MAPPING DIGCOMPRO ONTO THE ANAF PLATFORM: AN OPERATIONAL FRAMEWORK

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Abstract: *The digitalization of tax administration has reshaped the structure of citizen–state interaction. In Romania, this transformation encompasses a set of digital services and systems whose use is mandatory for specific taxpayer categories or legally defined operations. Effective engagement depends on infrastructure availability and on users' capacity to perform concrete digital tasks. This article identifies the digital competence requirements generated by selected ANAF services through operational decomposition, mapping them against DigComp 2.2 and its national adaptation, DigCompRo. The study develops an Operational Framework (OF)—an analytical matrix correlating digital tax services, user operations, activated competences, and estimated minimum competence levels. Conceptually, the contribution lies in treating digital services, operations, and competences as distinct analytical objects; methodologically, it proposes a procedure for translating platform tasks into competence requirements. The findings show that the five main competence domains are activated unevenly across the nine services analyzed.*
Keywords: DigCompRo; DigComp 2.2; ANAF; e-government; digital competences; operational framework; platform-generated competence requirements; digital skills policy; public administration.
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Introduction

The digitalization of public administration has changed far more than the channel through which citizens submit documents to the state—it has reshaped the structure of administrative interaction itself (Mountasser & Abdellatif, 2023; Smagulova et.al, 2025). At the European level, the Digital Decade Agenda sets measurable targets for online public services, digital competencies, and infrastructure, while the fiscal digitalization agenda advances electronic invoicing and digital reporting (European Commission, 2025a, 2025b; Eurostat, 2026a Smagulova et.al, 2025). Romania has followed this trajectory by gradually transforming the Ministry of Finance's national agency of fiscal administration (ANAF) into an increasingly integrated digital tax ecosystem. (Nedelescu, 2021; ANAF, 2024, 2026; Romanian Government, 2021; Ministry of Finance, 2026). ANAF's integrated digital tax ecosystems are based on a platform that encompasses all digital services, systems, and interfaces, each component of which is structurally distinct. This platform facilitates automation, structured reporting, and tighter integration between taxpayers and the fiscal authority. (Guiu, 2025; Nedelescu, 2021; Petras, 2023). The Romanian digital fiscal reform presents many benefits and challenges. Eurostat data for 2025 show that Romania recorded the lowest rate of public authority website use in the EU, at 24.1%, compared with an EU average of 71.9% (Eurostat, 2026a). Within the Romanian tax domain, 92.9% of individual taxpayers who filed online received no training, and 75.4% received no assistance—meaning a declaration submitted online may reflect the work of an accountant or software rather than the taxpayer's own competence (Petraș, 2023). The e-government literature treats digital competence as a precondition for effective participation (Morte-Nadal & Esteban-Navarro, 2022, 2025; van Dijk, 2020), and DigComp 2.2 offers a robust vocabulary for describing it across domains and levels of complexity (Vuorikari et al., 2022). At the European level, the Digital Competence Framework for Citizens — DigComp — was developed

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to provide a shared and coherent understanding of what digital competence means across member states, serving as a common reference point for policy, education, and training (European Commission, 2022). Its significance has grown considerably since the adoption of the Digital Decade targets, which set the ambition that at least 80% of the adult population across the EU should possess basic digital skills by 2030, placing digital literacy firmly at the heart of public policy agendas. Romania has responded to this framework by developing DigCompRo, which add a sixth foundational domain covering basic device use, attitudes toward digitalization, and awareness of digital transformation — an addition that directly addresses the needs of population segments with limited prior exposure to digital technology. (Romanian Government, GEO nr 27/2025).

By digital competences, in this paper we refer to those **defined by DigComp 2.2 and operationalized through DigCompRo**. In this context, our research objective is to analyze which digital competencies users should have for the platform's main interactions. The central research question is, "Which **digital competences are necessary for the effective use of selected ANAF digital tax services?"** The question follows a conceptual-deductive method targeting platform-generated requirements rather than subjective user limitations. Our approach is qualitative, analyzing the ANAF platform's online taxation services section and selecting the main services used by citizens. Each service was decomposed into operations that could be executed by users. To each operation was allocated a Digicomp descriptor. As a result, an Operational Framework (OF) is proposed. It includes a four-level analytical matrix correlating ANAF services, taxpayers' concrete operations, activated DigCompRo competences, and estimated minimum competence levels. The OF identifies platform-imposed demands and potential user friction points; it does not diagnose individual taxpayers. The article makes three contributions: methodologically, a procedure of operational decomposition mapping fiscal services onto competencies; conceptually, the treatment of services, operations, competencies, and levels as analytically distinct objects; practically, an OF serving as a diagnostic tool for requirements generated by ANAF services and for grounding digital education programs.

