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## DESTINATION BRAND GNOSIS (DBGNOSIS): AN INNOVATIVE TOOL FOR TOURISM RESEARCH

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**Abstract:** The present study addresses the case of Destination Brand Gnosis (DBGnosis), a purpose developed software for analysis of Big Data related to tourism destinations, especially to destination image studies. DB Gnosis was purposefully developed to carry out the research tasks of the Tower of Babel project, which analyses destination image formation through a global, multilingual, qualitative survey. In the present study, the program's potential is discussed, and its operation is minutely described. DB Gnosis is a free to use software, with intuitive controls, that allows for both quantitative and semantic Big Data analysis. It is also being constantly improved due to inputs and contributions from researchers, software engineers, and statisticians, and offers extremely fast data processing. It is a brand-new program that was purpose developed to fill a noticed gap in the realm of data analysis software packages, and this study is the first piece of academic literature to address it.

**Keywords:** Tourism Innovation; Technologies; Big data analysis; Destination Brand Gnosis (DBGnosis).

### 1 Introduction

The development of Information and Communication Technologies (ICTs), combined with the popularisation of internet use, has caused a shift in the way organisations communicate with customers and develop new products. Online, interactive, and social communication have become the rule, and products have become each time more personalised. The consumer co-creates contents and demands a direct and two-way communication with companies (Vaz, 2008). The pace of information traffic

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worldwide is ever increasing due to faster internet services and an increasingly globalised market. Even human relationships are totally immersed in the digital culture, as an increasing portion of social interactions take place in the cyberspace, which has been replacing face-to-face interactions. Therefore, reality becomes multidimensional and partially artificial or virtual. Communications happen in a global scale through network structures and mediated by smart devices. This is clearly illustrated by online forums, for instance, which millennials are more likely to resort to – rather than asking a friend or colleague personally – when in doubt about a special interest activity or product. Once their doubts are exposed to the community, people from the whole world connected to that network will engage in the discussion. Therefore, the boundaries for communication are no longer geographical, but simply of common interests.

In tourism, as in other industries, internet has become a fundamental communication platform for organisations, and employed on the most varied applications, such as customer service, sales, and promotion (Cruz et al., 2012). In this context, tourism entrepreneurs need to pay close attention to new ways of getting customers' attention and satisfying their needs, in order to achieve competitive advantages. Consequently, new research methods are also constantly being developed, as well as new platforms that gather consumers' information, creating new opportunities for market data analysis (i.e., social network sites – both generalist and travel specific ones – blogs, and reservation websites). In this context, studies on this field focus on the different types of ICTs, attempting to achieve a deeper understanding of their application and impact on the tourism industry.

This whole set of websites and applications creates a scenario in which a big amount of data is being constantly generated. Extracting useful insights from this world of non-structured data is one of the main challenges for tourism entrepreneurs and researchers. The good news is that the benefits, mainly in sales and branding, often overcome the expenses needed to analyse such data. It is in the context, which implies a constant monitoring of destinations' brand images, that the project The Tower of Babel of Tourism Destinations Worldwide arises. To analyse the data generated through such platform, the Destination Brand Gnosis (DBGnosis) software was developed. The following chapters present a discussion on tourism innovation through new technologies, which culminates with a more minute description of the software and its potential to achieve competitive advantages to tourism destinations.

## 2 Tourism innovation and new technologies

Upon analysing research studies that utilise new information and communication technologies, Buhalis and Law (2008) observe that tourism often come as the source or the object of such studies. Such scenario shows that tourism innovation (TI) advancements have increased tourism's potential of contribution to economic development. Due to the importance of TICs, organisations have gradually increased investments in technological tools for planning, in order to increase the efficiency of their business processes, as well as to increase productivity (Kim et al., 2008).

Kim et al. (2008) observe that new technologies are evolving in an ever-increasing pace. In this context, new applications and hardware are replacing old ones each time faster, which allows users to access speedier services. Those resources' effectiveness, however, can only be assured when workers embrace new technologies and use them properly. Therefore, technological innovations force tourism industry players to rethink, and sometimes, drastically change, their businesses' patterns (Buhalis and Law, 2008). Consequently, tourism companies need to invest in personnel formation in order to survive in the current competitive market.

The level of automation allowed by research method innovation brings about advantages such as consistent evaluation (without distortions that may be caused by human error in non-automated investigations) and a speedy analysis, when compared to those based purely on human perception (Law and Qi, 2009). In this context, the development of information technology has dramatically changed the way research, and particularly data analyses, is carried out. Those changes apply not only to scholars, but also to market researches and practitioners. A critical point in this process was the adoption of e-mail surveys, in the 1980's, which marked the beginning of online research. In the 1990's, the advent of web surveys continued such process. Since then, online surveys gained each time more popularity, so that in 2004, 35% of all surveys carried out in the USA were conducted online. Clearly, the future of online research is promising, and it is likely that most of academic research in tourism and hospitality will be online in a near future (Hung and Law, 2010).

Surveys and opinion researches are the most popular methods for collecting data about tourists. However, these approaches are generally time consuming and ensue a limited number of responses. Therefore, data is normally insufficient to reflect current travel trends (Vu et al., 2015). In qualitative investigations, typically, data from direct observation in field research is investigated. In some cases, Big data from web sites may also be the object of analysis. Qualitative researchers engage in naturalistic investigations, that is, they intuitively study real world configurations and describe them through narratives. In this manner, they search for patterns in the analysed phenomena, which are used to formulate theories.

