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USE OF MODERN INFORMATION TECHNOLOGIES TO ENSURE THE COMPETITIVENESS OF REGIONS IN THE CONTEXT OF DECENTRALIZATION OF POWER

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ABSTRACT

The article substantiates the use of modern information technologies to ensure the competitiveness of the regions. The directions of using information technologies to strengthen the competitiveness of Amalgamated hromada are considered. The optimal management of Amalgamated hromada with information technologies in such essential areas as accounting, document management, inventory management, etc., is investigated. The cost of accounting services for the year is calculated. The advantages of using a tracking complex (tracking equipment, software, integration into a web representation, automated Amalgamated hromada control systems, etc.) are considered. It is analyzed that the necessary tool should be using systems to assess the quality of Amalgamated hromada services with problems and suggestions. Such a tool will significantly strengthen the relationship of the community with the leaders of the Amalgamated hromada, and therefore the reaction of the Amalgamated hromada to changes in political, economic or social policy of Ukraine can be based on the views of residents. The use of automated school systems is relevant both for the Amalgamated hromada staff and for Amalgamated hromada schools. The main advantages of automation of the educational process in Amalgamated hromada schools are investigated. According to the algorithm, decision-making on the implementation of IT services and evaluating their effectiveness is carried out in 4 stages and formed an algorithm for the use of information technology in Amalgamated hromada to increase competitiveness. It is investigated that the central IT tool that uses Amalgamated hromada to improve its competitive advantage is its official representation on the Internet – the official website. Having all the necessary information on the site will increase site traffic and earn extra income through placement, although this should not end itself. An algorithm for using IT in Amalgamated hromada to increase competitiveness is proposed, where specific stages are identified – from checking the need for this service (capacity testing) to the decision-making stage.

Keywords: information technologies, competitiveness, costs, decentralization, Amalgamated hromada

JEL Classification: R19, R38, R58

INTRODUCTION

Globalization and regionalization have significantly increased the role of national regions, which is manifested by the acquisition of new qualities by areas, one of which is competitiveness and giving them the status of independent entities that form their development strategy in the economic space.

The current development and economic relations are characterized by the rapid growth of digitalization processes, covering ever larger areas and niches of socio-economic systems. In these conditions, the competitiveness of both the national economy and individual business entities depends on the ability to create, implement and effectively use digital technologies in all areas of operation.

Modern information technologies can ensure monitoring and transparency of the current situation at the local, regional and national levels, ensure the efficiency of decision-

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making and implementation, quality and accessibility of administrative services based on e-government, etc.

RESEARCH ANALYSIS AND TASK SETTING

The study of approaches to using modern information technologies to ensure the competitiveness of regions in the context of decentralization of power is debatable and insufficiently covered in the professional economic literature. Many works of domestic and foreign scientists are devoted to this issue. Among them are such as P. Bielienco, I. Brykovi, L. Vashchenko, M. Viter, S. Hnatiuk, L. Hrynevych, O. Hrytsunov, D. Dubov, I. Klymenko, P. Klimushyn, R. Fatkhudinova. That is why for the successful functioning of the regions in the context of decentralization of power, it is necessary to use modern information technologies.

The article aims to study the use of modern information technologies to ensure the competitiveness of regions in the context of decentralization.

PRESENTING MAIN MATERIAL

The transition of the Ukrainian government to understanding the need for decentralization processes such as European ones allows for the formation of final administrative units – united territorial communities, to introduce the latest innovative tools to ensure the comfort of residents, optimize the use of resources and potential to strengthen competitive advantages.

One of the critical potential ways to increase competitiveness is modern information technologies, including in the framework of the state program «state in a smartphone».

To identify potential ways to use modern information technology (IT) in the process of performing Amalgamated hromada their functions, including increasing competitiveness, it is necessary to identify some areas of IT use (*Figure 1*).