The findings carry practical relevance for several distinct audiences. Individual taxpayers benefit from a concrete understanding of which digital skills are actually required to navigate ANAF services effectively, replacing broad and often unhelpful assumptions with platform-grounded expectations. For educators and trainers, the framework offers an anchor for curriculum design that is rooted in operational reality rather than abstracted competence lists. Fiscal authorities and UX designers gain a systematic overview of where service complexity is most likely to generate user difficulties, informing both platform improvements and communication strategies. Policymakers and stakeholders responsible for national digital competence agendas, in turn, find in this framework a principled basis for aligning training priorities with the actual demands that public digital services place on citizens.

The article structure is the follow. Section 2 reviews the literature on DigComp 2.2, DigCompRo, and fiscal digitalization in Romania. Section 3 presents the research design and decomposition procedure. Section 4 applies the OF matrix. Section 5 offers conclusions, limitations, and directions for future research.

Literature Review

DigComp 2.2 and DigCompRo: conceptual granularity and operational applicability

DigComp 2.2 organizes digital competence into five domains—information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving—across 21 competences and eight proficiency levels grouped into four broad categories: foundational, intermediate, advanced, and highly specialized (Vuorikari et al., 2022). Its value for this study lies not in generating a global literacy score but in granularity: the framework distinguishes between locating information, evaluating data, managing digital identity, creating

content, protecting data, and resolving technical problems—actions that are not interchangeable within a digital tax ecosystem.

DigCompRo adapts this model to the Romanian institutional context. Adopted through Government Emergency Ordinance No. 27/2025, it constitutes the national reference standard for citizens' digital competences (Romanian Government, 2025). It should not be reduced to a transposition of DigComp 2.2 with Domain 0 appended: DigCompRo has its own six-domain structure, introduces Domain 0, and maps competences to the European framework in a context-specific way. In this article, Domain 0 is treated as a transversal precondition; the analysis focuses on Domains 1–5, which describe the operations the platform actually demands. DigComp 2.2 and DigCompRo are conceptually compatible but not perfectly equivalent. DigComp 2.2 uses eight proficiency levels; DigCompRo uses four general levels elaborated into eight secondary levels, enabling correlation without rigid psychometric equivalence (Romanian Government, 2025). The competence levels estimated in this article therefore represent minimum theoretical requirements derived from task complexity, not individual scores. This dual anchoring ensures European comparability and Romanian institutional relevance simultaneously.

Crucially, DigCompRo is not used here as a testing tool—it functions as a mapping grid, reversing the direction of application from platform operations toward competence descriptors rather than from individual toward score. Prior work has used DigComp for competence assessment, digital inclusion, or curriculum design (Nguyen et al., 2024; Morte-Nadal & Esteban-Navarro, 2022, 2025; Van Audenhove et al., 2024). None addresses the operational question pursued here: what competences does the concrete use of a regulated digital tax ecosystem actually require? Rather than measuring persons, the framework here decodes the platform.

The Digitalization of Romanian Tax Administration: Trajectory and Context

The first phase of fiscal digitalization in Romania digitized existing procedures—forms and legislation moved online—without fundamentally altering the compliance logic. Taxpayers continued to rely on physical documents, counter interactions, and traditionally delivered administrative guidance (Damaschin & Mihăilă, 2020). A digital base was established without yet constituting a functional digital tax ecosystem. The launch and expansion of the Virtual Private Space (SPV) marked a qualitative shift. SPV is a free, permanently accessible digital service through which taxpayers access fiscal information, receive official documents, and use ANAF's electronic services (ANAF, 2026). For this study, SPV is both a service and a gateway: it transforms the fiscal interaction into an authenticated digital experience requiring credential management, section navigation, interpretation of official communications, and fluid movement across functionalities. Post-2020 digitalization introduced structurally distinct components. SAF-T is not an application but a standard audit file transmitted through Declaration D406; the taxpayer's operational obligation is expressed through preparing and submitting D406 (ANAF, 2026). RO e-Factura involves receiving, storing, and transmitting electronic invoices, verifying document structure, and applying the Ministry of Finance's signature when technical requirements are met (Romanian Government, 2021). RO e-Transport monitors road goods transport subject to regulation (ANAF, 2024). RO e-TVA includes a pre-filled VAT return fed by structured fiscal data (Ministry of Finance, 2026). All confirm the same trajectory: tax compliance is increasingly mediated by structured data, digital workflows, and system-driven validations. These systems are not uniformly mandatory for all taxpayers: mandatory use applies to specific categories, operations, or legally defined relationships—a distinction essential for avoiding overgeneralization. RO e-Factura illustrates the paradigm shift most clearly: moving from PDF or unstructured formats to structured XML changes the user's task fundamentally, requiring an understanding of the relationship between format, structure, transmission, and procedural effect.

A legal clarification is required: RO e-Factura does not legally validate the economic reality or fiscal content of a transaction. It verifies invoice structure, applies the Ministry's signature under

regulatory conditions, and confers procedural effects on the communication. Legality, compliance, and regularity of the underlying transaction remain subject to applicable fiscal rules (Romanian Government, 2021; Stănciulescu, 2023). More broadly, mandatory digitalization and autonomous competence are distinct phenomena. High online submission rates can coexist with low autonomous competence because mediated use—through accountants, legal representatives, or family members—is pervasive and masks operational difficulties. For competence analysis, the intrinsic task structure of services matters more than the administrative outcome.

