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DEVELOPMENT OF FLEXIBLE SOFTWARE COMPONENTS AND ADAPTIVE E-COMMERCE INFORMATION SYSTEMS TO SUPPORT ONLINE TRADE IN USED GOODS

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Abstract

The subject area of information systems for conducting commerce activities has been analyzed. A comparative analysis of existing solutions has been conducted, with advantages and features of an own product have been shown. Functional requirements and development goals have been set.

Keywords: e-commerce, used goods, marketplace.

Current State of Systems for Selling and Buying Goods

In 21st century, technology has become an integral part of our daily lives. One of the ways humans utilize such advanced instruments is for communication, invention of Internet and consequent technology such as TCP/IP has enabled millions of people on the planet have seconds-to-milliseconds latency access to any publicly available data worldwide. Communication is the bedrock when it comes to trading, without it, there would be exactly exchange happening, as participants would not be able to express demand for anything resulting in no provided supply. Globalization of trade and advancement of computerized communications technologies enabled billions of consumers access to a lot of previously inaccessible markets. A person from Ukraine has the ability to order a totaled car for restoration from US, something that was arguably impossible, not due to Iron Curtain looming over the country, but due to the fact that it would require accumulating data from numerous sources, i.e. news papers with their classified advertisements, not to mention the language barrier between sellers and buyer.

Development of an e-commerce system is an opportunity to research modern information systems that provide services to simplify and popularize trading of used goods, and connect people of different cultures in general. However, most existing services are far from perfect and lack the inclusivity of letting all individuals, not only businesses, to easily sell any goods [2].

One major pain point that comes with e-commerce systems, is an indecent or lack of thereof search engine. Some don't even have proper filtering forms available, purely relying on full text search engines to index entirety of available catalog, which works

unreliably and often outputs many undesired results. This issue largely relates to services that let private individuals to sell goods.

A proposed solution to that would be to build a goods catalog similar to those found at another type of services known as “price aggregators”, those usually have vast amounts of data on goods of all kinds present in the database, allowing partnering stores to simply link web pages that sell the same good, enabling visitors of such price aggregator to view exactly which products are on sale and numerous places where they can buy it, as well as an abundance of catalog filtering options.

Having said that, a supposed implementation of an e-commerce system should include a multi-layered architecture that provides structured and fail-safe data module, to accommodate for advanced filtering techniques, and also be extensible to let new data units, as well as modification and extension of existing records, be available. Such a module should not be publicly available, instead it should be encapsulated away into a web module, that would be responsible for serializing data into a web-compatible format, to enable user access via web-browsers. Particular attention should be paid to the web module, as its responsiveness and overall user satisfaction will play a key role in system’s overall success.

At the time of writing, there’s several popular marketplaces of both used and new goods operating in Ukraine: OLX, Shafa and Rozetka. Additionally, it should also be stated that price aggregators are a common place of people to begin their shopping with, so let’s add one to the mix: E-Katalog.

OLX [1] is one of the most popular places for buying and selling both used and new goods. It provides basic service for all individuals looking to sell and buy goods, featuring a very basic filtering system, that ranges from trivial to unsatisfactory depending on the browsed category, mostly relying on the built-in capabilities of a search engine. Another downside of OLX is a rather dull user interface experience.

Shafa [2] is another marketplace that allows all individuals to buy and sell stuff. Unlike its aforementioned counterpart, this one provides much better filtering options and a richer user interface experience.

Rozetka [3] is another extremely popular marketplace, although only businesses have the ability to sell products, not private individuals, it is still a go-to place for many to shop new and sometimes used goods. It has plenty of useful features, as well as an ability to buy goods located in EU.

E-Katalog [4] is the final system on the list, being a price aggregator, its responsibilities are to maintain a as inclusive of a database as possible to show as many goods on sale as humanly possible, otherwise it would fail to sustain its business model by failing to aggregated prices for most products.

To demonstrate the main capabilities and differences between the applications reviewed, a comparison table was formed (Table 1).

Table 1 – Comparison of Competitors

Characteristic	OLX	Shafa	Rozetka	E-Katalog	Our application
Structured data search	-	+	+	+	+
Private individuals-sellers	+	+	-	-	+
Keyboard support	-	-	-	-	+
Stats	-	-	-	+	+
Total score	1	2	1	2	4

Thus, our own application has a higher total score, that is, the sum of all present features, than OLX, Shafa and E-Katalog by 75% ($100\% - 1/4 * 100\% = 75\%$), and beats Rozetka by 50% ($100\% - 2/4 * 100\% = 50\%$).

Our solution combines the best practices of existing marketplaces while significantly improving upon existing features. The key advantage is the structured catalog model found seemingly not found in any marketplace that allows private individuals to find goods, giving our solution an upper hand in consumer experience. Provided with such a system, we may also be able to expand the service scope from a simple marketplace to a curated consumer journalism website, publishing reviews of both old and new products, educating the masses on how to save money buying used instead of new, additionally providing an ability to let users review on their own, further popularizing the service and enhancing the experience.

Conclusion

An analysis of e-commerce solutions for selling used and new goods by businesses and private individuals has been conducted. A comparative analysis of existing services in the field has been performed, demonstrating the advantages and distinctive features of our own development.

The web system for trading used goods by businesses and private individuals alike offers the following functionality:

1. Structured search and filtering system.
2. Price aggregation, statistics.
3. Seller inclusivity.
4. A rich user experience with keyboard.

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