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ИССЛЕДОВАНИЯ И РАЗРАБОТКИ В ОБЛАСТИ МАШИНОСТРОЕНИЯ, ЭНЕРГЕТИКИ И УПРАВЛЕНИЯ

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Для студентов, аспирантов и молодых ученых.

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DESIGN STRONG S-BOXES BASED ON GRAY WOLF OPTIMIZER

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ПРОЕКТИРОВАНИЕ ПРОЧНЫХ S-БОКСОВ НА ОСНОВЕ ОПТИМИЗАТОРА СЕРОГО ВОЛКА

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In this study, a method for robust designs of 8×8 substitution boxes (S-boxes) was developed using a metaheuristic approach based on nature-inspired Grey Wolf Optimization algorithm (GWO). The GWO developed as a unique metaheuristic using inspiration from how grey wolves hunt. the GWO's capacity to swiftly explore the search space for the near/optimal feature subsets that maximize any given fitness function. The experiment's findings demonstrated that the proposed S-box architecture has sufficient cryptographic properties.

Keywords: gray wolf, S-Box, cryptography.

В этом исследовании метод для надежных конструкций блоков замены 8×8 (S-боксов) был разработан с использованием метаэвристического подхода, основанного на природном алгоритме оптимизации серого волка (GWO). GWO развивалась как уникальная метаэвристическая, используя вдохновение от того, как серые волки охотятся. Способность GWO быстро исследовать пространство поиска для близких/оптимальных подмножеств функций, которые максимизируют любую заданную функцию приспособленности. Результаты эксперимента продемонстрировали, что предлагаемая архитектура S-box обладает достаточными криптографическими свойствами.

Ключевые слова: серый волк, S-box, криптография.

Cryptography provides many services to secure the communication and transmission of data such as integrity and security. Encryption systems rely mainly on the s-box cipher properties. In recent symmetric key algorithm, the s-box is considered the important part. The strength of symmetric key cryptosystems is mainly based on their confusion and diffusion (Claude Shannon's properties) attributes [1]. The S-box is typically the only nonlinear component in a symmetric-key cryptosystem which the strength of the algorithm depends it., is important in constructing block ciphers that are cryptographically strong and resilient to common cryptanalysis attacks such as linear and differential attacks [2]. Block ciphers support two main operations known as substitution and permutation hiding the relationship between the cipher text and the secret key is the first characteristic provided by S-box [2]. Currently, there are three generic approaches that are most employed in the construction of S-boxes are the algebraic, random, and metaheuristic-based approaches. Each of these methods has advantages and disadvantages; by way of instance, the random search approach, it typically results in S-boxes with poor cryptographic properties [3]. Although the algebraic method is yields S-boxes with strong cryptographic features, but is not creating S-boxes on a large scale, The metaheuristic-

based approach is a great substitute for design S-box, by using the optimization method in general and nature-inspired solutions in particular. In this research a metaheuristic algorithm known as The Grey Wolf Optimizer (GWO) [4]. recently It was developed as a metaheuristic algorithm to simulate the hunting behavior of grey wolves. The standard version of GWO [5]. Has been used to resolve several global optimization issues. The top three possible solutions are "Alpha, Beta, and Delta," which denote the best solution, the second-best solution and the third-best solution, respectively, are primarily dependent upon for the position updating procedure in GWO. The grey wolves frequently live in packs, adhere to a rigid social strong structure Figure 1.

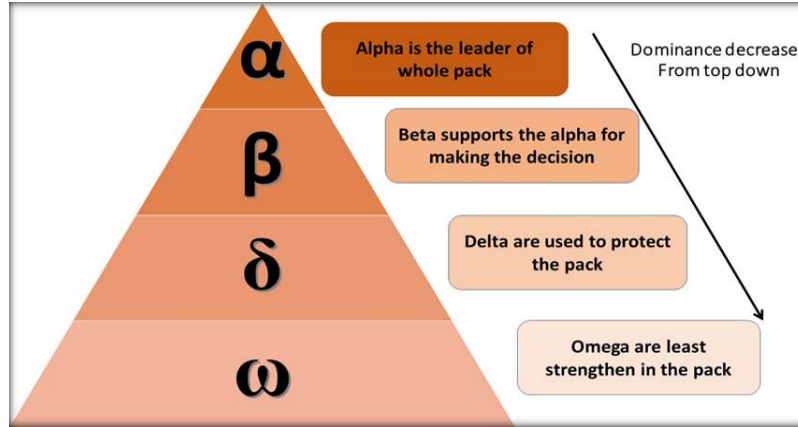


Fig. 1. Hierarchy of Grey Wolf [4]

The following are the study's main objectives:

Design and implement GWO algorithm based for s-box generation.

Performance testing based on six main criteria.

Grey wolves' three strategy hunting steps are encircling, haunting, and attacking the prey.

• **Encircling.** The grey wolves are encircling the prey in this step, it may be represented as follows:

$$D = |C \times X_p(t) - X(t)| \quad (1)$$

$$X(t+1) = X_p(t) - A \times D \quad (2)$$

Where X_p is the located of the target (prey) , X = the hunting wolf location vector, t = the current iteration. The coefficient vectors C and A can be calculated using the formulas below:

$$A = 2 \times A \times r_1 - a(t) \quad (3)$$

$$C = 2 \times r_2 \quad (4)$$

where "random vectors in the [0,1] range" are r_1, r_2 . During the iteration phase, the vector's components decrease linearly from 2 to 0 by:

$$a(t) = 2 - (2 \times t) | \text{MaxIter} \quad (5)$$

• **Haunting.** The mathematical model for the haunting behaviour of wolves is makes the assumption that α , β , and δ further information regarding the location of the target (prey); Therefore, the other wolves follow the location of the α , β , and δ as (best solution) ω . The hunting behavior of the wolves is explained by using the following.

$$\begin{aligned} D_\alpha &= |C_1 \times X_\alpha - X(t)| \\ D_\beta &= |C_2 \times X_\beta - X(t)| \\ D_\delta &= |C_3 \times X_\delta - X(t)| \end{aligned} \quad (6)$$

Where C_1, C_2 and C_3 are calculated by

$$\begin{aligned} X_{i1}(t) &= X_\alpha(t) - A_{i1} \times D_\alpha(t) \\ X_{i2}(t) &= X_\beta(t) - A_{i2} \times D_\beta(t) \\ X_{i3}(t) &= X_\delta(t) - A_{i3} \times D_\delta(t) \end{aligned} \quad (7)$$

Where X_α, X_β and X_δ are the initial three of the iteration best solutions t, A_1, A_2 and A_3 are calculated as in Eq. (3), and D_α, D_β and D_δ are calculated as Eq. (6).

$$X(t+1) = \frac{X_{i1}(t) + X_{i2}(t) + X_{i3}(t)}{3} \quad (8)$$

• **Attacking.** When the hunting phase is finished, the wolves begin the attacking phase. The value of a can be used to mathematically control the exploration and exploitation operations. during the course of the repetition procedure, declines linearly. Eq. after each iteration, the value of a is updated between the ranges of 2 and 0. Exploitation, according to [6], is devoted to the second half of iterations, which follows seamless change from exploration (see Figure 2).

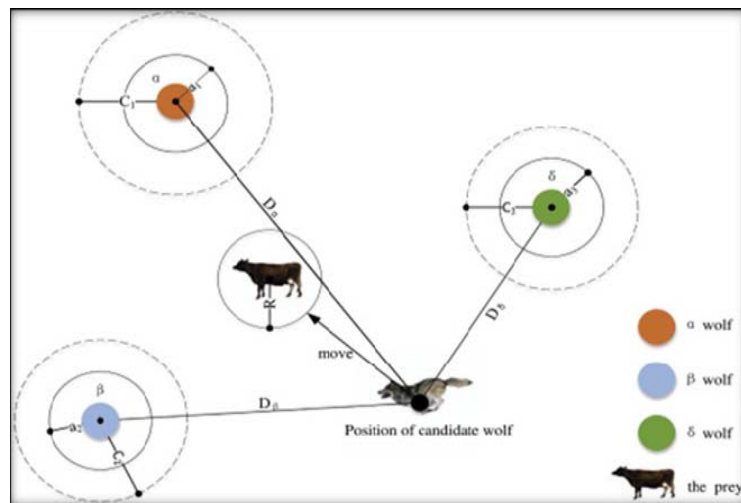


Fig. 2. Update Mechanism of GWO [5]

EVALUATING THE GENERATED S-BOXES

The performance of the proposed S-Box generating algorithm is evaluated based on six main statistical evaluation metrics, as follows:

A. BIJECTIVE CRITERION: it means that there are no unpaired elements, and that every element of one set is matched with another element in another set.

B. NONLINEARITY (NL): it is related to plaintext confusion and immunization of block ciphers from linear cryptanalysis. The Walsh spectrum determines the Boolean function $f(x)$ is nonlinear.

C. STRICT AVALANCHE CRITERIA (SAC): means that if the input bits of the Boolean function change random. it means the output bits should be equal a probability of half for each bit.

D. BITS INDEPENDENCE CRITERIA(BIC): it means that output bits have no association with one another, and that all input-output variables for all avalanche vectors are pairwise independent.

E. DIFFERENTIAL UNIFORMITY (DU): the attackers can identify the whole or partial plaintext or key by analyzing these differentials by using (DU).

F. LINEAR PROBABILITY: It means the lower LP with the S-box it will be more resistant to this analysis.

Table 1

Gwo Nonlinearity Score for 10Runs

Average Nonlinearity Score		Average Nonlinearity Score	
Run	GWO	Run	GWO
1	105.75	6	106.75
2	106.00	7	106.50
3	106.25	8	106.25
4	106.25	9	108.00
5	106.50	10	106.25

Table 2

The Results of the Six Criteria

	S-Boxes	Nonlinearity			SAC		BIC-NL		BIC-SAC	DP	LP
		Min	Max	Avg	Avg	Offset	Min	Avg	Avg	Max DP	
Proposed	GWO	106	108	106.45	0.511	0.0293	96	103.20	0.4995	10	0.1172

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BREAST CANCER CLASSIFICATION USING DEEP LEARNING

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КЛАССИФИКАЦИЯ РАКА МОЛОЧНОЙ ЖЕЛЕЗЫ С ИСПОЛЬЗОВАНИЕМ ГЛУБОКОГО ОБУЧЕНИЯ

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The need for early breast cancer (BC) identification at different screening locations and hospitals across the globe over the last ten years has spurred the hunt for new research directions. The purpose of this study is to assess deep learning systems' capacity for accurate BC classification. In order to distinguish between benign and malignant tumors, a CNN model and pre-trained models (PTM) like VGG19, ResNet50, MobileNet, and DenseNet were applied to the BreakHis dataset, which contains BC histological pictures. The ultimate outcomes demonstrate that every model's performance has improved.

Keywords: convolutional neural networks, breast cancer, pre-trained models, transfer learning.

Необходимость ранней идентификации рака молочной железы (БК) в различных местах скрининга и больницах по всему миру за последние десять лет способствует развитию новых направлений исследований. Цель этого исследования – оценить способность систем глубокого обучения к точной классификации БК. Чтобы различать доброкачественные и злокачественные опухоли, модель CNN и предварительно обученные модели (PTM), такие как VGG19, ResNet50, MobileNet и DenseNet, были применены к набору данных BreakHis, который содержит гистологические изображения БК. Конечные результаты демонстрируют, что эффективность каждой модели улучшилась.

Ключевые слова: сверточные нейронные сети, рак молочной железы, предварительно обученные модели, передача обучения.

Computer-aided diagnosis benefits greatly from artificial intelligence (AI), particularly when machine learning (ML) and deep learning (DL) are used. The identification of benign and malignant tumors in BC pictures is one particular use for CAD technology. ML uses a range of conventional classifiers. Researchers to evaluate histopathology photos and increase the accuracy of cancer detection are using deep learning algorithms more often [1, 2]. Histopathology scans are considered the gold standard for improving diagnostic accuracy (ACC), especially for individuals who have had previous exams like as mammography [3, 4].

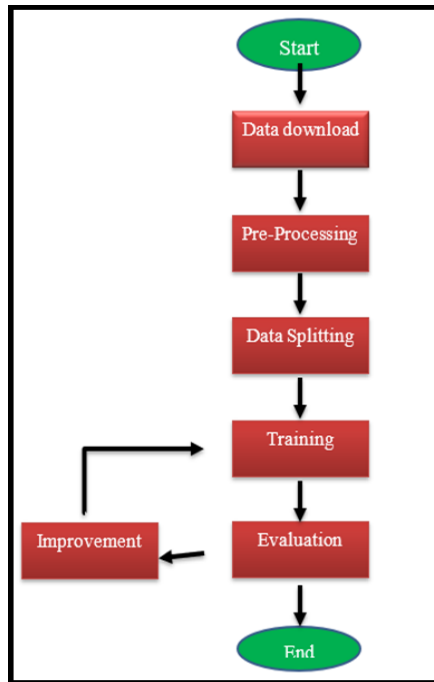


Fig. 1. Methodology workflow

ACC, precision (PRE), recall (RE), F1-score (F1-s), and confusion matrices (CM) were employed as evaluation measures to assess the presented models. After multiple trials of training and testing.

The break His dataset is used in this investigation. CNN and other pre-trained models including VGG-19, Mobile Net, ResNet-50, and Dense Net are used for testing and training. These models are used to categorize benign and malignant cancers. The evaluation results were analyzed to identify factors that impacted ACC. Based on these factors, solutions were proposed and implemented to improve the model's performance. A matrix of dimension $N \times N$, where N is the number of target classes, is known as a confusion matrix, and it is used to assess how well a classification model is performing. It contrasts the actual goal values with the values the model predicted. Where TP is true positive, FP is false positive, FN is false negative and TN is true positive.

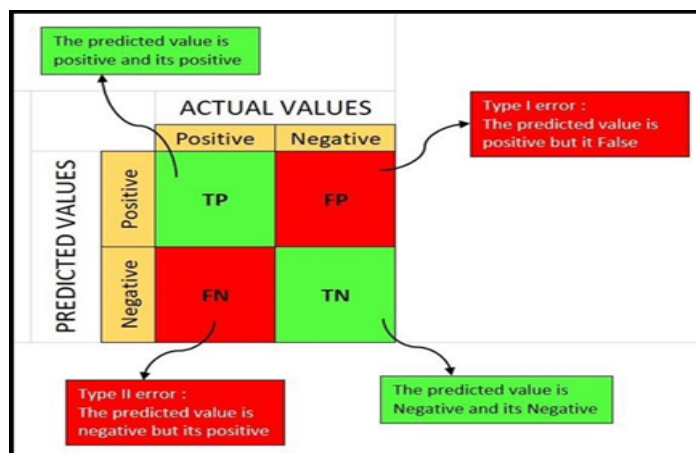


Fig. 2. Confusion matrix

$$ACC = \frac{TP + TN}{TP + TN + FP + FN}; \quad (1)$$

$$PRE = \frac{TP}{TP + FP}; \quad (2)$$

$$RE = \frac{TP}{TP + FN}; \quad (3)$$

$$F1-s = 2 \times \frac{PRE \times RE}{PRE + RE}. \quad (4)$$

The results were analyzed by training the models directly on the data without optimizing the models hyper parameters, as well as by improving the models by increasing the number of training epochs.

Table 1

Classification report before enhancement

Model	Class	PRE	RE	F1.S	ACC
VGG19	malignant	0.86	0.94	0.90	0.85
	Benign	0.85	0.66	0.74	
ResNet50	malignant	0.86	0.94	0.90	0.86
	Benign	0.84	0.68	0.75	
CNN	malignant	0.88	0.92	0.90	0.86
	Benign	0.81	0.74	0.77	
MobileNet	malignant	0.90	0.90	0.90	0.87
	Benign	0.79	0.79	0.79	
DenseNet	malignant	0.92	0.98	0.95	0.93
	Benign	0.94	0.83	0.88	

In Table 1 VGG19, CNN, ResNet50, MobileNet, and DenseNet are the models. DenseNet performs better than the other models, as evidenced by its PRE of 0.92, RE of 0.98, F1. Score – f1 of 0.95, and ACC of 0.93. Although the other models function well as well, Dens's efficiency surpasses theirs.

Table 2

Classification report after enhancement

Model	Class	PRE	RE	F1-score	ACC
VGG19	Malignant	0.87	0.93	0.90	0.86
	Benign	0.82	0.71	0.76	

ResNet50	Malignant	0.88	0.94	0.90	0.87
	Benign	0.84	0.72	0.77	
CNN	Malignant	0.87	0.94	0.90	0.86
	Benign	0.84	0.69	0.76	
MobileNet	Malignant	0.90	0.91	0.91	0.87
	Benign	0.80	0.79	0.79	
DenseNet	Malignant	0.95	0.97	0.96	0.94
	Benign	0.92	0.89	0.90	

In Table 2 TL models' outcomes on a BCL task for BC (malignant and benign) are presented with performance metrics such as PRE, RE, F1-factor, and ACC. DenseNet has the highest F1-s and ACC, with values of 96% and 94%, respectively, according to the table.

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THE INVOLVEMENT OF CONTEMPORARY OPERATING ROOMS OUTFITTED WITH CUTTING-EDGE EQUIPMENT AND PROCEDURES IN ASSISTING DOCTORS AND SURGEONS IN CARRYING OUT THEIR TASKS

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ПРИВЛЕЧЕНИЕ СОВРЕМЕННЫХ ОПЕРАЦИОННЫХ, ОСНАЩЕННЫХ СОВРЕМЕННЫМ ОБОРУДОВАНИЕМ И ПРОЦЕДУРАМИ, К ОКАЗАНИЮ ПОМОЩИ ВРАЧАМ И ХИРУРГАМ В ВЫПОЛНЕНИИ ИХ ЗАДАЧ

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In this work, we evaluate the efficiency and speed of operations performed in rooms equipped with the most recent therapeutic procedures to those performed in older rooms that lack technology.

Keywords: involvement, operating rooms, clinical labor.

В этой работе мы оцениваем эффективность и скорость операций, выполняемых в помещениях, оборудованных самыми последними терапевтическими процедурами, по сравнению с теми, которые выполняются в старых помещениях, где не хватает технологий.

Ключевые слова: вовлечение, операционные, клинический труд.

Clinical labor in surgery is frequently fast-paced, demanding, and time and resource restricted. It necessitates specialized technical and cognitive abilities and entails a variety of actions such as organizing care, responding to patients' changing situations, predicting requirements, and executing surgical operations. An operating room (OR) is a complex adaptive system (CAS) that requires experts to act and communicate, adapt, learn, and self-organize over time. It is a linked and dynamic ecosystem with the potential for diversions and disruptions.

Members of the surgical team are critical players in the operating room, with the goal of delivering safe surgical treatment. Furthermore, components like as an appropriate atmosphere, operational equipment, medications, and disposable objects are required to assist the intraoperative procedure. The surgical team's work process in the OR is primarily outlined by the surgical procedure and its stages, which may also include anaesthetic phases. Interruptions to the surgical team's work are common in the operating room. Good results frequently rely on individuals and teams' abilities to modify and adapt to unexpected occurrences and fast changing conditions through communication and engagement, also known as resilient performance.

The purpose of this study was to demonstrate the usefulness of new operating room technology in expediting the performance of the surgical team in the operating room.

There are times when all other types of medical care must be abandoned in favor of surgery. Surgery is the physical treatment of patients to repair or even remove organs and tissues from the body, and it is thus one of the most dangerous professions of medicine. Surgical equipment has a variety of responsibilities in assisting surgeons in providing the best possible care for patients.

Doctors are constantly adjusting and inventing in the field of surgery to provide the best possible treatment for patients. Traditional surgery necessitates intrusive methods that pose considerable risks, and doctors have long relied on cutting-edge technology to supplement their abilities and expertise. The most recent generation of surgical gadgets uses cutting-edge technology to provide diagnosis, care, and monitoring of surgical patients.

The operating room is a demanding setting with sophisticated equipment. Because of the need for sanitation and the need to establish a safe environment for both patients and healthcare staff, surgical equipment must be extremely reliable. The connections for this environment must have the same high performance.

In order to get the greatest clinical outcomes, doctors are turning to new technologies that allow patients to be treated utilizing minimally invasive treatments as an alternative to traditional surgical approaches. These include novel energy sources that sound like something out of a science fiction film. Microwaves, cryoenergy, and even lasers are allowing surgeons to give precise treatment with minimal impact on the patient.

This is further increased by the advent of robots into the surgical room. The most recent generation of medical robots can do many jobs at once, including diagnosis, treatment, and monitoring. However, it is critical to note that each patient is unique, and each will display symptoms in a different way.

Despite their complexity, robots cannot compete with surgeons' years of experience and ability in recognizing the nuances of treating patients as people. As a result, rather than replacing the surgeon totally, the ideal application of robots in the medical profession is to supplement the surgeon's talent with the accuracy that robotic systems can provide.

Using high-speed data connections, the latest generation of surgical technology assists doctors in diagnosing, treating, and monitoring patients. Connectors for medical equipment must offer high connection densities and diverse contact types, all while offering good performance, even in the difficult surgical environment, when combined with the demands of the most sophisticated advanced energy sources. Engineers seek adaptive and dependable connection solutions that include power, communication, high voltages, and even optical fiber.

THE INFORMATION AND ITS IMPORTANCE IN MAKING THE SOCIETY CONSCIOUS AND GUIDING PUBLIC OPINION

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ИНФОРМАЦИЯ И ЕЕ ЗНАЧЕНИЕ ДЛЯ ТОГО, ЧТОБЫ ОБЩЕСТВО ОСОЗНАВАЛО И НАПРАВЛЯЛО ОБЩЕСТВЕННОЕ МНЕНИЕ

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Discuss the harm caused by inaccurate information on social networking sites, as well as the resulting difficulties and solutions for raising a generation with strong values and morals, in this paper.

Keywords: information, social networking, facebook, WhatsApp, Twitter, TikTok.

В данной статье обсуждается вред, причиняемый неточной информацией на сайтах социальных сетей, а также трудности в воспитании поколения с нравственными (моральными) ценностями.

Ключевые слова: информация, социальные сети, Facebook, WhatsApp, Twitter, TikTok.

The information needs basic in our life as individuals, as a community, as organizations Business, or as a state. Moreover, information. It that form Our Knowledge balance and our perception from what is happening around us from social, political, and Economical updating's. Moreover, what update in aspects Scientific. Moreover, the information like it like any commodity she has its primary materials that Manufacture Of. In addition, it has her producers, her consumers, her value, and her Quality.

The value of information is determined according to its user according to the following:

– The value of the information to the individual who uses it is determine by the knowledge it adds to this individual because of his use of.

– For organizations, Business the value of information determine by a loss resulting on non-Use this information. Also, specify rate Benefit from The information by balancing between Costs of get on the information and interest from use it. as well be determined value The information by extent its ability in Removing non making sure condition when take decisions

– for to the community the value of information determine by how much Awareness that it's create in the society a result use and trade this The information and create public opinion is harmonious and consistent with Interests the society

So The higher the quality of the information, the better the benefit from it. According to Dr. Fayez Jumaa al-Najjar, "the quality of information is determined by the degree. Which the information presented benefit to its user. In addition, before appearance the revolution of information, the internet, and the digitization of information. Was the book and periodicals from Newspapers and magazines were the most important Sources for information and the most means to view? In addition, was the producers for the info are specialist's people. Therefore, the information was more Accuracy and subject in its production censored severe and audit So In my opinion the Quality of information was better. In addition, it was there rarity in the information and difficulty in Access to. Nevertheless, today the sources of information became multiple and everyone became producers for info. Equals in that the public and specialists. Moreover, became there abundance in the information on an account its quality and ease in Access to info. What care me in this the article is the value of information concerning the community, and extent effect it in consciousness the society and in Public opinion industry. Moreover, extent severity that cause in it the wrong information or Fake News in misleads society's awareness and creates public opinion perhaps it against the interests of society. Social media such as Facebook, WhatsApp, Twitter, TikTok, blogs, websites... etc. have become the most popular means of displaying information, and the information received through them is not subject to any kind of censorship and scrutiny. And it became possible for everyone and all age groups to view it, and through it everyone became producers and consumers of information. Therefore, these means have become essential sources in creating community awareness and public opinion making. Previously, the state had a monopoly on the means of making public opinion, so public opinion was directed and difficult to influence.

Moreover, here we must put a line under that fills the remaining part. How can the illiterate listener or the uneducated reader fill in the rest?

We see many Facebook pages of people who provide fabricated and irrational information whose purpose is to mislead the community and deceive the community's awareness and they find thousands of followers who are unwilling to rethink what they receive. While there are pages for thinkers, intellectuals, and scientists who provide valuable information, no one pays attention to what they provide. Here, he cited what Michael Hill said in his aforementioned book about "a survey conducted on 8,000 adults, which concluded that (individuals show more irrationality in an increasingly rational world) and There are many who are looking for something comfortable and intimate instead of the harsh truth. One finds resorting to irrationals a pleasure, entertainment, and a relief from the trouble of daily existence, but as information that is not trustworthy. And who are the petty individuals who draw thousands of followers to themselves by posting attention-grabbing and visually appealing titles for their blogs and websites, only to discover upon clicking that the content on the other end has nothing to do with the attention-grabbing copy? To make money, all you have to do is trick the reader into clicking on the link and viewing a commercial advertisement located in the page's footnote as well as another pop-up advertisement.

So, the following must be understood in order to eliminate misleading information and increase intellectual awareness.

First: education

There is no doubt that education is a major factor in increasing society's awareness and updating educational curricula in line with the development taking place in the field of science and informatics, and providing the student with knowledge and skill in how to deal with the Internet, with social media, and with information with a critical mind. It will increase the student's awareness of the information he receives. There are wonderful examples of countries that have realized the importance of information as a national wealth that must be invested in a way that benefits the state, and has sought to introduce media literacy into the curricula of public education, and Estonia is an example of that. According to BBC News on February 1, 2022, "Since 2010, Estonian public schools - from kindergarten to high school - have been offering their pupils lessons in media literacy. Students in grade 10 also participate in a compulsory 35-hour course on media and its impact."

Second: culture

The official bodies represented by the Ministry of Culture and the Ministry of Information must contribute to creating cultural awareness aware of the harm of misleading information and news to society and calling for refusal to deal with misleading information and its publishers, whether they are accounts on Facebook, Twitter, websites or WhatsApp accounts, according to a research report of the Broadband Committee on: Freedom of expression and countering disinformation on the Internet Published in 2020 by the International Telecommunication Union and the United Nations Educational, Scientific and Cultural Organization (UNESCO) "There are countries that have established official websites for fake news, such as the Pakistani government website FakeNews_Buster and the Sebnarnya.my portal to expose misleading information In Malaysia" and other sites in many countries to expose misleading news.

Third: Information Security (Cybersecurity)

Every country must have information security that protects the information systems of its institutions and prevents illegal access to data and information. It prohibits hacking campaigns on websites and using them to spread misleading news, as well as to expose

fake websites that are used to falsify people's awareness and spread misleading information and news that cause harm to the public interest. We have seen how cyberattacks by one country against another cause the disruption of information systems in state institutions such as airports, banks, and communications networks, and lead to the cessation of services.

Fourth: Legislation and the judiciary

The development of cybercrime must be accompanied by a development in the enactment of penal laws to prosecute and punish the perpetrators of cybercrime. Most countries work to combat cybercrime, including the dissemination of information and misleading news to society

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CREATING AN EDUCATIONAL SOFTWARE WITH SIMULATION SUPPORT TO HELP THIRD-YEAR SECONDARY SCHOOL STUDENTS IN TAIZA CITY DEVELOP PROCEDURAL PHYSICS KNOWLEDGE

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СОЗДАНИЕ ОБРАЗОВАТЕЛЬНОГО ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ С ПОДДЕРЖКОЙ МОДЕЛИРОВАНИЯ ДЛЯ ПОМОЩИ УЧАЩИМСЯ ТРЕТЬЕГО КЛАССА СРЕДНЕЙ ШКОЛЫ ГОРОДА ТАИЗА В РАЗВИТИИ ПРОЦЕДУРНЫХ ЗНАНИЙ ПО ФИЗИКЕ

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The aim of this research is to study the impact and effectiveness of simulation-based educational programs in developing procedural knowledge in physics for 11th grade students in Taiz, Yemen. The current research refers to procedural knowledge as the set of performance skills and scientific processes such as sensory observation, mathematical reasoning, data interpretation, drawing, and solving physics problems, which are performed by students according to sequential steps that help them solve physics problems accurately, quickly, and efficiently. and virtual simulation is an educational method used by teachers to bring learners closer to reality by

providing an educational environment similar to the natural environment, which may not be available to students. Either because of the impossibility, danger, cost, or lack of human resources, educational program content is supported by Virtual, The content of the educational software is supported by the Virtual Laboratory Program (Crocodile in Physics). The statistical package program (SPSS 26) was used to extract the results of two independent samples and two interrelated samples, the results indicate that all hypotheses are accepted.

Keywords: educational software, virtual simulation, virtual labs, procedural knowledge.

Целью данного исследования является изучение влияния и эффективности образовательных программ, основанных на моделировании, в развитии процедурных знаний по физике у учащихся 11-х классов в Таизе, Йемен. Текущее исследование относится к процедурным знаниям как к набору исполнительских навыков и научных процессов, таких как сенсорное наблюдение, математическое рассуждение, интерпретация данных, рисование и решение физических задач, которые выполняются учащимися в соответствии с последовательными шагами, которые помогают им точно решать физические задачи, быстро и эффективно, а виртуальное моделирование – это образовательный метод, используемый учителями, чтобы приблизить учащихся к реальности, создавая образовательную среду, аналогичную естественной среде, которая может быть недоступна учащимся. Либо из-за невозможности, опасности, стоимости или нехватки человеческих ресурсов содержание образовательной программы поддерживается Virtual. Содержание образовательного программного обеспечения поддерживается программой виртуальной лаборатории («Крокодил в физике»). Программа статистического пакета (SPSS 26) использовалась для извлечения результатов двух независимых выборок и двух взаимосвязанных выборок, результаты показывают, что все гипотезы приняты.

