

The development of ITSM research in Indonesia: A Systematic Literature Review

B. Herawan Hayadi¹, Husni Teja Sukmana^{2*}, Eggar Shafiera³, Jin-Mook Kim⁴

Computer Science Study Program, Faculty of Engineering and Computer Science, University Potensi Utama, Medan, Indonesia

^{2,3}Department of Information Technology, Syarif Hidayatullah State Islamic University Jakarta, Indonesia

⁴Division of IT Education, Sun Moon University, South Korea

*husniteja@uinjkt.ac.id **

** corresponding author*

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ABSTRACT

IT Service Management (ITSM) is a framework used to support businesses by increasing IT service quality. Several studies have tried to examine the development of ITSM based on their respective interests. However, the development of ITSM in Indonesia has not been widely studied, such as the types of research that are most often investigated, what domains are often researched, the areas and types of companies being studied. The things above are the main objectives of this research. The method used in capturing data, screening, and analysis is the systematic literature review method. There are many findings obtained from this research. One of them is the domination of the service operation research area (45%) among other areas. Meanwhile, applied research had been researched quite consistently over the last five years. From these results, it can be noticed that a deeper understanding of the synchronization between business and IT is needed. This is in accordance with the objectives of ITSM implementation so that future research is expected to provide balance in other areas, such as service strategy, design, transition, operation, and continuous service improvement.

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I. Introduction

The relationship between IT services in business improvement has been widely discussed [1]–[5]. Not only discussing the relationship between IT services and business but these researchers also usually develop research according to their respective interests. Some are interested in developing helpdesk applications to support business [6], [7], others are researching the relationship between IT service frameworks and other frameworks [8], [9]. Furthermore, some are already trying to take advantage of artificial intelligence in process automation in IT domain Service [1], [10].

In Indonesia, several researchers have published papers in this domain. Most of these researchers are related to the creation of a helpdesk system [7], [11], [12]. Some conduct audits with various case studies such as those conducted by [13], [14]. Others design IT service management in the regions, state-owned or private companies [15]–[17]. This indicates that the research domain is still being researched and developed by researchers in Indonesia.

Through various ministries, the Indonesian government has created various legal umbrellas to regulate ICT governance, starting with Presidential Decree No. 95 of 2018 concerning electronic-based government systems [18], where the scope of this regulation includes governance, management, ICT audits, and others. Furthermore, the regulation was passed down to various ministries such as the Ministry of Communication and Information regarding general guidelines for national ICT governance [19], the Ministry of State-Owned Enterprises [20], the Ministry of Education and Culture [21]. Almost every government institution has rules for the achievement of good governance. Even in various state-owned companies, this governance process must annually report the audit results to ensure compliance with the standard.

International organizations of standardization have published ICT service governance standards through ISO 20000-1. The use of ISO 20000-1 can have benefits both internally and externally for an organization [22]–[24]. External benefits associated with marketing and a good reputation for the company. Meanwhile, for internal gain, it increases uniformity and consistency in services and processes, improves control processes, and continuously increases ICT services quality (Continue Improvement Objective). Although the information related to ISO 20000-1 certification for this company is quite a lot until now, the number of companies, either state-owned or private, has not yet certified IT Service management governance [24].

For this reason, further research is needed to be related to finding the development of research in the field of IT service management in Indonesia, in the form of a systematic literature review. Is there a lack of existing research in Indonesia, so this issue does not enter the community and companies? Which parts of ICT service governance have been studied the most? Is this governance already using a standardized framework? We will explain more about these research questions in the methods and materials section.

Systematic Literature Review in IT Service management has been widely researched, including [25]–[31]. The domains of this research are diverse, ranging from the relationship between ITSM and SME [25], [27], [32], domains of management problems, and helpdesk [29], [33]. Simultaneously, a slightly more general literature review related to IT services was carried out by [28]. The research we conducted complemented the above studies with the limitation of the regional domain, namely the state of Indonesia. The data obtained will be increased by including studies conducted in Indonesian. The data source will be even more prosperous by involving sources from the thesis of undergraduate-doctoral students in Indonesia. We hoped this research would become a baseline for academics to continue research in this domain and for policymakers to see the relationship between the amount of this research and the level of maturity to get good governance from companies that impact service improvements (business).

