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METHODS AND TECHNIQUES FOR PREDICTIVE DATA ANALYSIS

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ABSTRACT

In the competitive environment, the use of data for decision making supports the reduction of uncertainties. In complex environments, where uncertainty is high, the need to substantiate data is greater. The forecaster can choose from many models, but not all of them are equally effective for every situation. Thus, the main objective of this article is to present the main techniques used by decision makers to estimate market conditions and make more assertive predictions. As a secondary objective, one of the techniques identified in the literature, ARIMA, was applied to estimate the Total Revenues in Florianópolis. As a conclusion, it was estimated that the Total Revenue of the municipality in 2024 will be of R\$2.449 billion. Number lower than expected for the Chamber for the current year 2021.

Keywords: forecasting; arima; data prediction; decision making.

INTRODUCTION

Data production doubles every two years, according to statistics released by the International Data Corporation - IDC. In the competitive environment, the use of data for decision making supports the reduction of uncertainties. In complex environments, where uncertainty is high, the need to substantiate data is greater. However, this data will only become a competitive advantage if it is converted into information. This growing amount of available data has required the application of new techniques for data analysis (LIAO et al., 2012). Many decision makers not only need to understand the forecasting process, but they also need to be familiar with the tools that can qualify and quantify markets. Although a large number of activities fall within the broad scope of market analysis, this article focuses on techniques used to make revenue forecasts.

According to Kress and Snyder (1994), any micro-forecasting technique generally falls into one of three broad categories of models: time series, random or judgmental. This article is centered on these categories.

For Montgomery et al. (2008) the prediction of future events is an important factor with application in different areas, such as operations management, marketing, finance and risk management, economics, industrial process control, and demography.

The main objective of this article is to present the main techniques used by decision makers to estimate market conditions and make more assertive predictions. For this, a review of the literature in the area was carried out. This research is characterized as exploratory.

As a secondary objective, one of the techniques identified in the literature was applied, ARIMA, to estimate the Total Revenues in Florianópolis – SC.

THEORETICAL FRAMEWORK

DATA PREDICTION TECHNIQUES

According to Liao et al. (2012), the availability of information caused by the popularization of the Internet in the early 2000s, played an important role in the advancement of methodologies and techniques for extracting knowledge from data.

The forecaster can choose from many models, but not all of them are equally effective for every situation.

The main factors to be considered when selecting a forecasting model, according to Kress and Snyder (1994), are: (i) length of the forecasting period; (ii) degree of precision sought; (iii) past data pattern; (iv) cost of using the forecast model; (v) types and amount of data available; (vi) ease of application and understanding.

Montgomery et al. (2008) classifies forecasting methods into two broad categories: qualitative techniques; and quantitative techniques.

Qualitative methods, also known as judgment models, incorporate judgments, opinions and intuitive probabilities (MONTGOMERY et al., 2008), (KRESS; SNYDER, 1994). These models are valuable forecasting techniques and are especially valuable for long-term forecasts and for developing forecasts for new or unique products. The main judgment models are composed by the sales force; buyer surveys; specialized jury; delphi method; construction of scenarios; technological forecasting; analogues; cross impact; simulation. According to Montgomery et al. (2008) these techniques are recommended in situations where there is little or no historical data to make a prediction.

Quantitative methods make use of formal data and forecasting models. According to Montgomery et al. (2008) the model formally summarizes the patterns in the data and expresses a statistical relationship between the previous and current values of the variable. Quantitative models are divided into time series models and causal models.

Time series models are classified by Silva (2010) as univariate. For the prediction of future values is explained only by the past values of the series that one wishes to study. In the causal models, other relevant information

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that influence the prediction of the viable are considered.

Time series models

According to Kress and Snyder (1994), these models use past data as a basis for estimating future results. Past patterns are analyzed and incorporated into the forecasting process. The models widely used are: moving averages (single and double); exponential smoothing (single and double); two-parameter exponential smoothing of the holt; classic decomposition; winter method; univariate ARIMA (BoxJenkins).

- Moving averages (single and double);
- Exponential smoothing (single and double);
- Exponential smoothing of two holt parameters;
- Classical decomposition; winter method;

ARIMA univariate (Box-Jenkins)

ARIMA: The integrated autoregressive moving average model (ARIMA) is a combination of the differentiated autoregressive model with the moving average model (RIZKYA et al., 2019). ARIMA models are used to predict past data in a short period of time, have a rapid change and/or have qualitative parameters.

According to Rizkya et al. (2019) an observation of an autoregressive process (the AR in ARIMA) consists of a linear function of the previous observation plus the random noise. So, an autoregressive process remembers where you were and uses that information to decide where to go next. According to the authors, the Autoregressive Integrated Moving Average (ARIMA) model was successfully implemented to solve forecasting problems, for example, consumer demand, econometrics, social sciences and other problems.

According to Rabelo (2019), every time series can be decomposed into 3 parts: trend, seasonality and residual.

Causal models

The basic premise of causal models is the dependence of other variables that the influence of other variables the sales of a product are directly influenced by some other predictable variable. Two types of causal models are: regression and correlation (single and multiple), ARIMA.

Regression and correlation (single and multiple):

TYPES OF DATA

Primary data vs. secondary data

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According to Crescitelli; De Oliveira; Barreto, (2006) the sources of research can be internal departments or specialized institutes, and these can have the most diverse sources. For Mattar (2012, p. 41) the data are divided into:

“Primary data: those that have not been collected before and are still in the possession of the respondents, and that are collected with the purpose of meeting the specific needs of the ongoing research. The primary sources of primary data are respondent, people who have information about the respondent and similar situations”.

“Secondary data: those that have already been collected, tabulated, sorted and, in turn, even analyzed. They are cataloged available to interested parties. The basic sources of secondary data are the company itself, publications, governments, non-governmental institutions and standardized market information services.

According to Mattar (1996, p. 134), primary data are “that were not collected before, (...) and that are collected with the purpose of meeting the specific needs of the ongoing research” – market research is the main way of collecting primary data – and secondary data, “that have already been collected, tabulated, sorted and, sometimes, even analyzed and that are cataloged at the disposal of interested parties”. A very similar definition is presented by Malhotra (2001).

According to Malhotra (2004), primary data are those collected for purposes other than the problem at hand, and secondary data are those originating from the researcher to solve the research problem.

The benefits of using secondary data are that you save time, money and effort. Whether the data needed for the research is available from secondary sources and will only require the effort to spend some time on the Internet, in libraries, visiting government agencies, non-governmental institutions, reading newspapers and magazines or consulting standardized information on companies surveys will only take a few days and will involve little costcosts. (MATTAR, p. 42 2012).

In secondary data research, the obtained data will be able to assign and establish a better research problem, indicate other already tested and approved methods of data collection, indicate other types of data to be collected to obtain the desired information and serve as a comparative and complementary to the primary data to be collected.

Structured, semi-structured, and unstructured data

According to Oliveira, Guerra, McDonnell (p. 19-20, 2018), data can be presented in different ways, with no single standard for dissemination or dissemination. There are several data structures and we can classify data into three major types regarding its structure or shape:

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Structured Data - These are sets of information organized in columns (attributes, variables, features, etc.) and rows (records, items, observations, etc.). These are data usually found directly in databases, files with some sort of separation between columns, Excel, files with fixed-size fields, etc.

Unstructured Data - This is data that does not have a predictable structure, that is, each set of information has a unique form. These are usually files with strong textual content. We have as examples e-mails, twitters, PDF, images, videos etc. Analyzing this type of data is much more complex and requires advanced knowledge in data mining. Despite this, it is the most numerous data type.

Semi-structured data - Data that also have a fixed organization, but do not follow the standard row/column structure, that is, they follow a more confusing and versatile structure, commonly hierarchical, structured in tags or field markers. Examples of semi-structured files: JSON, XML, HTML, YAML etc.

METHODOLOGICAL PROCEDURES

METHODS AND TECHNIQUES

Jenkins et al. (1994) apud Rizkya et al. (2019) define the application of ARIMA in four steps:

a. Model identification:

The ARIMA model can only be used in stationary time series. That is, when the time series develops in time randomly around a constant mean. Forecasting methods use mathematical transformations to “stationarize” a series and make predictions in this “best behaved” series, to then reverse the transformations and obtain the predictions for the original series (FEIJÓ, 2009).

b. Identification of parameters (ACF and PACF)

To use the ARIMA model, the value of d (stationary data) must be determined, the number of residual lag values (q) and the dependent lag value (p) used in the model. The main tools used to identify q and p are ACF and PACF (Partial Auto Correlation Function), and correlation which graphs the ACF and PACF values for lag. The partial autocorrelation coefficient measures the degree of proximity of the relationship between X_t and X_{t-k} , while the laboratory effect times 1, 2, 3, ..., $k-1$ are considered constant (RIZKYA et al., 2019).

c. Selection of the best ARIMA model

From the results of stationary identification and identification of ACF and PACF, there will be several alternative ARIMA models, in this step it is possible to estimate the autoregressive parameters.

d. Prevision

After obtaining the best model, the forecast for the future period can be made. In several cases, forecasting

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with this method is more reliable than forecasting with other time series methods (RIZKYA et al., 2019).

DATA SOURCE

In order to apply one of the forecasting techniques mapped in the literature, data on the total revenue of the municipalities were used. This type of data was chosen because it is available on the transparency portals.

Furthermore, regardless of the political ideology of the ruler, it is through the public budget that society can be changed. The government needs a budget to be able to function. The Fiscal Responsibility Law aims to establish public finance standards aimed at the responsibility for spending by the Union, states, Federal District and municipalities. Expenditures are conditioned to the capacity to collect taxes.

To apply the ARIMA method, secondary databases in structured format were used. The data is available from four different sources, they are:

Table 1 – Data sources used in the study

Source	Description	Purpose
IPEA – Institute for Applied Economic Research	Historical series with the total revenue of the municipalities.	Predict the total revenue, and the own revenue of a municipality using the ARIMA technique.
SICONFI - Accounting and Tax Information System for the Brazilian Public Sector	Accounting data of municipalities, separated by type of item.	Multiple regression analysis to verify the dependence of the municipalities' own collection with other variables.
IFGF - Firjan Index of Fiscal Management	Fiscal Management Index prepared by the Federation of Industries of Rio de Janeiro, which assesses the performance of municipalities in five indicators: own revenue, personnel expenses, investments, liquidity and debt cost.	Multiple regression analysis to verify the dependence of the municipalities' own collection with other variables.
UNDP Brazil – Atlas of Human Development in Brazil 2013.	Human development Index.	Multiple regression analysis to verify the dependence of the municipalities' own collection

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		with other variables.
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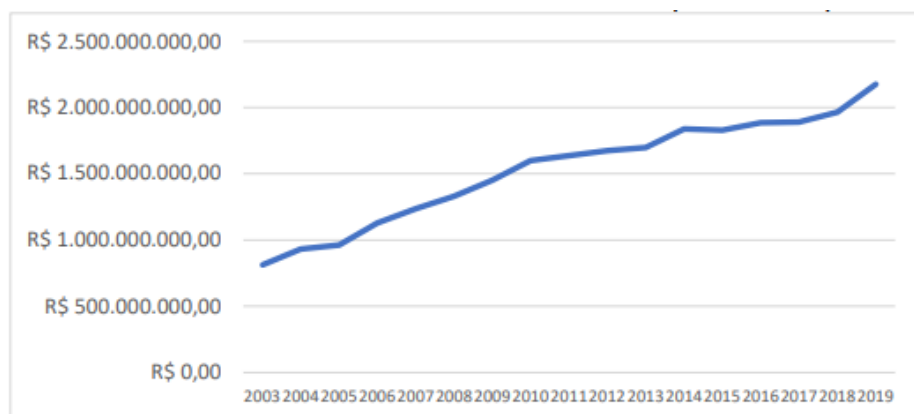
Source: Elaborated by the author.