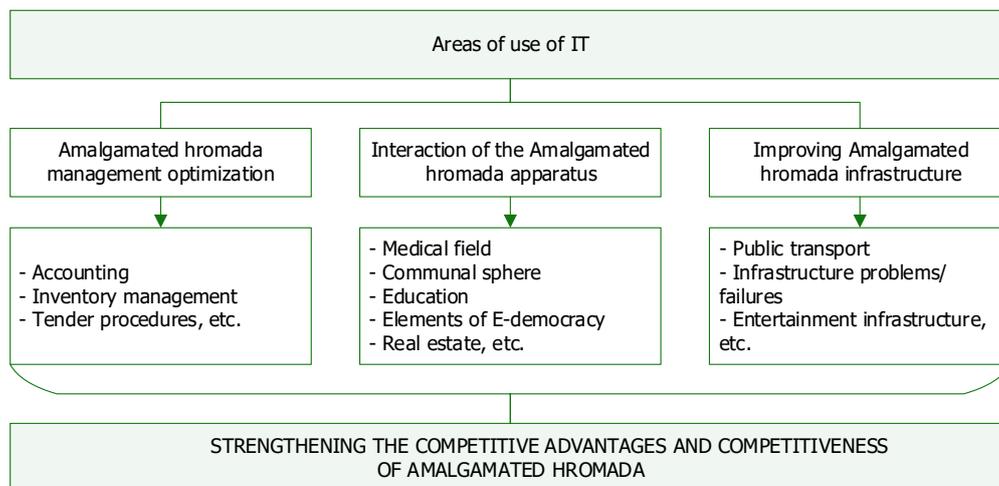


Figure 1. Areas of using IT to strengthen the competitiveness of Amalgamated hromada

In general, the uses of IT are not rigid and can intersect and be interconnected or conditioned. At the same time, such grouping allows separating the primary beneficiaries from implementing these IT tools, especially in decentralization.

First of all, it is necessary to start with the administrative potential as part of the demographic potential of Amalgamated hromada because, without understanding, readiness and competence of management and professionalism of Amalgamated hromada administration, the performance of any functions (accounting, personnel, land management and utilities, etc.) can be prolonged or even ineffective.

The optimal management of Amalgamated hromada with IT will be considered in such critical areas as accounting, document management, inventory management and more. The main tasks that need to be addressed in the optimization of Amalgamated hromada management using modern IT solutions include the following:

- expansion of competencies;
- increasing the speed of decision-making without losing the quality of services;

- strengthening control over operations performed by the Amalgamated hromada administration;
- effective cooperation with governing bodies, etc.

To accomplish these tasks, one of the main tools is automated community management systems – software packages that provide opportunities for communities (Amalgamated hromada) to implement a program with centralized accounting and management processes of some departments and organizations of municipal or Amalgamated hromada economy.

The main functionality of such software packages includes:

- accounting (maintaining all areas of accounting; synthetic and analytical accounting; operational analysis of the balance sheet, turnover, objects of analytical accounting, internal and external accounting, etc.);
- accounting for contracts (maintenance of warranties of any form; calendar planning of operations; analysis of settlements under contracts; quantitative and sum control of payments under agreements; calculation of penalties, etc.);
- accounting for cash (preparation of bank and cash documents; the formation of advance reports and keeping a log of settlements with accountable persons; accounting for salary payments on payment information; distribution of expenses (receipts) on accounts and contracts);
- management of purchase and sale (control of terms of payments and shipments; accounting of accounts receivable and cost; accounting of barter and customs transactions, etc.);
- costing and costing to determine the cost-effectiveness of Amalgamated hromada (operational calculation of the planned cost of production; maintaining information on arbitrary cost allocation bases; maintaining an archive of costing knowledge and values of cost allocation bases, etc.);
- management of motor transport (maintenance of the card index of motor transport; reception of applications for the performance of motor transport work; extract of travel letters; the account of fuel consumption; the statement of position of drivers; the understanding of a condition of tires and accumulators, etc.).

