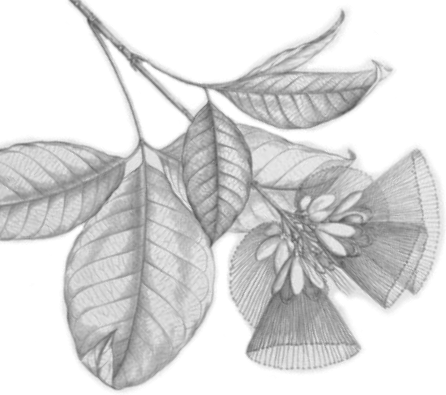

Knowledge Governance: Building a Conceptual Framework

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ABSTRACT

This exploratory systematic literature review is a starting point for a deep literature review on "Knowledge Governance" (KGOV) topic. The aim is to have a quick picture about KGOV; specifically trying to identify the seminal, core and relevant documents. We also seek to know the contexts of these studies, as well as on what ontological levels and activities they refer to. The principal results are: a) the identification of the structure of the topic, by retrieving the main seminal articles and the most cited (core documents) and b) the building of a structured analysis framework. This framework will be used to perform a deep literature review that aim to develop an integrated and holist conceptual model on Knowledge Governance. Major conclusions are related to clues for future research on this topic.

Keywords: Literature Review; Knowledge Governance; Education; Research; Innovation.

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Sustainable development is a knowledge intensive process, but there is a lack of wise use of global knowledge resource. This resource need to be managed in order to facilitate knowledge flows through networking spaces of the co-creation, acquisition, sharing and transfer of knowledge, as some authors defend, such as Ikujiro Nonaka, Ryoko Toyama and Noboru Konno (2000) or Isabel Pinho, Arménio Rego and Miguel Pina Cunha (2012).

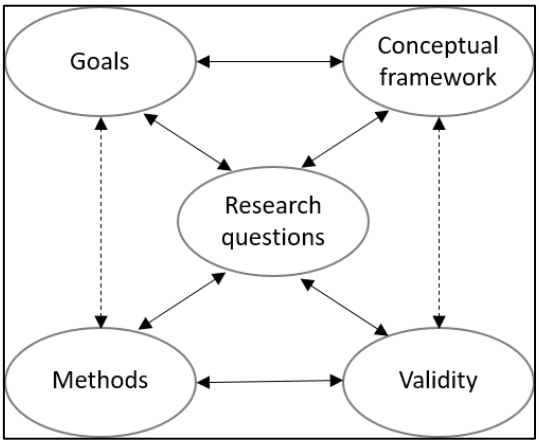
Our focus is creating value from knowledge at different scopes and contexts (Pinho & Pinho 2014). We defend that Knowledge Governance (KGOV) is a catalyst for building convergence spaces, by exploring the "proximity view" such as geographical proximity (Vale & Caldeira 2007), social, institutional, organizational and cognitive proximity (Boschma 2005), knowledge proximity (McCann & Ortega-Argilés 2015) or knowledge needs and knowledge providers proximity (McCann & Ortega-Argilés 2015). Knowledge governance refers to choosing the structures and mechanisms that can influence the processes of knowledge looking the interrelation between micro, meso and macro levels, with a strategic focus (Foss 2009; 2007; Pinho & Pinho 2016). Although some aspects of Knowledge Governance have already been identified (Antonelli 2006; 2013; Foss & Michailova 2009) it seems that there is lack of a theoretical transversal model which meets two main objectives: (a) to map Knowledge Governance domain and b) to take action for facilitating the creation, use and integration of Knowledge (Local and Global).

Our main research is motivated by advocacy of some authors (Foss 2007; Grandori & Furnari 2008; Husted et al. 2012) for qualitative and quantitative data explorations with multi-level analysis as a means of better grasping the complex social phenomena knowledge governance implementation. This exploratory literature review is a structural step to this main research.

The main concern in this study is to maintain an internal coherence of the whole study, guaranteed by the identification of the research question that constitute the heart and the driver of all research (Maxwell 2009; Neri de Souza et al. 2016); all components of this Interactive research design model should be aligned (see Figure 01).

The object of this study is Knowledge Governance. Because Knowledge is the most value resource in Knowledge Society there is a need to understand the state of art of Knowledge Governance theme. Knowledge governance is a move which aims to respond to the change: from hierarchical spaces of knowledge production and use to self-organizing networks inside multi-level governance scales, where the connecting knowledge and people requires the integration of macro, meso and micro social spaces (Pinho & Pinho 2016). We need to clarify this concept and consequently our main research question is: What is Knowledge Governance?

Figure 01. Maxwell's Interactive Research design model



Source: Maxwell (2009, p. 207)

To achieve the answer to this research question we start by performing an exploratory review in order to identify some key blocks related to the structure of this topic by looking for answers to the following questions:

a) What are the seminal, core, relevant and review documents on Knowledge Governance topic?
b) In which context (e.g., Education, Science and Innovation) Knowledge Governance theme is addressed in these documents?
c) In what layer (Micro, Meso, Macro and Network) and level of activity (or level of Analysis) those documents focus?

The scope of this article is limited to those issues. The answers will be the outputs of this exploratory review and they will be used as inputs to build a Knowledge Governance Conceptual Framework.

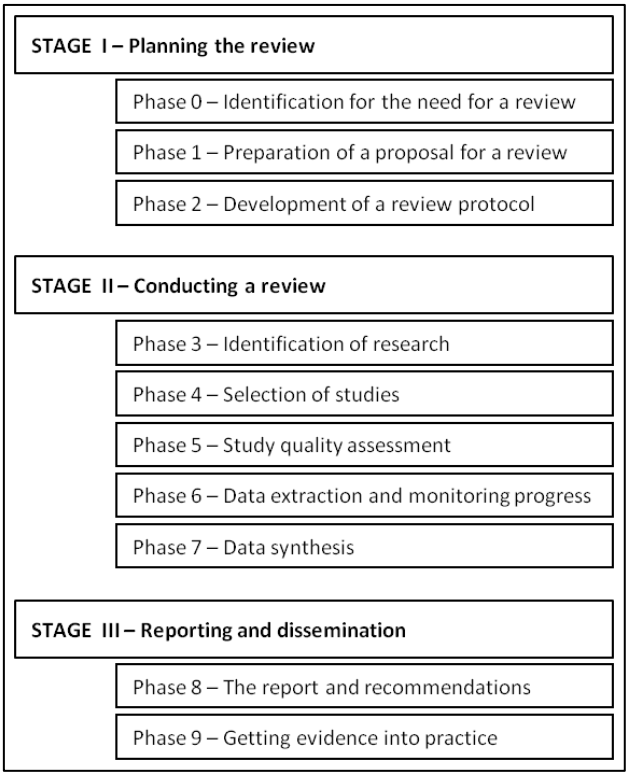
METHODOLOGY

We began to identify literature corpus on Knowledge Governance, considering that in essence the literature review can be considered a form of content analysis (Pinho & Leite 2014). Literature reviewers can use computer-aided text analysis (CATA) tools for content analysis to organize and manage data, to code bibliographic categories to make the review process more systematic, faster and more reliable (Costa et al. 2017). The literature review can be a challenge to deal with the excess of information; to overcome this barrier is necessary to define and follow clear research questions and the use of structured criteria to ensure the internal coherence of the whole research project.

