Module 1, Session 5

Slide 1 Introduction to MODULE 1

The topics to be discussed are food waste, demand, and inventory management. This key area allows food and retail companies to minimize waste, optimize costs, and provide superior service. Special emphasis will be placed on modern technological tools to support ordering processes and process automation.

Slide 2 – Session 5

Today's tools, such as online ordering platforms, mobile apps, and chatbots, allow for streamlining the food and service ordering process. Examples include in-app ordering, automated email confirmations, or artificial intelligence-based solutions that tailor proposals to individual customer needs.

Slide 3 - Basic concepts

Technology is divided into three levels of sophistication: high, medium, and low, along with their characteristics.

High technology is fully or almost fully automated and intelligent solutions. It is characterized by the ability to handle increasingly precise processes using advanced mechanisms and powerful forces.

Medium technology is partially automated and intelligent. It typically manipulates more sophisticated materials and uses medium levels of force, combining automation with elements requiring human intervention.

Low-tech are labor-intensive processes that require direct contact with large amounts of material and weak forces. They are less automated and more dependent on manual labor.

This division helps better understand the level of technological advancement in different fields and determine where it is worth investing in automation development.

Slide 4 - Digital solutions

Digitization in food ordering solves many problems associated with traditional methods, such as double bookings, human error, and inefficient order management. In addition, it allows for better cost control, increases order accuracy, and improves the customer experience. Software engineering plays a key role here, providing functional and easy-to-use applications for any user.

Slide 5 - Technology Tools

The slide provides an overview of technology tools supporting modern food service and hospitality processes. These tools can be divided into four main categories.

The first category is online ordering. It includes:

- Restaurant websites with built-in ordering modules,
- Delivery and ordering platforms, such as Uber Eats or Wolt,
- Table reservation systems,

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- Social media ordering integrations that make it easier to reach customers and place orders.

The second category is self-service. In this group, we find:
- Self-service kiosks,
- Mobile apps with payment and ordering functions,
- Tablets on tables that allow you to place orders directly from your seat,
- Automatic vending machines that provide quick access to products.

The third category is service automation. It includes:
- Chatbots in apps and on websites,
- Virtual assistants that help communicate with customers,
- Robots to support logistics and service processes,
- Artificial intelligence for product recommendations, and
- Virtual and augmented reality that creates new experiences for customers.

The fourth category is operations management and integration. This group includes:
- POS and hotel systems (PMS),
- AI for demand forecasting that optimizes purchasing processes,
- Automated invoicing and payment tools,
- Analytics and personalization that help tailor offerings to customer preferences.

Together, these tools create an ecosystem that improves operational efficiency, enhances service quality, and tailors services to meet the needs of today's customers.

Slide 6 - Self-service tools

Self-service tools support customer self-service. They allow customers to order food, book tables, or check into a hotel without needing staff.

Their great advantage is speed of service—they reduce order processing time, enabling simultaneous service to multiple customers in real time.

With a clearly defined process, such as through touchscreen interfaces, these tools minimize human error, significantly improving service quality.

Intuitive interfaces make use simple and convenient, even for those with limited knowledge of technology. They often offer support in several languages, making them more accessible.

Slide 7 - Self-service tools

Another perk is the ability to personalize orders—customers can change meal ingredients or add additional options.

For convenience, self-service tools are integrated with various payment methods, including cards and mobile wallets such as Apple Pay and Google Pay.

Such systems' 24/7 availability allows customers to use services at any time, whether through kiosks, apps, or websites.

Moreover, they increase operational efficiency, relieving the burden on employees and allowing them to focus on other tasks.

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Slide 8 - Self-service tools

With multichannel support, these tools can take various forms—kiosks, tablets on tables, mobile apps, or vending machines.
They also have the potential for upselling and cross-selling, suggesting additional products or services, which can increase the value of an order, such as offering a dessert as an add-on.
Integration with operational systems, such as POS, CRM, and warehouse systems, ensures that product and service availability is kept up to date.
Self-service tools are versatile and are used in industries ranging from food service and hospitality to entertainment and retail.
They also contribute to reducing operating costs by reducing the need for a large number of employees.
With the ability to track and analyze data, they record customer preferences, allowing them to optimize their offerings and processes.
Finally, it is worth noting that these tools adapt to modern customer expectations, providing convenience, speed, and a modern shopping experience, which is particularly appreciated by younger generations.
In conclusion, self-service tools benefit both customers and businesses by improving operational efficiency and service quality.