DISCUSSIONS AND ANALYSIS

On December 22, 2020, the City Council of Florianópolis approved the Annual Budget Law (LOA), which estimated and fixed the revenue and expenditure of the municipality's budget for the year 2021. The total revenue forecast for the year was of R\$2,454,678,930.00 billion. With 63.39% coming from the municipality's own resources, and 36.61% from earmarked resources.

According to IPEA (2020), the municipality collected BRL 2,176,442,525.00 in 2019, and Own Revenues represented 37.8% of the amount collected. Graphs 1 and 2 show the historical series since 2003 for Total Revenues and the contribution of own resources to the municipality's collection.

Graph 1 – Historical series Total Revenues of the Municipality of Florianópolis (Brazil)



Source: IPEA data, 2020.

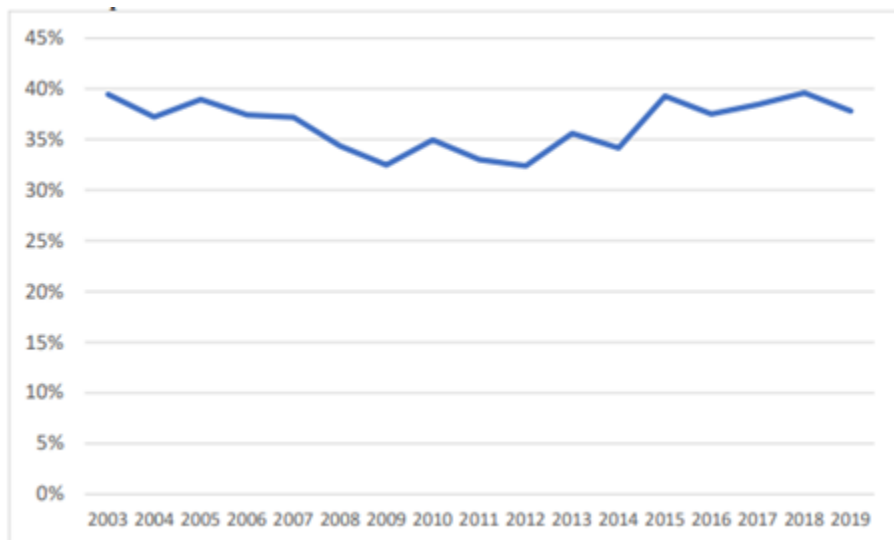
Graph 2 – Contribution of Own Revenue to the Total Revenue of the Municipality of Florianópolis

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Source: IPEA data, 2020.

Scheme: MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a Lagged and derived variable options: -F receitatotal -L 1

-M 8 -G year Relation: receitastotais

Instances: 17

Attributes: 2 (year; receitatotal)

Transformed training data: year; receitatotal; Lag_receitatotal-1; Lag_receitatotal-2; Lag_receitatotal-3; Lag_receitatotal-4;

Lag_receitatotal-5; Lag_receitatotal-6;

*Lag_receitatotal-7; Lag_receitatotal-8; year^2; year^3; year*Lag_receitatotal-1; year*Lag_receitatotal-2; year*Lag_receitatotal-3; year*Lag_receitatotal-4; year*Lag_receitatotal-5; year*Lag_receitatotal-6; year*Lag_receitatotal-7; year*Lag_receitatotal-8.*

Table 2 – Total Revenues obtained between 2003 and 2019 and revenue forecast

Year	Total Revenues	Year	Total Revenues
2003	R\$ 811.950.170	2014	R\$ 1.837.236.864
2004	R\$ 931.709.975	2015	R\$ 1.827.862.985
2005	R\$ 962.265.178	2016	R\$ 1.884.049.902
2006	R\$ 1.126.747.062	2017	R\$ 1.888.706.091
2007	R\$ 1.234.942.072	2018	R\$ 1.964.580.110
2008	R\$ 1.330.094.033	2019	R\$ 2.176.442.525
2009	R\$ 1.450.381.823	2020*	R\$ 2.162.163.627

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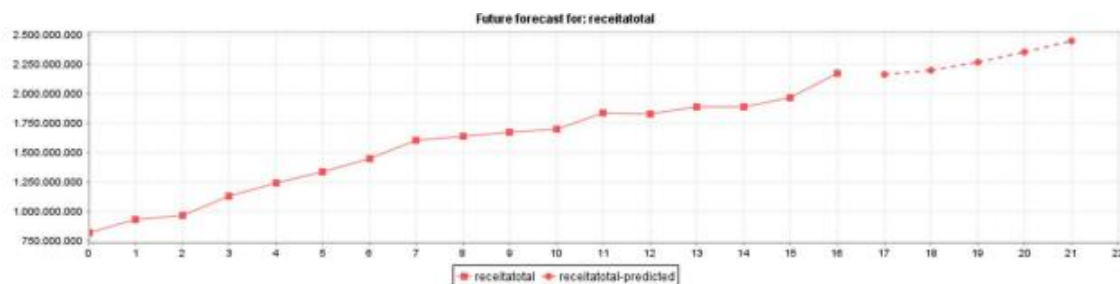
2010	R\$ 1.598.202.335	2021*	R\$ 2.197.891.434
2011	R\$ 1.636.598.632	2022*	R\$ 2.265.590.257
2012	R\$ 1.675.148.674	2023*	R\$ 2.354.766.356
2013	R\$ 1.698.738.978	2024*	R\$ 2.449.540.818

Source: Adapted from IPEA (2020).

As can be seen in Table 2 and Graph 3, the Total Revenue forecast for the municipality of Florianópolis is lower than that approved by the City Council. Through the Autoregressive Moving Averages Model (ARIMA), it is estimated that the municipality's Total Revenue in 2024 will be R\$2.449 billion. Number lower than expected for the Chamber for the current year 2021.

Graph 3 – Total Expected Revenue for Florianópolis – ARIMA Method.

Source: Elaborated
by the author.



CONCLUSIONS

The forecaster can choose from a large number of models, but not all of them are equally effective for every situation. the prediction of future events is an important factor with application in different areas, such as operations management, marketing, finance and risk management, economics, industrial process control, and demography (MONTGOMERY et al., 2008). As well as in budget management of public accounts.

The main objective of this article is to present the main techniques used by decision makers to estimate market conditions and make more assertive predictions. For this, a review of the literature in the area was carried out. This research is characterized as exploratory.

As a secondary objective, one of the techniques identified in the literature was applied, ARIMA, to estimate the Total Revenues in Florianópolis – SC. The total revenue forecast for the city of Florianópolis is lower than that approved by the City Council. Through the Auto-regressive Moving Average Model (ARIMA), it is estimated that the Total Revenue of the municipality in 2024 will be of R\$2.449 billion. Number lower than

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expected for the Chamber for the current year 2021.

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LINKED DATA IN GOVERNMENT: A REVIEW FROM DATA PROVENANCE MODELS

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ABSTRACT

In 2007, some fundamental principles associated with open government data were discussed, with the intuition that society can monitor data such as government-generated revenues and expenses. Based on these principles, the OGD (Open Government Data) was formed, which ended up standardizing the presentation of these data in an accessible and free form for all. Identify in the literature which provenance models support the use of Linked Data in government. This is a descriptive synthesis based on a systematic review carried out on the bases of CAPES (Coordination for the Improvement of Higher Education Personnel). Twenty-six articles in different languages that met the pre-established inclusion and exclusion criteria were found. Presentation of eight benefits and eight rules provided by open government data; challenges inherent in the amount of open and unconnected data and publishing connected open data; provenance models and provenance data collection tool. The government, in various spheres, and in several countries, has advanced in the publication of data via transparency portals. However, few open data catalogs have higher levels on the maturity scale when it comes to data binding.

Keywords: Provenance Model, Linked Data, Data Collection Tools, Open Data Plan, Linked Data in Government.

INTRODUCTION

Information and knowledge are important sources of power and can be found in various formats such as newspapers, books, magazines and databases. The Brazilian law on access to information enacted on November 18, 2011 allows the population to access previously restricted government data, although the concept of open data has been discussed since mid-2005 in the United States.

In December 2007 during a workshop in the city of Sebastopol, California, eight fundamental principles related to open government data were discussed, states Malamud et al. (2007). Oliveira (2020, p. 22) highlights some benefits provided by the use of open data:

- Increased social control over government actions;
- Generation of new business;

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- Transparency in the accountability of results and actions of public management;
- Saves time in fulfilling requests for government data and information;
- Possibility of developing scientific research based on the available data;
- Promotion of social and environmental benefits and sustainable development;
- Promotion of the country's scientific, economic and social development.

However, for the data to actually be used in a connected way, in order to generate reliable information, it is necessary that the data about the entity and availability is accessible, and the same set of connected data can be replicated and hosted in different places on the web.

Noted the broad relevance that open data aggregate to society, this article aims to identify in the literature which models of provenance support the use of Linked data in government.

OPEN GOVERNMENT DATE

Malamud et al. (2007) synthesize the OGD (Open Government Data) principles and emphasize that the developed rules do not address which data should be public or not, and issues such as security and privacy can justify the non-disclosure of certain data and bases. The rules are presented in the following sequence:

- Complete: Public data cannot be private and limited, non-electronic data must not lack incentives to be made available electronically.
- Primary: Data must be presented in its original form so that it can be interpreted according to the needs of the user or organization, which in turn also needs to keep it in its original format and only present their conclusions about it to their respective users.
- Timely: Data needs to be made available at the earliest possible opportunity.
- Accessible: All interested parties must have access to data over the internet in a standard format used by the current industry, thus facilitating its acquisition by standardized tools and not having difficulties during its acquisition.
- Processable by machines: Data must be capable of automatic processing, must be arranged in a structured way and images must have explanatory captions. It is also necessary to provide users with explanatory documentation on the format and content of the data.
- Non-discriminatory: Data must be available to all interested parties without prior registration allowing anonymous access.

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- Non-proprietary: The files containing the data must be arranged in non-proprietary formats in order to allow access to all interested parties, not subjecting them to any type of license over which entities have exclusive control.
- Free license: The data made available cannot be subject to any type of copyright, trade secret or other regulations. However, it is necessary to clarify which licenses and terms of service are subject to information containing personal data, copyrighted works and others.

Geiger and Lucke (2012) report the approach adopted by the OKF (Open Knowledge Foundation) which defends the provision of works at an affordable price by the population and with non-proprietary file formats with the intention of non-discrimination, allowing individuals to make derivations without restrictions. In this same line of reasoning, Geiger and Lucke (2012) abstract the concept of OKF adapting this approach to data, information and knowledge. Li et al. (2012), mention that one of the main difficulties about open data is in its integration, since they are found in several formats, with different vocabularies and with varied quality. However, according to Geiger and Lucke (2012), through the concept of Linked Data applied to open data, this barrier can be reduced.