As an example of computer-aided qualitative analysis in tourism, Cardoso et al. (2019) explore how the image of tourism destinations is processed in tourists' memories. The research is centred in two highly desirable, but distinct, destination categories: favourite destinations, based tourists' retrospective memories of positive experiences in situ; and dream destinations, built on tourists' prospective memory. Through a multilingual online survey, the authors collected respondents' perceptions, evoked by way of free-recall, associated to dream and favourite destinations.

Also analysing research innovation through computer-aided methods in tourism, Del Vecchio et al. (2014) focus on the increasing relevance of Big Data as a significant source of knowledge with a substantial impact on tourism entrepreneurship and planning. In this context, Big Data represents a relevant study field for both researches and practitioners. Big data is then, consolidated through an increasing body of work focused on comprehending its technological dimensions, as well as its applications to tourism.

### 3 New technologies and research in tourism

Since the 1970's, information technology advances have been increasingly making tourism services' commercialisation more efficient and causing significant changes in the industry's structure (Koo et al., 2015; Porter and Heppelmann, 2014; Sigala, 2015). For example, hotels have adopted new management tools that allow the integration of offices and departments, while airlines have used informatic systems for flights' management and sales (Koo et al., 2015). From tourism scholars' perspective, TIs have brought about new research methods, as well as new platforms for data analysis. Generalist social networks, such as Facebook and Twitter, tourism and related industries specific networks and apps, such as TripAdvisor and Yelp, and tourism service search and reservation websites, such as Booking.com, AirBnB and Edreams, all gather consumer data, offering a new array of research possibilities. In this context, studies in this field focus on the different types of TIs and their impact on the tourism sector. To this end, they adopt approaches such as the analysis of tourism inducing music videos published in social media (Oh et al., 2015); specific methodologies for studying the potential of Smart Tourism (Hunter et al., 2015); content analysis of official destination websites (Ashish and Shelley, 2015); and analyses of destination images through both printed and online marketing material (Hwang et al., 2015).

Among the new technologies applied to tourism management, smartphones, like in other industries, have been playing a particularly relevant role. Many studies have examined changes in tourists' behaviour caused by the use of smartphones. To this end, they employ techniques like in depth interviews (Wang et al., 2016), travellers' stories analysis (Wang et al., 2012), online surveys (Tussyadiah and Zach 2012), focus groups, and surveys with experts (Rasinger et al., 2009). The connection between tourism and ITs gives origin to the concept of Smart Tourism, which may include elements or activities such as: e-commerce (Kim et al., 2013), virtual reality (VR), and augmented reality (AR) (Hunter, 2014), playing a potentially significant role in the destination image formation process (Hunter et al., 2015). To investigate those topics, researches employ multiple approaches that allow for a deeper comprehension of the phenomenon, such as the Q method, designed to explore the communicability flow (Brown, 2009; Eden et al., 2005), and the V (visual) methodologies, which explore and interpret the meanings codified in media supports such as photography, videos, paintings, diagrams, and maps (Metro-Roland, 2009).

Another example of new technology-based methodology applied to tourism studies is the analysis of online comments (eWOM) (Munar and Jacobsen, 2014). Social network platforms, as well as blogs, reflect tourists' knowledge and opinions (Buhalis and Law, 2008; Sun et al., 2015; Volo, 2010), as well as their experiences and emotions (Jacobsen and Munar, 2012). Moreover, they allow users to access and interchange information in real time (Munar, 2010). Therefore, analysing this data is a current priority investigation stream for tourism studies (Williams et al., 2012). Since the 2000's, many studies have applied this technique to examine topics such as: the effect of the user-generated content on tourism (Jacobsen and Munar, 2012; Fotis, et al., 2012; Xiang and Gretzel, 2010), knowledge interchange in virtual communities (Hsu et al., 2007), and tourists'

motivations for joining social networks (Berger and Schwartz, 2011; Bronner and de Hoog, 2011).

Another important topic related to the Smart Tourism context is the Smart Tourism Ecosystem (STE), defined as complex of a community of digital devices and their environment functioning as a whole, or as an intelligent tourism system featuring a dynamic network and heterogeneous, spread out surroundings (Werthner, 2002). In other words, it combines the use of digital ecosystems and business networks (Gretzel et al., 2015). At last, the concept of e-tourism, or electronic tourism, must be addressed. E-tourism is understood as everything that happens electronically within the travel and tourism industry, or “as the design, implementation and application of IT and e-commerce solutions in the travel and tourism industry, as well as the analysis of the impact of the respective technical and economic processes and market structures on all the involved actors and especially on the traveller’s experience” (Werthner et al., 2015: 2).

#### 4 Big data analysis in tourism sector

Internet has dramatically changed the way people travel. Destination information search, reservations, and most services are currently done mostly online (Berne et al., 2012; Xiang and Gretzel, 2010). Moreover, the very existence of destinations, as well as travellers’ expectations and recollections, are also increasingly connected, either through real-time sharing in social media, or through utilitarian applications. All of those web-based actions leave a trail, and the sum of those trails form a big volume of varied, structured or non-structured information in different formats and from different sources. These information agglomerates are what is referred to as “Big Data”.

