ORIGINAL PAPER

Electronic Networking Programs in the Greek Health System. The case of "Clarity": a First Research

Sofia Voutsidou¹, Evaggelos Moraitis², Eleni Jelastopulu³, Georgios Charalampous²

¹University's General Hospital of Thessaloniki AHEPA, Thessaloniki, Greece

²Department of Health Sciences-PhD Studies Program in Health Management, Frederick University, Nicosia, Cyprus

³Department of Public Health, University of Patras, Patra, Greece

Corresponding author: Sofia Voutsidou, Administrative Officer, MSc in Health Management, University's General Hospital of Thessaloniki AHEPA, Thessaloniki, Greece. ORCID ID: <https://orcid.org/0000-0002-5001-1221>, e-mail: svoutsidou@gmail.com

doi: 10.5455/aim.2019.27.123-127

ACTA INFORM MED. 2019 JUN 27(2): 123-127

Received: Apr 15, 2019 • Accepted: May 29, 2019

ABSTRACT

Introduction: In order to improve the level of public administration, the Greek government mandated the use of the electronic system "Clarity", requiring all public bodies to upload their administrative and financial data on the Internet in an effort to curb corruption, increase control and create a sense of trust between the state and the public. Particular emphasis was placed on the application of the "Clarity" system into the healthcare sector, especially in hospitals. **Aim:** The goal of this primary quantitative and qualitative research is to investigate the implementation of the "Clarity" in the Greek health system in terms of transparency the administrative and financial activity of the NHS hospitals for both health professionals and users. **Methods:** Research materials include examination of the AHEPA Hospital (Thessaloniki) archives, which is used as a case study, and qualitative research questionnaires. A study sample has also been provided by all licensed program users (32 participants). **Results:** According to the findings within a university general hospital, this program helps to promote hospital management and guarantees a controlled and secure sharing of the majority of the administrative acts and decisions adopted. Also "Clarity" consolidates reliability and accountability; it promotes the direct communication of services and contributes towards a better systematization and data collection in order to upgrade the administrative/functional capacity and the control of expenditures. **Conclusion:** The benefits from the program "Clarity" can be increased through the functional interconnection of other similar electronic networking programs, setting as a prerequisite the creation of appropriate material infrastructure and personnel training.

Keywords: electronic programs, Health informatics, hospital management, open governance.

1. INTRODUCTION

Modernization has caused significant changes in the fields of technology and informatics. Thus the use of other scientific fields, such as economics, law, sociology and statistics and so on, has become imperative for the improvement in the administration of hospitals and more broadly in the Greek health and public sector. This conjunction has contributed to the orientation towards a system of overall quality management (1, 2) and to the adoption of modern management practices as well as strategic and open government. These features are characterized mostly through the principles of transparency, efficiency, equity, responsiveness and ensuring of quality services, which satisfy the expectations of people who use the Greek health system (3-5). The introduction and

usage of modern tools of administration and management has been a continuous procedure and has as an ongoing goal the increase in productivity, the rationalization of the expenses and the best possible utilization of the available resources, either material or human (6, 7).

An important and very promising tool of the ongoing administrative reforms for the upgrading of the services that are provided by the Greek public sector is the electronic networking program "Clarity" (in Greek: "Diavgeia"). Clarity is also used in the health system combined with filling programs, which only recently were introduced in the Greek health system, such as the "ESY.net" ("BI.Forms"), the electronic prescription, the electronic form of the patient's records, DRGs (Diagnosis Related Groups) and the "Price Obser-

© 2019 Sofia Voutsidou, Evaggelos Moraitis, Eleni Jelastopulu, Georgios Charalampous

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

vatory" from the Central Committee for Health Supplies (8-11). These programs are implemented within the Greek framework of open government e-GIF (Electronic Government Interoperability Framework) and electronic information management (12), specifying the requirements of the European action eEurope 2005-eGovernment and also the program eEurope-i2010 (13, 14), which provide for the promotion of electronic services in four major areas: e-Government, e-Learning, e-Business and e-Health.