Slide 9 - Online ordering tools

Online ordering tools provide accessibility via the internet, allowing customers to place orders via websites, mobile apps, and even social media platforms.
They also offer the option to customize offerings, allowing you to personalize your order by choosing toppings, removing ingredients, or customizing portions.
They are versatile and support different types of orders—from delivery to take-out to table reservations or food ordered on the spot before arrival.
Another advantage is that these tools increase the visibility of your offerings. By integrating with popular platforms such as Uber Eats or Wolt, restaurants, and hotels can reach a much larger number of customers.
The ease of use is also worth highlighting. With a simple and intuitive interface, orders can be placed quickly and conveniently, even if someone doesn't have much experience with technology.

Slide 10 - Online ordering tools

Another advantage of online payment options is that they support a variety of methods, such as credit cards, PayPal, Apple Pay, Google Pay, or BLIK, making the payment process significantly easier.
These tools often offer an order scheduling feature, so customers can schedule orders for a specific time - especially useful for group bookings or events.
Order notifications and tracking allow customers to monitor the status of their orders in real time through SMS, email, or in-app notifications.

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Automatic confirmations, on the other hand, eliminate the need for manual contact with service, which significantly speeds up the entire process.
The tools integrate with POS and logistics systems, enabling the automatic transfer of orders to the kitchen, inventory management, and delivery coordination.

Slide 11 - Online ordering tools

With customer data analytics, companies can better understand their customers' preferences, customize offers, and target promotions more effectively.
They also support promotions and loyalty programs, allowing them to implement discounts, promo codes, and points systems, which increase customer engagement.
Their multichannel availability allows orders through various channels - from dedicated apps to social media- increasing user convenience.
What's more, these tools have a global reach. Translations and international payment options allow them to reach tourists and customers outside the local market.
They also eliminate the problem of queues - they allow orders to be placed without physical waiting, significantly improving the customer experience.
Finally, their operational support is worth highlighting. They optimize ordering processes and reduce staff workload, allowing the team to focus on other important aspects of service.

Slides 12- Customer service automation

Customer service automation is based on AI technologies. Systems, such as chatbots or virtual assistants, answer customer questions and process orders quickly and efficiently.
One key advantage is real-time service—customers can get answers to their questions and place orders immediately without having to wait.
Another benefit is reducing staff workload—automating simple, repetitive tasks allows teams to focus on more complex issues and serve demanding customers.
The tools provide multichannel support, integrating with email, websites, mobile apps, social media such as Messenger and WhatsApp, and phone-based service systems.
Data analysis allows personalizing communications - the systems offer personalized recommendations and responses tailored to individual customer preferences.
One of the biggest advantages is 24/7 availability - automated solutions operate around the clock, increasing service availability and improving the customer experience.
Multi-language support enables communication with customers from different countries, which is particularly useful in tourism and international trade industries.
By standardizing processes, automation eliminates human error, improving service quality.

Slides 13 - Customer service automation

It is also an extremely scalable solution, allowing multiple customers to be served simultaneously without increasing the number of employees.

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Features such as recommendations and upselling allow you to suggest additional products or services, increasing order value.
The tools also offer automatic updates, informing customers of real-time order status, reservations, or changes in offerings.
These tools streamline operations and reporting by easily integrating with other systems such as CRM, PMS, and POS.
Customer service automation also reduces operating costs by reducing expenses for hiring and training staff.
It also ensures a consistently high level of service, leading to improved service quality and higher customer satisfaction.
Through analytics and reporting, companies can collect data on customer preferences and service performance, allowing them to optimize processes.
A final important feature is support for voice systems, such as Amazon Alexa, Google Assistant, and Siri, which allow orders to be handled by voice.

