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MODERN INFORMATION TECHNOLOGIES FOR CREATING A CONSOLIDATED INFORMATION RESOURCE IN MONETARY OPERATIONS WITH CRYPTOCURRENCY

The purpose of developing a consolidated information resource (CIR) is to combine systematically all available information about the types of cryptocurrency and the places and means of obtaining it. Looking for fresh news about cryptocurrency that appear daily in the Internet. Informing on all available cryptocurrency exchanges in the world and the tools they work with. The purpose of CIR is to inform an inexperienced user about the types of cryptocurrency, means for obtaining and selling it.

In our opinion, the target audience of the created information resource is the Ukrainian-speaking Internet users who are interested in cryptocurrency and operations with it; migrants from our country who are in a different language environment and need information on a simple transfer of currency to their relatives with the help of Blockchan technology; freelancers who fulfill orders for foreign investors and require unrestricted currency transactions.

The expected effect from the introducing a consolidated information resource will be a social component, since the information that will be collected from different sources will contribute to the effective search of the information from the world of cryptocurrency by the interested Ukrainian-speaking audience.

The inputs of the consolidated resource will be the information content obtained from various information sources, namely: third-party WEB-pages devoted to crypto-currency; exchange news, BTC exchange rates in relation to fiat currency or its FORKs, course diagrams, etc.

The output elements of the consolidated information resource will be the actual arrays of information on the updated WEB-pages structured according to the topics: news from the world of cryptocurrencies; the information review on the "Forum" of the site visitors; information on methods and means for obtaining cryptocurrency; information about the existing cryptocurrency exchanges and news from them; information about available fraudulent sites.

Keywords: Bitcoin, cryptocurrency, blockchain.

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СУЧАСНІ ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ ДЛЯ СТВОРЕННЯ КОНСОЛІДОВАНОГО ІНФОРМАЦІЙНОГО РЕСУРСУ ПРИ ЗДІЙСНЕННІ ОПЕРАЦІЙ З КРИПТОВАЛЮТОЮ

Мета розробки консолідованого інформаційного ресурсу (КІР) полягає у системному поєднанні усієї наявної інформації про види криптовалют та місцях і засобах її здобування. Пошук свіжих новин про криптовалюти, які щоденно з'являються в мережі Інтернет. Інформування про усі наявні в світі криптовалютних бірж та інструментах із якими вони працюють. Призначенням КІР є інформування недосвідченого користувача про види криптовалют, засоби для її здобування та продажу.

Цільовою аудиторією створюваного інформаційного ресурсу, на наш погляд є: україномовні користувачі інтернет які зацікавилися криптовалютою та операціях із нею; мігранти з нашої країни які перебувають в іншому мовному середовищі й потребують інформації про нескладний перевід валюти до

рідних з допомогою технології Blockchan; фрілансери що виконують замовлення для закордонних інвесторів і потребують безперешкодного здійснення валютних операцій.

Очікуваним ефектом від впровадження консолідованого інформаційного ресурсу буде соціальна складова, оскільки, інформація, яка буде зведена з різних джерел, сприяє ефективному пошуку інформації зі світу криптовалюти у зацікавленій україномовній аудиторії. В результаті створення такого ресурсу повинна функціонувати спільнота, об'єднана задоволенням інформаційних потреб зі світу криптовалюти. Функціонування даної спільноти забезпечить існування інформаційного ресурсу, в основі якого лежить взаємодія користувачів шляхом обміну корисним досвідом та знаннями на базі створеного форуму. Консолідований інформаційний ресурс в подальшому буде використовуватись, як середовище для взаємодії користувачів та обміну між ними знаннями та інформацією.

Вихідними елементами консолідованого інформаційного ресурсу будуть актуальні масиви інформації на оновлених WEB - сторінках структуровані по тематиці: новини з світу криптовалют; перегляд інформації на «Форумі» відвідувачів сайту; інформація про способи і засоби для здобування криптовалюти; інформація про існуючи біржі криптовалют та новини від них; інформація, про наявні шахрайські сайти.