Linked Open Government Data

The range of data that one or more organizations can generate in some scenarios can be extremely wide and complex. In addition to its storage, each organization stores and maintains data in the most different places and formats. The connected data standard allows any institution to publish data in a way that can be read by people and processed by machines. According to Reis et al. (2020), the term Linked Data emerged in 2006 with the publication of Design Issues by Berners-Lee (2006), with a Semantic Web subsection exclusive to Linked Data. Linked Data (Linked Data) refers to a set of best practices for publishing and linking structured datasets on the Web, with the aim of creating a “Web of Data” (REIS Jr. et al. 2020).

The ability of databases to exchange and share documents, queries and services, using different hardware and software platforms, data structure and interfaces, is called interoperability (ROSA et al., 2007). Through this exchange and sharing, interactions between systems are carried out. However, the information must be efficiently organized for these interactions to happen and the main characteristic for the success of these interactions is consistency, which is achieved through the use of patterns (ROSA et al., 2007).

The Linked Data model presented by Berners-Lee (2006), is composed of a set of rules for publishing on the web with the function of interconnecting data from different sources in a structured way through typed links,

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thus allowing it to become the most comprehensive surveys. According to Berners-Lee et al. (2009, apud BERNERS-LEE et al., 2005) Linked Data makes use of URI (Uniform Resource Identifier) and RDF (Resource Description Framework) in the attribution of its functions:

- Uniform Resource Identifier (URI) is a link formatting pattern that identifies entities on the web through a syntax rule, it is like the Uniform Resource Locator (URL) which aims to create links to locate documents on the network. “URI references are used to name everything in RDF” (KLYNE, CARROLL, 2004).
- Resource Description Framework (RDF) is a technology that aims to identify semantic meaning in entities through declarations (KLYNE and CARROLL, 2004). Divided into subject, predicate and object, Berners-Lee et al., (2009) clarify that the subject and the object can be two URIs and the predicate explains the relationship between them. Victorino et al. (2018) argue that RDF aims at the global networking of various data sources through semantics.

The model adopted and applied by the concept of Linked Open Data (LOD) also takes advantage of RDF and URI technologies, which strategically linked propose to create links between open data through correlations and interrelations. “Added value is created when stored data – not connected before – are combined and new conclusions can be reached” (GEIGER, LUCKE, 2012). Linked Open Data then makes it possible for knowledge to be extracted from open data and information stored in different places and formats. Thus, by associating Linked Open Data with Open Government Data (OGD), the LOGD (Linked Open Government Data) concept, defined by LI et al. (2012) as an “[...] open web-based ecosystem that connects government data with data processing services and citizens as consumers of that data”.

According to Freitas et al. (2011), as Linked Data can be aggregated and transformed into large chains of information producers and consumers, it is necessary for end users to be able to decide the quality and reliability of the information available. Linked Data catalyzes the existing demand to describe the provenance of information resources on the Web, which can be used as a basis for assessing the quality of information, improving the contextual information behind the generation, transformation and publication of information on the Web. provenance research has focused on the area of scientific workflows in eScience (FREITAS et al., 2011).

Open Data Publishing Maturity

Tim Berners-Lee (2006) suggested a 5-star scheme for publishing open data. The first stage of maturity in open data publishing, considered a star, consists of making data available on the web in any format. The

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second level, two stars, data is available in a structured, machine-readable format, ie not a digitized image. The third stage, three stars, data is available in a non-proprietary format such as Comma Separated Values (CSV). To advance to the fourth, four-star maturity stage, data is published using W3C open standards (RDF and SPARQL). The last stage, five stars, data catalogs need to be published using open standards, and allow links to others Linked Open Data.

OL: Open License

RE: Machine-Readable Structured Data

OF: Open Format

URI: Uniform Resource Identifier

LD: Linked Data

Figure 1 - Maturity in open data



Source: Lee (2006).

According to Oliveira (2020) the data is considered effectively open when it reaches the three-star level. However, the other stars provide more possibilities for those using this data, as they can more easily navigate through them and find new information and relationships.

Lifecycle for Linked Open Government Data

Keyzer et al. (2014), after analyzing five lifecycle models for linked open government data, concluded that there is no standardized model. While most approaches agree on the basic set of phases, the focus is on providing open data, with an emphasis on identification and selection; modeling and cleaning; publishing and

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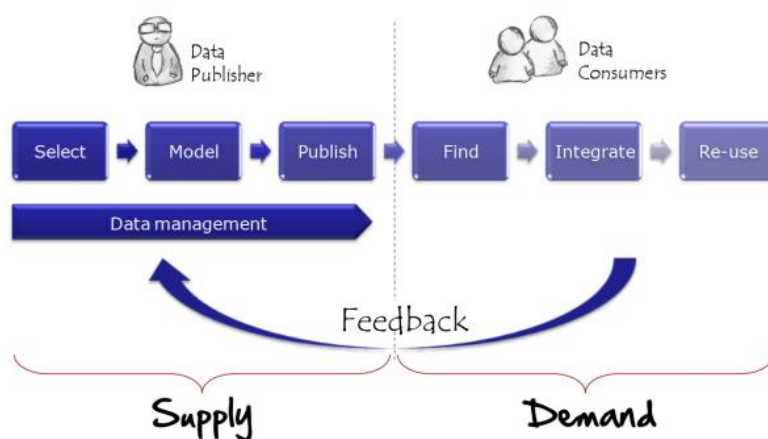
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data linking. From the perspective of the data user, the demand side is under-emphasized. The location and retrieval of data, integration and reuse, as well as the provision of feedbacks, are aspects little considered in such models.

The lifecycle for linked open government data involves phases that encompass both who publishes the data and who will use it.

Figure 2 – Lifecycle for linked open government data



Source: Keyzer et al. (2014).

Examples of open government portals

Data.gov USA

In May 2009, the US government made available a portal named data.gov with the release of its data through the initiative of the first American Chief of Information Vivek Kundra (HENDLER et al., 2012).

Data.gov is managed and hosted by the United States General Services Administration (SGA), Technology Transformation Service. Under the Open Government Data Act, government data must be made available in open, machine-readable formats, while continuing to ensure privacy and security.

Data.gov works with an expanded group of federal agencies to include their datasets in Data.gov as they implement the new law¹. In addition, the law requires the SGA to work to establish an “online repository of tools, best practices and schema standards to facilitate the adoption of open data practices across the Federal

¹ <https://www.data.gov/open-gov/>

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Government.

Data.gov UK

Li et al. (2012) mention that shortly after the action of the American government, countries like England and other members of the European Union also joined the movement, and in January 2012, more than 30 countries had already adopted the practice, totaling approximately 700,000 data sets. Since 2010, data.gov.uk has been helping people find and use open government data and supporting government publishers in data maintenance. Government Digital Service - GDS works with other organizations within and outside government to set the strategic direction for how data is managed, accessed and used. The institution works collaboratively on a range of issues with the Office of National Statistics, the Department of Digital, Culture, Media and Sport and the National Cybersecurity Center.

Brazilian Open Data Portal – PBDA

In 2011, Brazil, together with Indonesia, Mexico, Norway, Philippines, South Africa, United Kingdom and United States, was a co-founding member of the Partnership for Open Government, or Open Government Partnership (OGP). The creation of the Brazilian Open Data² Portal is the result of one of the commitments formalized in the first open government action plan, launched at the OGP and referenced by Decree no number of September 15, 2011.

The Portal aims to be the central point for searching, accessing, and using open government data in Brazil. In addition, the portal also aims to promote dialogue between actors in society and with the government to think about the best use of data, promoting positive impacts from a social and economic point of view.

Decree number 8777, of May 2, 2016, instituted the Open Data Policy in the Federal Executive Branch and established that any citizen can request the opening of databases under the terms of the Law on Access to Information - LAI, as long as the data is not governed by information confidentiality rules and, in addition, defines which authorities will be responsible for publishing and updating the Open Data Plan (PDA) of each agency (MARTINS, 2018).

The PDA is the document that will guide, in each agency, the actions of implementation and promotion of data opening, including geospatial data. Data must comply with minimum quality standards, in order to

² <https://dados.gov.br/>

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facilitate their understanding and reuse (ENAP, 2017).

Challenges for publishing connected open data

According to Open Knowledge Brazil³, the activity of publishing open data on the Web is a reality for a still small portion of the government. For most agencies, the lack of trained people is the main reason that contributes to this reality. There are several approaches, some quick and some more complex.

According to Isotani and Bittencourt (2015) the British Government Data Portal is one of the major government initiatives to open up Connected Data. The portal has in its base almost 19 thousand available data catalogs. One of the ways to categorize these catalogs in order to facilitate the search and discovery is through the 5 Star Open Data classification scheme. Table 1 shows the number of available catalogs according to star rating level.

Table 1 - Classification of British portal catalogs according to the 5-star scheme.

Number of Stars	Number of Catalogs	Percent
-	13.965	78%
★	281	2%
★★	1.145	6%
★★★	2.345	13%
★★★★	-	-
★★★★★	168	1%

Source: <https://ceweb.br/livros/dados-abertos-conectados/capitulo-2/#sh2.4.4>

As can be seen, most of the data catalogs (78%) have not been set a license and cannot be considered open. Some of these catalogs have open data formats such as eXtensible Markup Language (XML) and CSV, however they have not yet defined a license.

According to Open Knowledge International, it is possible to see the evolution of Brazil in the world ranking of open data (Global Open Data Index). In the last edition⁴ published, Brazil was ranked eighth. In 2013, the country occupied the 24th position. This result is a reflection of the work being promoted by the National

³ Open Data Maturity: Understand the 5 Stars | Open Knowledge Brazil (ok.org.br)

⁴ <https://index.okfn.org/place/>

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Open Data Infrastructure – INDA. Aimed at being the reference point for researching, accessing, sharing and using public data.

The open data policy in the federal executive branch consists of a series of normative, planning and guidance documents. The main instrument of the policy is Decree 8.777/2016. However, according to Martins (2018), although there is a large amount of data in the PBDA, they are superficially related through markers (tags). It is very difficult to perform integration, comparisons or combinations of datasets from different sources. Given the various activities of government agencies, updating open datasets does not always receive the due dedication, precisely because many agencies do not have the automation of this activity, causing the data to become outdated frequently.

According to Ávila (2015, p. 26) despite this available offer of open data, there is still a predominance of data in proprietary format, and not processable by machine, making its reuse and appropriation for knowledge production difficult.

The author presents, according to table 2, the list of countries and the data resources opened by them. The United States (USA) leads the way in the number of connected data resources when compared to nine other countries. However, when analyzing their participation in relation to the amount of data resources, the country drops to fourth place, with only 2.1%. Spain is the leader in this group of countries with regard to the share of connected data, with a 19.6% share of these countries in data resources.

Table 2 - Participation of connected data in government open data catalogs

Country	Connected open data resources	Total data resources	Participation (in%)
USA	7.051	332.568	2,12%
Germany	4	37.479	0,01%
Italy	2.055	21.850	9,41%
Japan	0	18.105	0,00%
Singapore	0	11.977	0,00%
United Kingdom	362	9.497	3,81%
Spain	1.775	9.029	19,66%
Brazil	15	8.582	0,17%
Australia	0	2.137	0,00%

Source: Ávila (2015).

