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IMPLEMENTATION OF INNOVATIVE HEALTHCARE INFRASTRUCTURE PROJECTS: THE EXPERIENCE OF SPAIN

РЕАЛІЗАЦІЯ ІННОВАЦІЙНИХ ІНФРАСТРУКТУРНИХ ПРОЕКТІВ У СФЕРІ ОХОРОНИ ЗДОРОВ'Я: ДОСВІД ІСПАНІЇ

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The article focuses on the implementation of innovative healthcare infrastructure projects, with a pilot case in Spain. It emphasizes the critical role of innovation and advance capabilities systems for healthcare for enhancing service quality and creating productive environments aligned with sustainable development principles. The article demonstrates the complexity of implementing social projects and the problems of their dissemination. It explores the key elements of implementing innovative healthcare infrastructure projects (using the example of health-oriented advanced lighting in medical facilities). The methodology incorporates a comprehensive analysis of current lighting technologies in medical institutions and their impact on both staff and patients. The study explores the adoption of biodynamic lighting systems, which adapt to human circadian rhythms, thereby contributing to health and well-being. The methodology incorporates a comprehensive analysis of current lighting technologies in medical institutions and their impact on both staff and patients. The article discusses the project CHRONOlight, implemented in a central Hospital, aiming to develop and optimize a biodynamic lighting system. The project serves as a model

for integrating innovative lighting solutions in healthcare facilities, showcasing the potential for significant improvements in patient care and worker productivity. The findings suggest that innovative lighting technologies are essential for advancing healthcare infrastructure towards more sustainable and effective practices. The emphasis is on the necessity of engaging stakeholders in the implementation process of innovations, and their characterization is described using the CHRONOlight project as an example. The need for using a project communication management model is highlighted, and a model for managing project communications for CHRONOlight is proposed.

Key words: innovations; project; health care; infrastructure; lighting; biorhythms; stakeholders; communications.

У статті увагу зосереджено на впровадженні інноваційних проєктів у сфері медичної інфраструктури, з прикладом пілотного проєкту в Іспанії (м. Севілья). Наголошено на важливості інновацій та систем передового досвіду в охороні здоров'я для підвищення якості послуг та створення продуктивних середовищ, що відповідають принципам сталого розвитку. Стаття демонструє складність впровадження соціальних проєктів та проблеми їхнього поширення. Розглядаються ключові елементи впровадження інноваційних проєктів медичної інфраструктури (на прикладі застосування передових освітлювальних систем у медичних установах). Методологія включає комплексний аналіз сучасних освітлювальних технологій у медичних закладах та їх вплив на персонал та пацієнтів. Досліджується впровадження систем біодинамічного освітлення, які адаптуються до циркадних ритмів людини. У статті розглянуто проєкт CHRONOlight, що реалізується у центральному госпіталі міста Севілья та який має на меті розробку й оптимізацію системи біодинамічного освітлення. Проєкт слугує моделлю для інтеграції інноваційних освітлювальних рішень у медичні установи, демонструючи потенціал значного покращення догляду за пацієнтами та продуктивності працівників. Результати підкреслюють, що інноваційні освітлювальні технології є необхідними для розвитку медичної інфраструктури у напрямку більш стійких та ефективних практик. Наголошується на необхідності залучення зацікавлених сторін у процес впровадження інновацій. Характеристика таких сторін описується на прикладі проєкту CHRONOlight. Підкреслюється потреба використання моделі управління комунікаціями проєкту. Запропоновано модель для управління комунікаціями проєкту CHRONOlight.

Ключові слова: інновації; проєкт; охорона здоров'я; інфраструктура; освітлення; біоритми; зацікавлені сторони; комунікації.

INTRODUCTION

Innovative projects in various spheres of society are a critical factor in stimulating progress in the world's developed countries. An important strategic task for any country is also to accelerate the development of social infrastructure (including education, healthcare, transportation, etc.), as this sphere ensures such livelihood. The complexity lies in the fact that the sectors that make up social infrastructure depend on budgetary funds (public management influences this sphere), are characterized by branching out in a certain territory (which determines the speed and quality of development) and are related to serving people (the role is underestimated) among the interaction with multilayer work protocols and multiple overlapping actors in the healthcare provision space.

Healthcare is of great importance in the social and individual life. The development of infrastructure in this area is associated with the need to introduce innovative technologies to improve the quality of medical services and create a healthy and more productive work environment that corresponds to the principles of sustainable development. Among the innovations in healthcare infrastructure, research focusing on the impact of lighting on human biorhythms is gaining traction. It is already established that suitable lighting contributes to the recovery of patients and improves the working conditions of medical staff [26; 27], providing a promising potential for enhancing healthcare performance and expanding the attention capability for current facilities.

