

**Seminar Paper Presentation**  
**Critical Evaluation of Prices in the Information Technology Age:  
History, Features and Critical Comparison of Market/Value  
Based, Cost Based and Arbitrary Prices**

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# Evolution of Marketing and Pricing Strategies



In the beginning of the 20th century considered as an art



Marketing as a science from the 1950s

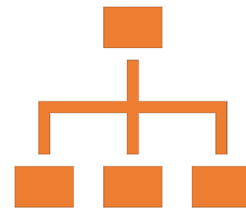


In the 1920s, 4 P's of Marketing Mix introduced



Until the 1970s, the market competitors utilized advertisement and branding only

# Evolution of Marketing and Pricing Strategies



Optimal Marketing Mix for the company decided by the upper-management, mostly by CEO



At the start of the twentieth century, additional marketing factors were developed: People, Performance, Psychodynamics, Pace, and Packaging

# Power of Branding



Utilized from the 1970s



Lowest risk when compared to other marketing alternatives



Especially important for the service-providing companies



Consumers relate branded products with higher exclusivity, and with consistent performance



Companies should invest in product branding to improve company's image

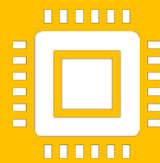
# Importance of Product Placement and Packaging on the End-Price



Both have significant influence on the price



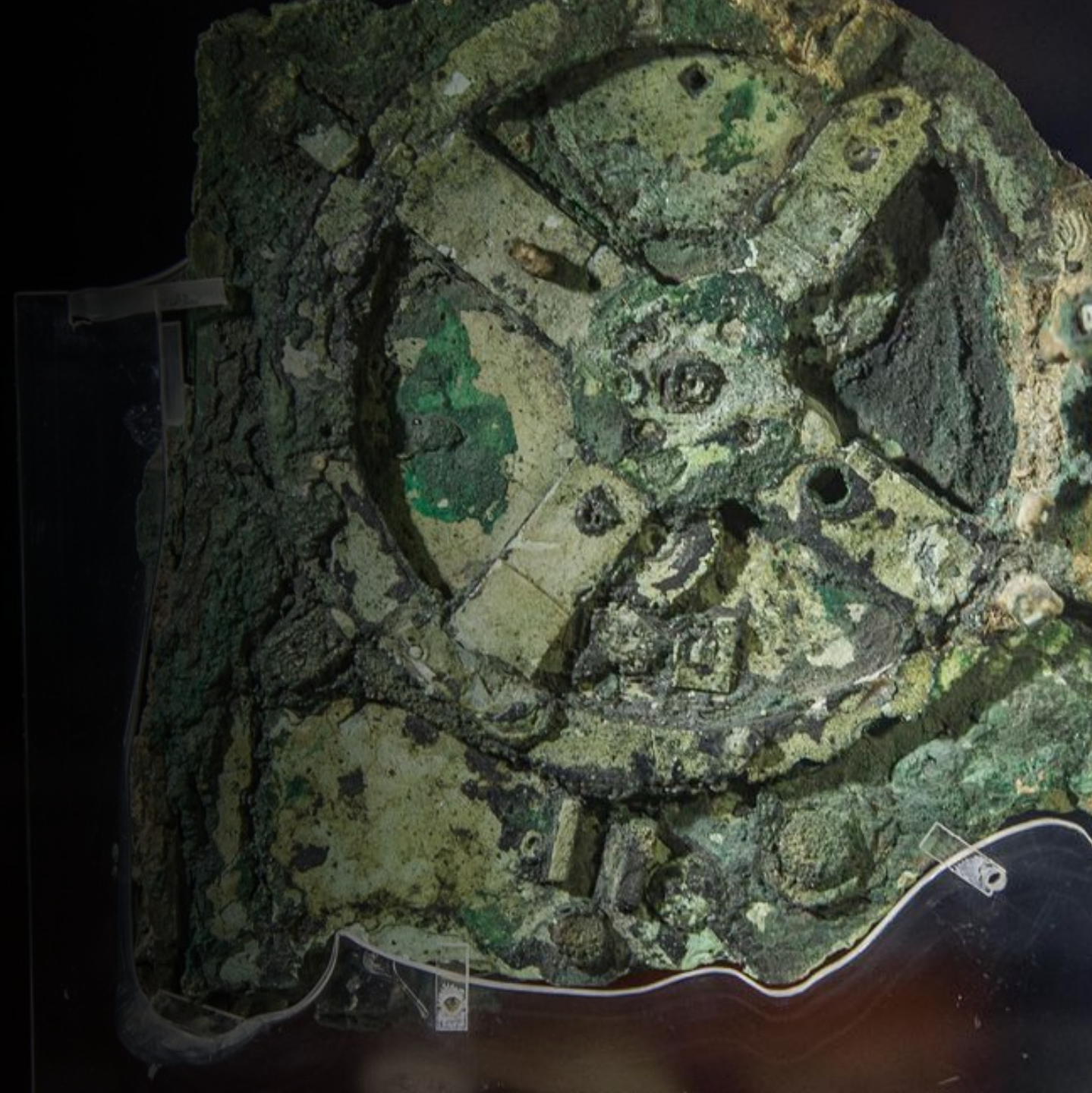
Consumers' willingness to pay at the moment of purchase can be higher due to product placement and product packaging



