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Measuring the Quality of the Strategic Financial Planning Information (Q-FPI) in the Local Government

Sandra Matos ^a, Susana Jorge ^b, and Patricia Moura e Sá ^b

^aCeBER, Faculty of Economics, University of Coimbra, Coimbra, Portugal; ^bFaculty of Economics and University of Minho, Research Centre in Political Science (CICP), University of Coimbra, Coimbra, Portugal

ABSTRACT

Having quality information about strategic financial planning is very important for any organization. In the Local Government (LG) it is pivotal, as it is expected to impact strategic decision-making and overall management of local public resources. Yet, empirical research has failed to assess the quality of financial planning information, which must be assured both for management and accountability purposes. By proposing a quality index for strategic financial planning information – the Q-FPI Index – based on programming documents made available on the municipalities' websites, this research contributes to address this gap. The paper describes the multidimensional conceptual model followed to build the Index, considering the identification of data quality requirements and defining indicators to operationalize them. The Index is then tested through a pilot application, using data from five Portuguese municipalities. The Q-FPI Index constitutes a flexible tool, capable of fostering continuous improvement of local government performance.

KEYWORDS

Quality information; quality index; programming documents; municipalities; Portugal

Introduction



Local governments are considered main entities for promoting social and economic development. Acting close to the populations, they systematically face the need to 'do more with less' (Da Cruz & Marques, 2014), constantly searching for delivering better public services under limited resources (Dewi et al., 2019). Strategic planning becomes critical for better public sector management (Berry, 2007). In the public sector, the development of tools, concepts, practices and procedures of strategic planning has been occurring since the 1960s (Obeidat & Udin, 2021). Recent empirical studies highlight that strategic planning, including financial planning, can improve the performance of local governments, fostering greater efficiency and efficacy in decision-making (Bryson et al., 2009; Johnsen, 2018).

The quality of information, of any kind, has been acknowledged as fundamental (Lee et al., 2002) and the poor quality of data underlined as severely impacting the efficacy and efficiency of an organization (Wand & Wang, 1996).

Consequently, ensuring good quality of financial planning information and of programming documents is critical to support better decision-making in municipalities, allowing them to achieve good management results (Bryson et al., 2018).

According to Druker (2008, p. 73), planning "is the process of translating the organization's strategic or mission goals to a set of actionable programs, and tracing the path of how those within the organization would meet the goals." In the present study, strategic financial planning is reflected in a set of programming documents (long, medium and short term planning), which lay out the broad lines for strategic development that guide the organization on what it must do, why and how it must proceed.

In the public sector, strategy planning involves to set out a course of action and program, expressed in financial terms, in a way that is expected to respond to citizens' needs (Aladwan & Forrester, 2016; Da Cruz et al., 2016; Obeidat & Udin, 2021). Therefore, high quality financial planning information is important not only for management purposes, but also to inform citizens on how (local) governments plan to fulfil their needs. Later, these plans and goals can be compared with the results obtained from their implementation, thus indirectly fostering accountability and increasing citizens' and other external stakeholders' confidence (Nurrizkiana et al., (2017a). In fact, it will be important for citizens and other external stakeholders (such as regulatory bodies) to have access to quality information in the financial planning documents disclosed.

CONTACT Sandra Matos  ssmsmatos@gmail.com  University of Coimbra, Coimbra, University of Coimbra, CeBER, Faculty of Economics, Av. Dias da Silva, 165, 3004-512 Coimbra Portugal

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Having considered the above, the Local Government (LG) setting emerges as an appropriate setting for developing tools to measure the quality of such information. The purpose of the current paper is therefore to develop a tool (in this case, an index) for evaluating the quality of information produced in the context of strategic financial planning in the LG. The relevance of such tool comes from the fact that quality financial planning information is an important requisite for local managers decision-making, as well as for the purpose of rendering accountability towards local citizens. Moreover, the Index proposed gives important hints on what needs to be improved in the planning documents. As a consequence of better-quality information, performance and transparency are expected to increase.

Within the scope of this research, to assess the quality of financial planning means, in practice, to identify, in programming documents, the 'signs' or evidences that the information for strategic financial planning embedded in such documents exhibits the desired quality attributes.

In the LG context, academic literature has almost exclusively addressed the quality of financial information considering *ex-post* financial information. Particular attention has been given to understanding factors that may influence the quality of financial reporting, affecting transparency and accountability, namely towards citizens (e.g., Cohen & Karatzimas, 2017; Da Cruz et al., 2016; Dewi et al., 2019; Sofyani et al., 2020). Very few studies (e.g., Cepiku et al., 2017) have looked at financial planning (*ex-ante*) information used for supporting management decision-making and, as far as we know, none has attempted to measure the quality of such information.

Accordingly, the present paper seeks to fill in this literature gap and aims at developing a tool that can be used to assess the quality of information that municipalities produce within their strategic financial planning processes. Among scholars, it has been highlighted that the quality of strategic planning information must be operationalized through multiple dimensions, as multidimensional methodologies help reveal different aspects of strategic planning in the public sector (Bryson et al., 2018). Therefore, this paper contributes to the literature by proposing an index to measure, in the LG setting, the quality of strategic financial planning information – the Q-FPI Index, considering a multidimensional perspective.

With reference to the LG context, and having in mind managers' and citizens' needs and concerns, this study addresses the following research questions:

(1) What are the data quality requirements identified in the literature?

- (2) Which dimensions should be considered for assessing the quality of information for strategic financial planning?
 (3) How can financial planning information quality dimensions be operationalized?

Following this introduction, the paper is organized as follows. The next section, which corresponds to the literature review, discusses the concept of information quality and highlights the dimensions of information quality that are suggested both by information systems scholars and by financial information researchers and accounting standard-setting committees. Afterwards, the methodology is described and the model for the development of the Q-FPI Index is clarified. Subsequently, the paper illustrates how the Index can be used to assess the quality of strategic planning information disclosed by five Portuguese municipalities. Finally, the main conclusions are summarized and the contributions of the study highlighted.

Information quality: a multidimensional perspective

This section analyses the streams of literature that have been dealing with the quality of information, and underlines the importance of the quality of programming documents for sound strategic financial planning.

Information systems perspective

Information quality (IQ) in organizations is paramount (Lee et al., 2002). Researchers who study management information systems believe that information quality is important. Over time, the number of scientific IQ studies grew significantly in response to organizational needs to measure and improve the quality of information (Ballou & Fisk, 1983; Ballou & Pazer, 1985, 1995; Wang & Strong, 1996).

IQ is a property that is inherent to information itself and that stands out for its characteristics. Many authors define it as a multidimensional concept, as can be seen in Table 1. This multidimensional approach means information quality depends on a number of perspectives (Arazy & Kopak, 2011; Batini & Scannapieca, 2006; Ghasemaghahi & Hassanein, 2019; Wang & Strong, 1996).

