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SEMIOTICS OF TAX INTERFACES:
Visual Literacy and Graphic Legibility in Virtual Income Tax Compliance

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ABSTRACT
Introduction: In this ecosystem, income tax filing and payment platforms operate not only as instrumental channels for collection, but also as visual and hypertextual artifacts that demand a multi-semiotic competence from the taxpayer. Methodology: This research study is descriptive-correlational, considering Spearman's rho test. A sample of 400 individuals was used. The instrument applied was a questionnaire to collect the information, which was processed using SPSS version 25. Based on the results, the information provided was analyzed. Results: A moderate positive correlation was determined. Visual literacy and compliance with online payments increase moderately when the degree of correlation between the two variables is measured, yielding a Spearman's rho statistic of 0.442, demonstrating the correlation. Discussion: The research found a 50.6% correlation with Bércovich & Muñoz (2022), who argued that the importance of digital skills requires a re-evaluation of interface aesthetics: the high reliance on visual patterns demonstrates that the average user does not read the tax code or extensive text guides, but rather navigates the screen using graphic cues and recognizable icons. Conclusions: The level of visual literacy influences income tax payment compliance on the SUNAT platform by 46.5%. Payment, when using the digital tax interface, is attributed to acquired tax knowledge (67%).

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Introduction

The digitalization of tax administrations in contemporary cyberspace has transformed the relationship between the State and the citizen, shifting tax compliance toward virtual environments saturated with graphic information and technological mediation. In this ecosystem, income tax filing and payment platforms operate not only as instrumental channels for revenue collection, but also as visual and hypertextual artifacts that demand multi-semiotic competence from the taxpayer. The effectiveness of voluntary compliance does not depend exclusively on the fear of penalties or on legal knowledge, but on visual literacy: the ability to decode, interpret, and navigate the graphic syntax of the digital interface.

As Dondis (2017) argues, the visual message requires a syntax of its own, in which shape, color, typography, and spatial arrangement construct the meaning of communication. In the sphere of government platforms (such as SUNAT in Peru), a lack of clarity in the visual design of interactive forms generates cognitive barriers and digital divides that disproportionately affect users. Alazzawie (2022) and Castelo & Barahona (2024) highlight the widespread adoption of virtual environments for meeting tax obligations; however, if the iconic language and the usability of the screen lack intelligibility, the interaction results in confusion, resistance, or involuntary error.

From the perspective of contemporary Visual Culture, this study analyzes the link between taxpayers' visual literacy and their linguistic comprehension of the graphic environment for the virtual payment of income tax. It examines how the visual information architecture of the tax portal acts as a cultural code that facilitates or hinders tax awareness, providing empirical evidence for the design of more accessible and inclusive civic-digital platforms.

Theoretical Reframing: The Tax Interface as a Visual Artifact

Analyzing digital tax compliance requires going beyond the accounting framework and incorporating the theory of perception and visual communication. Barton and Lee (2013) argue that digital texts should not be assessed in terms of the linearity of print, but as situated practices in which icons, hyperlinks, and screen structures converge. The virtual payment interface thus becomes a visual artifact of control and civic mediation. The mobile interface functions as a space of translation in which bureaucratic language becomes intuitive visual action for the user (Scolari, 2018). Debes (1969) defines visual literacy as the ability to integrate sensory experiences in order to interpret objects and graphic symbols. Transferred to fiscal cyberspace, this concept implies the user's ability to recognize validation icons, interpret the navigation maps of the tax return, and understand typographic alert notices. When the tax administration designs interfaces saturated with technical jargon and lacking intuitive iconic support, the "intelligibility of visual language" breaks down. As Rizo & Sandoval (2024) point out, visual communication in public policy is key to strengthening the social contract; hence, a graphically accessible interface reduces the perceived tax burden and encourages voluntary citizen cooperation. The accelerated advance of state and institutional digitalization without inclusive strategies carries the latent risk of deepening existing structural inequalities, drastically limiting the level of compliance and the benefits of the formal economy in vulnerable sectors or those with less technical training (Bercovich & Muñoz, 2022).

According to the Organisation for Economic Co-operation and Development (OECD) (2014), tax compliance can be achieved by adopting a system perspective. One of the obligations that taxpayers must meet is the filing of pre-filled returns in financial control interfaces, which helps to reduce the time micro-enterprises spend on tax management (Inter-American Center of Tax Administrations, 2020). The visual automation of taxes must stem from the internal logic of the software system (Organisation for Economic Co-operation and Development [OECD], 2014). It supports continuous transaction controls (CTC) in order to achieve a preventive audit model, which requires that the recording and digital validation of commercial operations cease to be a post-audit process and instead take place simultaneously with the transaction (Organisation for Economic Co-operation and Development [OECD], 2024). The immediate validation model, or *clearance*, allows state administrations to carry out cross-cutting traceability, closing VAT evasion gaps while also facilitating the creation of pre-filled tax returns (Inter-American Center of Tax Administrations [CIAT] & Inter-American Development Bank [IDB], 2025).