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Ávila (2015) highlights the following challenges that emerge as a result of the amount of open and unconnected data:

- Consumption restriction: in many cases, huge data sets are offered, whose consumption depends on a slow download. In addition, when obtaining the data set, the user needs a computational resource that can process it and has the ability to locate the data to obtain the answers he wants;
- Legal conditions for the use of data: the offer of open data requires the establishment of open licenses, as the non-establishment of these licenses could result in the improper reuse of the data;
- Indiscriminate duplication of datasets: because they are available to anyone, a given dataset can be widely replicated across the Web and information systems, resulting in new problems such as the impossibility of automatic updating and the risk of using datasets lagged;
- Absence of semantic elements to give meaning to the data: to obtain relevant answers, it is necessary to associate the data with an application context to generate information and knowledge. The traditional offer of open data does not aggregate such elements, making it possible to use such data in contexts where the same does not apply;
- Origin of data: in the current model, a secondary source may appropriate datasets from a primary source and offer them in easier ways for their consumption and for this reason, confuse users as to the true origin of the data.

According to Reis Jr. et al., (2020) the adoption of the data web can bring several problems, as the same set of connected data can be replicated and hosted in different places on the Web, through different URIs (URI – Uniform Resource Identifier). Data sets can be connected by different RDF (Resource Description Framework) triples, created differently, and maintained by different editors.

PROVENANCE MODELS

The representation of provenance, according to Arakaki (2020), is essential to allow data reliability, as it presents information about who created or modified a resource, what actions were carried out that modified a resource, in addition to presenting information about the resource itself. The term data source can be defined as the source or lineage of data and can be used to interpret and reproduce the results of scientific experiments (OLIVEIRA et. al, 2020).

The origin of data aims to describe the events and inputs used in the generation of a given information. According to Reis Jr. et al. (2020), data provenance is "[...] the description of the origins of a piece of data and

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the process by which it arrived in a database", that is, to ensure the provenance of data it is necessary to save both the origin of the data used as raw material, and the processes that transformed this data into the final product. According to Pomerantz (2015, p. 101, apud Arakaki, 2020), "[...] provenance means not only the history of a resource, but the relationships between this resource and other entities that influenced its history".

EXAMPLE OF TOOL FOR COLLECTING DATA FROM PROVENANCE

Victorino et al. (2018) developed a tool called BDgoldbr (Brazilian Database Government Open Linked Data) which puts the LOGD into practice. This tool makes use of the components based on conceptual descriptions such as RDF. Although the data are in fact made available by the Brazilian government, they do not respect a very well-defined standardization and each organization presents the data in its own way. All organizations make documents available in CSV formats which contain the data and Portable Document Format (PDF) which have a semantic explanation of the data (VITORINO et al., 2018).

The RDF triples semantically describe the published sources, the publishing entities and the terms obtained from the ontologies and such characteristics allow the user to carry out searches in the available data sources obtained from these institutions, making the search result more reliable. Still on BDgoldbr, Vitorino et al. (2018) clarify that the purpose of the software is not to focus on the development of ontologies, but rather that its flexibility is capable of querying RDF triples based on ontologies and that in this model the same data source can be consulted through different ontologies.

METHODOLOGICAL PROCEDURES

This study presents a descriptive synthesis based on a systematic review of the articles indexed in the Coordination for the Improvement of Higher Education Personnel (CAPES), which is of great importance for scientific research due to its electronic format, enabling the constant updating of the academic community. Systematic literature review is a retrospective technique that uses secondary data as a source of analysis. Using systematic and explicit methods to identify, select and critically analyze relevant research on certain topics, systematic review answers a previously formulated question (CLARKE; HORTON, 2001). The review allows synthesizing the knowledge in a model in a broader view about a domain, for this, the literature review has a fundamental role since the stored knowledge is accumulated over time.

In order to identify the main provenance models used in the literature, a search was performed on articles published in any language in peer-reviewed journals and indexed in the databases available on the Capes

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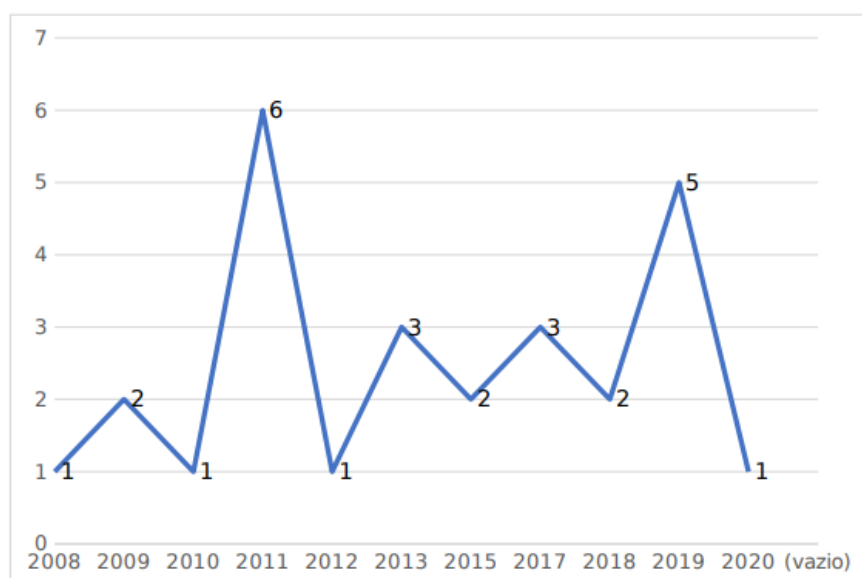
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Journal Portal, which contained the term “Provenance” in the title. Model”. As inclusion criteria, articles that touch on issues related to open data, linked open data, tools or models of provenance aimed at connecting and offering open government data were adopted. As this is a review of the domain not exclusively at the Brazilian level, the criterion adopted included articles from different languages and countries. Using these inclusion criteria, 26 articles were selected.

DISCUSSIONS

Graph 1 illustrates the historical series with the number of articles published per year. As can be seen, in 2008 the first article on the subject was published. 2001 and 2019 were the years that most articles were published on the subject, six and five articles respectively.

Graph 1 - Number of publications per year



Source: Elaborated by the authors.

The 26 articles published about this study are distributed among 19 journals. The most recurrent being Future Generation Computer Systems, which published six articles, followed by IEE Access and IEEE Transactions on Geoscience and Remote Sensing, with two articles published on the subject. The other periodicals had only one publication on the subject. Table 3 presents the list of journals resulting from the systematic review.

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Table 3 - List of periodicals

Title of the journal	Number of articles
Future Generation Computer Systems	6
IEEE Access	2
IEEE Transactions on Geoscience and Remote Sensing	2
ACM Transactions on Internet Technology (TOIT)	1
ACM Transactions on the Web (TWEB)	1
Bioinformatics	1
Concurrency and Computation: Practice and Experience	1
CPT: Pharmacometrics & Systems Pharmacology	1
Environmental Modelling & Software	1
Environmental Modelling & Software: with environment data news	1
IEEE Transactions on Dependable and Secure Computing	1
International Journal of Advanced Research in Computer Science	1
International Journal of Web Services Research	1
Journal of Data and Information Quality (JDIQ)	1
Multimedia Tools and Applications	
NPJ systems biology and applications	1
Philosophical Transactions: Mathematical, Physical and Engineering Sciences	1
Software: Practice and Experience	1
Studies in Computational Intelligence	1
Transactions in GIS	1

Source: Elaborated by the authors.

The 26 articles analyzed in this review are the result of the work carried out by 113 researchers as shown in the table below.

Table 4 – Number of authors per article

Number of authors	Author quantity count	Total authors
1 author	2	2
2 authors	4	8
3 authors	10	30

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Number of authors	Author quantity count	Total authors
4 authors	3	12
5 authors	2	10
6 authors	3	18
14 authors	1	14
19 authors	1	19
Total	26	113

Source: Elaborated by the authors.

Table 5 presents the list of authors with at least two articles published. As can be seen, Luc Moreaus, Paul Groth and Simon Miles are the researchers with the largest number of articles published on the subject, with six, five and four publications, respectively.

Table 5 – Number of articles published by author

Author	Number of articles published
MOREAU, Luc	6
GROTH, Paul	5
MILES, Simon	4
SIMMHAN, Yogesh	3
KWASNIKOWSKA, Natalia	2
ZIEBELIN, Danielle	2

Source: Elaborated by the authors.

Graph 2 illustrates the network formed by published studies on the Provenance Model. As noted, 11 articles do not reference any of the other articles identified through the systematic review. The most cited study, present in nine of the 26 articles analyzed, was the article published by Moreau et al. (2011).

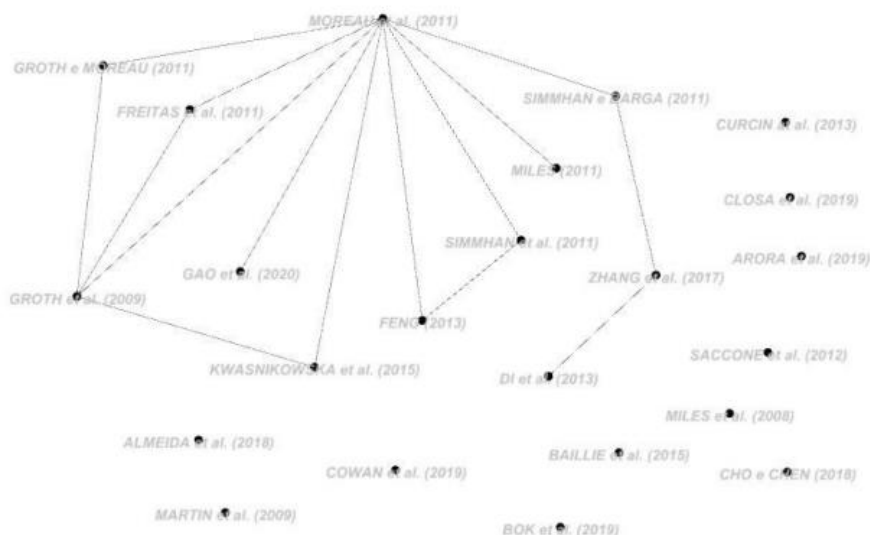
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Graph 2 – Network of authors on Provenance Models



Source: Elaborated by the authors.

According to Groth et al. (2009), provenance models enrich computational processes as they try to describe “[...] how documents were produced, how simulation results were generated and why business decisions were taken (GROTH et al., 2009) . Since processes may be in the hands of different organizations, they need to be detailed in the best way so that the handler can understand the responsibilities of the process and which processes it is interconnected with. Generic process models abstract and document their functionality while making use of interconnections with other models that also have their own individualized descriptions (GROTH et al., 2009).

Since processes can be distributed among the most diverse platforms, locations and owners, Groth et al. (2009) present some advantages that a generic provenance model presents: future proofs, which seek to assure the developer that their documentation will be understandable and useful in future applications, adding to later models; sharing allowing the model to be applied by different systems without the need for conversion; common tools enabling domain-independent process understanding; independent creation allowing traceability; clear guidelines enabling the developer to work on processes already knowing what types of data they will be operating with; finally, platform independence allowing for the interrelationship between the various existing platforms.

Structure P is a generic model presented by Groth et al. (2009) for process documentation based on non-functional requirements. The authors describe these requirements as:

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- Factual being interpreted as an action that took place in the system;
- Assignable, being possible to track the person responsible for a certain process executed in the system;
- Autonomously buildable by making automated the creation of process documentation that independently describes a component and that is able to be aggregated into a generalized format that explains the general functioning of the process that occurs between various components.