Ключові слова: Bitcoin, криптовалюта, блокчейн.

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СОВРЕМЕННЫЕ ИНФОРМАЦИОННЫЕ ТЕХНОЛОГИИ ДЛЯ СОЗДАНИЯ КОНСОЛИДИРОВАННОГО ИНФОРМАЦИОННОГО РЕСУРСА ПРИ ОСУЩЕСТВЛЕНИИ ОПЕРАЦИЙ С КРИПТОВАЛЮТОЙ

Цель разработки консолидированного информационного ресурса (КИР) заключается в системном сочетании всей имеющейся информации о видах криптовалюта и местах и способах ее получения. Поиск свежих новостей о криптовалюта, которые ежедневно появляются в сети Интернет. Информирование о имеющихся в мире криптовалютных биржах и инструментах, с которыми они работают. Назначением КИР является информирование неопытного пользователя о видах криптовалюта, средства для ее получения и продажи.

Целевой аудиторией создаваемого информационного ресурса, на наш взгляд являются: украиноязычные пользователи интернет заинтересовавшихся криптовалюта и операциях с ними; мигранты из нашей страны находящихся в другой языковой среде и нуждаются в информации о несложный перевод валюты к родным с помощью технологии Blockchan; фрилансеры выполняющие заказы для иностранных инвесторов и требуют беспрепятственного осуществления валютных операций.

Ожидаемым эффектом от внедрения консолидированного информационного ресурса будет социальная составляющая, поскольку, информация, которая будет возведена из разных источников, способствует эффективному поиску информации из мира криптовалюта в заинтересованной украиноязычной аудитории. В результате создания такого ресурса должна функционировать сообщество, объединенное удовольствием информационных потребностей из мира криптовалюта. Функционирование данного сообщества обеспечит существование информационного ресурса, в основе которого лежит взаимодействие пользователей путем обмена полезным опытом и знаниями на базе созданного форума. Консолидированный информационный ресурс в дальнейшем будет использоваться как среда для взаимодействия пользователей и обмена между ними знаниями и информацией.

Конечными элементами консолидированного информационного ресурса будут актуальные массивы информации на обновленных WEB - страницах структурированные по тематике: новости мира криптовалют; просмотр информации на «Форуме» посетителей сайта; информация о способах и средствах для получения криптовалют; информация о существующих биржах криптовалюа и новости от них; информация, об имеющихся мошеннических сайтах.

Ключевые слова: Bitcoin, криптовалюта, блокчейн.

Problem Statement

The development of the Internet makes people rethink the very essence of money, their form and purpose. Every day we hear or use electronic money, such as Bitcoin (derived from English) – a peer-to-peer system of electronic cash using the digital currency of the same name, which is often referred to cryptocurrency or virtual currency; Internet banking is providing banking services through the Internet with the possibility of round-the-clock access on any day of the week from any place where there is an Internet access, internet trading is the ability to make deals with all the classes of assets and currencies with the help of the Internet. One of the main benefits of online trading is that payment can be made within 24 hours.

The idea of introducing cryptocurrency is to create a currency that is not controlled by the state, freely distributed, does not depreciate and operations with it are transparent.

Cryptocurrency is a virtual digital currency. It is encrypted information, so it is protected against tampering because it cannot be copied (the prefix "crypto" in its name means the use of cryptography). The difference between cryptocurrency from the ordinary money in digital form is that the ordinary money is initially paid into an account through a bank payment terminal, and cryptocurrency is formed directly in a computer network. It is not connected with any known currency or the currency system of the state.

Analysis of the latest researches and publications

Domestic and foreign scientists D. Nikkolai, I. Guseva, T. Petrova, R. Price, L. Fridkin, T. Yatsyk, O. Zagnitko and others were engaged in studying the problems of introducing and developing cryptocurrency. Legislation of most countries of the world and Ukraine, in particular, does not recognize the legal status of cryptocurrency, since the legislation does not define the status of cryptocurrency, and the turnover of cryptocurrency in the country is allowed; difficulties arise when accounting transactions with cryptocurrencies are displayed.