Big Data offers opportunities for all kinds of organisations, including those in industrial fields. In this context, Big Data has been described as a current market hype, or a buzzword employed to highlight opportunities of precious insights on consumer behaviour (D’Amore et al., 2015). On the tourism sector, in particular, such information helps companies comprehend trends and customers’ preferences, as well as their likes, dislikes, and sentiments (Xiang et al., 2015). Such knowledge serves as a tool to revise marketing strategies, discover new business opportunities, improve the decision-making process, and identify risks. Travel agencies, for example, have been using Big Data to negotiate better prices with service providers and maximise sales for each reservation. Other opportunities to many organisations include: demand, and consequently sales, forecast; multichannel marketing campaign optimisation, product personalisation and customer loyalty building (Wang et al., 2002).

Analysing Big Data, however, is not an easy task. First, as Big Data comes in different formats, companies must invest significantly in new data processing tools, data storage hardware, and smart servers and software (Fan et al., 2014). Another additional difficulty is imposed by users’ privacy issues, which must be handled carefully, both from a legal standpoint, considering each country’s laws, and from the customer satisfaction stance (World Travel and Tourism Council, 2012). At last, information from certain sources present additional challenges. This is because Big Data includes both structured and unstructured data. Structured data, that is, those from reservation platforms, for example,

are easier to analyse, but represent only 25% of the total of online information, according to a 2012 report from the Technomathematics Research Foundation (Akerkar, 2012). According to the same report, the other 75%, the non-structured information, includes Facebook and Twitter posts, Yelp and TripAdvisor reviews, and pictures, videos, and testimonials from on many platforms. This data presents a great potential for predictive analysis, as they can provide answers to practically any question about user's behaviour, visions, and sentiments. The real relevant information is hidden in an ocean of irrelevant data. Therefore, extracting useful insights from this world of non-structured data is one of the main current challenges for tourism organisations. The good news is that the benefits often outweigh the expenses, either through an increase in sales, or through brand image building.

Given Big Data's potential to tourism, every company within the sector should immediately start investigating ways to capitalise on it, as well as try to discover what competitors are doing. Moreover, they should research about whether consumers use the technologies that leave the trails that form Big Data, and understand the adoption trajectory within their segments of interest. This is because being a leader, rather than a follower, may represent the difference between increasing or losing market share.

## 5 DB Gnosis software: an innovative tool for big data analysis

Destination Brand Gnosis (DB Gnosis) was created in the context of the "Tower of Babel" project (<http://favouritedestinations.com/en/>), carried out by the Euro-Asia Tourism Studies Association – EATSA – (<http://eatsa.byd.pl/id,8/founding-committee>). The project aims at surpassing the huge shortcomings of the dominant quantitative approach in destination image and destination brand equity studies, which is usually operationalised through a small set of Likert scales, ignoring the huge complexity and diversity of destinations worldwide. To this end, the Tower of Babel adopts a truly holistic approach to destination image analysis, building on the premise that the huge complexity and diversity of destinations worldwide can only be appropriately addressed through qualitative surveys with open-end questions, especially when concerning the assessment of two crucial dimensions of destination brand equity – destination awareness and destination brand image (e.g., Dias and Cardoso, 2017; Cardoso et al., 2019).

In this context, to allow the collection top of mind mental associations, the project was operationalised through an online multilingual survey, through which respondents were invited to to share their own free-recall evoked, subjective meanings regarding their preferred tourism destinations (i.e., Favourite Destinations, that is, the best destinations built on respondents' experience and retrospective memory; and Dream Destinations, that is, the most desired destinations built on respondents' imaginary and their prospective memory). More specifically, respondents spontaneously enunciated their preferred destinations and described them using three words. Within this multilingual survey procedure, respondents from all over the world have equal opportunity to answer in their own mother tongue, as well as to enunciate any kind of destination (local, regional, national or even pluri-national) without any kind of methodological restrictions. However, the price to pay for this adequateness in the data collection stage is the massive

amount of qualitative information to be processed afterwards. Therefore, the research team needed a software capable of evaluating thousands of destination brand images, based on tens of thousands of perceptions, automatically translated from 34 different languages. In the absence of such software, DB Gnosis was purpose developed for the task.

“DB Gnosis” is a fusion of “Destination Brand” (DB) with “Gnosis”, which is Greek for “Knowledge”. The name is a reference to the context in which the program was developed, that is, as a tool for analysing data, and therefore, gaining knowledge, about destination imagery associations, which is a key element for destination branding. The software is free to use and available for researchers who request it via “The Tower of Babel of Tourism Destinations Worldwide” project’s web page (direct link: <http://favourite destinations.com/en/dbgnosis/>). As it has been developed by demand to carry out the analysis tasks of the Tower of Babel project, its design and development are carried out by a software programmer based on inputs and demands from EATSA researchers. In this context, new functions, tailored to address the specific needs of researchers, are continuously incorporated. Therefore, DB Gnosis is on and on-going evolution process, and is open to suggestions of improvements and new tools that might facilitate mega data analysis tasks applied to tourism studies. In a near future, the program will also become open-source, so that programming savvy users will be able to add themselves functions and tools that best fit their analysis needs.