The authors also describe the structure P specifying the process as a whole, detailing its parts and the data model to be used. Afterwards, it is necessary to define the component's behavior and, with that, define the origin from the documentation generated by the process. As a rule, the process adopted by Groth et al. (2009) is very similar to software engineering where applications, in addition to taking advantage of subprocesses, also interact with other applications providing and receiving information. This entire encapsulation and abstraction process needs to be properly documented, from the models formed through the application's internal processes to the application model itself that aggregates its model documentation and its internal processes.

Groth et al. (2009) assign actor roles to applications that are composed of entities and each actor has a set of functionalities. An actor is then a large process, thus abstracting a set of smaller processes. An actor is directly related to a P-assertion that is about making a statement and belongs to a process. An assertion-P has an identity thus carrying information about who created it making it possible to identify the actor in case of failures or process modifications.

P-assertions have different functionalities, they can be of interaction that aims to identify the event through a set of variables that carry information that can be used as actor tracking through an assertive identity, an event identifier, a message abstraction exchanged at this event and documentation describing how the representation was generated. The other functionality attributed to assertion-P is the relationship that handles exceptions that may occur between events and aims to identify the origin of a given occurrence. So as soon as the cause of a problem occurs, it can be traced from the traceability of a P-assertion and presented all its documentation (GROTH et al., 2009).

For Moreau et al. (2011) provenance is precisely understood in the context of art or digital libraries to reciprocally attribute the documented history of an art object or documents from the life cycle process of a digital object. The provenance model has been growing in the electronic science community, as it is considered fundamental to the systems workflow. According to Moreau et al. (2011, p.744), "OPM allows you to

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characterize what caused the “things”, depending on others to result in a specific condition, considering a graph directed to expose these dependencies”.

According to Moreau et al. (2011) the open provenance model allows causality graphs to be fixed with time information. In this model, if causal dependencies exist, they will be exemplified with appropriate limits and time cannot be allocated to derive causality. OPM supports causality in distributed systems and time can be associated with instantaneous occurrences in a process.

The Open Provenance Model (OPM) proposed by Moreau, L. et al. (2011) is designed to meet the following assumptions:

- Allow the exchange of provenance information between systems, through a compatibility layer based on a shared provenance model.
- Allow developers to create and share tools that operate on such a provenance model.
- Define provenance accurately and regardless of technology.
- Support a digital representation of provenance for any "thing", whether produced by computer systems or not.
- Allow multiple levels of description to coexist.
- Define a basic set of rules that identify the valid inferences that can be made in the provenance representation.

The open provenance model established the graphical notion of OPM based on a set of syntactic rules and topological constraints. Provenance graphs are intended to demonstrate causality graphs showing how processes and artifacts arise. (MOREAU, et al. 2011).

CONCLUSIONS

In the current scenario, where a range of data is generated per second, the amount of information and knowledge that could be generated through them becomes unimaginable. However, each data source has a distinct format and standard for production and storage. This highlights one of the challenges in the current knowledge society: the ability to relate these data to the consequent decision-making in a precise way.

In order to generate more transparency in the data, the provenance models support the connection of data. Different data sources can be integrated if model criteria are followed. However, observing the maturity levels given open, it is verified that they are still in the initial stage.

The government, at various levels, has advanced in the publication of data via transparency portals. However,

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as pointed out by Isotani and Bittecourt (2015) and Ávila (2015), few data catalogs have higher levels in the maturity scale when it comes to data connection. Which consequently entails the restriction in the consumption of these data, duplication, misinterpretations, among other factors.

Although there are already rules that seek to direct the origin of open data, they are still relatively comprehensive, allowing each organization to interpret it differently. In addition to making them available in different file formats, while respecting the non-proprietary file format as defended by the OKF reported by Geiger and Lucke (2012) and Malamud et al. (2007) when they mention accessibility as one of the OGD rules. A solution that contributes to the abstraction of formats and data types is the LOGD provides means of accessing data through an open data network and applied by tools such as Bdgoldbr developed by Victorino et al. (2018).

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THE EFFECT OF LOCUS OF CONTROL, UNCERTAINTY AVOIDANCE ON ONLINE PURCHASE INTENTION WITH COGNITIVE TRUST AS A MEDIATOR

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ABSTRACT

The purpose of this paper is to examine the effect of internal locus of control (ILC), external locus of control (ELC), uncertainty avoidance (UA) on online purchase intention through the mediating role of cognitive trust (CT). The research adopted the quantitative approach using structural equation modeling based on a sample of 184 participants. Preliminary results showed that there is a negative relationship between ELC and CT and a positive relationship between UA and CT. The findings of this study provides online marketing managers a deep understanding of the online purchase intention of their customers.

Keywords : Internal locus of control, External locus of control, Uncertainty avoidance, Cognitive trust, online purchase intention

Introduction

Online buying is important for the competitiveness of firms because it reduces costs and saves time. However, there are many companies, in developing countries that still don't purchase online. To solve this problem, scholars and professionals did considerable efforts to encourage companies to purchase online. Researchers attempted to understand the factors that influence the online buying. The result of these attempts showed that many factors influence the online purchase. Among these factors, for instance, cognitive trust, internal locus of control, external locus of control, uncertainty avoidance that represent the focus of this paper have not received too much attention from marketing researchers.

Consequently, to provide a deeper understanding of the relationship among these factors, this paper focuses on searching how internal, external locus of control, uncertainty avoidance are related to online purchase intention through the mediating variable cognitive trust. This research topic is an interesting new significant contribution attempt in the following ways.

First, Although many empirical studies indicated that trust is a strong predictor of consumer behavior (Ling et al., 2011; Sotco-Acosta et al., 2014; Morrow et al., 2004; Alfina et al., 2014; Punyatoya, 2019; Meskaran et al., 2013), there is still a lack of studies that investigate the relationship between cognitive trust and online

purchase intention. Therefore, this paper seeks to answer to the following question:

Q1 does cognitive trust affect online purchase intention

Second, although it is undeniable that considerable research studies on locus of control has been published so far, many of them were applied in fields other than online consumer behavior. Despite the existence of several studies that attempted to explain this relationship, they have failed to explain the difference between the effect of the two forms of locus of control, namely (internal locus of control and external locus of control) cognitive trust (cognitive trust). Therefore, the current empirical research in this topic is still in its infant stage. Consequently, the following questions need to be answered:

Q2 Do internal /external locus of control have an impact on cognitive trust and online purchase intention?

Q3 Does cognitive trust mediates the relationship between the internal/external locus of control and online purchase intention ?

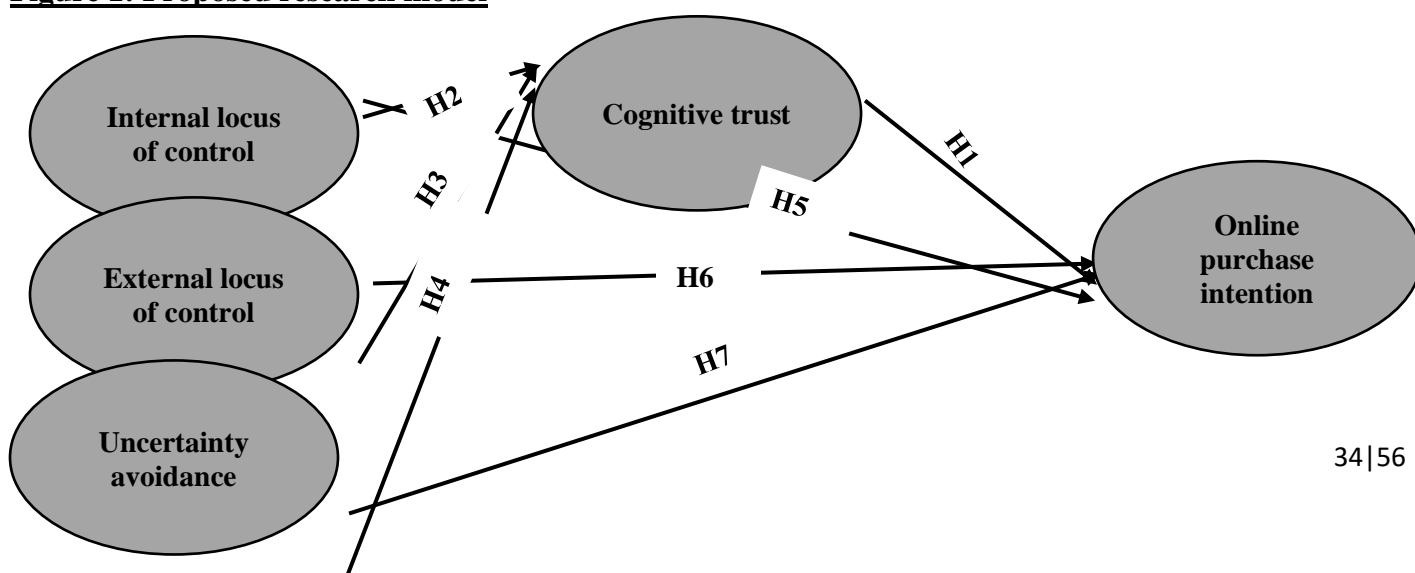
Third, although there are several studies that have examined the relationship between uncertainty avoidance and trust (Al and Kumar, 2011; Hwang and Lee, 2012; Xin et al., 2015; Hwang, 2009), none of them have investigated the relationship between uncertainty avoidance and forms cognitive trust). In addition, the empirical studies that have examined the effect of uncertainty avoidance on online consumer behavior (Al and Kumar, 2011; Sohaib et al., 2019; Hwang and Lee, 2012), most of them have failed to investigate the mechanisms that explain this relationship. Consequently, the need for the examination of cognitive trust as a mediating variable in the UA-OPI relationship requires answering to the following questions.

Q4 Does uncertainty avoidance significantly affect cognitive trust and online purchase intention?

Q5 Does cognitive trust mediates the relationship between uncertainty avoidance and online purchase intention?

Literature review

Figure 1: Proposed research model



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Trust and OPI

In the context of electronic commerce and online buying trust is considered as one of the important factors (Cited in Meskaran et al., 2013). The current literature is full of definitions of trust. For instance, according to Gefen et al, trust can be defined as the willingness of consumer to interpretation to the possibility of loss during shopping process, according to this definition, trust can be considered as a kind of behavioral intention too (cited in Meskaran et al., 2013). Alternatively, Mayer, Davis and Shoorman define trust as willingness of one party that is willing to accept the actions by the other party even though the first party is not being protected by the second party and fail to control the actions of the second party(Cited in Ling et al., 2011), etc.