Information technology advancement enabled for RFID chips, thus lowering the production, distribution, and storage costs

## Development of the Information Technology

- Until the 20th century, computing referred to the human processing the necessary information
- Clay tablets firstly used to spread the informations
- First mechanical analog computer (Antikythera mechanism)
- Information technology advancements stagnated until the 16th century



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- First mechanical calculator was invented in 1645, capable of processing four arithmetical equations
  - However, the first mass-produced calculator was introduced in 1820
  - In the 19th century, even the most advanced devices were analog
  - Based on the wheel-and-disc integrator
  - Provided a base for the research of the electronic devices





## Punched Card Data Storage System

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- Invented at the end of the 19th century as the storage medium
- Further developed as a necessity for the U.S. Statistic's Department
- Consequently, Tabulating Machine was developed
- The punched card data system stayed the most utilized data transportation and data storage medium until the 1950s





# Zuse Z3 and Colossus

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- During the 1940s, the transition from the electromechanical to electronic computation occurred
- Introduction of the world's first programmable computer, Zuse Z3
- In the same decade, Colossus, the first electronic digital computer was introduced
- Both computers were unable to store their programs internally, and were designed to perform a single task

# SSEM and Ferranti Mark 1

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- In 1948, SSEM, the first computer with internal storage capacity was developed
- Thereafter, Ferranti Mark 1, the first general purpose computer with both primary and secondary storage capabilities became commercially available

# The Second Generation of Computers

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- The second generation computers had transistors replacing traditional vacuum tubes
- Transistors were significantly faster, tinier, produced less heat, and required less power. Moreover, transistors lowered the cost, the size, and operational costs of running the computer
- The Atlas, the world's first supercomputer, was finished and operational by 1962. The Atlas presented the pinnacle of the second generation computers

# The Third and Fourth Generation Computers

- The third generation of computers were developed during the mid-1960s
- The major innovation responsible for this technological progress was the integrated circuit. IC allowed for the smaller devices, available to the broader audience
- Finally, the fourth generation of computers is marked by microprocessors
- In 1971, Intel developed Intel 4004 (4-bit) and Intel 8008 (8-bit)
- Intel 4004 had just over 4000 transistors, while today's modern microprocessors possess 10 to 50 billion
- Even today, Moore's law serves as the guideline and measurement of the success for the microprocessor developers



# Market/Value Based Pricing

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- The price is set according to competitors
- Utilized mostly in the highly competitive markets
- To determine the market-based price, the product's production costs, market factor price, and additionally, product premium should be added
- However, pricing policies usually depend on competitors' actions, and therefore, neglect the consumer demand
- Starbucks uses Market/Value based pricing to increase the profit margins. By processing the consumer data, Starbucks determines the highest price the consumer is willing to pay



# Cost-Based Pricing



Cost-based pricing is aimed towards covering the total product cost and towards achieving a substantial profit margin