The software package has its genesis on the C# (Csharp) language, and prioritises speed in mega data treatment. The program currently feature nine main tools designed to help Big Data researchers in their analysis tasks. Currently, it is available only for Windows, but Linux and MacOS compatible versions are to be developed soon. The program features a series of content folders, so that source files and those generated by the analysis processes are organised and no information is lost. As shown on the left side of Figure 1, each folder is named based on its utility, i.e., Original files, Translated files, Working files, Corrected files, and Canceled files.

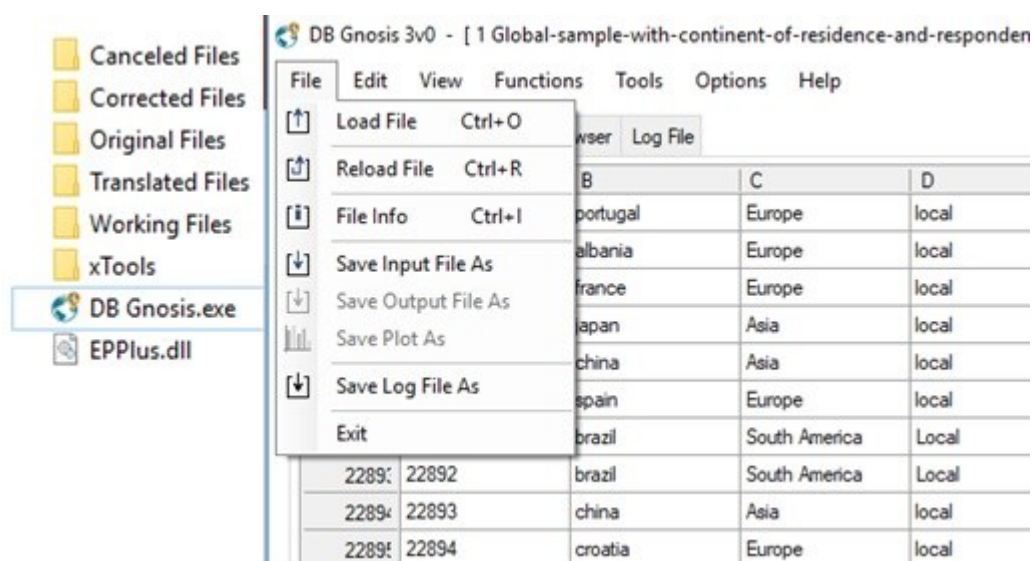


Figure 1. DBGnosis’ content folders and main menu

Speedy data treatment and file loading are top priorities in DB Gnosis. A 1983kb Excel file, for example, is loaded in eight seconds. User friendliness is also prioritised, as the developers considered that Big Data researchers are not necessarily programming savvy. In this context, all operations are executable through the software's simplified menu. The File tab, for example, allows users to load files, save analysis outputs and modified databases, and (re)load data. The Functions tab includes, as shown in Figure 2, translation, a function carried out through the software's connection with Google Translator. Naturally, Google's translations are not accurate enough to be directly employed for qualitative research purposes, as it does not consider more nuanced linguistic aspects. With this in mind, the translation sub-menu includes options for translation rules, which allow users to adopt patterns in order to adequate translations to the research project's needs.