Table 1 is structured into four categories of IQ – intrinsic, contextual, representational and accessibility, according to Wang and Strong (1996).

The intrinsic quality of information includes the internal characteristics of information (Batini & Scannapieca, 2006; Michnik & Lo, 2007), i.e., it

Table 1. Academics' view of information quality from a multidimensional perspective.

Authors	Intrinsic	Contextual	Representational	Accessibility
Wang & Strong, 1996	Accuracy, objectivity, believability, reputation	Relevancy, value-added, timeliness, completeness, appropriate amount of data	Interpretability, ease of understanding, representational consistency, concise representation	Accessibility, security
Wang & Wang, 1996 Batini & Scannapieca, 2006	Correct, unambiguous Believability, accuracy, objectivity, reputation	Complete Relevancy, value-added, timeliness, completeness and appropriate amount of data	Interpretability, ease of understanding, representational consistency, concise representation Meaningful	Accessibility, access security
Michnik & Lo, 2007	Accuracy, objectivity, believability, reputation	Relevancy, value-added timeliness, completeness, amount of information	Interpretability, ease of understanding, consistent representation, concise representation	Access, Convenience, Security
Arazy & Kopak, 2011	Accuracy, objectivity	Completeness	Representation	Accessibility information quality was not considered, because they made an empirical study based on Wikipedia
Ghasemaghahi & Hassanein, 2019	Believability, objectivity, accuracy	Timeliness, value-added, appropriate amount of date, relevancy, completeness.	Concise representation, interpretability, representational consistency, ease of understanding	Accessibility, access security

considers that information has quality on its own, regardless of the context in which it is used. Intrinsic quality is translated into reliability, accuracy, objectivity, believability, reputation, true representation, verifiability, neutrality, prudence and absence of error.

The contextual quality of information requires such quality to be assessed against the task at hand (Batini & Scannapieca, 2006; Ghasemaghahi & Hassanein, 2019; Michnik & Lo, 2007; Strong et al., 1997; Wang & Strong, 1996). Therefore, information must be useful, relevant, timely, complete, full and appropriate, so as to add value.

Concerning the representational quality of information, information must be clear (Ghasemaghahi & Hassanein, 2019; Wang & Strong, 1996), and have coherent representation, interpretability, understandability, conciseness and consistency.

Accessibility is another category of information quality, which emphasizes the importance of information storage and access (Batini & Scannapieca, 2006; Ghasemaghahi & Hassanein, 2019; Wang & Strong, 1996).

Meyen and Willshire (1997) report that 35% of users' concerns about IQ relate to accessibility issues, 27% to intrinsic issues, 24% to contextual issues and 14% to representation.

It follows a brief summary of the major works referred to in Table 1:

- Wang and Strong (1996) propose a "A Conceptual Framework for Data Quality", divided into 4 categories and 20 dimensions that capture the quality features of data considered important to data users. A striking feature of the study is that the quality attributes of the data are collected from the opinions of data users. These authors believe high quality data must be intrinsically good, contextually adjusted to a task, clearly represented and accessible to users.

- Wang and Wang (1996) define the dimensions of data quality according to the function of an information system, as a representation of a system in the real world. The dimensions arise from possible representation gaps. The quality of data depends on whether or not a certain number of intrinsic dimensions are met: integrity, lack of ambiguity, significance and correctness. The authors state that poor data quality can severely impact the overall efficacy of an organization.

- Batini and Scannapieca (2006) show that dimensions are the core of all research on quality of data. There are three approaches: theoretical, empirical and intuitive. The theoretical approach adopts a formal model for defining or justifying the dimensions. The empirical approach suggests a set of dimensions based on experience, interviews and questionnaires. The intuitive approach simply defines the dimensions according to

common sense and practical experience. These authors state that good quality data helps to improve the efficiency of organizations.

•Michnik and Lo (2007) propose to assess information quality with the assistance of multiple criteria analysis. They adopt in their paper four information categories: (1) intrinsic, (2) contextual, (3) representational, and (4) accessibility. According to the AHP (Analytic Hierarchy Process), these categories are divided into several criteria, which correspond to Wang and Strong's (1996) different dimensions of information quality. The model submitted by the authors developed a set of appropriate strategies for improving the quality of information, which are analyzed by a number of experts with different opinions, taking into account all criteria.

•Arazy and Kopak (2011) address the issue of the quality of the information available on the web. Their research seeks to establish the quality of information and to identify the underlying dimensions (for example, accuracy and completeness), subsequently developing measurement tools.

•Ghasemaghaei and Hassanein (2019) developed a dynamic model of perceptions and impacts on the quality of online information. In their study they highlight user characteristics, website characteristics, task characteristics and social characteristics as contextual factors that influence the quality of information. Furthermore, they also group the dimensions of information quality into four categories: intrinsic, contextual, representational and accessibility, thus using the typology proposed by Wang and Strong (1996).

Financial information perspective

In financial literature, there are also several studies on the quality of financial information. Kaplan et al. (1998) and Fletcher et al. (2004) set forth methodologies for the assessment of financial information based on the assessment of Accounting Information Systems (AIS). An accounting information system keeps and produces organizational data for planning, assessing and diagnosing the dynamics of transactions and financial situations (Kaplan et al., 1998).

The purpose of an accounting information system is to document economic events and capture their impact on an entity's financial position (Kaplan et al., 1998). According to Bernardes (2001), accounting systems are no longer developed from purely abstract structures, but are generated from its users' (information) needs. Therefore, accounting and financial information fit into the so-called usefulness paradigm (Phornlaphatrachakorn & Na Kalasindhu, 2021).

Alongside academic studies (e.g., Boolaky et al., 2020; Sellami & Gafsi, 2017; Tran et al., 2021), reference to the quality of financial information or of financial statements is found in national and international accounting and financial reporting pronouncements, which highlight a set of qualitative characteristics that financial information should display to be considered quality information. International organizations issuing accounting standards propose common qualitative attributes, for both the private and public sectors, as displayed in Table 2. The four international standard setting boards for the public sector recognize, in their conceptual frameworks, a set of qualitative characteristics that should be evident in financial reporting (Australian Accounting Standards Board, 2009; Canadian Institute of Chartered Accountants, 2009a; Governmental Accounting Standards Board, 1987; IPSASB, 2014). These qualitative characteristics are somehow a reflex from those established for business accounting in the conceptual framework by the International Accounting Standards Board (IASB) and its counterpart in the USA, the Financial Accounting Standards Board (FASB).

Paragraph 2.1 of the Conceptual Framework of the International Public Sector Accounting Standards Board (IPSASB, 2014) states that public sector financial reporting is intended to provide information about public sector entities, which is useful for several users, for accountability and for decision-making purposes. "The discharge of accountability obligations requires the provision of information about the entity's management of the resources entrusted to it for the delivery of services to constituents and others . . ." (paragraph 2.8). The information disclosed will also support decision-making, namely about resources to be made available to support future activities, by lenders, creditors, donors and others, or decisions about voting preferences by service recipients and taxpayers (paragraphs 2.9–2.10).