In an online environment, the absence of the physical interaction between the seller and buyer increase the risk probability of the customer's data, money and also the probability of product delivery (sometimes the customer does not get the product that was promoted in the adverting, but another one) (Cited in Ling et al., 2011). Consequently, there is a difference between online trust and offline trust. Studies found that people perceive higher risk online than offline, given that the online environment is complex and open (Cited in Soto-Acosta et al., 2014)

There is a belief that the construct of trust is composed of two parts: cognitive and affective. The first one is based on logic and reasoning, the second is based on emotions. (Ziegler and Golbeck, 2007). Morrow et al., 2004 emphasized the importance of the role of cognitive and affective trust in explaining the general trust construct. The authors also confirm the effect of these two components of trust in influencing the behavior of individuals (Morrow et al., 2004) and consumers as well (Alfina et al., 2014; Punyatoya, 2019). Although there are no studies that claim categorically that cognitive trust has an impact on online purchase intention the findings of the research conducted by (Ling et al., 2010) show that several forms of trust are positively related to online shopping intention. Similarly, one of the trust forms that is related to online purchase intention is the online trust. This construct was found by (Ling et al., 2011) to have a positive relationship with online purchase intention. It is known that trust is a form of thinking, because when people trust they, in fact use a form of thinking. In line with this perspective and the arguments that have been presented, there are several signals that imply that the cognitive trust is related to the online purchase intention. For instance, the findings of (Moon et al., 2017) confirm the positive predictability of cognitive attitude on online purchase intention. In addition, there was a study where two aspects the feel-think-do hierarchy (the affective aspect of trust) versus the think-feel-do hierarchy (the cognitive aspect of trust) as predictors of the online purchase intention. The results revealed the power of the think-feel-do hierarchy in predicting the online purchase intention(Verhagen

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and Bloemers, 2018). From these results, it could be implied that cognitive trust is related positively with online purchase.

Given the above arguments that support the positive effects of trust and its forms on online purchase intention, and given the lack of studies that explain the effect of cognitive trust on online purchase intention the following hypothesis might provide a deeper explanation of the trust-online purchase intention, thus we suggest

H1: cognitive trust has a positive effect on online purchase intention

Locus of control and trust

Locus of control is an important construct in the understanding of consumer online behavior individual characteristics. (Hoffman et al., 2003). There are two types of locus of control. The first type is Internal locus of control, in which people belief that events that happened to them are controlled by themselves (Triplett and Loh, 2017). These are called the internals, they feel that they have the responsibility of what happens to them (Srinivasan and Tikoo, 1992). The second type is external locus of control, in which people believe that others are the cause of what happens to them (Triplett and Loh, 2017). These are called the externals, who believe that what happens to them is out of their control and is determined by external factors (Srinivasan and Tikoo, 1992).

Although there are many studies in the topic of locus of control, most of them conducted in the medical and psychological field. Therefore, the locus of control empirical studies in the marketing filed are still limited and not sufficient. It is also confirmed that consumers who score high in the external locus of control are oriented to experience web in order to gain time and spend time with family and friends (Cited in Hoffman et al., 2003). Although locus of control is one of the key determinants of consumer behavior, there is still a lack in studies that provide a deep understanding of the mechanisms underpinning this relationship.

Prior studies have indicated that several forms of internet use are related to personal characteristics of the user. Based on this fact (Chak and Leung, 2004) tested the effect of locus of control on internet addiction. The results confirmed a high positive effect. According to (Koo, 2009) people with external locus of control have are likely to adopt a behavior use effect on the intention to use internet than people with internal locus of control.

People who have internal locus control have a tendency to buy consumer goods that present small level of risk in personal dissatisfaction than people with external locus of control(Cited in Busseri et al., 1998). The authors also indicated in their article that people with external locus of control have a tendency to act impulsively. The locus of control affects also the information search behavior. For instance, the findings of (Srinivasan and

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Tikoo, 1992) confirm that internals are engaged in information search more than externals . Based on this finding it could be implied that they have don't trust the merchants.

Based on the above discussion the following hypotheses are suggested:

H2: internal locus of control has an effect on cognitive trust

H3: external locus of control has an effect on cognitive trust

H5: internal locus of control has an effect on online purchase intention

H6: external locus of control has an effect on online purchase intention

H8: cognitive trust mediates the relationship between internal / external locus of control and online purchase intention

Uncertainty avoidance and trust

Uncertainty avoidance is considered as one of the main dimensions to have an impact on the online purchase intention. Based on the Hofsted's model, people with high uncertainty avoidance have a strong need for formal, structured norms, regulations and have a low tolerance level for uncertainty. This is the reason why they are institutions-oriented (Cited in Lim et al., 2004). In addition people with high uncertainty avoidance have a high resistance against change which is not the case for people with low uncertainty avoidance who are willing to take risks because they don't fear the future (Cited in Lim et al., 2004). Consequently, people with high uncertainty avoidance level may have a low level of trust that affects in turn their online purchase intention and vice versa. Therefore, uncertainty avoidance is an orientation to avoid risk and create security (Cited in Hwang, 2009).

Similarly, the concept of uncertainty avoidance has a relationship with concept of risk, especially the risk reducing. According to Srite and Karahanna, uncertainty avoidance is defined as the risk level that is accepted by individuals in uncertain situations. When people have high uncertainty avoidance level they avoid risks and when they have low uncertainty avoidance they can take risks.(Xin et al., 2015). Based on this evidence, high uncertainty avoidance people have low levels of trust while people with low uncertainty avoidance level high level of trust (Cited in Xin et al., 2015).

While studies that interest in the uncertainty avoidance-trust-online purchase intention are almost rare, one study is of interest in this topic. It tested moderating role of uncertainty avoidance on trust and purchase intention. The authors of this research (Hwang and Lee, 2012) found that uncertainty avoidance is predictor of trust while it has no effect on purchase intention.

The empirical findings of (Sohaib et al., 2019) indicated that manipulation of web atmosphere has an impact

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on the intention to purchase new products for consumers with different level of uncertainty avoidance. This means the uncertainty avoidance could have an effect on online purchase intention. Furthermore, In their study, (Lee et al., 2007) attempted to show the differences between consumers with different levels of uncertainty avoidance and product uncertainty evaluation. The results confirmed that the uncertainty avoidance level of consumers has an effect on the uncertainty product evaluation. In addition, the findings of (Al and Kumar, 2011) showed that people with high uncertainty avoidance is positively related to perceived risk but negatively with online buying . Although there are several studies involving uncertainty avoidance and trust, most of them have failed to explain the role of the cognitive trust uncertainty avoidance-online purchase intention relationship.

As discussed in the above paragraphs the following hypotheses are suggested:

H4: Uncertainty avoidance has an effect on cognitive trust

H7: Uncertainty avoidance has an effect on online purchase intention

H9 cognitive trust mediates the uncertainty avoidance-online purchase intention

Methodology and research design

A sample of 184 respondents was selected. These respondents were managers in different companies in the industrial sector in different industries. Before meeting the respondents, they were contacted by phone and being told the purpose of research and asked if they wanted to participate in this survey. Because the country is not Anglophone country, most managers understand French, for this reason two a French questionnaire versions was designed. The respondents were contacted face to face and were given an online questionnaire. The online questionnaire was chosen in order to increase data entry accuracy. In addition, to reduce bias, respondents were asked to fill the online questionnaire during the meeting so that to insure that the answers are theirs and not of another person. The average time spent for each questionnaire/ respondent was around 20 minutes. 4 questionnaires that were not valid were removed.

The measurement used in this research were adapted from the current literature. This resarch involves 5 constructs: internal locus of control, external locus of control, uncertainty avoidance, cognitive trust, online purchase intention. The item measures for these constructs are presented in the table 1.

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Table 1: Construct measures

<u>Internal (ILC)</u>	When I make plans, I am almost certain to make them work Getting people to do the right thing depends on ability; luck has nothing to do with it What happens to me is my own doing
<u>External (LOC)</u>	Finding another job is like taking part in a lottery . Success in your work is mainly determined by favorable conditions When there is a reorganization in your company, you are just lucky not being fired . The way my career will develop is something I have little influence on . Being promoted depends on whether there happens to be a vacancy
<u>Uncertainty avoidance</u>	It is important to have job requirements and instructions spelled out in detail so that employees always know what they are expected to do. Managers expect employees to closely follow instructions. Rules and regulations are important because they inform employees what the organization expects of them. Standard operating procedures are helpful to employees on the job. Instructions for operations are important for employees on the job.
<u>Cognitive trust</u>	Given my financial adviser's track record, I have no reservations about acting on his or her advice. Given my financial adviser's track record, I have good reason to doubt his or her competence. I can rely on my financial adviser to undertake a thorough analysis of the situation before advising me. I have to be cautious about acting on the advice of my financial adviser because his or her opinions are questionable. I can not confidently depend on my financial adviser since he/she may complicate my affairs by careless work.
<u>Online purchase intention</u>	I am likely to purchase tourism products online I am likely to recommend online shopping to my friends I am likely to make another online purchase if the products I buy prove to be useful

Data analysis

To test the model hypotheses, AMOS 22 was used to analyze the data collected using the method of

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confirmatory factor analysis. The results showed that all the model constructs have a *Cronbach alpha* that is higher than 0,7. Internal locus of control (ILC) 0,78, External locus of control (ELC), 0,77, uncertainty avoidance (UA) 0,79, Cognitive trust (CT) 0,93, online purchase intention (OPI) 0,85. The factor loadings of the construct were all higher than 0, 6, which means that the unidimensionality of the model was achieved.

Conclusion and Practical implications

Besides the theoretical contributions discussed above, this paper suggests several managerial implications for marketers who want to understand what are the causes that influence the online purchase intention so that to be able to take the appropriate actions and strategies to affect the consumers' online purchase behavior. First, in developing countries, most companies are small and medium sized that are seeking to reduce costs, online purchase is one of the methods that reduce costs for the company and for the consumer. By taking these results into account managers and marketers, will understand the causes of online purchase intention. Managers could also adapt their websites based on the type of locus of control or the level of the uncertainty avoidance of his customers so that they could customize the pages and the user experience to meet these psychological and sociological needs of consumers. Second, managers and marketers could also develop programs that change the consumer behavior, for instance if a consumer has a high level of uncertainty avoidance and is not willing to buy online, they could understand what are the variables to manipulate to achieve this objective

Limitations and future research

The findings of this paper have also some limitations to consider. First, data were collected using the cross-sectional design that does not allow investigating the changes in the long run. Future researchers are invited to use the longitudinal research design. Second, data were collected based on a sample of 184 which could affect the results. Future research could use a large sample so that the results will be much more consistent. Third, the research model investigated only one dimension of the Hofsted's model that is the uncertainty avoidance, and also only one component of trust that is cognitive trust. We recommend the future research to use the other dimensions of the Hofsted model and also the second component of trust that is the affective trust.

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IRANIAN CINEMA: POPULAR CULTURE AND BUSINESS ANALYSIS

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ABSTRACT

The Culture at a Distance and the Myth and Symbol methods examine open-source evidence, such as examples of popular culture, when conducting ethnographic analysis. By combining these techniques, a tool of cultural analysis can be developed. Because Iran is largely cut off from the West, acquiring insights regarding what its people think and feel can be difficult, and the resulting gaps can inhibit the establishment of viable and appropriate strategies and tactics involving the country. By examining 3 Iranian feature films, an example of analyzing popular culture to extrapolate strategically important cultural insights is discussed.

Keywords: Culture at a Distance Method; Myth and Symbol Method; Popular Culture; Iran; *Border Café; Offside; Bashu, The Little Stranger.*

INTRODUCTION

The Culture at a Distance Method is a form of ethnographic analysis that examines open-source secondary information as an alternative to conducting primary research. The Myth and Symbol Method of American Studies, although evolving independently, follows a similar path. By combining them, a technique for remotely, quickly, and cheaply analyzing cultures and peoples emerges. This kind of open-source research can be used to extrapolate social and cultural insights of value to decision makers. Doing so is similar to the services provided by the field of Competitive Intelligence that also analyzes open-source information.