Even though it achieves the smaller profit margins, larger total revenue



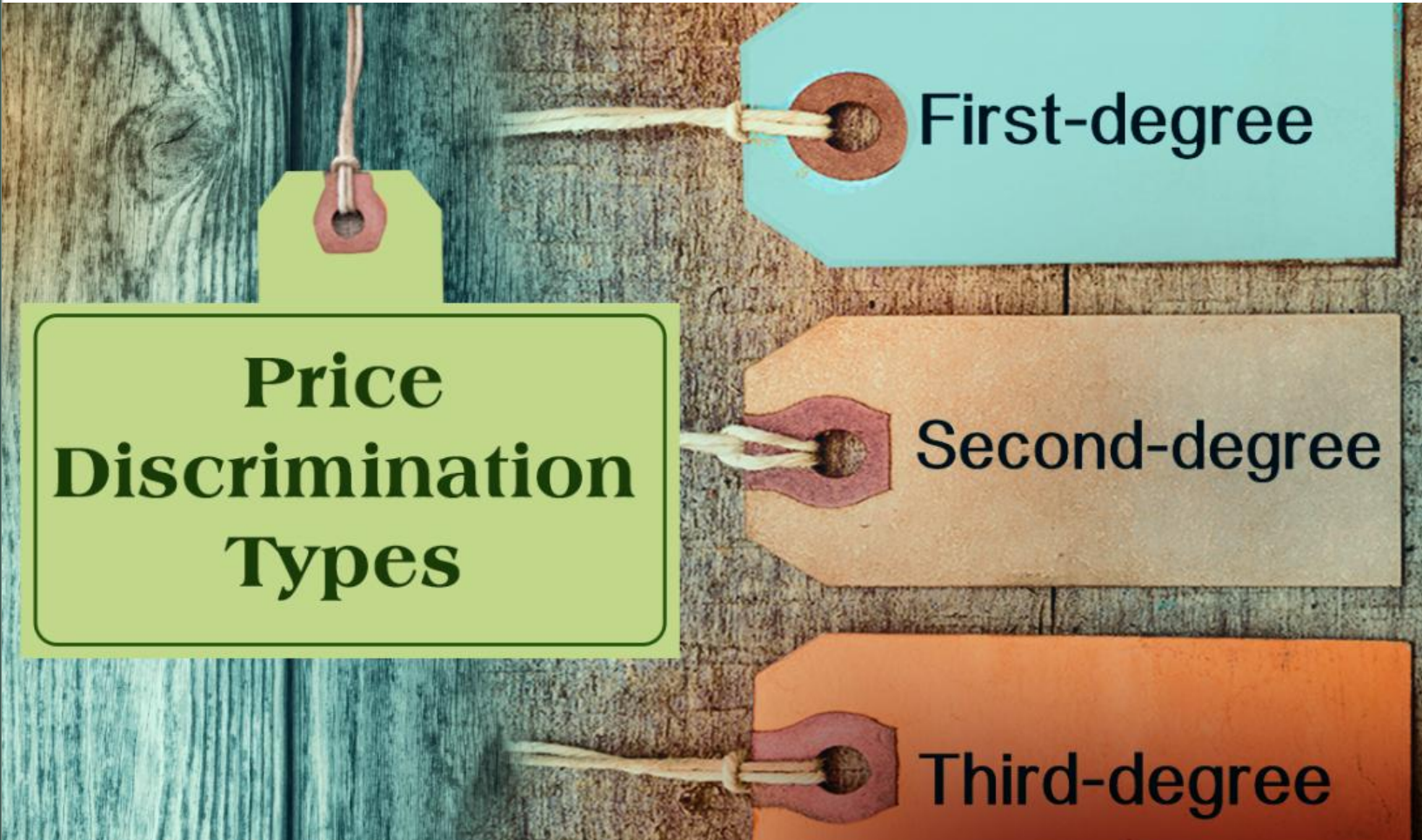
The companies utilizing the cost-based pricing strategy have to keep their production costs low



Desired price combines the total cost of the product with desired markup



Ryanair and Walmart utilize the cost-based pricing in combination with advanced data-processing, to achieve the most desirable price



**Price  
Discrimination  
Types**

First-degree

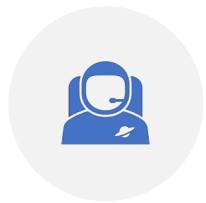
Second-degree

Third-degree

Arbitrary  
Pricing and  
Price  
Discrimination



# Adjusting the Prices to the Ever-Changing Consumer Behavior via the Market Data and Machine Learning Algorithms



At the start of the twenty-first century, the large corporations, mostly from the technology sector, started implementing new strategies to price their goods more effectively



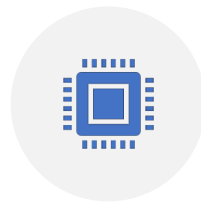
Information goods demanded a new pricing technique due to their characteristics



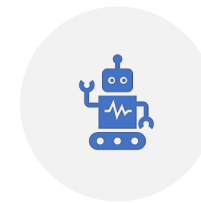
The information goods are cheap to reproduce, have no production limits, and do not have incremental production costs



However, their production cost is high. Therefore, if not successful, they are usually presenting sunk costs for the company



The large corporations adopted the machine learning algorithms to assist them in scaling their price optimally



Three types of machine learning: supervised learning, unsupervised learning, and reinforcement learning

# Machine Learning on the Example of Google

Google's advertisement pricing strategy is dynamical and utilizes the PageRank algorithm

PageRank algorithm is based on the second price auction system that combines several constraints: 1) Advertisement's expected clickthrough rate; 2) Landing page experience; 3) Advertisement's relevancy; 4) Advertisement's formatting style

By utilizing the Page Rank algorithm, Google guarantees not only the best experience for the users by showing them relevant and highly optimized advertisements but for the advertisers also