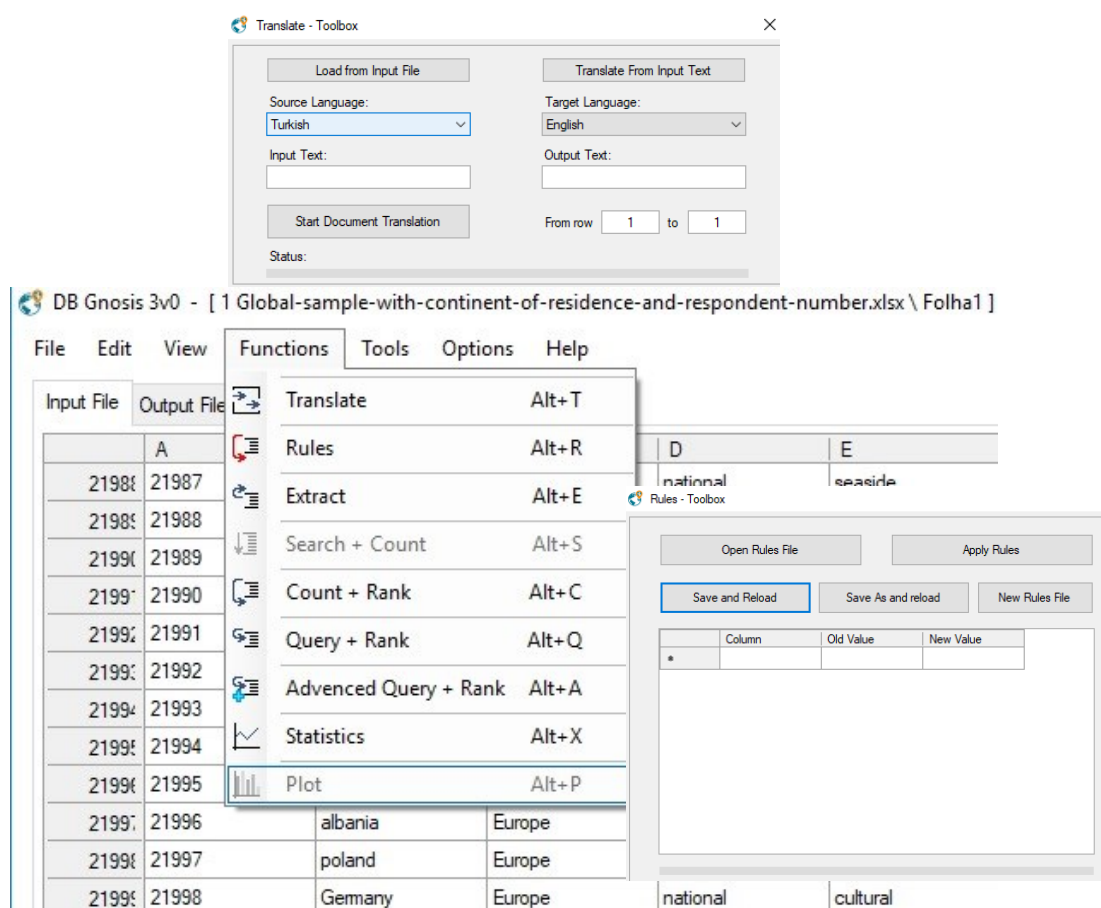


Figure 2. DBGnosis' functions

The Rules toolbox, as shown in the bottom part of Figure 2, allows users to indicate the column(s) of an Excel file in which the new rule must be applied. Once the rule is applied, a new, updated (with the modifications) version of the file is created. Moreover, this toolbox allows the conversion of text variables into numeric variables, as well as preparing the database for other programs. The Extract toolbox (Figure 3 – left side)

allows users to extract parts of a file and create a new file (to study a certain variable's behaviour, for instance). This is particularly useful for analysing Big Data, as users avoid overloading the system (and slowing down the analysis) by unnecessarily having the system (re)analyse the whole dataset – rather than only the part that actually needs to be analysed.

The Count Rank toolbox (Figure 3) includes statistical tools, namely, absolute and relative frequency counting, which can include an unlimited number of columns. The Count + Rank toolbox' output (Figure 4 – right side) allows for the visualisation of frequency counts, so that users can verify whether there are linguistic errors, as well as correct orthography before re-executing the count. There is also the Log File toolbox, which registers all the inputs entered by the user, allowing for easy replication of the analysis steps, as well as for copying and pasting in a text editor for including in the research report.

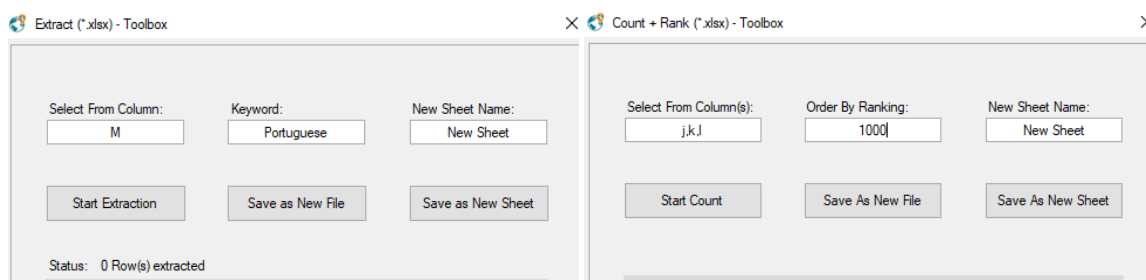


Figure 3. extract and count + rank toolboxes

	A	B	C
▶ 1	Variable Name:	Absolute Frequen...	Relative Frequen...
2	Dream	6750	0,287895589866...
3	Seaside	3850	0,164207114219...
4	Cultural	2952	0,125906337968...
5	City	1912	0,081549091529...
6	Gastronomy	1442	0,061503028235...
7	Mountains	1136	0,048451761494...
8	Shopping	1034	0,044101339247...
9	Rural	873	0,037234496289...
10	Wellness	763	0,032542864454...
11	Ecotourism	637	0,027168813443...
12	Sports	560	0,023884671159...
13	Religious	480	0,020472575279...
14	Cruise	424	0,018084108163...
15	Creative	313	0,013349825130...
16	Business	293	0,012496801160...
17	Golf	27	0,001151582359...

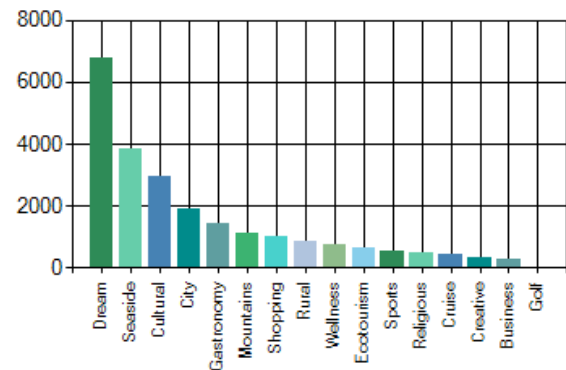
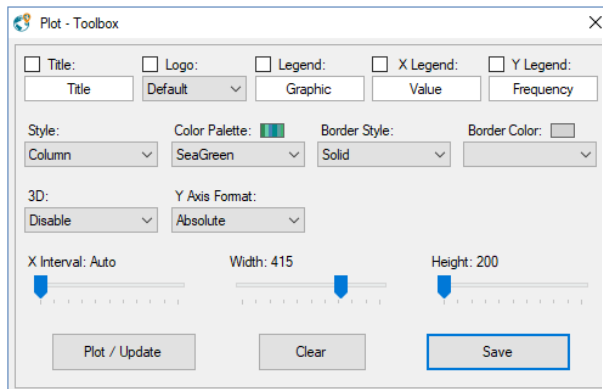