LITERATURE REVIEW

The implementation of innovative healthcare infrastructure projects is a dynamic process that benefits from structured project management, stakeholder collaboration. It involves not only the anticipation of expected challenges but also the readiness to address unforeseen difficulties. The management of social and technical aspects is crucial for the seamless integration of new practices into existing healthcare systems [7-9].

Innovations in the healthcare sector in Spain have demonstrated opportunities for improvement over the past few decades. The share of PROPTech investors interested in innovations in architecture, engineering, and construction worldwide continues to grow (Statista, 2022). The importance of the development of social infrastructure is proven in the works of modern scientists, who point to the fact that without innovation it is impossible to achieve the necessary development of individual regions, the country and the world as a whole. Universities make a significant contribution to research and innovation in healthcare [1]. Innovative lighting solutions are at the core of the CHRONOlight project, being implemented at the University of Seville (Spain) based at La Escuela Técnica Superior de Arquitectura de Sevilla [2]. The main goal of CHRONOlight is to develop and further optimize a wide-spectrum biodynamic lighting system that promotes the recovery and improvement of the health of hospital patients and caregivers. Significant attention is paid by researchers to the study of circadian rhythms and

the likelihood of disease occurrence in case of their disruption [11-16], as well as the impact of UV light [19-22] on the process of bacterial neutralization. Here, the role of management decisions related to innovation and their implementation, value and sustainability concepts, and the creation of an «innovation culture» among healthcare professionals is emphasized [3]. At the same time: 1) communication is a strategy and instrument that ensures the assimilation, acceptance, and diffusion of conceptions about the represented object, favoring the visibility of the innovation process [4]; 2) Effective communication and interaction between stakeholders in the commercialization of innovations are crucial for accelerating innovation introduction and forming long-term relationships [5]; 3) It is of utter importance that public authorities and civil society organisations join efforts to address these needs in order to promote transformative participation in health [6].

AIMS AND OBJECTIVES

The goal of this article is to study modern approaches to implementing innovative healthcare infrastructure projects to optimize the process of adoption and implementation of innovations, with an emphasis on the importance of stakeholder involvement and improving communication efficiency for users and health care providers engagement and systematic alignment with the projects.

METHODOLOGY AND RESEARCH METHODS

The methodology of this article is based on a comprehensive approach to analyzing the role of modern lighting technologies in medical institutions, their impact on the working conditions of medical personnel, and the well-being of patients. The research includes data systematization and analysis. Through systematization, stakeholders for the CHRONOlight Project were classified, their incentives and contributions to the project were identified. Observation and modeling methods were used to build a project communication management model for CHRONOlight. The generalization method was used to derive general conclusions. This includes analyzing the relationships between different aspects of the study, identifying key trends and patterns. Critical analysis involves identifying possible deviations and discussing their causes.

The methodology used allows for a comprehensive approach to studying the problem, providing a deep understanding of the impact of lighting innovations on the efficiency of healthcare facilities and the health of individuals in them. It also contributes to identifying opportunities for further research and developing recommendations for optimizing the use of lighting technologies in healthcare.

DESCRIPTION

The implementation of innovative healthcare infrastructure projects is a multifaceted endeavor

that involves the integration of data analytics, information technology, and the management of change within healthcare systems. These projects aim to improve operations, system design, and service delivery through the adoption of new technologies and methodologies.

Successful implementation of healthcare innovations requires a formal project management framework, collaboration among stakeholders, and a focus on analytics-driven projects [7]. The embedding of healthcare innovations into practice is a complex socio-technical process that involves normative restructuring, reworking of relational conventions, and the enacting of practices [8]. While healthcare institutions may anticipate certain risks in implementing innovation projects, unexpected challenges such as leadership changes, heterogeneous practices, security issues, and communication problems can arise, necessitating a clear communication strategy [9].

The implementation of innovative lighting solutions is an important step towards creating sustainable healthcare infrastructure that promotes health and well-being. Therefore, this direction becomes particularly relevant in ensuring high-quality medical services, creating optimal conditions for the work of medical personnel and the stay of patients in hospitals, as well as in the context of increasing social resilience in healthcare. Within the framework of the presented research, two key directions for the implementation of innovative projects are highlighted: 1) engaging stakeholders (clients, employees, investors, the public, etc.), which will increase the relevance and acceptability of innovations; 2) improving the efficiency of communications aimed at: project team and ensuring strong collaboration with key stakeholders. This will contribute to: solving problems related to the adoption of new technologies in healthcare infrastructure; strengthening the foundation for sustainable development of healthcare infrastructure; the ability to respond to modern challenges.

