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THE IMPACT OF AUTOMATED TECHNOLOGIES ON ORGANIZATIONAL CULTURE IN GEORGIAN STATE ELECTROSYSTEM

Abstract. *Organizational culture is a fundamental element of a company that shapes employees' behaviors, values, leadership styles, and decision-making processes. Its proper formation enhances staff motivation and engagement, facilitates effective communication and collaboration, improves adaptability to change, and supports the company's growth. Therefore, a strong corporate culture is a crucial factor in the organization's long-term success.*

Automated technologies are essential components of our daily lives, and their integration is evident in all areas. The energy sector is no exception. The Georgian State Electrosystem (GSE) has implemented automated technologies that ensure the creation and operation of a safe and stable electricity transmission system. Fostering an appropriate organizational culture during the introduction of these technologies is crucial for optimizing the use of these programs and achieving economically justified results.

A qualitative study was conducted at GSE. Through interviews, analysis of documentation, and statistical data from the company, it was determined that the introduction of automated technologies led to changes in the organizational culture. Values such as a commitment to continuous renewal, establishing close ties with supplier companies, and mobilizing personnel for cooperation with international organizations have become more prominent. With the entry of automation systems and solution provider companies into the Georgian market, values like innovation orientation and the sharing of best practices, knowledge, and innovative ideas were established. The development of a proper corporate environment within the company brought positive results to the organization, directly impacting its main activities by reducing both partial and complete blackouts, as well as technical losses in the transmission system. The results of the research carry important information because they clearly present the role of organizational culture in the successful activities of the country's most important energy link – Georgian State Electrosystem.

Key words: *Automated Technologies, Georgian State Electorsystem, Organizational Culture, Electricity Transmission, Corporate Environment*

JEL classification: *M14, Q40, Q55*

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ავტომატიზებული ტექნოლოგიების გავლენა ორგანიზაციულ კულტურაზე საქართველოს სახელმწიფო ელექტროსისტემაში

აბსტრაქტი: *ორგანიზაციული კულტურა კომპანიის ფუნდამენტური ელემენტია, რომელიც განსაზღვრავს თანამშრომლების ქცევას, ღირებულებებს, ლიდერობისა და გადაწყვეტილების მიღების სტილს. მისი მართებული ჩამოყალიბება ხელს უწყობს პერსონალის მოტივაციასა და ჩართულობას, ეფექტურ კომუნიკაციასა და ურთიერთ თანამშრომლობას, ცვლილებებთან ადაპტაციის უნარის ჩამოყალიბებასა და კომპანიის განვითარებას. შესაბამისად, ძლიერი და ჯანსაღი კორპორაციული კულტურის არსებობა ორგანიზაციის გრძელვადიანი წარმატების ერთ-ერთი მნიშვნელოვანი ფაქტორია.*

ავტომატიზებული ტექნოლოგიები ჩვენი ყოველდღიური ცხოვრების განუყოფელი ნაწილია და მათი ინტეგრაცია ყველა სფეროშია ასახული. გამონაკლისი არც ენერგოსექტორია. დღესდღეობით საქართველოს სახელმწიფო ელექტროსისტემაში დანერგილია ავტომატიზებული ტექნოლოგიები, რომლებიც უზრუნველყოფს უსაფრთხო და სტაბილური ელექტროენერგიის გადაცემის სისტემის შექმნასა და ოპერირებას. მნიშვნელოვანია ტექნოლოგიების დანერგვის პროცესში არსებობდეს შესაბამისი ორგანიზაციული კულტურა, რათა მოხდეს ამ პროგრამების ოპტიმალური გამოყენება და ეკონომიკურად გამართლებული შედეგის მიღება.

სსე-ში ჩატარდა თვისებრივი კვლევა. ინტერვიუების, კომპანიაში არსებული დოკუმენტაციისა და სტატისტიკური მონაცემების ანალიზის საფუძველზე დადგინდა, რომ კომპანიაში ავტომატიზებული ტექნოლოგიების დანერგვამ ორგანიზაციული კულტურის ცვლილებები გამოიწვია. წინა პლანზე გადმოინაცვლა ისეთმა ფასეულობებმა, როგორებიცაა მუდმივ განახლებაზე ზრუნვა, მჭიდრო კონტაქტების დამყარება მომწოდებელ კომპანიებთან და პერსონალის მობილიზება საერთაშორისო ორგანიზაციებთან თანამშრომლობისთვის.