Ключевые слова: образовательное программное обеспечение, виртуальное моделирование, виртуальные лаборатории, процедурные знания.

Educational software refers to educational materials that are prepared, programmed, and produced by the computer to be dealt with by students according to their learning speed and abilities [1]. Perhaps the best thing offered by software in teaching physics is providing an opportunity for an integrated program of sound, image, motion, color, and the increasing mix of verbal and visual text, simulation, and enabling the learner to enter, jump, and browse freely [2]. Virtual simulation is defined as the creation of artificial situations through computer simulation of real-life situations, which allows learners to gain experience in these educational situations that are difficult to find in reality due to their rarity, high cost of implementation, or danger [3]. Simulation programs represent one of the most important modern applications for teaching and learning, as they develop procedural physics knowledge, and the application of procedural skills and operations among students. They represent the successful translation of physical abstract concepts into procedurally applied events, as well as the ability of users to interact with them [4]. The objective's has been a studying the effect of simulation-supported educational software on the development of procedural knowledge in physics and a study of the effectiveness of (survival of impact) educational software supported by simulation on the development of procedural knowledge in physics. So it was population is the study population consisted of all third grade secondary students in the city of Taiz in its three neighborhoods (Cairo, Al-Muzaffar, Saleh), and because the study population is large, a random sample of 100 students was selected from Bakathir Secondary School from the Cairo Directorate. Of them (50) experimental group students, and (50) control group students.

METHODOLOGY AND STATISTICS

Before starting to apply the program to the study sample, the educational program was judged by specialists in software, computer engineering, and education technology. And The equation of the two study samples was verified using the (t) test for two independent samples, The measurement tool (procedural knowledge test) was prepared after analyzing the content of the "alternating current" unit of physics for the third year of secondary school, then creating a specification table to determine the test items. the validity of the study tool (achievement test) was verified by submitting it. For arbitrators in Physics, Curriculum and Teaching Methods, and the percentage of their agreement on it reached (97%), And verifying the stability of the test using the split-half method, through which the stability reached (0.92), and the Kuder-Richardson 20 equation was used, through which the stability reached (0.90).

DISCUSSION AND CONCLUSION

There is a statistically significant difference at a significance level of ($\alpha \leq 0.05$), between the mean scores of dimensional performance in the procedural knowledge test of physics among the experimental group and control group students, in favor of the experimental group, The mean of the experimental group was (18.04), while the mean of the control group was (14.16). The result was also in favor of the experimental group when studying the effectiveness – that is, in the case of follow-up performance (that is, when the test was repeated after 40 days), where the average for the experimental group was (17.11), while the average for the control group was (11.64). This may be due to the provision of content in auxiliary ways and means such as sound, images, static and animated graphics, and texts, with the ability to repeat watching lessons [5] and virtual simulation leads to the possibility of monitoring, measuring and controlling the variables of the experiment, and interpreting the results and conclusion, so that it stimulates the brain to learn[6]. There is a statistically significant difference at a significance level of ($\alpha \leq 0.05$) between the mean scores of dimensional and follow-up performance in the procedural knowledge test of physics among the experimental group students, in favor of dimensional performance; the average score for dimension performance was (20.65), while the average score for follow-up performance was (19.62). This may be attributed to the long period between dimensional and follow-u performance, which was 40 days in this case, which played an important role in the decomposition of some information according to the decomposition theory. This theory suggests that information in long-term memory begins to fade and gradually fades away over time [7].

MOST IMPORTANT RECOMMENDATIONS:

– It is essential that teachers focus on using simulation-assisted learning software to apply procedural knowledge in physics.

– Conducting training courses for teachers on how to design, produce and use educational programs for physics, and train them to work on virtual laboratory programs with the aim of applying procedural knowledge.

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**DESIGNING AN EDUCATIONAL SOFTWARE SUPPORTED
BY SIMULATION TO DEVELOP CONCEPTUAL KNOWLEDGE
IN PHYSICS FOR THIRD YEAR SECONDARY
SCHOOL STUDENTS – IN TAIZ CITY**

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**РАЗРАБОТКА ОБРАЗОВАТЕЛЬНОГО ПРОГРАММНОГО
ОБЕСПЕЧЕНИЯ, ПОДДЕРЖИВАЕМОГО СИМУЛЯЦИЕЙ,
ДЛЯ РАЗВИТИЯ КОНЦЕПТУАЛЬНЫХ ЗНАНИЙ ПО ФИЗИКЕ
ДЛЯ УЧАЩИХСЯ ТРЕТЬЕГО КУРСА СРЕДНЕЙ ШКОЛЫ
В ГОРОДЕ ТАИЗ**

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Educational software provides students with a variety of multimedia alternatives (images, text, still and animated graphics, and video clips) that support educational content, and virtual simulation is an educational method used by teachers to bring learners closer to reality by providing an educational environment similar to the natural environment, which may not be available to students. Either because of the impossibility, danger, cost, or lack of human resources, educational program content is supported by Virtual, The content of the educational software is supported by the Virtual Laboratory Program (Crocodile in Physics). The statistical package program (SPSS 26) was used to extract the results of two independent samples and two interrelated samples, The results indicate that all hypotheses are accepted.

Keywords: educational software, virtual simulation, virtual labs, conceptual knowledge.

Образовательное программное обеспечение предоставляет учащимся разнообразные мультимедийные альтернативы (изображения, текст, неподвижную и анимированную

графику и видеоклипы), которые поддерживают образовательный контент, а виртуальное моделирование – это образовательный метод, используемый учителями, чтобы приблизить учащихся к реальности, предоставляя образовательная среда, подобная естественной среде, которая может быть недоступна учащимся. Либо из-за невозможности, опасности, стоимости или нехватки человеческих ресурсов содержание образовательной программы поддерживается Virtual. Содержание образовательного программного обеспечения поддерживается программой виртуальной лаборатории (Крокодил в физике). Программа статистического пакета (SPSS 26) использовалась для извлечения результатов двух независимых выборок и двух взаимосвязанных выборок. Результаты показывают, что все гипотезы приняты.

Ключевые слова: образовательное программное обеспечение, виртуальное моделирование, виртуальные лаборатории, концептуальные знания.

Educational software refers to educational materials that are prepared, programmed, and produced by the computer to be dealt with by students according to their learning speed and abilities [1]. Today, the use of multimedia software in teaching and learning is no longer viewed as a luxury or a waste of time. Rather, it is viewed as one of the main pillars of which the curriculum in its broadest sense [2]. Virtual simulation is an educational technique used by teachers to bring learners closer to reality by providing an educational environment similar to the natural environment, which may not be available to students either due to impossibility, danger, cost, or lack of human resources [3]. Simulation programs represent one of the most important modern applications for teaching and learning, as they develop conceptual physics knowledge, and the application of procedural skills and operations among students. They represent the successful translation of physical abstract concepts into procedurally applied events, as well as the ability of users to interact with them [4]. The objective's has been a Studying the effect of simulation-supported educational software on the development of conceptual knowledge in physics. And a study of the effectiveness of (survival of impact) educational software supported by simulation on the development of conceptual knowledge in physics. So it was population is the study population consisted of all third grade secondary students in the city of Taiz in its three neighborhoods (Cairo, Al-Muzaffar, Salh), and because the study population is large, a random sample of 120 female students was selected from Zaid Al-Mashki.

METHODOLOGY AND STATISTICS

The experimental approach (semi-experimental design) was used. Pre-test, dimensional test and follow-up for two groups, one experimental and the other a control group before starting to apply the program to the study sample, specialists in software, computer engineering, and education technology judged the educational program. And The equation of the two study samples was verified using the (t) test for two independent samples, The measurement tool (conceptual knowledge test) was prepared after analyzing the content of the "alternating current" unit of physics for the third year of secondary school, then creating a specification table to determine the test items. The validity of the study tool (achievement test) was verified by submitting it. For arbitrators in Physics, Curriculum and Teaching Methods, and the percentage of their agreement on it reached (97%), And verifying the stability of the test using the split-half method, through which the stability reached (0.93), and the Kuder-Richardson 20 equation was used, through which the stability reached (0.91).

DISCUSSION AND CONCLUSION

At a significance level of ($\alpha \leq 0.05$), there is a statistically significant difference between the mean scores of dimensional performance in the conceptual knowledge test of physics among the experimental group and control group students, in favor of the experimental group. The mean of the experimental group was (21.95), while the mean of the control group was (17.93). The result was also in favor of the experimental group when studying the effectiveness – that is, in the case of follow-up performance (that is, when the test was repeated after 40 days), where the average for the experimental group was (21.08), while the average for the control group was (15.22). This may be attributed to the fact that teaching using simulation-supported educational software provides multiple learning resources that capture students' attention and increase their motivation for learning. It also takes into account individual differences among students[5], The results of this study are consistent with those of Said (2016) and Abu Halima (2018), as well as the study of Al-Arbeed (2010) There is a statistically significant difference at a significance level of ($\alpha \leq 0.05$) between the mean scores of dimensional and follow-up performance in the conceptual knowledge test of physics among the experimental group students, in favor of dimensional performance, The average score for dimension performance was (21.95), while the average score for follow-up performance was (21.08). This may be attributed to the long time interval of (40) days between the dimensional and follow-up performance, which led to a decrease in conceptual knowledge according to the theory of gradual decay and fading. This may be attributed to the long period of time (40) days between post-performance and follow-up, which led to a decrease in conceptual knowledge according to the theory of gradual decay and fading, which attributes the decay of information to the factor of time, as it decays due to lack of practice, which leads to its gradual fading over time [6].

MOST IMPORTANT RECOMMENDATIONS:

- It is necessary for teachers to focus on using simulation-supported educational software to develop conceptual knowledge in physics.
- Conduct training courses for teachers on how to design, produce and use physics educational programs to develop conceptual knowledge.

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THE EFFECTS OF VIRTUAL CLASSROOM & VIRTUAL LABS AND INTERNET ON LEARNING AS A TRIANGLE INTERACTION

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ВЛИЯНИЕ ВИРТУАЛЬНОГО КЛАССА И ВИРТУАЛЬНЫХ ЛАБОРАТОРИЙ И ИНТЕРНЕТА НА ОБУЧЕНИЕ КАК ТРЕУГОЛЬНОЕ ВЗАИМОДЕЙСТВИЕ

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This study aims to use virtual classroom (VClass), Virtual Labs (VLabs), and Internet Support (IntSup) technologies-based simulations that is interesting, easy to use by participants and streamline the time of technical teachers in bringing the technical materials as well as feasible to be used in learning anywhere and anytime. These technologies used both the practical of math course and theory in the government schools in Taiz city, Yemen country as the most significant tools of information age, have increasingly been used in each stage of education system. This paper has designed to study the adoption of the participants of the general class towards the VClass and VLabs simulations' usage with Internet support in three dimensions of their abilities, practical skills and knowledge. The interaction between these dimensions is the key purpose of this study to integrate technology in existing educational approach and introduce new technologies as an important tool to support new ways of practical teaching and learning. A model, which explains the effect of VClass, VLabs, IntSup and TeachOnline on learning, is established and tested. Using AMOS 21 (Analysis of Moment Structures) program, it explains 100% of VClass TOOLS, 46% of VLabs tools, 91% of Intsup and 83% of TeachOnline, with good model fit. The findings indicate that all hypotheses are accepted.

Keywords: virtual labs, Virtual classroom, internet support, online teaching.

Целью данного исследования является использование симуляций на основе технологий виртуального класса (VClass), виртуальных лабораторий (VLabs) и Интернет-поддержки (IntSup), которые интересны, просты в использовании участниками и сокращают время технических преподавателей при доставке технических материалов. а также возможность использования в обучении где угодно и когда угодно. Эти технологии использовали как практический курс математики, так и теорию в государственных школах города Тауз, страна Йемен, как наиболее важные инструменты информационного века, которые все чаще используются на каждом этапе системы образования. Целью данной статьи было изучение адаптации участников общего класса к использованию симуляций VClass и VLabs с поддержкой Интернета в трех измерениях их способностей, практических навыков и знаний. Взаимодействие между этими измерениями является ключевой целью данного исследования – интегрировать технологии в существующий образовательный подход и представить новые технологии как важный инструмент для поддержки новых способов практического преподавания и обучения. Создана и протестирована модель, объясняющая влияние VClass, VLabs, IntSup и TeachOnline на обучение. Используя программу AMOS 21

(Анализ моментных структур), она объясняет 100 % инструментов VClass, 46% инструментов VLabs, 91% Intsup и 83% TeachOnline, с хорошим соответствием модели. Результаты показывают, что все гипотезы принимаются.

Ключевые слова: виртуальные лаборатории, виртуальный класс, интернет-поддержка, онлайн-обучение.

Simulation is an experiential instructional method that teachers create to imitate or replicate actual events, problem procedures, or skills to achieve the desired instructional results [1]. The role of simulation to teach and access open surgical skills has become more prevalent in recent years [2]. The growing popularity of simulations and games invites the production of insights that help academic teachers to use simulations and games in their courses [3]. Exploring the many ways simulation can be used in the classroom, consider the perspective of international teachers of English language [4]. A good example of how simulation is applied to demonstrate the human factor in structured academic social situations in the fields of STEM as educators consistently seek innovative ways to teach ethics in science and math. As with any teaching method, simulation has its proponents and critics. Among advantages pointed out by [4] and other simulation supporters, mostly agree such as simulation increases students' interest and motivation in the topic being studied. It makes the material more realistic and relevant when compared to the traditional approach to education. The objective this work has been to interact with the best way of virtual classroom Simulation (VClass), and to study the important effects of virtual labs Simulation (VLabs), on education.

METHODOLOGY AND STATISTICS

The method adopted for the present study was descriptive and statistical in nature. It provides a flexible framework for selecting materials and participants, defining criteria and measures, and implementing evaluation techniques. By adapting these different techniques, the proposed structure model for VClass, VLabs and IntSup aims to assess the relationship between them. To assess the relationship between interactive VClass, VLabs and IntSup; Different statistical techniques were used including instrument development, a confirmatory factor analysis (CFA), Principal Component Factor and Cronbach's alpha, (exploratory factor analysis (EFA) is used to determine how many latent variables would be used)), Construct Reliability, and a test of a structural model. Convergent validity and Discriminant validity were used in this research according to the recommendations of [5]. To assess the fit of the model to the data, Chi-square per degrees of freedom $P=0.160$, $GFI=0.97$, $AGFI=0.91$, $CFI=0.99$, $RMSR=0.030$, and $RMSEA=0.039$ were computed. If the model fits the data adequately, the t -values of the structural coefficients will be evaluated to test the research hypotheses. Figure 1 illustrates proposed TeachOnline Model below.



Fig. 1. TeachOnline Model

POPULATION AND SAMPLE

The difficulty of studying the whole population enforces the researcher to randomly, choose a sample of 200 of students. The reliability of the constructs of VClass, VLabs, and IntSup were 0.98, 0.97, and 0.97, respectively. All constructs exceeded the recommended level of 0.70 [6]. A model, which explains the effect of VClass, VLabs, IntSup and TeachOnline on learning, is established and tested. Using AMOS 21 (Analysis of Moment Structures) program, it explains 100% of VClass TOOLS, 46% of VLabs tools, 93 % of Intsup and 83% of TeachOnline, with good model fit. The findings indicate that all hypotheses are accepted.

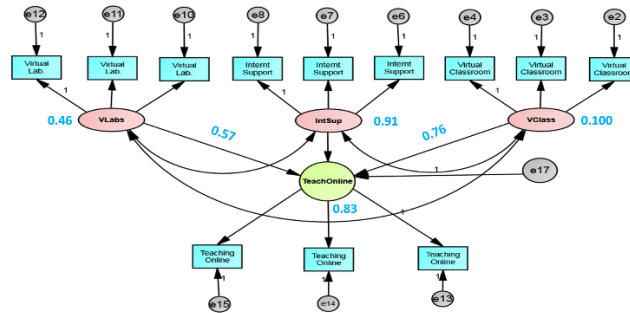


Fig. 2. Standardized TeachOnline Model

DISCUSSION AND CONCLUSION

This study tends to identify, within the framework of [7]. It has investigated the underlying relationships between VClass, VLabs, IntSup and TeachOnline which support learning and teaching for class. All hypotheses postulated by the structural model are supported. Having its stronger impact on ability, practical skills and knowledge, it is emphasized that virtual classroom and virtual labs with the support of the Internet are required in the class for receiving knowledge through practical simulation anywhere and anytime. In addition, researchers may build on this model to identify and examine other factors that may influence learning to use simulation such as the biology, chemistry, and science skills that support TeachOnline, including the different levels of information technology of organizations and virtual resources.

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REVOLUTIONARY TECHNOLOGICAL ADVANCEMENTS: A JOURNEY THROUGH TIME AND PROGRESS

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РЕВОЛЮЦИОННЫЕ ТЕХНОЛОГИЧЕСКИЕ ДОСТИЖЕНИЯ: ПУТЕШЕСТВИЕ СКВОЗЬ ВРЕМЯ И ПРОГРЕСС

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Technology is described as "the practical application of scientific knowledge, usually in industry" (Oxford Dictionary). While many people identify technology with current gadgets and digital devices, it has a lot deeper and more complex history than many people do understand. This article will investigate how far back technology dates by traveling through time and examining some of the important milestones and technologies that have affected our world today.

Keywords: technology, robots, 3D printing, medicine advances.

Технология описывается как «практическое применение научных знаний, обычно в промышленности» (Оксфордский словарь). Хотя многие люди идентифицируют технологии с современными гаджетами и цифровыми устройствами, у них гораздо более глубокая и сложная история, чем многие люди понимают. В этой статье будет исследовано, насколько далеки технологии, путешествуя во времени и изучая некоторые важные вехи и технологии, которые повлияли на наш мир сегодня.

Ключевые слова: технологии, роботы, 3D-печать, достижения медицины.

What if one of our ancestors from 500 years ago or more returned? What would their reaction be if they saw how the world has changed and what has transpired to it because of the technological and technological revolution that has essentially transformed everything in our world? [1, 2].

As we enter the year 2023, time has flown by and science has advanced as well. Knowledge has expanded and ignorance has diminished, leading to a significant improvement in human welfare. We have progressed to a degree of civilization that our predecessors could never have anticipated.

Our circumstances have developed far more comfortable than those of our ancestors have. The modern period has seen unprecedented techno-



Picture of operating room technology [4]

logical advancement, with smart machines, smart brains, and various smart products that have altered the globe. The engineering utilized in technology and the harnessing of this technology to serve people, which has become vital to us, deserve recognition [2].

Technology is the bedrock of all professions, and the progress that the world has made now is due to people who lit the sparks of those sciences in earlier ages. Arab experts in mathematics, medicine, and engineering, as well as Russian, European, and other intellectuals, have helped the globe achieve this height of civilization.

Currently, everything is dependent on technology, and it is an intrinsic component of everything around us. For example, the medical profession is strongly intertwined to technology, resulting in previously inconceivable advances. The medical gadgets that are currently available have expanded the field's capabilities beyond human capability, and its services have considerably improved people's lives. Furthermore, the research carried out by these sophisticated instruments and other innovations have contributed to growth.

We live in an age known as the peak era, in which the past has become plain to us and the future is full with possibilities. Diseases have claimed the lives of hundreds and millions of people in the past, with no one knowing what caused them or how to treat them. Nevertheless, because to advances in science and technology, some of these illnesses have been wiped off., and even if they remain, finding and treating them has gotten significantly quicker [3].

This technology has provided joy to many individuals, particularly those who have lost one or two limbs and now have prosthetic limbs that move naturally. As medicine advances and provides us with a sense of security, we are now living in a secure and protected environment.

Technological Changes have occurred Throughout History

The steam engine, telegraph, and telephone were a few of the innovative technologies of the 18th and 19th centuries. With the emergence of radio, television, computers, and the internet in the twentieth century, technology expanded swiftly. Nowadays, technology is rapidly evolving, with new technologies such as artificial intelligence, robots, and 3D printing affecting our way of life.

The Technology's Impact on Society

The technological development has had a significant impact on humanity. According to the Organisation for Economic Co-operation and Development (OECD), "during the previous two centuries, technical innovation has been a primary engine of economic growth and social progress" (OECD, 2017). Technology has altered the way we live, from better healthcare and education to enhanced production and efficiency.

Conclusion

Technology has been advancing since prehistoric times, with major milestones and breakthroughs occurring over the ages. Technology has changed every way of life, from primitive tools and weapons to sophisticated electronics and electronic systems. As technology improves, it is apparent that its impact on society will only grow. Ultimately, technology extends back to primordial times and has evolved greatly throughout the millennia. Ancient inventions and breakthroughs affected the world we live in today, while current technology such as artificial intelligence and robots continue to transform the way we live. It seems apparent that technology will continue to play a significant part in our lives for many years to come.

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PRINTED MEDICATIONS, NEW TECHNOLOGIES, AND A MEDICAL REVOLUTION IN THE HORIZON

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ПЕЧАТНЫЕ ЛЕКАРСТВА, НОВЫЕ ТЕХНОЛОГИИ И МЕДИЦИНСКАЯ РЕВОЛЮЦИЯ НА ГОРИЗОНТЕ

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In this study report, we shed light on 3D printing of advertising and its future potential.

Keywords: 3D printing, medical, 3D medical devices.

В этом исследовании изложена информация о 3D-печати рекламы и ее будущем потенциале.

Ключевые слова: 3D-печать, медицинские, 3D-медицинские приборы.

3D printing technologies aid in the design of medical equipment through additive manufacturing. Only a few layers of basic raw materials are used to create 3D medical devices. 3D printing technology is adaptable, allowing designers to modify any feature without the use of extra equipment. 3D printing software for medical devices is in high demand since it handles numerous activities such as printing, analysis, design, planning, simulation, and visualization.

According to Medgadget, the market for 3D printing software for medical devices is predicted to reach \$657.08 million by 2027, with a compound annual growth rate of 17.62%. This article is about 3D printing for medical devices, but what about pharmaceuticals? Can 3D printing be used to make pills? Can this technology be applied in another, more crucial dimension, that of giving "personalized medications" tailored to each individual's health and physical condition?

To some extent, every human being in our planet has a unique physique, and no human body is comparable to another. Yes, we have a similar appearance, yet each person's physique is unique, like a fingerprint. We all have fingerprints, yet none of them match.

The other never will. The same is true for medical disorders. Regardless of the diagnosis, they are similar but not identical. So how can we expect the same treatment or prescription to be effective for everyone?

Customized medications for every ailment and every person are a key medical aim for humanity, but achieving them is tough. In this context, scientists at the University of California, Los Angeles, USA, developed a new technology based on a 3D printing system that enables the production of "customized medicines" with very simple machines, according to a study recently published on the university's platform.

Printing medicines with a "Compact System" is an important goal for doctors because it not only allows medicines to be made in hospitals - close to patients - but also makes it easy to manufacture medicines in remote locations that are difficult to reach in all countries.

Indeed, scientists claim that 3D printers can help make medicines in the patient's home, and "customized medicine" does not imply that each person will have unique drugs made for him alone; rather, the same medicines can be modified to suit each case, ensuring that the drug dose is very accurate, and this new 3D printing system helps make that happen.

The new method is based on a small 3D printer the size of a coffee maker, complete with a 3D print head, a specific spot for a smartphone, and a container to hold the medicine solution.

The working approach is straightforward and straightforward. First, the patient or medical staff receives the medication formula assigned to the patient, which includes a specific dose of the medication, then the drug solution is poured with a special chemical into the container designated for the drug solution, and finally, the process is carried out on the smartphone using the device's screen light. It's a good idea to combine the medication and make it into a pill.

Scientists at the University's College of Medicine conducted several critical tests utilizing various medications and cellphones, and they were able to print pharmaceuticals including "Warfarin," a regularly used blood thinner, in a variety of dosages, sizes, and forms. Scientists acknowledge their strategy still requires... However, if the studies go as planned, this will be a step toward "more personalized medicine", something experts have long desired.

Professor Abdel Basset, senior author of the study and team leader, stated in this context, "There are still many challenges to achieving this dream, but we hope that 3D printed medicines will facilitate treatment at sensitive points of care such as hospital emergency departments, operating rooms, as well as in "Remote areas, and we aspire that one day soon they will be in people's homes as well". Of course, printed medications will not replace all drugs, but it is a lofty ambition, and perhaps one day it will be feasible to produce medicines individually tailored for you at home. Something is feasible in the Fourth Industrial Revolution and 3D printer age.

According to Rawan Abdel Salam, a pharmacy specialist, the pharmaceutical industry aspires to further development in light of the decline of medicinal plants, which are considered the primary source of many medicines and carry the chemical and drug compositions required by patients. In an interview with Al-Arabi from Amman, Abdel Salam noted that experts have been conducting studies to tackle this problem and find an alternative owing to climate change and high temperatures and their influence on plants. She said, "There could be a glimmer of hope in terms of printing medicines using a 3D method and technology, which is used in the field of medical devices and food."

Conclusion

Printed medications represent a groundbreaking development in the field of medicine, promising a medical revolution on the horizon. The ability to customize medications, in-

corporate advanced drug delivery systems, enhance accessibility, and accelerate drug development has the potential to transform patient care. As the technology evolves and regulatory frameworks adapt, printed medications hold the promise of improving treatment outcomes, advancing personalized medicine, and revolutionizing the way drugs are manufactured and distributed. With continued research, collaboration, and innovation, printed medications have the potential to reshape the future of healthcare and make a lasting impact on patient well-being.

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OBSTACLES TO USING AVAILABLE TECHNOLOGY IN ENGLISH TEACHING IN YEMENI SCHOOLS

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ПРЕПЯТСТВИЯ НА ПУТИ ИСПОЛЬЗОВАНИЯ ИМЕЮЩЕЙСЯ ТЕХНОЛОГИИ ПРЕПОДАВАНИЯ АНГЛИЙСКОГО ЯЗЫКА В ШКОЛАХ ЙЕМЕНА

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Education is regarded as the cornerstone that enables students to gain skills in their life, and it has now become a priority for education to study other languages, at least the English language, in order to stay up with the times and cope with the world overseas. From this vantage point, this paper describes the difficulties that students and instructors in Yemeni schools experience when teaching or studying English.

Keywords: Yemeni Schools, Teaching, Technology, languages, English language.

Образование позволяет учащимся получить навыки в своей жизни, и в настоящее время образование стало приоритетом для изучения других языков, по крайней мере английского языка, чтобы идти в ногу со временем. С этой точки зрения в настоящей статье описываются трудности, с которыми сталкиваются учащиеся и инструкторы йеменских школ при преподавании или изучении английского языка.

Ключевые слова: йеменские школы, преподавание, технологии, языки, английский язык.

The English language is now regarded as the official language that the globe uses to communicate with one another when they are from different countries. Many challenges

exist, such as the inscription on the stone and the obstacles experienced by English language teachers, such as:

- The English language becomes a necessary subject in the seventh grade of the basic stage of education.

- Educational schools, particularly in rural regions, lack basic educational practices and are almost non-existent.

- A lack of instructional personnel for pupils, particularly in rural regions, which is essentially non-existent.

- There are more than 200 pupils in the class.

There are several factors impeding the educational process, including Yemen's persistent issues. Perhaps we already know that training is the foundation that allows students to develop skills that will aid them in their academic and practical life. It is well known that there is no optimal strategy for all educational situations because each educational situation has a unique strategy that varies depending on the nature of the objectives, content and capabilities available, learner characteristics, and the urgency of the need. For students to study English to aid them in the future, whether they desire to travel or continue their education, many techniques must be used to provide knowledge to students in an easy and fluid manner, and technology plays the most important role in this sector. Other education can be summed up as follows:

- Realizing the concept of the learner as the center of the educational process, with individual characteristics taken into consideration.

- Risk reduction while utilizing simulation as a teaching technique.

- Reducing the teacher's work and time.

- Simplicity and convenience in developing instructional materials.

- Identifying pupils' areas of weakness when teaching the educational content in order to assist them in overcoming them.

- Improving kids' mental and cognitive abilities.

- Confirming and introducing kids to scientific principles.

- Creating motivation, intrigue, and captivating attention while presenting instructional content.

Despite the numerous benefits, there are also drawbacks, such as a lack of social interaction among students, health issues associated with prolonged sitting, and so on. However, educational technology device training programs must be designed and implemented, and instructors must be educated to utilize them.

Students aspiring to be teachers must understand that educational technology gadgets are worthless unless they are employed to support the educational process. In presenting and presenting educational information to students in a novel format based on the use of sound, image, and sound effects, which arouses the student's attention in the teaching and learning processes, in a suspenseful and alive environment. Problems are solved as a result of his active engagement in the accumulation of experiences.

As a result, we require several solutions for the use of educational technology in Yemeni schools to teach topics, which must include the following:

- Teachers with experience in both specialty and technology.

- Providing schools with technology educational skills.

- Scaling down the size of research groups.

There are other conditions that we hope will be considered in the case of the state's stability and restoration to security and stability.

Finally, the educational process in Yemen has several challenges, with students bearing the brunt of the burden because they are the next generation.

USING A VIDEO CAMERA TO REDUCE MATERIAL CUTTING LOSSES IN A 3D MODEL MILLING MACHINE

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ИСПОЛЬЗОВАНИЕ ВИДЕОКАМЕРЫ ДЛЯ СНИЖЕНИЯ ПОТЕРЬ МАТЕРИАЛА ПРИ РЕЗКЕ НА ФРЕЗЕРНОМ СТАНКЕ С ТРЕХМЕРНОЙ МОДЕЛЬЮ

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The paper examines the usage of a video camera software to detect faults in a three-dimensional milling machine and its beneficial influence on the firm's economics when it is utilized efficiently to detect defects, as the company decreases defects while saving time.

Keywords: 3D milling machine, economy, video camera.

Аннотация: В статье рассматривается использование программного обеспечения видеокамеры для обнаружения неисправностей в трехмерном фрезерном станке и его благотворное влияние на экономику фирмы, когда оно эффективно используется для обнаружения дефектов, поскольку компания уменьшает количество дефектов, экономя время.