Using Content Analysis can bring several benefits (Duriau et al. 2007). Content analysis is a replicable methodology that provides a deeper access to cognitive soft structures that are embedded in spoken and written language. Another feature is related to its analytical flexibility since it can be done on two levels: quantitative level (the manifest content of the text can be analyzed using several text statistics) and qualitative level (latent content should emerge beyond the descriptive analysis and the narrative requiring a critical interpretation and writing on the results obtained).

The research design of this paper followed the guidelines, as proposed by David Tranfield, David Denyer and Palminder Smart (2003), with three main stages: planning the review; conducting the review and reporting the outcomes from the review (Figure 02).

Figure 02. Stages of the systematic review process.



Source: Based on Tranfield et al. (2003)

STAGE I - PLANNING THE REVIEW

In the first Stage - Planning the review - we identify the need of building a Conceptual Framework on Knowledge Governance. Because Knowledge Governance is a need to value the most precious resource we want to identify the state of art on this theme. Next steps were to prepare the proposal and develop the review protocol.

Any systematic review needs a detailed protocol that describes in advance the process and methods. The review protocol is a plan that helps protect the objectivity of the work, through an explicit description of the steps that must be taken. In short, it should contain information on: (1) the specific objectives of the review; (2) research strategy; (3) final results of the research (Table 01). We followed a simplified version of Prisma Statement Protocol (Moher et al. 2015; Tranfield et al. 2003) (see Table 01).

Table 01. The adopted Review protocol.

COMPONENTS	
Objectives	-Identify seminal, core and relevant documents on Knowledge Governance topic -Identify in which context those documents focus -Identify in which ontological layer and levels of activities those documents focus
Search strategy	- Information sources selection (databases, reference books, etc.) - Time frame and the language - Search terms and search strings - Select tools for collecting and organizing information - Define the criteria for inclusion and exclusion
Outputs	- Sample of documents (subject to analysis and synthesis review) - Seminal, relevant and core articles, books - Conceptual Framework model

Source: Authors.

STAGE II - CONDUCTING A REVIEW

After having clearly defined the limits of the literature review, which resulted from a planning work, composed by a succession of decision-making, we started this stage II, conducting the review.

a. PHASE 3 - IDENTIFICATION OF RESEARCH

Arising from our initial question (What is Knowledge Governance?) we define the specific research question of this exploratory review: What is the state of art of Knowledge Governance topic? The main objective is to build a Knowledge Governance Conceptual Framework, and we decided to capture some insights by making a content analysis of selected literature documents. To facilitated the alignment of research question with research objective, data corpus and type of analysis we constructed table 02, that explicit those items (Souza et al. 2015).

Table 02. Overall Internal Coherence of the Research.

RESEARCH QUESTION	**RESEARCH OBJECTIVE**	**DATA CORPUS**	**TYPES OF ANALYSIS**
What is the state of art of Knowledge Governance topic?	Building a Knowledge Governance Conceptual Framework	Literature documents (Articles and Chapters…)	Content analysis

Source: Authors.

After we capture literature documents we read the title and abstract of each document and classified then in order to answer the following questions: a) What are the seminal, core, relevant and

review documents on Knowledge Governance topic?; b) In which context (Education, Science, Innovation, Ecosystem policy and Theory) Knowledge Governance theme is addressed in the document?; and c) In what level of activity or level of Analysis they focus?

This classification work was structured on clear definitions of specific objectives. In Table 03 we summarize the Overall Internal Consistency of this literature review, by showing the structure of analysis with the alignment between Research Questions; Analysis dimensions, Analysis Categories and its Sub Categories.

Table 03. Internal Consistency of Research Analysis.

RESEARCH QUESTIONS	ANALYSIS DIMENSIONS	ANALYSIS CATEGORIES	SUB CATEGORIES
What are the seminal, core and relevant documents on Knowledge Governance topic?	Significance	Seminal Core Relevant Review	
In what context?	KG Context	C1_Education C2_Science C3_Innovation C4_Ecosystem_policy C5_Theory	Higher Education Non Higher Education
In what level of activity or level of Analysis they focus?	Layer	L1_Micro L2_Meso L3_Macro L4_Network	Level of Activity L1.1_Individual L1.2_Project L1.3_Groups L2.1_Organizational L2.2_Institutional L3.1_National L3.2_Supra L3.3_Global L3.4_Ecosystem L4.1_Ego-nework L4.2_Research Network L4.3_Knowledge Network

Source: Authors.

b. PHASE 4 - SELECTION OF STUDIES

We search in Scopus, on 20 February 2018, without time frame restriction (i.e., all years), using "Knowledge Governance" search term and selecting Article Title, Abstract, Keywords scope and limited to English language. We used Endnote to organize our information. As a result, we obtained 102 records.

c. Phase 5 - Study Quality Assessment: Criteria of Inclusion and Exclusion

In this exploratory study we considered all 102 captured documents because we wanted to make a transversal analysis and we were looking for patterns and common denominators regardless of the contexts.

After one first reading of title and abstract of all 102 captured documents we decided to add more 42 documents that came from our previous research projects and experience on Knowledge scope and we also decided to consider the most cited references inside the initial corpus sample. Inside this final sample, of 144 documents. We then read all the title and abstracts for our final sample of 144 references, to obtain a transverse and global view of our corpus data. Some of these references immediately called our attention, both because of their seminal nature (Grandori 1997; 2001) or by its synthesis nature of an emerging research field such as the the book entitled "knowledge_governance: Processes and perspectives" by Nicola Foss and Snejina Michailova (2009).