2. AIM

This article examines the fulfillment of the program "Clarity" in the field of health and especially in the environment of a university's general hospital institution, which is a legal entity. Furthermore, we evaluate the complementation of the program in the U.G.H.Th. AHEPA, the creation of the AHEPA organization (American Hellenic Educational Progressive Association), which is used as a case study because it's one of the biggest hospitals in the country (capacity of 680 beds) and its role as a purely academic institution combining the provision of comprehensive health care (primary, secondary and tertiary care) with research and educational purposes. The goal is to record the needs and the problems that occur during the everyday usage, as seen from the point of view of the people that are using the program, and also to propose measures for the betterment of its function. This task is being approached for the first time since this is a new program which was applied in Greece recently. Related research that had been done until now was concerned with the general public sector and had as main entities of implementation either the National School of Public Administration and the National Centre of Public Administration & Self-government or the local Self-government (Decentralized Administration of Epirus and Western Macedonia). We also examined the contribution of the program to hospital management and its potentials for a creative link with other electronic health programs for the maximization of results.

Through the program "Clarity" Greece has established for the first time with L. 3861/2010 (Government Gazette 112/t. A/13.7.2010), the obligatory and comprehensive upload on the internet of the acts, the decisions including financial information, personnel matters and clinical research of all the entities of public services, including health services, except of national security issues and sensitive personal data (15). Therefore all decisions on administrative and financial must be published as a condition for their implementation, after obtaining a special and unique Number of Internet Upload (NIU), which is their "identity". The online posting is carried out by specialized operators of the program, exclusively, by using passwords to ensure the safety and reliability of the data. A small number of members of the Project Management Team (PMT), which has been established in each institution promoting participatory governance model, has the duty of supervising the implementation. Because of the innovation that the program "Clarity" contributed to the administrative structures and the promotion of benchmarking, it was nominated for the European Public Sector Award (EPSA) in 2011 (15).

There search done under the program is useful, because its

implementation in the field of health signifies a gradual culture change in public administration and hospital management. It also signifies an enhancement of the principles of legality, equality, impartiality, transparency and justification of the acts and of sound administration (16). Furthermore, it contributes to the systematization, the coordination and the transparency of the administrative procedures by making more accessible the decisions which are taken and to better administrative-economical and clinical checks, based on the criteria of cost and productivity (17-19).

3. METHODS

The material used is derived from an overall review of the Greek and international bibliography and also from the conduct of primary quantitative and qualitative research. Recent European directions were used along with the Greek Government Gazette (FEK), in which legislation pertinent to the issue was published. The method that was used, after ensuring the appropriate permissions by the Scientific Board and the Board of Directors of the hospital, was a combination of primary research in the archive resources of the University's General Hospital of Thessaloniki AHEPA and the usage of a strictly structured questionnaire, which was especially designed to elicit responses for the needs and the purposes of this study. Having as a goal the implementation, in a pivotal form, of the program "Clarity" in the health services from the end of 2010 or essentially the beginning of 2011, the study concentrated on the period 2009- 2012, that is two years before and after the implementation of the program. Thus, it was possible to make comparisons and draw more valid conclusions.

In an attempt to evaluate the program, the primary quality research was focused on the recording of the behavior and the views of the people working in the hospital, the ones that are specialized in handling it. This was achieved through the completion of a quality research based on a strictly structured questionnaire with two sections: nine journalist's questions and twenty-five open ended and closed type questions, as it occurred from the pivotal implementation. The questionnaire was accompanied with a letter which highlighted the privacy, anonymity and security of the information obtained, the confidentiality of the information during the collection and the processing of the data and the fact that participation was voluntary. The participants provided informed consent. Their consent was verbal. The time it took to complete the questionnaire was approximately 10-15 minutes. The questionnaire was completed by the participants on a voluntary basis, during their break in the work area after being debriefed.

The sample was completed by 32 people (15 men and 17 women). It included all of the administrative personnel working in the University's General Hospital of Thessaloniki AHEPA and was authorized by the central administration for the purposes of the program "Clarity." Most of them (53,13%) belong to the age group of 41-50 years and have a lot of experience, as 37,50% have already completed 21-30 years of service while many others (34,38%) have 11-20 years in the health sector. Most operators (78,13%) knew foreign languages, mainly English (71,88%), French (18,75%), German (6,25%) and Italian (3,13%). The main criterion for their selection was their

	Decisions of the Board of Directors		Manager's Decisions		Other Decisions		AVERAGE	
	2011 (%)	2012 (%)	2011 (%)	2012 (%)	2011 (%)	2012 (%)	2011 (%)	2012 (%)
UPLOADED	70,84	67,13	96,32	96,78	56,67	53,75	74,61	72,55
NOT UPLOADED	29,16	32,87	3,68	3,22	43,33	46,25	25,39	27,45

Table 1. Cumulative suspension rates for 2011-2012. (Source: Archives of U.G.H.Th. AHEPA, processed data)

familiarity with computers, with most (62.50%) having excellent computer skills at all levels (word, excel, internet, e-mail). The persons involved had a special password to the electronic system in order to upload the various acts and decisions. High ranking administrative personnel and people in positions of responsibility and persons who, in accordance with the legislation formed the Project Management Team for the surveillance and the coordination of the implementation of "Clarity" in the hospital were included in the Sample.