The development of health care infrastructure contributes to the creation of a strong, adaptive and efficient health care system capable of meeting the needs of society, as well as responding to modern challenges in the field of public health. Innovative ideas have always been there; time has come to listen to the people who had these ideas, evaluate them rigorously, focus on the impact they have on health outcomes, and promote innovation [10].

Here it is worth focusing on the important effects of innovative activities that can improve people's health and quality of life. However, issues remain unexplored of the optimization of interaction between all stakeholders of the innovation process at different levels.

RESULTS AND DISCUSSION

The modern healthcare system in Europe represents a complex network of medical, preventive, pharmaceutical, and sanitary-epidemiological institutions, employing millions of people. The fundamental task of each medical institution is to provide assistance and care for patients, as well as to ensure comfortable conditions for them, including adequate lighting. However, equally important is the issue of proper lighting in medical institutions considering the health and safety of the medical staff in their workplaces.

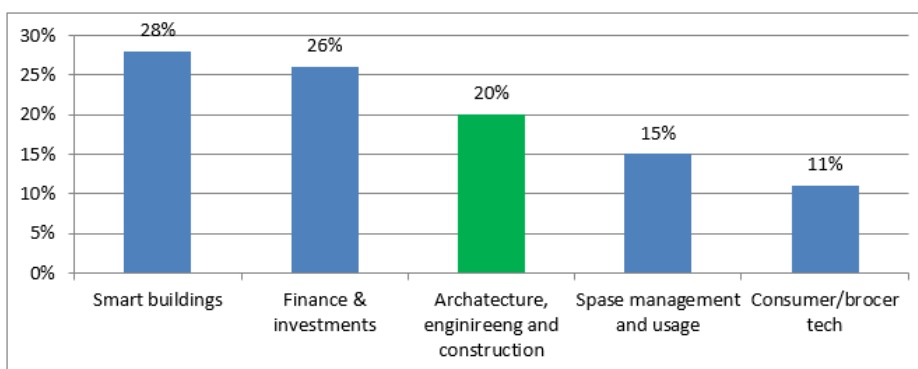
Lighting plays a critical role in medical institutions, as it affects both the well-being of patients and the ability of medical staff to provide high-quality care. Thus, modern lighting has ceased to be just a part of the technical equipment of hospitals, becoming an important element of the treatment process and ensuring comfortable working conditions for healthcare professionals.

The problem of outdated lighting equipment in some medical facilities raises concerns about the quality of lighting, especially in old healthcare institutions where sometimes luminaires installed several decades ago are still partially functional.

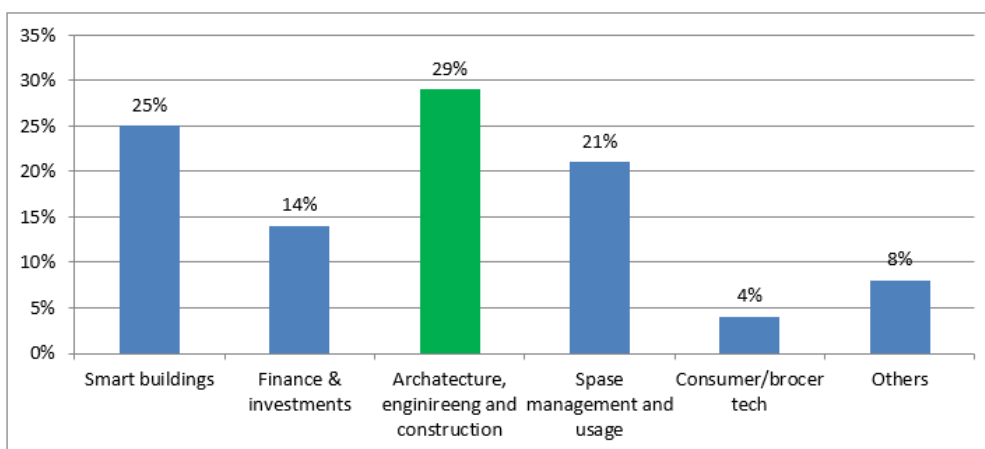
This is significantly different from newer, particularly private medical facilities, which have modern lighting that provides better conditions for medical staff and patients.

The significance of innovative developments in the field of lighting for medical facilities is growing, considering their potential to improve the working environment for medical professionals and the overall well-being of patients. The importance of integrating high-quality lighting into medical processes, particularly in procedures that require high attention and precision, is undeniable. Additionally, attention should be paid to the energy efficiency of lighting systems, optimizing lighting costs, adapting the lighting environment to the specific needs of the medical facility, and the potential of innovative lighting technologies to prevent the spread of infections.