Table 2. Qualitative characteristics of financial information by international standard-setters.

Qualitative Characteristics	CF joint project				
	IASB-FASB	GASB	IPSASB	AASB	CICA
Relevance	✓	✓	✓	✓	✓
Understandability	✓	✓	✓	✓	✓
Comparability	✓	✓	✓	✓	✓
Timeliness	✓	✓	✓	-	-
Faithful representation	✓	-	✓	-	-
Consistency	-	✓	-	-	-
Reliability	-	✓	-	✓	✓
Verifiability	✓	-	✓	-	-

Source: Cohen and Karatzimas (2017)

Key: IASB – International Accounting Standards Board; GASB – Governmental Accounting Standards Board; IPSASB – International Public Sector Accounting Standards Board; AASB – Australian Accounting Standards Board; CICA – Canadian Institute of Chartered Accountants.

Consequently, financial statements are mostly intended for providing information on the financial position, financial performance, cash flows and changes in the financial position of an entity, being useful to a large number of users. Paragraphs 3.1–3.5 of the IPSASB's Conceptual Framework further specify that qualitative characteristics are attributes that make information provided in the financial reporting useful. These characteristics must therefore be reflected in the preparation of financial statements.

Specifically for financial reporting, Conceptual Framework of the IPSASB (2014) refers to six main quality characteristics (Chapter 3) as prerequisites required for public sector entities' financial statements: relevance, reliability (faithful representation), understandability, timeliness, comparability and verifiability.

Relevance is when information is capable of making difference, which happens when it has confirmatory value, predictive value, or both. Thus, this qualitative characteristic helps to confirm or adjust users' past expectations and predictions about the entity's financial condition, performance and service delivery; it also helps to confirm or correct expectations about future financial outcomes, starting from financial information included in previous statements (paragraphs 3.6–3.8).

Reliability or faithful representation (paragraph 3.10) is attained when the depiction of the phenomenon is complete, neutral, and free from material error. Therefore, information must be as complete, neutral and error-free as possible.

Understandability is the quality of information that enables users to comprehend its meaning. As such, all efforts should be undertaken to represent economic and other phenomena in a manner that is clear to a wide range of users (paragraph 3.17).

Timeliness (paragraph 3.19) means having information available for users before it loses its capacity to be useful for accountability and decision-making purposes. Delays in obtaining the information can be a critical issue for many decisions that must be taken.

Comparability is the characteristic of information quality that allows users to identify similarities and differences between two sets of phenomena, requiring consistency (paragraph 3.21).

As to verifiability, it is the quality that helps to reassure users that the information in financial reports is a true representation of the economic and other events it intends to represent. Therefore, the more verifiable the information is the more reliable it will be. Sometimes it is referred as supportability. Whether referred to as verifiability or supportability, this characteristic implies that different knowledgeable and independent observers could reach general consensus about what the information represents (paragraph 3.26).

Academic studies show that information quality has a significant impact on the performance of organizations (e.g., Beest et al., 2009; Boolaky et al., 2020; Jones, 1991; Tran et al., 2021). The quality of financial information has also been highlighted as critical for transparency and accountability purposes, focusing on financial reporting (e.g., Dewi et al., 2019; Sofyani et al., 2020).

Therefore, the quality of financial information has been considered in the literature from a financial reporting standpoint. However, in the public sector, including in the LG, programming documents (such as, strategic financial plans and budgets), also require quality attributes. Financial planning documents are key instruments to the definition of public policies and to political decision-making in the public sector context; and also, to inform citizens about plans and projects that are going to be implemented (Aladwan & Forrester, 2016). Therefore, the quality of the information in these documents has to be assured, either for management or for accountability purposes. The qualitative characteristics may approximate those of financial reporting information.

Strategic financial planning fosters good performance and influences decisions, which is why the delivery of good quality programming documents is a decisive factor for obtaining good outcomes.

In the public sector setting, some researchers have found evidence that strategic planning helps to produce desirable results and outcomes (Bryson et al., 2018), which helps managers decide in their organization's best interests (Bryson et al., 2009). Cepiku et al. (2017) examined the connections between strategic planning and financial management for the fifteen largest Italian cities in the context of the global financial crisis that broke out in the United States in 2007. After analyzing, in depth, the documents for strategic planning and financial reporting, as well as other documents, the authors realized that the cities featuring enhanced strategic planning, generally display more responsible behavior.

Therefore, assessing the quality of programming documents, combining different dimensions, is an exercise than needs to be constantly carried out in LG, and for which a valid assessment tool is highly recommended.

The conceptual development of a tool for assessing strategic financial planning information quality – the Q-FPI index

This section describes the model followed to build the Q-FPI Index proposed for the assessment of information quality in strategic financial planning in the LG, starting by the overall methodology adopted.

Methodology

To assess the quality of the programming documents, the Q-FPI Index proposed in this research follows a model based on the identification of the main dimensions of information quality. Such dimensions can be used to make the documents more useful for decision-making (Braam & Beest, 2013), providing guidance on the preparation of documents for financial planning, and ensuring focus on the qualitative characteristics of the information (AL-Shatnawi, 2017).

This model was inspired by two major literature streams: information systems literature (which tends to define quality of information in general, and more abstracted, terms), and financial information literature (which tries to translate those general characteristics into the particular context of financial documents preparation and reporting). Both were briefly described in the previous section. Consequently, besides focusing on the quality dimensions of information suggested by information systems literature, this research also takes into account the characteristics of the quality of the information in financial reports according to the financial reporting standards, assumed to be important also for strategic financial planning documents. In doing so, the model begins by identifying the requirements of information quality in the literature on information systems and then specifically on financial information. Consequently, the model follows a multidimensional perspective, capturing the intrinsic, representative, contextual and accessibility features of the programming documents related to LG strategic financial management (Batini & Scannapieca, 2006; Batini et al., 2009;

Ghasemaghahi & Hassanein, 2019; Pipino et al., 2002; Strong et al., 1997; Wang & Strong, 1996; Wand & Wang, 1996; Wang, 1998), while supporting strategic financial management and accountability.

Figure 1 illustrates the process of conceptual development of the Index for assessing the quality of strategic financial planning information (Q-FPI).

The process has been organized into four broad stages:

- Stage 1 – Identification of information quality requirements based on information systems literature and on quality of financial information literature;
- Stage 2 – Selection of information quality dimensions for strategic financial planning;
- Stage 3 – Operationalization of the information quality dimensions for strategic financial planning (indicators);

In this stage the indicators and the ways of measuring information quality dimensions in strategic financial planning are laid out.

- Stage 4 – Index validation (pilot study using data of five Portuguese municipalities).