In addition, the significant tasks performed by software systems for community management automation include an accounting of personnel and wages, accounting of Amalgamated hromada property, management analysis, budget planning and control, tax accounting, customer relationships, utility accounting, etc.

As for other options for introducing the latest technologies, they are the basis for strengthening the control of Amalgamated hromada and increase comfort. In particular, we can note the installation of tracking equipment on buses and other equipment and the web representation (both on the official website and in the mobile application) to configure the display of equipment on the Amalgamated hromada map.

The advantages of using a tracking complex (tracking equipment, software, integration into a web representation, automated Amalgamated hromada control systems, etc.) are shown in *Figure 2*.

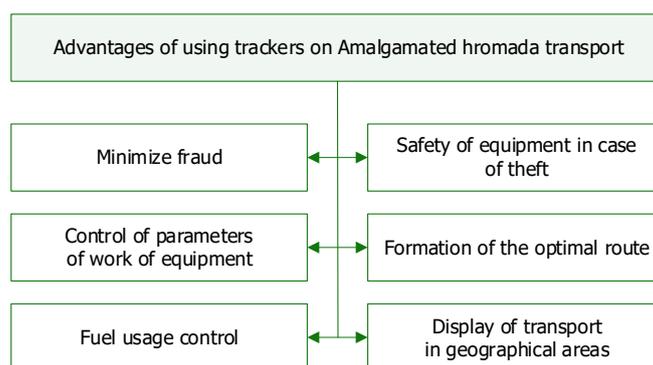


Figure 2. Advantages of using trackers on Amalgamated hromada transport (Source: compiled by the author on the basis [1])

Thus, it is possible to minimize driver fraud in terms of cheating mileage, hours, theft of fuel and consumables, misuse of transport, control of stops, breaks, and the overall mode of operation.

The obligation to introduce tracking equipment, together with the integration of online services of bus routes [2] (the latter services are in most cases free for Amalgamated hromada), will allow residents to form paths with minimal time, and thus increase comfort, which directly contributes to the competitiveness of Amalgamated hromada.

The primary tool in the interaction of the Amalgamated hromada apparatus with the public and business is its web representation – the Amalgamated hromada website. Note that the usual website in current conditions is insufficient functionality – it is necessary to develop a mobile application with the functionality available on the full version of the site.

On the main page of Amalgamated hromada, in addition to the mandatory elements defined by current regulations (e.g., budget, composition, etc.) and additional functionality that would significantly increase the attractiveness of Amalgamated hromada compared to standard sites. Such functionalities include:

- search engine (e.g. Ring [3]) selects information about events, persons, companies, places, streets, etc., in open databases. Such information will better reflect OTG's business partners; there is official information, which in commercial search engines is usually not included in the top search;
- directory of electronic services Amalgamated hromada with a hyperlink to each of them, including other Amalgamated hromada areas, which, if necessary, will quickly find the necessary medical institutions, and educational institutions nearby;
- handbook that provides information on the composition of deputies, draft decisions, results of roll-call voting, decisions, and materials to them, information on the leadership of the council and deputies with personal pages of each, and the possibility of posting activity reports (for example, «Portal of roll-call voting of city council deputies» [4], «Database of information about deputies of the city council» [11], etc.);
- It is mandatory for the user to go to the page of the relevant Center for Administrative Services, namely the page where citizens are registered in the queue, such as the so-called «Transparent Offices» [5].

In general, these recommendations coincide with the Government's vision in the framework of the project «State in a smartphone». The launched application «Action» is a very effective tool for optimizing the cooperation processes between authorities / local governments with the people of the regions. At the same time, the expansion of functionality, which is inherent in the IT services in this Amalgamated hromada, will allow residents of the community to keep «a hand on the pulse» of events in the region. An additional positive of the use of Amalgamated hromada applications by community residents for Amalgamated hromada leaders will be to control the community's interests and identify different problems in the work of both public utilities and the community's bureaucracy.