This paper's composition is divided into five main parts: an introduction, followed by a discussion of previous studies. Chapter 3 will explain the research method, followed by the conduct and analysis of the SLR results, which will finally be summarized in chapter 6.

II. Related Work

Based on the results of our exploration of various databases, several studies have made study literature in the ITSM field, including those done by [25], [28], [33], [34]. Almost all of the methods that they have done referring to research conducted by [35]. So, this has motivated us to use a similar method.

Two of the above studies have focused on making ITSM study literature on the domain of small-medium companies [25], [34]. They believe that the challenges in implementing ITSM for different SMEs with enterprise companies are already due to differences in the number of employees, lack of resources on technology, and the associated knowledge of ITSM. We also raise SME in our literature research study, but only as part of the type of object to be studied (RQ 4). That because in our research, we want to find any domain (not limited to SME) that has been studied based on the existing literature.

There is one study of literature sourced from books that examine how the ITIL framework fits the perspective of services [28]. The method used is different from what is usually done in research related to literature studies, including research that we did previously. This study uses the service domain logic because this method can describe the IT sector's perspective service. Reference is limited to books, not based on other publications (journals, conference proceedings, etc.) wherein our opinion, it is not possible to map or describe the perspective service according to its purpose. Other sources are needed in the form of more diverse publications, for that our research tries to add to this.

Literature reviews relate to the problem management simulation process carried out by [33]. This study tries to answer several questions related to problem management simulations, namely: the relationship between the simulations used concerning helpdesk operations, the main benefits obtained when using simulations for the helpdesk, and the search for studies related to problem management simulations. This research is different from the research we did, wherein our study,

problem management was the object of research, not the subject of research. The discussion of problem management is contained in RQ2 regarding what areas are currently being studied.

From all the related work above, we see that there are differences in the form of the research's objectives and scope. In this study, we tried to find a common thread between the many studies related to the ITSM domain, especially in the Indonesian sphere (never been studied), and the implementation and standardization of ITSM in Indonesia. To find this implied objective, we tried to map existing studies based on the most investigated research areas (RQ1), which areas were most studied (RQ2), the framework used (RQ3), the domains and case studies used (RQ4), and the research approach (RQ5). So that in implementing this search, the resources we use in searching for literature related to ITSM are both in English and Indonesian.

III. Research Method

A very popular method in research related to SLR is the method used by Kitchen ham [35] dan Brereton [36]. We found a variety of research domains that use this method, including in the field of software engineering [37], [38], the use of gamification in education [39], ERP [40], and others. The ITSM domain, which researches small-medium enterprises [27], also uses the approach that was first studied by [35].

Although using the same method, some researchers differ slightly in the process. Some researchers divide into three major stages as adopted by [27], namely the planning stages, implementation, and report review. Some divide it into two main items: flow and (process steps) and outcome, as adopted by [41]. The stages, which we adopt later in this paper, can be seen in Figure 1.

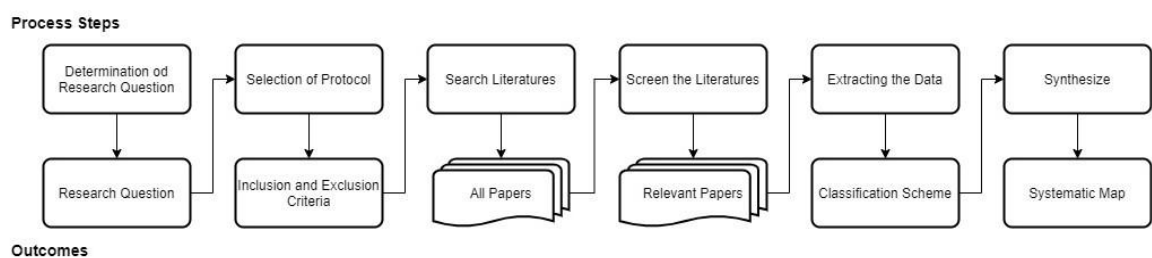


Fig. 1. The Systematic Mapping Stage

3.1. Determination of Research Questions

The purpose of this study is to see the development of research related to IT Service Management in Indonesia, so we set a couple of questions that we consider important, namely:

RQ1: What research areas have been investigated most related to the IT Service Management domain in Indonesia?