4. RESULTS

Our review of the hospital's archives showed that six years after the implementation of "Clarity" in the public health services more than 70% of the administrative and economic acts of the hospital were uploaded to the electronic networking program. On the other hand, the percentage of decisions and acts of the hospital's administration which were not uploaded to "Clarity" amounted to between 25% and 27%.

The topics which are not included are linked to administrative changes in human resources, disciplinary offences and measures, the conduct of preliminary checks, and administrative inquiries under oath, and the assigned service tasks. Moreover, issues relating to sensitive personal data including health issues were not included.

Today, health professionals and the broader public could be informed about most of the hospital's administrative and financial operations. It is undoubtedly a major and positive change since in the past none of the hospital's management decisions were distributed to the public. Nowadays, all interested parties have access and can check electronically data regarding the hospital staff (qualifications and selection criteria), the total budget and the money spent for the supplies of the hospital in materials, medicines and medical equipment. In that framework the main goals of the program "Clarity", that of transparency and accountability to the public, seem to be served. Moreover, it is expected that the disclosure of every hospital's administrative and financial data will facilitate the comparative review of their operation thus opening the road to the adoption of the best practices which is a crucial factor of hospital management.

Despite the fact that the implementation of "Clarity" burdens the functionality of the public services, all of the operators stated that they were more or less pleased with the implementation of the program, stating as most important the social benefits that ensue from it, along with the facilitation of the citizens.

The role of the Project Management Team (PMT) has been proven crucial for the implementation of the "Clarity" program in the hospital. It has taken, mostly in a peripheral level, the responsibility of educating the hospital's operators (in a percentage that reaches 78,13%) and it provides consultation and

Figure 1. Satisfaction of operators by the application of "Clarity"

Figure 2. The view of the operators about the usefulness of the program

Figure 3. The contribution of "Clarity" program to hospital management

resolves every day inquiries (65,63%) by communicating, when needed, with the central-guiding Project Management Team (9,38%). The PMT is often called to facilitate communication in order to achieve a greater degree of homogenization and standardization of the information that is uploaded, through the program "Clarity" on the internet. The degree which the hospital achieved was about 75% with an overall degree of compliance to the predetermined standards of uploading, either from the central or the familiar PMT, reaching 65,63% and 56,25% accordingly.

Over 80% of the operators of "Clarity" program believe that the program has significantly contributed to the hospital's management. The success of this program based on the expressed views of the hospital's authorized operators, can be pinpointed mainly in the actions linked to the transparency of

the public life (93,75%), the publication of the produced administrative activity (90,63%), the ease in searching for acts and decisions (84,38%) and the betterment in the administrative/economic control (62,50%). At the same time though on a lesser scale it affects the regaining of the public's trust (34,38%) and the quality of the given services (25%). The problems and the malfunctions which were pinpointed during the everyday usage of the program are linked mostly to difficulties in comprehending the legislative framework (90,63%), to delays in document processing (84,38%), to procedural difficulties concerning the electronic uploading (62,50%) and finally the insufficient way of presenting and searching the uploaded acts and decisions of the administrative organs (43,75%).

The majority of the hospital's operators of "Clarity" (75%) are convinced about the necessity of its functional interconnection with electronic programs based on the same philosophy and aims as recently implemented in the Greek health system. This is crucial to the creation of an electronic network for the timely exchange of information and data, the organizational and functional unification of the services provided, the reduction of red tape, the imposition of economic controls and cost confinement (20).

The hospital's operators of the program are proposing to link "Clarity" first with the "ESY.net" ("BI.Forms"), which captures the financial and operating data of all the Greek NHS hospital on a monthly basis making comparisons feasible and with the "Price Observatory" of the central Committee for Health Supplies, which records the purchase prices of hospital's materials and medical equipment in order to ensure the lowest price. In a second stage they are proposing to be linked with the drawing up of the institution's global budget, the Central Electronic List of Prescriptions and the National System of Electronic Public Agreements.

