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The 1st International Conference on Computer, Science, Engineering and Technology

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1st International Conference on Computer, Science, Engineering and Technology (ICComSET)

PREFACE

It's our great pleasure to welcome you to the 1st International Conference on Computer, Science, Engineering and Technology (ICComSET-2018), Tasikmalaya, West Java, Indonesia from 27-28 November 2018.

The International Conference on Computer, Science, Engineering and Technology (ICComSET-2018), provides an excellent international forum for sharing knowledge and result in theory, methodology an applications of Computer, Science, Engineering and Technology in theoretical and practical aspects. The aim of the conference is to provide a platform to the researchers and practitioners from both academia as well as industry to meet and share cutting-edge development.

ICComSET-2018 secretariat has received 250 submissions from 6 countries: Malaysia, Taiwan, India, Mexico, Tunisia, and Indonesia. The new program held in the City of Tasikmalaya was organized by the Universitas Muhammadiyah Tasikmalaya (UMTAS) at Santika Hotel, Tasikmalaya from 27-28 November 2018, and supported by several universities including: STIKES Bakti Tunas Husada, Universitas Perjuangan Tasikmalaya, STIKES Muhammadiyah Ciamis, Universitas Muhammadiyah Sidoarjo, and Indonesian Collaboration Publication Community (Komunitas Kolaborasi Publikasi Indonesia/ KO2PI).

Each paper has been reviewed by the program committee. Only 166 paper were accepted for the oral session (acceptance rate: 65.3 %). The conference program consist of 3 keynote speakers (90 min), 6 Invited speakers (120 min), 5 parallel session, one poster session and a round table.

We would like to thank scientific committee, and reviewers, as well as the committee of the Universitas Muhammadiyah Tasikmalaya who have participated in the success of this event so that this event can be held as planned. We also conveyed to the Rector of Universitas Muhammadiyah Tasikmalaya who had supported this event both in terms of finance and other supporting facilities.

The Editors
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The 1st ICComSET 2018
Computer, Science, Engineering and Technology
tion for Smart Society in Empowering Industry 4.0
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TASIKMALAYA


November 27-28,


New Paradigm
Law Practice Technology
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align the skill that law student
must have upon graduation with
the employment needs of a
radically changing legal market.


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Grounded Theory Methodology in Architectural Research

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Grounded Theory Methodology in Architectural Research

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Abstract. The grounded theory method expresses the value of daily life demonstrated by architectural composition. A spatial analysis of a phenomenon in an issue may create a new substantive theory/concept. By elaborating literature, grounded theory methodology emphasizes human behaviour patterns. It is best when combined with a comprehensive observation, in depth interview and architectural drawing. While its structural analysis exposes social phenomena, an investigation may reveal the problem, gathering daily impressions and feelings towards architecture. The operational step are; 1. Data collection: 1) Observation, drawing and mapping, 2) In depth interviews, transcripts and memos; 2. Data analysis: 1) Open coding, 2) Axial coding, 3) Selective coding, 4) Constant comparison analysis, 5) Core category, 6) Negative case analysis, 7) Theoretical note (Theoretical coding), 8) Theoretical sensitivity, 9) Theoretical sampling, 10) Theoretical saturation, 11) Validity, 12) Theoretical memo ("Memoing"), 13) Hypothesis; before finally formulating a new theory/concept.

1. Introduction

There are five approaches in qualitative research, which are: narrative, ethnography, phenomenological, grounded theory and case study [1, 2]. Although, grounded theory is seldom used in architectural research, however, this method is effective for social and health, that is why it is suitable for investigating psychology architecture. This method is best to express the value of daily life that is described through the spatial elements of architecture, and producing an analysis through a social phenomenon in architecture in order to create a new substantive theory/concept.

Grounded theory methodology in architectural research needs to be elaborated in order to create a clear and a systematic step based on the pattern of human behaviour. Through a comprehensive observation, theoretical description, and in depth interview, a structured analysis may reveal, a new understanding, opening an insight about social phenomenon that occurs on the site. Impressions and feelings experienced in everyday life can be extracted from the architectural phenomena. It is essential to understand the value of architecture from the informants. The next step is to formulate a substantive theory from the facts that founded in the study field, taken based on data gathering through an inductive analysis.

2. Material and Method

2.1. Methods of Study

Literature study was used by elaborating various references regarding grounded theory and a suggested operational step was composed to comply with the architectural research.