The analytical gap is the absence of a systematic user-perspective mapping of competence requirements. OECD (2023) recommends user-centered digital governance for Romania; Burlacu et al. (2025) link e-government success to digital skills and coherent training. This article contributes a competence map specific to the digital tax ecosystem, formulated from the perspective of the operations taxpayers must perform. RO e-Transport and RO e-TVA are excluded from the current OF due to their sectoral and logistical complexity and remain topics for future research.

Digital literacy in e-government contexts

The e-government literature's foundational models—TAM, UTAUT (Venkatesh et al., 2003)—explain adoption attitudes and intentions; digital divide research explains access, competence, and outcome gaps (Scheerder et al., 2017; van Dijk, 2020). Both operate at a level of analysis different from the operational question pursued here: what does the platform demand, step by step, for the completion of a valid fiscal interaction?

Recent research confirms the importance of digital literacy in e-government contexts. Duan and Dong (2025) show how digital literacy shapes perceived usefulness and use behavior; Morte-Nadal and Esteban-Navarro (2025) call for greater attention to citizens' capabilities and service design. Relevant as these contributions are, none provides a detailed operational mapping for a mandatory digital tax ecosystem. Literature searches combining "DigComp" with "task analysis", "digital tax platform", or "e-government competence requirements" reveal no studies combining operational decomposition of a digital tax platform with DigComp/DigCompRo mapping and minimum competence level estimation. The Romanian case sharpens this absence. DigCompRo provides a normative competence framework; the digital tax ecosystem structures fiscal communication and compliance with growing comprehensiveness. The intersection of these two realities defines the research object: competence requirements generated by digital tax systems, distinct from declared or measured user competences. The Operational Framework developed in Section 3 addresses this gap by correlating four elements: the fiscal service, the required operations, the activated competences, and the estimated minimum competence level.

Methodology

Delimitation of the object of study and research design

The study's methodological approach is analytical, deductive, and task-oriented. Its purpose is to identify the digital competence requirements generated by the use of selected digital tax components, rather than to measure taxpayers' performance directly. Accordingly, the research does not use questionnaires, competence tests, experiments, platform analytics, or direct user observation. It constructs an analytical framework through which the tasks required by the platform become visible and comparable.

The object of study is not defined by the generic term "applications". Although useful in everyday language, this term is too narrow methodologically, because it refers primarily to the software interface visible to the user. This article therefore uses the formulation "digital tax components", which includes electronic tax services, standardised reporting tools, SPV functionalities, and regulated tax information systems. The delimitation is based on the terminology used in ANAF documents and in the relevant legal acts, rather than on informal platform names (ANAF, n.d.; GEO No. 116/2023; OPANAF Order No. 1783/2021; GEO No. 120/2021; GEO No.

41/2022; GEO No. 70/2024). This choice is important because the elements analysed do not have the same legal and functional nature. The Virtual Private Space (SPV) is treated as an electronic tax communication service, as ANAF presents it as a free, permanently accessible service through which users can receive tax information, tax-administrative acts, and access to other electronic services. SAF-T is understood as a Standard Audit File for Tax, transmitted through the D406 informative return; at the infrastructure level, it is associated with the national RO e-SAF-T information system. RO e-Factura, RO e-Transport, and RO e-TVA are treated as tax information systems or national systems integrated into the tax administration infrastructure. The article does not claim that all these components are mandatory for all taxpayers and in all situations. The more accurate formulation is more nuanced: they are digital tax services, tools, or systems whose use is mandatory for certain categories of taxpayers, operations, or flows provided for by law. This clarification prevents two conceptual conflations: on the one hand, reducing the entire digital tax ecosystem to a simple collection of applications, and on the other, unjustifiably extending digital obligations to all taxpayers.

The research design starts from four analytical reference points: the digital tax component, the operation performed by the taxpayer, the DigCompRo competence activated, and the estimated minimum level. A detailed explanation of this relationship is developed in the Operational Framework, in order to avoid repeating the same logic across several sections.

Selection of digital tax components and methodological framing

The selection of components was guided by functional diversity rather than by an exhaustive inventory of the ANAF ecosystem. The components retained capture different types of digital tax interaction that could plausibly be used by non-specialist taxpayers: authentication, filing, consultation, institutional communication, verification, procedural monitoring, and the management of a high-stakes digital tax flow.

The inclusion criteria were: relevance for the non-specialist taxpayer; a reasonable likelihood of use in routine tax interaction; operational diversity; accessibility through the official ANAF digital environment or services connected to it; and the possibility of decomposition into observable operations. Components involving advanced logistical, accounting, cross-border, or tax reconciliation flows are retained in the delimitation of the ecosystem, but are not included in the applied OF matrix.