RQ2: What are the most researched areas of ITSM in Indonesia?

RQ3: What is the ITSM framework that is most widely used in Indonesia?

RQ4: In what domains is ITSM mostly investigated in Indonesia?

RQ5: What were the approaches to each study?

3.2. Selection of protocol

The protocol includes determining the inclusion and exclusion of the criteria to ensure the existing papers meet the research question's expectations. The research location is chosen, namely in Indonesia, is an important point in determining the protocol. The choice of language can use

Indonesian or English, assuming that many published studies use international languages such as English. As for time, we only filter based on studies with a maximum period of 5 years.

3.3. Search literature

This process begins by specifying a few keywords. The first keyword covers the words IT Service and IT Service Management. After collecting several papers, it turned out that many researchers used the ITIL framework in their research. We expanded the research keywords by using several ITIL processes such as ITIL, Service Strategy, Service Design, Service Transition, Service Operation, Incident management, Problem management, service desk, and helpdesk.

The second step is to determine the source of the database paper. The database that we use in this study refers to several studies such as [27], [38], [39], [41], including Science direct, IEEE explore, ACM ProQuest. Because some data sources come from research results that are not published in journals and conferences, we are adding sources from Google Scholar to aggregate data from repositories that campuses usually use to store such data, including undergraduate thesis data, thesis, and research results).

3.4. Screen the literature

This process is used to filter the results of the searching process based on protocols and data sources. First, we excluded several papers according to Table 1. After that, we continued to read the papers' abstracts and keywords, then began to include papers that fit into the included category in Table 1 to be analyzed and synthesized in the next process.

3.5. Extracting the data

Next, we use some literature to filter existing papers based on RQ's estimated answers, as shown in Table 1.

Table 1. Research Question and Description

No	Research Question	Description
RQ1	What areas of research are the most investigated regarding the domain of IT Service Management in Indonesia?	software development, Model development, implementation research, curriculum, assessment, etc.)
RQ2	What are the most researched areas of ITSM in Indonesia?	service strategy, design, transition, operation, and CSI
RQ3	What is the most widely used ITSM framework in Indonesia?	ITIL, IBM, Microsoft
RQ4	In what domains and areas are ITSM mostly investigated in Indonesia?	Type of company, type of area
RQ5	What approach was undertaken in each study?	Type of company, type of area

3.6. Synthesize

Based on Table 1, we began to investigate further by reading all the papers and mapping the papers according to the research questions.

3.7. Write the report

In this phase, the results of this research begin to be written to be disseminated and published so that further researchers can understand the current status of research related to the development of ITSM in Indonesia.

IV. Result

After determining the method used in this study, the next step is to conduct a literature search according to the protocol that has been made. The search for papers regarding ITSM research in Indonesia was carried out on several databases such as IEEExplore (<https://ieeexplore.ieee.org/>), ProQuest (<https://www.proquest.com/>), ACM (<https://dl.acm.org/>), Science Direct (<https://www.sciencedirect.com/>), Springer (<https://link.springer.com/>), and Google Scholar (<https://scholar.google.co.id/>). The searching data process is done in four stages to search for data according to this study's need and predetermined criteria, as shown in Table 2.

Table 2. Process of Searching Data

Stage	Description
1	Perform a search on the database specified in the period 2015 to 2020, in the form of a thesis, dissertation, or paper
2	Collecting data that meets conditions such as the ITSM research domain carried out in Indonesia and using Indonesian or English
3	Implement exclude technical reports and web-based guidelines
4	Exclude data that appears as a paper and thesis with the same title and topic

Data originating from these sources is then selected according to predetermined protocols. Table 3 displays the amount of data obtained in each stage. After searching data, we found 165 data according to the needs of research and the existing criteria. Then from 165 data, we will do further analysis to answer specific research questions.