The implementation of innovation is a complex process characterized by uncertainty, and the diffusion of innovation is difficult to assess quantitatively, as people and human networks are complex. However, the share of PROPTech investors interested in innovations in architecture, engineering, and construction worldwide was 20% in 2021, and in the first half of 2022, it reached 29% (Figure 1).



a) Details: Worldwide; REBNY; Royal Institution of Chartered Surveyors; MetaProp; 2021; Proptech investors



б) Details: Worldwide; REBNY; Royal Institution of Chartered Surveyors; MetaProp; H1 2022; Proptech investors

Fig. 1. Share of proptech investors interested in selected areas of innovation worldwide: a) in 2021; б) 1st half of 2022

Source: statista, 2022 [28]

At the same time, lighting solutions in medicine are associated with a high level of regulation. Light in a modern hospital should not only provide the necessary level of visibility for patients and staff but also create an appropriate atmosphere, especially in hazardous and adverse working conditions (infectious; oncological institutions and departments; radiological, X-ray services; operating rooms, sterilization departments, etc.) where hundreds of thousands of healthcare workers are employed. Therefore, the issue of protecting and promoting the health of healthcare workers, especially those working around the clock, becomes even more significant.

Today in Spain, projects related to the use of innovative lighting technologies in medical facilities are being implemented, focusing on the impact of lighting on the circadian rhythms of staff and patients. These projects include research initiatives (universities and research centers in Spain conduct research on the impact of the lighting environment on human health, studying the impact of different types of lighting on sleep quality, productivity of medical staff, and the overall condition of patients); innovations in medical facilities (medical institutions are implementing advanced lighting systems that mimic natural daylight or adapt to human circadian rhythms to improve conditions for patients and staff); collaboration with industrial partners (medical institutions collaborate with companies specializing in the development and production of innovative lighting solutions to introduce cutting-edge technologies into medical practice); government programs and initiatives (the Spanish government or regional authorities initiate or support projects aimed at improving conditions in hospitals through innovative lighting technologies, with the aim of improving the quality of medical services); international collaborations (medical and scientific institutions participate in international research projects aimed at studying and implementing innovations in the field of medical lighting).

The implementation practice of innovative projects in the healthcare infrastructure is presented using the pilot case of the CHRONOlight project [2], implemented in the Paediatric Hospital of the Hospital Universitario Virgen del Rocío in Seville (Spain). The main goal of CHRONOlight is to develop and further optimize a wide-spectrum biodynamic lighting system that promotes the recovery and improvement of the health of hospital patients and caregivers. To achieve this goal, the lighting system will reproduce the spectral distribution according to the adequate regulation of chronobiological markers, according to biochemical measurements of cortisol and melatonin, simultaneously aiding in the elimination or neutralization of pathogens in medical environments through ultraviolet light radiation, preventing the spread of nosocomial

diseases and viruses. The concept verification will take place in the children's hospital of the university hospital complex Virgen del Rocío in Seville, where the lighting system will be installed in the intensive care unit, as well as in the neurosurgery and cardiology departments. The proposal was supported and participated in by the medical staff and department heads of the hospital. SIMON lighting, a transnational company specializing in advanced lighting solutions, collaborates with the proposal, providing its research department and creating luminaire prototypes.

Studies have shown that people who have been subject to night or shift work have a higher risk of developing cancer-breast, prostate, lung, pancreas, ovarian, colorectal or melanoma cancer- and of suffering from other diseases such as cardiovascular diseases, atherosclerosis, type II diabetes, cognitive deficits, mood swings, anxiety or depression [11], and even autoimmune diseases such as multiple sclerosis [12]. Chronodisruption has also been associated with delirium [13] and bipolar disorders [14], and acute chronodisruption is associated with impaired mental activity, metabolic abnormalities, and immune defects [15]. Likewise, alterations in the circadian rhythms of different biomarkers - among them plasma levels of melatonin and urinary excretion of 6-sulfatexymelatonin - have been detected in different pathologies, including sepsis [16].

At the same time, the role of light in the synthesis of melatonin and circadian rhythm is of significant importance. Human physiological behaviour shows repetitive 24-hour cycles known as circadian rhythms, mainly regulated by the suprachiasmatic nucleus (SCN), in which a rhythmic pattern of clock gene expression is generated. This intrinsic circadian rhythm is synchronized by the light/dark cycle through the retinohypothalamic tract [17]. During night-time, the SCN send neural signals through a multisynaptic connection that finally projects onto the pineal gland, causing the nocturnal release of norepinephrine (NA) in the pinealocyte. The binding of NA to its specific receptors on the pinealocyte membrane promotes the activation of melatonin synthesis, which synchronises the peripheral circadian clocks throughout the body [18]. In addition to its function on the SCN synchronization, the input of light generates the inhibition on the nocturnal synthesis of melatonin. In humans this suppression is highly dependent on the intensity and light wavelength.