In Ukraine, the turnover issues of cryptocurrencies remain without a clear answer as for their legality. On the one hand, according to Article 32 of the Law of Ukraine "On the National Bank of Ukraine", the monetary unit of Ukraine is the hryvnia. The issue and turnover of other monetary units on the territory of Ukraine and the use of money surrogates as a means of payment are prohibited [On the National Bank of Ukraine: the Law of Ukraine dated May 20, 1999 No. 679-XIV // Bulletin of the Verkhovna Rada of Ukraine. 1999. № 29. Art. 238].

Goal Setting

Today, Ukraine's economy is rapidly integrating into the global economy, so the idea of creating a consolidated information resource for the transactions with cryptocurrency is timely and needs to be theoretically grounded and practically implemented.

The purpose of the article is to develop a consolidated information resource (CIR) which will enable the system to combine all available information about the types of cryptocurrency and the places and means of obtaining it, to search for fresh news about cryptocurrency that daily appear in the Internet, will inform about all the world's largest cryptocurrency exchanges and tools with which they work, will warn the users of the consolidated information resource about fraudulent operations with cryptocurrency.

The target audience of the created information resource is the Ukrainian-speaking Internet users who are interested in cryptocurrency and operations with it; migrants from our country who are in a different language environment and need information on a simple transfer of currency to their relatives with the help of Blockchan technology; freelancers who fulfil orders for foreign investors and require unrestricted currency transactions.

The expected effect from the introduction of a consolidated information resource will be a social component, since the information that will be collected from different sources will contribute to the effective search of the information from the world of cryptocurrency by the interested Ukrainian-speaking audience.

As a result of creating such a resource there must operate a community united to meet the information needs of the world of cryptocurrency. The functioning of this community will ensure the existence of the informational resource based on the interaction of users through the exchange of useful experiences and knowledge on the basis of the created forum. The consolidated information resource will be used as an environment for interaction and sharing knowledge and information between users.

Consolidated information resource in the form of a WEB-site is used by individuals to obtain information on types of cryptocurrency, reference information on transactions with cryptocurrencies, their rates and quotations on the world's cryptocurency exchanges.

The inputs of the consolidated resource will be the information content obtained from various information sources, namely: third-party WEB-pages devoted to crypto-currency; exchange news, BTC exchange rates in relation to fiat currency or its FORKs, course diagrams, etc.

The output elements of the consolidated information resource will be the actual arrays of information on the updated WEB-pages structured according to the topics: news from the world of cryptocurrencies; the information review on the "Forum" of the site visitors; information on methods and means for obtaining

cryptocurrency; information about the existing cryptocurrency exchanges and news from them; information about available fraudulent sites.

Free content management system – WordPress was chosen for the practical implementation of the task, which easily and quickly creates a fully functioning website. It contains a large number of third-party plugins that will ensure the efficient creation of a consolidated information resource. It includes a management system for relational databases MySQL, which is a public DBMS with support for many programming languages. To find information and consolidate it from the known internet sources, the manual method will first be selected. The next step to fill the site will be the use of parsing donor sites that are used in our research.

Presentation of research material

The system analysis establishes a sequence of actions between the structural elements of the investigated consolidated resource in the process of working with cryptocurrency. It allows distributing the problem on simple elements.