Table 3. Number of Databases in each Stage

Database	1 st Stage	2 nd Stage	3 rd Stage	4 th Stage
IEEExplore				28
ACM				3
Google Scholar				125
Proquest	1.610.000	174	172	2
Science Direct				6
Springer				1
Total				165

Figure 2 shows an overview of research developments each year. Research on ITSM in Indonesia has continued to increase since 2015 and was at its peak in 2018 with 39 studies. Then in 2019, the number of studies decreased to 25 and only increased slightly in 2020. Research in journals and proceedings dominates almost every year, where proceedings have the highest number in 2017 as many as 21, and journals with 15 studies in 2020. Research on ITSM is also found in the form of an undergraduate thesis and a thesis. The thesis category's definition includes the thesis that is still in the form of a thesis proposal.

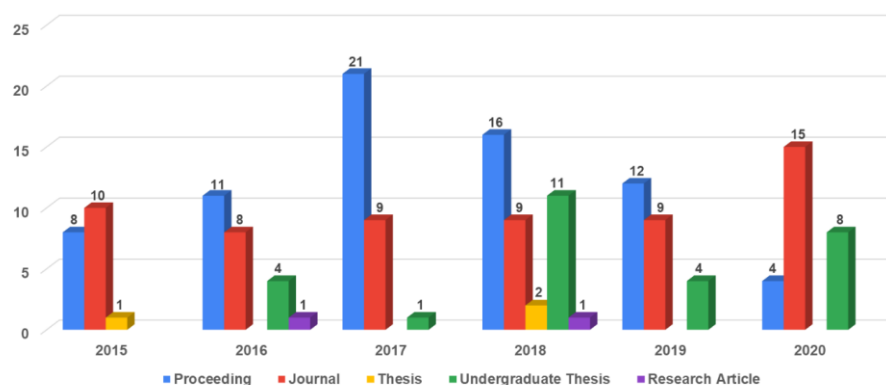


Fig. 2. Type of Resources Documents per year

RQ1: What regions of research are the most investigated regarding the domain of IT Service Management in Indonesia?

The data that has been obtained is divided into six groups of research fields, namely assessment, model search, implementation, software assessment, systematic literature review (SLR), and software development. However, from the search results, it turns out that several studies related to assessment also combine the fields of software development and implementation. It can be seen from Figure 3 that the most dominating research field in the first three years was the implementation, and this indicates that there are still many companies or organizations that want to implement ITSM both partially (for example, helpdesk implementation) and administratively by making standard operation procedures [42]– [44].