UV light has proven to be an effective weapon to contribute to the neutralization of bacteria linked to nosocomial diseases. In fact, there are currently protocols to evaluate the efficacy of this type of lighting in eliminating bacteria [19]. The International Commission on Illumination (CIE) defined its position

regarding the use of UV-C light for the disinfection of Covid19; determining that, although its effectiveness is proven, UV light irradiation should not be carried out in occupied spaces [20]. UV-C light has been shown to be effective in disinfecting surfaces contaminated with the Ebola virus [21] and influenza [22]. In this way, the design of a prototype of biodynamic luminaire is proposed, which innovatively integrates the spectral range of visible light to promote the regulation of melatonin, while incorporating UV light emitters with hygienic reasons.

The main objective of CHRONOlight is the development and subsequent optimization of a biodynamic wide spectrum lighting system, that contributes to the recovery and health improvement of hospital patients and their caregivers. CHRONOlight proposal fits in Challenge 1: Health, demographic change, and well-being, since the aim of the biodynamic lighting system corresponds to the suitable regulation of the circadian rhythm for patients and caregivers in hospital rooms, providing a better chronoregulation of the biological markers, contributing to improve overall condition of hospitalized patients and their carer, therefore, reducing hospitalization, rest times and reintegration. The suitable entrainment of melatonin and cortisol also promotes a decrease in risks linked to cardiovascular diseases, cancer, obesity, or depression. Further, the pathogens neutralization provided by the UV light built-in the biodynamic lighting contributes to the risk-control on environmental infection (nosocomial and epidemic), for both patients, caregivers, and hospital staff thru elimination/neutralization of pathogens in the hospital facilities, when the rooms are unoccupied.

It is assumed that the CHRONOlight project will have a social impact, which is expressed in the impact on public health, namely:

- Improvement of the quality of life/health children patients and their caregivers. To help an easier return to daily life, with a reduction of hospitalization secondary effects.

- Improve caregiver conciliation between work and family life, reducing absenteeism rate thanks to early reincorporation during children illnesses episodes (an estimated 7,150,000 working days are yearly lost due to accompaniment nationwide). This has a special incidence in the female population, as the main affected sector, which would allow reducing the impact of motherhood on their professional development and career, with a need to consider the associated opportunity costs.

- Benefits for the regional/national productive and business system (hospital influence area) due to labour cost reduction. The cost borne by public social coverage systems (leave days) must be added, as well as those supported by the caregivers themselves (employed workers have only a 2-day payed leave for

care providing). This aspect has a special impact on the economic independence of female caregivers.

- Efficiency of paediatric health care enhancement, increasing the turnover rate and decreasing the cases of over hospitalization, reducing health cost as well as human capital cost.

Therefore, such a project is extremely important for the medical field of any country.

The complexity of implementing social projects and the challenges of their dissemination

The 21st century is a period of advanced technologies aimed at ensuring people's well-being. Unfortunately, the implementation of socially important projects often faces a large number of problems, the resolution of which assigns a special role to communications. Effective communications are crucial in advocating for decisions regarding the development of healthcare systems at various levels of management. Of the ten main functions of public health in the WHO document «Fundamentals of European Policy and Strategy for the 21st Century,» one is defined as communication in the interest of public health, stating that it is the art and technique of informing individual citizens, institutions, and various audiences of the public, influencing them, and creating positive motivation regarding important health issues and determinants. This highlights the need to improve communication with all stakeholders within the CHRONOlight project. Additionally, the importance of effective communication in the implementation of lighting projects and engaging stakeholders is crucial for the successful implementation of innovations. It is important to understand how to inform and involve various stakeholders, including medical personnel, patients, facility administration, and equipment providers. The large number of elements in the process of implementing innovative projects in the healthcare system and the place and role of communication in this process can be conveniently presented in the form of Figure 2.

Essentially, these components intertwine in the process of integrating innovative lighting solutions into hospital environments, ensuring that projects align with the goals of state management, meet management requirements, and successfully address the challenges of change management.

Stakeholders of the CHRONOlight project and their significance.

Stakeholders provide opportunities for the system («contribution» - material resources or services contributed by stakeholders to the project for the purpose of participation and profit) and are a source of demands for the system («incentive» - goods that can satisfy the needs of a person in performing certain actions). The CHRONOlight project has specific stakeholders who have their own contributions to the project and incentives (Table 1).