There were several ways proposed for the interconnection of the electronic programs in the area of health services, which can be easily implemented with the appropriate adjustments, in order to create an overall coherent network of electronic information and automated procedures (21). The suggested actions are mostly about managerial and technical issues such as the direct electronic connection for automated control, the cross checking and update of the data through the informative systems without the intervention of the operators, the entry and channeling to the electronic system of the same data only once in order to avoid repetitions, overlapping or fragmentation of the data and finally the formation of a unified operator's team with the aim of the supervision, the more effective coordination and control, along with an overall evaluation.

5. DISCUSSION

For the interoperability and the interconnection of the electronic health programs we suggest the creation within each entity of a unified PMT, which will be in charge of overall coordination. It also suggests the amplification of the authorized operators, who will have access codes for all the electronic programs, which will be implemented within each hospital, along with their exemption from any other duties.

The need for ongoing training and education of the operators of "Clarity" is emphasized, especially in legal or interpretative matters and less on matters of operating the program. Spe-

cial attention should be given to the clarification of the legal framework through the organization of specialized seminars and conferences for solving problems along with the provision of additional clarifications, especially for the area of health services, with a simultaneous review and more thorough control over the uploaded material. For a more consistent implementation of the law it is essential that there be a further briefing of the operators, concerning sensitive personal data, as there has been shown that there is a shortcoming in their exact determination and also an offsetting of the person's sensitive personal data, such as health issues, disciplinary offences, nationality, political convictions and trade union actions with data which are not anticipated such as first name and family name, social security number, address and telephone number, nationality etc. This fact affects the uploaded material but also the correct interpretation of the program's legal framework.

For the confinement of bureaucracy and to avoid keeping multiple records it is suggested to electronically distribute documents and to introduce the digital signature, which is also envisaged with the Presidential Decree 150/2001 (Government Gazette 125/t. A/25.6.2001) and it is in compliance with the Directive 99/93/EC of the European Council and Board. As the digital signature is linked uniquely to the signatory and can define his identity (22), it is expected to decisively contribute to the security of the information systems and the ensuring of the confidentiality, the integrity and the reliability of the data that are uploaded to "Clarity", thus minimizing the chances of interventions or alterations of their content.

6. CONCLUSION

It follows from the research that familiarization by the employees with the new technology, the broad visibility and diffusion of the best practices, the update of the entities in matters concerning sensitive personal data and concern for the access availability to people with special needs in the overall produced acts and decisions which are infused in the internet, are crucial guidelines for the program's upgrade.

In the end the electronic networking program "Clarity", despite the fact that several improvements can be made, is one important institutional initiative. But it is essential that the problems and the dysfunction that occur during its everyday usage will not become an excuse for turning back. It would be better to perceive them as an opportunity for creative development and utilization of its capabilities in a steady forward course in order for it to become embedded in the health system as a progressive system of transparent procedures and improved hospital management.

Acknowledgments: This research was conducted as part of the Graduate Studies Program in Health Management at the Department of Health Sciences at Frederick University in Cyprus. The Transparency Department of the Decentralized Administration of Epirus and Western Macedonia, especially Nikos Demos, contributed to the creation of the questionnaire. Also the professors of the program Drs. Aris Sissouras and Evaggelos Moraitis contributed to the further improvement of the research tool used. Data analysis was done by Lambros Makris, postdoctoral researcher in the Institute of Informatics and Telematics of the Greek National Centre for Research and Technological Development.

- **Author's contribution:** SV, EM, EJ and GC gave substantial contribution to the conception and design of the work. SV and EM gave substantial contribution to acquisition, analysis and interpretation of data. EM, EJ and GC had a role in revising the article critically for important intellectual content. Each author gave final approval of the version to be published and agreed to be accountable for all aspects of the work ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
- **Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms
- **Conflicts of interest:** There are no conflicts of interest.
- **Financial support and sponsorship:** Nil.