2.2. Grounded Theory Methodology

The grounded theory methodology was invented by Barney Glaser and Anselm Strauss (Classic grounded theory) [3, 4], which was later on developed by Juliet Corbin (Straussian grounded theory) [5, 6]. Straussian grounded theory was popular for research in social science and well-known as the basic social. Next, Kathy Charmaz [7, 8], once modified the grounded theory methodology to decrease its rigidness and modified it in order to be easily combined with other disciplines (Constructivist grounded theory). Currently, it became more flexible and versatile.

3. Results and Discussion

Grounded theory methodology aims to formulate a substantive theory. In order to produce a significant one, it needs theoretical sensitivity to process findings into a theoretical basis in conceptual and well integrated way [9]. It means in order to produce an ideal condition, a phenomenon shall be obtained, data shall be processed to produce a meaningful idea, organizing information into a well-structured writing. In the grounded theory approach, concept, hypothesis, and theory shall be formulated from empirical data, transforming phenomena to a conceptual-theoretical level. An operational step suggested for an ideal grounded theory methodology is presented as follows (see Figure 1):

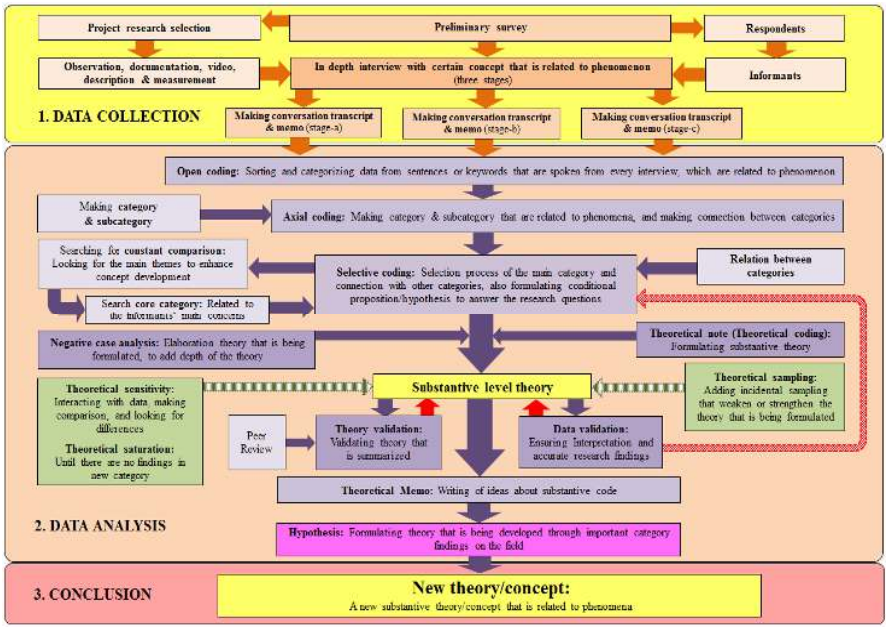

Figure 1. Diagram of Grounded Theory Methodology in Architectural Research [10]

A field survey shall be conducted to obtain preliminary data. Researchers are suggested to observe and to evaluate a phenomenon, evaluating any indicator or factor. In depth interview is organized in order to obtain cause and reason.

3.1. Data Collection

Data collection begins with an observation, producing maps, measurement, drawing, and visualization (shooting and video). The process continues with in depth interviews by using a recorder to obtain indicator and factor in a casual way in order to encourage freedom of speech.

Raw data is transcribed and rewritten in a text format, producing transcripts and memos, as well as Autodesk CAD files, tables and images. The processed data are then coded (open coding), separated into categories and subcategories.

Although data has been processed, re-visit is suggested in order to ensure an actual data clarification. Observation, mapping and interviews shall be repeated at least twice in a minimum period of 14 days to anticipate any changes in the actual condition.

With these suggested steps, the conclusions of the grounded theory research method may avoid a generalization, but produce a specific argumentation. The grounded theory research methodology intends to create specific clarification based on; (1) a condition affected by a phenomenon; (2) interaction as a response to the condition; (3) the consequences arise from any action or interaction. The theoretical formulation is generated from a grounded theory research may not justify an applicability for all members of the population, and only applicable to a specific situation or condition.

