

Systematic Literature Review SDLC in Software Engineering

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Abstract— Software Engineering is a branch of computer science that is used to find out what is wrong in software. The purpose of this study is to provide a number of papers with the theme Software Development Life Cycle (SDLC) on software engineering. We conducted a literature review for papers published in the period 2018 to 2022. As many as 80 papers that we took from the Scopus database and the Web of Science were then reviewed based on the SLR flow that we determined, which was to separate journal articles and conference papers, only taking the most cited papers. at least 3 times and the final result of our review is 48 papers related to a comprehensive discussion of SRL (SDLC in software development).

Keywords-systematic literature review; software development life cycle; software engineering;

I. INTRODUCTION

Software engineering is a branch of engineering that focuses on all facets of the creation of software, from the early phases of system specification to the maintenance of the system after it has been put into use [1].

The success of software development depends on qualified and skilled software project managers and development teams implementing practically tested management strategies during various project phases [2]. The use of smaller software projects is increasing in both the public and private sectors nowadays. No matter if the objectives are to replicate a comparable project using pre-existing intellectual properties or to create something from the start, managing a project and its many phases is realistic and made simpler with the right tools and frameworks [3].

The time required for tasks including specifying, developing, testing, deploying, utilizing, and maintaining a system or piece of software is known as the Software Development Life Cycle (SDLC). The efficiency of the development team and the caliber of the program are determined by the success of creating and analyzing the

software process metrics throughout the SDLC [4]. Software testing is one of the most crucial factors to take into account during the SDLC because it enables increasing the software's quality. Due to development delays, this testing phase frequently loses importance. After the coding process is complete and just before the software is handed to the customer, it is then often carried out. In this situation, it is important to begin testing software as soon as the SDLC is completed. Early testing makes it possible to find numerous flaws quickly, which improves quality and customer happiness [5].

By doing research that considers practices and actions that result in the construction of an accessible software product, taking into account this SDLC quality trait, the SLR aims to support the field of software engineering [6]. SLR is a technique for locating, evaluating, and condensing research that is currently available on a certain research topic [7].

II. METHODOLOGY

This study is a systematic review of the available literature. The recommended 10-stage review process is the ideal one. The planning, doing the review, and reporting phases make up the three steps of the processes. The three phases each contain ten processes. The planning phase begins with activities including defining research topics, developing a review technique, and validating the produced protocol. The second step, conducting, comprises finding relevant research, selecting primary studies, judging the caliber of the studies, extracting data, and analyzing that data. The final stage includes the steps of documenting and validating the SRL report. Understanding current and emerging approaches, recognised challenges, and possible research opportunities on the application of SDLC in software engineering are the objectives of this SLR [8].

A. Research questions

RQ1: What research topics are being addressed?

RQ2: Which organizations are most active in SLR-based research?

B. The research process

Picking out pertinent research. The terms "software development life cycle" and "software engineering" were found. The software development life cycle, software engineering, and SLR were then chosen and combined with one another to create a search phrase. The search term was finally:

a) Scopus:

((SDLC)) AND (Software engineering) AND (SLR) AND (LIMIT-TO (PUBSTAGE,"final"))

AND (LIMIT-TO (LANGUAGE,"English"))

b) Web of Science:

((TS=(SDLC)) AND TS=(software engineering)) AND TS=(SLR)

C. Study selection

According to the review protocol, a 6-step selection process was used on the relevant research. The selection criteria were applied to ensure that only primary studies on SDLC in software engineering were examined.

1. Editorials, novels, book chapters, and reviews were omitted from the first relevant study findings that were published in the English language. This process was used to make sure that only primary journal and conference publications that had undergone rigorous evaluation and peer review were chosen.
2. The published date was used to filter the studies that emerged from step 2. studies that were released five years ago. Studies published during the last five years were regarded well suited to SDLC based on the stated goal of this systematic review since they give evidence in the pertinent applications of software engineering.
3. The included studies were sorted by the number of citations they received. We excluded any articles that weren't quoted three or more times. Publications with 0–2 citations are not included because they can contain a weak argument or a poorly researched topic.
4. The accuracy of the publishing information and its application to the current SLR were checked in the step 3 results. The published results without any metadata such as author names, source titles, or abstracts were disregarded. After examining all of the papers that were included, only the publications that utilized SDLC either directly or indirectly in software engineering were selected.
5. The publications that were produced, both inside and outside of Scopus, were integrated, and the duplicates were removed.

D. Quality assessment

To guarantee that the conclusion is supported by the highest caliber evidence, only articles in the most prestigious and well regarded scientific journals are taken into account. As a result, the publication search databases recognized for producing high-

quality, peer reviewed publications were first and foremost included in the quality assessment checklist. Second, low-quality works are infrequently mentioned.

The quantity of citations was therefore included in the quality checklist. We only included works that had three or more citations. The third factor is the alignment of the study's design with the defined research objectives. Risk of bias is the fourth factor, followed by outcome measure preference and overall reporting quality. The quality evaluation was added to keep out publications of low quality, poor writing, and incoherent content.

F. Data extraction process

The articles that were produced after the selection processes previously outlined and quality assessment were subjected to data extraction. Publication date, number of citations, conference information, source journal information, research titles, the field of study, the goal of the study, and the research questions, if they were underlined, were among the data types extracted.