Ключевые слова: 3D фрезерный станок, эконом, видеокамера.

This software, which uses a video camera to detect defects in a 3D milling machine, could have a positive impact on the economy. When the software is used to detect defects, the company can save more time and money in repairing machines, and they can avoid producing unwanted parts and thus save financial and time resources.

Moreover, this program can help improve the quality of the products produced, as it allows the company to accurately assess the quality of manufactured sheets and ensure the quality of the finish, which increases customer satisfaction and enhances the company's reputation.

In addition, this program can help improve the efficiency of the production process in general, as the company can save more time and effort in managing and maintaining machines, reducing production costs and increasing productivity.

It is important to note that despite the potential benefits of this program, the costs of developing and implementing the program and purchasing and installing the camera needed to run it can be prohibitive, so the company must evaluate the benefits and costs before deciding to use the program.

Economically, if a 3D milling machine has a defect this can lead to additional costs and delays in the production of the finished parts. Although the use of a video camera can help detect and correct defects, it can also increase production costs.

In addition, the software used to pre-cut sheet metal can require significant investments in technology and software. Thus, this can increase production costs and raise prices.

On the other hand, if defects in the milling machine are fixed and efficiency is improved, this can lead to cost reductions and increased productivity, thus increasing profits. Data analysis software and artificial intelligence can also be used to improve production processes and reduce losses.

Overall, it can be said that the impact of this program on the economy depends on several factors, such as the extent to which defects affect costs and productivity as well as the effectiveness and cost of using the program.

In general, the impact of a sheet cutting processing program on the economy is the impact on operations, costs, and productivity.

In order to better understand this effect, some of the following key points can be considered:

- Manufacturing cost: The cost of producing sheet metal is one of the most important factors affecting productivity and profits. Since defects in the 3D milling machine can lead to increased costs, this will affect profits and can drive up prices.

- Productivity: If defects in the 3D milling machine lead to a delay in the production of finished parts, this will affect productivity and the ability to fulfill orders. Thus, increasing productivity can help fulfill orders better and improve profits.

- The program used: The use of the sheet cutting processing program requires special technology and software, and therefore may incur additional costs. On the other hand, the use of data analysis software and artificial intelligence can help improve operations and reduce costs and losses.

- Quality improvement: Using a video camera to monitor and correct defects can improve product quality and reduce losses due to defects.

Finally, this program, which employs a video camera to detect problems in a 3D milling machine, has the potential to benefit the economy.

When employing software to identify problems, the organization may save time and money in fixing equipment, as well as avoid making undesired components, which saves money and time.

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A SURVEY ON 5G COVERAGE IMPROVEMENT TECHNIQUES IN LIBYA: ISSUES AND FUTURE CHALLENGES

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ОБЗОР МЕТОДОВ УЛУЧШЕНИЯ ПОКРЫТИЯ 5G В ЛИВИИ: ПРОБЛЕМЫ И БУДУЩИЕ ВЫЗОВЫ

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Using the development of Belarusian communications networks as an example, this article addresses the most significant challenges and issues confronting the technological development of networks in Libya, as well as the distinctions across network generations.

Keywords: 5G, Libya, URLLC, wave.

На примере развития белорусских сетей связи в данной статье рассматриваются наиболее существенные вызовы и проблемы, стоящие перед технологическим развитием сетей в Ливии, а также различия между поколениями сетей.

Ключевые слова: 5G, Ливия, URLLC, волна.

The lack of stability in the Libyan state must have made it difficult to pay attention to and develop technological aspects, which must be developed in order to modernize the operating systems in Libya, as well as make it easier for workers to work and link all the atmosphere of the state with one system, not to mention benefiting from information technology techniques in supplying markets with goods that increase demand and other things, developed.

As the use of wireless devices grows in popularity, as is the quantity of data used, user needs, and expectations. Wireless evaluation advances have resulted in the introduction of new services and use cases to match these demands and expectations. The main services provided by these wireless technologies are minimal latency, high bandwidth, maximum throughput, and increased capacity. Fifth-generation (5G) wireless technology has been proposed to meet these important requirements by providing new optimized and expanded services. High data rates, ultra-reliable low-latency communication (URLLC), high connection, increased bandwidth, and improved mobility support are among the new issues introduced by 5G.

Table 1 compares technological generations in terms of access mechanisms, data rates, frequency ranges, applications, and critical factors. To achieve these fundamental features of 5G and beyond, new technologies are being suggested, including as millimetre wave (mmWave) spectrum for big bandwidths, multiple input and multiple output (MIMO) for vast connection, and extreme mobile broadband (eMBB) for high data rates and low latency.

Table 1

Compares technological generations from 1G to 5G

Generation	Access Techniques	Data Rate	Frequency Bands	Applications	Key Parameters
5G	NOMA, FBMC	2.4 Kbps	1.8 GHz, 2.4 GHz, 30–300 GHz	Voice, Data, Video calling, ultra HD video, virtual reality applications	Ultra-low latency, ultra- high availability, ultra-speed, and ultra- reliability
4G	LTEA, OFDMA, SCFDMA, WIMAX	10 Kbps	2.3 GHz, 2.5 GHz, 3.5 GHz	Voice, data, video calling, HD television, and online gaming	Faster broadband internet and lower latency
3G	WCDMA, UMTS, CDMA	384 Kbps to 5 Mbps	800 MHz, 850 MHz, 900 MHz, 1800 MHz, 1900 MHz, 2100 MHz	Voice, data, and video calling	Broadband internet and smart phones
2G	GSM, TDMA, CDMA	100 Mbps to 200 Mbps	800 MHz, 900 MHz, 1800 MHz, 1900 MHz	Voice and data	Digital
1G	FDMA, AMPS	10 Gbps to 50 Gbps	800 MHz	Voice	Mobility

Traditional multiple access approaches will not be able to meet the future 5G demands of high data speeds, low latency, enormous interconnection, and good spectral efficiency. The increased number of cellular users in 5G increases the complexity of the receiver. Non-orthogonal multiple access (NOMA) approaches, on the other hand, can be utilized to minimize receiver complexity. To decrease system complexity, this will allocate several users in one resource block using allocation methods and decode the users at the receiver. This strategy will increase system capacity, bit error rate, and throughput. Device-to-Device (D2D) technology is also used to minimize system complexity, protect against unauthorized users, and improve dependability. Using carrier aggregation (CA) techniques, the bandwidth of the cellular network may be increased. Massive MIMO's potential prospects and problems in 5G and beyond.

Small cells are required for 5G to accomplish essential criteria such as improved mobile wide band, URLLC, enormous connections, and increased spectral efficiency. Small cells employ low-power transmitting stations and are particularly simple to deploy because to their minimal hardware complexity. Indoors, these little cells may be installed on a wall, while outside, they can be mounted on miniature towers or light posts. The coverage and data rate of tiny cells are determined by the operating frequency, transmission power, and antenna height and tilt angle. The coverage area's radius is always proportionate to the transmitted power. Small cells provide several advantages, including high data speeds, faster deployment, lower costs, the ability to function with minimal power, and the need for less installation area. The 5G network incorporates tiny cells, MIMO, beam-forming, and mmWaves to deliver high data speeds and big capacity.

The mmWave band, which ranges from 30 GHz to 300 GHz, is substantially less used and allows very fast communication. However, the difficulty with high frequency mmWave is that it collides with barriers in the free space, such as trees, buildings, and so on, causing multipath fading and hence lower signal strength. As a result, mmWaves are the ideal frequency bands for short-distance communication and may be employed in tiny cells. Figure 1 depicts a geographical region without and with tiny cells. In Figure 1a, the mmWave signal is subjected to multipath fading; however, in Figure 1b, the multipath fading is prevented, and the coverage is superior to that of the conventional technique.



Fig. 1. (a) Obstructions are obstructing the mmWave signal.
 (b) Small cells are utilized to prevent multipath fading

In addition to 5G and 6G network applications, Libyan consumers want more network capacity, throughput, data rates, spectral efficiency, low latency, and a larger coverage area than 5G networks. By 2030, it will have automated the nation, resulting in smart production, a smart society, and smart lifestyles. highlighted the security and privacy concerns that may develop with the 6G needs, unique network design, applications and enabling technologies like physical layer security, distributed AI/ML, Visible Light Communication, THz bands, and quantum communication. 6G security and privacy challenges were also addressed in four major areas, including distributed AI, real-time edge computing, 3D intercoms, and intelligent radio. For truly immersive applications such as 3D communication, virtual reality, and digital twins, 6G capabilities must be realized at scale. The benefits of the future 6G technology for real-time application processing on edge networks have been highlighted. The difficult difficulties and future prospects of 6G-based edge computing were also explored. Quantum machine learning for 6G communications, ultra-reliable communications for edge computing, energy harvesting for increased battery life, and other future issues of 6G networks must be solved.

Conclusion

A quick comment regarding the difficulties Libya has in developing networks owing to the country's instability. Evaluation of mobile networks from 1G to 5G, their needs, major 5G criteria, 5G coverage enhancement such as tiny cells, CA, D2D, NOMA, MIMO, and 5G optimization. Furthermore, we discussed the benefits and drawbacks of current technology as well as future difficulties for enhanced coverage in 5G networks.

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THE TECHNIQUES USED IN THE TECHNIQUE FOR ENSURED TRUTHFULNESS AND DEPENDABILITY OF NEWS AND ECONOMIC REPORTS

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МЕТОДЫ, ИСПОЛЬЗУЕМЫЕ В ТЕХНИКЕ ОБЕСПЕЧЕНИЯ ПРАВДИВОСТИ И ДОСТОВЕРНОСТИ НОВОСТЕЙ И ЭКОНОМИЧЕСКИХ ОТЧЕТОВ

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The article addresses a critical point in the issue of fake news that extends beyond its immediate political dimensions to the fact that it has a huge negative impact on young people and rising generations due to its ability to fragment any ability they have to believe and believe, dismantling their ability to positively participate in political and cultural issues.

Keywords: news, Covid 19, media literacy.

В статье рассматривается критический момент в вопросе о поддельных новостях, который выходит за рамки его непосредственных политических аспектов и заключается в том, что он оказывает огромное негативное влияние на молодежь из-за его способности фрагментировать любую способность, в которую они должны верить, демонтировать их способность к позитивному участию в политических и культурных вопросах.

Ключевые слова: новости, Covid 19, медиаграмотность.

In an era of information overload and widespread dissemination of news and economic data, ensuring the veracity and reliability of information has become of paramount importance. The techniques employed to guarantee the truthfulness and

dependability of news and economic reporting play a crucial role in maintaining public trust and facilitating informed decision-making. This article explores various techniques utilized to enhance the credibility and accuracy of news and economic information, highlighting their significance in today's information-driven society.

– **Fact-Checking and Verification:** fact-checking is a vital technique employed to verify the accuracy of news and economic information. Fact-checkers meticulously scrutinize claims, statements, and data presented in news articles or economic reports. They employ rigorous research methods, cross-referencing sources, and consulting subject matter experts to ensure the information is supported by evidence and reliable data. Fact-checking organizations and journalists play a critical role in debunking misinformation and providing accurate information to the public.

– **Source Evaluation and Attribution:** evaluating the credibility and expertise of sources is crucial for maintaining the trustworthiness of news and economic reporting. Journalists and analysts need to assess the reputation, expertise, and independence of their sources before using their information. Transparently attributing the sources and providing contextual information about their qualifications and potential biases enables readers to make informed judgments about the reliability of the information presented.

– **Data Integrity and Methodological Rigor:** in economic reporting, ensuring data integrity and employing rigorous methodologies are essential for producing dependable analyses and forecasts. Economic data sources, such as government agencies, research institutions, and international organizations, follow standardized data collection and reporting procedures. Journalists and economists must critically examine the data, assess its quality and reliability, and understand the methodologies used for its collection and analysis. Transparently reporting the data sources and methodologies adds credibility to economic reporting.

– **Peer Review and Expert Analysis:** in both news and economic reporting, peer review and expert analysis contribute to the overall reliability and accuracy of the information presented. Peer review involves subjecting research articles, economic models, or investigative reports to scrutiny by independent experts in the respective fields. Expert analysis provides additional insights, context, and interpretation of complex topics. By seeking input from knowledgeable individuals and subject matter experts, journalists and economists enhance the accuracy and credibility of their work.

– **Ethical Journalism and Disclosure:** adhering to ethical journalism standards is paramount for ensuring the truthfulness and dependability of news reporting. Journalistic ethics encompass principles such as accuracy, fairness, objectivity, and independence. Ethical journalists disclose conflicts of interest, avoid sensationalism, and strive to provide a balanced representation of diverse perspectives. By upholding these ethical principles, journalists enhance the credibility of their reporting and build trust with their audience.

– **Transparency and Corrections:** transparency is a key element in maintaining the trustworthiness of news and economic reporting. News organizations and economic analysts should be transparent about their sources, methodologies, and potential conflicts of interest. Moreover, when errors or inaccuracies are identified, prompt corrections and retractions should be made to rectify the misinformation and demonstrate accountability.

Conclusion

In an era of information proliferation, ensuring the truthfulness and dependability of news and economic reporting is crucial for informed decision-making and maintaining public trust. Techniques such as fact-checking, source evaluation, data integrity, peer review, and ethical journalism contribute to the credibility and accuracy of information. By employing these techniques and fostering a commitment to transparency, journalists and

economists can enhance the reliability of their work, allowing individuals and organizations to make well-informed decisions based on trustworthy information.

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YEMENI INSTITUTIONAL ELECTRONIC TECHNICAL IMPROVEMENT AND ITS IMPACT ON YEMENI CITIZEN COMFORT

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СОВЕРШЕНСТВОВАНИЕ ЭЛЕКТРОННОЙ ТЕХНИКИ ЙЕМЕНСКИХ УЧРЕЖДЕНИЙ И ЕГО ВЛИЯНИЕ НА КОМФОРТ ЙЕМЕНСКИХ ГРАЖДАН

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This article examines the positive and negative effects of technology on Yemeni society's comfort, as well as ways to benefit from modern technologies imported from Belarus in developing the medical field, as well as providing point derivatives for electric diesel engines using devices that legalize the use of petroleum derivatives purchased from Belarus in 2018.

Keywords: war in Yemen, education, Yemen-based organizations.

В данной работе рассматривается положительное и отрицательное влияние технологий на комфорт йеменского общества, а также пути использования современных технологий, импортируемых из Беларуси, в развитии медицинской сферы, а также в обеспечении точечных производных для электрических дизельных двигателей с помощью устройств, легализующих использование нефтяных производных, закупленных в Беларуси в 2018 году.

Ключевые слова: война в Йемене, образование, йеменские организации.

Over the years, societies have experienced technological improvements that have made life simpler and more pleasant for its members while also causing certain conflicts among and among their members. As a result, technology might be viewed as a two-edged sword. Individuals must understand the proper method to be used when using its means, because many technological factors have contributed to various social changes in both positive and negative ways.

Technology has revolutionized the way people have lived, how companies have run, how adolescents have grown up, and how people in society as a whole have lived day to day since the start of civilisation. Communication, travel, study, business, convenience, and health are all examples of social practices. Regardless matter how profound the consequences on human behavior have been, technology has generally had both beneficial and bad effects on society.

The good benefits of technology on Yemeni society may be seen in the following ways, which are among the most visible positive effects of technology on societies:

1. Improving modes of transportation: this was accomplished through the invention and development of planes, trains, and speedboats, as well as cars and buses, all of which enabled individuals to travel and move to their destinations quickly and in record time when compared to the ancient methods of walking and harnessing livestock to travel. Transportation is one of the most critical fundamental infrastructures for every civilization, and technological advancements have tremendously aided in the development of transportation networks.

2. Improving communication systems: communication systems are one of the most crucial components of sophisticated society. Technology has aided in the development of faster, more efficient, and better communication systems than the traditional methods, which relied on certain species of birds and the discharge of messages through the rise of smoke. E-mail, phone conversations, and numerous applications are examples of modern communication systems, as are worldwide corporations that provide digital communication networks between persons.

3. Improving the teaching and learning processes: technology has made it simple to learn any language or skill, thanks to platforms such as Google and YouTube, and paper books have been made available in an electronic format, in addition to broadcasting many lectures and seminars. This adds to the acceleration of the teaching and learning processes, and has assisted many different educational institutions in developing e-learning platforms that eliminate the need for students and professors to leave their homes or workplaces to access them, saving time and effort.

4. Individual equality: technology has achieved equality among individuals in societies, as well as seen the effects of justice in them, and has eliminated social disparities between them. It has helped to provide health and education to the greatest amount of people in civilizations, regardless of their origins. The elimination of workplace discrimination and the reduction of salary disparities, in addition to exposing gender prejudice, the exclusion of minorities, hate speech, and other issues.

Some of the negative consequences of technology on society are as follows:

1. Increasing the population: technology has contributed to the extension of people's lives via the supply of ample food, as well as to the management of resources that aid in the frequency and expansion of reproductive processes. Some epidemics and uncommon diseases have been altered by technology and combated by medicinal and therapeutic approaches, resulting in Community lifestyles, population expansion, and congestion in communities.

2. Increased cybercrime: this is due to the overuse of technology and the Internet, and children or innocent individuals may become victims of these cybercrimes committed by a criminal element in society.

3. Increased health and mental risks: Technology impacts people's physical and mental health, makes them sluggish, and lowers their emotions and sentiments. Furthermore, excessive use of some of them causes sleep issues, as well as concern with them and less time spent with family and friends.

Technology has had a huge and inconceivable influence on human lives from the dawn of civilisation. While assessing the whole influence of technology on human civilization is challenging, it is apparent that technology has made life easier, more pleasurable, more convenient. However, when utilized or created recklessly, it has the potential for terrible outcomes and hence has significant drawbacks. As technology advances, it becomes increasingly vital for engineers to be more conscious and responsible, and for end users to strike a balance between using modern systems and outmoded technologies to get things done in a more healthy and productive manner. Perhaps the beneficial and negative impacts of technology have a part in Yemeni society's comfort. For example, current technology imported from Belarus were used to advance the medical profession, and instruments to provide point derivatives for electric diesel engines utilizing devices that legalized the use of petroleum derivatives obtained from Belarus in 2018 were also used.

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BUILDING A NUCLEAR REACTOR IN YEMEN AND POTENTIAL AND APPROPRIATE PLACES TO BUILD A LIGHT WATER NUCLEAR REACTOR

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СТРОИТЕЛЬСТВО ЯДЕРНОГО РЕАКТОРА В ЙЕМЕНЕ И ПОТЕНЦИАЛЬНЫЕ И ПОДХОДЯЩИЕ МЕСТА ДЛЯ СТРОИТЕЛЬСТВА ЛЕГКОВОДНОГО ЯДЕРНОГО РЕАКТОРА

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Inside the intermediate condition, the light water reactor runs inside a peaceful seismic activity in the Shabwa governorate to cover Yemen's energy demands under the supervision of active Russian design businesses. In terms of nuclear safety, the seismically quiet desert may be divided into two identical zones within geographical vicinity to Yemen's governor. The Mokha

water desalination plant can benefit from Russian and Belarussian experiences in the development and management of nuclear reactors for water desalination, as they have extensive experience in such promising national projects that have been tested for years in several countries.

Keywords: nuclear Energy; reactors include, SMRs, water reactor, reactor engineering.

В промежуточном состоянии легководный реактор работает внутри мирной сейсмической активности в мухафазе Шабва, чтобы покрыть энергетические потребности Йемена под наблюдением активных российских проектных предприятий. С точки зрения ядерной безопасности, сейсмически тихая пустыня может быть разделена на две идентичные зоны в пределах географической близости от губернатора Йемена. Мохская опреснительная установка может извлечь выгоду из российского и белорусского опыта разработки и управления ядерными реакторами для опреснения воды, поскольку они имеют большой опыт в таких перспективных национальных проектах, которые годами апробировались в нескольких странах.

Ключевые слова: атомная энергетика, реакторы включают в себя SMR, водяной реактор, проектирование реакторов.

The prospect of building a nuclear reactor in Yemen is a topic that demands careful consideration due to the complex geopolitical situation and the potential risks associated with nuclear technology. This article aims to explore the potential and appropriate places to build a light water nuclear reactor in Yemen, taking into account various factors such as safety, security, and the country's energy needs.

1. Assessing the Need for Nuclear Power: before discussing potential locations, it is essential to evaluate the necessity of nuclear power in Yemen. The decision to build a nuclear reactor should be driven by the country's energy demands, long-term sustainability goals, and economic viability. A comprehensive energy plan that considers alternative renewable energy sources should be developed in parallel with the consideration of nuclear power.

2. Safety as the Foremost Priority: safety should be the primary concern when selecting a location for a nuclear reactor. The chosen site must be geologically stable, away from seismic zones, and have a low risk of natural disasters such as floods or tsunamis. Additionally, proximity to densely populated areas should be minimized to mitigate potential risks to human life and the environment.

3. Water Availability and Cooling: light water reactors, the most common type of nuclear reactors, require a substantial water supply for cooling purposes. Therefore, the availability of a reliable water source should be a crucial factor in determining suitable locations for a nuclear reactor in Yemen. Coastal areas may offer advantages due to proximity to seawater, which can be used for cooling purposes.

4. Infrastructure and Support Services: the chosen location should have adequate infrastructure and support services in place to accommodate the construction and operation of a nuclear reactor. This includes reliable transportation networks, access to skilled labor, and the availability of necessary equipment and materials. The presence of established research and educational institutions in the vicinity can also contribute to the development of a skilled workforce.

5. Security and Political Stability: given Yemen's turbulent political landscape, security considerations become even more crucial for a nuclear facility. The selected site must be in an area with stable governance and security arrangements to safeguard against unauthorized access, theft, or misuse of nuclear materials. Close cooperation with international organizations such as the International Atomic Energy Agency (IAEA) can enhance security and ensure compliance with international nuclear safety standards.

6. Public Acceptance and Communication: the establishment of a nuclear reactor requires transparent communication with the public and stakeholders to address concerns and build trust. Public acceptance is crucial for the success of any nuclear project. A comprehensive public engagement strategy should be developed to provide accurate information about the benefits, risks, and safety measures associated with nuclear power.

7. International Collaboration and Expertise: building and operating a nuclear reactor necessitates technical expertise, licensing processes, and regulatory frameworks. Yemen should explore opportunities for international collaboration, seeking assistance from experienced countries and organizations with established nuclear programs. Collaborative partnerships can provide guidance, training, and support in ensuring the safe and efficient operation of a nuclear reactor.

Conclusion

The decision to build a nuclear reactor in Yemen requires a thorough assessment of various factors, including safety, security, energy needs, and public acceptance. Identifying appropriate locations that meet strict safety criteria, considering water availability, infrastructure, and political stability, is crucial. International collaboration, transparent communication, and engagement with stakeholders are essential elements in establishing and operating a nuclear reactor responsibly. Ultimately, the pursuit of nuclear power should align with Yemen's long-term energy goals and be accompanied by a comprehensive energy plan that incorporates renewable energy sources to ensure a sustainable and secure future for the nation.

ENVIRONMENTAL BENEFITS OF SOLAR ENERGY TO PREVENT ENERGY LOSSES AND STRENGTHEN THE ENVIRONMENT OF YEMEN

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ЭКОЛОГИЧЕСКИЕ ПРЕИМУЩЕСТВА СОЛНЕЧНОЙ ЭНЕРГИИ ДЛЯ ПРЕДОТВРАЩЕНИЯ ПОТЕРЬ ЭНЕРГИИ И УКРЕПЛЕНИЯ ОКРУЖАЮЩЕЙ СРЕДЫ ЙЕМЕНА

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In this study, we shed light on the extent of the difficulties faced by Yemenis because of the lack of government power and the search for alternatives due to the high cost of fuel, and how they eventually transitioned to solar.

Keywords: solar energy, Yemen, environment.

Рассмотрены масштабы трудностей, с которыми сталкиваются йеменцы в результате отсутствия государственной власти и поиска альтернатив из-за высокой стоимости топлива, и на то, как они в конечном итоге перешли к солнечной энергии.

Ключевые слова: солнечная энергия, Йемен, окружающая среда.

Today, because of the conditions that the Yemeni people are enduring as a result of the instability created by the events of 2011, the government's electric current has been totally cut off since that time, forcing Yemenis to seek alternate energy options in order to continue their everyday lives. Appropriate alternatives, but they have several downsides, including the fact that there is currently no equipment that fully utilizes solar energy.

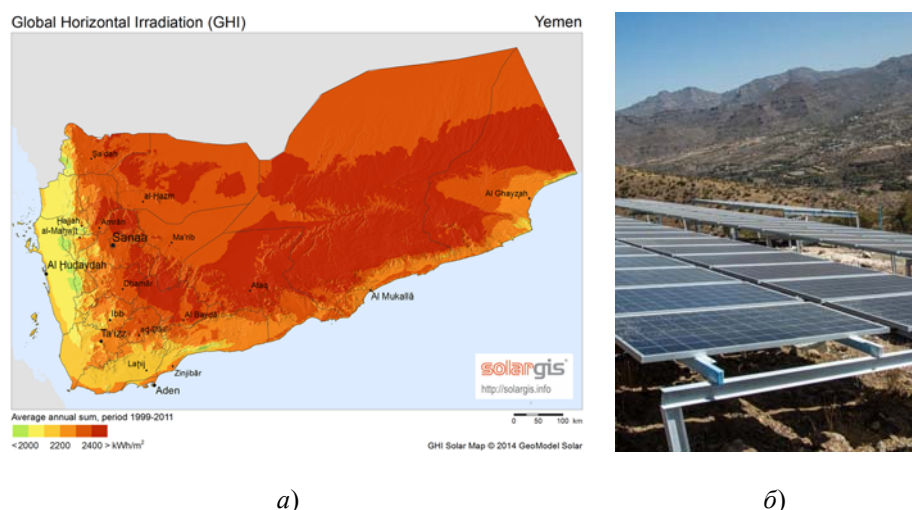


Fig1. Images of the Republic of Yemen's map that show potential installation sites for solar panels

With the start of Yemen's civil war, solar panels swiftly expanded throughout the country. Sana'a had a permanent power outage on March 23, 2015. The Marib power station, which supplied energy to Yemeni cities, has been decommissioned. As a result, the generator industry flourished for a long period. However, due to Yemen's volatile conditions, it cannot be assured that the generators will always be operational due to high fuel costs, fuel shortages, and unavailability of fuel at other times. As a result, Yemenis were forced to rely on solar energy.

The solar energy project in Yemen, which works to solve issues related to development and alternative energy, works to improve resilience in the Yemeni countryside because it is one of the most practical, measurable, and least harmful to the environment projects. Mini solar systems provide an alternative and renewable source of green energy, providing rural people with a low-cost and continuous electrical supply for extended periods. It also gives a solution and hope to communities that may have few other options.

Even prior to the 2015 crisis, just 23% of Yemenis had access to energy. Because of the high prices of fossil fuels and the embargo that makes access to energy supplies more difficult, the crisis has exacerbated the country's energy challenges. Previously, 20 liters of diesel cost US\$7; however, due to the country's acute fuel crisis, the equal quantity of diesel can now cost up to \$40, making energy unaffordable or accessible to the majority of Yemenis. Energy scarcity also has an impact on commercial initiatives, such as medium, small, and micro firms, as well as private sector projects, all of which suffer the most from a lack of access to alternative energy.

In fact, the massive increase in fuel prices and the permanent disruption of Yemen's public electricity network forced citizens to choose between installing home solar systems or subscribing to commercial electricity networks for diesel power generation; both options are expensive, and the renewable energy option is out of reach for many Yemenis. Whatever choice is chosen, the expense adds huge financial obligations to houses who are already experiencing suffocating financial difficulties.

Small solar grids generate alternative energy alternatives that might be a better source than diesel since it is green energy that is inexpensive in cost and can be easily deployed in rural regions, improving the lives of a huge number of Yemenis.

The struggles endured by Yemenis due to a lack of public energy and the search for alternatives due to high gasoline prices, and how they eventually switched to solar energy and benefited from solar energy transfers that can benefit countries from these experiences that have improved the use of sunlight, which Belarus can also benefit from in order to improve the environment from other energies.

**THE EFFECT OF USING INTERACTIVE MENTAL MAPS
ON RAISING THE LEVEL OF ACADEMIC ACHIEVEMENT
OF GRAMMAR AMONG SECOND YEAR SECONDARY
SCHOOL STUDENTS IN TAIZ**

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**ВЛИЯНИЕ ИСПОЛЬЗОВАНИЯ ИНТЕРАКТИВНЫХ МЕНТАЛЬНЫХ
КАРТ НА ПОВЫШЕНИЕ УРОВНЯ УСПЕВАЕМОСТИ
ПО ГРАММАТИКЕ СРЕДИ УЧАЩИХСЯ ВТОРОГО КУРСА
СРЕДНЕЙ ШКОЛЫ В ТАИЗЕ**

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The effect of using interactive mental maps on improving the academic achievement of second year secondary school students in grammar in the city of Taiz, Interactive mind maps are defined as an ideal intellectual tool for organizing ideas, categorizing and organizing facts and ideas using a central conceptual axis in the center of the map, and branching into main concepts

and then other sub-concepts.[1] They are expanded either by words, symbols, pictures or colours, reflecting the workings of the human (educated) brain and investing all of the brain's full potential in the left and right hemispheres, The statistical package analysis program (SPSS 26) was used to extract the results of the study for two independent samples and two interrelated samples, and the results indicate that all hypotheses are accepted.

Keywords: educational program, interactive mind maps, level of educational attainment.

Влияние использования интерактивных ментальных карт на улучшение успеваемости учащихся второго класса средней школы по грамматике в городе Тауз, Интерактивные интеллектуальные карты определяются как идеальный интеллектуальный инструмент для организации идей, категоризация и систематизация фактов и идей с использованием центральной концептуальной оси в центре карты, и разветвление на основные понятия, а затем другие субпонятия. [1]. Они расширяются либо словами, символы, изображения или цвета, отражающие работу человека (образованный) мозг и инвестирование всего полного потенциала мозга в левое и правое полушария, программа анализа статистического пакета (SPSS 26) был использован для извлечения результатов исследования для двух независимых образцов и двух взаимосвязанных образцов, и результаты показывают, что все гипотезы приняты.