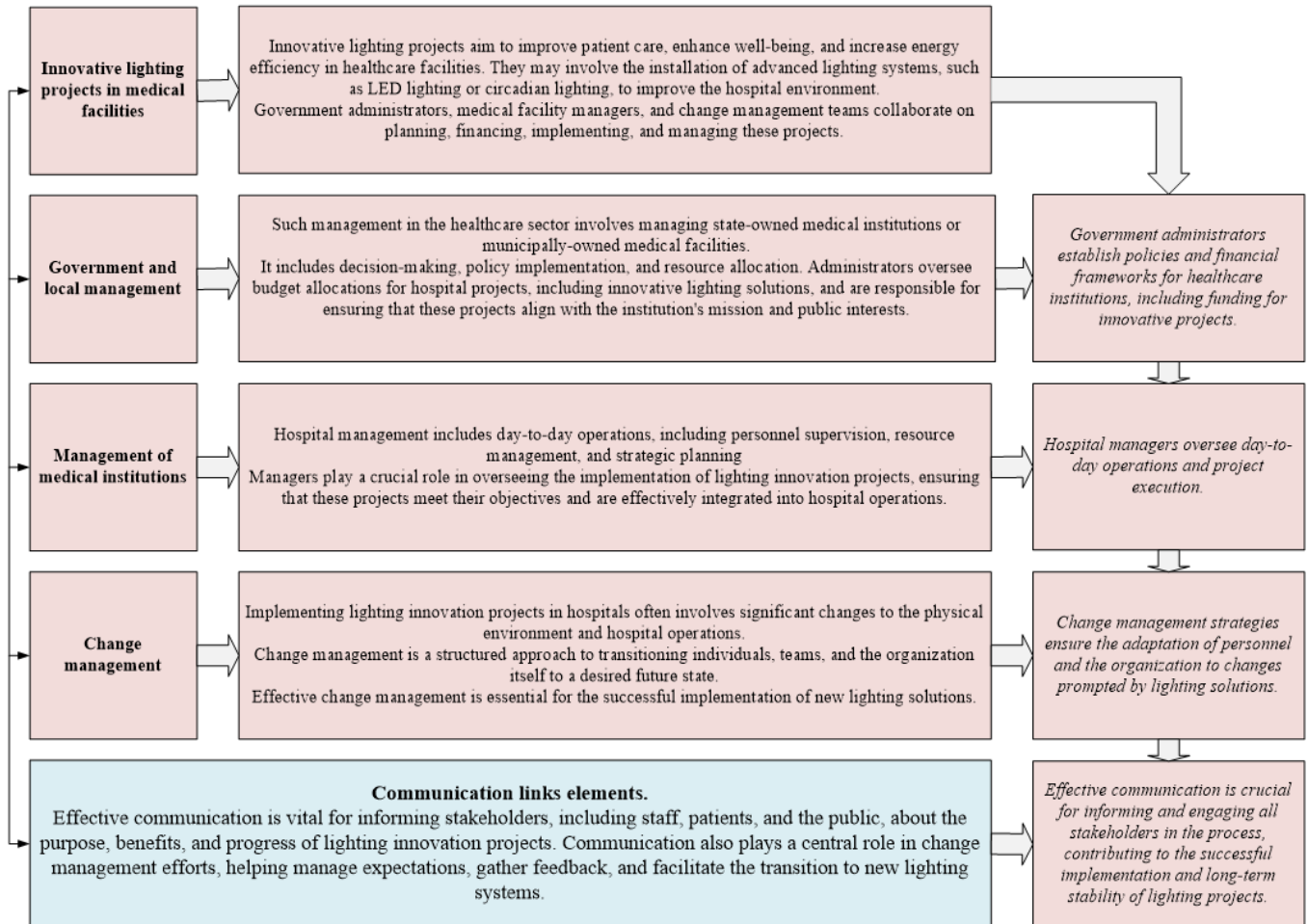


Fig. 2. Key elements of the implementation process of innovative healthcare infrastructure projects (using the example of lighting in medical facilities)

Source: identified and constructed by the authors

After identifying stakeholders and determining their contributions and incentives, it is necessary to rank them, select indicators, and tools for working with each of them separately. External stakeholders have a greater influence on the long-term success of the project, as they are often interested in the end users. However, they must be identified and managed during the project [23]. In the decision-making process regarding the implementation of innovations in the social infrastructure sector (to which the CHRONOlght project belongs), significant importance is given to the support of government bodies, which play a significant role in the continuous development of innovative activity and can positively (or negatively) affect the satisfaction of society's needs.

The use of a project communication management model.

Communication plays a pivotal role in the diffusion of innovations, acting as the medium through which new ideas and technologies spread within a social system. The process involves not only the dissemination of information but also the interpersonal and mediated interactions that influence the adoption of innovations.

Communication channels, including new media, interpersonal networks, and formal sources, are integral to the diffusion of innovations, with new media channels emerging as influential due to their ability to reach underserved populations and serve both personal and impersonal influence functions [24].