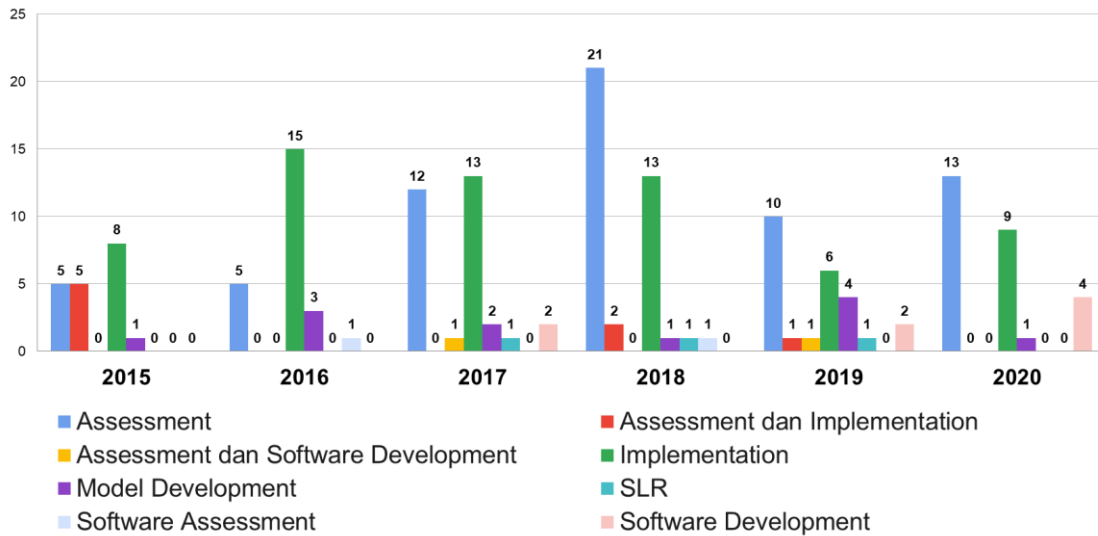


Fig. 3. The Most Investigated Regions

After a lot of research on implementation in the first three years, there was a shift in the research field in 2018, research on assessment began to be carried out a lot. The assessment itself is useful for evaluating the quality of ITSM implementation in a company, as found in research [45]–[47]. This measurement is important to determine the success of the implementation of ITSM itself. This research shows a measuring tool using the Cobit framework, ISO 20000-1, and the Maturity model.

RQ2: What are the most researched areas of ITSM in Indonesia?

Table 4. Most ITIL Areas have been Researched

ITIL Area	Reference	%
Service Strategy	[48]–[57]	7%
Service Design	[45], [58]–[79]	17%
Service Transition	[80]–[86]	4%
Service Operation	[14], [42], [44], [46], [47], [87]–[144]	45%
Continual Service Improvement	[145]–[149]	4%
Service Strategy, Service Design	[150]	1%
Service Strategy, Service Transition	[151]	1%
Service Transition, Service Operation	[152], [153]	1%
Service Design, Service Operation	[154]–[159]	4%
Service Operation, Continual Service Improvement	[160]–[163]	3%
Service Design, Service Transition, Service Operation	[43]	1%
Service Strategy, Service Design, Service Transition, Service Operation	[164], [165]	1%
Service Strategy, Service Design, Service Transition, Service Operation, Continual Service Improvement	[166]–[180]	11%

ITIL V.3 has five areas: service strategy, service design, service transition, service operation, and continual service improvement. Research related to ITSM conducted in Indonesia mostly does not research the ITIL area as a whole. The selection of the ITIL area used in the study is tailored to the needs of the company. Not all companies need or can adapt directly to all ITIL areas. Based on Table 4, one of the most researched ITIL areas in Indonesia is the service operation area (45%).

Service operations focus on daily service management for the user or customer needs. Several studies included in the service operation area discussed service desks owned by the company [44], [101], [110], [119], [127], [138], [142], [181] because the service desk has an important role in the service operation area.

From the table above, 11% of the studies have tried to include all areas of ITIL V.3. In our opinion, this is very good and needs attention for future studies. Because the big idea of ITSM is the alignment between IT goals and business goals [1]– [5], it is necessary to follow a good IT service strategy plan to support the business.

3.2. RQ3: What is the most widely used ITSM framework in Indonesia?

ITIL has become very popular and is widely used as a framework in implementing ITSM because ITIL is a best practice that is easily implemented in various companies. As shown in Figure 4, research in Indonesia that uses the ITIL framework is in the first position with 119 studies and very far when the number is compared to other frameworks. These results are consistent with previous literature studies [31], [182], [183].

Several studies have conducted a combination of several frameworks, such as research conducted by [171] and [184], which combines ITIL and COBIT in the IT services evaluation process. Other research also uses a combination of ITIL and COBIT in designing [95][158], and companies that have implemented ITSM researched towards the development [65].