ავტომატიზაციის სისტემებისა და გადაწყვეტილებების პროვაიდერი კომპანიების ქართულ ბაზარზე შემოსვლით დამკვიდრდა ისეთი ღირებულებები, როგორებიცაა სიახლეზე ორიენტირება, საუკეთესო პრაქტიკების, ცოდნის, ინოვაციური იდეების გაზიარება. კომპანიაში გამართული კორპორატიული გარემოს ჩამოყალიბებამ დადებითი შედეგი მოუტანა ორგანიზაციას, რაც პირდაპირ აისახა მის ძირითად საქმიანობაზე. შემცირდა ნაწილობრივი და სრული ჩაქრობები, გადაცემის სისტემის ტექნიკური კარგვები.

კვლევის შედეგები მნიშვნელოვანი ინფორმაციის მატარებელია, რადგან მკაფიოდ წარმოაჩენს ორგანიზაციული კულტურის როლს ქვეყნის ენერგეტიკის უმნიშვნელოვანესი რგოლის – საქართველოს სახელმწიფო ელექტროსისტემის წარმატებულ საქმიანობაში.

საკვანძო სიტყვები: *ავტომატიზებული ტექნოლოგიები, საქართველოს სახელმწიფო ელექტროსისტემა, ორგანიზაციული კულტურა, ენერგიის გადაცემა*

JEL კლასიფიკაცია: *M14, Q40, Q55*

Introduction and review of literature

Organizational culture significantly influences many aspects of a company's operations, from corporate style and communication methods to decision-making approaches and stakeholder relationships. Currently, one of the primary responsibilities of managers is to foster an organizational culture, which is essential for a successful and sustainable firm (Shein, 2010).

Automation dramatically affects various sectors worldwide, including manufacturing, construction, education, healthcare, the automotive industry, retail, finance, and more. Processes have become simplified, enabling businesses to make accurate projections and decisions more swiftly.

The application of automated technology in the energy sector greatly enhances efficiency, safety, and sustainability. These technologies facilitate the operation of power plants by allowing operators to control and optimize numerous processes without wasting time or resources. Moreover, automated technologies that support remote monitoring and control of energy plants help improve operational modes while reducing risks and costs. However, the implementation of automated technology can present challenges within an organization, as introducing innovations often leads to employee dissatisfaction and negative attitudes (Davis, 1989). Therefore, businesses must manage change effectively. Merely advancing technology is insufficient; there must also be a conducive corporate environment where employee opportunities are continually evolving. It is vital to respond to environmental circumstances, embrace new ideas, emphasize learning, and implement innovations (Denison et al., 2006). Organizational culture plays a crucial role in the effective operation of energy systems, the introduction of innovations, and adaptability to change, as well as staff development, can all be achieved through the synergy of the corporate environment and the automation process.

The research aims to determine the impact of automated technology on the organizational culture of the Georgian State Electrosystem.

Abbreviation

GSE - Georgian State Electorsystem
AEM - Automatic Electricity Metering System
SCADA - Supervisory Control and Data Acquisition
RAS - Remedial Action Scheme
WAM - Work and Asset Management Program
AGC - Automatic Generation Control Program
KfW- German Reconstruction Credit Bank

Automated technologies in the field of energy[1]

SCADA - Equipped with cutting-edge technology and a telecommunications system, the movement, frequency, import, export, and transit operations passing through the system are all controlled, and all

[1] Information obtained from www.gse.com.ge

necessary information is obtained to ensure the system's sustainability.
RAS - To increase the stability of the country's energy system and the reliability of electricity exchange in neighboring energy systems, a remedial action scheme was implemented in Georgia's energy system, which is provided to ensure a hopeful and continuous power supply to consumers, to localize emergency concerns in certain areas of the system, and to prevent the development of accidents.
WAM - Work and asset management program that provides operational management of processes of high voltage devices and technological measures;
AEM - To arrange the metering system, an automatic electricity metering program was developed that collects commercial data and network information directly from meters. Tables, graphs, and diagrams depict the results of the calculations.
AGC program - This system automates the production of Enguri HPP generators, enabling more exact regulation of electricity transitions in international systems. It also allows for better control of electricity generation and spending balances.