Table 1. Operational delimitation, methodological classification, and analytical treatment of digital tax components

Digital tax component	Methodological classification	Treatment in the OF	Methodological rationale
Virtual Private Space (SPV)	Electronic tax communication service	Selected	It is the gateway service for authenticated interaction with ANAF and supports access to other electronic services.
Single Tax Return (D212)	Tax return/form submitted electronically	Selected	It involves locating the form, completing tax data, validating it, and submitting it electronically.
Digital requests to ANAF	Electronic institutional communication service	Selected	It involves choosing the appropriate channel, drafting a request, attaching documents where applicable, and tracking the response.
Requesting, receiving, and consulting the taxpayer account statement	Tax consultation functionality/service through SPV	Selected	It requires accessing tax information, interpreting balances, and identifying any discrepancies.
Downloading electronic returns	Electronic document management functionality	Selected	It represents a flow for retrieving, saving, and organising digital tax documents.

Digital tax component	Methodological classification	Treatment in the OF	Methodological rationale
Verification of electronic documents issued through SPV	Document verification/authentication service	Selected	It enables verification of the authenticity and integrity of electronic documents communicated through SPV.
Consulting outstanding payment obligations to public budgets	Tax consultation service	Selected	It involves reading and interpreting current tax obligations and choosing any subsequent action.
Status of the processing of a VAT return with a negative amount	Procedural monitoring service	Selected	It captures the monitoring of an administrative flow and the interpretation of messages concerning the status of the procedure.
RO e-Factura	Tax information system / national electronic invoicing system	Selected	It includes generating or uploading XML invoices, structural validation, submission, interpretation of errors, and archiving.
SAF-T / D406 / RO e-SAF-T	Standard Audit File for Tax, informative return, and tax information system	Excluded from the applied OF matrix	It is relevant to the digital tax ecosystem, but involves technical tax-accounting reporting and a more specialised organisational or professional profile.
RO e-Transport	Tax information system / national transport monitoring system	Excluded	It has a sector-specific logistics profile, distinct requirements regarding transport data, and a monitoring logic that requires separate analysis.
RO e-TVA	National information system and pre-completed VAT return	Excluded	It belongs to a flow of reconciliation and operational use of VAT data that is more specialised than the non-specialist taxpayer profile analysed here.
Form 707	Specialised tax form	Excluded	It represents a more specific filing scenario and is less central to the operational set targeted here.
Automatic ANAF notifications	Passive communication/notification function	Excluded	It overlaps with platform interaction and information reception, without adding a distinct operational flow.
Online appointments	Generic appointment-management function	Excluded	It does not add distinct digital tax requirements beyond the general operation of a web interface.
EU VAT refund	Cross-border digital tax procedure	Excluded	It targets a specialised cross-border scenario that would require a dedicated analysis.

The final selection retains nine components for the applied OF matrix: SPV, the Single Tax Return D212, digital requests to ANAF, the taxpayer account statement, downloading electronic returns, verification of electronic documents issued through SPV, consultation of outstanding tax obligations, monitoring the status of VAT refund processing, and RO e-Factura. The exclusions do not indicate a lack of institutional relevance but only that those components have more specialised user profiles or require a distinct analytical framework.

The Operational Framework (OF) and the grid for estimating levels

The concept of an operational framework has been defined and applied in diverse ways in the management and systems literature. Stretton (2021) understands it as a structure that organises the relationships between strategic objectives, operational activities, and implementation processes. Taelman et al. (2020) use it as an integrated analytical model that connects processes, tasks, actors, and implementation requirements. For Al Majali (2023), the operational framework functions as an organisational structure and as a mechanism for aligning activities, processes, and functional requirements. Globocnik et al. (2020) approach it as a formal control instrument between planning and execution, while Bakam et al. (2022) emphasise its diagnostic dimension in identifying critical

points and operational complexity. The common element of these approaches is their relational logic. An operational framework does not inventory isolated elements, but organises the relationships between them. The present study adopts this logic and defines the Operational Framework (OF) as an analytical structure for relating digital tax components, taxpayer operations, activated DigCompRo competences, and estimated minimum competence levels. The OF is not a software tool, a mathematical model, an IT architecture, or a psychometric assessment. It is a methodological procedure through which the competence requirements generated by the platform are made explicit. The result of this approach is a four-level matrix. Table 2 presents the architecture of the OF and clearly separates the object analysed, the user's action, the digital competence, and the estimated minimum level. This separation is necessary to prevent the methodology from conflating the tax service with the operation, the operation with the digital competence, or the digital competence with the performance level.

Table 2. Architecture of the Operational Framework

Level	Content	Function in the analysis
Level 1	Digital tax component / digital tax service analysed	Identifies the institutional, technical, or procedural point of interaction with the tax administration.
Level 2	Digital operations performed by the taxpayer	Decomposes the component into concrete, observable, and user-executable actions.
Level 3	DigCompRo competences activated	Links the operations to the digital competences required to complete the task.
Level 4	Estimated minimum competence level	Estimates the minimum threshold required to complete the task under normal conditions of use.