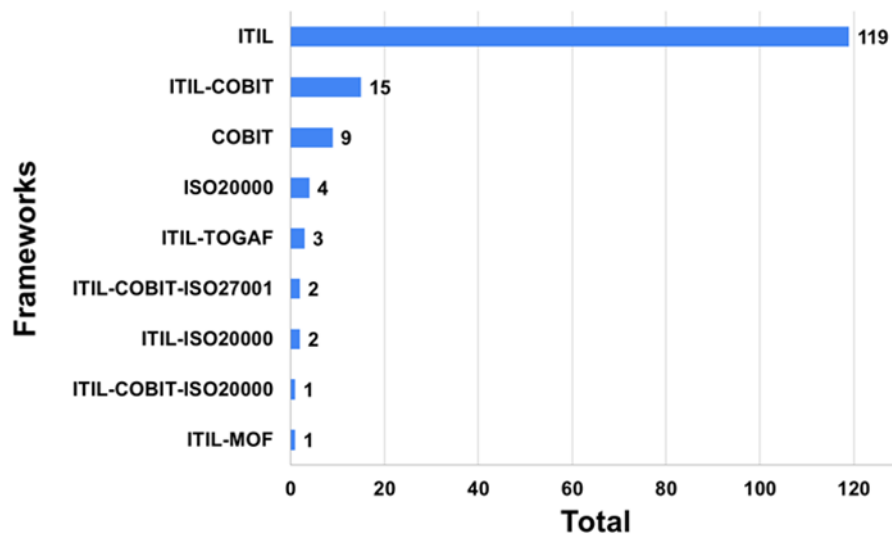


Fig. 4. The Most Widely used ITSM Framework

3.2. RQ4: In what domains and areas are ITSM mostly investigated in Indonesia?

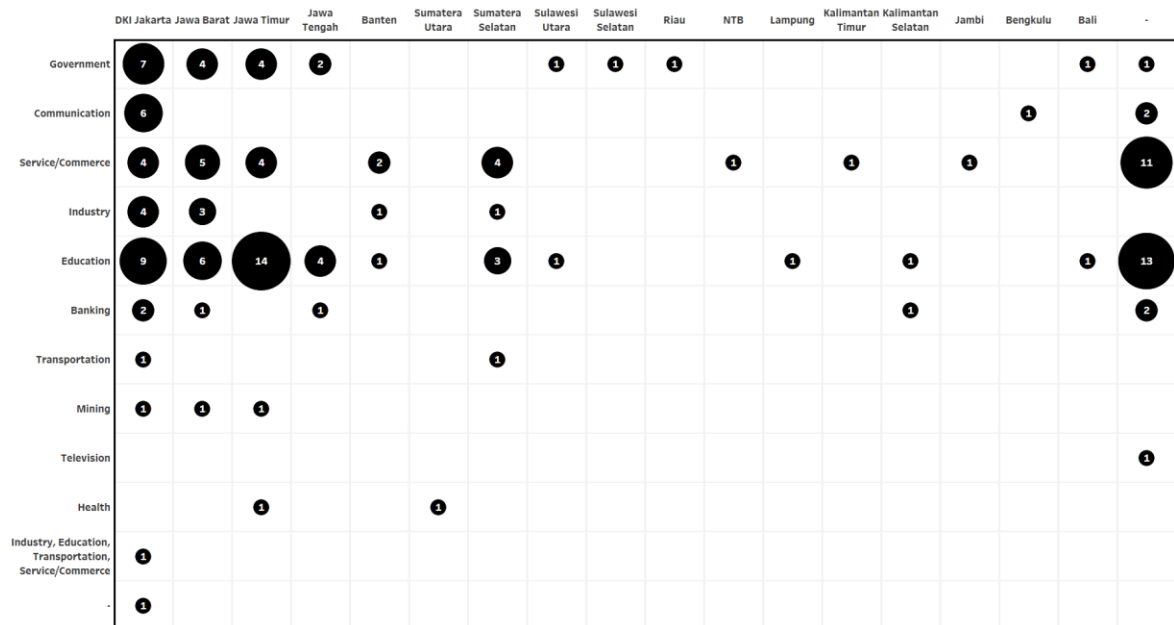


Fig. 5. Domains and Area Mostly Investigated

Figure 5 presents a picture spread of research on some domain companies that were conducted in each province. Not all studies mention the complete company domain and location. Therefore, a sign (-) represents data that does not mention the company's domain or area.

Research that has been conducted in educational institutions has received more attention since 2015 to date, especially educational institutions located in East Java Province with a total of 14 studies. Research with the educational domain is found in both universities [172], [185], [186], or high schools [108], and this is natural because most of these researchers are academics on campus, so there is the possibility of selecting objects in the Education unit due to easier access to data.