The Index is of a theoretical basis and uses a set of indicators to operationalize each information quality dimension. The evaluation is of dichotomous nature using a binary scale, thus assuming only two values, 0 where the phenomenon does not occur and 1 where it does (Costa et al., 2018; Pino, 2007).

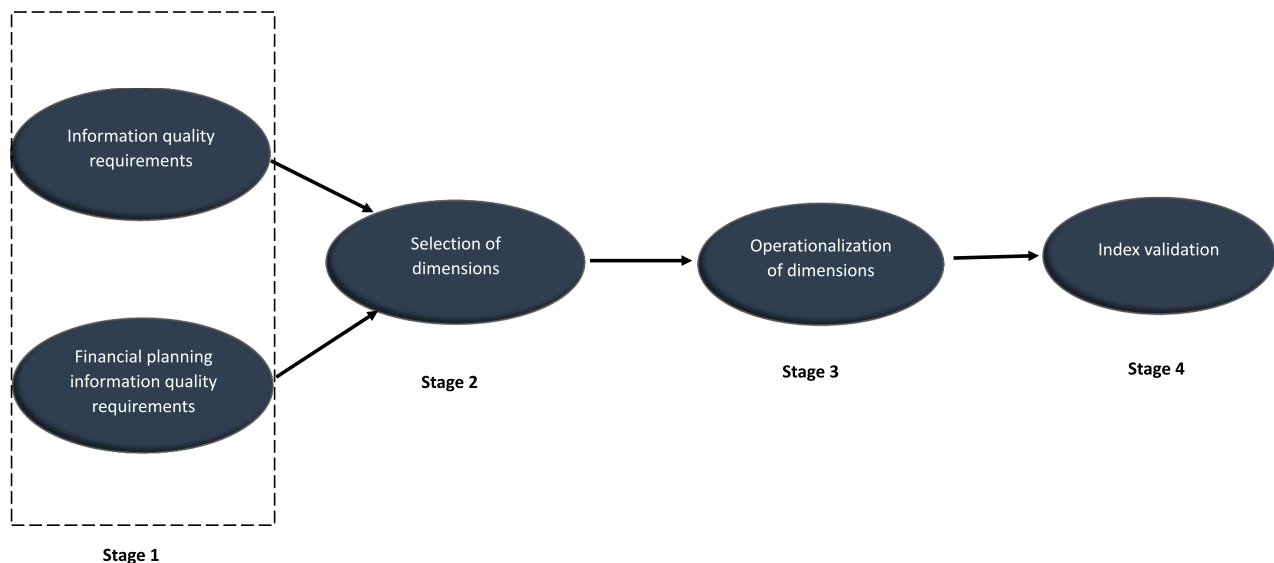


Figure 1. Development process of the Q-FPI Index.

The Index is validated on the basis of programming documents, more specifically the Strategic Financial Plan (including investment plan), the Budget and their Reports, and other documents alike disclosed on municipalities' official webpages. Such strategic financial planning documents are generally used across the European Union and in other countries. Therefore, with slight adjustments, the index methodology can be replicated in other contexts. As the model is flexible, the indicators for each dimension can be adjusted. One example is the Accessibility dimension – it can be said that strategic financial planning information is accessible to the public in a way other than through the website.

The stages involved in the development of the Index are described in detail next.

Selection of information quality dimensions for strategic financial planning (stage 2)

The quality dimensions of strategic financial information were identified based on the analysis of a number of scientific papers. Such papers were selected based on keywords associated with “information quality” and come from non-financial and financial literature (stage 1). The following are the characteristics (dimensions) for the quality of information that were mentioned most often in those papers: Reliability, Relevance, Timeliness, Completeness, Understandability, Comparability, Consistency, Accessibility and Data Security, as highlighted in Table 3.

Reliability is the characteristic that is most often mentioned in the papers analyzed. This intrinsic quality of information is considered a fundamental dimension of the quality of strategic financial information, encompassing internal characteristics of the information and translating into trustworthiness, accuracy, objectivity, credibility, reputation, faithful representation, neutrality, prudence and absence of mistakes. Reliable information has no mistakes and inaccuracies and can be relied on when making decisions.

Table 3. Characteristics/Dimensions for the quality of information mentioned most often in the 30 papers analyzed (financial and non-financial literature).

Qualitative Characteristics /Dimensions	No. of papers	%
RELIABILITY	30	100%
RELEVANCE	26	87%
TIMELINESS	17	57%
COMPLETENESS	16	53%
UNDERSTANDABILITY	24	80%
COMPARABILITY	14	47%
CONSISTENCY	18	60%
ACCESSIBILITY	8	27%
DATA SECURITY	5	17%

In 87% of the analyzed papers, *relevance* is mentioned as a fundamental qualitative characteristic. This contextual characteristic of information requires such quality to be assessed in the context of the task at hand. Relevance means that information can make the difference in decision-making.

Besides being relevant, information must be timely and complete. Consequently, we propose the following dimensions of contextual information quality: **Relevance, Timeliness and Completeness.**

Understandability is yet another characteristic that literature frequently highlights. In simple terms, understandability as a quality of financial information means asking whether the organization's financial information is presented in an organized, clear and easy to interpret manner (Jonas & Blanchet, 2000), allowing users to easily understand its meaning. The representational quality of information requires quality information to be clear (Ghasemaghaei & Hassanein, 2019; Wang & Strong, 1996). Besides being understandable, information must be comparable, concise and consistent. Therefore, the representational dimensions proposed are **Understandability, Comparability and Consistency.** Consistent representation means data is presented always in the same way and is compactly represented with previous data (Batini & Scannapieca, 2006; Pipino et al., 2002). Regarding financial information, for related items over time, it must follow the same accounting principles and criteria (Cole et al., 2012) and be prepared without judgment (Solsma & Wilder, 2015).

The quality of accessible information is translated into the Dimensions of **Accessibility** (access to data) and **Data Security.** *Accessibility* includes concerns about the ease of access to information. *Data security* is different from accessibility; it is the quality of secure information, representing the degree to which data is suitably restricted to ensure it is secure (Pipino et al., 2002).

Derived from the literature review, Figure 2 presents the dimensions of information quality that need be considered when evaluating strategic planning documents.

Thus, as displayed in Figure 2, nine dimensions of information quality assessment were firstly identified. However, two of these dimensions (Timeliness and Data Security) were excluded from the Q-FPI Index, since it would not be possible to measure them in the empirical context the authors chose to test it, as explained next

- *Timeliness* is a dimension of the contextual requirements of information quality, which translates into appropriate information or information adjusted to the time or occasion (Michnik & Lo, 2007). From a theoretical standpoint, it should be considered when assessing information quality for strategic

financial planning. However, in the operationalization process, when the Portuguese context was considered, it was removed. Municipalities in Portugal follow a budgetary calendar, laid down in national laws, according to which, every year, the executive body (Town Council) delivers to the deliberative body (Municipal Assembly) such programming documents by October, the 31st. Yet, many of these documents, disclosed on the municipalities' official webpages (the model assumes online disclosure), do not have dates, although they may have been submitted in due time to the Municipal Assembly, in compliance with the laws in force. Therefore, it is not possible to know exactly when the competent bodies have approved these documents. Furthermore, it would be difficult to evaluate either whether they are adjusted to the right time or to the proper occasion, since the moment of use and the exact needs of such use are also unknown.

