# ELMO TRAINING AND THE USE OF AGILE METHODS IN THE PUBLIC SECTOR

*TREINAMENTO ELMO E O USO DE MÉTODOS ÁGEIS NO SETOR PÚBLICO*

*LA FORMACIÓN DE ELMO Y EL USO DE MÉTODOS ÁGILES EN EL SECTOR PÚBLICO*

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## ABSTRACT

The objective of the study is to report the experience of using agile methodology not following the flow of services for ELMO training. Project management following agile hybrid methodology, SCRUM wrapping model and Kanban fermentation. Data include continuous monitoring of metrics recorded in tables, tables and graphs, for the period from January to July 2021. 1443 health professionals were trained. It registered a total of 79 activities, with 5% (n = 4) in "delay", 8.9% (n = 7) in "refining", 5% (n = 4) not "in progress", 25, 31 % (n = 20) "in progress" and 55.7% (n = 44) "completed". Overall income was calculated at 0.45 activities / day. The use of simplified methodologies in public organizations promotes the optimization of teamwork and management of activities. Improved Technological Innovation follows information and the interlocution between demands, tracing satisfactory results, within the limitations of the current public service.
**Descriptors:** *COVID-19; Tecnologic Innovation; IT Management; Public Sector Modernization.*

## RESUMO

O estudo objetiva relatar a experiência do uso de metodologia ágil no acompanhamento de fluxo de serviços para treinamento do ELMO. O gerenciamento do projeto seguiu metodologia ágil híbrida, envolvendo modelo SCRUM e ferramenta Kanban. Os dados incluem acompanhamento contínuo de métricas registradas em planilhas, tabelas e gráficos, referente ao período de janeiro a julho de 2021. Foram treinados 1443 profissionais de saúde. Registrou-se um total de 79 atividades, com 5% (n=4) em "backlog", 8,9% (n=7) em "refinamento", 5% (n=4) no "a fazer", 25,31% (n=20) "em progresso" e 55,7% (n=44) "concluídas". O *throughput* geral foi calculado em 0,45 atividades/dia. A utilização de metodologias ágeis em organizações públicas promoveu otimização do trabalho em equipe e gerenciamento das atividades. A Inovação Tecnológica melhorou o acompanhamento das informações e a interlocução entre as demandas, trazendo resultados satisfatórios, dentro das limitações do serviço público atual.
**Descritores:** *COVID-19; Inovação Tecnológica; Gerenciamento de TI; Modernização do Setor Público.*

## RESUMEN

El objetivo del estudio es reportar la experiencia de utilizar metodología ágil no siguiendo el flujo de servicios para la formación ELMO. Gestión de proyectos siguiendo metodología ágil híbrida, modelo de envoltura SCRUM y fermentación Kanban. Los datos incluyen el monitoreo continuo de métricas registradas en tablas, tablas y gráficos, para el período de enero a julio de 2021. Se capacitaron 1443 profesionales de la salud. Se registró un total de 79 actividades, con 5% (n = 4) en "retraso", 8,9% (n = 7) en "refinación", 5% (n = 4) no "en curso", 25, 31% (n = 20) "en curso" y 55,7% (n = 44) "completado". Los ingresos totales se calcularon en 0,45 actividades / día. El uso de metodologías simplificadas en las organizaciones públicas promueve la optimización del trabajo en equipo y la gestión de actividades. La Innovación Tecnológica Mejorada sigue la información y la interlocución entre demandas, trazando resultados satisfactorios, dentro de las limitaciones del servicio público actual.
**Descriptores:** *COVID-19; Innovación Tecnológica; Gestión de TI; Modernización del Sector Público.*

# INTRODUCTION

The outbreak of respiratory disease caused by the new coronavirus (SARS-CoV-2) was detected in the city of Wuhan, China, at the end of 2019. In two months, thousands of cases of COVID-19 (current name of the disease) were confirmed in the world, resulting in countless deaths[1].

In Brazil, the first case of COVID-19 infection was reported in February 2020. Therefore, the number of cases increased rapidly, making the country the pandemic epicenter of America and second in the world in terms of diagnosed cases and deaths. This period was also characterized by the scarcity of numbers of mechanical fans and ICU beds available, associated with the collapse of the worldwide mechanical fan industry[2].

During the first wave of people infected by the disease in the state of Ceará, in April 2020, the idea of Helmet Cearense emerged, aiming at the development of a device that would allow the delivery of a mixture of oxygen gases and compressed air to the patient. Later, this device would become the ELMO, a name chosen for being associated with the model used by ancient warriors and meaning helmet in Portuguese. As it does not need a mechanical ventilator to function, the equipment has become an alternative non-invasive treatment for patients infected with COVID-19[3-5]. As a result, there was a great demand for the product, with no adequate support initially, which signaled the need for interventions with more dynamic methodologies.