An example of this potential will focus on Iran, a country that is little understood in the West because of its isolation triggered by political turmoil. Previous researchers Tajeddini and Trueman (2016) have discussed how business leaders and organizations in Iran have been impacted by restriction and tensions caused by the current international pressures. This paper can be viewed as a mirror opposite; it deals with difficulties Westerners experience when attempting to understanding this largely isolated country and how to build appropriate assessments of it.

In spite of current difficulties, Iran is of great interest to the outside world because it is potentially the biggest and most lucrative market in the Islamic Middle East. Once the current tensions are normalized, Iran

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will emerge as a much sought-after target market and business partner. The current situation, furthermore, has created a pent-up demand for both the importing and exporting of goods and services which makes future trade with Iran even more lucrative and attractive.

A small and circumscribed application of the Culture at a Distance and the Myth and Symbol methods examines 3 well-known post-1979 Iranian popular films for clues regarding how its people tend to think, act, evaluate situations, and so forth. Such research can be (and was) completed quickly, cheaply, and without traveling to Iran.

This exercise showcases how the method works and why it can serve an important role in business and strategic research. By doing so, clues are provided regarding how strategic researchers can work with cultural specialists and other humanists to enhance the decision-making process.

CULTURE AT A DISTANCE METHOD

During World War 2, the United States military needed to better understand the Japanese. Due to the conflict, however, American researchers were not permitted to travel to Japan. As a result, anthropologists such as Ruth Benedict developed a method of conducting ethnographic analysis using readily available open-source secondary information including novels, feature films, and other examples of popular culture.

During the war, many skilled social scientists, such as anthropologists, interrupted their academic careers (Eddy & Partridge 1978 29) to pursue practitioner-oriented assignments aimed at understanding other peoples. They include Ruth Benedict's analysis of Japan (1946) and Margaret Mead's analysis of the United States (1942). During that time, much work was completed, and techniques of investigation were developed. The Culture at a Distance Method is one example of the research techniques that were developed and employed.

The essence of the approach involves examining whatever open-source material is readily available and milking it of useful cultural content. The goal is to piece together the findings of this ethnographic scavenger hunt to create a mosaic of cultural understanding starting with the available data, and using intuition to fill in the gaps.

Consider archaeology as an analogy. Archaeological fieldwork yields but a small sample of what once existed and how people lived their lives. Using artifacts the archaeologist discovers, their context, and supplemental information, the investigator seeks to recreate what is missing. Although the products of such analyses are typically incomplete and contain errors, useful findings emerge.

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The Culture at a Distance Method employs a similar approach. Using whatever imperfect and incomplete information can be gathered, a search for social and cultural patterns commences. The goal is to start with the available facts, fill in the blanks using whatever information is available, and develop coherent profiles of the peoples and cultures being portrayed.

Raw data used by the Culture at a Distance Method includes examples of popular culture, such as novels and feature films. For a film to be popular, the themes explored need to resonate with the audience. Thus, by examining successful films, important clues regarding the people who choose to watch them can be identified.

The classic example of this method is Ruth Benedict's *the Chrysanthemum and the Sword: Patterns of Japanese Culture* (1946) that was originally written as a classified strategic document. During the war, various governmental agencies complained that the Japanese acted in ways that could not be predicted. The decision makers in charge needed a grounding in Japanese culture when forging appropriate strategies.

To create a handbook or reference guide regarding Japanese culture, Ruth Benedict conducted an open-source investigation using whatever secondary information came her way. Aspects of popular culture such as novels and feature films proved to be an invaluable source of information.

In spite of handicaps, Benedict quickly created an analysis of Japanese culture that has stood the test of time. It is not perfect or correct in every instance, but on balance, it has provided useful strategic insights. Created quickly, under adverse conditions, and far from the culture being investigated Benedict provided otherwise unavailable insights to decision makers.

THE MYTH AND SYMBOL METHOD

The Culture at a Distance Method is similar to the Myth and Symbol Method of American studies that examines successful artistic products in order to better understand a society. Those seeking an overview of this method may consult Smith (1957), Slotkin (1986), and Sklar (1975).

By examining the so called "myths and symbols" that appear in popular culture, the essence of the culture, nation, or society can be better understood. Similar techniques have arisen among popular culture scholars. Walle's (1997) "Hack Writers V. Belle Letters: The Strategic Implications of Literary Achievement", for example, argues that before items of popular culture such as feature films are created, a process of (overt or covert) marketing research inevitably takes place in which public preferences, demands, and expectations are assessed. When a novel or feature film is successful, the artist or creative team has made

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an appropriate and accurate analysis. Thus, by assuming that successful/profitable popular culture products are reflections of the audience, strategic insights can be extrapolated from them.

The example examined in this discussion is the country of Iran which currently has tense relationships with the West. As a result, cultural contact between the two is not as intimate as it could be. Because intellectual exchanges between Iran and the West are limited, few ethnographic analyses of Iran are being undertaken. This is exactly the type of situation where popular culture specialists can help decision makers by analyzing open-source information in order to extrapolate cultural insights.

THE DIFFICULTY IN UNDERSTANDING IRAN

Iran has a complex history. As a result, understanding this country and its people can be difficult. Present day Iran, of course, occupies the core of the ancient Persian Empire, a nation that is much celebrated in world history. As a result of this legacy, Iran (Persia) has been a “high civilization” for thousands of years even if its strength and power have waxed and waned over time and with changing circumstances.

During the Arab Conquest, Persia, having been weakened by infighting among its royal families, could not defend itself and was defeated. The strength and power of the civilization, however, prevented the people from adopting the Arab language and way of life. Eventually, Persia reasserted itself as a free-standing empire. By the turn of the 20th century, the Persian Empire (ruled by the Qajar dynasty) and the Ottoman Empire were Middle Eastern rivals although both faced stress from outside military and economic pressures. Around this time, the Western colonial regimes, gained an interest in the region, spurred on by the thirst for oil. Soon after World War 1, Reza Shah overthrew the Qajar regime. Ruling from 1925 until 1941, he enacted reforms but was forced to abdicate in favor of his son because the British feared he might be sympathetic to Germany during World War 2. Throughout the war, Iran served as a vital supply route to Russia resulting in a disruptive and troublesome Allied occupation dominated by Britain and the United States.

After the war, tensions between the West and the Soviet Union heated up and NATO needed air bases close to Russia where bombers and spy planes could be stationed. Due to Iran’s strategic location, the United States was very generous to and supportive of the Shah even if some of the methods he used on his own people were harsh. For the sake of expedience, the United States looked the other way causing many Iranians to dislike the Shah and become leery of the United States.

In spite of his abuses, the Shah showed an interest in modernization and economic reform, pledging to transform Iran into a developed country. His efforts, furthermore, demonstrated significant progress.

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Influenced by economic development specialists such as Walter Rostow (1952), the United States was pleased with this course of action. Many Iranians, especially those who were educated and urban, applauded these progressive policies even while opposing the Shah's undemocratic tactics and his aggressive tendencies such as sponsoring the feared secret police (SAVAK).

During this era, Tehran had the appearance and "feel" of a sophisticated Western city in Europe or the United States. College students wore the Hippie attire of the era, Volkswagen "bugs" were popular with youth, and rock and roll music was everywhere. Indeed, as trends sprung up in the West, they quickly found their way to Tehran. A conservative segment remained, but to the "young moderns" these people appeared to be anachronisms destined to fade over time. Western observers concluded that life was increasingly secular, modern, and progressive.

Simultaneously, the campaigns to modernize and westernize were triggering unseen side effects that ultimately had significant implications for the future of Iran. This is because social and religious conservatism, although powerful forces, tended to be covert. Those who held traditional views found secular and progressive trends to be a threat to what they held dear while those with strict religious beliefs, were alarmed by new habits such as openly drinking alcoholic beverages, women wearing "immodest" clothing, and an over-exposure to risqué Western motion pictures, and other foreign influences. Nevertheless, many religious and conservative Iranians, took the path of least resistance in order to avoid being labeled as "backward" by the increasingly secular forces that ruled their lives.

Similar to other parts of the World, the early rumblings for significant change came from the college students of the urban centers such as Tehran. As active opposition to the Shah grew, other segments of the population became involved in this resistance, including religious conservatives who ultimately dominated and gained control.

Although the rural hinterland folk were only slightly involved in this process, when jockeying for control, the religious faction used their numbers to establish the critical mass needed to control the country. As these events were unfolding, Western consultants, economic development experts, and strategic planners were completely caught off guard. Up until that point, the overt actions of the Iranian majority had not indicated a revolution was brewing. Not anticipating the 1979 coup is a glaring example of experts using conventional research methods failing to predict future events.

Accurately assessing the feelings of the Iranian people is a tricky business. The country has previously surprised and befuddled the "experts". Because the standard techniques of investigation have failed, perhaps

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using more indirect methods of investigation is appropriate. With this in mind, an analysis based upon popular culture will examine three well known Iranian feature films: *Border Café*, *Offside*, and *Bashu, the Little Stranger*.

BORDER CAFÉ

Kambozia Partovi (1955-2020) was an Iranian film maker who made a number of feature films that were popular in Iran while simultaneously receiving international recognition. For the most part, Partovi worked within the filmmaking guidelines established by the Iranian government.

On occasion, however, he rebelled. Partovi, for example, made his *Closed Curtain* in secret without getting a license from the government, and he smuggled the film out of Iran to be screened at a film festival where he won a prize. Upon returning home, he was forced to surrender his passport so he could not travel internationally to further promote the film.

In addition to ignoring governmental requirements by not applying for a permit, *Closed Curtain* contains content that strict Muslims would find objectionable, including the fact that the protagonist has a beloved pet dog although many Muslims consider dogs to be unclean animals. The dog furthermore, is named “Boy”. No doubt, anthropomorphizing an unclean animal would be especially objectionable to religious conservatives. Not only that, the main action in the film occurs after the police break up a beach party involving liquor which, according to the Muslim religion, is tabu. Thus, although Partovi was a well known and respected filmmaker, he sometimes found himself at odds with the authorities regarding religious and cultural issues.

His *Border Café* (2005) explores issues regarding religion, tradition, and freedom in a film that successfully passed through the censorship process although some scenes that, apparently, were romantic in nature, had to be edited out. The story concerns a widow (Reyhan) who wants to continue operating the couple’s truck stop after her husband’s death. In doing so, the plot deals with controversial issues by exploring the tensions between cultural traditions (many being connected to religion and individual freedom), with especial reference to woman’s rights.

As the film begins, we meet Reyhan, a woman who has recently been widowed. Because she has become a woman without a man, her dead husband’s brother wants to do the right thing by taking Reyhan as a second wife so he can provide for her and the children in a respectable manner. He is very generous and begins to build her a new home by adding a second story to his residence. (Building a second residence suggests he will probably not burden her with sexual demands).

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The brother-in-law is portrayed as conservative and as a representative of the traditional way of life. He is horrified by the possibility that his brother's wife might bring shame and dishonor to the family if she reopens the truck stop and refuses to conform to the norms of the community. On the other hand, the Brother-in-Law is depicted as honorable and concerned, although angry and frustrated when she refuses his offers. He simply wants Reyhan to adjust to social expectations and he cannot accept that she hesitates to do so.

Reyhan, however, longs to return to her restaurant. From her point of view, unnecessary problems have developed because the traditions of the community insist that she marry her dead husband's brother and work under his supervision. She ignores the brother-in-law complaints that her deviant behavior will bring shame and dishonor to the family.