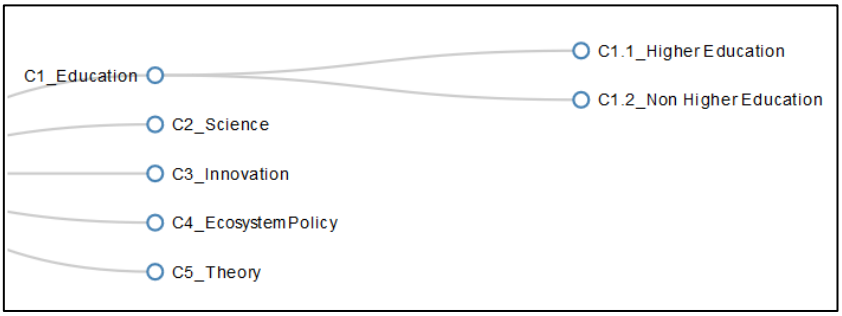
d. Phase 6 - Data Extraction and Monitoring Progress

Our document sample consists of 144 records; those documents are classified in three dimensions: Significance, Context and Ontological Layer. We used webQDA to facilitate the content analysis.

By Significance we mean the resource value to fit research questions of this Literature Review. Inside this category we defined four subcategories: Seminal is a document that was one of starting point to this theme; Core is a document that has much citation in this literature sample; a Relevant one is a document with importance to some issue related to Knowledge Governance; and Review is a document that presents a literature review on Knowledge Governance theme or related one.

Related to Context, we classify documents on five different categories: C1-Education (C1.1 Higher and C.1.2 Non - Higher education); C2-Science; C3-Innovation; C4-Ecosystem; and C5-Theory, as Figure 03 shows.

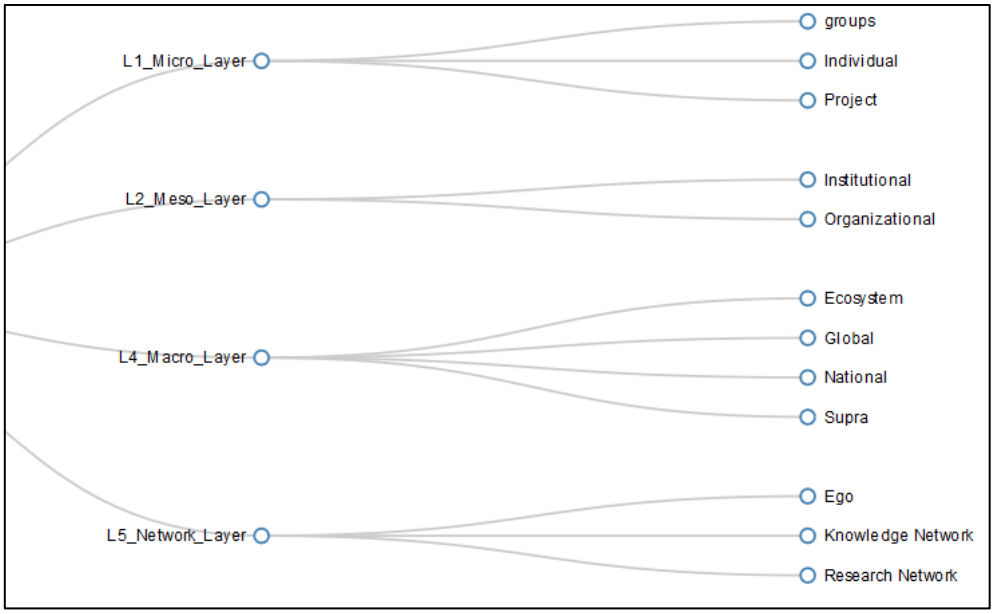
Figure 03. Context classification.



Source: Authors

The third dimension is the Ontological Layer: we considered Micro, Meso, Macro and Network layers (Pinho 2012). Notice that we star from traditional tree levels (Micro, Meso, Macro) and next we add Network layer because this is the transversal social space where people interact building tacit and explicit knowledge. More and more, it seems that understanding Network space is the challenge that we should face if we want to implement an effective Knowledge Governance implementation. Therefore, rom previous search on this topic (Dopfer et al. 2004; Leite et al. 2014; Leite & Pinho 2017; Pinho & Pinho 2016) and from this exploratory first reading we agreed to organize onto four main ontological categories and 12 subcategories (see Figure 04). At Micro level we classify articles that focus on Knowledge Governance related to individuals, groups and projects. At Meso level we choose articles that focus on Institutions and Organizations. At Macro level we classify the articles that have a national scope (example: Country), Supra National (example: European Union), Ecosystem (example: Tropical Forest) or even Global scope (example: global climate change).

Figure 04. Ontological Level.



Source: Authors

e. Phase 7 - Data Synthesis

Notice that when we capture the 102 documents from Scopus we had read only the title, the abstracts and keywords of each document. Next we had added more 42 documents from our previous research experience on this topic. At this moment of data synthesis we decided to read all the content of six seminal documents. After (re)reading the six seminal references we have a solid background to begin reading the references classified as core and relevant.

We used CASP Systematic Review Checklist to validate and rethink about the results (CASP 2018). See Table 04. With this tool we take a collaborative work in final in the discussion of the results, as well as in the final shared synthesis of this review.

Table 04. CASP Systematic Review Checklist of the results of the conducted review.

SECTION A: Are the results of the review valid?		**Y**	**D/K**	**N**
1	Did the review address a clearly focused question?	X		
2	Did the authors look for the right type of papers?	X		
3	Do you think all the important, relevant studies were included?	X		
4	Did the review's authors do enough to assess quality of the included studies?	X		
5	If the results of the review have been combined, was it reasonable to do so?	X		
SECTION B: What are the results?		**Y**	**D/K**	**N**
6	What are the overall results of the review?	X		
7	How precise are the results?	X		
SECTION C: Will the results help locally?		**Y**	**D/K**	**N**
8	Can the results be applied to the local population?	X		
9	Were all important outcomes considered?	X		
10	Are the benefits worth the harms and costs?	X		

Source: CASP (2018)
Caption: Y- yes; D/K – don´t know; N - no

STAGE III - REPORTING AND DISSEMINATION

a. PHASE 8 - THE REPORT AND RECOMMENDATION

This paper presents the process of the conducted exploratory literature review. Collective writing of this article is a fundamental task, because it allows knowledge integration from diverse author's backgrounds. Despite being a challenge in terms of teamwork skills, this proves to be an effective process because it provides a higher quality product. In addition, this collaborative process of co-authorship has a learning impact on the improvement of individual authors' competences and a collaboration impact by the construction of their research networks.

b. PHASE 9 - GETTING EVIDENCE INTO PRACTICE

The main output of this exploratory literature review is the obtained framework. This will be an analytical tool to be used in the next research developments, specifically in a deeper literature review that we will carry out.