Slide 14 - Operations and integration management systems

Operations management and integration systems play a key role in modern business processes.
For starters - these systems offer support for back-office processes. They automate and streamline activities such as order taking, inventory management, and payment finalization, significantly increasing operational efficiency.
One of their main advantages is integration with other systems. They can be linked to hotel management systems (PMS), point-of-sale (POS), and warehouse or logistics systems, ensuring seamless data exchange across the organization.
Another important feature is advanced reporting and analysis. They generate detailed reports on operational performance, customer preferences, sales results, and market trends, supporting strategic decision-making.
These systems centralize the management of orders from different channels, such as online orders, offline orders, and mobile applications. This makes work organization more organized and transparent.
Another aspect is handling payments and invoicing—these systems allow automatic invoicing and payment processing by various methods, including cards, mobile wallets, or wire transfers.
They also allow for the optimization of operations. Monitoring processes such as preparing orders, managing deliveries, or scheduling staff shifts helps improve efficiency and minimize costs.
Artificial intelligence algorithms allow demand forecasting. Analyzing historical data makes it possible to predict inventory needs, sales, or team scheduling.

Slide 15 Operations and integration management systems

An important component is inventory management, which makes it easy to control stock levels and automatically place orders for missing products.

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The systems are also scalable - they can be tailored to meet the needs of small and large enterprises, making them versatile tools.
They also support multiple locations, simultaneously allowing central operations management at different points of sale or locations.
Automating processes reduces operational costs, errors, and the cost of managing operations.
It also increases labor efficiency, as integrated tools enable staff to process orders faster and more efficiently.
Data security is important, and it is provided by built-in protection systems, such as payment encryption, and compliance with regulations such as RODO or PCI DSS.
Personalization and customer service are other benefits - CRM systems allow customization of services based on collected data.
Compatibility with mobile devices means operations can be managed from anywhere via apps.
For international companies, multilingual and multi-currency features are important for handling visitors from different countries.
Examples of such systems are:
- POS systems
- Hotel systems
- Invoicing and payment systems
- Analytical systems
- AI for demand forecasting

These systems are key to effectively managing operations, improving customer experience, and increasing business profitability.

Slide 16 Restaurant chatbot

The chatbot offers a wide range of services. First, it allows customers to order food and track its status—they can easily check what stage their order is at.
It also offers an FAQ function, which provides information about available customer service options, such as opening hours or offer details.
The chatbot also allows you to make reservations, which is extremely convenient for both individual customers and groups.
Another feature is to provide food quality control procedures and take feedback on previous deliveries. This allows restaurants to continuously improve the quality of their services.
Chatbots can find patterns and similarities to understand customer preferences better.
In addition, it can compare customers' preferred choices with other proposals, offering the most relevant recommendations.
Finally, it is worth noting that the chatbot analyzes order history and customer feedback to provide the most customized meals tailored to individual tastes and needs.

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With such features, the restaurant chatbot improves the quality of service, increases customer satisfaction, and streamlines operational processes.

Slide 17 Artificial Intelligence market

According to forecasts, the size of the artificial intelligence market in the food and beverage industry will reach $9.68 billion in 2024 and grow to an impressive $48.99 billion by 2029. This implies a compound annual growth rate of 38.30% over the period under review.

Such rapid growth is driven by consumers' changing needs, who expect fast, affordable, and easily accessible food options.

In response to these trends, major companies in the food industry are increasingly turning to artificial intelligence-based solutions. These technologies can improve various aspects of production and distribution processes, helping to increase efficiency and better tailor offerings to customers' needs.

Artificial intelligence is becoming a key element in the future of the food and beverage industry, accelerating its development and adaptation to market expectations.

Learn more about the AI market in the link:

https://www.youtube.com/watch?v=g1cr2wayJZI

Slide 18 Artificial intelligence market

According to forecasts, the chatbot market is expected to be worth $7.01 billion in 2024 and grow to an impressive $20.81 billion by 2029. This represents rapid growth with a compound annual growth rate (CAGR) of 24.32%.

This growth is fueled by two key factors: the growing demand for instant messaging applications and the adoption of consumer analytics, which demonstrate chatbots' important role in the digital world.