- *Data security* was another dimension that could not be operationalized. This dimension relates to actions taken to protect information from espionage or sabotage, crime, attack or leak (Michnik & Lo, 2007). In the current research, this dimension was not considered, because the model is based on the assumption that all documents on the official websites of municipalities are secure and that information is shielded from sabotage.

Accordingly, seven dimensions for assessing the quality of strategic financial planning information were finally considered in the Q-FPI Index.

Operationalization of the information quality dimensions for strategic financial planning – establishing the indicators (stage 3)

In Stage 3, the indicators for the operationalization of the quality dimensions for assessing strategic financial planning information are identified. This a complex procedure that needs to be adjusted to each particular setting. However, to enhance the internal validity of these measures, the process is based on a definition that reflects the way each dimension is characterized in previous literature. Table 4 displays such definitions and shows the number of indicators considered for each dimension.

The 58 indicators are arranged in an Index used to measure the overall level of information quality for strategic financial planning from a multidimensional perspective. Appendix lists all indicators by dimension.

As an illustrative example, for one particular dimension of the Index (*Accessibility*), Table 5 provides an overview of the relevant indicators, issues and respective scales used. The nine indicators and related questions, are thus shown in Table 5. Given the dichotomous scales used, the resulting score ranges from 0 to 9.

If a given municipality obtains the maximum score it means that, in addition to complying with the legal provisions concerning the principle of transparency, it has top quality in terms of Accessibility in its strategic financial planning information.

It must be stressed that indicators are literature-based. The operationalization process entails asking the right questions for the indicators used to measure each dimension (Beest et al., 2009; Jonas & Blanchet, 2000).

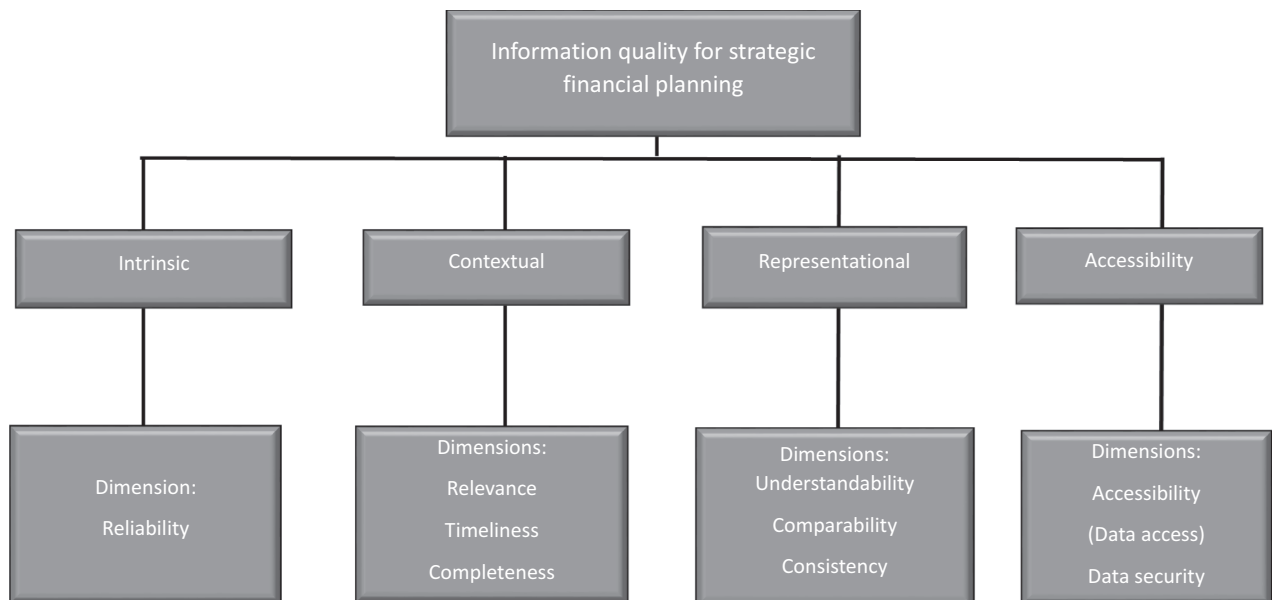


Figure 2. Dimensions of information quality to be considered in strategic financial planning documents.

Table 4. No. of indicators by Dimension of Quality of Strategic Financial Planning Information.

Information Quality in Strategic Financial Planning	Definitions	No. Indicators
Reliability	It is the quality of reliable information, free from errors and inaccuracies.	11
Relevance	It is the quality of information that can make a difference in decision making.	10
Completeness	Is the quality of information to be comprehensive and sufficient for decision making.	6
Understandability	It is the quality of the information that is clear, unambiguous and that allows users to easily understand its meaning.	7
Comparability	It is the quality of information that allows users to identify similarities and differences between two or more sets of phenomena.	8
Consistency	It is the quality of the information coherent and compatible with the previous data.	7
Accessibility	It is the quality of the information available and easy to obtain.	9
Total		58

In line with the index methodology, for all items, the answers to the questions identified are based on the strategic financial programming documents municipalities produce. In every case, items are awarded a binary score ('1' when the item is available (in the document disclosed on the municipality webpage) and '0' when the item is not available).

The global Q-FPI Index includes 58 indicators and reports one overall score and seven subtotals, one for each quality dimension: Reliability; Relevance; Understandability; Comparability; Completeness; Consistency; and Accessibility. According to the formula presented below, the index total score corresponds to the sum of the scores of the 58 indicators (in practice, this means all indicators have the same weight) and is expressed in %:

$$\begin{aligned}
 Q_FPI = & \left(\left(\sum_{1}^{11} Reability + \sum_{1}^{10} Relevance \right. \right. \\
 & + \sum_{1}^{6} Completeness + \sum_{1}^{7} Understandability \\
 & + \sum_{1}^{8} Comparability + \sum_{1}^{7} Consistency \\
 & \left. \left. + \sum_{1}^{9} Acessibility \right) / 58 \right) \times 100
 \end{aligned}$$

The denominator represents the total number of indicators included. The numerator corresponds to each municipality's score per year. The Q-FPI Index enables comparison over time, either by year or fixed period.

The conversion of the sum into a value ranging from 0 to 100 facilitates its interpretation and the comparison of the scores obtained among entities or over time for a given entity.

In our case, it quantifies the quality of the information used in strategic financial planning, provided by the municipalities on their websites and can be calculated either for one year or over a period of time (for instance, for the electoral mandate (Helpap, 2016).