The possibilities of measures to contain new cases consider interventions in the social structure, including adaptations in the work process and improvement in the training of professionals[6]. For them to be able to handle the helmet properly and because it is a new technology, qualified training of the health team is necessary. The Public Health School of Ceará (ESP/CE), as a training institution, since December 2020, has been training these professionals.

In this context, the Technological Innovation Center (NIT), active at ESP/CE, began to articulate strategies using agile methodology, with a SCRUM and Kanban model of activities[7]. The aim was to receive and organize the flow of assistance to professionals and institutions that needed to be trained. A differentiated management format for customer relationship was also used, the Costumer Relationship Management (CRM)[8].

In view of the above, this paper aims to report the experience of using agile methodology in managing and monitoring the flow of services for ELMO training.

# METHODS

The present study, with a descriptive and explanatory approach, is presented as an experience report. In this sense, it promotes a reflection on the use of an agile methodology in monitoring the flow of services for ELMO training and its organizational contribution to the practice of continuing education in the public sector.

The experience was lived at ESP/CE, covering the period from January to July 2021. A SCRUM model agile methodology was used to manage activities arising from demands associated with ELMO training. The activities were developed and organized on a shared board, divided into tabs such as: "backlog"; "refinement"; "to do"; "in progress" and "completed". The generated data were registered in spreadsheets, tables and graphs, created in the Excel program. The card classification percentages were calculated, in addition to the average flow rate of activities, also called throughput (number of activities completed/working days).

# RESULTS

The flow of services to meet ELMO training was implemented in a collaborative and virtual way, in the midst of the COVID-19 pandemic period. Professionals from various sectors of ESP/CE participated in this experience: Superintendence, Administrative-Financial Board, Center for Educational Development in Health, Legal Advice and the Technological Innovation Center.

There are currently two distinct flows of requests for training, one for professionals linked to the Unified Health System (SUS) in Ceará and the other for professionals originating from the public health system of other Brazilian states, autonomous or from the private sector. The main difference between the flows is the gratuity for the first situation and paid service in the second scenario. Communication with the training applicant was carried out through virtual service, on an institutional website (chat) and/or WhatsApp® application. For the management of customer information, the Bitrix® software was used, with a CRM approach.

1443 health professionals were trained, of which 87.7% (n=1265) presented themselves as linked to the SUS/CE and 12.4% (n=178) classified as self-employed or from the private sector. Of the total requests for paid training, 4.78% (n=13) were forwarded to the internal procedural flow and subsequent execution of the training, and 69.23% have already been carried out or are in progress. Dropouts were also registered

(30.77%), with possible justifications related to the delay in the process, amounts and bureaucracy in the documentation. Such issues are under consideration for further improvement.

The project management followed a hybrid agile methodology, involving some practices of the SCRUM model and the Kanban tool, available on a source code hosting platform with version control files (Github®). On this occasion, strategic roles were defined and ceremonies included in the work routine were defined, such as short-term meetings (daily), management and integration meetings with other areas, from graphic design laboratories, advertising, in addition to other concomitant projects.

As for the main activities, they were related to periodic planning; adjustments, with the development team, in institutional website and/or CRM; contribution to events and scientific production, in addition to monitoring the flow of processes to carry out the training. Demands were shared with the team for operationalization in a collaborative way via virtual or in person, allowing for more agility, transparency, organization and collective construction of ideas.

The actions generated cards, described in detail, with objective, context, scope and acceptance criteria. The development of each of these was recorded in the comments space, generating notifications in the Telegram® application. This was possible due to the robotic integration between the two programs, which made it easier for everyone on the team to recognize the progress of these demands.

A total of 79 activities were registered, managed through the ceremonies and development of weekly reports describing the productions. They were distributed as 5% (n=4) in "backlog"; 8.9% (n=7) in "refinement"; 5% (n=4) in the "to do"; 25.31% (n=20) "in progress" and 55.7% (n=44) "completed". Overall throughput was calculated at 0.45 activities/day.

## DISCUSSION

The study showed that there was great interest on the part of the population, both public and private, in the training offered, even for those who had not yet acquired the ELMO equipment. The context of the pandemic brought new needs to professionals working in health services, from knowledge about this technology, its implementation and adaptation to the work routine.

Since then, it has been an opportunity that has propelled a collaborative workday in a remote context. The ESP/CE Systems Development Center, after several meetings with the sectors involved in the process, adopted the CRM customer relationship management tool. It presented itself as a qualified business strategy aimed at understanding and anticipating the needs of current and potential training applicants.

In this experience, for strategic information management, SCRUM was an interesting agile method, which proposed the division of process flows into stages, providing the establishment of short-term goals, frequent and quick meetings to establish of priorities. This methodology is focused on aligning the development of projects with feedbacks, contributing to the planning and direction of actions, fundamental in the administration of constant improvements8, as noted in the report in question. For the ELMO project, the use of SCRUM, associated with the Kanban of activities, provided a better visualization of the demands and, consequently, enhanced its resolution, through a collaborative and transparent construction.