Organizational culture models

Cameron and Quinn model

Cameron and Quinn (Cameron, Kim S.; Quinn, Robert E., 2006) identified the following models of corporate culture:

- Hierarchy culture - companies that adopt this approach exhibit control and standardization, a strictly defined organizational structure, and bureaucracy. In such firms, there are multiple levels of management and a chain of subordinates. Organizations with a hierarchical culture are stable and low-risk.
- Market culture - emphasizes external relationships with suppliers, customers, contractors, and consultants. This culture, like Hierarchy culture, values control and stability, not through rigid rules, but through market positioning and stakeholder collaboration. Market culture is characterized by result-oriented firms that prioritize success over employee satisfaction.
- Clan culture - organizations that adhere to the described culture acknowledge a united value system and value communication. They adhere to the principle of one big family and are people-oriented. Organizations foster a collaborative working atmosphere in which all employees are valued.
- Adhocracy culture - companies that practice adhocracy promote flexibility, adaptation, individuality, and innovative thinking. Organizations prioritize continuous innovation and are committed to discovering and executing new ideas.

Charles Handy Corporate Cultures

Handy's (Handy 1996) organizational culture model is also referred to as the culture of the Greek Gods.

- Power culture - In organizations with this culture, power is concentrated in the hands of a small number of people, who have sole decision-making authority. Employees do not have the freedom to voice their opinions and beliefs. As a result, the company's performance is determined by the managers' ability to make sound decisions. This culture is also known as the Zeus culture, after the most powerful god in Greek mythology.
- Person culture - is one in which people are more concerned with themselves than with the aims of the firm. Organization comes in second place, with employees being less loyal to management. This culture is known as the Dionysian culture, after the god of drink and song.
- Role culture - In this culture, each employee is assigned a role and duty based on their expertise, education, qualifications, experience, and interests. Each employee is liable for the tasks allocated to him or her. Power is defined by duty. This culture is also known as the Apollo culture, after the god of rules and roles in Greek mythology.

- Task culture - entails forming teams to attain goals or solve crucial problems, and people with similar interests and specialties collaborate. All team members must contribute equally to the project and complete tasks in the most inventive manner feasible. This culture is also known as the Athena culture, in honor of the goddess of knowledge.

Features of Denison's Organizational Culture (Denison et al. 2006)

1. Engagement involves the following three features:
   - Empowerment means that employees have authority, initiative, and the ability to control their work. This fosters a higher sense of responsibility toward the organization.
   - Team orientation is essential for collaborating to achieve common objectives.
   - Capability Development - The corporation is continually working to improve staff abilities to remain competitive and fulfill current business demands.
2. Consistency
   - Core values. Employees share values, which foster a feeling of identity and set clear expectations.
   - Agreement. Members of the group can agree on crucial matters. This includes a basic level of agreement and the ability to resolve conflicts as they develop.
   - Coordination and Integration. Different functions and units of the organization can collaborate effectively to achieve common goals.
3. Adaptability - Organizations that can learn from their mistakes and adjust have the ability and experience to do so. They can take advantage of opportunities or hazards presented by environmental elements to benefit the internal system.
   - Creating Change. The organization is capable of accepting and adapting to change.
   - Customer focus. The organization understands its customers, responds to their requests, and anticipates the client's future needs.
   - Organizational learning. The organization collects and evaluates information from its surroundings, then applies it through innovation, the acquisition of new knowledge, and the development of skills.
4. Mission - Successful firms have a defined purpose and direction that outlines their objectives and vision.

Methodology

Descriptive research was employed in the report to describe organizational culture. Interviews were performed with seven firm representatives, including previous employees (organization development manager and international project manager), as well as current employees (human resources manager, personnel specialists, industry experts, and department heads). Semi-structured face-to-face interviews were conducted. To obtain detailed information, secondary data and unstructured interviews were reviewed, and the data were examined using the content analysis method. Documentation and statistical data from the company were used. The information was gathered using the company's annual reports, financial statements, outages, blackouts, and energy losses reported by personnel.