This Index sets levels corresponding to the reference values used for assessing the quality dimensions of strategic financial planning information. The reference values for the Q-FPI Index are organized into three levels, which help classifying the quality of such information made available by the municipalities: Level I – Insufficient [0 to 33%]; Level II – Acceptable [33% to 67%]; and Level III – Good [67% to 100%]. The assessment was inspired by Da Cruz et al. (2016), who measured the municipalities' transparency level.

Index validation: pilot implementation of the Q-FPI Index in five Portuguese municipalities (Stage 4)

In order to validate the quality index of the programming documents produced by LG entities within the strategic financial planning process – stage 4, five Portuguese municipalities were randomly chosen. The Q-FPI Index was applied as illustrated in the next paragraphs.

The Index was tested against data collected from documentary sources (strategic financial planning documents) that are published and disclosed on the official websites of the municipalities, namely Budget, Great Options of the Plan – GOP (which include the Multiannual Investment Plan (PPI) and the Most Relevant Activities (AMR) statement) and respective reports, as well as other published documents relevant to assessing the quality of strategic financial planning information.

As in the sections above, it becomes clear that the Q-FPI Index is a composite measurement tool for a comprehensive assessment of the quality of strategic financial programming documents, in terms of the extent to which they adequately respond to the key dimensions of information quality

The advent of the internet changed the way governments relate to citizens, and the websites of municipalities are key elements of this new interaction model that facilitates the access to information (Da Cruz et al., 2016). Therefore, it is obvious to conduct this assessment exercise based on the documents disclosed through this channel.



Table 5. Operationalization of the accessibility dimension of the Q-FPI index.

Code	Indicator	Question	Operationalization
Ac1	The Great Options of the Plan (GOP) are accessible on the municipality's website.	Are the GOP's accessible on the municipality's website?	0 – The GOP are not accessible on the municipality's website. 1 – The GOP are accessible on the municipality's website.
Ac2	The Multiannual Investments Plan (PPI) is accessible on the municipality's website.	Is the PPI accessible on the municipality's website?	0 – PPI is not accessible on the municipality's website. 1 – PPI is accessible on the municipality's website.
Ac3	The Most Relevant Activities (AMR) statement is accessible on the municipality's website.	Is the AMR statement accessible on the municipality's website?	0 – AMR statement is not accessible on the municipality's website. 1 – AMR statement is accessible on the municipality's website.
Ac4	The Budget is accessible on the municipality's website.	Is Budget accessible on the municipality's website?	0 – Budget is not accessible on the municipality's website. 1 – Budget is accessible on the municipality's website.
Ac5	The Annual Report of Programming Documents is accessible on the municipality's website.	Is the Annual Report of Programming Documents accessible on the municipality's website?	0 – The Annual Report of Programming Documents is not accessible on the municipality's website. 1 – The Annual Report of Programming Documents is accessible on the municipality's website.
Ac6	The Annual Accounts are accessible on the municipality's website.	Are the Annual Accounts accessible on the municipality's website?	0 – The Annual Accounts are not accessible on the municipality's website. 1 – The Annual Accounts are accessible on the municipality's website.
Ac7	The Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments is accessible on the municipality's website.	Is the Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments accessible on the municipality's website?	0 – The Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments is not accessible on the municipality's website. 1 – The Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments is accessible on the municipality's website.
Ac8	The Internal Control Standard is accessible on the municipality's website.	Is the Internal Control Standard accessible on the municipality's website?	0 – The Internal Control Standard is not accessible on the municipality's website. 1 – The Internal Control Standard is accessible on the municipality's website.
Ac9	Other documents related to the strategic guidelines are accessible on the municipality's website.	Are other documents related to the strategic guidelines accessible on the municipality's website?	0 – Other documents related to the strategic guidelines are not accessible on the municipality's website. 1 – Other documents related to the strategic guidelines are accessible on the municipality's website.

The disclosure of financial programming documents on local governments' websites is essential to keep stakeholders informed about the intended strategic financial planning. Using the methodology of analysis of the documents that were published on the websites over the past four years (in this case, between 2016 and 2019), corresponding to the last completed electoral mandate, it is possible to use the proposed index to assess the quality of the information embedded in the strategic financial planning documents disclosed. Based on the results, it is also possible to identify the areas (dimensions) in which municipalities are doing relatively well and those that need to be particularly improved.

As an illustration, Table 6 displays the results of the pilot study in five Portuguese municipalities for the *Accessibility* dimension of the Q-FPI Index.

Table 7 applies the Q-FPI Index considering all indicators/dimensions for the municipalities selected (referred to as: Municipality_α, Municipality_β, Municipality_γ, Municipality_δ and Municipality_ξ), and computing the total score for the seven dimensions for the 2016–2019 period.

Over the last four years (2016–2019), and according to the reference levels, municipalities have shown improvement in the quality of the strategic financial planning information, with the exception of Municipality_γ.

In 2016, the Q-FPI Index for three municipalities, Municipality_α, Municipality_γ, and Municipality_ξ was 'Acceptable'. The Q-FPI Index for Municipality_β 2016 was 69%; it was the only one in that year to have achieved Level III, with a quality assessment classified as 'Good'. On the other hand, the Q-FPI Index for Municipality_δ 2016 was 21% (Level I), with a quality assessment of 'Insufficient'. In the following years, this municipality achieved 38% (Level II), with the quality assessment of the information for strategic financial planning being regarded as 'Acceptable'.

The Q-FPI Index applied by dimension of information quality

Table 8 presents the scores for the selected municipalities in all of the individual dimensions that form the general index.

As can be seen, Municipality δ scores zero in two dimensions (Comparability and Completeness), justifying the 'Insufficient' in terms of the quality of its financial planning information. The information provided in the strategic financial planning documents is not comparable, nor does it allow similarities and differences

between two or more items to be found. Information on this municipality is also not complete, nor comprehensive and sufficient for supporting decision-making.

Municipality β scores 100% in two dimensions (Understandability and Consistency), which means that it presents clear strategic financial planning information, without ambiguity and that allows users to easily understand its meaning; additionally, the information is consistent, and is always presented in the same way, it is coherent and compatible with previous years' data.

The radar chart in Figure 3 illustrates the applicability of the Q-FPI Index by dimension for the five Portuguese municipalities in 2019. The dimensions that are very close to the center correspond to those that need to be particularly improved by the municipalities.

Conclusion

Quality financial planning information influences both decision-making (Braam & Beest, 2013) and local government performance (Bryson et al., 2018; Johnsen, 2018). Moreover, as some authors highlight, information quality is also important to financial accountability (Dewi et al., 2019). In this regard, it is fundamental that governments work to establish greater trust in the information they prepare and disclose; this should be one of the highest priorities for leaders and preparers of strategic financial planning documents. To establish such trust, it is important that governments provide accurate and complete information (IFAC, 2012).