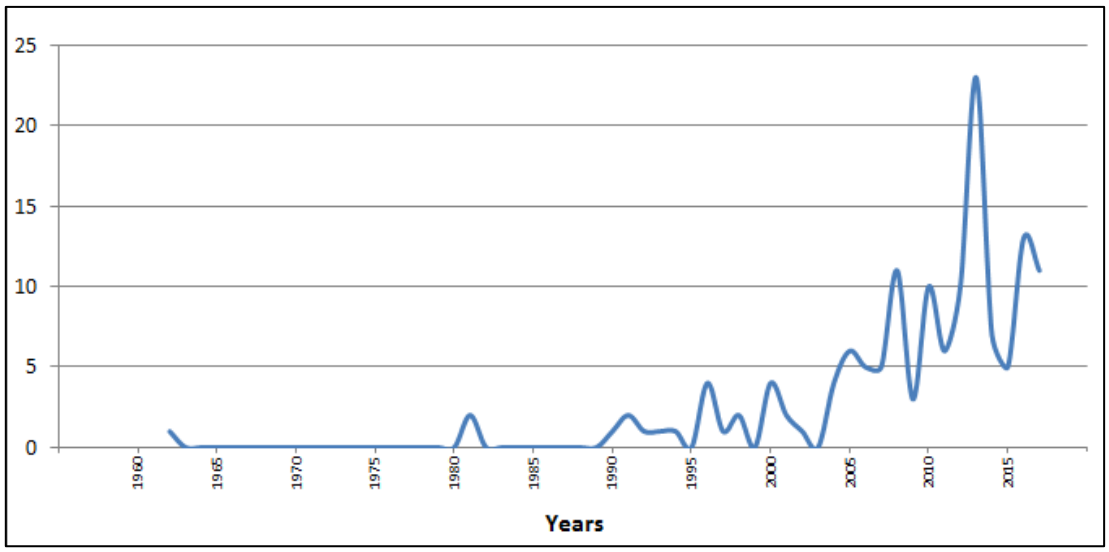
RESULTS

DESCRIPTIVE ANALYSIS

Our corpus sample has 144 references, distributed along the 1962-2017 time period (Figure 05). As saw, there seems to be a we can suggest a growing trend around this theme.

In 1962 Kenneth Arrow, wrote a book chapter linking Economic Welfare and the nature of the market for knowledge (Arrow 1962). Later, in 1981 we found two articles: The first one look at Knowledge as a resource (Williamson 1981) and the second is related to theoretical discussions or applications of structural equation models (Fornell & Larcker 1981); The use of Structural equation models incorporating unobservable variables and measurement error and is useful to application in theory testing and empirical model in several fields such as some related to knowledge resource; in structural equations the theory is the motor of analysis, and the data serve, or not, to confirm the theory. Thus these articles are relevant for researchers wishing to develop and contribute to the theory of knowledge governance.

Figure 05. Number of publication distribution.



Source: Authors

It is notable that the number of publications jumped significantly from few papers until 2004 to making a peak in 2013 with 23 papers. The most prolific authors are Antonelli with 9 papers (Antonelli 2006; 2007; 2008; 2013; 2016; Antonelli et al. 2014; Antonelli & Calderini, 2008; Antonelli & Fassio 2014; 2016), Giebels (Giebels & de Jonge 2014; Giebels & Teisman 2015; Giebels et al. 2015; 2016) and Muller (Müller et al. 2013; Pemsel & Müller 2012; Pemsel et al. 2016; 2014) with four papers, and Fassio (Antonelli et al. 2014; Antonelli & Fassio 2014; 2016), Fong (Chen & Fong 2012; 2013; Fong & Chen 2012) and Pensel (Pemsel & Müller 2012; Pemsel et al. 2016; 2014) with 3 papers. If we observe the decomposition of scientific literature into disciplinary and sub disciplinary structures we found that the main articles are published on journals that belongs to the Business, Management Accountability area (54%), followed by Social Science (40%), Economics (21%) and Environmental (18%). Notice that some articles are published in journals that belong to one or more area, which justifies that the sum of these privous percentages is superior to 100%.

Next we consider to answers our initial questions.

a) What are the seminal, core, relevant and review documents on Knowledge Governance topic?

We found six seminal documents (Foss 2007; Grandori 1997; 2001; Nahapiet & Ghoshal 1998; Nonaka 1994; Tsai & Ghoshal 1998). But if we consider the related term "Governance of Knowledge" that some authors of core documents use and call for attention we need to include this term and others related to our future literature review (Antonelli & Calderini 2008; De Sá Freire et al. 2017; Krafft & Ravix 2008; Nooteboom 2000; Pemsel & Müller 2012), such as "Governance of Knowledge" term. Some reviews can also be useful to take a broad overview on this topic (Alves & Barbosa 2010; Fang et al. 2013; Pinho & Pinho 2014).

b) In which context (e.g., Education, Science and Innovation) Knowledge Governance theme is addressed in these documents?

We found some important documents on different context: a) Education (Antonelli 2008; Diogo 2015; Mittelman 2016); b) Science context (Lemmens 2013; Pinho 2016; Wang 2013); c) Innovation (Fong & Chen 2012; Martín-Castilla & Rodríguez-Ruiz 2008; Peltokorpi & Tsuyuki 2006); and d) Ecosystem Policy (Duncan 2013; Kiminami & Furuzawa 2013; Tadaki & Sinner 2014). Notice that during the reading of documents we add the last category: Ecosystem policy.

c) In what layer (Micro, Meso, Macro and Network) and level of activity (or level of Analysis) those documents focus?

There are relevant documents that can drive future review on specific themes and diverse contexts, such as: a) at Micro layer (Michailova & Sidorova 2011; Müller et al. 2013; Pemsel et al. 2014); b) at Meso layer (Cao & Xiang 2013; Foss & Mahoney 2010; Santiago et al. 2015; Vale & Caldeira 2008) c) Macro layer (Antonelli 2013; Antonelli & Fassio 2016; Diogo 2015; Giebels et al. 2016); and d) Network layer (Pinho 2016; Pinho & Pinho 2014; Pinho & Pinho 2016; Weiner 2018; Williams & Lee 2009).