Moreover, chatbots, especially those specialized in food ordering, are becoming an integral part of modern digital and retail landscapes, supporting the growth of both companies and their customer relationships.

The chatbot market has an exciting future, responding to changing consumer needs and adapting to modern technological realities.

Slide 19 Projected chatbot market growth rate by region until 2029

The map shows regions marked in darker colors, such as Asia, with high growth rates. Dynamic growth in these areas is driven by large populations, growing use of digital technologies, and a rapidly expanding e-commerce market.

Regions marked with lighter shades, such as Europe and North America, indicate medium growth, driven by the maturity of the markets and the widespread adoption of chatbots in various industries, such as retail, financial services, and hospitality.

In contrast, regions marked with the brightest color show lower growth rates, which may be due to technological limitations or lower innovation adoption.

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In conclusion, the chatbot market is growing at different rates depending on the region, but its growth potential remains global and promising.

Slide 20 Using mobile apps related to food waste

The use of mobile apps to reduce food waste is linked to several important factors. On the one hand, they are influenced by consumer behavior toward food waste, including food neophobia (a reluctance to try new or unusual foods), moral attitudes toward waste, and knowledge about food preservation and storage. People who are more aware of these areas are more likely to use such apps.

On the other hand, willingness to use mobile apps is driven by factors related to the perceived value of the tool itself. Key among these is perceived usefulness, which is how helpful the app is perceived to be in daily life and in reducing waste.

Perceived ease of use - whether the app is easy to use, intuitive, and accessible to users of different technology skill levels.

Perceived risk is related to concerns about using the app, such as data protection or the risk of app errors.

These elements together influence consumers' decisions to use mobile apps that support a more sustainable approach to food and reduce food waste.

Slide 21 - Active food waste mobile apps by year of foundation

An analysis of the number of active mobile apps that reduce food waste over the years shows that the number has fluctuated significantly. In 2011, there were 5 apps of this type, but already in 2012, the number dropped to 2. This was followed by a rapid increase—in 2013, the number of apps reached 8, reaching a maximum in 2014-2015, when there were 11 apps each.

After 2015, interest in setting up new apps of this kind markedly declined. In 2017, the number of active apps dropped to 7, and in 2019, it dropped even further—to 5.

The data shows that the development of food waste-related apps reached its peak in the middle of the previous decade, after which the trend slowed down. The COVID-19 pandemic caused this.

Slide 22 - Mobile applications in the food supply chain

Mobile applications to support the food supply chain are being developed worldwide, but their distribution varies by region.

Two apps have been identified in the African region - one each in Ghana and South Africa. There are four applications in Asia. The largest number is in India (2), and one each in Singapore and South Korea. Europe leads the way regarding the number of apps, totaling 37. The highest number of apps was recorded in Italy (10), followed by Germany (7) and France (6). Other countries such as the Netherlands, Spain, Sweden, Switzerland, the UK, and Norway also have single apps. In the North American region, 15 apps have been registered. Most operate in the US (12), with the remainder in Canada (3). Only one app was recorded in South America, in Brazil.

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Europe leads the way in the number of apps supporting the food supply chain, accounting for more than half of all apps worldwide.

Slide 23 - Examples of mobile apps for saving food

Today's mobile apps play a key role in reducing food waste, offering users a variety of functions such as managing products in the refrigerator, donating surplus food, or buying food at discounted prices. Some examples of such applications are presented below:

1. Too Good To Go - one of the most popular apps that allows users to buy surplus food from restaurants, bakeries, and stores at discounted prices while reducing waste.
2. Eco dal Frigo is an app that helps users manage food products in the refrigerator and reminds them of their expiration dates.
3. Eat You Later - a platform to find and purchase food nearing its expiration date at attractive prices.
4. No Food Waste - an application that focuses on distributing surplus food to those in need while reducing waste in the supply chain.
5. Bring the Food is a tool that supports the donation of surplus food, both on an individual and organizational level, to local communities.
6. Regusto - an app that enables purchasing surplus food from producers and retailers, reducing waste and promoting sustainability.

Each app reduces food waste at various stages of food use and distribution, encouraging a more responsible approach to resources.

Slide 24 – Thank you!

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