financial world, opening up new opportunities for business growth and development.

IoT analytics unlocks the enormous potential value of IoT device data that otherwise remains untapped. By collecting, storing, processing and analyzing massive volumes of streaming sensor data, businesses can accelerate digital transformation through improved operational efficiencies, lower costs, increased productivity, new data-driven services and overall smarter decision making across the business. Data experts who understand key business drivers are critical to providing insights tailored to different industry domains.

The key is to move beyond just connectivity and infrastructure, investing in scalable analytics platforms to analyze data both in real time and over the long term. This enables businesses to move from reactive to proactive data-driven decisions across all







areas of their operations. Applying the right analytics techniques transforms raw IoT data into meaningful information that creates a competitive advantage for business growth.

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