As part of the decentralization reform, significant attention is paid to the anti-corruption component of the reform. Thus, in the framework of Amalgamated hromada – public interaction, it is necessary to provide the latter with the opportunity to respond to abuses of power, and fraud detected by residents or businesses and record relevant statements both on the Amalgamated hromada website and on various portals, such as the Anti-Corruption Portal [6]. The openness of power and decentralization provides for the possibility of covering information on the income of Amalgamated hromada leaders, for which it is worth implementing the transition to portals with such information, such as the Declaration Portal [7].

Speaking about the optimization of Amalgamated hromada management, it is impossible not to mention the elements of e-democracy, one of the elements of which may be the use of chatbots built into Amalgamated hromada web offices. Using available data sets provides answers to users' questions, not only online but also on popular social networks [8].

Optimization of Amalgamated hromada management is to establish effective leadership of the Amalgamated hromada management staff and utilities, which are subordinated to Amalgamated hromada, primarily the primary consumers of budget funds – medicine and education.

About medicine, to facilitate the work of Amalgamated hromada institutions and community residents, it is advisable to create a site with information about medical institutions. At the same time, the uniform requirements for websites will make it easier to navigate the sites and search for information on it. In Amalgamated hromada, where there are no hospitals, it is necessary to provide on the websites the possibility of registration in hospitals to which this Amalgamated hromada belongs. In addition, for such Amalgamated hromada, the most profitable will be the visualization and presentation on the community site of the nearest medical institutions (for example, the Map of medical institutions (Kyiv)) [9].

It is mandatory to automate medical facilities as much as possible, which will speed up the organizational issues of treatment and improve the atmosphere in the institutions, including in the queues that form to the doctors. Examples of such automated systems are Medea Medical Information System [10], Health of the Nation Information System (E-Health) [11], E-Health Platform – Polyclinic without queues [12], etc.

Such information systems are complex independent decisions for the management of all processes of functioning of clinics. The software product combines work with data, the comfort of communications, information support of doctors, financial and economic activity, analysis and decision-making by managers. The advantages of use include:

- simultaneous online and offline operation of services;
- maintaining the entire volume of accounting records of the medical institution;
- for an exchange with other medical systems, data can be imported and exported by accepted international standards and so on.

Given the aging of the nation and the emigration of the working population, the issue of finding a cure for the community has become essential for Amalgamated hromada, especially since the beginning of the decentralization reform. In our opinion, it is worth paying attention to such services as:

- iMedic portal;
- Database of available drugs in state pharmacies;
- Portal Tabletki.Ua;
- The project «There is a medicine», etc.

The ability to search Amalgamated hromada sites or Amalgamated hromada medical facilities using information obtained from these sites will allow you to detect the presence / absence of drugs in the hospital or pharmacies Amalgamated hromada and find the nearest pharmacies where drugs are available.

Automation of processes and setting up the portal will simplify the hospital's work, which will increase the well-being of residents, which will increase the competitiveness of Amalgamated hromada compared to other communities where there has been no significant informatization. At the same time, the high information content of Amalgamated hromada sites will allow businesses to identify demand and fill it with both goods and medical services.

Turning to education, it is worth noting the many options for the use of IT, which would increase the competitiveness of Amalgamated hromada G, ranging from technological websites of educational institutions and ending with intelligent boards in offices.

He use of automated school systems, such as AS School [13], is relevant for both Amalgamated hromada staff and Amalgamated hromada schools; however, we emphasize the need to use a single approach to reduce integration problems and save on product implementation in institutions. The cost of such systems ranges from 30 to 80 thousand UAH [14], which is quite a low cost compared to similar plans for other areas. Consider the main advantages of using automated systems in schools (*Figure 3*).