DigComp 2.2 serves as the conceptual framework for structuring digital competences, while DigCompRo provides the national operational reference for expressing proficiency levels, with the correspondence between the two presented in Table 3. The analysis focuses exclusively on operations associated with the functional domains relevant to the use of ANAF digital tax services, excluding the activities of technical specialists or fiscal experts involved in designing and managing digital infrastructures. Accordingly, the proficiency levels retained are basic, intermediate, and advanced, the highly specialised level being inapplicable to the profile of the non-specialist taxpayer. Although the compatibility between the eight levels of DigComp 2.2 and the four general levels of DigCompRo is useful for mapping purposes, it does not imply full psychometric equivalence between the two frameworks (Vuorikari et al., 2022; GEO No. 27/2025)

Table 3. Mapping DigCompRo in relation to DigComp 2.2 (GEO nr 27/2025, Appendix 3 **)**

DigCompRo (2024)	DigComp 2.2 (2022)
0. Foundations, access and attitudes towards digital transformation	
0.1. Use of digital devices and technologies	
0.2. Exploring digitalization and digital transformation	
0.3. Constant, ethical and inclusive engagement in the digital world	5.4. Identifying digital competence gaps
1. Information and data literacy	
1.1. Browsing, searching and filtering data, information and digital content	1.1. Browsing, searching and filtering data, information and digital content
1.2. Evaluating data, information and digital content	1.2. Evaluating data, information and digital content
1.3. Managing data, information and digital content	1.3. Managing data, information and digital content
2. Communication, interaction and collaboration	
2.1. Interaction through and with digital technologies	2.1. Interaction through digital technologies 2.5. Netiquette
2.2. Sharing and collaboration through digital technologies	2.2. Sharing through digital technologies 2.4. Collaborating through digital technologies
2.3. Active citizenship through media and digital technologies	2.3. Engaging in citizenship through digital technologies

	2.5. Netiquette
2.4. Managing digital identities	2.6. Managing digital identity
3. Digital content creation	
3.1. Developing digital content	3.1. Developing digital content
3.2. Integrating and reusing digital content	3.2. Integrating and re-elaborating digital content
3.3. Creating, understanding and respecting copyright and licences	3.3. Copyright and licences
3.4. Programming	3.4. Programming
4. Safety and sustainable use of resources	
4.1. Protecting devices	4.1. Protecting devices
4.2. Protection of personal data and data confidentiality	4.2. Protection of personal data and data confidentiality
4.3. Protecting health and well-being	4.3. Protecting health and well-being
4.4. Protecting the environment	4.4. Protecting the environment
5. Problem solving and entrepreneurship	
5.1. Solving technical problems	5.1. Solving technical problems
5.2. Identifying needs and technological responses	5.2. Identifying needs and technological responses
5.3. Creative and innovative use of digital technologies	5.3. Creatively using digital technology
5.4. Identifying entrepreneurial opportunities and creating added value/ benefits through digital technologies	
5.5. Adopting options for a sustainable digital future	

Methodological grid estimates three minimum competence levels: **Basic** covers simple, familiar actions such as navigation, authentication, downloading, and saving files. **Intermediate** covers tasks requiring form completion, basic tax-data interpretation, document submission, response tracking, and routine error management. **Advanced** covers regulated and technically complex flows involving structured files, validations, system messages, error correction, and administrative or fiscal consequences.

Operational decomposition and DigCompRo mapping procedure

Each selected component was decomposed into the operations that the taxpayer actually performs while using the service or system. The analysis does not treat the platform as an isolated technical object but follows the structure of the actions required of the user: authentication, navigation, service selection, downloading, completion, uploading, submission, verification, interpretation, status tracking, responding to errors, and archiving. The mapping procedure has four steps. First, the digital tax component is defined as the unit of analysis. The component is then decomposed into observable taxpayer operations. In the third step, each operation is linked to the most directly relevant DigCompRo descriptor. In the fourth step, the estimated minimum level is assigned by applying the grid in Table 3. The same component may activate competences from several DigCompRo domains, but each competence is retained only if it is directly connected to an operation within the flow.

Authentication in SPV illustrates the mapping logic. The user accesses the ANAF portal, identifies the SPV section, uses login credentials or a digital certificate, and navigates within the authenticated space to locate the desired service. These operations activate competence 1.1(text) , because the user finds and accesses the relevant digital environment; competence 2.4, because authentication involves the management of a digital identity; and competence 2.1, because the user interacts functionally with the platform after authentication. The estimated minimum level for this task is basic. The operations are sequential, repetitive, and relatively familiar. They do not require the production of a tax document, the interpretation of complex tax data, or the resolution of advanced technical errors. The example also shows why SPV is analysed as a gateway service: it does not exhaust the complexity of the ANAF ecosystem, but it conditions access to many of the authenticated interactions examined in the matrix. For consistency, the mapping applied two additional rules. Competence 4.2, concerning the protection of personal data and privacy, is activated only when the user actively submits, uploads, validates, modifies, or archives sensitive tax or personal data. The passive consultation of data displayed in the platform is not sufficient to activate this competence separately. Competence 5.2, concerning the identification of needs and

technological responses, is activated only when the user must choose a channel, function, tool, or subsequent digital action; merely understanding tax content remains within the scope of competence 1.2. The estimation of the minimum level is not an assessment of actual users. It is a methodological inference derived from the complexity of the operation, the degree of autonomy required, the type of data handled, the existence of technical formats, the need for interpretation, and the possible administrative consequences of an error. The levels reported represent theoretical minimum requirements generated by the structure of the digital task.