Income tax is an annual tax, running from January to December, that takes into account all income received during the annual period (SUNAT, 2025). According to Vilca (2023), it is a tax levied on the income or profits that a person or entity obtains in a fiscal year. The tax is translated into user interfaces (UI) that prioritize the automation of deductions, dynamic taxpayer profiling, and the simplification of the annual calculation of earnings [CIAT, OECD 2020]. According to the Organisation for Economic Co-operation and Development (OECD, 2020), compliance with the tax should be achieved through the digital transformation of Tax Administration 3.0, connecting the government control system with taxpayers' commercial and software ecosystems. In Peru, this can be achieved through the implementation of electronic invoicing, based on the sales and purchase reports filed by businesses, which helps to automate processes and raises the perception of risk (Bellon et al., 2022). In addition, Palomares and Sánchez (2026) consider that the tools implemented by SUNAT, such as the Integrated System of Electronic Records (SIRE) and virtual accounting books, have transformed tax control in the country. The study highlights that current technology makes it possible to cross-check information automatically on a massive scale, which optimizes the detection of tax inconsistencies within very short time frames and drastically reduces errors in monthly returns.

Objective

The objective is to determine the level of visual literacy and its relationship with payment compliance in the digital income tax interface in Peru.

1. Methodology

The research is a descriptive-correlational study that uses Spearman's rho test to validate the variables: level of literacy and virtual payment compliance. The instrument used was a questionnaire, processed with SPSS version 25. A sample of 400 natural persons was taken, with the unit of analysis comprising legal representatives, accountants, and taxpayers, who are the ones who use the payment interface. The information collected was processed, and the results obtained were analyzed.

4, *Results*

The results address the following hypothesis:

H1: There is a relationship between the level of visual literacy and virtual payment compliance in the digital income tax interface.

Table 1. Level of visual literacy and virtual payment compliance

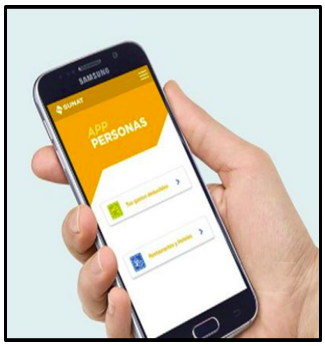
			Level of visual literacy	Virtual payment compliance
Spearman's rho	LEVEL OF VISUAL LITERACY	Correlation coefficient	1.000	,442**
		Sig. (two-tailed)	.	,000
		N	400	400
	VIRTUAL PAYMENT COMPLIANCE	Correlation coefficient	,442	1.000
		Sig. (two-tailed)	,000	.
		N	400	400

Source: Authors' own elaboration

Regarding the correlation between the variables visual literacy and virtual payment compliance for income tax, the hypothesis was tested using Spearman's rho statistic. The p-value = 0.000 (the probability of making an error when rejecting H0) is lower than the significance level $\alpha = 0.05$; we therefore reject the null hypothesis H0 and conclude that the level of visual literacy is related to virtual payment compliance for income tax.

To measure the degree of relationship between the two variables, the value of Spearman's rho statistic, equal to 0.442, was examined; there is therefore a moderate positive correlation, which means that visual literacy and virtual payment compliance for the tax increase moderately together.

Figure 1. *Emprende SUNAT tax payment interface*



Source: SUNAT, 2025

The tax administration uses the "Emprende SUNAT" payment interface, a form of civic-digital mediation intended to improve the visual literacy of natural persons. *Applying the perspective of **Carlos Scolari**, SUNAT's Persona Emprende interface operates as an ecosystem of interactions in which tax technicalities are translated through conversational metaphors. This is complemented by the theory of **Charles Peirce**, since the icons for issuing receipts act as indexical signs that guide the taxpayer's behavior without the need for prior legal training.*

Table 2. *Characteristics of virtual payment compliance in the digital income tax interface*

CHARACTERISTIC	N	%
Knowledge of tax matters	268	67.0
Formal businesses	246	61.5
Monthly income	243	60.8
Educational level	235	58.75
Personal conviction	198	49.5
Natural persons with fourth- and fifth-category income	181	45.3

Source: Authors' own elaboration

Table 2 shows the most salient characteristics of taxpayers. Knowledge of tax matters stands out with 67% (268), followed by formal businesses with 61.5% (246), monthly income with 60.8% (243), educational level with 58.75% (235), personal conviction with 49.5% (198), and, no less important, natural persons with fourth- and fifth-category income with 45.3% (181).