Ключевые слова: образовательная программа, интерактивные интеллект-карты, уровень образования.

Mind mapping is a tool that assists in thinking and learning. The concept of "mind mapping" is similar to the concept of a neuron in the brain that activates brain hemispheres to increase visual memory retention, facilitate information retrieval, and ease of recall when needed [2] In any case, we find that mental maps depend on a specific imaginative scenario that takes learners on a journey of ideas that revolve around a specific concept, with an emphasis on building mental images of these concepts, whether read or written, saturated with colors, and varied in size to provide an integrated picture of the subject , As the student categorizes the concepts, which means that the neuron has a central point and branching arms, the mind maps become closer in shape to neurons [3]. Therefore, mind maps are a tool that aids in thinking, remembering and learning by storing and retrieving information in the brain. It allows facts and ideas to be organized in the same way the mind does, which makes it a way to take notes as well [4]. Objectives this work Recognizing the effect of using interactive mental maps on enhancing academic achievement in grammatical subjects for second year secondary school students in the city of Taiz and Recognizing the effectiveness of using interactive mental maps in retaining learning for second year secondary school students in the city of Taiz.

POPULATION AND SAMPLE

The study population consists of all second year secondary school students in the city of Taiz, and because the community is large, a random sample consisting of (90) students from second year secondary school students at Al Nahda School - Al Qaher District - Taiz city, was chosen, of whom (45) were an experimental group, and (45) A female student in a control group.

METHODOLOGY AND STATISTICS

Arbitrators in the field of educational technology, curricula, teaching methods and the Arabic language carried out the arbitration process of the program before its implementation. It was also verified that there was equivalence between the experimental and control groups. This is based on the light of a table of specifications, and the study tool (test) was judged by arbitrators in the Arabic language, curricula, and methods of teaching the Arabic language, and the decisions that the percentage of the arbitrators agreed on

exceeded (75%) were accepted, and the stability of the test was verified using the midterm division. The stability was (0.88), while the stability of Coder Richardson 21 was (0.91). A two-sample t-test was used to confirm the validity of the first and third hypotheses, while a two-sample t-test was used to confirm the validity of the second hypothesis.

DISCUSSION AND CONCLUSION

There are statistically significant differences at the significance level ($\alpha \leq 0.05$) between the mean scores of the experimental group in the grammar test in the pre and post measurement in favor of the post measurement. The mean of the pre-measurement was (14.22), and the mean of the post-measurement was (30.33). There are statistically significant differences at the significance level (0.05) between the mean ranks of the control and experimental groups in the post-measurement in favor of the experimental group, as the mean rank of the control group was (23.73) and the mean rank. The experimental group (30.33). The same result was obtained in the case of follow-up measurement, where the mean of the experimental group was (27.69) and the mean of the control group was (19.42). These results can be attributed to the fact that the interaction of multimedia, including sound, images, static and animation, increases motivation towards learning and provides immediate feedback during the explanation process in the experimental group, increases students' motivation to learn the scientific material presented to them [5]. There are statistically significant differences at the level of (0.05) between the mean scores of the experimental group in the post and follow-up measurements in favor of the post-measurement, where the average of the experimental group in the post-measurement was (30.33) while the mean in the follow-up measurement was (27.69). With the passage of time, he forgets some of the information he learned because of the circumstances, his psychological state, and his mood, but that does not mean that he has lost it completely [6].

MOST IMPORTANT RECOMMENDATIONS:

– Training Arabic language teachers on the use of computerized interactive mind maps – which was built in the current study - to raise the level of achievement of male and female students in the second grade of secondary school in all schools.

– Encourage high school students and encourage them to use technological programs in the educational process with the aim of raising the level of their educational attainment in all academic courses due to its effectiveness in raising the level of their educational attainment at various levels.

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FLIPPED CLASSROOM AS A TECHNIQUE FOR A TRIANGLE EFFECTIVENESS OF EDUCATIONAL TECHNOLOGY IN TAIZ UNIVERSITY

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ПЕРЕВЕРНУТЫЙ КЛАСС КАК ТЕХНИКА ДЛЯ ТРЕУГОЛЬНОЙ ЭФФЕКТИВНОСТИ ОБРАЗОВАТЕЛЬНЫХ ТЕХНОЛОГИЙ В УНИВЕРСИТЕТЕ ТАИЗ

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This study aimed to find out the effectiveness of an electronic environment based on the flipped classroom model in developing computer skills on student achievement and skill performance. The sample of the study consisted of 88 students both from different departments in the College of Education, Taiz University, the study used a semi-experimental approach in which the sample was divided into two groups. The first is experimental, on which the flipped model was applied. The second is a control group that was taught in the traditional way. The measurement tool was an achievement test to measure academic achievement and a note card to measure skillful performance, the results showed that there were statistically significant differences between the two groups at the level ($\alpha \leq 0.05$). Where the mean of the scores showed a difference in performance skill in favor of the Experimental Group who studied through the flipped classroom model, In addition, a questionnaire was used in the study to find out the students' attitude towards learning using the flipped classroom model, the results of which indicated their acceptance of using the model as an effective teaching strategy, the most important recommendations declared that the policy of universities should include the flipped classroom model in the computer-teaching guide. They should train the teaching staff on because of its effectiveness and benefits to help them to train the student on self-learning and the optimal exploitation of Internet sites and social communication, and freeing them from continuing negativity because of getting used to receiving the information presented in the classroom.

Key words: flipped classroom, computer skills.

Целью данного исследования было выяснить эффективность электронной среды, основанной на модели перевернутого класса, в развитии компьютерных навыков, влияющих на успеваемость учащихся и их навыки. Выборка исследования состояла из 88 студентов разных факультетов Педагогического колледжа Университета Тауз. В исследовании использовался полуконтрольный подход, при котором выборка была разделена на две группы. Первый – экспериментальный, на котором была применена перевернутая модель. Вторая – контрольная группа, обучавшаяся традиционным способом. Инструментом измерения был тест достижения для измерения академической успеваемости и карточка для заметок для измерения умелой работы. Результаты показали, что между двумя группами были статистически значимые различия на уровне ($\alpha \leq 0,05$), где среднее значение баллов показало разницу в исполнительских навыках в пользу экспериментальной группы, которая обучалась по модели перевернутого клас-

са. Кроме того, в исследовании использовалась анкета, чтобы выяснить отношение учащихся к обучению с использованием модели перевернутого класса. , результаты которого показали согласие с использованием модели в качестве эффективной стратегии обучения, наиболее важные рекомендации заявили, что политика университетов должна включать модель перевернутого класса в руководство по компьютерному обучению. Они должны обучать преподавательский состав, учитывая его эффективность и преимущества, чтобы помочь им обучить студентов самообучению и оптимальному использованию интернет-сайтов и социальных коммуникаций, а также освободить их от продолжающегося негатива из-за привыкания к получению представленной информации. в классе.

Ключевые слова: перевернутый класс, навыки работы на компьютере.

Scientifically, the world is witnessing an amazing revolution, especially in the computer and the Internet, which led to a change in all aspects of life. Self-learning is considered one of the most important capabilities that must be available in the current and future generations. One of the educational strategies that help prepare students to adopt self-learning is the flipped classroom model. The flipped classroom strategy is one of the strategies that depend on the student's use of educational technologies and their employment in the learning process. Flipped education is concerned with the digital generation, the generation around which many programs and devices have emerged that require a professional teacher who cares about digital research and reading skills, searches for everything new, and is interested in electronic culture. Which is in line with the characteristics of the current generation and reduces, as much as possible, the usual method of education, hence the role of flipped education in the optimal investment of e-learning resources and directing best practices to integrate the various tools and means of technology in the curriculum and effectively (Shakaa, 2016, 5).

The flipped classroom is one of the blended learning strategies, which is an educational system that takes advantage of all available technological capabilities and media, because it combines more than one learning method and tool, whether electronic or traditional, to provide a new quality of learning that suits the characteristics and needs of learners on the one hand, and fits the nature of the course. And educational goals to be achieved on the other hand (Basharat, 2017, 3).

The flipped classroom is a type of blended learning design that restructures traditional education as it uses appropriate technology, such as video and multimedia to transfer lectures outside the classroom and lecture halls (John Krogstie, 2014, 23) and is called (the flipped classroom, flipped or flipped education, flipped learning).

METHODOLOGY

The semi-experimental approach was used in the current study based on the comparison between the experimental group, which was applied to the inverted classroom model, with the control group, which was taught in the traditional way, and an achievement test and skill performance of the two groups.

RESULTS

In the first hypothesis that focuses on educational attainment, the results showed that the values of the significance level for the two groups in the educational achievement test for computer skills amounted to (0.131), which is not statistically significant at the level of significance ($\alpha \leq 0.05$), and this indicates that there are no statistically significant differences at the level ($\alpha \leq (0.05)$) between the averages of the responses of the sample students of the experimental group and the control group in the measurement of the computer skills achievement test for students of the College of Education at Taiz University. As for the second hypothesis, which focuses on skillful performance,

the results showed that there were statistically significant differences at the level of ($\alpha \leq 0.05$) between the mean responses of the sample students to the experimental group and the control group in the measurement of the performance test of computer skills among students of the College of Education at Taiz University, for the group variable. Where the T value was (8.18) with a significance level of (0.05), which is statistically significant at a significance level ($\alpha \leq 0.05$).

RECOMMENDATIONS & SUGGESTIONS

Recommendations

Carrying out studies looking at the impact of developing faculty members and teachers in modern technologies that enable them to use the flipped classroom model

Carrying out studies looking at the requirements for developing the expertise of faculty members in integrating modern technology in education and the impact of providing it.

Suggestions

Computer skills become a basic subject for student teachers, and through it the student-teacher is trained on modern strategies and the integration of e-learning to enhance the motivation for self-learning.

To train teachers to use the Internet and search on specialized learning sites to provide learners with it, and to stimulate their motivation towards learning.

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YEMEN'S MARKETING TECHNOLOGY SYSTEM FOR LOCAL PRODUCTS

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СИСТЕМА МАРКЕТИНГОВЫХ ТЕХНОЛОГИЙ ЙЕМЕНА ДЛЯ МЕСТНЫХ ПРОДУКТОВ

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This study sheds light on the use of technology and social media platforms in Yemen in marketing and promotional activities, as well as their effectiveness and benefiting from the experiences of developed countries in the fields of technology, such as the Russian Federation and the European Union, to take strengths and apply them in Yemen.

Keywords: Yemen's Marketing, use of technology, shopping.

Рассмотрены технологии и платформ социальных сетей в Йемене в маркетинговой и рекламной деятельности, а также на их эффективность и использование опыта развитых стран в области технологий, таких как Российская Федерация и Европейские страны. Союзом, чтобы взять на себя сильные стороны и применить их в Йемене.

Ключевые слова: йеменский маркетинг, использование технологий, шопинг.

Except for walkers and people on diets, no one is injured by shopping technology. Today, technology has evolved from the square of enjoyment to the square of need, and we can purchase from our websites, administer markets, and sell our products using websites and application programs made possible by technology. When local and foreign items compete, imported ones frequently outperform. Because of several factors, the most important of which is its synchronization with promotional campaigns that influenced consumer conviction and wooed him to their side at the expense of local products, and this effect was reflected in the decline in domestic product and unemployment inflation.

The figures illustrate the rate of decrease in local productive investment structures, some of which were closed and some of which lay off their employees, or some of which were closed owing to low domestic demand.

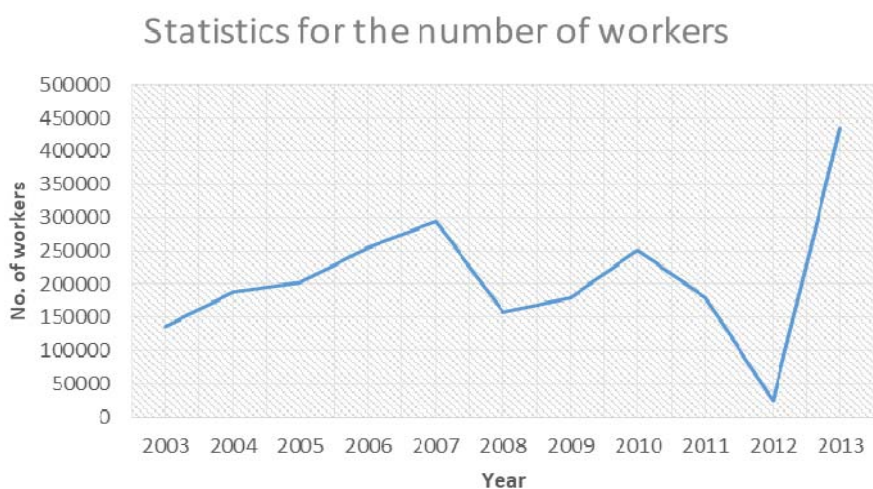


Fig. 1. According to the Yemeni Central Statistical Organization, a statistical distribution chart of the number of personnel in the technology marketing sector systems in Yemen

As a consequence, focusing on marketing technology will improve the direction of growth of local products, industries, factories, and sectors, as the same source clearly demonstrated via many factors it highlighted that were the reason of this unpleasant outcome, including

- Issues with administration, organization, and marketing.
- The difficulty in collecting information about investment prospects and related technology.

Despite the advent of marketing technology in certain local items, albeit in an inadequate manner, the situation has worsened after 10 years of this report.

It may occur to one to wonder what the implications of marketing technology are on the performance of the relevant institutions that are manufactured and promoted, and this question can be answered through numbers and indicators of the uses of technology and its general impact, as well as its ability to shape the mentality of the consuming public and, prior to that, on the marketing plans of companies and institutions, according to what was published by the Technology Society on December.

Concerning technical innovation and economic success, (Researchers have discovered a relationship between technological innovation and national economic prosperity. According to Christine Chiang's analysis of 120 nations between 1980 and 2006, every 10-percentage point gain in broadband penetration contributes 1.3 percent to the GDP of a high-income country and 1.21 percent to the GDP of low- and middle-income countries.

To get a sense of how much money is spent on information technology throughout the world, consider that firms spend \$ 6 trillion every year on hardware, software, data centers, networks, and workers, whether internal or external information technology services. To put this figure into context, if we take the global IT economy as a nation and its yearly GDP spending, it would rank third in the world, behind China and Japan, and more than double the size of the UK economy.

Furthermore, Taylor Reynolds examined the significance of telecom infrastructure investment in economic recovery across OECD nations and discovered that practically everyone sees technological progress as critical to their economic stimulus packages. He says that there is a clear correlation between telecommunications investment and economic development, particularly following periods of recession. These investments assist countries in creating jobs and paving the path for long-term economic prosperity. This summarizes the total economic ramifications of technology.

If technology is used to improve marketing and shopping for local products, it will result in a significant shift for the Yemeni consumer, who, as a result of the technological revolution, has become a close friend to it, not only in cities. To keep manufacturing going. Technology has made it simple to reach the Yemeni customer. According to figures provided on the worldwide social baker's website, Yemen has 504,860 Facebook members, ranks 106th in the list of nations, and is the largest platform in Yemen.

Despite the fact that customers in Yemen connect with Facebook, Instagram users in Yemen in 2022 demonstrate the supremacy of this marketing technology aspect.

According to Meta Ad Tools data, Instagram has 657.6 thousand users in Yemen in early 2022. This demonstrates the Yemeni consumer's sensitivity to marketing expansion when focused, deliberate, and knowledgeable information is available.

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THE ECONOMIC ASPECTS AND CHALLENGES ASSOCIATED WITH CREATING NEWS REPORTS USING ARTIFICIAL INTELLIGENCE TECHNOLOGY

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ЭКОНОМИЧЕСКИЕ АСПЕКТЫ И ПРОБЛЕМЫ, СВЯЗАННЫЕ С СОЗДАНИЕМ НОВОСТНЫХ СЮЖЕТОВ С ИСПОЛЬЗОВАНИЕМ ТЕХНОЛОГИЙ ИСКУССТВЕННОГО ИНТЕЛЛЕКТА

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This study explores the relationship between artificial intelligence and journalism, as well as the challenges that come with using AI in the workplace. The difficulties and financial implications of employing artificial intelligence in news reporting.

Keywords: Technology, news, digital media strategy.

В этом исследовании исследуется взаимосвязь между искусственным интеллектом и журналистикой, а также проблемы, связанные с использованием ИИ на рабочем месте. Трудности и финансовые последствия использования искусственного интеллекта в новостных репортажах.

Ключевые слова: технологии, новости, стратегия цифровых медиа.

Artificial intelligence approaches have recently played a significant influence in the media. Sometimes we notice news, not from imagination, of things that did not happen in reality, but are a figment of artificial intelligence's imagination, which at first glance appears to be real and not fiction, but upon closer examination, we conclude that it is not reality but a simulation via artificial intelligence.

For example, "the world awoke with shock, anger, and bewilderment in the media world with this news," a state reminiscent of the alert that followed - years ago - the news of the Chinese Xinhua News Agency's use of a virtual broadcaster in its news bulletins, in what was described at the time as a "global precedent" for riding the wave of artificial intelligence technologies, which he saw as posing many existential threats to the media profession.

The "last time" was when it was discovered that CNET, a popular technology and electronics website, had secretly published scores of stories generated entirely by artificial intelligence.

The initiative had not been fully advertised on the site, and the pieces were ascribed to a writer known as "CNET Money Staff." Keep the experience hidden from the eyes of the media and criticism[1].

The move has been attacked for its lack of openness, as an attempt to destroy the jobs of beginner writers, and for raising concerns about the accuracy of the current generation of AI text generators.

The machine-written copy may be impossible to discern from human work, despite being full of clichés and missing a sense of passion, comedy, and inventiveness, as the Washington Post claims, but this begs the question... What is going on? What predicts such events? Should we, as journalists, be concerned or euphoric in our superiority? And what can we glean from this?

Is our perception of artificial intelligence influenced by Hollywood?

An army of robots with glowing minds is bursting laboratory gates and invading the planet, stealing all jobs and turning people into worthless beasts. We cannot dispute the Hollywood picture that many people, whether journalists or not, have while discussing current breakthroughs in artificial intelligence[2].

According to Mattia Peretti, director of the JournalismAI project at the London School of Economics, there is one important distinction to be made when discussing artificial intelligence: the distinction between the AI we have today and what is known as "narrow AI," or computer programs that can perform a single task very well. It may be better than humans, and between the artificial intelligence that science fiction usually depicts to us, i.e. "general artificial intelligence", and this does not go beyond being just an idea or a dream of making machines that think and act like a human mind, although the quest for the latter with flexible behaviors and skills such as memory and learning is still ongoing. Self-sufficient and responsive to emotions.

What impact will artificial intelligence have on the future of journalism?

According to the Reuters Institute's report on Journalism, Media, and Technology Trends and Forecasts for 2023, the next wave of technological innovation has arrived, and it is only the subsequent developments in the field of artificial intelligence that raise more opportunities and challenges for journalism. Among the issues raised about the effects of AI on newsrooms were those raised at a 2017 forum organized by the Tao Center for Digital Journalism and the Brown Institute for Media Innovation Policy Exchange, where participants discussed topics such as: How journalists can use AI to help prepare reports? What jobs may artificial intelligence take over? What aspects of artificial intelligence have news organizations yet to explore? Will artificial intelligence ultimately be a part of every news story?

Perhaps the best way to gain a deeper understanding of these technologies is to conduct direct experiments with them, as the German Bavarian Radio team did by establishing a laboratory concerned with using artificial intelligence to develop investigative stories.

According to Jeremy Gilbert, professor of digital media strategy at Northwestern University, here are three specific areas of journalism where AI might have a substantial impact:

– Data: Journalists today face more data than ever before, particularly when working on investigative projects. In this case, artificial intelligence techniques can assist filter through a large quantity of documents and open doors to new subjects. Journalists may also train algorithms to analyze current trends and provide immediate updates.

– Adapting the news experience: There is little question that news organizations who have not yet completely embraced digitalization will find themselves in a precarious position in the future, unable to keep up with shifting audience expectations. Digitization has increased the effectiveness of feedback, allowing organizations to learn more about their

audience, and AI is not only capable of determining what a follower knows about a particular topic based on their previous digital behavior, but is also capable of using the data to provide updates about the topic to the follower based on his needs.

– Finding the facts, asking the questions, writing the narrative, directing it, and then releasing it on social media may not be enough in the future, as journalists must consider how to build multiple formats of that story. Gilbert uses the example of asking a query to Alexa, Amazon's clever virtual assistant, and expecting a specific, concise answer rather than a 1,000-word tale with an answer somewhere in it. That is why the articles themselves must become personalised responses to the queries provided by news consumers. A 35-year-old is obviously seeking for a different response than a 9-year-old. This new narrative paradigm is only achievable with AI, and the ChatGPT experience exemplifies the possibilities for developing new sorts of semi-automated content with the capacity to ensure efficient outcomes.

Promising encounters

• Reuters, which manufactures most of its artificial intelligence tools in-house, and the Associated Press, which relies on purchasing tools and collaborating with startups, are two international news agencies that have had a pioneering experience in employing artificial intelligence despite the difference in approach.

• Through its EDITOR tool, the New York Times has also deployed artificial intelligence to assist its journalists in improving grammar and keyword selection.

• The Newsroom is a firm that employs artificial intelligence to generate summaries of the day's top articles, complete with contextual information and links to related items.

Artificial intelligence creates new forms of challenges and ethical difficulties that will exacerbate the journalist's travails for example:

This implies that we need more journalists who can monitor and report abuses, and deep falsification technology and its link with fraud, extortion, and disinformation are among the issues that require special attention.

Conclusion

Artificial intelligence has addressed many problems in the media industry, and it may have even combined reality and imagination. However, artificial intelligence continues to be a source of concern and concerns, particularly if it is not strictly controlled, since it will be negatively reflected in the media, as the media platform is the way by which people interact now.

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THE RELATIONSHIP BETWEEN SELF-CONCEPT AND ADJUSTMENT AMONG INDIAN AND YEMENI STUDENTS OF UNDER-GRADUATE STUDENT

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ВЗАИМОСВЯЗЬ МЕЖДУ САМООЦЕНКОЙ И КОРРЕКТИРОВКОЙ СРЕДИ ИНДИЙСКИХ И ЙЕМЕНСКИХ СТУДЕНТОВ

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The purpose of this study is to shed light on the issue of education and the relationship between self-concept and adjustment among Indian and Yemeni undergraduate students.

Keywords: Yemeni war, Indian, Yemeni undergraduate students.

Цель данного исследования – осветить проблему образования и взаимосвязь между самооценкой и адаптацией среди индийских и йеменских студентов.

Ключевые слова: йеменская война, Индия, йеменские студенты.

Even if a society is primitive, there is a science agreed upon among them that causes them to formulate their collective thinking. In addition, through individual or social experiences, their vision of the concept of science and wisdom is formed, and from here some concepts emerge that, through them, the general evaluation of human being comes. Individuals' personalities are influenced by two fundamental psychological factors: self-concept and adaptability. The goal of education is to help students develop their personalities and adapt to their surroundings. Maladjustment occurs when the adjustment is not done correctly.

The researcher attempted to investigate the pupils' self-concept and existing adjustment difficulties in relation to their level. It has also been made to investigate the link between the learners' self-concept and their adjustment challenges. The current study employed a normative survey approach. A simple random selection procedure was used to choose a sample of 80 Aurangabad City pupils. According to the survey, Yemeni pupils have a higher self-concept than Indian kids. As a result, it is determined that there is no difference for challenges between Yemeni and Indian pupils. In addition, the coefficient of correlation is (-0.04), which is within the range of (0.00 to -0.30), demonstrating a minor association between students' self-concept and level of adjustment.

Education quality in Yemen and India

Education quality differs between Yemen and India due to issues such as accessibility, facilities, finance, curriculum, teacher training, and political instability.

Yemen's education system has been significantly impacted by the continuous conflict and economic hardship, with many pupils absent and schools damaged or destroyed. According to the UN, 2 million Yemeni youngsters were not attending school in 2019, and just 48% of schools were operational. The conflict has caused disruptions in schooling, with instructors not being paid and resources being redirected to military spending. Despite these obstacles, there are determined instructors and students working to obtain an education.

The quality of education in India differs between government and private schools. While private schools in India often give a higher level of education, government-run schools are plagued by a lack of facilities, poorly educated instructors, and insufficient

money. In addition, various issues such as poverty, social injustice, and a rote learning system may lead to a lack of relevance and quality in education. Recent initiatives, such as the Right to Education Act and Digital India, have tried to increase educational access and quality in India.

As a result, education quality in Yemen and India is a complicated subject impacted by a variety of factors. Both nations' education systems may be improved and efforts must be made to give a quality education to all students.

The influence of education on social structure

Education has a large influence on social structure. It has the potential to impact social mobility, economic inequality, and cultural dynamics.

For starters, education equips individuals with information and abilities that can aid in their social advancement. Better socioeconomic status is associated with better levels of education, which can lead to increased access to resources such as decent employment, healthcare, and cheap housing. Education may also assist bridge the gap between social classes by offering opportunity for those from underprivileged origins to seek higher education and achieve upward mobility.

Second, education has the potential to lessen income disparity by giving individuals with the skills necessary to achieve high-paying employment. Furthermore, education may help people expand their intellectual ability, which can lead to the formation of new enterprises and industries.

Finally, education has the potential to influence cultural dynamics by providing individuals with access to new kinds of information that might challenge established societal norms and values. Education may also contribute to the promotion of social variety by supporting the development of social and political beliefs that encourage multiculturalism and inclusion. This can lead to a more welcoming and open society that cherishes diversity.

Overall, education has the potential to shape social structure by providing individuals with the tools they need to impact social mobility, economic disparity, and cultural dynamics.

The impact of Yemen's conflict on education

Yemen's war has had a terrible impact on the country's education system. According to the UN, an estimated 2 million children in Yemen are out of school, and the fighting has damaged or destroyed roughly 2,500 schools.

From early childhood development through graduate education, the conflict has affected education at all levels. Due to security concerns, schools have been closed, and access to education has been severely hampered by the fighting. Due to violence, teachers have frequently been unable to attend classrooms, leaving many students without an education.

Aside from the direct impact of combat, the conflict has had a significant impact on Yemen's economy and infrastructure, making it impossible for schools to function. Many schools lack basic resources such as textbooks, and there are chronic teacher shortages.

Overall, Yemen's conflict has deprived a generation of youngsters of an education, which will have long-term economic and social ramifications for the country. School is vital for social and economic growth, and it is critical that efforts be made to guarantee that all children, even those living in war zones, have access to school.

War's impact on adjustment and self-esteem

The impact of war on adjustment and self-esteem varies greatly depending on the individual and the specifics of the fight. In general, war may be detrimental to mental health, especially adjustment and self-esteem. The stress of living in a warzone or fleeing

as a refugee, as well as the loss of loved ones or property, can all contribute to feelings of anxiety, despair, and poor self-worth.

Furthermore, people in war-torn areas may find it difficult to get basic necessities such as food, housing, and medical treatment, which can have a negative influence on their mental health. Children who grow up in a warzone may be more prone to mental health issues because they may have encountered trauma during a vital period in their development.

It's essential to note, however, that not everyone who experiences conflict will react the same way; some individuals may be more robust than others, or have access to tools that help them manage. Seeking out help and services, such as counselling, can also help people adjust and retain their self-esteem in the aftermath of a battle.

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DEVELOPMENT INDICATORS DECLINED, AND THE YEMENI WAR, COUPS, AND SEVERE WEATHER DID PRESENT ADDITIONAL CHALLENGES FOR LIVING IN YEMEN

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ПОКАЗАТЕЛИ РАЗВИТИЯ СНИЗИЛИСЬ, А ВОЙНА В ЙЕМЕНЕ, ПЕРЕВОРОТЫ И СУРОВЫЕ ПОГОДНЫЕ УСЛОВИЯ СОЗДАЛИ ДОПОЛНИТЕЛЬНЫЕ ПРОБЛЕМЫ ДЛЯ ЖИЗНИ В ЙЕМЕНЕ

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The problems of the Yemeni economy are presented in this paper, which is on the verge of collapse after eight years of conflict, leaving millions of Yemenis at risk of catastrophic hunger, as more than 17 million people still suffer from high levels of food insecurity, with women and children accounting for 75% of those affected. Some of the issues that have worn out Yemeni citizens as a result of the conflict have been discussed. As a result, we must band together, as this is one of the world's most urgent humanitarian situations. It is time for international leaders to put genuine and effective pressure on all sides to return to the negotiation table and find a lasting solution to the crisis.

Keywords: Yemeni Economy, problems, humanitarian organizations, humanitarian disaster.

Проблемы йеменской экономики представлены в этом документе, который находится на грани краха после восьми лет конфликта, в результате чего миллионы йеменцев подвергаются риску катастрофического голода, поскольку более 17 миллионов человек все еще страдают от высокого уровня продовольственной безопасности, при этом женщины и де-

ти составляют 75% пострадавших. Обсуждались некоторые из вопросов, которые изнурили йеменских граждан в результате конфликта. В результате мы должны объединиться, поскольку это одна из самых неотложных гуманитарных ситуаций в мире. Международным лидерам пора оказать подлинное и эффективное давление на все стороны, с тем чтобы они вернулись за стол переговоров и нашли долговременное решение кризиса.

Ключевые слова: Йеменская экономика, проблемы, гуманитарные организации, гуманитарная катастрофа.

Yemen is involved in a complicated conflict that is harming its economy, eroding institutions, and inflicting an unparalleled humanitarian disaster. As the conflict approaches its fifth year, the country has huge security and political obstacles on the ground, refusing to comment on the country's near prospects for peace. Yemen has been devastated by the country's recent brutal conflict, huge displacement, and a series of shocks.