Results and discussion

The applied OF matrix and mapping results

The application of the OF to the nine selected components shows that the ANAF digital ecosystem does not require a uniform level of digital competence. Some interactions remain close to the basic level because they involve authentication, navigation, downloading, or local saving. Others require intermediate competences because they include completion, submission, interpretation, or status tracking. RO e-Factura occupies a distinct position because of the technical and procedural complexity of the flow. The delimitation of the operations was grounded in the official functionalities of the services analysed. For SPV, the analysis considered access, communication, and receipt of tax documents; for the Single Tax Return D212, the stages of completion, verification, and submission; for electronic document verification, the function of checking the authenticity and integrity of documents communicated through SPV; and for RO e-Factura, the operations related to generating, validating, submitting, and managing the electronic invoice (ANAF, n.d.; ANAF, 2025; Ministry of Finance, n.d.; Ministry of Finance Order No. 1365/2021).

Table 4. Applied OF matrix: digital tax components, operations, DigCompRo competences, minimum levels, and mapping justification

Component	Main digital operations	DigCompRo competences activated	Estimated minimum level	Justification of the mapping and the minimum level
SPV - electronic tax communication service	Identifying the service in the ANAF portal; accessing SPV; authenticating through an account or digital certificate; verifying the digital identity; consulting menus, messages, and notifications; accessing communicated documents; downloading relevant documents; closing the session/logging out.	1.1; 2.1; 2.4	Basic	The mapping to 1.1 is justified by searching and navigating within the portal; 2.1 by interaction with the tax administration through a digital service; and 2.4 by authentication and the management of digital identity. The basic level is appropriate because the flow is sequential, repetitive, and relatively familiar, without the production of a tax document or complex tax interpretation.
Single Tax Return D212 - electronically submitted tax return	Locating the form or filing service; selecting the fiscal year and the type of return; retrieving or completing identification data; entering income, deductions, and contributions; checking fields and amounts; validating the form; correcting reported errors; submitting the return; checking the acknowledgement receipt; saving the copy.	1.1; 1.3; 3.1; 4.2	Intermediate	The mapping to 1.1 and 1.3 derives from identifying the form and managing tax data; 3.1 is activated by completing digital tax content; and 4.2 by processing personal and tax data. The intermediate level is justified because the user does not merely access information, but produces and submits a tax document with administrative effects, while any errors must be identified and corrected.

Component	Main digital operations	DigCompRo competences activated	Estimated minimum level	Justification of the mapping and the minimum level
Digital requests to ANAF - electronic institutional communication service	Identifying the type of request; choosing the appropriate channel or form; drafting the request; completing identification data; attaching supporting documents, where applicable; checking the information submitted; submitting through SPV; tracking the registration number; reading the response received.	5.2; 1.3; 2.1; 3.1; 4.2	Intermediate	The mapping includes 5.2 because the user must choose the digital service appropriate to their need; 2.1 because they interact with the tax administration; 3.1 because they formulate digital content; and 1.3 and 4.2 because they manage and submit personal or tax data. The intermediate level is justified by the need to formulate the request correctly, attach relevant documents where applicable, and track the institutional response.
Taxpayer account statement - tax consultation service through SPV	Accessing the service; requesting the statement; selecting the taxpayer and/or period; opening the document; reading balances, obligations, and payments; comparing the information with the user's own records; identifying any discrepancies; downloading/exporting the statement; determining a subsequent action, if necessary.	1.1; 1.2; 1.3; 5.2	Intermediate	The mapping to 1.1 and 1.3 is supported by accessing, retrieving, and managing tax information; 1.2 is activated by the evaluation and interpretation of data; and 5.2 by the choice of a subsequent course of action. The intermediate level is necessary because the task is not limited to viewing: the user must understand balances, payments, obligations, and possible inconsistencies. Comparison with the user's own records is not a technical function of the platform, but a cognitive operation relevant to the competence level.
Downloading electronic returns - document management functionality	Accessing the documents or returns section; filtering by period, type of return, or taxpayer; selecting the document; downloading the file; checking the format; saving locally; organising it into folders; keeping a copy for later use.	1.1; 1.3; 4.1	Basic	The mapping to 1.1 and 1.3 results from locating and managing digital documents; 4.1 is justified by the secure storage of files. The basic level is appropriate because the operation involves retrieving and organising files, without completion, submission, or substantial tax interpretation.
Verification of electronic documents issued through SPV - verification service	Identifying the document to be verified; accessing the verification service; entering the code or requested identifiers; initiating the verification; reading the result; interpreting the valid/invalid result; identifying an error or discrepancy; saving the result; formulating a clarification, if necessary.	1.2; 4.1; 4.2; 5.1	Intermediate	The mapping to 1.2 is justified by evaluating the verification result; 4.1 and 4.2 by controlling document integrity and protecting data; and 5.1 by responding to technical errors or discrepancies. The intermediate level is justified because the user must interpret the validation result and decide whether further action is needed.
Outstanding tax obligations - tax consultation service	Accessing the dedicated section; selecting the taxpayer and/or period; reading the types of obligations; identifying amounts, due dates, and ancillary charges; comparing them with payments made; connecting the information with payment or clarification options; choosing a subsequent action: payment, further verification, or a request for clarification; saving relevant evidence.	1.1; 1.2; 5.2	Intermediate	The mapping to 1.1 and 1.2 is justified by accessing and interpreting tax information; 5.2 by choosing a subsequent digital or administrative solution. The intermediate level is appropriate because the user must understand the tax significance of the amounts, due dates, and ancillary charges, rather than merely view the information.