As for specific subjects, numerous programs, educational sites, and online courses allow you to significantly increase the level of knowledge about events or phenomena in a short period. For example, «Interactive learning map» [15] is an electronic cartographic resource that combines the properties of an electronic textbook and a cartographic manual for studying and improving knowledge of the history of Ukraine. Developed by modern technologies, the educational resource meets the requirements approved by the Ministry of Education and Science of Ukraine for the course, is a visual tool that combines different forms of perception helps the teacher to prepare and conduct lessons based on computer class, multi-media projector, interactive whiteboard, and students - in the deepening of geographical knowledge and the development of spatial competence.

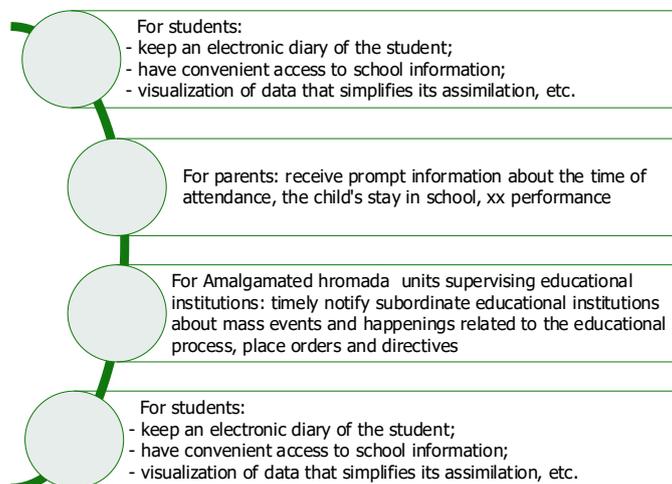


Figure 3. Advantages of automation of the educational process in Amalgamated hromada schools

There are many such course improvements, including free ones, and their use in educational activities depends on the interest of the school principal and a particular teacher.

If we consider Amalgamated hromada as a whole, namely the web representation of Amalgamated hromada on the Internet, then in our opinion, first of all, should be reflected all available within Amalgamated hromada Amalgamated hromada educational institutions – from nurseries to higher education institutions, for example, the formation of Amalgamated hromada map with filters, formed based on information obtained from a database of 12416 primary institutions [16]. In addition, the ability to enroll a child in kindergarten [17], school or university [18] online will free up some of the resources of educational institutions, which will be aimed at improving the quality of education or training.

It is also considered that most of the opportunities to optimize the Amalgamated hromada site using third-party web resources are free for Amalgamated hromada. The costs will include only funds that will be used to develop, update and maintain your website.

Availability of links to Amalgamated hromada educational activities:

- will significantly simplify the work of parents and students;
- will increase the traffic of the Amalgamated hromada site, and therefore raise it in search rankings, which will interest investors;
- it will reduce educational emigration because the choice among educational institutions and their search will quickly identify priority institutions in the Amalgamated hromada.

Children's leisure in the form of tracking on the map of clubs (for example, through the functionality of the site «Portal Circle» [19] or Portal Electronic queue in children's schools [20]), when integrated into the site Amalgamated hromada, allows you to see the entire base of extracurricular activities in Amalgamated hromada, choose circles on filters (closest to home, by age, by area of activity, even by the form of ownership) and enroll the child in the selected circle for a specific time.

Turning to ways to improve the Amalgamated hromada infrastructure through the implementation of IT, it should be noted the need for a systematic approach to this issue, which should be to establish uniform requirements for finished products / services.

Different vendors will slow down the equipment due to possible conflicts and failures, including software when combined into a single network. For example, when installing street surveillance cameras from different suppliers, operational repairs are complicated, and coding methods may differ, which will slow down the operation of monitoring systems and so on.

The availability of informing residents about the nearest sports and cultural and entertainment facilities will increase the morale and physical education of children and adults, namely: biathlon shooting ranges, playgrounds with training equipment, swimming pools, sports palaces, bike tracks, gyms, rowing canals, sports complexes, aeroclubs and aviation sports clubs, sports and youth schools, etc. [21].