THE BASIS OF THEORETICAL CONCEPTUALIZATION OF KNOWLEDGE GOVERNANCE

Having answered the three initial research questions that structure this literature review, new questions arise:

- What are the main background theories of Knowledge Governance Theory?
- What are the main concepts that support Knowledge Governance Theory?

Observing the evolution of the KG background we can say that three blocks contribute to the Theoretical conceptualization of KG: a) Organizational Knowledge Management Theory. Here we look to only some theoretical contributions of KG theory; b) Social Capital Theory and; c) Governance Theory.

From Organizational Knowledge Management Theory Ikujiro Nonaka call for management models to deal with knowledge creation (Nonaka 1994). Thise Theory focus on organizational context and later some publications contributed follow this approach by develop the Organizational knowledge creation theory (Nonaka & Takeuchi 1995; Nonaka et al. 2006).

Another theory support knowledge governance background: the Social Capital theory. In 1998 an article titled: Social capital and value creation: The role of intrafirm networks (Tsai & Ghoshal 1998) and another title: Social Capital, Intellectual Capital, and the organizational advantage (Nahapiet & Ghoshal 1998).

Governance should not be confused with some related terms. Accordingly to Michael Gallagher (2001), we must clearly explain the differences between governance, leadership, management and administration (see Table 05).

Table 05. Concepts and definitions regarding to the meaning of governance, leadership and management.

CONCEPT	DEFINITION
Governance	is the structure of relationships that bring about organisational coherence, authorise policies, plans and decisions, and account for their probity, responsiveness and cost-effectiveness
Leadership	is seeing opportunities and setting strategic directions, and investing in and drawing on people's capabilities to develop organisational purposes and values.
Management	is achieving intended outcomes through the allocation of responsibilities and resources, and monitoring their efficiency and effectiveness
Administration	is the implementation of authorised procedures and the application of systems to achieve agreed results.

Source: Based on Gallagher (2001, p. 49)

Governance term was coined by Anna Grandori (Grandori 1997; 2001). She focuses on governance structures, coordination mechanisms and cognitive models and calls for attention on to go beyond of hierarchy scope if we want to understand performance at firm level.

Bart Nooteboom analyses "problems and solutions in the governance of knowledge exchange and joint knowledge production" (2000, p. 69). The theoretical approach and analysis is based on a combination of some elements of transaction cost economics, social exchange theory and theory of knowledge. The contribution of theory of knowledge yields an analysis of absorptive capacity, communicative capacity and learning by interaction. Note this author use the term "governance of knowledge" with similar meaning of "knowledge governance" term.

Some concepts have emerged from the first reading and from observing the most frequent words. This first overview analysis result on free codes set.

FROM FREE CODES TO TREE CODES

After looking at free codes we asked how they were distributed related to core, relevant, seminal and review documents (see Table 06).

Table 06. Matrix Free codes x Significance.

FREE CODES	SIGNIFICANCE			
	CORE	RELEVANT	SEMINAL	REVIEW
academic	1	20	0	0
coordination	10	13	2	1
creation	12	33	6	0
ecosystem	1	35	0	0
empirical	7	26	3	1
framework	11	36	4	1
industry	8	32	0	0
institutional	0	28	1	0
knowledge governance	23	45	5	0
model	5	44	2	0
network	2	39	1	0
Networks	5	22	3	0
performance	15	34	0	0
policy	2	34	0	0
Project	45	39	1	0
structure	4	17	1	0
sustainability	3	23	0	0
transfer	23	38	1	0
university	1	21	0	0
value	13	26	1	0

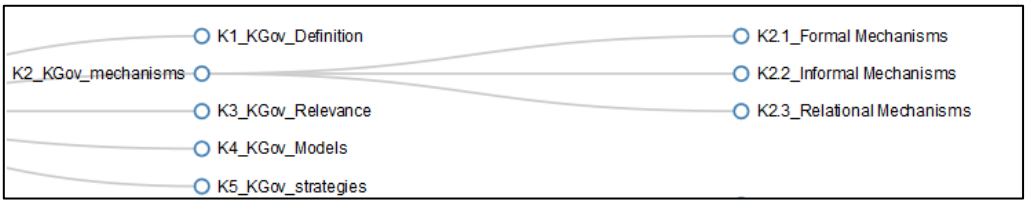
Source: Authors

Defining the topic, planning the search and selecting seminal, core and relevant papers was the way to capture the quality of the literature corpus, from diverse disciplines and fields (Pinho & Leite 2014). After we answered the tree initial questions and the two related to theoretical foundation of KG we can return to our main Research Question (What is Knowledge Governance?) and use the results of this exploratory review to think about future developments. Thus now we define others questions:

- What are Knowledge Governance Definition(s)?
- What are Knowledge Governance mechanisms? (Formal, Informal and Relational)
- Why Knowledge Governance is important? (relevance)
- What are Knowledge Governance models?
- What are Knowledge Governance Strategies?

With those questions we can begin identifying some blocks of Knowledge Governance theory (see Figure 06).

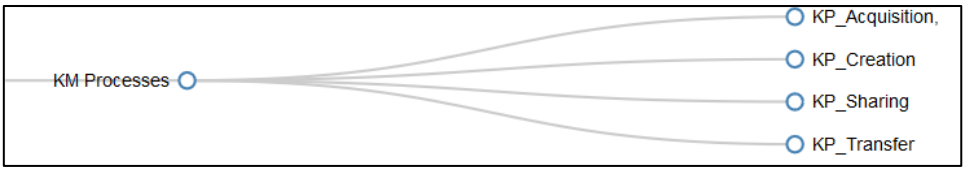
Figure 06. Knowledge Governance blocks.



Source: Authors

Future work also can focus on the Link between Knowledge Governance and Knowledge Management by taking a Knowledge Processes approach (Pinho & Pinho 2014). With this perspective we can focus on diverse Knowledge Processes: a) KP Acquisition; b) KP Creation; c) KP Sharing and KP Transfer. Later it will be possible to consider knowledge Integration (see Figure 07).

Figure 07. Knowledge Governance blocks.



Source: Authors

KNOWLEDGE GOVERNANCE CONCEPTUAL FRAMEWORK

We follow Charmaz when she call for the importance of clarifying and organizing concepts , "ways of seeing, organizing, and understanding experience that are embedded in our disciplinary lenses" (2000, p. 515).