Component	Main digital operations	DigCompRo competences activated	Estimated minimum level	Justification of the mapping and the minimum level
VAT refund status - procedural monitoring service	Identifying the return or file; accessing the monitoring service; entering/selecting the relevant data; reading the status; interpreting procedural messages; tracking deadlines; identifying any requests from the tax administration; identifying the need for clarification or subsequent action; archiving the information.	1.2; 2.1; 5.2	Intermediate	The mapping to 1.2 is supported by the interpretation of procedural status; 2.1 by interaction with the tax administration; and 5.2 by choosing an action according to the status of the file. The intermediate level is justified because the user follows an administrative process and must understand the consequences of each status, without the service necessarily involving the production of a new document.
RO e-Factura - tax information system / national system	Preparing invoice data; generating the electronic/XML invoice; uploading or submitting it through the applications available in the portal or through technical integration, as applicable; structural validation; reading error messages; correcting and resubmitting, where applicable; downloading the valid copy; consulting invoices received and sent; storing/archiving documents; protecting commercial and tax data.	1.3; 3.1; 4.1; 4.2; 5.1	Advanced	The mapping to 1.3 is justified by managing files and structured data; 3.1 by generating digital tax content; 4.1 and 4.2 by file security and data protection; and 5.1 by handling validation errors. The advanced level is justified because the flow involves structured files, technical validations, error correction, data protection, and administrative consequences in the event of incorrect submission.

Methodological note. The operations in the table do not represent an exhaustive official procedure for using each service but a methodological decomposition of the user's main observable digital steps. They were identified on the basis of the functionalities described in official ANAF/Ministry of Finance sources and are used to map DigCompRo competences and estimate the minimum level. The minimum level does not represent an average of the operations, but the level required by the most demanding stage in the flow. Domain 0 competencies are treated as general prerequisites for digital access and are not repeated in every row of the matrix.

Patterns emerging from the matrix and domain-level DigCompRo analysis

The OF matrix highlights several recurring patterns concerning the activation of DigCompRo domains and the distribution of minimum competence levels.

Domain 1 is present in all nine components analysed. Competence 1.1 supports navigation, service access, and document retrieval; competence 1.2 is activated where tax information must be evaluated, as in the taxpayer account statement, outstanding obligations, or VAT refund status; and competence 1.3 covers the organisation, saving, completion, or submission of tax data and files. In this sense, information literacy is not merely a general background ability but an operational condition for meaningful interaction with the platform (Duan & Dong, 2025).

Domain 2 is activated through interaction with the platform and through the management of digital identity. Competence 2.4 covers registration and authentication in SPV, where digital identity functions as an access gateway. Competence 2.1 covers functional interaction with ANAF through SPV, including the submission of requests and the monitoring of VAT refund status. A taxpayer who cannot authenticate or manage access data is effectively blocked from an important part of the digital tax ecosystem (Morte-Nadal & Esteban-Navarro, 2025).

Domain 3 appears in fewer components, but its stakes are high. The Single Tax Return, digital requests, and RO e-Factura require the user to produce a document or digital content that enters an institutional circuit. The advanced level in RO e-Factura results from the structured nature of XML invoices and the need to interpret validation messages, not merely from the fact that a digital document is produced.

Domain 4 appears selectively in flows where the user actively manages tax files or sensitive personal and tax data. Competence 4.1 covers the protection of downloaded, validated, stored, or archived files. Competence 4.2 becomes relevant in submissions, uploads, validations, or archiving of data, not in the simple passive consultation of information. This delimitation keeps the analysis proportionate to administrative, procedural, and confidentiality risks.
Domain 5 is activated when the taxpayer must respond to a technical, procedural, or flow-related uncertainty. Competence 5.1 appears in the verification of electronic documents and in RO e-Factura, where validation errors or system messages may occur. Competence 5.2 appears when the user must choose a channel, function, or subsequent digital step. The application of these rules explains why Domains 4 and 5 appear selectively only in flows that involve active data management, errors, validations, or the choice of a subsequent digital action.