Infrastructure projects should be fully or partially reflected on the official website of Amalgamated hromada, which will confirm the quality of the use of targeted funds and monitor the state of Amalgamated hromada infrastructure.

Infrastructural (new and updated) implementations of the latest IT approaches include:

1. Informatization by public utilities of repair works and supply of public utilities. In our opinion, it is mandatory to equip specialized equipment with trackers, which will allow users to display information about the availability of special equipment at emergency facilities of the Amalgamated hromada infrastructure online. Additional information on the number of funds allocated for this repair, reflected on the Amalgamated hromada website, will allow for public control over the efficiency of use.
2. Opening of centres for the provision of administrative services, at least in the main settlement of Amalgamated hromada, which will stimulate the acceleration of the resolution of a significant part of legal issues arising among the residents of Amalgamated hromada.
3. Web-cameras in Amalgamated hromada is an essential tool for increasing competitiveness in Amalgamated hromada, especially in the context of changing government structures on the ground, because:
 - a) Increase security – The National Police, with access to video and archival data, will be able to solve some crimes «in hot pursuit»;

- b) Improve traffic – detected congestion can be eliminated by rapid changes in lighting, street equipment, and drivers to determine the optimal route to bypass traffic jams, etc;
 - c) Improve the environment – Detected objects that significantly pollute the domain will be identified, and the results of observations can be the basis for a decision in lawsuits against pollutants;
 - d) It will increase social stability, allowing continuous monitoring and control over illegal actions of participants or third parties, etc., in places where people or children congregate.
4. Automation of the access regime in administrative institutions (with a regular generation of reports on the Amalgamated hromada website) will monitor the regularity of visits by officials to workplaces.
 5. Installation of information boards (information panels), which will display the waiting time of shuttle buses (with installed tracking equipment), will increase the comfort, increase the attractiveness of Amalgamated hromada in the eyes of community residents.

In our opinion, a necessary tool should be the use of Amalgamated hromada service quality assessment systems with problems and suggestions. Such a tool will significantly strengthen the relationship of the community with the leaders of the Amalgamated hromada, and therefore the reaction of the Amalgamated hromada to changes in political, economic or social policy of Ukraine can be based on the views of residents.

Based on the above, we will form an algorithm for using Amalgamated hromada IT to achieve competitive advantages over other regions (*Figure 4*).