Public administrations have faced social and political demands to improve their performance. Project management is a practice that helps meet this demand. Oliveira et al.7 (2020) brought as results in their study that the greatest difficulties faced are the problems related to deadlines, the lack of knowledge and experience of the team about the methodology. They suggest that the SCRUM and Kanban approaches improve the project's prospects for success, reinforcing what was found in the present study, in which greater speed was observed in meeting external requests and organizing internal work.

The development cycle of internal activities related to ELMO training was carried out by checking the risks, estimating deadlines, costs and defining a list of priorities, according to emergency needs.

In this sense, it promotes a reflection on the use of agile methodology in monitoring the flow of services for ELMO training. It is considered that knowledge about the ELMO can be expanded, generating more research and dissemination of content, through extensive courses, workshops and other opportunities, in addition to the training already proposed. This provides an opportunity to strengthen this concept within the scope of the SUS.

## FINAL CONSIDERATIONS

The experience in managing a flow of services used an agile methodology for organizing and managing information, from tracking customer needs to the bureaucratic and regulated progress of processes in a public institution, also mediating business with the private sector.

ESP/CE, despite not having a service system already in place for ELMO training, managed to virtually organize an internal flow of processes, managing and adapting its various sectors to meet the emergency situation of the pandemic caused by the new coronavirus (SARS-CoV- two). This was only possible because the sectors involved were open to meet what was required, generating innovation and, as a consequence, the fulfillment of its mission to improve the population's quality of life.

The use of agile methodologies in this reported experience promoted optimization in the development of teamwork, communication, rhythm, planning and transparency of activities, greater quality in deliveries, measurement of what was produced and definition of indicators.

The importance of improvements in the suggested flow of services and in the ways of working is perceived, as they are in constant improvement. Adjustments are suggested regarding the processing time of the processes, communication between sectors, lower turnover of professionals in ESP/CE, among other issues. The public sector still presents difficulties in the performance of its workers, given the new proposals brought by Innovation in Technology, considering that this sector is in expansion.

The contribution of the NIT, in the management of assignments, through agile methodology, specific tools such as CRM software and an organized table of activities, allowed better monitoring of information and dialogue between the demands of other sectors, bringing satisfactory results, within the limitations of the current public service.

## REFERENCES

1. Brasil. Ministério da Saúde. Protocolo de manejo clínico da Covid-19 na Atenção Especializada; 2020[citado em 20 agosto 2021]. Disponível em: https://portaldeboaspraticas.iff.fiocruz.br/wp-content/uploads/2020/04/manejo_clinico_covid-19_atencao_especializada.pdf.
2. Tomaz BS. Eficácia de um novo tipo de capacete para oferta de CPAP, o elmo, no tratamento da insuficiência respiratória aguda hipoxêmica secundária à Covid-19 [dissertação]. Universidade Federal do Ceará; 2021.
3. Holanda MA, Tomaz BS, Menezes DGA de, Lino JA, Gomes GC. ELMO 1.0: a helmet interface for CPAP and high-flow oxygen delivery. Jornal Brasileiro de Pneumologia [online]. 2021; 47(2):e20200590. Disponível em: http://www.jornaldepneumologia.com.br/details/3501/en-US/elmo-1-0--a-helmet-interface-for-cpap-and-high-flow-oxygen-delivery.

4. Bello G, De Pascale G, Antonelli M. Noninvasive Ventilation. Clin Chest Med [online]. 2016; 37(4):711-721.Disponível em: https://www.ncbi.nlm.nih.gov/pubmed/27842751.

5. Pontes SMP, Melo LHP. Maia NPS, Nogueira ANC, Vasconcelos TB, Pereira EDB, Bastos VPD, Holanda MA. Influence of the ventilatory mode on acute adverse effects and facial thermography after noninvasive ventilation. Jornal Brasileiro de Pneumologia [online]. 2017; 43(2):87-94.  Disponível em: https://www.ncbi.nlm.nih.gov/pubmed/28538774 .

6. Gouveia GPM, Gouveia SSV, Vasconcelos SS, Silva ESM, Medeiros RG, Silva RL. Incidência e letalidade da covid-19 no Ceará, 2020. Cadernos ESP [online]. 2020 [citado em 12 agosto 2021]; 14(1):10-16. Disponível em: https://cadernos.esp.ce.gov.br/index.php/cadernos/article/view/326.

7. Oliveira RA de, Zych DR, Oliveira J de, Michaloski AO. Desafios no uso de metodologias ágeis de gestão de projetos em órgãos públicos: um estudo de caso da Receita Estadual do Paraná. Rev Gestão e Projetos [online]. 2020. 11(2):12-36. Disponível em: https://periodicos.uninove.br/gep/article/view/16522.

8. Da Silva RPM. Implementação de CRM para viabilização de marketing de relacionamento: um estudo de caso [tese]. Rio de Janeiro: Fundação Getúlio Vargas; 2002.