Figure 4. count + rank toolbox' output and log file

The Plot toolbox (Figure 5) allows researchers to create and personalise graphics considering their research projects' specific needs. The Query toolbox (Figure 6 – left side) features keyword counting and variable ordering according to pre-established criteria. The Advanced Query toolbox (Figure 6 – right side) allows for more detailed word query, including searches in multiple columns and up to three keywords.

```
12:07:28 Start Count + Rank ...
Input file : C:\Users\Lucy\Desktop\Gnosis 3v.0\Original Files\1 Global-sample-with-continent-of-re
Input sheet : Folha1
Sample size : 23446
Pseudocode : Select Value From Column(s) E Order by Ranking 16
```

Ranking:	Variable Name:	Absolute Frequency:	Relative Frequency:
1	Dream	6750	0,287895589866075
2	Seaside	3850	0,16420711421991
3	Cultural	2952	0,125906337968097
4	City	1912	0,081549091529472
5	Gastronomy	1442	0,0615030282350934
6	Mountains	1136	0,048451761494498
7	Shopping	1034	0,0441013392476329
8	Rural	873	0,0372344962893457
9	Wellness	763	0,0325428644544912
10	Ecotourism	637	0,0271688134436578
11	Sports	560	0,0238846711592596
12	Religious	480	0,0204725752793654
13	Cruise	424	0,0180841081634394
14	Creative	313	0,0133498251300862
15	Business	293	0,0124968011601126
16	Golf	27	0,0011515823594643

Figure 5. plot toolbox

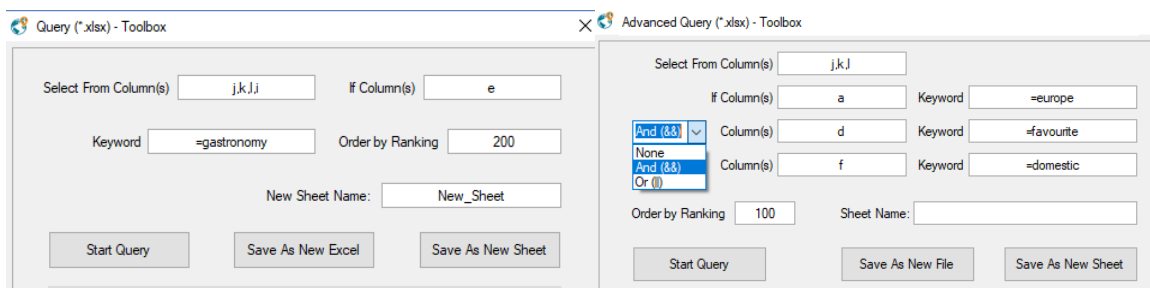


Figure 6. query and advanced query toolboxes

The Statistics toolbox (Figure 7 – left side) allows users to perform basic statistical analyses, namely averages, means, and median. The software's statistical capabilities are

quite limited, as DB Gnosis is essentially a qualitative Big Data Analysis tools. Therefore, the qualitative capabilities are meant simply to provide very basic support for qualitative analysis, rather than replacing dedicated statistical packages. The Tools menu (Figure 7 – right side) features a calculator and a notepad function, as well as database engine and translation server tests, which were added due to requests from researchers.

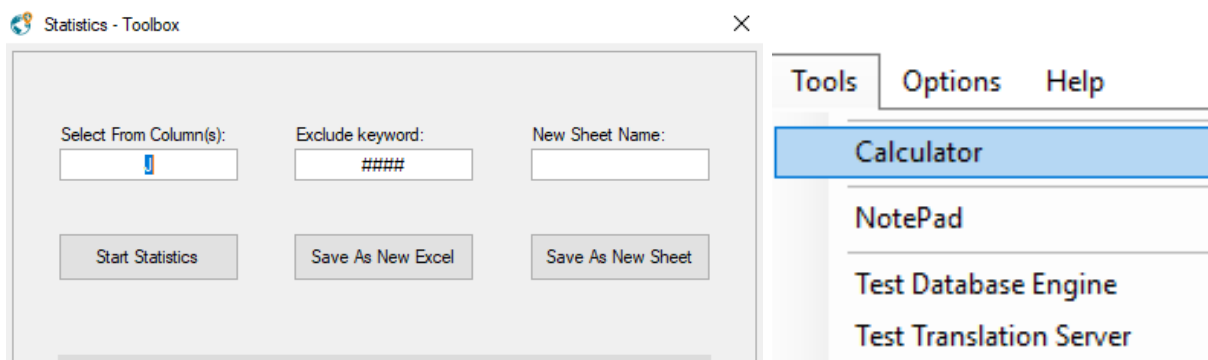


Figure 7. statistics toolbox and tools tab

The Web browser menu (Figure 8) features web searches for keywords, and keyword frequency count on output files (Figure 9). Search and counting results, from which specific words can be excluded, are sent to the input file (figure 9). Through the Search + count toolbox, users can search for isolated words or concepts (word combinations). The tool allows up to 6 simultaneous counts, as shown in Figure 11. Finally, DB Gnosis also allows for text searches in .txt files (Figure 11). To this end, the program converts .doc or .pdf files into .txt, which also allows for all the previously described analyses at high speed.