The paper follows ethical standards. All study participants were told of the study's goal, as well as the related risks and benefits. All respondents participated voluntarily, and all agreed that their data and company paperwork could be made public.

Results

Georgian State Electrosystem, LLC was established in 2002 through the merger of JSC Electric Transmission and LLC Electric Dispatcherization - 2000. The organizational culture developed from these two companies was incorporated into GSE, directly influenced by the social, economic, and political circumstances of that time, particularly in the 1990s. From 2003 to 2008, the Irish company ESBI Georgia Ltd managed GSE, which declared the company bankrupt in 2004 and filed for rehabilitation in court. In

2006, the court suspended the bankruptcy proceedings, granting ESBI Georgia Ltd a 15-year deadline to submit a rehabilitation plan.

According to qualitative research and document analysis within the organization, management originally built the **Zeus** culture. Power remained concentrated in the hands of a few individuals who had the authority to make centralized decisions. According to the Cameron and Quinn model, a **Hierarchy culture** was formed. Several levels of management and a chain of subordinates observed a clearly defined organizational structure within the organization. Employees understood their roles and responsibilities and prioritized smooth and predictable implementation.

To establish GSE as a financially strong and independent company, obtaining appropriate funds was considered a strategic task. Furthermore, to effectively manage Georgia's electricity system, an automated SCADA system was planned for introduction in 2007, resulting in the purchase of the latest equipment, installation, and management. It became vital to find suitable investors. Table 1 shows investments from international financial institutions.

Table 1.

Investors (USD)	2005	2006	2007
Word Bank	23 600 000	11 560 000	15 864 288
KfW		22 782 297	8 313 250

This led to the presentation of new values, such as forming external relationships with contractors and consultants, as well as a greater sense of duty towards investors. Control and stability, however, remained crucial factors, not only through carefully defined regulations but also through market positioning and collaboration with stakeholders. Orientation toward achievement and profit became increasingly important.

Table 2.

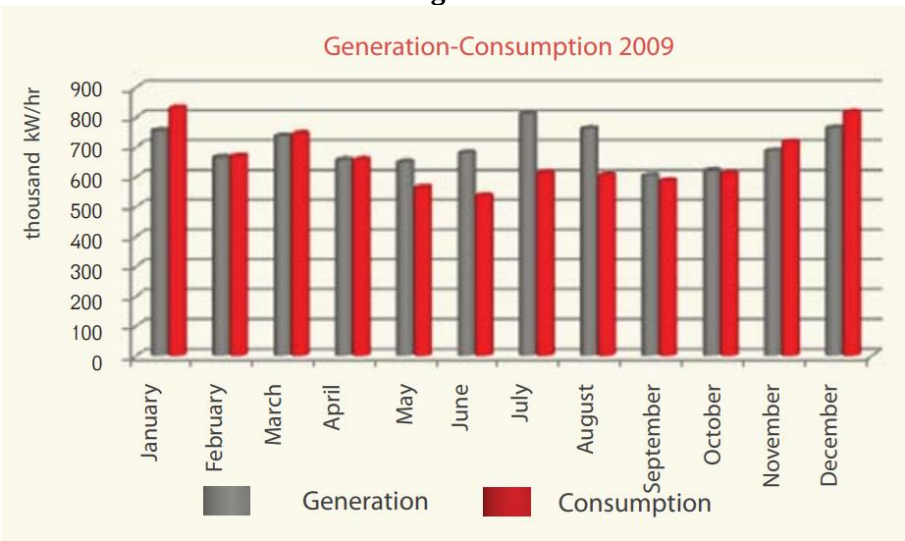
Contractors	Company
SCADA and Telecommunication project	Siemens
Circuit breakers and transformers	AREVA Energietechnik
Rehabilitation consultant	Fichtner GmbH & Co KG

Thus, characteristics of **Market culture** (Cameron, Kim S., and Quinn, Robert E. 2006) were established within the company alongside a hybrid model of **Hierarchy and Market culture.** Hiring employees with relevant skills and qualifications became necessary, as did training existing staff. An employee development program was created not only for technical skills but also for business competencies.