The current scenario has been labeled by the UN as "the world's largest humanitarian calamity", and while peace efforts have persisted, the cost of the battle has risen. Yemen was the poorest country in the Middle East and North Africa regions prior to the conflict. Following more than four years of conflict, the economy has collapsed and critical infrastructure has been devastated, resulting in chronic food insecurity and the world's greatest cholera outbreak. According to UN estimates, 80% of Yemenis – or 24.4 million people - needed humanitarian assistance, with 14.4 million in urgent need. The population is heavily reliant on food help, with the World Food Program providing emergency food aid to 6.9 million people each month. The protracted war, economic collapse, and breakdown of governmental institutions and services in Yemen may be one of the driving forces behind the world's greatest humanitarian disaster [2–4].

- Alternatively, around 10 million people are on the edge of becoming hungry.
- In five governorates and 37 districts, acute malnutrition rates exceeded the World Health Organization's emergency level of 15%.
- Fewer than half of the country's health-care institutions are completely operational.
- The percentage of the population linked to partially functional public water networks does not surpass 22% in rural regions and 46% in urban areas.
- 36% of girls and 24% of boys of school age are not enrolled.

Situations, Yemen's present famine is driven by hyperinflation created by the conflict rather than a shortage of food. The World Bank Group is an important partner in the fight against food insecurity. Humanitarian food supply alone will not be enough to halt the development of famine conditions. Despite the significant demand for external supervision services in Yemen, due to the insecure operational environment, there are few impartial and professional monitoring firms.

Despite the existence of the blockade imposed between groups in Yemen and the difficulty of movement between regions, the rapid response by organizations operating in Yemen to reduce poverty may play a positive role in reducing the further exacerbation of poverty in some Yemeni regions, and the negatives also remain the lack of coordination between organizations and the presence of some randomness.

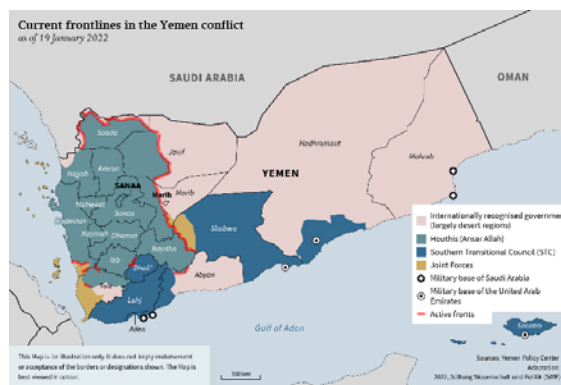


Fig. 1. Map of conflict locations in Yemen [1]

To ameliorate Yemen's deteriorating dilemma, dramatic solutions to the following issues must be found:

- Eliminate or decrease malnutrition by coordinating efforts to supply food imports and ease their entry into Yemeni territory.
- Constructing roadways to assist supply transportation
- Focusing on essential services in the health, water, and sanitation sectors.
- Maintaining support for fundamental services and the preservation of institutions.
- Offer assistance with livelihoods, human capital, and fundamental economic recovery.

Yemen's economy, which is on the verge of collapse after eight years of fighting, has left millions of Yemenis facing the possibility of catastrophic starvation, with more than 17 million people still suffering from severe food insecurity, 75% of whom are women and children. Some of the issues that have afflicted Yemeni citizens as a result of the conflict, and so we must unify, since this is one of the world's most urgent humanitarian crises. It is time for international leaders to apply serious and effective pressure to get all sides back to the negotiation table so that a lasting solution to the conflict can be implemented until the continuing war is over in Yemen.

In conclusion, despite the decrease of the state's services, humanitarian organizations offer an effective function in alleviating people's suffering, which helps to elevate some families out of the mask of absolute poverty.

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YEMEN'S E-COMMERCE ISSUES AND DIFFICULTIES

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ВОПРОСЫ И ТРУДНОСТИ ЭЛЕКТРОННОЙ ТОРГОВЛИ ЙЕМЕНА

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With all of the technological advances in the Arab world and the Gulf States, where is e-commerce in Yemen? What are the primary impediments to Yemen engaging in this type of trade?, Where Yemen needs to take more than one experience from more than one country that has succeeded in applying this trade, whether at the local or external level, as an example at the local level, what the European Union, Russia, Belarus, and other countries also apply, as an example at the individual level, what is done by importing via Ali Express from China or Amazon from America.

Keywords: E-Commerce, technical advancements, e-commerce system.

Учитывая все технологические достижения арабского мира и стран Персидского залива, где находится электронная коммерция в Йемене? Каковы основные препятствия для участия Йемена в этом виде торговли? Где Йемену необходимо перенять не один опыт более чем одна страна, которая преуспела в применении этой торговли, будь то на местном или внешнем уровне, в качестве примера на местном уровне, что также применяют Европейский Союз, Россия, Беларусь и другие страны, в качестве примера на индивидуальном уровне, что делается при импорте через Али Экспресс из Китая или Амазон из Америки.

Ключевые слова: электронная коммерция, технические достижения, система электронной коммерции.

E-commerce in Yemen is an essential source of income from home, and it also helps to revitalize the Yemeni economy in light of Yemen's unfortunate reality. Whereas the number of Internet commerce users in Yemen is 7 million, at a time when the country's population reaches 26 million, this is a very tiny percentage and does not look encouraging. While the number of persons who made an online purchase did not surpass 660, and their experiences were not as good as planned, they did confront a number of challenges that we will discuss today. It can be said that the development of e-commerce in Yemen is based on individual cases rather than society as a whole, especially since Yemen, unlike other Arab countries, is seeing development in some areas but not others, making the development of e-commerce in Yemen difficult and time-consuming. The Yemeni economy saw significant downturn and stagnation in 2019, which was a key factor for the low usage of e-commerce, but e-commerce regained strength in the start of 2020. If you are interested in e-commerce, you may read this article until the conclusion to learn more about it and the areas and challenges to its implementation, particularly in Yemen.

Due to a lack of capacities and infrastructure, Yemen is regarded as one of the Arab and Gulf countries with the least capacity and inclination to adopt electronic commerce. It may be claimed that if Yemen's e-commerce system is successfully implemented, it will inject vigor and dynamism into the Yemeni economy for a variety of reasons, the most important of which are:

1. Creating new work opportunities: Yemen has a relatively high unemployment rate. In fact, many Yemeni youth and graduates do not have the slightest opportunity to work to help them earn a living, and opportunities for migration and travel are very limited due to Yemen's crises, so the adoption of e-commerce will allow many of these young people to work from home and earn high profits without the need for a real job.

2. Reducing the severity of the economic crisis: The implementation of an e-commerce system in Yemen will allow the country to face the catastrophic repercussions on the standard of living and the economy, as Yemen has been experiencing a suffocating economic crisis for over a decade, and it can even be considered a true disaster affecting all economic, commercial, and living levels. As a result, the widespread use of electronic commerce in Yemen will enable the start of the Yemeni economy's recovery, as well as savings from the expenses of fees and taxes paid on commercial transactions in traditional trade, and as for digital transactions used in electronic commerce, It does not require all of these additional taxes and fees, and hence this money may be spent on other items that assist enhance the population's standard of life.

3. Promoting technological progress: There is no doubt that if the e-commerce system is implemented in Yemen, it will prioritize the technology and communications sector and contribute to its development to a large extent, because e-commerce is completely dependent on it, so the real and practical application of this type of trade cannot be reached without a real ground and base from which to start, and thus the spread of e-

commerce in Yemen, Thus, current methods and gadgets will be used in the commerce and economy sector, and this technology will be introduced and transferred to other sectors such as health, education, and others. We believe that e-commerce will allow technology to be brought into and brought to Yemen, which will eventually place Yemen at the forefront of local and global trade.

The significance of e-commerce for Yemen, and the significant return that this sort of trade will bring to all critical and productive sectors, as well as how it will assist to enhancing the population's reality and existence. So, using and working with electronic commerce in Yemen has become an urgent necessity and it can be developed through some simple procedures, and even if it is difficult, electronic commerce is a great reality that deserves experience and work, and here are some of these procedures.

1. Promote the use of digital investments.
2. Creating an all-encompassing strategy plan.
3. Legal actions made by Yemen's government:

a. The Telecommunications Law: aims to grow the telecommunications industry and allow it to keep up with technological advances, as well as to regulate and safeguard electronic communications.

b. Anti-Money Laundering Law: This is intended to provide credibility and validity to those who engage in electronic commerce and other industries without violating public laws or engaging in unlawful activity.

c. Commercial law comprises the law of corporations, agencies, trademarks, and trade names, and it governs all commercial and financial exchanges and activities.

d. The Law for the Protection of Rights and Intellectual Property is a crucial step toward enabling and encouraging everyone to express their ideas and create projects without fear of infringing on their privacy.

e. Adopting electronic payment in some sectors: To promote electronic commerce in Yemen, no one can ignore the development of electronic payment services in the development of electronic commerce in Yemen or in any other country, and increase people's confidence and demand to use it to secure their needs and buy what they want.

f. Cybercrime Law: aims to crack down on those who use the Internet to do fraudulent acts by impersonating legitimate persons in order to legitimize and facilitate their conduct.

4. Technology reliance: Several steps and decisions have been done in this area in order to rely on the electronic system in all institutions and departments, including:

- a. The National Information Center is established.
- b. City of ICT.
- c. Center for Information Security.

Obstacles to e-commerce adoption in Yemen:

There are several fundamental barriers to the expansion of e-commerce in Yemen, including:

1. **Internet and communication technologies:** such technologies are very weak at the current stage, especially since this sector has been severely affected by the crisis, and this will prevent Yemen from adopting and working in the e-commerce system largely at this stage, as communication problems are ignored. Working using outdated and ineffective technology, such as the Internet, will have a detrimental impact on the expansion of e-commerce in Yemen and will not bring answers. It will, rather, be the first cause to disable it.

2. **Electronic payment service:** this service is one of the most prominent methods that make the electronic commerce process in Yemen easier and more widely used, but

such services and many others may appear unavailable and inapplicable in Yemen at the moment, and thus the purchase and payment processes are mostly done by traditional methods. Everyone is familiar with it, most notably cash payment, and as the situation in Yemen worsened, many inhabitants were forced to revert to the barter system, in which you may receive a product by trading it for another commodity that is similar in purchasing value.

3. Understanding of the population and their culture: Yemen has previously adopted e-commerce in numerous places (including the capital, Sana'a, and Aden), and several training centers have been built to teach Yemeni youth and certify specialist cadres for this sort of trade.

However, such steps and initiatives are still limited, work on them is very cautious, especially with limited capabilities, and the application of e-commerce in Yemen may appear impossible in some Yemeni regions due to their complex geographical nature and lack of basic technology (communications, electricity, transportation). Adoption of electronic commerce in Yemen has become an urgent requirement due to its significant positive influence on all aspects of life in the country, and despite all of the poor and disappointing prospects, optimism remains high. You may construct your own online store using a variety of platforms and applications, and keep in mind that we at receipt voucher platform allow you to do so since we help you develop a professional online store and provide it to you free. We also offer an electronic payment service that you may use, as well as a variety of other services that will assist you in growing your business, such as linking services with social networking sites, online selling, and commission marketing services. You may learn about e-commerce in Yemen or e-commerce in general, by utilizing the receipt voucher platform, reading numerous key subjects on the blog, and watching YouTube videos. To summarize, e-commerce in Yemen still requires many processes, and we recommend that you start e-commerce in Yemen since it will undoubtedly grow and develop, and you may be one of the pioneers of progress.

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THE IMPACT OF SMART DEVICES AND DIGITAL BIOMARKERS IN THE FUTURE OF MEDICINE

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ВЛИЯНИЕ ИНТЕЛЛЕКТУАЛЬНЫХ УСТРОЙСТВ И ЦИФРОВЫХ БИОМАРКЕРОВ В БУДУЩЕМ МЕДИЦИНЫ

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It should be mentioned that the application of digital biomarkers in medication development or healthcare delivery needs years of thorough study and validation, which is either ongoing or about to begin in most situations. Furthermore, the great majority of digital biomarkers have yet to be put to use. Despite the fact that digital biomarkers have not yet been authorized as a medication development tool, biopharmaceutical firms are striving to create novel endpoints based on digital biomarkers. As a result, digital biomarker research will accelerate in the future years..

Keywords: Yemeni Economy, problems, humanitarian organizations, humanitarian disaster.

Следует отметить, что применение цифровых биомаркеров в разработке лекарств или оказании медицинской помощи требует многих лет тщательного изучения и проверки, которые либо продолжаются, либо скоро начнутся в большинстве ситуаций. Кроме того, подавляющее большинство цифровых биомаркеров еще предстоит использовать. Несмотря на то, что цифровые биомаркеры еще не были авторизованы в качестве инструмента разработки лекарств, биофармацевтические фирмы стремятся создать новые конечные точки на основе цифровых биомаркеров. В результате исследования цифровых биомаркеров ускорятся в ближайшие годы.

Ключевые слова: Йеменская экономика, проблемы, гуманитарные организации, гуманитарная катастрофа.

Smart sensors are devices that gather data from their surroundings and process it before transmitting it. They've been employed in a variety of applications, including mobile and portable devices (think phones and tablets). Smart sensors are outfitted with signal conditioning, integrated algorithms, and a digital interface to help them complete their jobs. The most important element of a smart sensor is its capacity to communicate, which can be accomplished by presenting data directly to the user or sending data wirelessly.

The phrase "digital biomarkers" refers to data regarding health or disease management that is directly acquired using digital health technology in order to explain, alter, and/or forecast health-related outcomes. They cover a wide variety of diagnostic and prognostic assessments that are routinely performed outside of the clinical setting utilizing home-based linked goods such as wearable, implantable, and ingestible devices and sensors.

Applications for digital biomarkers:

In healthcare, smart sensor technology is used to capture data such as blood pressure, skin conductance, movement, posture, oxygen levels, respiration, sleep, temperature, and heart rate. Fitbit, Misfit, Jawbone, Apple Health, Sleep as Android, WIWE, MocaCare, and

Skeeper – or fitness trackers, step counters, health apps, sleep sensors, pocket EKGs, and blood pressure or other health parameter measuring devices – have emerged as major players in the health, wellness, and fitness market in recent years. These gadgets create an incredible quantity of data for individuals tracking their own personal wellness data and, increasingly, for patients under direct medical care, including those participating in clinical studies.

Cardiovascular problems

Several firms, for example, have focused on identifying atrial fibrillation (afib) for cardiovascular illness. While the FDA has not yet authorized any algorithms based simply on smart watch data, a digital biomarker for afib identification in combination with an approved EKG is available. Similarly, an accelerometer was employed as the key outcome measure in a trial-employing nitrate to treat congestive heart failure that was just reported in *The New England Journal of Medicine*.

Sleep

In terms of sleep, the path to commercial usage of digital biomarkers appears to be significantly different, as it also entails a healthy living environment. A number of digital biomarkers, such as Fitbit's sleep phases function, are commercially available since significantly less validation is necessary. Fitbit has proven wrist-worn trackers with movement and cardiac sensors' ability to reliably distinguish light, deep, and REM sleep phases. The findings of the 2017 study "Estimation of Sleep Stages Using Cardiac and Accelerometer Data from a Wrist-Worn Device" were published in the journal *Sleep*. According to Fitbit, the study's findings show that these devices can be used to track sleep phases with a decent degree of accuracy in typical adult sleepers. The capacity to capture valid sleep stage data via wrist-worn devices can aid in the simplification of sleep research and raise public awareness of sleep difficulties.

Respiratory problems

Propeller Health can detect environmental triggers for patients with asthma, chronic obstructive pulmonary disease, and other respiratory disorders using sensor-equipped inhalers. For patients to better manage their diseases, the Propeller Health system contains a sensor that connects to a rescue inhaler or controller inhaler drugs. The FDA has authorized this system as a medical device. Furthermore, the business has produced the first environmental-based asthma risk prediction tool.

How might smart sensors and digital biomarkers improve the present medicines in the pharmaceutical industry?

Failure is prevalent in medication development, particularly for neurodegenerative illnesses. In comparison to other therapeutic fields, medication development for neurological illnesses often takes longer, costs more, and has a lower success rate. Such failures are expensive, deterring future investments and impeding therapeutic progress. Because success is uncommon, there is a bigger unmet medical need in this area. Given the scarcity of valid physiological biomarkers, digital biomarkers may aid in addressing present deficiencies. Objective, high-frequency data can help guide key decision-making in therapeutic development and allow for a more effective evaluation of the treatment of increasingly frequent diseases.

Conclusion

Pharmaceutical firms have recently realized the enormous potential of digital biomarkers, and a slew of research are being conducted to better understand health and illness through the lens of this data. Furthermore, using digital biomarkers, researchers will be able to better examine the origins of illnesses and forecast future health consequences. The widespread assessment of digital biomarkers enabled by user-friendly gadgets coupled

with smart sensors will aid in the transition of healthcare from a reactive to a preventative strategy.

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THE EFFECTIVE IMPACT OF CHINESE UNIVERSITIES IN DEVELOPING THE CAPABILITIES OF FOREIGN STUDENTS [MINI REVIEW]

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ЭФФЕКТИВНОЕ ВОЗДЕЙСТВИЕ КИТАЙСКИХ УНИВЕРСИТЕТОВ НА РАЗВИТИЕ ПОТЕНЦИАЛА ИНОСТРАННЫХ СТУДЕНТОВ [МИНИ-ОБЗОР]

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China has been able to astonish all countries across the world with its quick and confident economic expansion in recent years. It has also been noticed that science in China has advanced significantly. Without a question, international students in China have a variety of appealing benefits, such as financial scholarships that assure their livelihood in the country while also offering a learning atmosphere. As Chinese universities provide a scientific and suitable atmosphere for creativity and innovation, there are chances for acquaintance and the sharing of information and ideas. In this study, we discussed how Chinese colleges might help international students strengthen their skills.

Keywords: China, Yemen, university, effective, impact.

Китай смог удивить все страны мира своей быстрой и уверенной экономической экспансией в последние годы. Также было замечено, что наука в Китае значительно продвинулась вперед. Без сомнения, иностранные студенты в Китае имеют множество привлекательных преимуществ, таких как финансовые стипендии, которые обеспечивают их средства к существованию в стране, а также предлагают атмосферу обучения. Поскольку китайские университеты обеспечивают научную и подходящую атмосферу для творчества и инноваций, есть шансы на знакомство и обмен информацией и идеями. В этом исследовании мы обсудили, как китайские колледжи могут помочь иностранным студентам укрепить свои навыки.

Ключевые слова: Китай, Йемен, университет, эффективный, воздействие.

Today's knowledge society presents numerous challenges to society's various sectors and institutions. Especially in the university education sector, which necessitates having all of the elements of competition not only at the national level, but also at the global level, and the most important of these ingredients is the human element, which accompanies high competencies and skills that can achieve institutional excellence, especially when appropriate personnel are selected and appointed in their appropriate jobs, working to develop their performance, discovering and developing their potential.

Universities are among the most powerful agents of social change and development in their respective societies. It is vital to national development and development in the fields of knowledge development and social and cultural transformation. The relationship between universities and development is not one-sided. While universities can shape and develop society, they are also shaped by society, and universities can make different contributions to development in different countries.

Even though Chinese universities are one of the most important institutions of intellectual capital, responsible for the production of knowledge through scientific research, the transfer of knowledge through one of the most important functions of universities, teaching, and then working to disseminate and market it through the third function of the university, community service and environmental development; As a result, there is a gap in Chinese universities' ability to attract foreign cadres with competitive advantages over other universities. It is noted that Chinese universities have a number of flaws, including centralization in human resource management, poor response to change demands, poor coordination between foreign offices and foreign students, and a lack of opportunities for foreign students to attend management development seminars and conferences. And to work on managing the academic talents of international students in Chinese universities under the openness theory? This question leads to a number of sub-questions.

- In light of openness, what are the theoretical foundations for talent management in Chinese universities?

- What is the reality of developing academic talents from foreign students in Chinese universities?

- In light of the theoretical and field frameworks, what is the proposed perception of the effective impact of Chinese universities in developing the capabilities of foreign students in order to achieve their competitive advantage?

The answers to these questions will seek to identify what is the effective impact of Chinese universities on developing the capabilities of foreign students in the context of university education, as well as the most important features of China's theory of openness to the peoples of the world, in addition to identifying the reality of managing academic talents in Chinese universities from foreign students, and working on a proposed vision for the management of academic talents. Where this perception will be of great importance. It is evident in the constant pursuit of Chinese universities to achieve institutional excellence and competitiveness.

This is due to its possession of competencies and talented human cadres with outstanding performance, which is achieved through its adoption of talent management strategies. Talent and talent management in the field of university education are topics Research is little covered in Chinese universities.

Therefore, it is necessary to develop a proposed vision for managing the talents of foreign students in Chinese universities in the knowledge society in the light of the theoretical and field frameworks.

Where this proposed scenario is built in light of the theoretical framework and the field study results, and this scenario is presented to a group of refereed experts for review

in order to identify the extent of its realism and applicability in the environment of Chinese universities, and the arbitrators' opinions may be represented by adding other axes to the proposed scenario Obstacles to implementing this vision, as well as dividing the vision's foundations into global ones, with more clarification of some procedures for implementing talent management processes for international students in Chinese universities. Where this perception aims to enables them to face the challenges of the knowledge society.

- Enabling university education policy planners at the central level and university leaders at the decentralized level to identify the most important processes on which the talent management system for foreign students is based in the university, its faculties, and its various units and departments.

Determining the necessary requirements for the optimal implementation of the talent management system for foreign students in Chinese universities, what are the obstacles that prevent that?

Where this perception stems from global principles, including:

The knowledge society and the current and future challenges it imposes that have affected the performance of the university system in various countries of the world, especially with regard to the challenge of increasing the importance of intellectual capital as one of the most important strategic resources in the university, and how to benefit from it in achieving University strategic goals.

- Increasing global competition between universities for effective management of their human resources and attracting talented workforce; As it has a pivotal role in achieving institutional excellence and obtaining a ranking within the recognized international classifications of universities.

- Most of the world's universities tend to try to benefit from openness to other peoples and countries in all that is new in the field of benefiting from foreign students.

Where many dimensions will accompany this perception and implementation mechanisms, as the dimensions are represented in a set of proposed processes that Chinese universities can follow to apply the talent management approach of their employees, which enables them to face the challenges of the knowledge society, so that each process includes a set of executive mechanisms and procedures.

- Organizing the labour force of talented international students at Chinese universities.

- Hiring talented international students to work in Chinese universities.

- Developing the skills of talented international students in Chinese universities.

- Keeping talented international students in Chinese universities.

- Assessing the performance of talented international students at Chinese universities.

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THE WOUNDED OF THE YEMENI WAR ARE AMONG THE CAUSES OF THE ECONOMIC DECLINE

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РАНЕННЫЕ В ЙЕМЕНСКОЙ ВОЙНЕ ОТНОСЯТСЯ К ЧИСЛУ ПРИЧИН ЭКОНОМИЧЕСКОГО СПАДА

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In this study article, we shed light on the harsh reality that has befallen Yemen as a result of the continuous conflict since 2015.

Key words: Yemeni war, economic, educational, future of Yemen.

Аннотация: Показана суровая реальность в Йемене в результате продолжающегося конфликта с 2015 года.

Ключевые слова: йеменская война, экономическая, образовательная, будущее Йемена.

War is defined as an armed confrontation between governments or armed groups over control of territory or resources or for other causes. Many conflicts have occurred throughout history, and war is regarded as one of the worst occurrences in history, causing death, damage, and devastation to many nations and peoples. The main global wars of the twentieth century were well-known for their huge engagements that resulted in significant losses of life and property. The techniques, means, and causes of war differ between countries, civilizations, and epochs. The main global wars of the twentieth century were well-known for their huge engagements that resulted in significant losses of life and property. The techniques, means, and causes of war differ between countries, civilizations, and epochs. Minor wars erupt as a result of disagreements over the allocation of water and land, whereas big wars erupt as a result of power rivalry and political and economic interests. In combat, warriors may employ a variety of tactics, such as striking military and civilian targets, air, land, and sea bombardment, suicide bombing and electronic and cyber warfare.

Yemen's conflict began in 2015, when the Iranian-backed Houthi movement gained control of the Yemeni capital, Sanaa, and significant areas of the nation, causing former Yemeni President Abd Rabbo Mansour Hadi to flee to Saudi Arabia and seek military assistance from the Saudi-led Arab coalition. The coalition's goal is to retake Yemeni land and assist the Yemeni government on the basis of constitutional legitimacy.

The coalition's goal is to retake control of Yemeni territory and assist the Yemeni government on the basis of constitutional legitimacy. Yemen's conflict includes air, land,

and maritime operations between Arab coalition troops and the Iranian-backed Houthis. Yemen is presently experiencing the world's worst humanitarian catastrophe, with millions of Yemenis suffering from a shortage of food, water, health care, and shelter, and the war has killed many people and damaged numerous important infrastructure such as hospitals, schools, and industries.

Yemen's conflict is regarded as one of the world's worst humanitarian crises, and it has severely harmed the country's economic structure. Many economic sectors have been harmed, beginning with infrastructure and progressing to industrial and agricultural facilities, as well as key services such as electricity, health, and education. Many economic and investment projects have been delayed due to a lack of security and political stability, and government and corporate institutions have been damaged and wrecked, resulting in a considerable fall in growth. The economy will suffer as a result, as will unemployment and poverty rates. The economy will suffer as a result, as will unemployment and poverty rates. Yemen is now experiencing an extreme scarcity of essential supplies of food and medical goods, in addition to rising commodity prices, degradation of the currency market, and depreciation of the Yemeni pound. Thus, the Yemeni conflict significantly harmed the Yemeni economy and severely harmed Yemen's economic and social structures.

The Yemeni war had a significant impact on Yemen's educational framework, which did not escape the damage and deterioration that devastated all educational institutions in the nation. Hundreds of schools, colleges, and training institutions, for example, have been destroyed in Yemen as a result of indiscriminate bombing and armed conflict. Furthermore, Yemen's education infrastructure has been harmed, with existing schools suffering from a lack of textbooks and study materials, and some educational institutions suspended due to armed conflict, preventing a large number of children and youth from obtaining basic education and the skills required for employment. In the work market. As a result, the Yemeni conflict exacerbated the country's economic predicament, leaving many households unable to afford schooling and educational institutions. As a result, instead of attending school and acquiring an education, many youngsters resort to labor to assist their families meet their fundamental needs. As a result, the Yemeni conflict has had a terrible impact on Yemen's educational framework, and the government must restore that structure while focusing on providing security and stability for the rehabilitation of schools and educational opportunities for Yemen's children and youth.

Yemen's conflict, which began in 2015 and is still ongoing, has had a significant influence on the country's social structure. Among these factors are:

- Rising rates of poverty, unemployment, and declining economic conditions, which wreak havoc on communal life.

- The deterioration of infrastructure and public services such as health, education, energy, and water, which worsens the socioeconomic condition.

- The intensification of sectarian, ethnic, and tribal disputes, which leads to the dissolution of national unity, the weakening of national belonging, and the escalation of social tensions.

- An growth in the number of refugees and internally displaced people, resulting in the loss of homes and lands, as well as the fragmentation of families and families.

- The rise in violence against women, children, adolescents, and youth, which has a severe impact on the family and society.

- The deterioration of human rights protection and the increase of external interference, resulting in an aggravation of Yemen's humanitarian and socioeconomic crisis.

In general, the Yemeni conflict destroyed communal life and disintegrated Yemen's social fabric, and the degree of the long-term damage is difficult to assess.

Yemen's conflict, which began in 2015, has had a significant detrimental influence on the country's political system. Indeed, the conflict has fragmented authority, and foreign and local efforts to attain political stability have failed, leaving Yemen in a state of political uncertainty and profound differences. In 2015, the Houthis, who are backed by Iran, staged a coup against Yemeni President Abdrabbo Mansour Hadi, weakening their grip on the country. After President Hadi was forced to quit Yemen, Saudi Arabia and its allies launched a military operation against the Houthis.

During this battle, there have been several egregious abuses of human rights and international humanitarian law. It also intensified radicalism and political polarization in Yemen. The war has resulted in a rise in the multiplication of armed organizations, as well as heightened levels of violence and general disorder in the governmental system. It also caused the government to disintegrate and the Yemeni constitution to be torn apart, leaving Yemen without a proper political structure for governance and development. These negative consequences are likely to last long after the conflict is over.

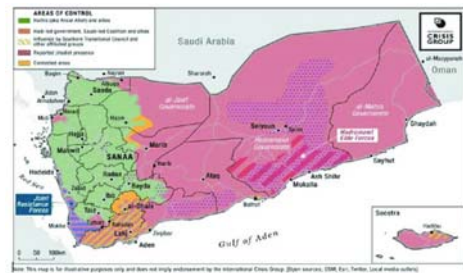
There is no way to forecast the implications of Yemen's future conflict, but they will almost certainly involve devastating impacts on civilians, particularly children and women, who suffer significantly from a shortage of food and clean water, as well as degradation of health and education systems [1–2].



Photograph of a snapshot of Yemen's health status in war zones



Photograph of a demolished school in Yemen's war zones



Map of Yemen showing conflict zones

War may also destroy a country's infrastructure and damage its economy, resulting to an intensification of the humanitarian situation as well as an increase in poverty and instability.

Yemen's conflict is a proxy extension of a global struggle, with the goal of destabilizing the area in order to capture its resources. However, serious and persistent work must be done to alleviate the suffering of the people through the solidarity of all benefactors and with the assistance of neighboring countries in order for Yemen to achieve stability and a peaceful and smooth transfer of power away from partisan and regional conflicts. In addition, God willing, the supply of basic requirements for all Yemenis.