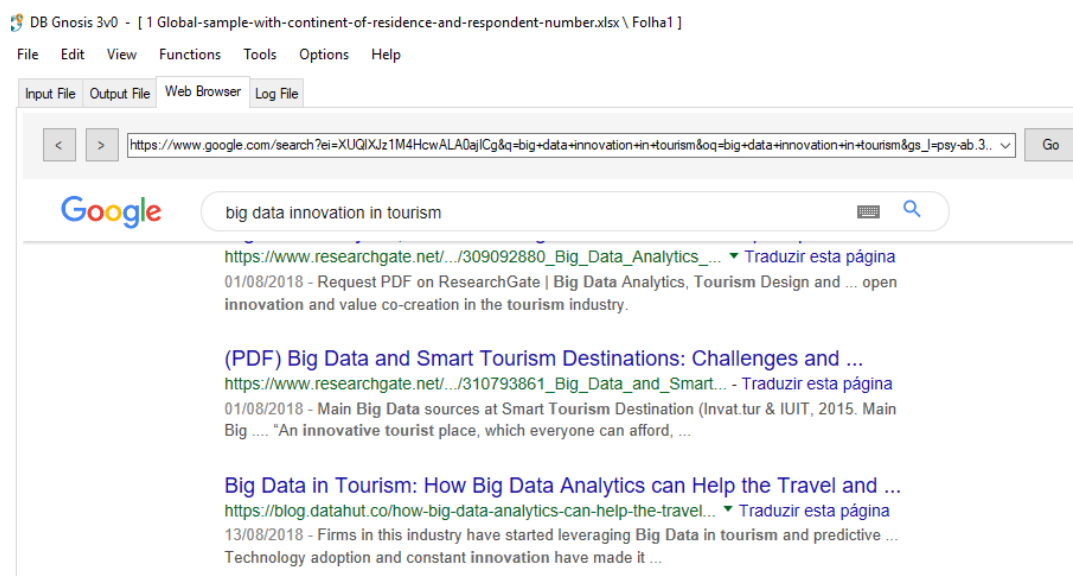


Figure 8. web browser menu

DB Gnosis 3v0 - [ <https://www.smartdatacollective.com/envisioning-tourist-demand-big-data/> ]