The actions taken by ESBI Limited helped the company emerge from the crisis and set a path for development. Although the rehabilitation plan continued, the company experienced positive changes and advanced to a new phase linked to long-term commercial activities. After the contract ended in 2008, the Irish staff were replaced by Georgian employees. On November 20, the Ministry of Finance approved GSE's new rehabilitation plan, guiding the organization's activities for the next 15 years. The project proposed by ESBI Georgia Ltd included financial rehabilitation, the introduction of new automated technologies, and improvements to corporate culture in the energy sector, positively impacting the company's operations. Partial and complete blackouts decreased, and technical losses in the transmission system were reduced. The power generated from April to September (inclusive) sharply exceeded the actual demand throughout the country, enabling the export of surplus energy to neighboring countries.

Diagram 1 shows electricity generation and consumption in 2009. Power export saw a significant increase compared to previous years, tripling the total volume of energy imported in 2009.

Diagram 1



Source: https://www.gse.com.ge/comunikatsia/publikaciebi

Diagram 2

Source: https://www.gse.com.ge/comunikatsia/publikaciebi

The new aim was to align the technical direction closely with international standards. As shown in diagrams 3 and 4, a new party emerged in Georgia's energy market: Turkey, which, in addition to facilitating exports from Georgia, would also allow transit to both Turkey and Europe.

Diagram 3

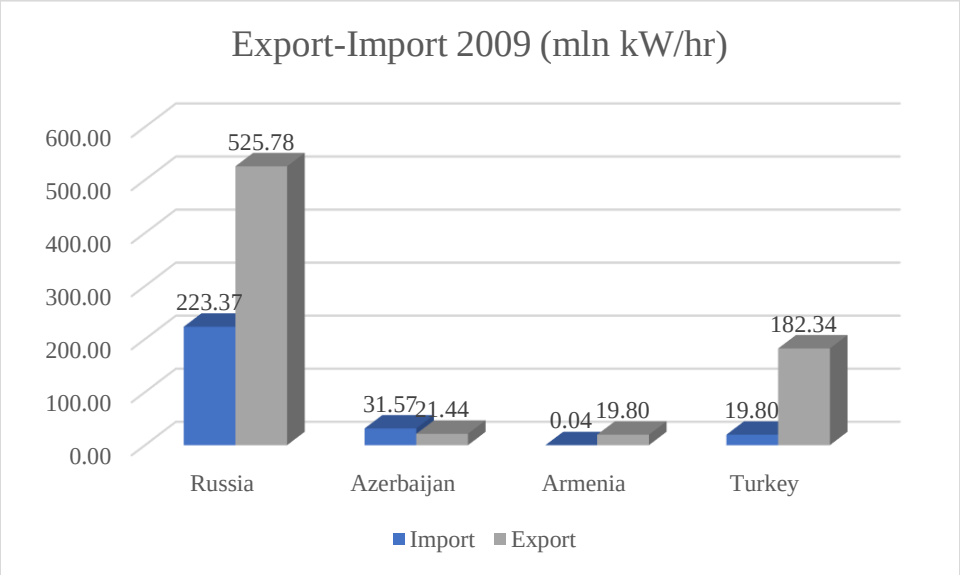
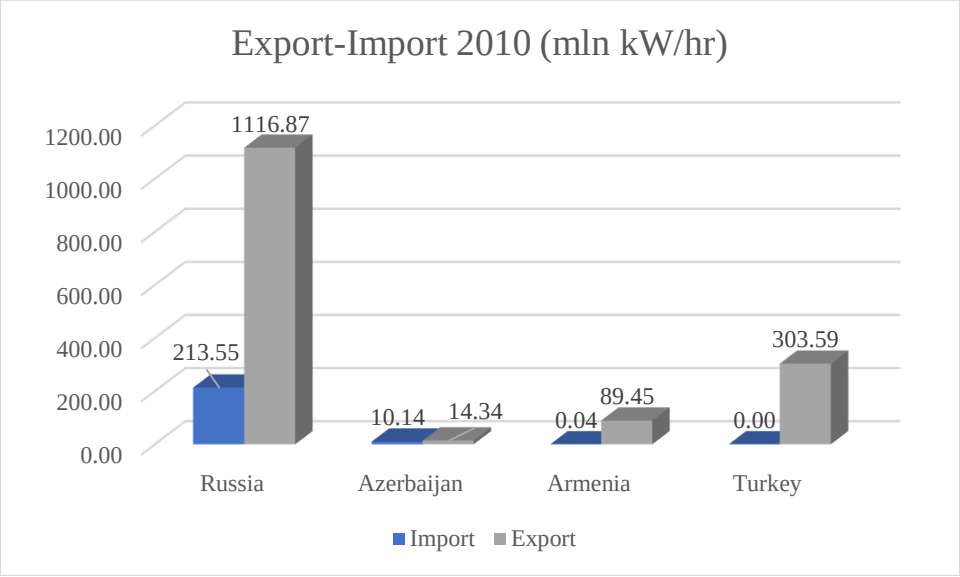