Therefore, in order to create such a CIR an objective tree is used Fig.1. It helps to concretely and consistently establish its basic forms. The objective tree connects the purpose and the task at each hierarchical level. The main objective corresponds to the top of the tree, and in its branches there are tasks that will allow achieving the objective of the upper level.
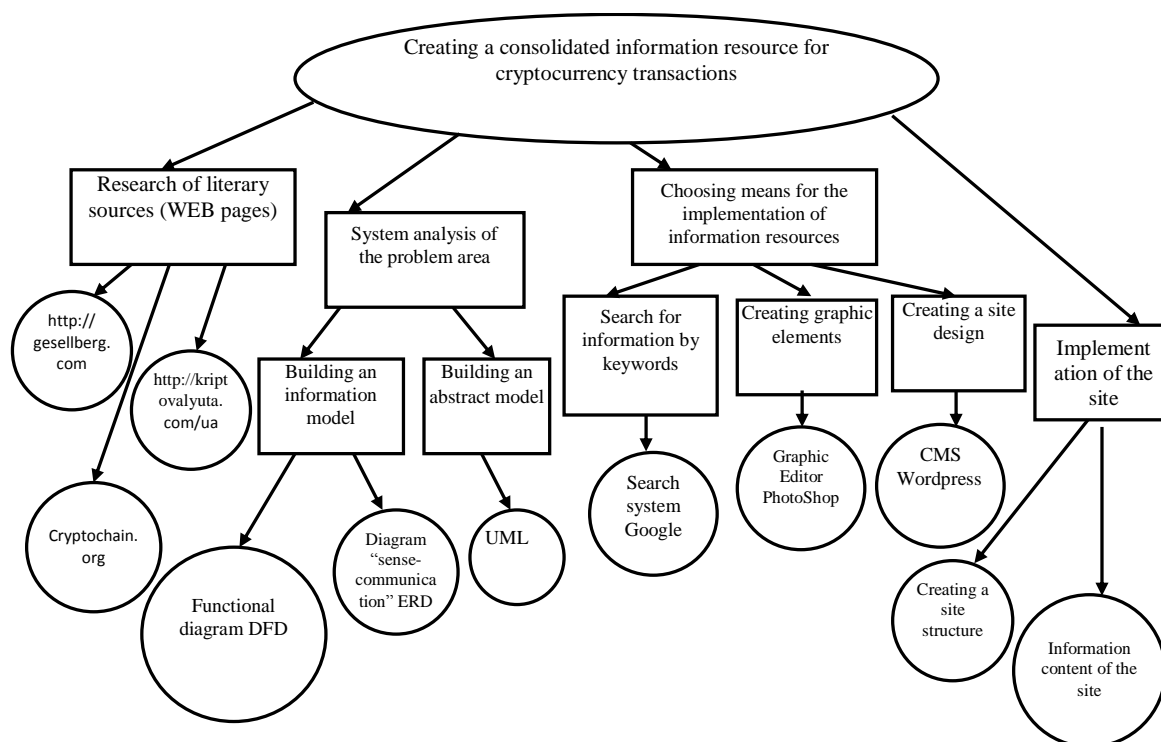

Fig. 1. The objective tree of CIR

We consider the process of modeling a consolidated information resource, using information models in the UML language. Such a model is a diagram of usage options Fig. 2.

We apply this diagram to specify the general peculiarities of the behaviour of the projected system without considering the internal structure of this system. The actors of this system will be three subjects, one of which is a miner, that is the one who obtains cryptocurrency, the second is the one who buys cryptocurrency, having as his aim its accumulation, and in the future he can become the consumer of the goods for the cryptocurrency, and the third is the one who sells the goods or services for crypcurrency.

Each actor interacts with the consolidated information resource and is its user, that is, they all apply to obtain the information they need.

The miners, both beginners and experienced ones, receive operational information from the site about means of obtaining cryptocurrency through individual mining on their own equipment or in cloud-based services. They also learn about existing trading platforms (exchanges) and cryptocurrency courses on their basis.

The buyers of cryptocurrency get information about the existing exchanges, the types of cryptocurrency on them and their quotes.

The sellers of goods or services for the cryptocurrency post information about themselves on the consolidated information resource.

Next, in our research we used data flow diagrams (DFDs) that are considered to be the main means for modeling projected systems [4].