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LIBYA'S ORGANIZATIONAL AND ECONOMIC FRAMEWORK FOR BUSINESS GROWTH

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ОРГАНИЗАЦИОННО-ЭКОНОМИЧЕСКИЕ РАМКИ ЭКОНОМИЧЕСКОГО РОСТА ЛИВИИ

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The goal of this research is to provide a regulatory and economic mechanism to increase the efficiency of Libyan business organizations. To accomplish this purpose, the inductive technique was utilized in addition to the descriptive analytical approach, because it is more commonly used in the study of social and human phenomena and because it is more appropriate for the nature of the study. Perhaps the Libyan economy's weakness is due to a weakness in the regulatory mechanism, as the economy suffers from the absence of state support for economic methods and the complete absence of the work of the Investment Promotion Agency and the provision of confidence to external investors to trust the Libyan market and the guarantees provided. In this regard, the previously developed regulatory and economic mechanism will help increase the efficiency of the performance of Libyan commercial structures by creating an appropriate business climate (trust system), and will form an adaptive legislative framework and redistribute the potential of Libyan resources, taking into account the current features of Libya's transition to market relations and the fact that the state is the guiding and organizing force.

Keywords: organizational and economic mechanism, Libyan economy, Libya.

Целью данного исследования является создание нормативно-экономического механизма для повышения эффективности ливийских бизнес-организаций. Для достижения этой цели в дополнение к описательно-аналитическому подходу использовался индуктивный метод, поскольку он чаще используется при изучении социальных и человеческих явлений и более соответствует характеру исследования. Возможно, это слабость ливийской экономики. Это связано со слабостью механизма регулирования, так как экономика страдает от отсутствия государственной поддержки экономических методов и полного отсутствия работы Агентства по продвижению инвестиций и предоставления уверенности внешним инвесторам в доверии ливийскому рынку и предоставленные гарантии. В связи с этим ранее разработанный нормативно-экономический механизм будет способствовать повышению эффективности деятельности ливийских коммерческих структур за счет создания соответствующего бизнес-климата (системы доверия), а также позволит сформировать адаптивную законодательную базу и перераспределить потенциал ливийских ресурсов, принимая во внимание современные особенности перехода Ливии к рыночным отношениям и то, что направляющей и организующей силой является государство.

Ключевые слова: организационно-экономический механизм, ливийская экономика, Ливия.

Current trends of increased competitiveness and globalization's expanding influence contribute to the hunt for better, more effective instruments for managing economic systems. Market analysis and system optimization are possible with the participation of these economic systems' effective regulatory and economic mechanisms. As a result,

researching the regulatory and economic mechanisms for regulating business entities under the Libyan state is a top priority.

The following are the primary reasons why it is critical for Libya to build such a system today:

1. First, Libya has reached a certain point in its economic recovery and restructuring of the whole public administration structure. The purposeful business development stage should be the second level of this transition.

2. economic development cannot happen on its own since Libya has yet to build a conducive business climate.

3. Libya has its unique religious and national commercial features that make it impossible to replicate the experience of industrialized nations in the precise application.

4. any change need enormous resource potential from the state, business, and society, allowing for complete control over macroeconomic and microeconomic processes.

Theoretical and practical concerns of regulatory and economic mechanisms for the development of economic system management at various levels have been substantially and fully researched. The nature and content of the regulatory and economic mechanisms of economic systems, as well as the technique of their evolution are discussed in the scholarly works of numerous foreign writers.

However, concerns concerning the creation of organizational and economic processes, the optimization of business structure management, and the assessment of their efficacy in current settings demand additional investigation.

According to F. Zinoviev, the organizational and economic mechanism is "a system that determines the order of actions". The organizational mechanism itself is an organizational and technical management tool based on their ability to use market management principles (independence, contractual relations, commercial interest, legal force, etc.) separately, considering organizational and economic mechanisms. The author divides the regulatory and economic mechanism into organizational and economic mechanisms and considers the organizational and economic mechanism to be a system that determines the course of action, the regulatory mechanism to be an organizational and technological means, and the economic mechanism to be a system.

F. Fedorovich. It represents the organizational and economic mechanism of business development in the form of a multi-level hierarchical system of interconnected main elements and their typical groups, with these elements directly including the subjects and goals of management themselves, who, in our opinion, define this definition with the concept of "system control". Another researcher, T. Kravtsova, defined the organizational and economic mechanism as a "component of the management system" (the most active) of the management system, allowing for the effect of factors on the state on which the outcome is dependent".

Governments must swiftly invent, update, and enforce regulatory requirements for their operations as technology promotes the rise of new business and governance models. The essential dilemma is how to safeguard citizens while still ensuring fair markets, allowing for the growth of innovation and entrepreneurship.

The intensity and quality of modernization of corporate structures determines the country's economic progress. It should be emphasized that, given the existing conditions for the creation of an innovative economic model, the successful growth of small and medium firms in Libya is owing to the country's continued active governmental control, since the country is experiencing economic stagnation.

The transition to a new Western-style economic growth model, which involves a high concentration of information and technology, is connected to ensuring the sustainable

development of the Libyan national economy and boosting the competitiveness of national institutions.

There are now a number of issues that must be addressed in order to ensure the creative growth of company structures in Libya. One of them is the absence of a viable legislative and economic framework for company development. Its development should not only assure economic growth but also financial stability.

The organizational and economic mechanism for the development of business structures can be defined as a collection of organizational forms, economic methods, and external and internal influence levers on business processes aimed at the most comprehensive implementation and development in order to increase the efficiency of financial and economic activities and create favorable conditions for the development of business structures.

Thus, the economic system's management mechanism is a complex collection of management tools, forms, and procedures produced and employed by the subject of management to actively impact the economic system in order to boost its efficiency. This economic category integrates economic, regulatory, legal, and other management forms, procedures, rules, and norms into an economic mechanism and organizational structure.

The organizational and economic mechanism for managing company structures, according to the author's view, is made up of the following subsystems: administrative, functional, and practical subsystems.

According to N.V. Yermalinskaya, a Belarusian researcher, the organizational and economic mechanism for the effective functioning of integrated structures in the agro-industrial complex includes subsystems (creation, work, interaction with the external environment), their corresponding means of influence (formation of the system and within the system), control (control unit containing target-setting groups, organizational and coordinating, regulatory-analytical and motivating mechanisms), This strategy appears appealing; nevertheless, when developing an organizational and economic mechanism for the external control of the growth of commercial structures in Libya, a systematic approach (Fig. 1) is advised.

The entire process of developing an enhanced regulatory and economic system for company development in Libya may be separated into two parts: an internal mechanism and an external mechanism. The state is the target of an external mechanism (external factors), which consists of all regulatory levers that aid the state in providing acceptable economic and organizational circumstances for boosting business economic activity. This component of the organizational and economic mechanism for the growth of company structures is independent of internal efforts and should be considered as an external environment condition influencing financial and economic activities.

The internal corporate mechanism (internal factors) is developed by the organization, and its efficiency is determined by the forms, techniques, and instruments employed by each corporation.

As a rule, the internal corporate mechanism is inextricably linked to the broad outward organizational and economic mechanism; it is organically interwoven into and an essential part of it. We think that developing a new mechanism inside the firm that may assure successful business growth management is an individual process of each individual corporation, based on the features of economic activity and field of operation. Managers can employ existing economic models, methodologies, and levers from economic science and practice, learn from other organizations, or develop organizational and economic innovations in this situation. The following, in our opinion, are the required requirements for the implementation of innovations:

- the availability of an institutional development plan;
- economic interest in innovations;
- management's desire and capacity to recognize innovations;
- the organizational flexibility of corporate governance.

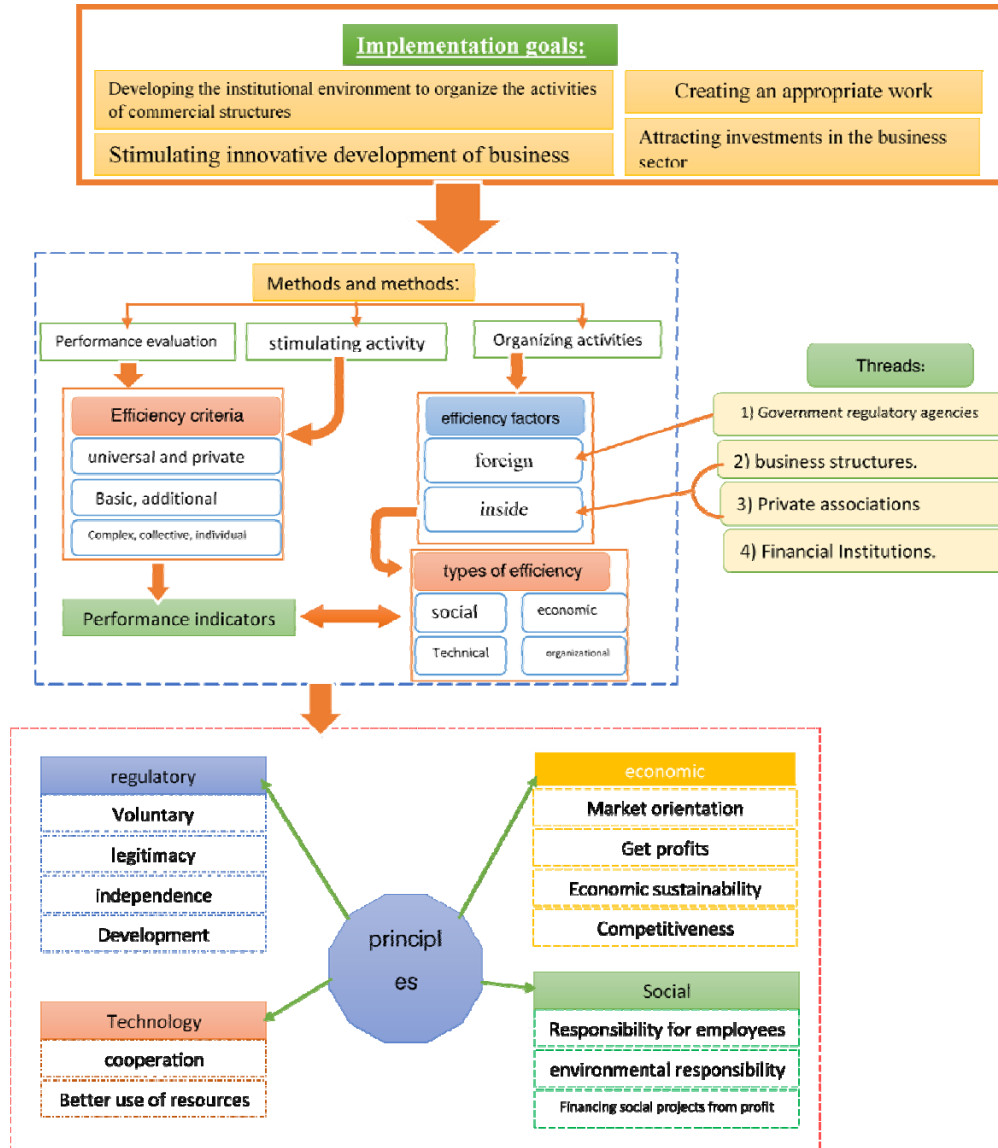


Fig. 1. Depicts a regulatory and economic method for improving the efficiency of Libyan business entities

Contacts between legislative bodies of countries, which take place in the form of bilateral cooperation groups, especially at the level of the parliamentary group in the Libyan parliament, are an important component of bilateral cooperation between the state and businessmen in Libya. Relations between the Houses of Parliament. However, we believe that the existing conversation platforms should be broadened to include an important component such as active engagement between the media community, expert circles, and professionals in potential areas of collaboration that are critical to the Libyan economy.

We conclude from our examination in this article that the Libyan economy is rentier and weak, and that its regulatory system has to be changed, since the economy suffers from a lack of official support for economic processes. Looking at the Investment Promotion Authority from a researcher's perspective, the most significant challenge is creating confidence to international investors to trust the Libyan market and the assurances given. As a result, we see the state interfering in market economy interactions, which has a detrimental impact on economic entities' competitiveness and inventive development. In this regard, the developed regulatory and economic mechanisms will aid in increasing the efficiency of the performance of Libyan commercial structures by creating an appropriate business climate (trust system), as well as forming an adaptive legislative framework for redistributing the capabilities of available Libyan resources. Considering the existing characteristics of Libya's transition to market economy interactions, as well as the fact that the state is the directing and organizing link in economic changes.

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YEMEN'S E-COMMERCE ISSUES AND DIFFICULTIES

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ВОПРОСЫ И ТРУДНОСТИ ЭЛЕКТРОННОЙ ТОРГОВЛИ ЙЕМЕНА

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With all of the technological advances in the Arab world and the Gulf States, where is e-commerce in Yemen? What are the primary impediments to Yemen engaging in this type of trade?, Where Yemen needs to take more than one experience from more than one country that has

succeeded in applying this trade, whether at the local or external level, as an example at the local level, what the European Union, Russia, Belarus, and other countries also apply, as an example at the individual level, what is done by importing via Ali Express from China or Amazon from America.

Keywords: E-Commerce, technical advancements, e-commerce system.

Со всеми технологическими достижениями в арабском мире и государствах Персидского залива, где электронная торговля в Йемене? Каковы основные препятствия для участия Йемена в этом типе торговли? В тех случаях, когда Йемену необходимо взять более одного опыта из более чем одной страны, которой удалось применить эту торговлю, будь то на местном или внешнем уровне, в качестве примера на местном уровне, что Европейский Союз, Россия, Беларусь и другие страны также применяют, в качестве примера на индивидуальном уровне, что делается путем импорта через Ali Express из Китая или Amazon из Америки.

Ключевые слова: электронная коммерция, технические достижения, система электронной коммерции.

E-commerce in Yemen is an essential source of income from home, and it also helps to revitalize the Yemeni economy in light of Yemen's unfortunate reality. Whereas the number of Internet commerce users in Yemen is 7 million, at a time when the country's population reaches 26 million, this is a very tiny percentage and does not look encouraging. While the number of persons who made an online purchase did not surpass 660, and their experiences were not as good as planned, they did confront a number of challenges that we will discuss today. It can be said that the development of e-commerce in Yemen is based on individual cases rather than society as a whole, especially since Yemen, unlike other Arab countries, is seeing development in some areas but not others, making the development of e-commerce in Yemen difficult and time-consuming. The Yemeni economy saw significant downturn and stagnation in 2019, which was a key factor for the low usage of e-commerce, but e-commerce regained strength in the start of 2020. If you are interested in e-commerce, you may read this article until the conclusion to learn more about it and the areas and challenges to its implementation, particularly in Yemen.

Due to a lack of capacities and infrastructure, Yemen is regarded as one of the Arab and Gulf countries with the least capacity and inclination to adopt electronic commerce. It may be claimed that if Yemen's e-commerce system is successfully implemented, it will inject vigor and dynamism into the Yemeni economy for a variety of reasons, the most important of which are:

1. **Creating new work opportunities:** Yemen has a relatively high unemployment rate. In fact, many Yemeni youth and graduates do not have the slightest opportunity to work to help them earn a living, and opportunities for migration and travel are very limited due to Yemen's crises, so the adoption of e-commerce will allow many of these young people to work from home and earn high profits without the need for a real job.

2. **Reducing the severity of the economic crisis:** the implementation of an e-commerce system in Yemen will allow the country to face the catastrophic repercussions on the standard of living and the economy, as Yemen has been experiencing a suffocating economic crisis for over a decade, and it can even be considered a true disaster affecting all economic, commercial, and living levels. As a result, the widespread use of electronic commerce in Yemen will enable the start of the Yemeni economy's recovery, as well as savings from the expenses of fees and taxes paid on commercial transactions in traditional trade, and as for digital transactions used in electronic commerce, It does not require all of

these additional taxes and fees, and hence this money may be spent on other items that assist enhance the population's standard of life.

3. Promoting technological progress: there is no doubt that if the e-commerce system is implemented in Yemen, it will prioritize the technology and communications sector and contribute to its development to a large extent, because e-commerce is completely dependent on it, so the real and practical application of this type of trade cannot be reached without a real ground and base from which to start, and thus the spread of e-commerce in Yemen, Thus, current methods and gadgets will be used in the commerce and economy sector, and this technology will be introduced and transferred to other sectors such as health, education, and others. We believe that e-commerce will allow technology to be brought into and brought to Yemen, which will eventually place Yemen at the forefront of local and global trade.

The significance of e-commerce for Yemen, and the significant return that this sort of trade will bring to all critical and productive sectors, as well as how it will assist to enhancing the population's reality and existence. So, using and working with electronic commerce in Yemen has become an urgent necessity and it can be developed through some simple procedures, and even if it is difficult, electronic commerce is a great reality that deserves experience and work, and here are some of these procedures.

1. Promote the use of digital investments.
2. Creating an all-encompassing strategy plan
3. Legal actions made by Yemen's government

a. The Telecommunications Law: aims to grow the telecommunications industry and allow it to keep up with technological advances, as well as to regulate and safeguard electronic communications.

b. Anti-Money Laundering Law: This is intended to provide credibility and validity to those who engage in electronic commerce and other industries without violating public laws or engaging in unlawful activity.

c. Commercial law comprises the law of corporations, agencies, trademarks, and trade names, and it governs all commercial and financial exchanges and activities.

d. The Law for the Protection of Rights and Intellectual Property is a crucial step toward enabling and encouraging everyone to express their ideas and create projects without fear of infringing on their privacy.

e. Adopting electronic payment in some sectors: To promote electronic commerce in Yemen, no one can ignore the development of electronic payment services in the development of electronic commerce in Yemen or in any other country, and increase people's confidence and demand to use it to secure their needs and buy what they want.

f. Cybercrime Law: aims to crack down on those who use the Internet to do fraudulent acts by impersonating legitimate persons in order to legitimize and facilitate their conduct.

4. Technology reliance: Several steps and decisions have been done in this area in order to rely on the electronic system in all institutions and departments, including:

- a. The National Information Center is established.
- b. City of ICT.
- c. Center for Information Security.

Obstacles to e-commerce adoption in Yemen:

There are several fundamental barriers to the expansion of e-commerce in Yemen, including:

5. Internet and communication technologies: such technologies are very weak at the current stage, especially since this sector has been severely affected by the crisis, and

this will prevent Yemen from adopting and working in the e-commerce system largely at this stage, as communication problems are ignored. Working using outdated and ineffective technology, such as the Internet, will have a detrimental impact on the expansion of e-commerce in Yemen and will not bring answers. It will, rather, be the first cause to disable it.

6. Electronic payment service: this service is one of the most prominent methods that make the electronic commerce process in Yemen easier and more widely used, but such services and many others may appear unavailable and inapplicable in Yemen at the moment, and thus the purchase and payment processes are mostly done by traditional methods. Everyone is familiar with it, most notably cash payment, and as the situation in Yemen worsened, many inhabitants were forced to revert to the barter system, in which you may receive a product by trading it for another commodity that is similar in purchasing value.

7. Understanding of the population and their culture: Yemen has previously adopted e-commerce in numerous places (including the capital, Sana'a, and Aden), and several training centers have been built to teach Yemeni youth and certify specialist cadres for this sort of trade.

However, such steps and initiatives are still limited, work on them is very cautious, especially with limited capabilities, and the application of e-commerce in Yemen may appear impossible in some Yemeni regions due to their complex geographical nature and lack of basic technology (communications, electricity, transportation). Adoption of electronic commerce in Yemen has become an urgent requirement due to its significant positive influence on all aspects of life in the country, and despite all of the poor and disappointing prospects, optimism remains high. You may construct your own online store using a variety of platforms and applications, and keep in mind that we at receipt voucher platform allow you to do so since we help you develop a professional online store and provide it to you free.

We also offer an electronic payment service that you may use, as well as a variety of other services that will assist you in growing your business, such as linking services with social networking sites, online selling, and commission marketing services.

You may learn about e-commerce in Yemen or e-commerce in general, by utilizing the receipt voucher platform, reading numerous key subjects on the blog, and watching YouTube videos.

To summarize, e-commerce in Yemen still requires many processes, and we recommend that you start e-commerce in Yemen since it will undoubtedly grow and develop, and you may be one of the pioneers of progress.

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**ANNUAL INTERNATIONAL TRADE DATA FOR YEMEN
FROM BELARUS AS WELL AS OTHER COUNTRIES
FROM 2006 TO 2019 YEARS**

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**ЕЖЕГОДНЫЕ ДАННЫЕ О МЕЖДУНАРОДНОЙ ТОРГОВЛЕ
ЙЕМЕНА ИЗ БЕЛАРУСИ, А ТАКЖЕ ДРУГИХ СТРАН
С 2006 ПО 2019 ГОД**

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This report examines the volume of exports and imports in the Republic of Yemen from Belarus and other countries from 2006 to 2019, since Yemen imported many Belarusian goods as well as the supply of many local Yemeni products such as fish, Yemeni coffee, and other goods.

Keywords: export, Yemen, Belarus, import.

Рассмотрен объем экспорта и импорта в Йеменскую Республику из Беларуси и других стран с 2006 по 2019 год, поскольку Йемен импортировал много белорусских товаров, а также поставки многих местных йеменских продуктов, таких как рыба, йеменский кофе и другие товары.

Ключевые слова: экспорт, Йемен, Беларусь, импорт.

Trade is one of the most significant economic activity in human history, dating back to prehistoric times. Trade helped to promote the exchange of goods or services, or both, between two or more parties, and as human civilization progressed, trade evolved with it; as its scope expanded to include two or more countries, it was dubbed the concept of international trade.

One of the most significant components for the development and prosperity of the world's economies; where its importance emerges in its function that supports each country's gain from the benefits supplied by other nations. Because of nations' incapacity to meet the demands of their communities by depending on local resources, and it is also feasible to gain from these resources if they are handled wisely. In this study, we will discuss Belarusian imports to the Republic of Yemen from 2006 to 2019.

The following are the top ten items exported from Yemen in 2019:

- 62% (\$14.9 million): 1101 - Wheat or wheat-rye flour.
- 33% (\$7.97 million): 1103 - Cereals, meal and granules of cereals.

– 1.26% (\$300 thousand): 2303 - Residues from the manufacture of starch and similar residues, beet pulp, bagasse or sugar cane pulp, and other waste from the manufacture of sugar, vinasse and other waste from brewing or distilling, whether or not granulated.

– 0.235% (\$55,000): 6117 - Other ready-made knitted or crocheted clothing accessories; parts of clothing or clothing accessories, knitted or crocheted

– 0.224% (\$53 thousand): 4411 - Fibreboards of wood or other lignified materials, whether or not containing resins or other organic substances.

– 0.222% (\$53 thousand): 4412 - Plywood, veneered panels and the like, of laminated wood.

– 0.222% (\$52,000): 2306 - Cakes and other solid wastes obtained from the extraction of vegetable fats or oils, other than those of heading 2304 or 2305, whether or not milled or ground, whether or not granulated.

– 0.216% (\$51 thousand): 1511 - Palm oil and its fractions, whether or not refined, but not chemically modified.

– 0.122% (\$29,000): 1516 - Animal or vegetable fats and oils and fractions thereof, whether wholly or partially hydrogenated, interesterified, re-esterified or elaidinized, whether or not refined, but not further processed.

– 0.116% (\$27 thousand): 4413 - Pressed wood in the form of boards, blocks, beams or profiled shapes.

In 2019, Yemen's total imports totaled \$4.71 billion. In terms of value, the increase in goods supplied to Yemen was 42% over 2018. Imports of products increased by \$1.4 billion (in 2018, Yemen imported items worth \$3.3 billion).

In 2019, the biggest trade partners for Yemeni imports were

- UAE with a share of 24% (1.13 billion US\$)
- China with a share of 10.3% (489 million US\$)
- Saudi Arabia with a share of 6.45% (304 million US\$)
- Other (hidden partners) with a share of 6.18% (291 million US\$)
- Oman with a share of 5.46% (257 million US\$)
- Türkiye with a share of 5.44% (257 million US\$)
- Argentina with a share of 5.39% (254 million US\$)
- Brazil with a share of 4.67% (220 million US\$)
- India with a share of 3.7% (174 million US\$)
- Egypt with a share of 3.14% (148 million US\$)

Imports into Yemen in 2019 were comprised of the following major commodity groups:

– 28% (1.34 billion USD): 27 - Mineral fuels, petroleum and products of their distillation; bituminous substances; mineral waxes

– 18% (852 million USD): 10 - Cereals

– 5.59% (263 million USD): 17 - Sugar and sugar confectionery

– 4.42% (USD 208 million): 87 - Means of land transport other than railway or tram rolling stock, and parts and accessories thereof

– 4.25% (200 million USD): 85 - Electrical machinery and equipment, parts thereof; sound recording and reproducing apparatus, apparatus for recording and reproducing television images and sound, parts and accessories thereof

– 4.21% (198 million USD): 72 - Ferrous metals

– 3.46% (163 million USD): 39 - Plastics and articles thereof

– 2.79% (131 million USD): 11 - Products of the flour and cereals industry; malt; starches; inulin; wheat gluten

– 2.71% (127 million USD): 30 - Pharmaceutical products

– 2.18% (102 million USD): 23 - Residues and waste from the food industry; prepared animal feed

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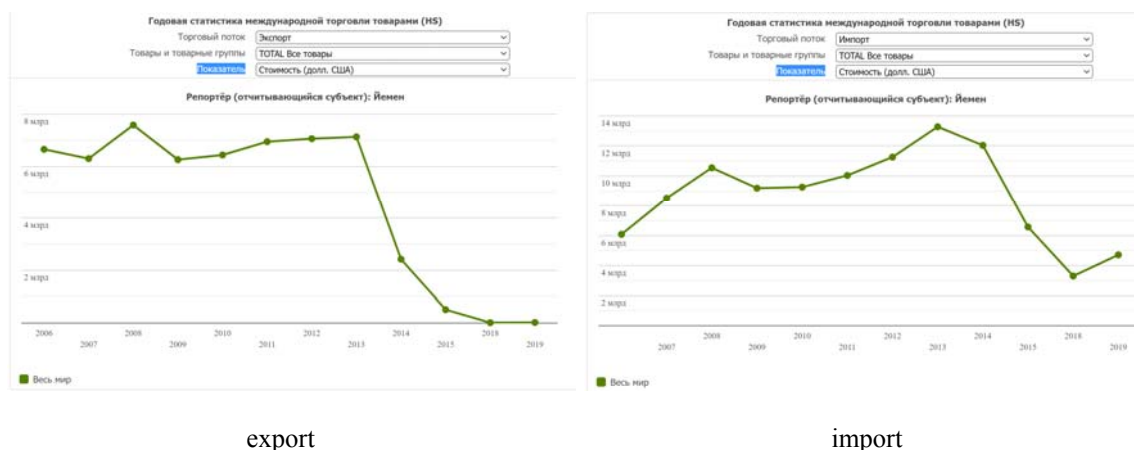
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- 2.18% (102 million USD): 23 - Residues and waste from the food industry; prepared animal feed

The following are the top ten items imported into Yemen in 2019:

- 28% (\$1.33 billion): 2710 - Petroleum oils and petroleum products obtained from bituminous minerals, other than crude; products, not elsewhere specified or included, containing 70% by weight or more of oil or oil products derived from bituminous rocks, these oil products being the main constituents of the preparations; used oils
- 11.5% (\$546 million): 1001 - Wheat and meslin
- 5.03% (\$237 million): 1701 - Cane or beet sugar and chemically pure sucrose, in the solid state.
- 3.47% (\$163 million): 1005 - Corn
- 2.98% (\$140 million): 1006 - Rice
- 2.68% (\$126 million): 1101 - Wheat or wheat-rye flour.
- 2.2% (\$104 million): 7213 - Hot-rolled bars, in loose coils, of iron or non-alloy steel.
- 1.99% (\$93 million): 8703 - Cars and other motor vehicles primarily for the transport of persons (other than motor vehicles of heading 8702), including vans and racing cars.
- 1.97% (\$93 million): 3004 - Medicinal products (other than those of heading 3002, 3005 or 3006) consisting of mixed or unmixed products, for therapeutic or prophylactic use, put up in unit dosage forms.

- 1.48% (\$70 million): 8541 - Diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, including photovoltaic cells, assembled or not assembled in modules, mounted or not mounted in panels; light emitting diodes; piezo sensors

In this fig. Annual Statistics of International Merchandise Trade (HS) [1].



The Republic of Yemen's import of Belarusian goods increased during the period of stability in Yemen, but with the period of instability due to the war in Yemen, the import rate has decreased, as Yemen used to import many goods from Belarus, including medical medicines, some devices, and others. Perhaps Belarus discovered a new way to market its commodities through the UAE, which is regarded as a free market for Asian nations, and so Yemen will be imported from there.

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THE ECONOMIC FALLOUT OF THE WAR IN YEMEN: FROM MACROECONOMIC SHOCKS TO MICROECONOMIC SUFFERING

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ЭКОНОМИЧЕСКИЕ ПОСЛЕДСТВИЯ ВОЙНЫ В ЙЕМЕНЕ: ОТ МАКРОЭКОНОМИЧЕСКИХ ПОТряСЕНИЙ ДО МИКРОЭКОНОМИЧЕСКИХ СТРАДАНИЙ

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Maintaining macroeconomic stability, particularly the coordination of monetary policies, must be a top priority in this work and as efforts to bring peace to Yemen advance, as it will be crucial in addressing food insecurity among the most vulnerable populations, which is the Yemeni people. Thus, keeping track of macroeconomic and microeconomic dynamics and the connections between them improves our understanding of the living conditions of common people throughout Yemen, supporting policy reforms aimed at achieving inclusive growth and lowering poverty rates.

Keywords: Yemeni war, economic, educational, future of Yemen.

Поддержание макроэкономической стабильности, особенно координации денежно-кредитной политики, должно быть одним из главных приоритетов в этой работе и по мере продвижения усилий по установлению мира в Йемене, поскольку это будет иметь решающее значение для решения проблемы отсутствия продовольственной безопасности среди наиболее уязвимых слоев населения, каковым является йеменский народ. Таким образом, отслеживание макро- и микроэкономической динамики и связей между ними улучшает наше понимание условий жизни простых людей по всему Йемену, поддерживая политические реформы, направленные на достижение инклюзивного роста и снижение уровня бедности.

Ключевые слова: йеменская война, экономическая, образовательная, будущее Йемена.