Diagram 4.



A significant outcome of establishing trade relations with Turkey was that Georgia could transit electricity from Azerbaijan, Armenia, and Russia. The implementation of energy transit towards Turkey would also enable connections to Europe. Through energy export and transit, the rich energy resources of the Caucasus region could be sent to the European market, thus contributing to the establishment of a regional electricity market and fostering electricity trade between countries. Consequently, it became necessary to develop infrastructure compatible with the energy systems of Turkey and Europe, involving the introduction of modern automated technologies (see Chapter 1) and requiring appropriate investment. In addition to existing contractors, suppliers, creditors, and partners, new stakeholders emerged in the form of countries and large

financial institutions, including the World Bank, the German Reconstruction Credit Bank (KfW), the European Bank for Reconstruction and Development (EBRD), the Asian Development Bank (ADB), and USAID. This led to a further strengthening of market culture, as the company assumed greater responsibility towards countries, investors, donor companies, and international partners, and in turn became a more commercial and profit-oriented entity. It was necessary to set new strategic goals. Values such as continuous renewal, establishing close contacts with supplying companies, and mobilizing personnel for cooperation with international companies gained prominence. With the entry of automated system solution provider companies into the Georgian market, values focused on innovation orientation, sharing best practices, knowledge, and innovative ideas were established. In turn, these values led to the emergence of new characteristics of organizational culture in the form of continuous learning and improvement of process quality. It became essential to involve more employees in work processes, encourage the expression of initiatives, and develop the ability to accept and adapt to changes (Denison et al. 2006). The introduction of automated programs promoted international cooperation, teamwork, and communication across cultures. GSE became a member of CIGRE (a joint global community sharing knowledge and experience in the energy sector, https://www.cigre.org/). GSE employees actively participate in CIGRE activities, and through frequent meetings and informal business relations, friendly connections have been established, which will further contribute to the integration of Georgia's energy. system with Turkey and Europe.

Conclusions

As a result of the research, the following situation was revealed: the Irish company established the culture of Zeus. A hybrid model of hierarchical and market culture has also been developed. The introduction of automated technologies led to the strengthening of market culture and the weakening of Zeus culture, fostering the emergence of new values. These processes and the establishment of a suitable corporate environment positively impacted the company's activities. Complete blackouts and technical losses in the transmission system decreased, while excess electricity generation commenced, allowing Georgia to emerge as an ecologically clean energy exporting country and a transit state.

REFERENCES

Cameron, Kim S. and Quinn, Robert E. (2006), Diagnosing and Changing Organizational Culture Based on the Competing Values Framework

Daniel Denison, Jay Janovics, Joana Young, Hee Jae Cho, (2006)Diagnosing Organizational Cultures: Validating a Model and Method,

Handy, C. (1996). Gods of Management, The Changing Work of Organization. New York: Oxford University Press. https://books.google.ge/books?id=cG6f-mxkJo0C&printsec=frontcover&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false

Schein, E. (2010). Organizational Culture and Leadership. San Francisco, CA: Jossey-Bass Publishers.

Davis, Fred & Davis, Fred. (1989). Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Quarterly. 13. 319-. 10.2307/249008.