Distribution of competence levels and interpretation of results

The distribution of minimum levels is uneven, but coherent. Two components - SPV and the downloading of electronic returns—fall at the basic level. Six components require at least intermediate competence: D212, digital requests, the taxpayer account statement, verification of electronic documents, outstanding tax obligations, and VAT refund monitoring. RO e-Factura is the only component classified at the advanced level, because it concentrates technical and procedural operations with significant tax stakes.

This distribution shows that using ANAF is not a single generic act of online access. It is a sequence of operations: authentication, localization, consultation, completion, submission, verification, interpretation, validation, and archiving. Each operation activates a different configuration of competences. The platform, therefore, cannot be adequately described through a general statement about digital literacy; it must be analyzed at the level of specific tasks.

The relationship between these requirements and the low use of digital public services in Romania must be formulated cautiously. Eurostat (2026) reports that, in 2025, 24.1% of people in Romania used public-authority websites or applications, compared with the EU average of 71.9%. This information provides context for digital civic engagement, but it does not demonstrate a causal relationship between ANAF requirements and the low use of e-government. The OF results support only the hypothesis of a potential mismatch between the requirements generated by digital tax platforms and the real competences of some users. This hypothesis must be tested empirically.

The central finding of Chapter 4 is diagnostic: the OF does not measure users' actual competences but makes visible the competence requirements structurally generated by the digital tax components analyzed.

Conclusions

The main contribution of the article lies in the development of an analytical operational framework through which the competence requirements embedded in selected ANAF digital tax components become visible, structured, and comparable. The study does not measure taxpayers' competences; it makes visible the competence requirements generated by the digital tax components analysed.

Methodologically, the study proposes a procedure for operationally decomposing digital tax tasks and offers a diagnostic instrument for identifying the areas in which the services analysed require basic, intermediate, or advanced competencies. The separation between component, operation, competence, and minimum level thus becomes a contribution of the research, not merely a presentational convention.

The results confirm the stratified character of the ANAF digital ecosystem. Registration in SPV and the downloading of documents remain close to the basic level. Most of the selected components require intermediate competence, because they involve interpreting tax information, selecting the correct function, submitting data, or tracking institutional responses. RO e-Factura

concentrates advanced requirements through the management of structured files, document validation, interpretation of system messages, and archiving of tax-relevant results.

The study also shows that DigCompRo domains are activated unevenly. Digital tax interaction forms a specific area of civic digital competence: narrower than the full DigComp/DigCompRo framework, but more demanding than the basic use of technology.

For digital education, the OF suggests that support for taxpayers should be built around the platform's real tasks. All users need competences in accessing, searching, retrieving, and managing data. Those who file documents or send requests also need competence in digital content creation and data protection. RO e-Factura users need additional support concerning structured files, validation, interpretation of error messages, and archiving.

For platform design, the results show that the institutional response should not be exclusively educational. When a component requires intermediate or advanced competences, it may be necessary to simplify workflows, clarify error messages, introduce contextual instructions, or reduce interface ambiguity. The OF identifies the areas where high competence requirements arise; the choice between training, redesign, or procedural support remains an institutional decision.

The e-government literature supports this direction, since digital literacy and digital inclusion are associated with users' capacity to interact effectively with digital public services (Duan & Dong, 2025; Morte-Nadal & Esteban-Navarro, 2025). The contribution of the present study is more specific: it shows how a regulated tax platform generates concrete competence requirements at the task level.

Several limitations frame the interpretation of these findings. First, the study is conceptual and non-empirical. The OF was developed through operational decomposition, deductive mapping, and reference to the DigCompRo descriptors; it was not based on questionnaires, competence tests, platform analytics, experiments, or direct observation. Therefore, the levels in Table 4 should be read as theoretical minimum requirements generated by the components analyzed, not as measured levels of Romanian taxpayers' competencies.

Second, the mapping procedure involves analytical judgment. Although the study applies explicit rules, especially for 4.2 and 5.2, other researchers might refine certain decompositions or reclassify borderline operations. The relationship between DigComp 2.2 and DigCompRo also requires caution: the frameworks are compatible for mapping, but their competence scales are not perfectly equivalent (Vuorikari et al., 2022; GEO No. 27/2025). Finally, the nine components analysed are representative, not exhaustive. SAF-T/D406, RO e-Transport, RO e-TVA, Form 707, automatic notifications, online appointments, and cross-border procedures remain outside the applied matrix and should be examined separately.

Future research should validate the OF empirically. The present study identifies competence requirements generated by the platform; it does not measure taxpayers' actual competencies. A next step would be to design an assessment instrument based on DigCompRo and test it with real ANAF users. This could be complemented by task-based observation, in which users perform operations such as authentication in SPV, filing the D212 return, consulting tax obligations, verifying electronic documents, or using RO e-Factura.

A second direction is to extend the OF to the wider digital tax ecosystem, including SAF-T/D406, RO e-Transport, RO e-TVA, and cross-border VAT procedures. This would test whether the patterns identified here remain stable in more specialized compliance flows. In addition, the OF could be tested as an instrument for assessing platform design in order to identify areas where interface complexity can be reduced.

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