REFERENCES

1. Binioris S. Management of Total Quality in Health. Athens: Pashalidis Publications; 2001: 21-25.
2. Douglas TJ, Judge WQ. Total Quality Management Implementation and Competitive Advantage: The role of structural control and exploration. *Acad Manage J*. 2001; 44(1): 158-169.
3. Pollitt C and Bouckaert G. Public Management Reform. A Comparative Analysis, 2nd ed. Oxford: Oxford University Press; 2004: 6-8.
4. Sarris M. Sociology of Health and Quality of Life. Athens: Papazisis; 2001: 159-161.
5. OECD. Strengthening Health Information Infrastructure for Health Care Quality Governance: Good practices, new opportunities and data privacy protection challenges, p. 49-59. Available from: http://www.oecd-ilibrary.org/social-issues-migration-health/strengthening-health-information-infrastructure-for-health-care-quality-governance_9789264193505-en. Accessed on December 2018.
6. DuBrin AJ. Essentials of Management. 2nd Greek ed. Athens: Greek Publications; 2004: 289-290.
7. Nikolentzos A, Kontodimopoulos N, Polyzos N. et al. Reengineering NHS Hospitals in Greece: Redistribution Leads to Rational Mergers. *Glob J Health Sci*. 2015; 7(5): 272-287.
8. Papadakis M. Computer Applications in Health Services. In: Souliotis K, editor. Politics and Economy of Health. Strategic Planning-Organisation and Management-Economic Operation-Sectoral Policies. Athens: Papazisis. 2006: 223-224.
9. Apostolakis I. Health Information Systems, 2nd ed. Athens: Papazisis. 2007: 81-84.
10. Polyzos N. A three-year Performance Evaluation of the NHS Hospitals in Greece. *Hippokratia*. 2012; 16(4): 350-355.
11. Kastanioti C, Kontodimopoulos N, Stasinopoulos D. et al. Public procurement of health technologies in Greece in an era of economic crisis. *Health Policy*. 2013; 109(1): 7-13.
12. Soumplis D and Poulis K. Online open data applications for the Greek public administration. Bachelor's Thesis, Aegean University, GR, p. 24-26. Available from: <http://docplayer.gr/10405326-Diadiktyakes-efarmoges-anoihton-dedomenon-gia-tin-elliniki-dimosia-dioikisi.html>. Accessed on December 2018.
13. Alexopoulos Ch. Interoperability of Information Systems. Field Theoretical Analysis and Documentation. Bachelor's Thesis, Aegean University, GR, p. 41-43. Available from: <http://www.slideshare.net/xalexopoulos/thesis-mis-presentation>. Accessed on December 2018.
14. Manouselis E. eGovernment: Definition, Interoperability, Current situation in Greece. Bachelor's Thesis, University of Patras, GR, 6, p. 23. Available from: http://nemertes.lis.upatras.gr/jspui/bitstream/10889/6292/3/Nimertis_Manouselis%28mech%29.pdf. Accessed on December 2018.
15. National School of Public Administration. Evaluation report of the application "Clarity" program. Athens, p. 45-53. Available from: http://www.enap.gr/attachments/article/7311/teliko_diavgeia.pdf. Accessed on December 2018.
16. Boursanidis Ch. Comparative health policy: governance structures and management tools in EU health systems. In: Kon-tiadis XI and Souliotis KN, editors. Institutions and health policies. Athens: Papazisis. 2010: 249-257.
17. Yfantopoulos JN. The economics of Health. Theory and Policy. Athens: Publications Typothito. 2006: 475-477.
18. Bovaird T, Löffler E. Understanding public management and governance. In: Bovaird T and Löffler E, editors. Public Management and Governance. Oxon: Routledge; 2009: 3-14.
19. Sullivan EJ, Decker PJ. Effective Leadership and Management in Health Services, 6th ed. Athens: Giourdas Publications; 2009: 195-197.
20. Kyriopoulos G, Beazoglou T. Networks integrated healthcare: An attempt for the comprehensive approach to health reform. In: Georgousi E, Kyriopoulos G and Beazoglou T, editors. Integrated care networks in health. Athens: Themelio. 2000: 15-35.
21. Paulopoulos S, Berler A. The issue of interconnectivity on Information Infrastructure of Health Units. In: Apostolakis I, editor. Management Information Infrastructure Issues in Health Units. Selected texts with special agenda of the 6th Panhellenic Scientific Conference Management of Health Services. Athens: MediForce. 2005: 79-97.
22. Tzikopoulos A, Apostolakis I. Electronic Administration and Communication in Health Units. In: Apostolakis I, editor. Management Information Infrastructure Issues in Health Units. Selected texts with special agenda of the 6th Panhellenic Scientific Conference Management of Health Services. Athens: MediForce. 2005: 115-119.