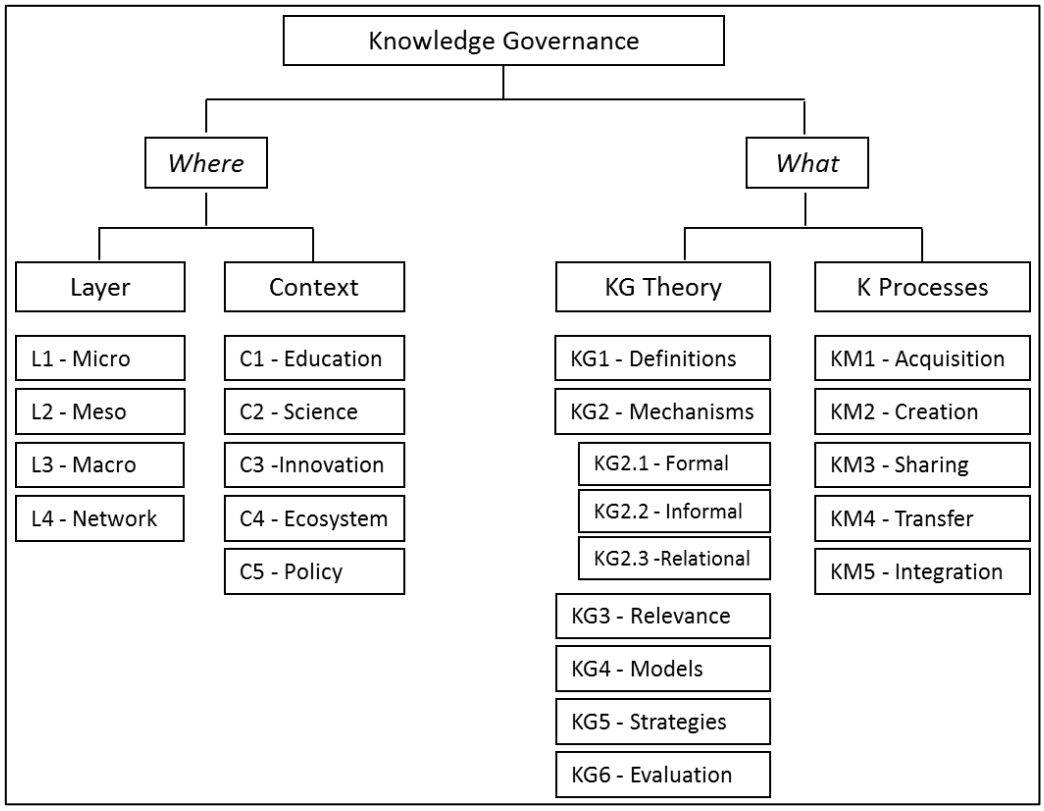
By performing a content analysis the main result is a literature map which provides the structure of our Knowledge Governance conceptual framework (Figure 08).

LIMITATIONS AND FUTURE WORK

This paper has explored relevant literature on Knowledge Governance, an emergent theme that cross some disciplines and which is consolidating its theoretical base and seeks to have a practical impact on society, from the valorisation of knowledge through its governance, in various ontological levels. This exploratory review was made taken an qualitative research approach and using qualitative software tool (WebQDA) to organize all information and to facilitate the collective analyse data made by the authors. This collaborative work was based on a discussion of interpretations, classifications and

also the construction of the conceptual framework. This framework will be the starting point for a deeper literature review, where we decided to do a content analysis of all the documents now selected.

Figure 08. Knowledge Governance conceptual framework.



Source: Authors

There are some limitations to this work: we use only one database (Scopus), only one language (English) and only one term (Knowledge Governance). Despite these limitations, the strategy of conducting an exploratory review with a clear approach was effective because exhaustion has a solid basis for undertaking a literature review using more databases, including more languages and using more search terms. In this review we will seek not only to broaden the search but also to seek a deeper analysis in order to obtain an answer to our initial questions and questions that will emerge with the full reading of the selected documents.

Although this study is an exploratory literature review, its main result - the Knowledge Governance Conceptual Model - contributes to the development of the theory on this topic. We can consider that Conceptual Model is also an important input to the next integrative review (Torraco 2005). Thus it is possible to begin to construct the protocol of the future revision of the literature identifying its 3 objectives: a) Identify Knowledge Governance definition(s); b) Identify main concepts; and c) Identify the main background theories.

Future work can add theoretical contributions to capitalising on existing knowledge, as well as understanding and shaping the knowledge base of the Education, Science, Innovation, Ecosystem and Policy ecosystem, which range from different financial to non-financial types of value.

REFERENCES

Alves A, Barbosa RR 2010. Influences and barriers to information sharing: A theoretical perspective. *Ciência da Informação*, 39(2):115-128.

Antonelli C 2006. The business governance of localized knowledge: An information economics approach for the economics of knowledge. *Industry and Innovation*, 13(3):227-261.

Antonelli C 2007. Technological knowledge as an essential facility. *Journal of Evolutionary Economics*, 17(4):451-471.

Antonelli C 2008. The new economics of the university: A knowledge governance approach. *Journal of Technology Transfer*, 33(1):1-22.

Antonelli C 2013. Knowledge Governance: Pecuniary Knowledge Externalities and Total Factor Productivity Growth. *Economic Development Quarterly*, 27(1):62-70.

Antonelli C 2016. A Schumpeterian growth model: wealth and directed technological change. *Journal of Technology Transfer*, 41(3):395-406.

Antonelli C, Amidei FB, Fassio C 2014. The mechanisms of knowledge governance: State owned enterprises and Italian economic growth, 1950-1994. *Structural Change and Economic Dynamics*, 31:43-63.

Antonelli C, Calderini M 2008. The governance of knowledge compositeness and technological performance: The case of the automotive industry in Europe. *Economics of Innovation and New Technology*, 17(1):23-41.

Antonelli C, Fassio C 2014. The heterogeneity of knowledge and the academic mode of knowledge governance: Italian evidence in the first part of the 20th century. *Science and Public Policy*, 41(1):15-28.

Antonelli C, Fassio C 2016. Globalization and the Knowledge-Driven Economy. *Economic Development Quarterly*, 30(1), 3-14.

Arrow K 1962. Economic welfare and the allocation of resources for invention. In National Bureau of Economic Research. *The rate and direction of inventive activity: Economic and social factors*. Princeton University Press, Princeton, NJ, p. 609-626.