1) *Observation, drawing and mapping* are produced an illustration of a building's floor, taken to highlight a phenomenon. Camera and video (pocket camera and mobile phone), tape measure, paper and pen are the effective tools to capture moments. Measurements, sketches and data are redrawn by using an Autodesk CAD program, and printed in pdf or jpg format.
2) *In depth interviews, transcripts and memos.* Interviews are taken with selective informants only to whom directly involved with phenomenon in order to avoid any bias. After an interview, the transcript was organized to define categories, selected labels, interconnection and integration.

   Memos are written to respect either any kind of information, abstract or concrete, integrative or original, whether produced by writing or drawing. The recording shall be guided to directly related to the research's theme, however, if the talk is deviated, memo shall be simplified by eliminating the unnecessarily information. Memo shall have date, title and description. Any changes shall be noted whether coming out of the analysis process, the emergence of new thoughts, ideas or perspectives, reflections on the feasibility of research questions or even from interview results. Only by then, the memo contains a comprehensive information about the process and the substantive findings of the research.

3.2. Data Analysis

3.2.1. Open Coding is a process of studying, sorting and categorizing data from sentences or key words taken from each interview. This process is related directly to the phenomena and spatial issues, including conditions, reasons, causes, and the reaction of informants in order to solve the problems. The computer program is used to sort information and categorizing data into several categories to form an organized open coding.

3.2.2. Axial Coding re-creates links between categories, including: conditions, context/reason/causes and effects compiled based on criteria in each category and subcategories.

a) *Causal conditions* are used to find the reasons, causes and consequences. *Current conditions* are taken from existing conditions.
b) *Effects* are a consequence produced by the problem or action.
c) *Central phenomenon* is the major problem elaborated as the focus of the research.
d) *Context* is the situation or a setting, presenting a set of features associated with a spatial organization.
e) *Intervening condition* is any factors related to action or interaction in a specific context.
f) *Strategy of action/interaction* is a strategy for solving the problem based on the action/interaction of informants.
g) *Consequence* is a response to the phenomena.

3.2.3. Selective Coding is a selection process to organize data into categories, linking systematically by identifying each code before composing them into a table or a diagram. Categories are selected by producing an axial coding and validating the relationships between categories, so that conditional propositions or hypotheses can be formulated to answer research questions.

3.2.4. Constant Comparison Analysis. The coding process identifies the similarities and differences of the emerging categories, highlighting a feature that unites units of an observational phenomenon into a category. The researcher later shifts focus to see the differences in the category in order to notify the emerging subcategories. With a back and forth process, the researcher may find the inspiration and possible answer for the research question, as well as to find a new theory that is substantial concluded from the analysed comparison.

Throughout the constant comparison analysis, researchers formulate an abstract produced by various data collections. Meaning is linked to integrate any categories. Therefore, variations can be accommodated into the theory. During coding, category and subcategory are compared to capture the theme, literature, then utilized to produce a concept [11]. By doing a constant comparison to each interview (commonly in depth interviews are guided to seek a consistent answer), a comparison may guide researcher to a production of a theoretical framework, so that a concept may be developed as a core category which has not been existed in the previous theories.

3.2.5. Core Category. It relates to the informants' main concerns, representing the substance of the study; Taken from a constant comparison or any other category.

3.2.6. Negative Case Analysis is a negative case founded from an analysis conducted on the links, for example an interviews misses-interpretation founded from a formulated theory can be elaborated to compliment or formulating a new theory [7]. However, any interview results that are differentiated from the previous statement or general opinion, may be assessed to validate the data.

3.2.7. Theoretical Note (Theoretical Coding) is a visual development or a visualization to describe a condition that affects the central phenomena. A data collection and an analysis is compiled to formulate a substantive theory of the domain or field. This is the last stage of the grounded theory (research method), although it can then be subjected to empirical test because the variables or categories collected from the data in the field make it possible to do so. However, Creswell said argument taken from the categories are the most significant ones.

3.2.8. Theoretical Sensitivity consists of data interaction, data analysis, comparisons, and observations [7]. Questions can be developed as a respect to a critique at a later stage, for example stage changing from descriptive level to the analytical level needed to provide theoretical sensitivity in order to produce a higher theoretical impact. Each emerging category, idea, concept or relationships in the research may affect data analysis in the next level. A formulated theory can be elaborated with the science of architecture, and be further modified, however, if necessary, researchers can return to the field and collect additional data.