An armed conflict between governments or armed factions for the purpose of gaining control over territory, resources, or other objectives is called a war. Many wars have broken out throughout history, and war is considered to be one of the worst events because it has devastated and killed countless numbers of people and nations. Large-scale battles that caused enormous losses in terms of both lives and property characterized the major world wars of the 20th century. Nations, civilizations, and eras have different ways of waging war and different reasons for it. Large-scale battles that caused enormous losses in terms of both lives and property characterized the major world wars of the 20th century. Different nations, civilizations, and eras have different war tactics, strategies, and causes. Big wars are caused by power struggles and competing political and economic interests, while minor wars are caused by disputes over the distribution of land and water. Warriors can use a range of tactics in battle, including suicide bombing, electronic and cyberwarfare, and bombarding military and civilian targets from the air, land, and sea.

The conflict in Yemen started in 2015 when the Houthi movement, supported by Iran, took over major parts of the country, including the capital city of Sanaa. This led to the exile of former Yemeni President Abd Rabbo Mansour Hadi, who fled to Saudi Arabia in order to request military support from the Saudi-led Arab coalition. Regaining land in Yemen and supporting the legitimate government based on the constitution are the objectives of the coalition. Regaining control over Yemeni territory and supporting the legitimate government in Yemen are the objectives of the coalition. Yemen is the scene of

air, land, and maritime warfare between the Houthis, who are supported by Iran, and the troops of the Arab coalition. Numerous lives have been lost in the conflict, and a large amount of essential infrastructure—such as factories, schools, and hospitals—has been destroyed. Currently, millions of Yemenis are facing the worst humanitarian crisis the world has ever seen due to a lack of food, water, medical care, and shelter. Yemen's Effects of the War:

Yemen's conflict is regarded as one of the world's worst humanitarian crises, and it has severely harmed the country's economic structure. Many economic sectors have been harmed, beginning with infrastructure and progressing to industrial and agricultural facilities, as well as key services such as electricity, health, and education. Many economic and investment projects have been delayed due to a lack of security and political stability, and government and corporate institutions have been damaged and wrecked, resulting in a considerable fall in growth. The economy will suffer as a result, as will unemployment and poverty rates. The economy will suffer as a result, as will unemployment and poverty rates. Yemen is now experiencing an extreme scarcity of essential supplies of food and medical goods, in addition to rising commodity prices, degradation of the currency market, and depreciation of the Yemeni pound. Thus, the Yemeni conflict significantly harmed the Yemeni economy and severely harmed Yemen's economic and social structures.

The Yemeni war had a significant impact on Yemen's educational framework, which did not escape the damage and deterioration that devastated all educational institutions in the nation. Hundreds of schools, colleges, and training institutions, for example, have been destroyed in Yemen as a result of indiscriminate bombing and armed conflict. Furthermore, Yemen's education infrastructure has been harmed, with existing schools suffering from a lack of textbooks and study materials, and some educational institutions suspended due to armed conflict, preventing a large number of children and youth from obtaining basic education and the skills required for employment. In the work market. As a result, the Yemeni conflict exacerbated the country's economic predicament, leaving many households unable to afford schooling and educational institutions. As a result, instead of attending school and acquiring an education, many youngsters resort to labor to assist their families meet their fundamental needs. As a result, the Yemeni conflict has had a terrible impact on Yemen's educational framework, and the government must restore that structure while focusing on providing security and stability for the rehabilitation of schools and educational opportunities for Yemen's children and youth.

Yemen's conflict, which began in 2015 and is still ongoing, has had a significant influence on the country's social structure. Among these factors are:

- Rising rates of poverty, unemployment, and declining economic conditions, which wreak havoc on communal life.
- The deterioration of infrastructure and public services such as health, education, energy, and water, which worsens the socioeconomic condition.
- The intensification of sectarian, ethnic, and tribal disputes, which leads to the dissolution of national unity, the weakening of national belonging, and the escalation of social tensions.
- An growth in the number of refugees and internally displaced people, resulting in the loss of homes and lands, as well as the fragmentation of families and families.
- The rise in violence against women, children, adolescents, and youth, which has a severe impact on the family and society.
- The deterioration of human rights protection and the increase of external interference, resulting in an aggravation of Yemen's humanitarian and socioeconomic crisis.

In general, the Yemeni conflict destroyed communal life and disintegrated Yemen's social fabric, and the degree of the long-term damage is difficult to assess.

Yemen's conflict, which began in 2015, has had a significant detrimental influence on the country's political system. Indeed, the conflict has fragmented authority, and foreign and local efforts to attain political stability have failed, leaving Yemen in a state of political uncertainty and profound differences. In 2015, the Houthis, who are backed by Iran, staged a coup against Yemeni President Abdrabbo Mansour Hadi, weakening their grip on the country. After President Hadi was forced to quit Yemen, Saudi Arabia and its allies launched a military operation against the Houthis.

During this battle, there have been several egregious abuses of human rights and international humanitarian law. It also intensified radicalism and political polarization in Yemen. The war has resulted in a rise in the multiplication of armed organizations, as well as heightened levels of violence and general disorder in the governmental system. It also caused the government to disintegrate and the Yemeni constitution to be torn apart, leaving Yemen without a proper political structure for governance and development. These negative consequences are likely to last long after the conflict is over.

There is no way to forecast the implications of Yemen's future conflict, but they will almost certainly involve devastating impacts on civilians, particularly children and women, who suffer significantly from a shortage of food and clean water, as well as degradation of health and education systems[1, 2].



Photograph of a snapshot of Yemen's health status in war zones



Photograph of a demolished school in Yemen's war zones

War may also destroy a country's infrastructure and damage its economy, resulting to an intensification of the humanitarian situation as well as an increase in poverty and instability.

Conclusion

As efforts to bring about peace in Yemen progress, upholding macroeconomic stability—in particular, the coordination of monetary policies—must be given high priority because it will be essential to addressing food insecurity among the most vulnerable groups, the Yemeni people. Thus, monitoring macroeconomic and microeconomic dynamics and the relationships between them helps, we had better understand Yemen's common people's living conditions and supports policy changes meant to promote inclusive growth and reduce poverty.

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TECHNOLOGY IN EDUCATION IN YEMEN: ISSUES INSTRUCTORS FACE AND HOW THEY RELATE TO THE COUNTRY'S CURRENT REALITY

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ТЕХНОЛОГИИ В ОБРАЗОВАНИИ В ЙЕМЕНЕ: ПРОБЛЕМЫ, С КОТОРЫМИ СТАЛКИВАЮТСЯ ИНСТРУКТОРЫ, И КАК ОНИ СООТНОСЯТСЯ С ТЕКУЩЕЙ РЕАЛЬНОСТЬЮ СТРАНЫ

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This article examines the challenges faced by instructors in Yemen when incorporating technology in education and explores how these challenges relate to the country's current reality. Yemen faces significant obstacles in terms of limited access to technology, inadequate training and professional development, language and content limitations, socio-economic barriers, infrastructure and resource limitations, and cultural factors. These challenges are deeply intertwined with the country's ongoing conflict, economic instability, and limited resources. Understanding these issues and their relation to Yemen's current reality is crucial for developing effective strategies to support instructors in leveraging technology to enhance educational outcomes. Collaborative efforts from government bodies, educational institutions, and international organizations are needed to address these challenges and create an enabling environment for technology integration in Yemeni classrooms.

Keywords: Yemen's economic, use of technology, education.

В этой работе рассматриваются проблемы, с которыми сталкиваются инструкторы в Йемене при внедрении технологий в образование, и исследуется, как эти проблемы связаны с текущей реальностью страны. Йемен сталкивается со значительными препятствиями с точки зрения ограниченного доступа к технологиям, неадекватной подготовки и профессионального развития, языковых и содержательных ограничений, социально-экономических барьеров, ограничений инфраструктуры и ресурсов, а также культурных факторов. Эти проблемы тесно связаны с продолжающимся конфликтом в стране, экономической нестабильностью и ограниченными ресурсами. Понимание этих проблем и их связи с нынешней реальностью Йемена имеет решающее значение для разработки эффективных стратегий поддержки инструкторов в использовании технологий для повышения результатов образования. Для решения этих проблем и создания благоприятных условий для интеграции технологий в школах Йемена необходимы совместные усилия государственных органов, учебных заведений и международных организаций.

Ключевые слова: экономика Йемена, использование технологий, образование.

Technology has the potential to revolutionize education by enhancing access to quality learning resources and fostering innovative teaching approaches. However, in a country like Yemen, where educational infrastructure and resources are limited, instructors face unique challenges in integrating technology into the classroom. This article explores

the issues Yemeni instructors encounter when incorporating technology in education and examines how these challenges relate to the country's current reality.

Yemen faces significant challenges regarding access to technology. Many schools lack basic infrastructure, such as reliable electricity supply and internet connectivity. Instructors often struggle to find appropriate devices and software for educational purposes. The lack of access to technology hinders instructors' ability to effectively integrate digital tools into their teaching methods.

Yemeni instructors often lack the necessary training and professional development opportunities to effectively utilize technology in education. Limited access to quality training programs prevents instructors from acquiring the skills needed to incorporate technology into their teaching practices. Without proper guidance, instructors may struggle to navigate educational software and platforms, hindering their ability to deliver engaging and effective digital learning experiences.

The availability of technological resources tailored to the Yemeni context, including localized educational software and content, remains limited. Instructors often face challenges in finding relevant and locally appropriate digital resources that align with the curriculum and language requirements. The lack of localized content impedes instructors' ability to create engaging and culturally relevant digital learning materials.

Yemen's socio-economic challenges, including poverty and ongoing conflict, exacerbate the difficulties faced by instructors when integrating technology in education. Many students and their families do not have access to personal devices or reliable internet connections at home. This digital divide hampers instructors' efforts to implement effective blended learning models or to assign online activities as part of the curriculum.

The country's educational infrastructure and resources suffer from years of underinvestment and ongoing conflict. Insufficient funding leads to a scarcity of up-to-date technological equipment, such as computers, projectors, and interactive whiteboards. Instructors must work with outdated or inadequate resources, hindering their ability to create engaging and interactive learning environments.

Yemen's cultural and societal factors also influence the integration of technology in education. Traditional teaching methods are deeply ingrained, and there may be resistance to change among some instructors, students, and parents. Overcoming cultural barriers and fostering a mindset shift towards embracing technology as an educational tool present additional challenges for instructors.

Yemen's current reality, characterized by conflict, economic instability, and limited resources, significantly impacts the challenges faced by instructors when integrating technology in education. The ongoing conflict has disrupted infrastructure development and access to resources, making it even more challenging to implement effective technology-based teaching and learning practices. Moreover, the prioritization of immediate needs, such as addressing humanitarian crises, often leaves little room for investments in educational technology.

While technology has the potential to transform education, Yemeni instructors face numerous challenges in integrating technology into their classrooms. Limited access to technology, inadequate training, language and content limitations, socio-economic barriers, infrastructure and resource limitations, and cultural factors all contribute to the difficulties faced by instructors. Understanding these challenges and their relation to Yemen's current reality is crucial for designing effective strategies and initiatives that support instructors in leveraging technology to enhance educational outcomes in the country. It requires collaborative efforts from government bodies, educational institutions, and international organizations to address these challenges and create an enabling environment for technology integration in Yemeni classrooms.

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METFORMIN FLOATING TABLET FORMULATION AND IN VITRO EVALUATION USING MULTIPLE PROPORTIONS OF HPMC

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СОСТАВ ПЛАВАЮЩЕЙ ТАБЛЕТКИ МЕТФОРМИНА И ОЦЕНКА НА VITRO С ИСПОЛЬЗОВАНИЕМ НЕСКОЛЬКИХ ПРОПОРЦИЙ НРМС

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Hardness, friability, dissolving, floating ability, and in vitro drug release were the physical attributes of the formed floating tablets that were assessed. The evaluation results were acceptable and in the restricted rate. F2 and F3 had floating times longer than 15 hours, while F1 had a floating time of only 15 hours. F1 and F2 were completely dissolved in less than 17 hours, whereas F3 had the best floating capacity to hold the drug release, with a 95% retention rate over 20 hours. Will Belarus utilize this research to create pharmaceutical tablets with this degree of effectiveness?

Keywords: HPMC, GIT, PVP.

Твердость, хрупкость, растворимость, способность к плаванию и высвобождение лекарственного средства in vitro были физическими характеристиками образованных плавающих таблеток, которые были оценены. Результаты оценки были приемлемыми и в ограниченном объеме. F2 и F3 имели время плавания более 15 часов, в то время как F1 имел время плавания всего 15 часов. F1 и F2 были полностью растворены менее чем за 17 часа, тогда как F3 имел лучшую плавающую способность удерживать высвобождение лекарственного средства с 95% коэффициентом удержания в течение 20 часов. Будет ли Беларусь использовать это исследование для создания фармацевтических таблеток с такой степенью эффективности?

Ключевые слова: HPMC, GIT, PVP.

The most convenient and favored method of medication delivery to the systemic circulation is oral administration. Oral controlled release drug delivery has lately gained popularity in the pharmaceutical industry as a means of achieving increased therapeutic benefits such as convenience of dosage administration, patient compliance, and formulation flexibility. Drugs with short half-lives and easy absorption from the

gastrointestinal tract (GIT) are swiftly removed from the systemic circulation. To ensure adequate therapeutic action, these medications must be dosed on a regular basis. To overcome this constraint, the creation of oral sustained-release formulations is an attempt to slowly release the medication into the gastrointestinal tract (GIT) while maintaining an effective drug concentration in the systemic circulation for an extended period of time.

We are studying Metformin, HPMC, PVP, Magnesium Stearate, Talc, and lactose powders were weighted and mixed using geometric techniques, then the powder was wetted with drops of ethyl alcohol to make a pasty mass, which was sieved in a sieve (12& 16) MM to get granules. The granulation was then dried in an oven at 50 degrees Celsius for 5 hours. Tablets were made using the wet granulation process, with distinct compositions for each recipe.

Granules were made by geometrically combining the weighted powders as shown in Fig. 1, then using Ethanol drops as a binder. The wet mass combination was then dried at room temperature for 24 hours. The dry granules were sieved using sieves with mesh sizes of 12 and 16. The bulk was then compacted to make tablets.



Fig. 1. Photo depicts the engineering mixing device's mixing parameters

Figure 2 depicts the results of a metformin HCl pill dissolving test. According to these data, the sole formula F3, which employs HPMC as the polymer, can tolerate drug release, but in the other formulae, the drug has been completely removed before 20 hours. This occurs because the HPMC forms a barrier gel with high viscosity, which is more resistant to the diffusion process, causing medication release from matrix tablets to be sluggish as the amount of HPMC polymer increases.



Fig. 2. Photo of floating Tablet of Metformin HCL

Evolution of floating time of depicts a floating tablet of Metformin HCL

Formulation Code	Floating Time
F1	15
F2	17
F3	20

Table 1 shows the results of each formula's floating time. The fundamental prerequisite for preparation to float is that the system maintain a specific gravity lower than the total specific gravity of the stomach contents. When the density of the tablets is less than one, the tablet floats. The molecular weight of each polymer can impact the floating lag time.

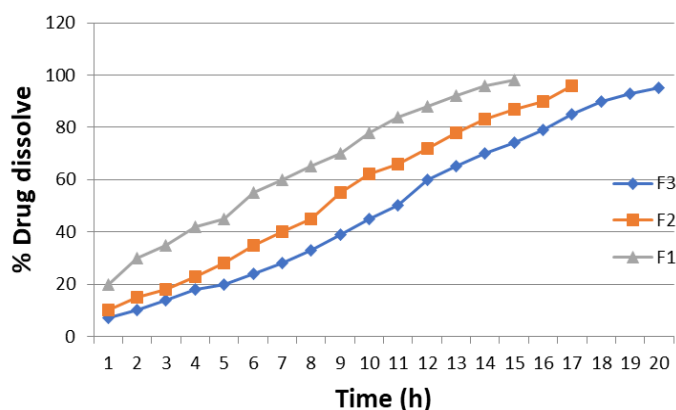


Fig. 3. Curve of dissolution profile of Metformin HCL Floating Tablets

The lower the molecular weight of a polymer, the faster the tablet floats to the medium's surface. The solubility of the polymer employed as a matrix also influences floating time. As demonstrated in Fig. 3 and Table 1, the longer the matrix is dissolved in the medium, the longer the matrix floats on the medium's surface.

Based on the findings of this investigation, it can be concluded that metformin HCl floating tablet with HPMC (F3) was the optimum formula, as the matrix can tolerate drug release for up to 20 hours. We also determined that the amount of HPMC in the tablet can affect its floating time and drug release from the tablet.

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SAMPLING SCREENING AND ANALYSIS OF POP-BFRS IN ARTICLES, PRODUCTS AND RECYCLING STREAMS

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ОТБОР ПРОБ И АНАЛИЗ СОЗ-BFRS В ИЗДЕЛИЯХ, ПРОДУКТАХ И ПОТОКАХ РЕЦИРКУЛЯЦИИ

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In different branches of chemistry and its multiple fields, analytical chemistry is the biosphere for all fields of chemistry, and quantitative analysis in analytical chemistry is the determination of absolute or relative abundance, often expressed as a concentration of one substance, several substances, or several properties of the chemical substance in a sample. It is an analytical method that gives more accurate data on the composition of a sample and the components that enter into its composition and their quantities, and this is the goal through which this study was conducted for a group of persistent organic compounds known as polybrominated diphenyl ethers, which rocked the thrones of European, Asian and American industries with names and congeners exceeding 209 homogeneous, where they were attended with some exemptions for some of them, and then they were replaced by new flame retardants as environmentally friendly and contribute to extinguishing fires, and based on various studies, this organic analytical study was conducted for these compounds, of which bromine is one of the causes of their problems, where the methods of collecting samples were addressed. And how to analyze them with the latest contemporary technologies that have developed with the development of products' goods and the mechanics of the behavior of these exciting vehicles.

Keywords: flame retardants, polybrominated diphenyl ethers (PBDEs), methods of analysis.

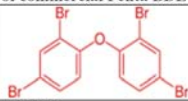
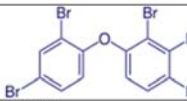
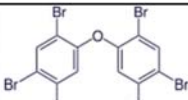
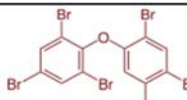
В различных отраслях химии и ее многочисленных областях аналитическая химия является биосферой для всех областей химии, а количественный анализ в аналитической химии – это определение абсолютного или относительного содержания, часто выражаемого как концентрация одного вещества, нескольких веществ, или несколько свойств химического вещества в образце. Это аналитический метод, дающий более точные данные о составе образца и входящих в его состав компонентах и их количествах, и именно с этой целью было проведено данное исследование для группы стойких органических соединений, известных как полибромдифенил эфиры, которые потрясли троны европейской, азиатской и американской промышленности с названиями и родственниками, превышающими 209 однородных, где они присутствовали с не-

которыми исключениями для некоторых из них, а затем были заменены новыми антипиренами как экологически безопасные и способствующие тушению пожаров и на основе различных исследований было проведено это органическое аналитическое исследование для этих соединений, из которых бром является одной из причин их проблем, где были рассмотрены методы сбора образцов. И как их анализировать с помощью новейших современных технологий, которые имеют разрабатывается с развитием продуктов товаров и механики поведения этих увлекаемых транспортных средств.

Ключевые слова: антипирены, полибромдифениловые эфиры (ПБДЭ), методы анализа.

Notable additive halogenated flame retardants include commercial grades of PentaBDE (c-PentaBDE, or “Penta”), octaBDE (c-Octa-BDE), decaBDE (c-DecaBDE), and dodecane Hexabromocycline (c-HBCD). Commercial formulations (eg c-PentaBDE, c-Octa, etc.) are mixtures of PBDE congeners. The added flame retardants are mixed into the polymer formula and are not chemically bonded to the polymer. Thus these flame retardants leach out more easily than the materials that were added and end up in the air and dust. For example, the commercial mixture c-PentaBDE is primarily a mixture of PBDE congeners. In one recent study, the total North American consumption of c-Penta-, c-Octa- and c-DecaBDE from 1970 to 2020 in products was estimated to be 46,000 tons, 25,000 tons, and 380,000 tons, respectively [1, 2]. Although the prepared brominated flame retardants have been replaced by new NBFRs and new NBFRs have been used for many years, their use as alternative flame retardants has increased significantly in recent years [3, 4]. Much scientific research has indicated the industrial use of new NBFRs as flame retardants as additives to polymers, textiles, furniture, electrical electronics, automobiles, petrochemicals, and building materials [5]. Thus, when new NBFRs are added to consumer products, their release to the environment from these products will increase during the manufacture, use and recycling of these materials in the future [6, 7].

Brominated flame retardants are chemicals with which goods are treated to inhibit or delay the flame of any fire, such as tools and plastics in cars, and may be a surface treatment as with fabrics, or as additives during the manufacture of a material such as some types of plastics. It is used to reduce fire hazards by reacting to the combustion of the polymer. Some BFRs, such as PBBs, are additives that are not chemically bonded to plastics, but are physically bonded to the material being processed, making them easily emitted into the environment [8].

Composition of commercial Penta BDE	
Structure	
Congener	BDE-47
Name	2,2',4,4'-tetra-bromodiphenyl ether
Major POP-PBDEs and other PBDE congeners in c-OctaBDE in treated articles ²⁵⁴	
Structure	
Congener	BDE-85
Name	2,2',3,4,4'-penta-bromodiphenyl ether
Structure	
Congener	BDE-153
Name	2,2',4,4',5,5'-hexa-bromodiphenyl ether
Structure	
Congener	BDE-154
Name	2,2',4,4',5,6'-hexa-bromodiphenyl ether

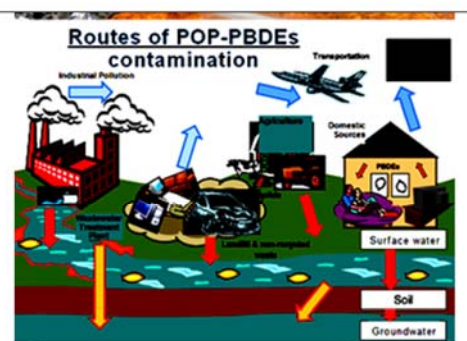
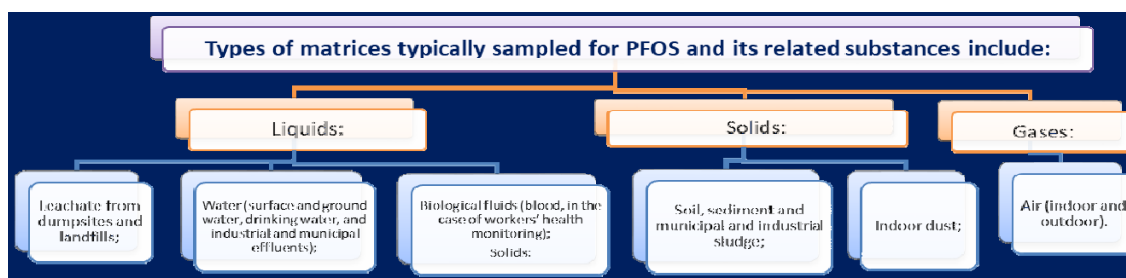


Figure (1): Routes of contamination migration

Analysis and sampling

Sample preparation, extraction and clean-up



- Extraction of POP-BFRs from polymers [9]
- Solid–liquid extraction
- Extraction of persistent organic pollutants from brominated flame retardants by "dissolving and precipitation" method (Extraction of POP-BFRs by “Dissolution and Precipitation” method)

However, this method can also result in losses or losses of the analyte either by targeted analyte adsorption into the precipitate, or if the solubility of the analyte is negatively affected by the solvent. Pöhlein et al. (2005) also developed two methods for identifying and quantifying brominated flame retardants in styrenic polymers. POP-PBDEs and HBDEs or HBCD and other BFRs are extracted from the most POP- and BFR-related polymers (ABS, PS, ABS/PC blend, PPE/PS blend, PVC,) by dissolution with tetrahydrofuran and precipitation performed with either ethanol[10], 1-propanol [11] or n-hexane [12]. These methods result in high extraction efficiency and short recovery time. (Extraction of POP-PBDEs in flexible and rigid polyurethane foam ,Clean-up of the polymer/plastic extracts).

Techniques used include X-ray technology (XRF), sliding spark spectroscopy, X-ray transmission (XRT) or laser-induced breakdown spectrometry (LIBS) [13]. The important note is that not every sifting method is suitable for every type of material. It can be used to screen bromine in consumer goods in the field or in recycling plants. There are four current techniques that have proven ability to sort bromine in long-term experiments and/or are widely used in facilities, and they can be considered as BAT/BEP for bromine screening [14]: 1-X-ray (XRF) 2-X-ray transmission 3-(XRT) Spark spectroscopy. 4-neutron active analysis.

Table 1

Forms of separation techniques, input materials and products, development status and relevant notes on the economy

formation	appropriate input	BFR-free products	the extent of development	Economic	Ref
Separation by sinking and flotation technique of cut parts (with static electricity)	Plastic from waste electrical and electronic equipment dismantling	acrylonitrile butadiene styrene, polystyrene	Accredited	The economy depends on the yield of BFR-free products	Schlummer (2011)
Sink-float disassembly (static separation)	TV covers	Heavy Duty Polystyrene	Accredited	Accredited	Schlummer (2011)
Disassembly by manual sorting (sinking and floating)	Plastic from waste electrical and electronic equipment dismantling	acrylonitrile butadiene styrene, polystyrene, acrylonitrile butadiene styrene-polycarbonate	Accredited	Not approved in industrialized countries	
Sinking and Floating Shredder (Static Separation)	Mixed Waste Electrical and Electronic Equipment (Small Appliances)	acrylonitrile butadiene styrene, polystyrene, polypropylene	Accredited	The system is working successfully in wersag AG (Großschirma) Germany	Hamos (2012) Wersag GmbH (2012)
X-ray transmission spectroscopy	Waste electrical and electronic equipment mixed	BFR-free and chlorinated PVC-free polymers	Accredited	no information	Schlummer(2011) Unisensor (2012)

The most recent analytical techniques for analyzing the Stockholm Convention POP-PBDEs (from tetrabromo to heptabromodiphenyl) and hexabromobiphenyl are chromatographic techniques[15]. Since gas chromatography (GC) is commonly used for POP-PBDEs (see eg IEC 62321-6)[16]. Liquid chromatography (LC, HPLC) technology has rarely been applied, especially due to the low separation efficiency. The international standard IEC 62321 in addition to GC/MS also describes a high-performance liquid chromatography method coupled with ultraviolet (HPLC/UV) detection.

Table 2

Advantages and drawbacks of different detection techniques for PBDE/BFRs are highlighted in the table [17]

Detection	Advantages	Drawbacks
ECD	purchase cost maintenance cost ease of use	fair sensitivity for BFRs instability of linear range very low selectivity
EI-LRMS	facilitates the use of labelled standards good selectivity	low sensitivity
ECNI-LRMS	good sensitivity good selectivity for brominated compounds	frequent source maintenance required
EI-HRMS	good sensitivity very good selectivity	purchase cost maintenance cost difficult to use higher "down-time"

The following table presents methods that can be used to analyze POP-containing BDEs in products and in waste, sediment, flue gas and waste water:

Table 3

Methods for analyzing POPs-containing brominated diphenyl ethers

A Record	Analysis method.
EPA 1614	Brominated brominated diphenyl ethers (BDEs) in water, soil, sediment and tissues by HRGC/HRMS
EPA1614A	Brominated brominated diphenyl ethers (BDEs) in water, soil, sediment and tissues by HRGC/HRMS
EPA527	Determination of Selected Pesticides and Flame Retardants in Drinking Water by Solid Phase Extraction and Gas Chromatography Coupled with Capillary Mass Spectrometry
EPA8270D	Semi-volatile organic compounds by gas chromatography coupled with mass spectrometry
IEC 62321-2008	Electro-technical products - Determination of levels for six controlled substances (lead, mercury, cadmium, hexavalent chromium, PBBs and PBDEs).
ISO 22032:2009	Determination of selected polybrominated diphenyl ethers in sediment and sewage sludge - method used for extraction by gas chromatography coupled with mass spectrometry.
China GB/Z 21277-2007	Rapid separation of lead, mercury, chromium and bromine cadmium for controlled substances in electrical and electronic equipment - X-ray fluorescence spectrometry.

Based on the foregoing review of the methods of sampling and analysis of PBDEs, we find that it is necessary to study the new polybrominated flame retardants, organophosphorous ester inhibitors, inorganic flame retardants, in addition to HBCD in subsequent studies. Contemporary with these compounds, which undoubtedly constitute a great importance in the life of every human being, given that this brief study was not able to accommodate all these compounds in this research, and God we ask that this research obtain your interest and interest.

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TEMPERATURE DEPENDENT IMPEDANCE ANALYSIS OF DYCRO₃ And 20% C_O-DOPED DYCRO₃ NANOPARTICLES

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ТЕМПЕРАТУРНО-ЗАВИСИМЫЙ АНАЛИЗ ИМПЕДАНСА DyCrO₃ И 20 % Co-ЛЕГИРОВАННЫХ DyCrO₃ НАНОЧАСТИЦ

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In present work, investigation of the temperature dependent impedance of DyCrO₃ and 20% Co-doped DyCrO₃ perovskite has been done. The values of the real and imaginary parts of impedance exhibit significant decrease with the increase in temperature indicating the increase in conductivity. The impedance data reveal that there are no characteristic resonance peaks for pure sample, which indicate the absence of relaxation process. The doped sample shows an electrical relaxation peak, this peak is shifted towards the lower temperature at higher frequencies. The Nyquist plots show a single distorted incomplete semicircle at lower temperatures, which implies the grain boundary resistance, dominates over the grain resistance and straight line at higher temperatures.

Keywords: temperature, DyCrO₃, nanoparticles.