This research develops and tests a tool for measuring the quality of strategic financial planning information in the context of the LG. For that purpose, it started by identifying the dimensions of information quality proposed in the literature from two major research fields: information systems and financial information. These dimensions were then operationalized by selecting a set of relevant indicators. This led to the development of the Q-FPI Index, which measures the quality of the information disclosed in the programming documents that are produced within the strategic financial planning process. Later, the proposed index was pilot-tested using data from five Portuguese municipalities.

By being aware of the dimensions in which they are under-performing, municipalities understand what should be improved in the strategic financial planning information they produced. Given its importance for both internal decision-making and accountability, efforts carried out to improve the quality of planning information are expected to pay-off.

The Q-FPI Index is a simple and comprehensive tool that can be easily applied to any public sector entity. The methodology followed apparently is both robust and

Table 6. Pilot study results for the accessibility dimension of the Q-FPI index.

Dimension _ Q-FPI	Code	Question	Municipality_α			Municipality_β			Municipality_γ			Municipality_δ			Municipality_ε		
			2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018
Accessibility	Ac1	Are the GOP's accessible on the municipality's website?	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1
	Ac2	Is the PPI accessible on the municipality's website?	0	1	1	1	1	1	1	1	0	0	1	1	1	1	1
	Ac3	Is AMR statement accessible on the municipality's website?	0	1	1	1	1	1	1	1	0	0	1	1	1	1	1
	Ac4	Is the Budget accessible on the municipality's website?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Ac5	Is the Annual Report of Programming Documents accessible on the municipality's website?	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1
	Ac6	Are the Annual Accounts accessible on the municipality's website?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Ac7	Is the Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments accessible on the municipality's website?	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1
	Ac8	Is the Internal Control Standard accessible on the municipality's website?	0	0	0	0	0	1	1	1	1	1	1	1	1	0	1
	Ac9	Are other documents related to the strategic guidelines accessible on the municipality's website?	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1
Total score_	Accessibility Dimension		5	7	7	7	7	8	9	9	9	9	4	6	6	5	9

Table 7. Q-FPI Index by municipality, 2016–2019.

Operationalization of the dimensions – Q-FPI Index by municipality, 2016–19

Dimensions Q-FPI	Maximum score	Dimension score Municipality_α			Dimension score Municipality_β			Dimension score Municipality_γ			Dimension score Municipality_δ			Dimension score Municipality_ξ			
		2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019	2016	2017	2018	2019
Accessibility	9	5	7	7	7	7	8	9	9	6	6	6	6	5	8	9	9
Understandability	7	3	7	7	7	7	7	7	7	4	4	4	4	3	6	7	7
Comparability	8	3	5	5	5	3	3	4	3	1	1	0	0	0	5	5	5
Completeness	6	2	3	3	3	3	3	3	3	2	2	2	2	0	3	4	4
Consistency	7	1	6	7	7	7	7	7	7	6	6	1	1	2	6	6	7
Relevance	10	2	3	3	3	4	4	4	3	3	3	3	3	0	2	3	5
Reliability	11	3	10	9	10	9	9	9	9	5	5	3	3	4	9	9	9
Total score_ Seven Dimensions	58	19	41	41	42	40	41	43	41	27	27	18	18	22	20	40	45
Q-FPI Index	33%	71%	71%	71%	72%	69%	71%	74%	71%	47%	47%	31%	31%	21%	34%	69%	81%

Table 8. Q-FPI Index by dimension and municipality, 2016–2019.

IQ-FPI Index by dimension and municipality, 2016–19

Index	Municipality_α			Municipality_β			Municipality_γ			Municipality_δ			Municipality_ξ						
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2019
Accessibility	56%	78%	78%	100%	89%	100%	67%	67%	56%	44%	67%	67%	56%	89%	100%	89%	100%	100%	100%
Understandability	43%	100%	100%	100%	100%	100%	57%	57%	57%	29%	57%	57%	29%	86%	86%	43%	100%	100%	100%
Comparability	38%	63%	63%	38%	38%	50%	13%	13%	0%	0%	0%	0%	0%	63%	63%	0%	63%	63%	63%
Completeness	33%	50%	50%	50%	50%	50%	33%	33%	33%	0%	0%	0%	0%	50%	50%	0%	67%	67%	67%
Consistency	14%	86%	100%	100%	100%	100%	86%	86%	14%	29%	100%	100%	29%	86%	86%	100%	86%	86%	100%
Relevance	20%	30%	30%	40%	40%	40%	30%	30%	30%	0%	20%	20%	0%	30%	30%	20%	50%	50%	60%
Reliability	27%	91%	82%	82%	82%	82%	45%	45%	27%	36%	45%	27%	36%	82%	82%	36%	82%	82%	82%

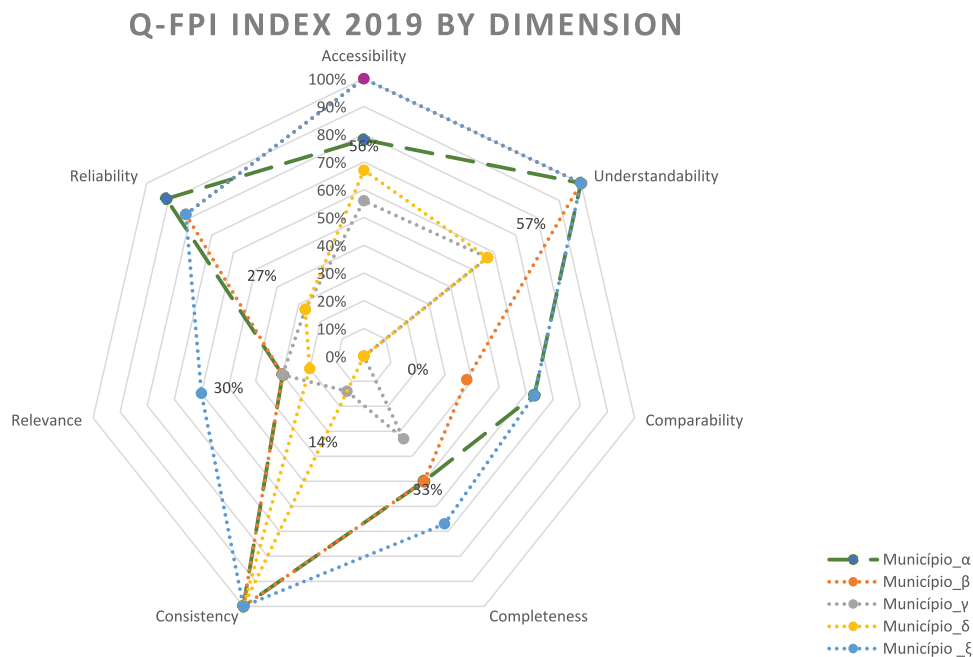


Figure 3. Q-FPI Index ₂₀₁₉ by dimension.

flexible, since the items used to assess the dimensions that form the Q-FPI index can be customized according to the implementation context.