Boschma R 2005. Proximity and Innovation: A Critical Assessment. *Regional Studies*, 39(1):61-74.

Cao Y, Xiang Y 2013. The impact of knowledge governance on knowledge sharing: The mediating role of the guanxi effect. *Chinese Management Studies*, 7(1):36-52.

CASP [homepage on the Internet]. CASP Appraisal Checklists. [cited 2018 Apr 02]. Systematic-Review-Checklist. Available from: http://www.casp-uk.net/casp-tools-checklists.

Charmaz K 2000. Grounded Theory: Objectivist and Constructivist Methods. In NK Denzin, YS Lincoln (Eds.). *Handbook of Qualitative Research*. Sage Publications, London, p. 509-535.

Chen L, Fong PSW 2012. Revealing performance heterogeneity through knowledge management maturity evaluation: A capability-based approach. *Expert Systems with Applications*, 39(18):13523-13539.

Chen L, Fong PSW 2013. Visualizing evolution of knowledge management capability in construction firms. *Journal of Construction Engineering and Management*, 139(7):839-851.

Costa AP, De Sousa FN, Moreira A, De Souza DN 2017. Research through Design: Qualitative Analysis to Evaluate the Usability. In PA Costa, PL Reis, F Neri de Sousa, A Moreira, D Lamas (Eds.). *Computer Supported Qualitative Research*. Springer International Publishing, Cham, p. 1-12.

De Sá Freire P, Dandolini GA, De Souza JA, Silva TC, Couto RM 2017. Knowledge Governance (GovC): The State of the Art about the Term. *Biblios*, 69:21-40.

Diogo S 2015. Same challenges, different processes: perceptions on governance changes in Portuguese and Finnish higher education. *European Journal of Higher Education*, 5(2):211-225.

Dopfer K, Foster J, Potts J 2004. Micro-meso-macro. *Journal of Evolutionary Economics*, 14(3):263-279.

Duncan R 2013. Converting community knowledge into catchment nutrient limits: A constructivist analysis of a new zealand collaborative approach to water management. *Nature and Culture*, 8(2):205-225.

Duriau VJ, Reger RK, Pfarrer MD 2007. A Content Analysis of the Content Analysis Literature in Organization Studies: Research Themes, Data Sources, and Methodological Refinements. *Organizational Research Methods*, 10(1):5-34.

Fang SC, Yang CW, Hsu WY 2013. Inter-organizational knowledge transfer: The perspective of knowledge governance. *Journal of Knowledge Management*, 17(6):943-957.

Fong PSW, Chen L 2012. Governance of learning mechanisms: Evidence from construction firms. *Journal of Construction Engineering and Management*, 138(9):1053-1064.

Fornell C, Larcker DF 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1):39-50.

Foss NJ 2007. The Emerging Knowledge Governance Approach: Challenges and Characteristics. *Organization*, 14(1):29-52.

Foss NJ 2009. Alternative research strategies in the knowledge movement: From macro bias to micro-foundations and multi-level explanation. *Eur Manage Rev*, 6(1):16-28.

Foss NJ, Mahoney JT 2010. Exploring Knowledge Governance. *International Journal of Strategic Change Management*, 2(2-3):93-101.

Foss NJ, Michailova S 2009. *Knowledge governance: Processes and perspectives*. Oxford University Press, Oxford.

Gallagher M 2001. Modern university governance: A national perspective. In MC House (coord.), P Kinnear (ed.). *The idea of a university: Enterprise or academy?*. Australian National University, The Australia Institute, Australia, p. 49-57.

Giebels D, De Jonge VN 2014. Making ecosystem-based management effective: Identifying and evaluating empirical approaches to the governance of knowledge. *Emergence: Complexity and Organization*, 16(1):60-76.

Giebels D, Teisman GR 2015. Towards ecosystem-based management for Mainports: A historical analysis of the role of knowledge in the development of the Rotterdam harbor from 1827 to 2008. *Ocean and Coastal Management*, 108:39-51.

Giebels D, Van Buuren A, Edelenbos J 2015. Using knowledge in a complex decision-making process - Evidence and principles from the Danish Houting project's ecosystem-based management approach. *Environmental Science and Policy*, 47:53-67.

Giebels D, Van Buuren A, Edelenbos J 2016. Knowledge governance for ecosystem-based management: Understanding its context-dependency. *Environmental Science and Policy*, 55:424-435.

Grandori A 1997. Governance structures, coordination mechanisms and cognitive models. *Journal of Management & Governance*, 1(1):29-47.

Grandori A 2001. Neither hierarchy nor identity: Knowledge-governance mechanisms and the theory of the firm. *Journal of Management and Governance*, 5(3-4):381-399.

Grandori A, Furnari S 2008. A chemistry of organization: Combinatory analysis and design. *Organization Studies*, 29(3):459-485.

Husted K, Michailova S, Minbaeva DB, Pedersen T 2012. Knowledge-sharing hostility and governance mechanisms: an empirical test. *Journal of Knowledge Management*, 16(5):754-773.

Kiminami L, Furuzawa S 2013. Knowledge creation through international cooperation in agriculture. *Studies in Regional Science*, 43(1):79-87.

Krafft J, Ravix JL 2008. Corporate governance and the governance of knowledge: Rethinking the relationship in terms of corporate coherence. *Economics of Innovation and New Technology*, 17(1):79-95.

Leite D, Miorando BS, Pinho I, Caregnato CE, Lima EGS 2014. Research networks evaluation: indicators of interactive and formative dynamics. *Comunicação & Informação*, 17(2):23-37.

Leite D, Pinho I 2017. What Is RNPE Evaluation? Does Metrics Mean the Same?. In D Leite, I Pinho. *Evaluating Collaboration Networks in Higher Education Research: Drivers of Excellence*. Springer International Publishing, Cham, p. 79-102.

Lemmens T 2013. Pharmaceutical Knowledge Governance: A Human Rights Perspective. *Journal of Law, Medicine and Ethics*, 41(1):163-184.

Martín-Castilla JI, Rodríguez-Ruiz Ó 2008. EFQM model: knowledge governance and competitive advantage. *Journal of Intellectual Capital*, 9(1):133-156.

Maxwell J 2009. The SAGE Handbook of Applied Social Research Methods. 2nd ed. SAGE Publications, Inc, Thousand Oaks, California. Available from: http://dx.doi.org/10.4135/9781483348858.