Apart from education, research in government areas has also been carried out in several provinces related to Presidential Decree No. 95 of 2018, which discusses electronic-based government systems [18].

In terms of the distribution of research in each province, Figure 5 shows that the number of studies conducted is not evenly distributed in each region. In the provinces of Bengkulu, East Kalimantan, Lampung, NTB, Riau, South Sulawesi, and North Sumatra, only one study was conducted in each province.

3.2. RQ5: What approach was undertaken in each study?

The papers that have been collected are divided into several approach categories, such as empirical studies, literature reviews, theoretical works, and practical experiences. Judging from Figure 6 shows that as much as 78.79% of research on ITSM in Indonesia is carried out using a practical experiences approach. Research that falls into the practical experiences category uses companies or organizations as a case study in their research and is mostly related to the implementation of ITSM.

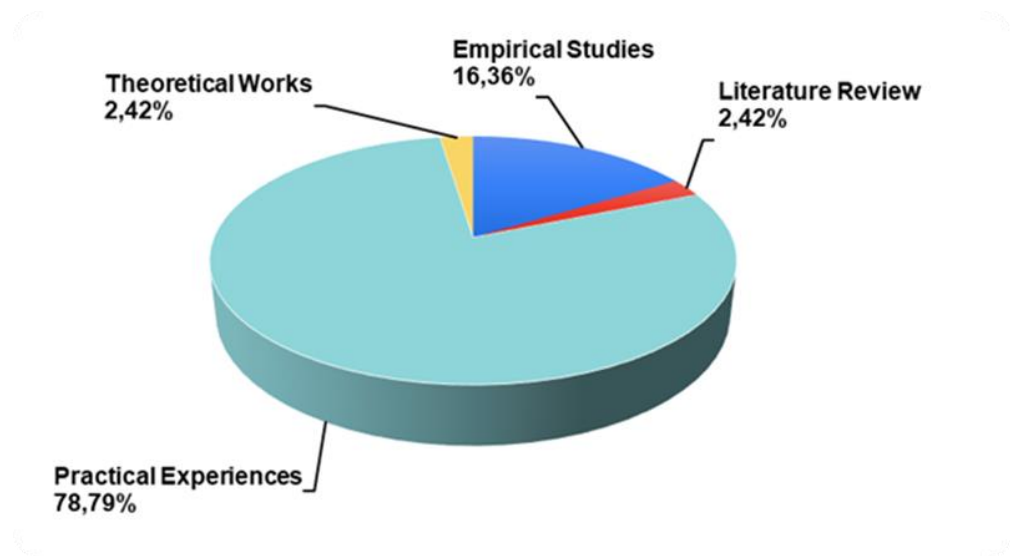


Fig. 6. Type of Research in ITSM Domain

Research with practical experiences approach is carried out by adjusting the company's field conditions or conditions, which are used as a case study. Like was done in research [109], [127], [138], which designed an application related to ITSM and later it will be used in managing IT services at the company.

V. CONCLUSION

From the results of the SLR conduct above, we summarize the four findings. First: that research related to ITSM in Indonesia is still lacking, with 165 publications for five years. There is still a lot less compared to research related to e-learning or e-commerce, which may cause few institutions in Indonesia that fulfill ITSM with ISO 20000-1-based certification. Second, the most researched area is Service Operations at 45%, followed by service design (17%) and the combination of all processes at 11%. Meanwhile, other areas are still slightly below 10%, which allows future researchers to develop research in areas that still lack research. Third, the sector that is most researched is the education sector (54 studies), followed by the field of communication (33 studies) and government (22 studies). The distribution of research based on provincial objects is still unbalanced, Java and Bali region still dominate research objects related to this field. Fourth, just like other systematic literature review studies, the most widely used framework is the ITIL framework with a usage level of 110, followed by a combination of ITIL and COBIT (15). The use of other frameworks such as MOF from Microsoft is so small, with only one researches

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