The current paper makes a relevant contribution to the literature by showing how quality information dimensions that are usually proposed for reporting (*ex-post*) can be adapted to assess planning and programming documents (*ex-ante*). By providing a model that the LG, namely municipalities, can use to measure the quality of the financial planning information, this research also contributes to the advancement of studies in accountability. In fact, by concentrating in reporting issues, these studies tend to neglect the importance of providing citizens with information about intentions and plans that public sector entities are expecting to implement, so that, later, they can better evaluate their actions and performance.

Despite its potential contributions, this study also has some limitations. First, the number of indicators in each dimension of the Index is not the same, which may lead to consider certain dimensions of the quality of financial planning more important than others, which is arguable. Furthermore, the model assumes online information disclosure. However, Transparency Laws existent in many countries worldwide require information, including financial planning information, to be made accessible to the public, but not necessarily online. In such cases, at least for the Accessibility dimension, indicators may need to be adjusted.

An additional limitation of the proposed Index comes from the assumption of giving the same weight to every item. Much more sophisticated approaches are proposed in the literature in this regard (e.g., Da Cruz et al., 2016).

Finally, the Index was operationalized with reference to the Portuguese LG context. Despite the similarities between financial planning information that may exist between municipalities across jurisdictions, some specificities may compromise the general application of the model, especially in relation to certain indicators. Further research is needed to validate it in other countries/settings.

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ORCID

Sandra Matos <http://orcid.org/0000-0003-3928-0292>

Susana Jorge <http://orcid.org/0000-0003-4850-2387>

Patricia Moura e Sá <http://orcid.org/0000-0002-6125-5651>

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Appendix. Appendix – List of all indicators by dimension

Category	Quality Dimensions of the Financial Strategic Planning Information	Code	Indicators
Accessibility	Accessibility	Ac1	The Grand Options of the Plan (GOP) are accessible on the municipality's website.
		Ac2	The Multiannual Investments Plan (PPI) is accessible on the municipality's website.
		Ac3	The Most Relevant Activities (AMR) statement is accessible on the municipality's website.
		Ac4	The Budget is accessible on the municipality's website.
		Ac5	The Annual Report of Programming Documents is accessible on the municipality's website.
		Ac6	The Annual Accounts are accessible on the municipality's website.
		Ac7	The Prior Authorization by the Municipal Assembly for the municipality to assume Multiannual Commitments is accessible on the municipality's website.
		Ac8	The Internal Control Standard is accessible on the municipality's website.
		Ac9	Other documents related to the strategic guidelines are accessible on the municipality's website.
Representational	Understandability	C1	The Annual Report of Programming Documents is structured.
		C2	The Plurianual Investments Plan is structured according to the accounting structure of POICAL.
		C3	The Most Relevant Activities presents a structure .
		C4	The Budget presents an accounting structure in accordance with the Official Accounting Plan of Local Authorities (POCAL).
		C5	The Annual Report of Programming Documents is informative.
		C6	The Programming Documents are readable.
		C7	The Programming Documents describe the encodings of the various acronyms provided for in the "GOP", "PPI" and "AMR".
	Comparability	Cp1	The Annual Report of Programming Documents compares the percentage weight of GOP programs with previous years
		Cp2	The Annual Report of Programming Documents compares the percentage weight of the revenue provided for in the Budget with revenue from previous years
		Cp3	The Annual Report of Programming Documents compares the percentage weight of the estimated expenditure in the Budget with that of previous years
		Cp4	The PPI results for the current period are compared with previous periods
		Cp5	The Annual Report of Programming Documents identifies trends in the Municipality's budgetary situation
		Cp6	The Annual Report of Programming Documents presents a comparison with some Intermunicipal Community Index
		Cp7	The Annual Report of Programming Documents compares the volume of Municipal Investment in Portugal with Public Investment in Europe
Contextual	Completeness	Cp8	The weight of the GOP coincides with the strategic policy in relation to the previous year
		Co1	The PPI columns are all filled
		Co2	The Annual Report of Programming documents presents the calculation of the Balance reports
		Co3	The Annual Report of Programming Documents analyzes the GOP
		Co4	The Annual Report of Programming Documents is complete
	Co5	The Annual Report of Programming Documents presents and justifies the proposed budgetary policy	
	Consistency	Co6	PPI projects have an execution phase
		Cs1	The Budget has the same format
		Cs2	PPI is always presented in the same format and is consistent with others from previous years
		Cs3	GOP's are consistent in values
Cs4		PPI is consistent with the Budget	
Relevance	Cs5	PPI is consistency in project start and end dates	
	Cs6	GOP's are consistent with the Budget.	
	Cs7	The projects registered at AMR have the same designation, year, number of years of action for others	
	R1	The Annual Report of Programming Documents presents information on multi-annual commitments	
	R2	The Annual Report of Programming Documents discloses information in terms of risk analysis	
R3	PPI presents a PPBS (Planning- Programming-Budgeting System) approach		
R4	The Annual Report of Programming Documents disseminates information on the interconnection with the Intermunicipal Community's Integrated Territorial Development Strategy (CIM)		
R5	The budget has a weight in capital revenue of more than 50% derived from community participation in co-financed projects		
R6	The Annual Report of Programming Documents discloses the Strategic Vision		
R7	The Annual Report of Programming Documents discloses the strategic guidelines		
R8	The Annual Report of Programming Documents analyzes the financial indicators (Debt, Degree of expenditure execution, Total debt)		
R9	The GOPs present municipal projects taking advantage of the common co-financing opportunities provided by the European Union's Multiannual Financial Framework 2014-2020 (Common Strategic Framework - QE, according to the Resolution of the Council of Ministers no. 39/2013, of July 14) and other community initiatives		
R10	The Annual Report of Programming Documents presents the calculation of the specific limits of net and medium and long-term debt		

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Category	Quality Dimensions of the Financial Strategic Planning Information	Code	Indicators
Intrinsic	Reliability	F1	The Report of Programming Documents presents inconsistencies in the index
		F2	The Annual Report of Programming presents inconsistencies in the values of the Current Budget Balance calculation. Of which: Current Budgeted Gross Revenue \geq Current Budgeted Expenses + Average amortization of MLP Loans
		F3	The Annual Report of Programming Documents describes a service for monitoring the Execution of the GOP /PPI
		F4	The GOP's are elaborated with rigor
		F5	The PPI is rigorously prepared
		F6	AMR are elaborated with rigor
		F7	The PPI identifies the currency unit (rule_ euro)
		F8	The Annual Report of Programming Documents describes the supporting legislation
		F9	The Annual Report of Programming Documents identifies the main categories of expected capital expenditures and their respective amounts
		F10	The Annual Report of Programming Documents identifies the factors that influenced the main categories of expected capital expenditures
		F11	The GOP's are signed