Refusing to act in the socially prescribed manner, Reyhan defies her brother-in-law and successfully reopens the restaurant. By doing so, she demonstrates that to be a contributing member of society does not require adhering to every norm of the culture.

Wanting to put an end to the shame Reyhan is bringing on his family by being an independent woman, the brother-in-law uses maneuvers related to Islamic inheritance laws to take control of the café and evict Reyhan. Although the Islamic cleric who is hearing the case is sympathetic to Reyhan, he indicates that the law is the law and she is ultimately denied the restaurant that she and her husband had built.

It now appears that the traditional way of life will prevail because Reyhan has no means of supporting herself and will be forced to adhere to the conservative lifestyle dictated by the brother-in-law. Nevertheless Reyhan's spirit of independence is not broken and, as the film ends, she makes arrangements to rent and reopen an inactive restaurant and start again. Although the traditional way of life thwarts her at every turn, she struggles on. In the final scenes, the saddened and bewildered Brother-in-Law cannot understand what he did wrong.

By viewing this film, several motifs emerge that reveal issues and situations of interest to the Iranian people. In the first place, the potentially hurtful role of tradition is discussed. Equally important is the celebration of personal freedom. Many of these concerns center around the rights of women in a world where men have traditionally dominated. There is a reference to Islamic law and subtle hints that it might

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not always be equitable or appropriate.

OFFSIDE

Jafar Panahi (1960-still living) is an Iranian feature film director who over the years has been in conflict with the government regarding the content of his movies. This has led to significant legal troubles including a six year prison term coupled with a ban on making new films for 20 years. Not a passive person willing to give up the fight, while under house arrest Panahi used his smart phone to make a video diary of his life under confinement called *This is Not a Film* (2011). A documentary, it explores the challenges and obstacles that are met when opposing a strong and rigid government that limits freedom of expression. Smuggled out of Iran, this work of protest has been screened at film festivals, released to the public, and won acclaim.

Panahi has a long history of making films that criticize the restrictive measures of the Iranian government, especially in regard to women. This is the theme of his *The Circle* (2000), a film made up of a number of interrelated but freestanding segments, each of which draws attention to the inequities and injustices that women face.

Offside (2006) is another of Panahi's feature films that deals with the limited rights of women in Iran. The plot and action center around the 2006 World Cup Soccer qualifying match that pitted Iran against Bahrain. In the opening scenes, the audience is introduced to a woman who is disguised as a man in an attempt to watch the game in person. According to Iranian law, Women cannot legally attend soccer games because the government fears that the females in attendance might be exposed to men acting in rowdy, lewd, and indelicate ways as they cheer their team on.

It is well known, however, that women often disguise themselves as men in order to gain admission. As a result, gatekeepers keep an eye open for offenders and detain them when possible. Unfortunately, our protagonist is caught, and taken to a holding pen with a number of other women who had become male impersonators in attempts to watch the game. The prisoners are guarded by apathetic soldiers who appear to be young draftees who simply want to serve their time in uniform, satisfy their military obligations, and get on with their lives. When the passionate soccer women are juxtaposed with the rather dispirited soldiers, the two emerge as foils demonstrating the strength of the women vs. the weakness of those who passively

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support the government and its inequities, but do so without a strong commitment or a sense of purpose.

Towards the end of the game the soldiers take their prisoners to a bus and transport them to the police station for processing. During the trip, the women keep up with the game by listening to a portable radio. When the Iranian team wins, a spontaneous celebration takes place and everyone is very happy except the woman we met at the beginning of the film. She tells the others that she wanted to see the game in honor of a friend who was killed when a riot that broke out after another soccer game.

Various themes in *Offside* indicate issues of interest to the Iranian public. As with *Border Café*, the plot revolves around the fact that since women are treated according to long standing traditions, they do not possess the same rights as men. As in *Border Café*, the women assert themselves even when punished for doing so. The comparison of the passionate women with the unresponsive conscripted soldiers who imprison them indicates the possible outcome of a future conflict; perhaps, the forceful demands of the public will overwhelm the uninspired defenders of the status quo. In these portrayals, Panahi appears to suggest that although the Iranian regime is strong, it lacks the full support of the people.

Another somewhat unrelated theme makes reference to the fact that people are killed in conflicts between rival soccer fans: an indication that the emotional emphasis upon leisure diversions, such as sports, need to be rethought.

By dealing with the common tactic of women posing as men to attend soccer games, therefore, a wider range of issues regarding Iranian life and culture is addressed.

BASHU: THE LITTLE STRANGER

Iranian film director, Bahram Beyzair (1938-still living) comes from a highly regarded family of intellectuals and poets. Starting his career as a college professor specializing in theater, he began filmmaking rather late in life. Successful, he has been declared to be the greatest Iranian film director of all time. Nevertheless, the Iranian government has refused to allow him to produce various of his screenplays into films. In 1981, during the Iranian Cultural Revolution, he was stripped of his university affiliation. He is currently on the faculty of Stanford University.

His masterpiece and a film judged as the best Iranian film of all time is *Bashu: the Little Stranger*

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(1986). The story begins with a battle of the Iran-Iraq war (1980-88) in which young Bashu (a dark skinned Iranian of Arab descent) sees his family being killed. To get away from the carnage, he sneaks onto a commercial truck and is transported far away to the northern part of Iran near the Caspian Sea. Under these conditions, he finds himself in a strange land, hungry, unable to understand the language, and suffering from Post Traumatic Stress Disorder.

Wandering with no particular plan in mind, Bashu finds himself in a land populated by the Gilak people, a rural ethnic group that speaks a distinct language. It is worthwhile to note that in Iranian films the Gilaki language is typically used for comic relief....apparently these people tend to be depicted as an Iranian version of “country bumpkins”. In this film, however, the Gilaki language is used within the context of a serious drama.

Wandering around, Bashu eventually encounters two young children who tell their mother about the strange boy who is all alone. After initially attempting to drive the young boy away, the woman eventually shows compassion, leaves him food, and begins to care for him. When the neighbors find out that the woman is helping a dark skinned outsider with no family, however, trouble emerges. The people are prejudiced and encourage her to abandon the child. Such scenes juxtapose the heartlessness of the community with the compassion of the woman.

At the climax, a bunch of prejudiced boys attack Bashu, but he finds a textbook in Persian (the universal and official language of Iran) and he reads a passage that reminds the cruel boys that they are all Iranians. After this fact sinks in, the aggression stops.

This film, made after Beyzair had been forced to leave the university, was apparently produced with the realization that censorship and governmental intervention could arise. Thus, none of the action revolves around the dominant power structure (those of Persian descent). Bashu is from southern Iran and a member of an Arabic speaking minority. The Gilak, are an ethnic group of the far north that do not appear to be highly regarded by the dominant forces of society and the government. As a result, the depictions of these people would probably not anger the censors. In the grand finale, furthermore, it is a book in Persian that calls for Iranian unity that ultimately relieves the tensions of hate and prejudice. The censors were, no doubt, pleased with this portrayal.

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ISOLATING THEMES OF STRATEGIC INTEREST.

As emphasized above, Iran is a country of significant strategic interest to the West because once relationships are normalized, a gold mine of opportunity will emerge. Nevertheless, due to the current state of Iranian isolation, significant misunderstanding exists. As discussed, furthermore, in the past conventional researchers were unable to predict how the Iranian people would respond (recall how the 1979 revolution caught the experts by surprise).

To deal with these issues, a method of analysis based upon principles of popular culture scholarship examined a select list of notable Iranian feature films to better explore issues of interest to the Iranian public.

In all three films, there is a major concern because people lack the ability and the freedom to make decisions that impact their lives. In each case, furthermore, strong women stand up for what is right and what is right for them. In all three films, a major theme dealt with the fact the cultural and religious traditions were instrumental in holding people back from experiencing freedom and self-determinism. In some cases, the Islamic religion and governmental policies were portrayed as hurtful conservative forces that inhibited progress and personal freedom.

The films tend to attack prejudice, and ethnocentrism. In *Bahsu, the Little Stranger*, for example, there was a plea for all Iranians to unite.

These themes are portrayed in Table 1.

Themes in a Sample of Iranian Films

THEME	DISCUSSION
Individual Freedom	A recurring theme in the films involves the quest for personal freedom and the ability to transcend the demands of the dominant status quo.
Women's Rights	The films express concern regarding the rights of women and the inability of women to practice self-determinism.
Oppression from Traditions	The films indicate that the traditions of society (both local mores and the legal establishment) tend to deny personal priorities.
Transcending Xenophobia	In the films, those who are different or hold divergent views are thwarted or held in low esteem, but they fight back against oppression.
DISCUSSION	
This sample of films points to issues of concern to Iranian movie audiences. Although these findings are not definitive, they provide useful clues. As Western businesses seek to develop future strategies regarding Iran and its people, cultural understanding is needed. The tools showcased in this paper can be useful in this regard.	

Table 1

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Qualitative research techniques such as the Culture at a Distance, the Myth and Symbol, and the analytic methods of Popular Culture have much to contribute as the West seeks to normalize relationships with countries such as Iran. By doing so, it can explore social and economic considerations as well as anticipating their full ramifications.

POPULAR CULTURE AND STRATEGIC THOUGHT

Because Iran is a lucrative future business partner and market, Western corporations need to develop an understanding of its people in anticipation of the eventual normalizing of commercial and economic relationships. Currently, however, doing so has been difficult because the contact between Iran and the West is slight and sporadic.

To overcome this problem, a system for conducting ethnographic analysis using open-source secondary information has been demonstrated. Using techniques of analysis familiar to popular culture scholars, a small sample of popular Iranian feature films was examined to identify themes that concern people who are members of that culture. Having provided this simplified example of qualitative and critical analysis, the value of more complicated projects is suggested.

Business researchers, incidentally, have already developed such research methods and acknowledged their value. Consider, for example, Alf Walle's *Qualitative Research in Intelligence and Marketing* (2001) that reminds the reader that although business research is typically quantitative and "formal", a strong qualitative alternative exists. He observes "A key component of that methodology involves combining scraps of seemingly unrelated data into a seamless interpretation capable of demonstrating the goals, strengths, and weaknesses of the group being investigated" (2001 1).

Currently countries such as Iran are being analyzed regarding managerial issues in the quest to help their organizations better perceive their available options (Tajeddini 2015). This paper provides further insights by discussing how outsiders can simultaneously develop the skills and abilities needed to more effectively relate to such communities.

This type of analysis is respected and has earned a place within business research. "Although the techniques of qualitative analysis are not scientific, quantifiable, or 'replicable', they have their place in the decision-making process and they have been embraced by practitioners" (2001 1).

The method suggested here is incomplete and imperfect, but it is quick and cheap. As a result, analyzing secondary open-source information can provide valuable and timely insights. It can be used in

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freestanding research or in pioneering investigations that help more scientific researchers develop testable hypotheses. The example showcased here has been simplified for didactic reasons. Other research projects can (and should) be more complex and tailored to the specific research questions at hand.

In the final analysis, popular culture researchers possess valuable insights and a distinctive toolkit that is increasingly recognized by business researchers and decision makers. Building upon the successes of other qualitative methods such as Competitive Intelligence, popular culture analysts can, where appropriate, transcend the Ivory Tower and embrace practitioner roles. This paper has showcased one example of doing so.

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