The structure of social networks, including the number and strength of links, significantly affects the extent and rate of innovation diffusion, with certain network topologies and heterogeneities influencing the diffusion process [25].

The effectiveness of communication in this process is shaped by the nature of the media used, the structure and strength of social networks, and the characteristics of the innovation itself. Understanding these dynamics is crucial for effectively promoting and managing the adoption of new innovations within a social system. Within the framework of the presented study, a communication management model was developed for the CHRONOlght project (Figure 3).

All components of the model are functionally and organizationally interrelated. It consists of a subject, an object of management, and a block of scientific regulation. According to the proposed model, the main node that organizes communicative

Contribution and incentives of internal and external stakeholders of the CHRONOlight project

Type	Characteristic	Contribution	Incentive
<i>Internal stakeholders</i>			
Project Team	a group of specialists (researchers) working on the project during the entire period of its implementation.	time; professional skills; technologies; innovations; involvement in activities.	creating a working atmosphere; obtaining reliable and up-to-date information; experience in implementing innovative projects; improvement of conditions for users; access to modern technologies; the possibility of conducting experiments; Certification training; remuneration.
Project Management	top-level organizational leaders who are responsible for effective management on a day-to-day basis.	decision support; project management.	remuneration; prestige.
Industry Specialists	A group of experts on the main subject of the project	knowledge; qualification.	material-technical base; design documentation; exchange of experience; remuneration.
Investors	a legal entity or an individual investing own, borrowed or other borrowed funds in project management.	Investment.	Access to modern technologies; dividends; investment security; capital growth.
<i>External stakeholders</i>			
Business Analysts*	An organization or individual that enables successful group communication.	Control; correction.	increasing the efficiency of project implementation; risk reduction; remuneration.
Customer**	the organization or individual that receives the product or service.	project requirements; project product requirements; financial resources; organizational process assets.	Intellectual Property; meeting the needs of users; potentially possible profit; reduction of resource costs; quality product.
Consumers	an entity (a legal entity or an individual) that is a buyer or user of project results.	specification of requirements for the project product; feedback; demand.	improving the quality of life; improvement of working conditions; product value.
Government agencies	a state organization that provides legal support for the implementation of the project.	lobbying for project results; involvement in the project.	taxes; meeting the needs of the population; development of the health care sector.
Local Communities	infrastructure facilities of the surrounding areas.	fulfillment of social obligations.	well-being of the region's infrastructure
Partners	An organization or individual entering into an agreement with the owner to obtain the rights to use an intellectual property object.	Financial resources.	profit; production of innovative products.
Contractors	an organization or a natural person entering into an agreement with the customer for the supply of the product.	trust; timely fulfillment of the order.	timely payment; long-term partnership.

*It is proposed to identify among the external stakeholders to enhance project implementation efficiency and reduce project risks.

** Considering that healthcare is a sector of social activity of the state and local self-government, we will classify them as key stakeholders in innovative projects in this field.

Source: identified and systematized by the authors

activity is the responsible person (persons) from the project team, who are the main carriers of analytical information, plan and keep records of communicative activity (possibly by target groups). At the level of a healthcare institution, the organizer of communicative activity is a person involved in conducting regular communications with patients, their relatives, and a person responsible for the

working conditions of hospital staff. Medical personnel are involved in conducting planned communicative interventions depending on the form of the event, the number of participants, and the set tasks (interviews, surveys, etc.). Medical personnel are also informal disseminators of information. Managers (representatives) of mass media and non-governmental organizations working in the

field of healthcare are included as management subjects. Their participation as management subjects is extremely important and aims to provide

the population as a whole and specific target groups with unbiased, objective information on health preservation and improvement.