Table 3. *The level of visual literacy influences virtual income tax payment compliance*

Scale	N	%
Strongly disagree	10	2.5
Disagree	50	12.5
Neither agree nor disagree	61	15.3
Agree	186	46.5
Strongly agree	93	23.3
Total	400	100.0

Source: Authors' own elaboration

Table 3 shows that most respondents agree that the level of literacy influences income tax payment compliance, accounting for 46.5% of the total. They are followed by those who strongly agree, with 23.3%, while 15.3% remain neutral. To a lesser extent, 12.5% disagree and only 2.5% strongly disagree with the statement.

Table 4. *Businesses comply voluntarily with filing through the typography and screen layout of SUNAT*

Scale	N	%
Strongly disagree	15	3.8
Disagree	80	20.0
Neither agree nor disagree	133	33.3
Agree	139	34.8
Strongly agree	33	8.3
Total	400	100.0

Source: Authors' own elaboration

Table 4 shows that the largest proportion of respondents consider that businesses comply voluntarily with filing their income tax return: 34.8% agree. They are followed by those who remain neutral, with 33.3%, and those who disagree, with 20.0%. To a lesser extent, 8.3% strongly agree and 3.8% strongly disagree.

Table 5. *I feel secure when using the digital services (web/app) offered by the SUNAT interface*

	Frequency	Percentage
STRONGLY DISAGREE	8	2.0
DISAGREE	26	6.5
NEITHER AGREE NOR DISAGREE	101	25.3
AGREE	203	50.7
STRONGLY AGREE	62	15.5
Total	400	100.0

Source: Authors' own elaboration

As shown in Table 5, most respondents indicated that they agree, representing 50.7% of the total. This is followed by the option Neither agree nor disagree, with 25.3%, and Strongly agree, with 15.5%. To a lesser extent are those who answered Disagree, with 6.5%, and Strongly disagree, with 2.0%.

2. Discussion

The quantitative findings confirm that taxpayers' visual literacy has a statistically significant and moderate relationship with virtual payment compliance for income tax ($\rho = 0.442$; $p < .001$). This result provides empirical support for the claims of Debes (1969) and Dondis (2017) regarding the need for a comprehensible graphic syntax in technology-mediated communication processes. The evidence shows that 67% of the users surveyed depend on visual patterns and schemes to interact with the tax platform, which demonstrates that citizens do not process information through the linear reading of lengthy tax codes, but rather through chromatic decoding, icon recognition, and intuitive on-screen navigation.

Likewise, the data reveal that 58.75% attribute to educational and informational level a direct influence on the usability of the system. In line with Bércovich & Muñoz (2022), digital skills are not neutral: they are conditioned by the legibility of the interface. The presence of 33.3% of participants in a neutral or disagreeing position regarding the ease of use of the environment should not be interpreted solely as a deficit in voluntary tax culture (Alcívar et al., 2024; Belén & Torres, 2024), but as a barrier in SUNAT's visual information architecture. When the design of the application or web portal accumulates technical jargon or lacks clear graphic anchors, cognitive fatigue is generated. For this reason, visual literacy must be assumed as a responsibility of public design: the State must produce civic-digital artifacts that are visually transparent, accessible, and inclusive in order to reduce the digital divide (Sánchez, 2025; Yunga et al., 2025).

3. Conclusions

1. A moderate positive relationship ($\boldsymbol{\rho = 0.442}$; $\boldsymbol{p < .001}$) was demonstrated between the level of visual literacy and virtual payment compliance for income tax on the SUNAT platform, confirming that competence in interpreting digital interfaces affects users' tax behavior.

2. A total of 67% of the taxpayers analyzed rely on visual and iconographic knowledge to fulfill their tax obligations in a virtual environment, which positions the digital interface not as a mere technical support, but as a decisive semiotic artifact for mediation between the State and the citizen.
3. Some 46.5% of respondents perceive that the graphic legibility and typographic layout of the screens directly influence the effectiveness of the filing process. It is concluded that the usability (UI/UX) of government tax applications needs to be optimized, transforming them into visually intuitive platforms that reduce involuntary errors and promote voluntary civic compliance.

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