3.2.9. Theoretical Sampling is a tool to test the formulated theory. Although random sampling may illustrate a different perspective, a new investigation may be conducted in order to perfect the analysis [7, 12]. Theoretical sampling can be used to strengthen the explanation; However, this need to be conducted in a trusted way in order to highlight the weakness of an existing category. A process is suggested to be done continuously in order to stimulate the emergence of the core category [13].

3.2.10. Theoretical Saturation. The process of collecting and analyzing data continue until the theoretical saturation is obtained [7], until no categories are found. However, in the reality a change maybe occurred; that is why a modification of a category may be needed, Therefore the results shown are just a contemplation from the process of formulating a theory that shall be never ending (provisionally).

Saturation occurs only when the researcher believes if the formulated theory can fully explain the data. It may appear different stages in each study and it is unpredictable [11]. "The researcher need 20-30 interviews in several visits to find information until no more data found to saturate the categories" [1].

After the first interview; transcripts, memos and coding are organized, the next interviews taken from the same person or the same family are only conducted to find out if there is still new category can be found if different question are questioned while highlighting the previous statement. The process of collecting data is done repeatedly, at least three times in 14 days until no new category can be found or if the repetitive answers are happening a few times. Saturation can be occurred not only because targeted questions are repeated, but also when the researcher perceives there is no meaningful statement emerges during interviews.

3.2.11. Validity. After analyzing the data, the researcher must ensure the interpretation and findings, by respecting validity and reliability of the data. Validity means that researchers are able to track results based on findings to the population, while a meaningful reliability means a stable score from informants. The validity of the data is done from the analysis of the researcher and the information of the informants in the field and outside testers. Reliability plays a small role in qualitative research and is highly dependent on the reliability of the coder in analyzing the text code being studied.

a) *Data Validity.* Interviews were conducted to informant minimum three times with a period of at least 14 days with different concepts to obtain consistent results. By re-interviewing with different concepts, it indicates that the possibility of answers to questions may vary by giving the informant the freedom to express his or her opinion. The concept of the given question shows the causal relationship from the previous interview, which reveals a truth that occurs and experienced daily by the informant.
   In depth interview gives freedom in delivering opinions widely. Therefore, a phenomenon faced daily will emerge by itself according to the research phenomenon. Although the proposed concept differs in three interviews, and the answer becomes fixed (saturated) and there is no new category found (saturate), the bottom line that is causing problems or phenomenon in the field can be pulled out. Thus, all the data obtained can be valid to answer the problems and the purpose of research.
b) *Theory Legitimacy.* The validity of the theory is an active part of the research process. For example, when performing a constant comparison in the open coding stage, the researcher cross checks the validity of the relationship between the data and the categories that arise through the data validation process above. The process of examining such data is done on the axial coding stage (axial coding). After the theory is formulated, the researcher validates the compilation process by comparing it with similar processes in the literature. Peer review, such as informants' involvement, can be used to check the validity of the theory and credibility of the data.
c) *Reliability.* Reliability indicates that the research method used to interpret data is consistent and will give a uniform result every time it is used. Thus, the result of data obtained is an agreement or understanding of a point of view that can be trusted or deemed saturated.
   By conducting mapping and direct field interviews with consistent "measuring tools", asking the same questions to all informants repeatedly three times in a minimum of 14 days, and also with different questions developed from previous interviews, the data that are suitable to the existing condition can be obtained. The concluded result is a phenomenon faced by informants, and its causing factors should be found out.

3.2.12. Theoretical Memo ("Memoing"). Theoretical memos are an important stage in grounded theory, which is the writing of ideas about the substantive code and their theoretical relation that emerged during the coding and analysis process. The theoretical memo can be either writing or drawing which is a constant comparison.Memos as tools to improve, tracking ideas that are developed when comparing events/categories with concepts in theory development. Theoretical memos are total creative freedom without rules on how to write, grammar or style of language [3].

3.2.13. Hypothesis. Hypothesis about relationships between categories must be developed and verified in the field to check and perform necessary revisions (axial coding process). Hypothesis that is created shows the relationship between the important categories of phenomena and spatial, that can support the theory of territory understanding that is being formulated. The purpose of hypothesis formulation is to compare the existing theory with the findings in the field to answer the research question.