В настоящей работе проведено исследование температурно-зависимого импеданса перовскита DyCrO₃ и перовскита DyCrO₃, легированного 20%-м кобальтом. Значения действительной и мнимой частей импеданса существенно уменьшаются с ростом температуры, что указывает на увеличение проводимости. Данные импеданса показывают, что для чистого образца характерные резонансные пики отсутствуют, что указывает на отсутствие процесса релаксации. В легированном образце наблюдается пик электрической релаксации, который при более высоких частотах смещается в сторону более низких температур. Графики Найквиста показывают одиночный искаженный неполный полукруг при более низких температурах, что означает, что сопротивление границ зерен преобладает над сопротивлением зерен, и прямая линия при более высоких температурах.

Ключевые слова: температура, DyCrO₃, наночастицы.

It has been reported that RCrO₃ exhibits ferroelectric and antiferromagnetic properties at comparatively lower temperatures, and are assumed to be a new series of multiferroic materials. This type of materials can be utilized in different applications such as power transformer, resonators and filters, cables, capacitor, transducers etc. These perovskites show fascinating electrical and magnetic features and pronounced catalytic activity. DyCrO₃ is relatively new rare-earth chromite material that has orthorhombic crystal symmetry with *Pbnm* space group. Dy³⁺ cations have higher magnetic moments (10.63μB), and hence its oxides exhibit a high magnetocaloric influence and may be handy in magnetic refrigeration at the magnetic ordering transition temperature [1–4]. In literature, a number of reports are available on the effect of cobalt doping on physical properties of perovskite materials [5–7]. These reports indicate that as a result of possible temperature driven change of spin and oxidation states of Co³⁺ ions.

Thus, it appeared reasonable to study the dependence of the electrical properties of DyCrO₃ on the doping of Co and Cr ions at B-site. In the current work, we report the temperature dependent impedance of DyCrO₃ and 20% Co-doped DyCrO₃ samples.

Results and discussion

The impedance analysis is a very important tool utilized to give information about the grain boundary and grain-electrode effects, and hence provide an idea about the conduction mechanism of the studied materials. To investigate the electrical characterisations of the concerned samples, We have used the impedance spectra as a function of temperature at selected frequencies (in the frequency interval 75 kHz-5 MHz). Fig.1 and 2). Fig. 1 and 2 show the variation of real (Z') and imaginary (Z'') parts of impedance with temperature at selected frequencies.

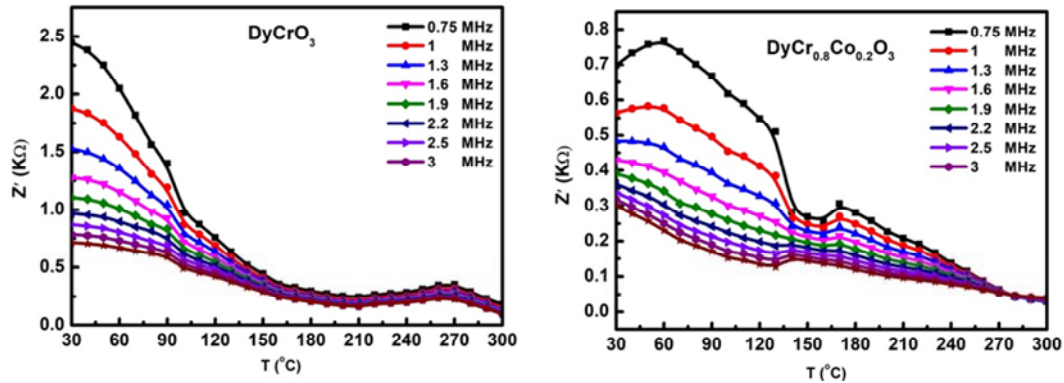


Fig. 1. Variation of real part (Z') of impedance as a function of temperature for DyCrO_3 and $\text{DyCr}_{0.8}\text{Mn}_{0.2}\text{O}_3$

It is clear from these plots that Z' and Z'' for studied samples decrease with the rise in frequency as well as cobalt doping. The decline in the magnitude of real and imaginary impedance with an increase in frequency and cobalt doping indicates the increase in the ac conductivity of this samples. This result also suggests an increase in the semiconducting properties of the doped sample. Fig. 1 also exhibits that Z' has significant frequency dependence at lower frequencies for both samples due to the activity of resistive grain boundaries in this region [8]. It is also clear from Fig. 1 and 2 that Z' and Z'' decrease with the increase in temperature. This reduction reveals the negative resistance coefficient of these samples. It can be noticed that the values of Z'' for pure and doped samples are merged at higher temperature indicating to the accumulation of space charge at the boundaries of homogeneous phases [9]. These figures also reveal that there are no characteristic resonance peaks for pure sample, which indicate the absence of relaxation process for all probing temperature at selected frequencies. But the doped sample shows a resonance peaks at lower and at intermediate temperatures which indicate the presence of relaxation process in this sample. The peak position at lower temperature exhibit shifting towards lower temperatures with the increase in frequency which may be due to immobile species ($\text{Cr}^{3+}/\text{Cr}^{4+}$) contribute to relaxation process at lower temperatures [10]. The peak shifting indicates the change in the relaxation time with frequency.

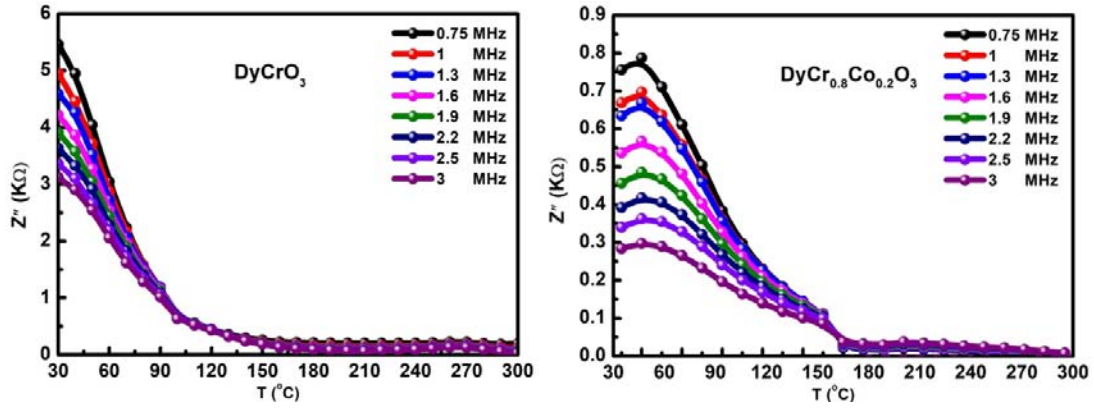


Fig. 2. Variation of imaginary part (Z'') of impedance as a function of temperature for DyCrO_3 and $\text{DyCr}_{0.8}\text{Mn}_{0.2}\text{O}_3$

In the impedance analysis, the impedance data is usually plotted in a complex plane. This plot is showing the variation of Z' with Z'' and known as Nyquist plot [11].

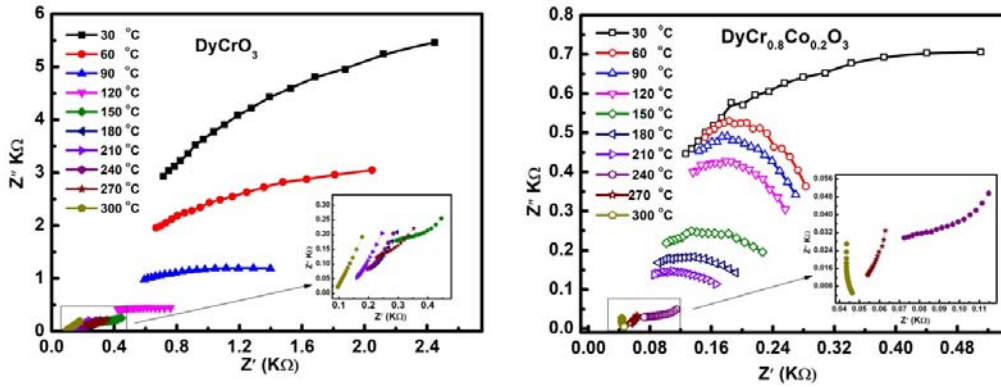


Fig. 3. Nyquist plots of DyCrO_3 and $\text{DyCr}_{0.8}\text{Mn}_{0.2}\text{O}_3$ at different temperature

In an ideal case, the Nyquist plot has multiple semicircles over a wide range of frequencies in the complex Z' – Z'' plane. These semicircles reflect the contribution of a specific process (grain boundaries, grains interior, electrodes and contacts) to the total impedance of the sample. Fig. 3 shows the Z' vs. Z'' plots (Nyquist plots) of studied samples at different temperatures.

Conclusion

The Nyquist plots display depressed semi-circular patterns, which indicate the non-Debye behaviour and the distributed relaxation times. Both samples show a single distorted incomplete semicircle at lower temperatures, which implies the grain boundary resistance, dominates over the grain resistance and straight line at higher temperatures. It is well known that samples with higher d.c. conductivity show distorted Nyquist plots. Therefore, this result is on expected lines since our samples have higher values of d.c. conductivity as has been published in the previous work on this system [5].

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MORPHOLOGY OF THE PROCESS OF HIGH-TEMPERATURE COPPER OXIDE REDUCTION ON THE SURFACE OF ALUMINUM OXIDE

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МОРФОЛОГИЯ ПРОЦЕССА ВЫСОКОТЕМПЕРАТУРНОГО ВОССТАНОВЛЕНИЯ ОКСИДА МЕДИ НА ПОВЕРХНОСТИ ОКСИДА АЛЮМИНИЯ

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Micro-powders were thermally processed in the air at $T = 800\text{ }^{\circ}\text{C}$ to produce an $\text{Al}_2\text{O}_3:\text{CuO}$ micro-powder. The micro-powder $\text{Al}_2\text{O}_3:\text{Cu}^{\circ}$ was then produced in hydrogen at $T = 800\text{ }^{\circ}\text{C}$ (exposure period 1 hour). The processes of phase creation in the final product under the impact of heat treatment in air or in a hydrogen environment were explored using the X-ray -phase analysis method (RF).

Keywords: $\text{Al}_2\text{O}_3:\text{CuO}$, $\text{Al}_2\text{O}_3:\text{Cu}^{\circ}$, micro-powder, hydrogen, high-temperature.

Микророшки подверглись термической обработке на воздухе при $T = 800\text{ }^{\circ}\text{C}$ с получением микророшка $\text{Al}_2\text{O}_3:\text{CuO}$. Затем микророшок $\text{Al}_2\text{O}_3:\text{Cu}^{\circ}$ получали в водороде при $T = 800\text{ }^{\circ}\text{C}$ (выдержка 1 час). Методом рентгенофазового анализа (РФ) исследованы процессы фазообразования в конечном продукте под воздействием термообработки на воздухе или в среде водорода.

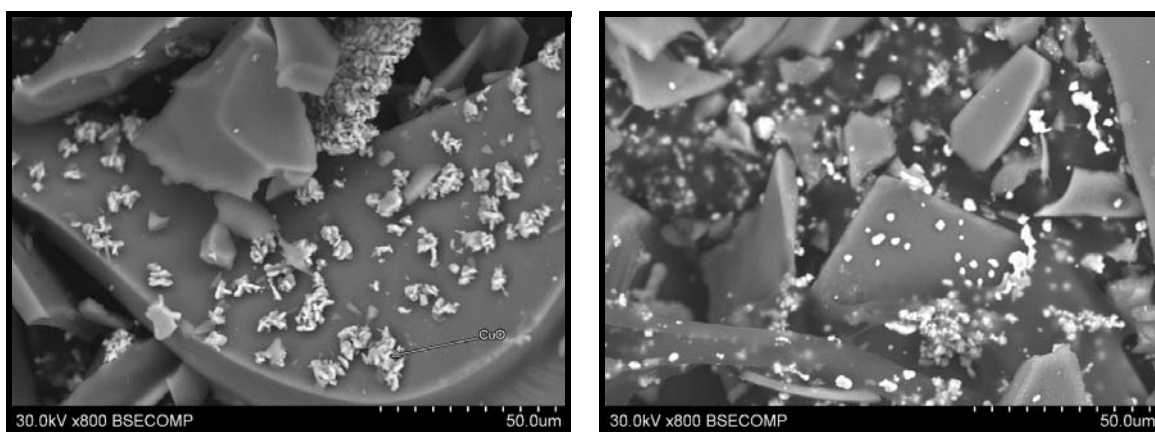
Ключевые слова: $\text{Al}_2\text{O}_3:\text{CuO}$, $\text{Al}_2\text{O}_3:\text{Cu}^{\circ}$, микророшок, водород, высокая температура.

The solution of the technological challenge on the process of developing functional materials based on extremely porous inorganic substances of a high degree of purity was studied within the framework of the research. The investigated compounds were created by directly restoring metal oxides to their elemental state in a hydrogen recovery environment. The goal of the research was to create hybrid materials in the form of composite microporos with excellent sorption capacity and selectivity of various types of microorganisms. Figure 1 depicts the characteristics of metal phase localisation on the surface of a chemically inert dielectric matrix (for example, aluminum oxide).

To investigate the phase composition and shape of a synthetic micro-powder created on the basis of aluminum oxide (Al_2O_3) obtained by drying and subsequent annealing in the air of aqueous solutions containing aluminum nitrate and copper nitrate. Copper nitrate concentration in 30 ml of aqueous solution:

- 1 mol. of aluminum nitrate 0.25 mol. of copper nitrate,
- 1 mol. of aluminum nitrate 0.40 mol. of copper nitrate,
- 1 mol. of aluminum nitrate 0.50 mol. Copper nitrate.

Micro-powders were thermally processed in the air at $T = 800\text{ }^{\circ}\text{C}$ to produce an $\text{Al}_2\text{O}_3:\text{CuO}$ micro-powder. Then in hydrogen at $T = 800\text{ }^{\circ}\text{C}$ (exposure period 1 hour) to get an $\text{Al}_2\text{O}_3:\text{Cu}^{\circ}$ micro-powder.

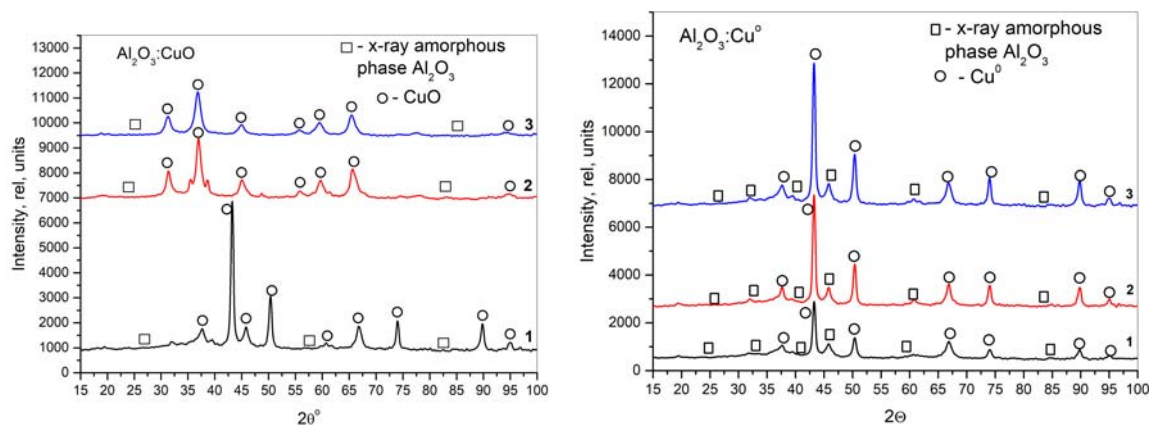


$\text{Al}_2\text{O}_3 : \text{CuO}$

$\text{Al}_2\text{O}_3 : \text{Cu}^{\circ}$

Fig. 1. SEM-image of the surface of the micro-powder of the composition $\text{Al}_2\text{O}_3 : \text{Cu}^{\circ}$ formed by heat treatment in hydrogen at $T = 800\text{ }^{\circ}\text{C}$ (exposure time-1 h) the initial micro-powder of the composition $\text{Al}_2\text{O}_3 : \text{CuO}$

Figure 2 shows X-ray diffraction patterns of aluminum oxide-based starting materials and composite products. The peaks become clearer as the concentration of copper in the compound increases, as a comparison of the peaks with the PDF database (48-1548 JCPDS-1996) proved that the main phase of the sample is CuO with a monoclinic crystalline structure, and Cu retains the monoclinic crystalline system for the annealed samples with an atmosphere of hydrogen gas.



micro-powders were heat-treated in air at = 800 °C
(holding time - 1 h)

micro-powders were heat-treated in hydrogen
at =800° (holding time – 1 h)

Fig. 2. XRF spectra of micro-powder produced based on aluminum oxide (Al_2O_3), obtained by drying and subsequent annealing in air of aqueous solutions of aluminum nitrate and copper nitrate salts. Copper nitrate concentrations in 30 mL of aqueous solution: 1-0.25 mol; 2- 0.40 mol; 3- 0.50 mol of copper nitrate per 1 mol of aluminum nitrate

The elemental analysis performed by the EDX (EDS) test revealed that the synthesized micro-powder contains the following elements: O(40.74 AT.%), Al (27.72 AT.%), and Cu (31.54 AT.%). Copper may be observed dispersed over the surface of the main matrix in the form of a disordered "mesh" structure (see Figure 1.2), which might favorably enhance the supposed catalytic characteristics of produced materials.

Conclusion

1. Copper nitrate technical approaches were developed in relation to aluminum salts (which had varying quantities of copper nitrate), Xerogels and powders with the compositions $\text{Al}_2\text{O}_3:\text{CuO}$ and $\text{Al}_2\text{O}_3:\text{Cu}^0$ were produced.

2. The morphology of composite materials formed in the form of $\text{Al}_2\text{O}_3:\text{Cu}^0$ micro-powders was studied using SEM. The characteristics of reduced copper atom agglomerates on the surface of a chemically pure Al_2O_3 matrix are established.

3. The elemental content of the produced materials was determined using EDX (EDS), and the phase composition of micro-powders was investigated using XRD.

PHYSICOCHEMICAL PRINCIPLES FOR CREATING MODIFIED COATINGS WITH REDUCED METAL NANOPARTICLES

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ФИЗИКО-ХИМИЧЕСКИЕ ПРИНЦИПЫ СОЗДАНИЯ МОДИФИЦИРОВАННЫХ ПОКРЫТИЙ С НАНОЧАСТИЦАМИ ВОССТАНОВЛЕННОГО МЕТАЛЛА

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In this study, we examine the prospect of increasing the performance qualities of composite materials by employing sol-gel technology to generate coatings or modified surfaces with sufficient depth for active material penetration into the main matrix.

Keywords: SiO₂, Plasmonic, nanoparticles.

В данном исследовании мы рассматриваем перспективу повышения эксплуатационных качеств композиционных материалов за счет использования золь-гель технологии для создания покрытий или модифицированных поверхностей с достаточной глубиной для проникновения активного материала в основную матрицу.

Ключевые слова: SiO₂, плазмоника, наночастицы.

Scientific research advances in tandem with the expanding global demand for new optoelectronic technology products with cheap manufacturing costs and competitive functional qualities (when compared to current analogues). According to this viewpoint, investigating the conditions for obtaining structural materials for nanoelectronics and nanophotonics necessitates a combined approach to the formation of complex composite structures containing modified materials, as well as nanoparticles of metals or their compounds that perform an active functional load. In general, technological methods for obtaining thin films by vacuum deposition methods have significantly contributed to the development and study of semiconductor heterostructures, allowing them to be optimized for subsequent use in many technical and scientific fields. However, in order to generate coatings or modified surfaces with a suitable depth of penetration of active compounds into the main matrix, simpler and less expensive technical procedures, such as sol-gel technology, must be used [1, 2].

Noble metals (copper subgroups) are easily generated in the form of reduced metal nanoparticles, which may be confined in a carrier matrix with a restricted size dispersion, according to research. The observed plasmon resonance effect in this case enables the creation of new structural materials for subsequent use as ultra-small sensors used in biomedical research, as well as the creation of microsensors with selective sensitivity and nonlinear optical matrices [1, 2].

The physicochemical principles behind the production of such materials are based on the chemical inertness of noble metal nanoparticles in relation to their carrier matrix (in this example, a sol-gel matrix).

Nanoparticle reduction in sol-gel materials can occur both on the surface and throughout the full depth of the silicate or aluminosilicate workpiece. In the case of film formation, thick-film coatings consist of two layers: a SiO₂ film in contact with the substrate and domain structures based on metal nanoparticles formed on the surface and in the structure of the SiO₂ layer itself (high and low metal nanoparticle concentrations are formed, respectively). In general, noble metal colloidal nanoparticles can change the surface of porous silicon and materials based on it, forming a chemically active layer with a regulated penetration depth [1].

An examination of the literature and patent studies for the production of thick-film coatings revealed that their ultimate functional qualities are determined by a number of interconnected factors:

- Starting component composition: binders, filler type (if necessary), organic solvents, mutual concentration of reagents, degree of purity, and so forth.
- methods for applying the coating and the characteristics of "growing" metal nanoparticles (or metal compounds) in it;
- a method for regulating the dispersion of the sizes and shapes of micro- and nanoparticles, as well as the ability to control the phase composition and degree of crystallinity of the formed functional layers.

In our example, we looked at sol-gel coatings with different quantities of micro- and nanoparticles of reduced copper or silver. Atomic force microscopy (AFM) and X-ray phase analysis (XRD) were used to examine samples of manufactured materials. It was found that at a high concentration of dopant salts in the initial ash (above 20 wt.%) with sequential annealing of the resulting films in air and then in hydrogen, a two-layer thick film coating is formed, the top layer of which is formed by metal microparticles in the form of densely packed spherical domains sizes of at least 200 nm (and an increase in domain sizes was observed with increasing concentration of the metal salt in the initial film-forming solution).

Based on the results, technological conditions for the synthesis of coatings with the highest degree of top layer homogeneity, comprised of tightly packed nanoparticles of reduced metal, were created. Plasmonic effects have only been observed and researched in monolithic optically homogenous high-silica glasses containing nanoparticles of reduced metals at concentrations of up to 0.1 wt.% [2]. The diffuse plasmon resonance peak in the reflection spectra of composite two-layer coatings was determined by the type of micro- and nanoparticles of reduced metal present on the surface. A shift in several thermodynamic constants was detected for all sol-gel materials including metal nanoparticles, which was connected with the tiny dimension of the produced nanoparticles. The melting temperature of nanoparticles of reduced copper generated in the framework of high-silica glasses, for example, was found to be more than two times lower than that of a monolithic metal. The reduced metals had a high reactivity in the coatings, but the reduction was done

in such a way that metal hydrides were not created (the phase composition of the generated surface layers was regulated by X-ray diffraction).

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SODIUM ION BATTERY: ION ENERGY BATTERY (ION BATTERY)- WHICH HARNESSSES THE ENERGY OF IONS AND ELECTRONS, IS A ONE-OF-A-KIND BATTERY“HEAVIER IONS GIVE MORE ENERGY THAN LIGHTER IONS”

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ИОННО-НАТРИЕВАЯ БАТАРЕЯ: ИОННО-ЭНЕРГЕТИЧЕСКАЯ БАТАРЕЯ (ИОННАЯ БАТАРЕЯ), ИСПОЛЬЗУЮЩАЯ ЭНЕРГИЮ ИОНОВ И ЭЛЕКТРОНОВ, ЯВЛЯЕТСЯ ЕДИНСТВЕННОЙ В СВОЕМ РОДЕ БАТАРЕЕЙ. БОЛЕЕ ТЯЖЕЛЫЕ ИОНЫ ОТДАЮТ БОЛЬШЕ ЭНЕРГИИ, ЧЕМ БОЛЕЕ ЛЕГКИЕ ИОНЫ

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Ion energy battery (Ion Battery) is the kind of battery ever in battery technology, which takes the energy of electrons and ions. In order to extract the energy of ions, graphene-doped hydrogen is used. When ions move at the surface of it, electrons of graphene-doped hydrogen move, resulting in the production of electricity. From that point of view, more energy is produced. The membrane in this battery is also made from graphene-doped hydrogen. Additionally, in this battery, heavier mass gives more energy than lighter mass. For example, a sodium-ion battery will give more energy than a lithium-ion battery due to this design of the battery.

Keywords: Battery, Energy, Sodium Ion, Graphene dope hydrogen, Electron and Ion.

Ионная батарея (Ion Battery) – это вид батареи, когда-либо существовавший в аккумуляторной технике, который принимает энергию электронов и ионов. Для извлечения энергии ионов используется водород, легированный графеном. Когда ионы движутся на его поверхности, электроны легированного графеном водорода перемещаются, в результате чего вырабатывается электричество. С этой точки зрения вырабатывается больше энергии. Мембрана в этой батарее также изготовлена из водорода, легированного графеном. Кроме того, в этой батарее более тяжелая масса дает больше энергии, чем более легкая. Например, натриево-ионная батарея будет давать больше энергии, чем литиево-ионная, благодаря такой конструкции батареи.

Ключевые слова: аккумулятор, энергия, ионный натрий, графеновый водород, электрон и ион.

Scientists and engineers are constantly researching new technologies in the rapidly developing field of energy storage in order to fulfill the increasing demand for cost-effective and environmentally friendly energy sources. One such innovative and effective energy storage technology is the Sodium Ion Battery (ION battery), which makes use of the energy of ions and electrons. In-depth discussion of ion energy batteries – sodium ion batteries in particular – is provided in this work, along with an emphasis on their benefits and potential to completely alter the energy storage market. Ion energy batteries, which include sodium ion batteries, are a type of rechargeable battery that stores and releases electrical energy through the movement of ions between two electrodes. Sodium ions are used as the charge carriers in sodium-ion batteries, as opposed to lithium ions in conventional lithium-ion batteries. For large-scale energy storage applications, sodium offers a compelling substitute because it is more readily available and less expensive than lithium.

Battery for Ion Energy (ion battery) [1, 2]. The energy in the ion energy BATTERY comes from two sources: ions and electrons, as shown in Figure 1a. In particular, the energy from ions is obtained by using hydrogen doped with Graphene. Electricity is produced when ions interact with the hydrogen sheet doped with Graphene. This battery design encourages higher energy output in sodium ions in addition to making electricity production easier. This is explained by the fact that energy can be used in two different ways. Furthermore, heavier ions have a higher energy yield than lighter ions due to the battery's design favoring heavier ions. For example, in this battery configuration, sodium ions produce more energy than lithium ions.

According to Figure 1b in the literature review, a typical battery found on the market only uses electron energy – not ion energy. It is not possible to establish more energy from it because of this limitation. The energy density is impacted by this kind of battery technology design. Whereas the energy density of sodium-ion batteries typically ranges from 80 to 150 Wh/kg, that of lithium-ion batteries typically ranges from 100 to 265 Wh/kg. This suggests that lithium-ion batteries are more energy dense than sodium-ion batteries [1], meaning that more energy for sodium ion could not be produced overall in this kind of battery.

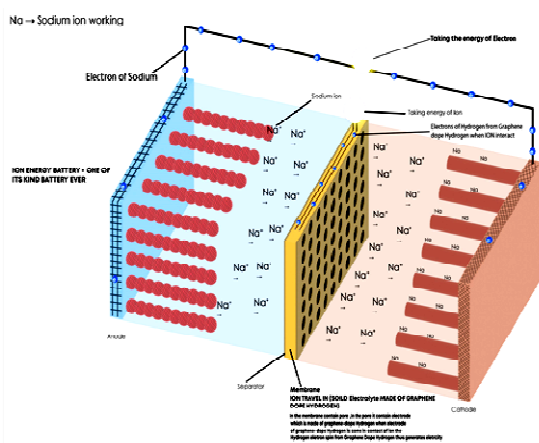


Fig. 1a. Ion energy battery design

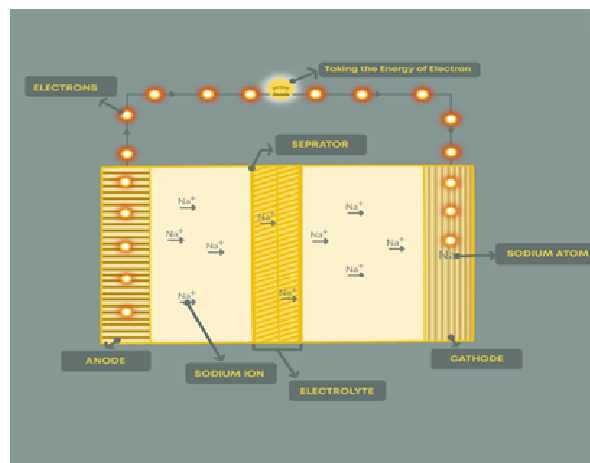


Fig. 1b. Normal sodium ion battery

This is due to the kinetic energy of an object, which is the energy it possesses because of its motion. The kinetic energy of a point mass m is given [2]:

$$K.E. = \frac{1}{2}mv^2$$

K.E. - Kinetic energy is directly units of Joules (J);

m- mass of the object, kg;

v- its velocity, m.s⁻¹.

Results

The energy for a sodium-ion battery will be higher, as per the given figure of 6. Sodium-ion batteries will provide more energy than lithium-ion batteries. Both batteries follow the same design structure of Ion Energy battery. This is explained by the law of kinetic energy of charge. Here, it is the factor by which sodium ions will provide more energy than lithium ions. There is one more explanation in Figure 1 as to why the sodium-ion battery, as per the normal battery design, could not provide more energy than the lithium-ion battery. Since in the normal design structure, the energy is only taken from one source, which is the energy of electrons only, due to which the energy will be higher in the lithium-ion battery in the normal state of rechargeable battery design.

Conclusion

The Ion Energy battery will provide greater energy output when energy is extracted from both electrons and ions. It is essential to expose the graphene doped with hydrogen, alongside nitrogen, boron, and metal, to optimize electrical conduction within particle regions like A. A. sublattices and A.B. sublattices. Ultimately, this revolutionary concept will enhance energy storage and significantly increase mileage in electric cars. By harnessing the potential of Ion Energy batteries, we can look forward to a future where vehicles are not only more energy-efficient but also more environmentally friendly, contributing to a sustainable and cleaner transportation ecosystem. Also, sodium-ion batteries offer a higher energy potential than ever before.

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**В трех частях
Часть 3**

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