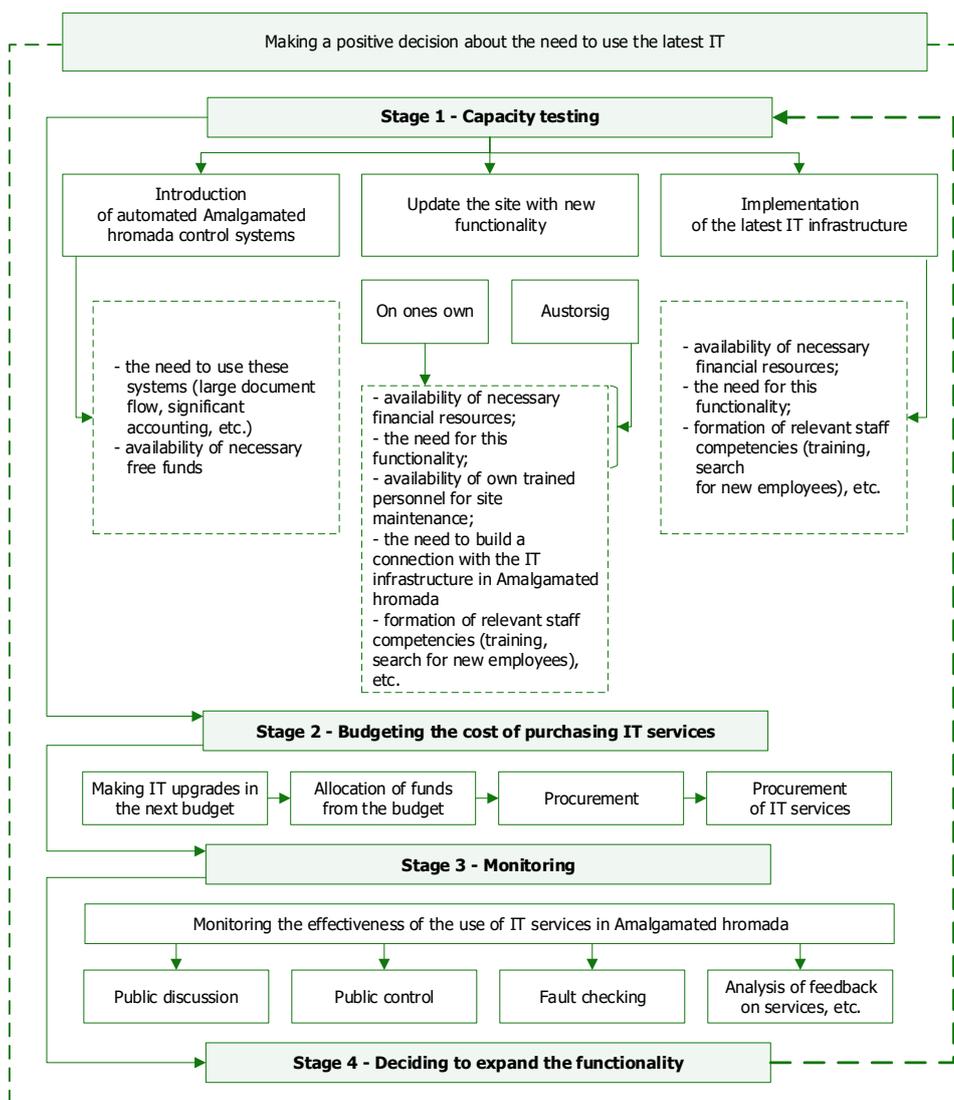


Figure 4. Algorithm for using IT in Amalgamated hromada to increase competitiveness

According to the algorithm, decision-making on implementing IT services and evaluating their effectiveness is carried out in 4 stages. The most important is the first stage when the possibilities of implementing IT services (financial, human, technical, etc.) and their need are calculated (in rural Amalgamated hromada, there is usually no need to install a board with the marks of buses).

The next stage involves bureaucratic procedures for forming a strategy for the use of IT in the activities of Amalgamated hromada and the formation of the necessary budget procedures, procurement and actual implementation of new technologies in Amalgamated hromada.

The third stage involves all-party monitoring of the effectiveness of implementing IT services in Amalgamated hromada – from public discussion on forums to check the logging of software failures to decide in the fourth stage on the need to expand the functionality of IT services in Amalgamated hromada.

Summing up, we note that, in our opinion, the primary IT tool that uses Amalgamated hromada to increase its competitive advantage is its official representation on the Internet – the official website. Availability in modern social networks is also mandatory, as the leading news/changes in the Amalgamated hromada should be shared with the community residents. Also, the development of a mobile application that would duplicate the functionality of the leading site – will further expand the number of informed citizens, business representatives, etc.

The leading site should have an Amalgamated hromada map on one of the pages; wherewith the help of filters and masks, and the user should be able to select relevant information for him at the moment, for example:

- Are there any repairs nearby?
- Is there a traffic jam nearby?
- Where is the nearest pharmacy or hospital?
- In which kindergarten to enroll a child?
- How much did the budget spend on kindergarten, etc.

Having all the necessary information on the site will increase site traffic and earn extra income through placement, although this should not end itself.