3.3 New Theory/Concept

From the results of systematic analysis using grounded theory methodology, findings of a new theory/concept that are substantive are formulated.

4. Conclusion

Grounded theory is useful in the architectural research because it generates a new substantive theory/concept, based on a phenomenon happened in the daily life (theory is grounded by data). The following are operational step for grounded theory methodology in architectural research: 1. Data collection: 1) Observation, drawing and mapping, 2) In depth interviews, transcripts and memos; 2. Data analysis: 1) Open coding, 2) Axial coding, 3) Selective coding, 4) Constant comparison analysis, 5) Core category, 6) Negative case analysis, 7) Theoretical note (Theoretical coding), 8) Theoretical sensitivity, 9) Theoretical sampling, 10) Theoretical saturation, 11) Validity, 12) Theoretical memo ("Memoing"), 13) Hypothesis; 3. New theory/concept.

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"Grounded Theory Method in Architectural Research"

as
Presenter

in The 1st International Conference on Computer, Science, Engineering and Technology (ICComSET), Tasikmalaya, West Java, Indonesia, 27-28 November 2018.

Dr. Ahmad Qonit AD., MA.
Rector of Universitas Muhammadiyah Tasikmalaya

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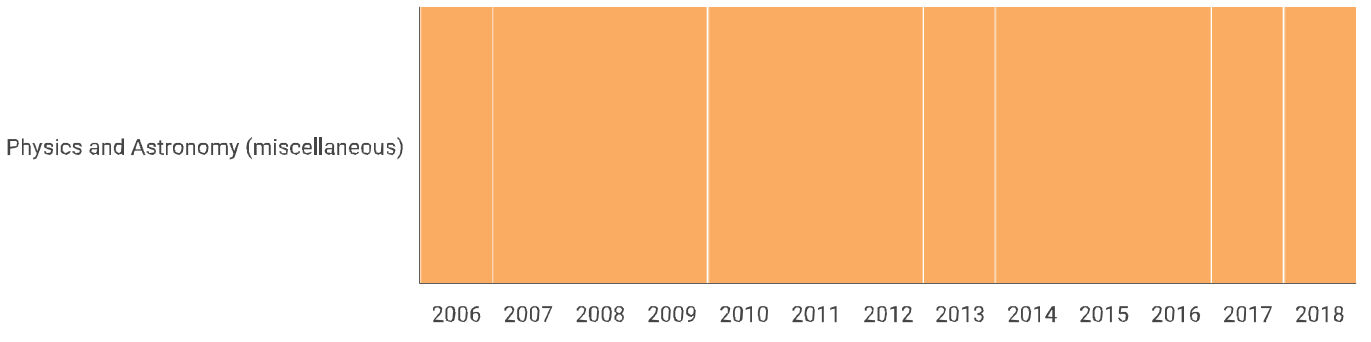

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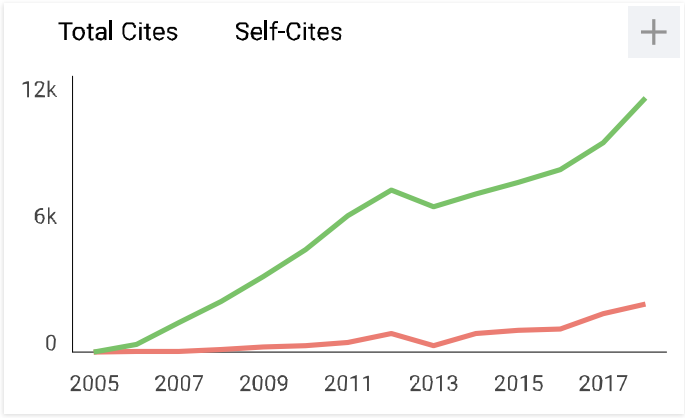