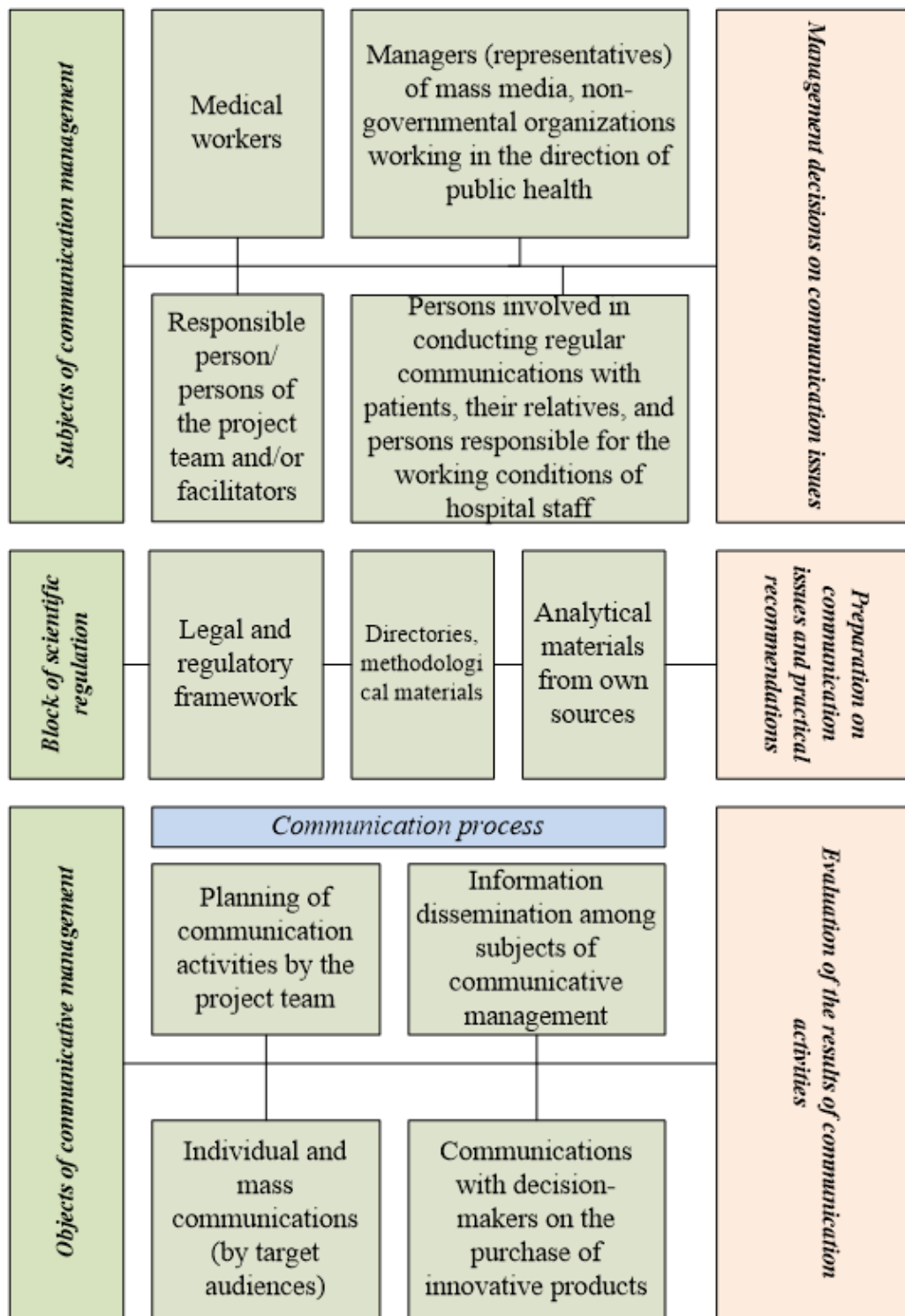


Fig. 3. Project Communication Management Model for CHRONOlight

Source: author's development

The object of management is the process of communication with the population as a whole and with specific target groups of communicative influence. The following target groups are included in the model: patients and their relatives, families; decision-makers regarding the healthcare system and public health system. The evaluation of the effectiveness of the communication process

includes: decisions made regarding the ordering of innovative products and changes in behavior in favor of health promotion and preservation. The block of scientific regulation provides the subject and object of management with the necessary information on communication issues and also provides medical personnel with information on practical issues when working with innovative products.

CONCLUSIONS

The modern healthcare system is tasked with providing quality medical care to patients and ensuring optimal working conditions for medical personnel. Medical institutions must take care to create a comprehensive set of measures to support the normal health and disease prevention of patients and staff. The integration of modern lighting technologies into medical institutions is an important element of sustainable development of healthcare infrastructure, playing a key role in creating a healthy work environment. Thus, adequate lighting is transforming today from a technical tool into a significant element of the healing environment.

Projects that involve the use of expanded capabilities lighting technologies in medical facilities demonstrate significant potential for improving the working conditions both medical personnel and the overall well-being of patients. In this project focusing in the contribution of the lighting system to reduce hospitalization times through improvements in the baseline state of health as well as reducing comorbidities typical of the hospital environment. These initiatives emphasize the importance of communication and involving all stakeholders in the project implementation process, thus engaging in the application and the aligned use of the system

and protocols. Identifying specific stakeholders of the CHRONOlight project, describing their characteristics, contributions to the project, and incentives allows for the selection of indicators and tools to work with each one individually. This will increase the efficiency of project implementation. The presented model of project communication management for CHRONOlight is designed to promote behavior change in favor of health promotion and preservation. Overall, both engaging all potential stakeholders and improving communication will contribute to improving working conditions and health indicators for patients.

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