McCann P, Ortega-Argilés R 2015. Smart Specialization, Regional Growth and Applications to European Union Cohesion Policy. *Regional Studies*, 49(8):1291-1302.

Michailova S, Sidorova E 2011. From group-based work to organisational learning: The role of communication forms and knowledge sharing. *Knowledge Management Research and Practice*, 9(1):73-83.

Mittelman JH 2016. Global Governance and Universities: The Power of Ideas and Knowledge. *Globalizations*, 13(5):608-621.

Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA 2015. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ*, 349:g7647.

Müller R, Glückler J, Aubry M, Shao J 2013. Project management knowledge flows in networks of project managers and project management offices: A case study in the pharmaceutical industry. *Project Management Journal*, 44(2):4-19.

Nahapiet J, Ghoshal S 1998. Social Capital, Intellectual Capital, and the organizational advantage. *Academy of Management Review*, 23(2):242-266.

Neri de Souza F, Neri D, Costa AP 2016. Asking questions in the qualitative research context. *The Qualitative Report*, 21(13):6-18.

Nonaka I 1994. A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1):14-37.

Nonaka I, Takeuchi H 1995. *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press, Oxford.

Nonaka I, Toyama R, Konno N 2000. SECI, Ba and leadership: a unified model of dynamic knowledge creation. *Long Range Planning*, 33(1):5-34.

Nonaka I, Von Krogh G, Voelpel S 2006. Organizational knowledge creation theory: evolutionary paths and future advances. *Organization Studies*, 27(8):1179-1208.

Nooteboom B 2000. Learning by Interaction: Absorptive Capacity, Cognitive Distance and Governance. *Journal of Management and Governance*, 4(1):69-92.

Peltokorpi V, Tsuyuki E 2006. Knowledge governance in a Japanese project-based organization. *Knowledge Management Research and Practice*, 4(1):36-45.

Pemsel S, Müller R 2012. The governance of knowledge in project-based organizations. *International Journal of Project Management*, 30(8):865-876.

Pemsel S, Müller R, Söderlund J 2016. Knowledge Governance Strategies in Project-based Organizations. *Long Range Planning*, 49(6):648-660.

Pemsel S, Wiewiora A, Müller R, Aubry M, Brown K 2014. A conceptualization of knowledge governance in project-based organizations. *International Journal of Project Management*, 32(8):1411-1422.

Pinho I 2012. Governança e gestão do conhecimento científico, no contexto académico: o estado de arte. In D Leite, EGS Lima (Eds.). *Conhecimento, avaliação e redes de colaboração. Produção e produtividade na universidade*. Editora Sulina, Porto Alegre, Brasil, p. 223-243.

Pinho I 2016. Knowledge Governance and University Research Center. *Proceedings of the TAKE Conference - Theory and Applications in the Knowledge Economy*, Aveiro.

Pinho I, Leite D 2014. Doing a literature review using content analysis-Research Networks Review. *CIAIQ2014*, Badajoz, Espanha,

Pinho I, Pinho C 2014. Linking networks governance and Knowledge Management as support to knowledge valorization. *International Journal of Knowledge Engineering and Management*, 3(6):31-45.

Pinho I, Pinho C 2016. Aligning Knowledge Management with Research Knowledge Governance. In JT Martins, A Molnar (Eds.). *Handbook of Research on Innovations in Information Retrieval, Analysis, and Management*. IGI Global, Pennsylvania, p. 489-504.

Pinho I, Rego A, Cunha MP 2012. Improving knowledge management processes: A hybrid positive approach. *Journal of Knowledge Management*, 16(2):215 - 242.

Santiago R, Carvalho T, Cardoso S 2015. Portuguese academics' perceptions of higher education institutions' governance and management: a generational perspective. *Studies in Higher Education*, 40(8):1471-1484.

Souza FN, Souza DN, Costa AP 2015. Questioning in the Qualitative Research Process How ICT can support this process? *CIAIQ2015*, 3.

Tadaki M, Sinner J 2014. Measure, model, optimise: Understanding reductionist concepts of value in freshwater governance. *Geoforum*, 51:140-151.

Torraco R 2005. Writing Integrative Literature Reviews: Guidelines and Examples *Human Resource Development Review*, 4:356-367.

Tranfield D, Denyer D, Smart P 2003. Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14(3):207-222.

Tsai W, Ghoshal S 1998. Social capital and value creation: The role of intrafirm networks. *Academy of management Journal*, 41(4):464-476.

Vale M, Caldeira J 2007. Proximity and knowledge governance in localized production systems: The footwear industry in the north region of Portugal. *European Planning Studies*, 15(4):531-548.

Vale M, Caldeira J 2008. Fashion and the governance of knowledge in a traditional industry: The case of the footwear sectoral innovation system in the northern region of portugal. *Economics of Innovation and New Technology*, 17(1):61-78.

Wang H 2013. A CoPs approach to knowledge governance: A university-industry case study in China. *Frontiers of Business Research in China*, 7(4):581-601.

Weiner RR 2018. Network Knowledge Governance: Algorithms and Platform Politics. *The European Legacy*, 23(3):306-310.

Williams C, Lee SH 2009. Resource allocations, knowledge network characteristics and entrepreneurial orientation of multinational corporations. *Research Policy*, 38(8):1376-1387.

Williamson OE 1981. The economics of organization: The transaction cost approach. *American Journal of Sociology*, 87(3):548-577.

Governança do Conhecimento: Construindo uma Estrutura Conceitual

RESUMO

Esta revisão sistemática exploratória da literatura é um ponto de partida para uma revisão profunda da literatura sobre o tópico "Governança do Conhecimento" (KGOV). O objetivo é ter uma imagem rápida sobre o KGOV; especificamente tentando identificar os documentos seminais, essenciais e relevantes. Procuramos também conhecer os contextos desses estudos, bem como em que níveis e atividades ontológicos se referem. Os principais resultados são: a) identificação da estrutura do tópico, recuperando os principais artigos seminais e os mais citados (documentos centrais) e b) a construção de um modelo estruturado de análise. Este modelo será utilizado para realizar uma revisão profunda da literatura que objetiva desenvolver um modelo conceitual integrado e holístico sobre Governança do Conhecimento. As principais conclusões estão relacionadas a pistas para pesquisas futuras sobre esse tópico.

Palavras-Chave: Revisão de Literatura; Governança do Conhecimento; Educação; Pesquisa; Inovação.

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