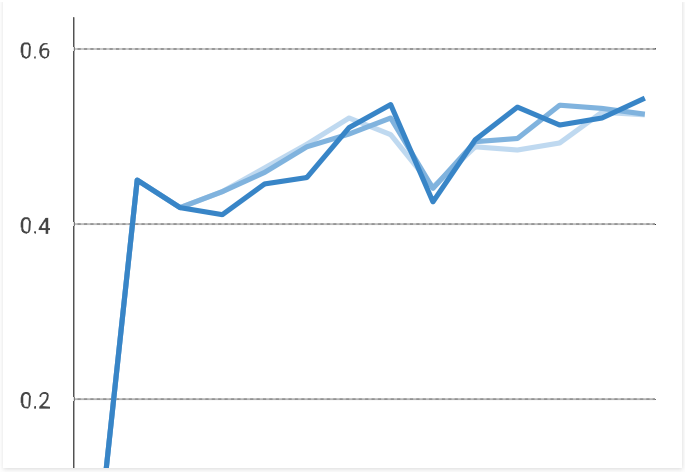

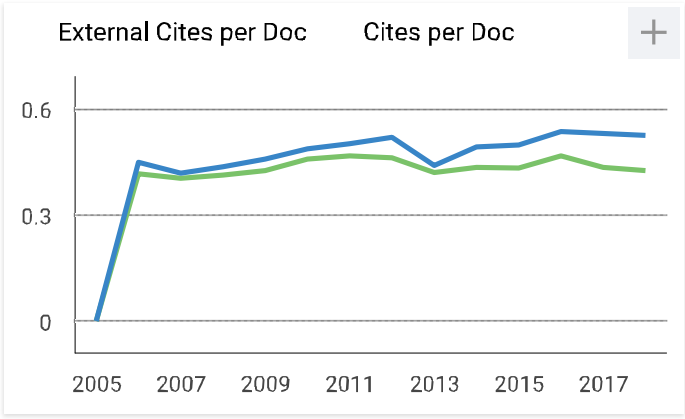

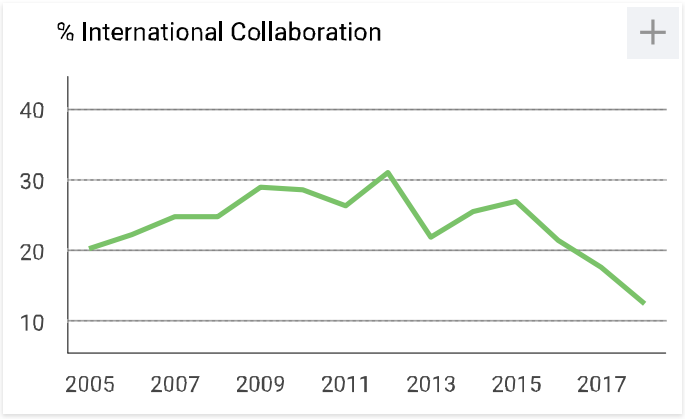

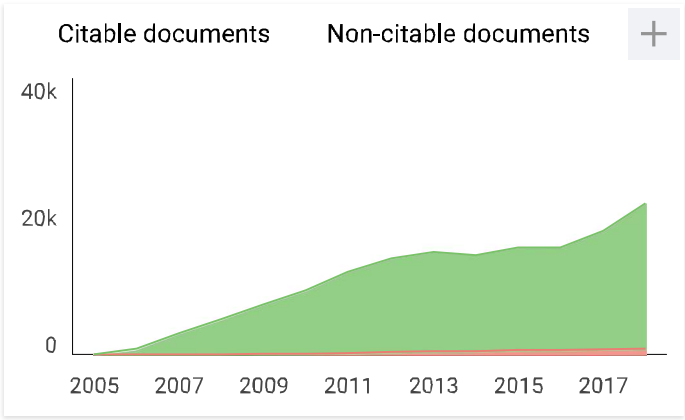

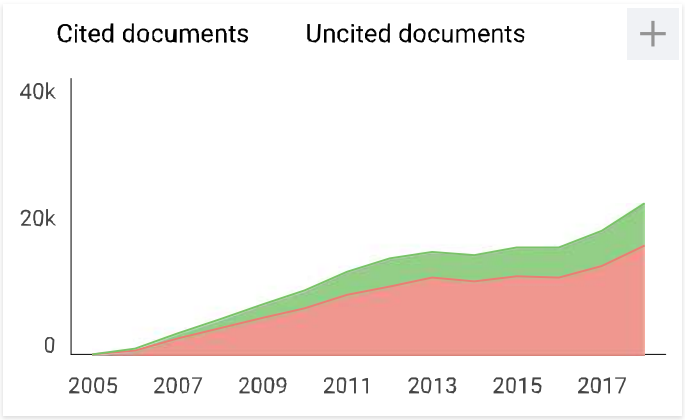

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