The presence of an active population, which through the primary means of communication will inform about the identified problems in the utilities (pipe breaks, power outages, etc.), transport infrastructure (large potholes, damage to sidewalks, falling trees) in the social sphere (not enough doctors, rudeness of government officials) bodies) will increase public confidence in the stability of Amalgamated hromada in general.

Additional infrastructure projects that use modern IT solutions – along with the city video cameras and tracking equipment on public vehicles – are essential to open administrative service centers, simplifying most registration operations for community residents.

Last but not least is the possibility for activists to cover the issue of ecology or cultural heritage, displaying on the Amalgamated hromada map (on the website) photos of confirmations with geolocation data and with the appropriate placement of labels on the map.

CONCLUSIONS

Thus, an example of improving the infrastructure with the help of IT services can be the use of trackers on community transport, not only on buses but also on other public transport, which will allow community residents to track traffic using a web page or a separate/integrated application.

To date, there are a significant number of individual applications in the field of transport, education, medicine and more. The combination of analogs of such applications in one community's IT services will significantly improve the latter's image and strengthen its competitive advantages over other communities.

In general, the use of the latest IT services will strengthen the recovery of villages and settlements by increasing the possibility of an impact on Amalgamated hromada through Amalgamated hromada IT services, improving living conditions in the community by enhancing standards of utilities and quality control over the work of utilities, public involvement decisions in communities.

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ВИКОРИСТАННЯ СУЧАСНИХ ІНФОРМАЦІЙНИХ ТЕХНОЛОГІЙ ДЛЯ ЗАБЕЗПЕЧЕННЯ КОНКУРЕНТОСПРОМОЖНОСТІ РЕГІОНІВ У КОНТЕКСТІ ДЕЦЕНТРАЛІЗАЦІЇ ВЛАДИ

Обґрунтовано використання сучасних інформаційних технологій для забезпечення конкурентоспроможності регіонів. Розглянуто напрями використання інформаційних технологій для посилення конкурентоспроможності об'єднаних територіальних громад (далі – ОТГ). Досліджено оптимальне управління ОТГ із використанням інформаційних технологій у таких основних сферах, як бухгалтерський облік, документооборот, управління запасами тощо. Проведено розрахунок витрат на обслуговування бухгалтерії за рік. Розглянуто переваги використання трекінгового

комплексу (трекінгове обладнання, програмне забезпечення, інтеграція у веб представництво, автоматизовані системи управління ОТГ тощо). Проаналізовано, що необхідним інструментом має стати використання систем оцінки якості надання послуг ОТГ із вказівкою проблем і пропозицій. Такий інструмент дозволить значно посилити взаємозв'язок громади з очільниками ОТГ, а отже, і реакція ОТГ на зміни в політичній, економічній чи соціальній політиці України зможе базуватися на думках мешканців. Актуальним як і для апарату ОТГ, так і для шкільних закладів ОТГ є використання автоматизованих систем шкіл. Досліджено основні переваги від автоматизації освітнього процесу в школах ОТГ. Відповідно до алгоритму ухвалення рішень про впровадження та ІТ-сервісів й оцінювання їхньої ефективності здійснюється в чотири етапи і сформовано алгоритм використання інформаційних технологій в ОТГ для підвищення конкурентоспроможності. Досліджено, що головним інструментом ІТ, який використовує ОТГ для підвищення власних конкурентних переваг, є його офіційне представництво в мережі «Інтернет» – офіційний вебсайт. Наявність усієї необхідної інформації на сайті дозволить збільшити відвідуваність сайту й отримувати додаткові доходи за рахунок розміщення, хоча це і не повинно бути самоціллю. Запропоновано алгоритм використання ІТ в ОТГ для підвищення конкурентоспроможності, де ідентифіковані конкретні етапи – від перевірки потреби цього сервісу (перевірка потенціалу) до етапу прийняття рішення.

Ключові слова: інформаційні технології, конкурентоспроможність, витрати, децентралізація, об'єднані територіальні громади

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