The first was the contextual diagram of the highest level in which the external main points were found out: an administrator creates pages of users, edits the blog and articles, manages web-users, publishes the given comments and also deletes them; a user looks for interesting for him posts on various collective blogs, he has the right to view and comment on the records of other users, to change his account or profile. From the user to the CIR requests are received (an incoming stream), and publications are returned back (an output stream). From the administrator to the CIR the content for the update is received (an incoming stream), and visit statistics is returned back (an output stream).

Further, in our studies we performed a selection of sources (books, WEB-pages) containing the information with the answer needed to solve the problem, and then we determined the type of sources and the way of organizing the approach to them. In developing a strategy for consolidating information we need to consider the type of data source location, its position and availability on a local or remote server [2].
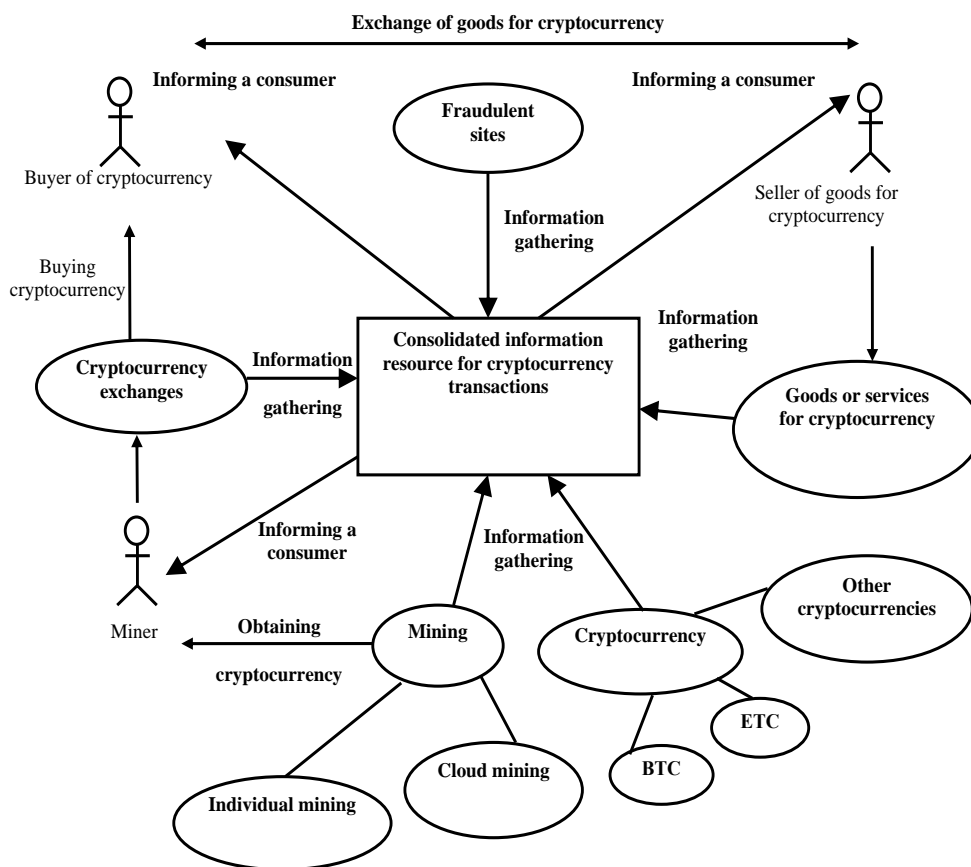

Fig. 2. The diagram of usage options

Another method of gathering information is using free widgets or informers, provided that the site owner returns the link back to the donor website. They improve the appearance of the site and provide a visitor with additional useful information about real-time cryptocurrency courses. The graphic capabilities of an informer allow customizing it, taking into account the style of the consolidated information resource [3].