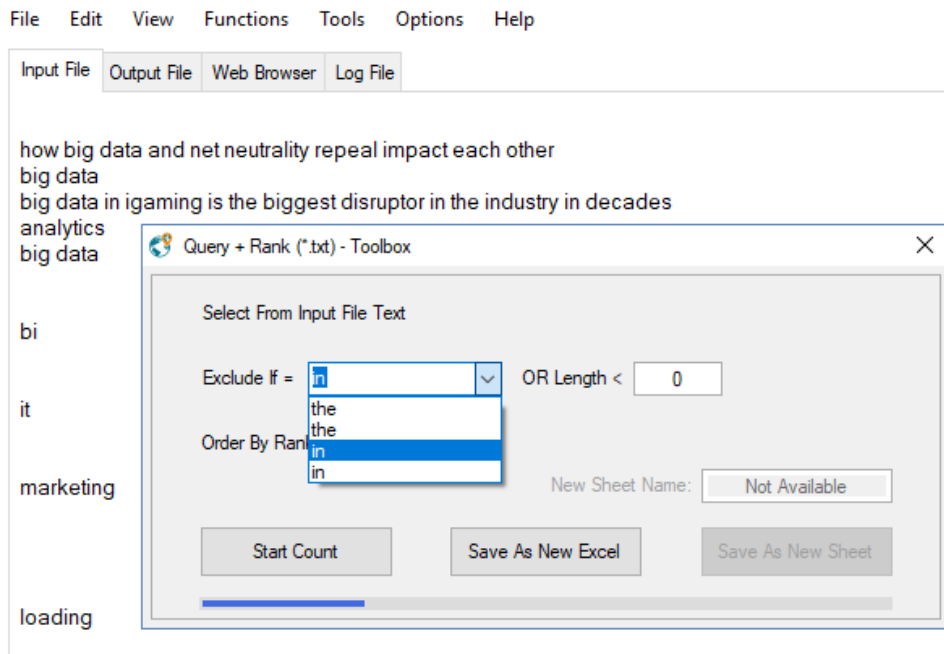


Figure 9. input file and web browser query rank

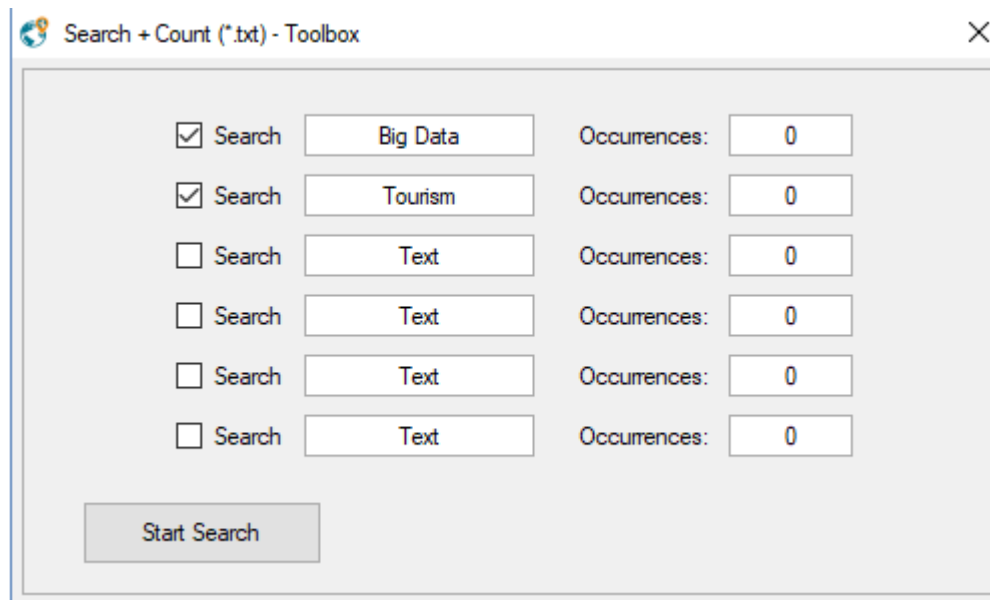


Figure 10. search + count toolbox



Figure 11. files conversion into .txt

## 6 Conclusion

In the last decade or so, the impact of Big Data on the tourism industry has been noticeable. The World Travel and Tourism Council (WTTC) has commented on such impact in 2014, and observed that, although it does not substitute creativity, employing and relying on new technologies is fundamental for companies competing in today's globalised market. In fact, information traffic on the web is increasingly faster, due to advances in information technology. In the tourism sector, the use of information technologies has been expanding at a dramatic pace (Porter and Heppelmann, 2014). This includes sales and management systems used by airlines, hotels, and travel agencies, as well as utilitarian mobile applications and travel experiences shared in social media by tourists. All those applications leave what is often regarded as a trail of data, that is, a massive amount of structured and unstructured data in many different formats, which has been referred to as "Big Data". In order to manage tourist activities in a sustainable manner, as well as to achieve competitive advantages in the global market, companies and destinations need to analyse this data trail and extract useful insights from it. Therefore, Big Data analysis is a current priority in the tourism industry and academia.

It is in this context that the Tower of Babel arises. The project is operationalised through an online platform that allows for global and multilingual qualitative surveys. The specific survey carried out for the project collected free recall invoked data, consisting of preferred (dream and favourite) destination names and attributes associated to them, in 34 different languages, ensuing tens of thousands of observations from countries in the five continents. To convert all this data into useful knowledge for scientific and practical purposes, the responsible research team had to analyse it in such a way that, despite the big volume, semantic meanings and nuances were also considered. The absence of a software that was able to help researchers in such complex qualitative data analysis motivated the development of DB Gnosis.

The software's name gathers the Greek word "Gnosis", which means "knowledge", with "DB", short for "Destination Branding, a reference to the fact that the software was developed primarily for gaining knowledge on destination image processing, which is essential for destination branding. The program is designed and developed by a software programmer in direct collaboration with researchers from the Euro-Asia Tourism Studies Association - EATSA - responsible for the Tower of Babel project, which results in the continuous incorporation of functions tailored to address the specific need of researchers. In sum, the main reason to use DB Gnosis is that it is a free to use software, with intuitive controls, that allows for quantitative and semantic Big Data analysis. It is also being constantly improved due to inputs and contributions from researchers, software engineers, and statisticians, and offers extremely fast data processing. Moreover, the program will soon become open-source, allowing developing savvy users to easily add functions and packages that fit their analysis needs.

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### **GNOSE DA MARCA DE DESTINO (DBGNOSIS): UMA FERRAMENTA INOVADORA PARA PESQUISA EM TURISMO**

**Resumo:** O presente estudo trata do caso da Gnose da Marca de Destino (DBGnosis), um software desenvolvido especificamente para a análise de Big Data relacionados a destinos turísticos, especialmente para estudos de imagens de destinos. O DBGnosis foi desenvolvido propositadamente para realizar as tarefas de pesquisa do projeto Torre de Babel, que analisa a formação da imagem de destino por meio de uma pesquisa qualitativa global, multilíngue. No presente estudo, o potencial do programa é discutido e sua operação é minuciosamente descrita. O DBGnosis é um software de uso livre, com controles intuitivos, que permite a análise quantitativa e semântica do Big Data. Também está sendo constantemente aprimorado devido a contribuições de pesquisadores, engenheiros de software e estatísticos, e oferece processamento de dados extremamente rápido. É um programa totalmente novo, desenvolvido com o objetivo de preencher uma lacuna observada no campo dos pacotes de software de análise de dados, e este estudo é a primeira peça de literatura acadêmica a abordá-lo.

**Palavras-Chave:** Inovação em Turismo; Tecnologias; Análise de Big Data; Gnose da Marca de Destino (DBGnosis).