When using manual search of relevant information from the world of cryptocurrency, periodical visits to donor sites are expected. After finding a new article, it is possible to copy it manually to the clipboard of a personal computer and paste it in an own informsource. However, an alternative to manual search of the interesting for the site visitor information is the parsing of third-party WEB-resources. Parsing is an effective solution to the problem of automated gathering and change of available information [3-6].

The consequence of successful implementation of CIR is creating a dynamic site based on content management systems. CMS WordPress [7] was chosen when creating CIR for cryptocurrency transactions, which makes it easy to insert text fragments directly from MS Word into WEB pages.

The means of expanding WordPress is installing additional free plugins from third-party sites.

TablePress allows creating (without requiring special knowledge of HTML) and managing the content of tables on the site. The user-friendly interface makes it easy to edit the table data, which can contain text, numbers, formulas, even HTML (pictures or links). An additional JavaScript library can be used to add functions: sorting, highlighting, filtering, etc. [8].

Asgaros Forum is filled with dozens of functions and will allow creating a forum for visitors. Contact form designer Contact Form 7 organizes the connection between the administrator and the site visitor. Plugin - DW Question Answer will be used to build a system for answering questions and connecting with the visitor. Plugin - TablePress will allow inserting multifunction tables in the posts and WEB pages without the need to write their code, since in the standard version of WordPress tables are not provided. Plugin - wpDiscuz will allow the website visitors to discuss, vote for comments and share them with each other [9-10].

In order to verify if the consolidated resource for transactions with cryptocurrency works properly and in order to use it easy, we will carry out a trial check of all possible functions of the WEB site. Login to the site is possible from all known WEB browsers, because it is indexed by search engines. The direct access to the site is also possible through the link Cryptobchain.com.

At first the visitor sees "Static Home Page" with the latest blog post in Fig. 3.

When going to the News page, the visitor can see the previous blog news. The "Cryptocurrency Exchanges" page provides relevant information on their rate in relation to USD and a table describing known cryptocurrency exchanges to which hypertext markers lead.
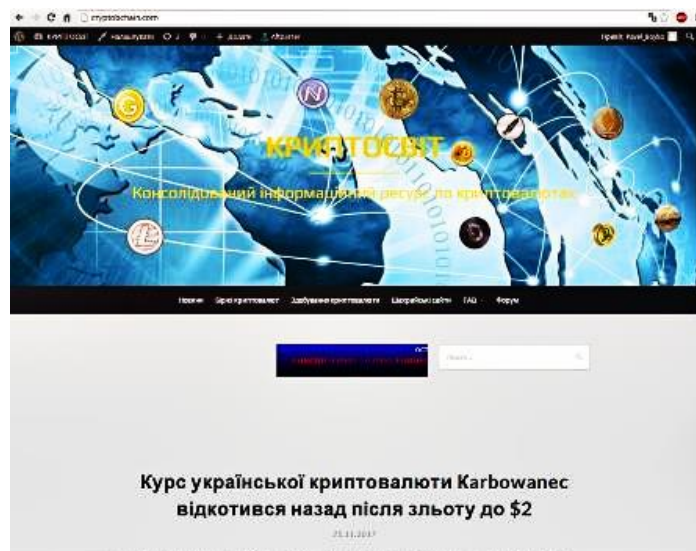

Fig. 3. A home page with a widget in the form of a running currency exchange band and a search form widget

On the "Obtaining cryptocurrency" page, the ways to earn crypocurrency in cloud-based services are considered and an example of getting BTC in one of these services is given. The page "Fraudulent Sites" provides a description of a typical site, on which someone disguised as a miner tries to gain bitcoins from a trusting visitor by deceit, as well as a list of fraudulent sites that are better not to visit.

Conclusions

The created information site "Cryptoworld" is easy to use and coincides with the general rules for creating an information system. It has a blog structure for Internet users. "Forum", "Question/Answer" and "Feedback" pages serve the communication needs of visitors. Such a Ukrainian-speaking site can be considered quite of a high quality and popular in the Internet community.

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