III. RESULTS

Scopus and Web of Science, respectively, were used to retrieve a total of 80 English-language articles. The publications were not combined when they were retrieved for this review. Instead, separate processing was applied to each of the two sets. First, a different filter was used to the resulting publications sets to eliminate all books, book chapters, editorials, and reviews. Only conference proceedings and journal publications were to be kept after the procedure. This activity resulted in publications from Scopus 34 and the Web of Science 46, respectively. To guarantee that only papers published between 2018 and 2022 were included, a publication date filter was then used. In five years, the approach led to the publication of 34 Scopus-indexed publications and 46 Web of Science-indexed papers. The amount of citations received was used to sort the final papers. Only works that have received three or more citations are thought to be of high caliber. According to the citation criterion, there are a total of 18 papers from Scopus and 22 papers from Web Science.

The accuracy of the publications that resulted was verified. In order to ensure that only publications with pertinent information such as author, source title, and abstracts were taken into consideration for this SLR, an exercise was conducted. The check for relevance came after the check for accuracy. At this point, the inclusion criteria were designed to make sure that only publications with accurate information and connections to the SDLC in software engineering were included. A total of 46 papers from Web of Science and 34 from Scopus were integrated, and duplicates were eliminated. There were 48 publications total on the final list. Fig. 1 below provides a summary of the SLR execution procedure.

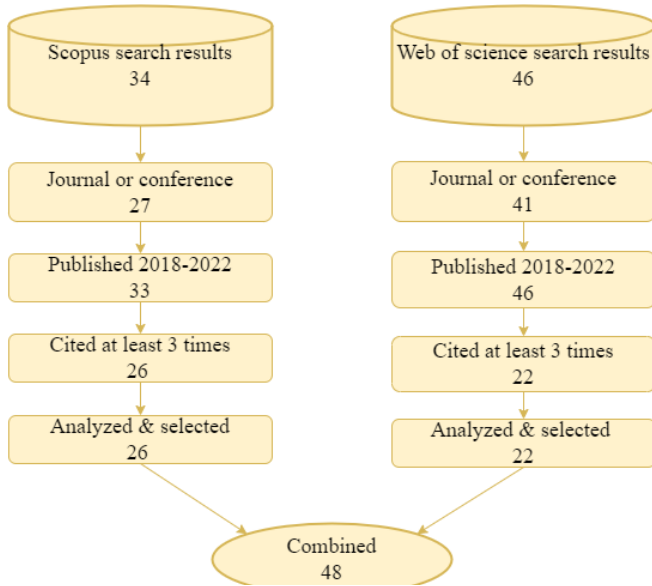


Fig.1. SLR execution flow

Lowest number of selected from scopus, papers publication in years 2018, and 2019. The year 2018 has 4 papers, and 2019 has 2 papers. while the years 2020 and 2022 have 24 papers each. In the web of science selected papers in 2018 have 12 papers and 2019 have 10 papers. While the years between 2020 and 2022 have decreased, there were only 4 papers related to SDLC in the field of software engineering that were published, this was due to the Covid-19 pandemic at that time. Measures to combat the pandemic include travel restrictions and quarantines, which have a negative impact on research activities, particularly in the field of software engineering. Fig.2 summarizes the five years' worth of software engineering decisions based on the software development life cycle below.

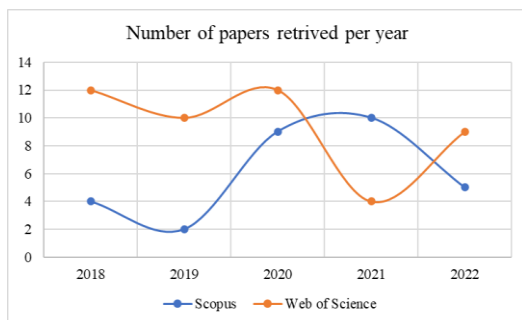


Fig. 2 shows the number of papers published each year.

As shown in Fig. 3, only 14 of the 80 research that were chosen for assessment were conference papers, whereas 66 were journal articles. Type of publication that you have chosen. This result is consistent with the quality assessment technique of choosing superior studies. The superiority of the research chosen for review is thus indicated by the much greater quantity of journal papers.

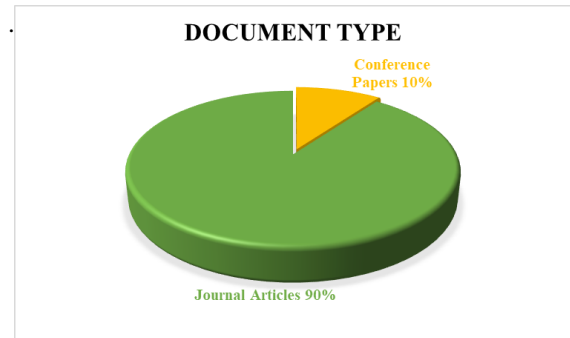


Fig. 3. Type of selected publication.

Thus, a significant number of journal papers that are cited more by year and indicate the quality of the study selected for review (see Figure 4).

The frequency with which a study is mentioned is an important quality control measure. Comparatively to subpar studies, high quality papers published in respected publications are more likely to be cited. As a result, only works that have been cited three or more times are chosen. The research published in 2022 received the fewest citations overall, while the articles published in 2018 received the most.

The quantity of citations and the year of publication have no relation to one another. This outcome is anticipated given that the paper's quality does not correlate with the year it was published. The database from scopus selected in 2019 yielded 72 citations from 2 papers. Instead, 7 papers were selected in 2019 and have a total of 53 citations from the web of science database. Nevertheless, significantly higher the number of citations in 2020 for the scopus database and 2018 for the web of science database. This can be attributed to the explosive growth in the advancement of the internet and technology, which saw several publications in the system development life cycle that will be used as a reference in the next published paper.

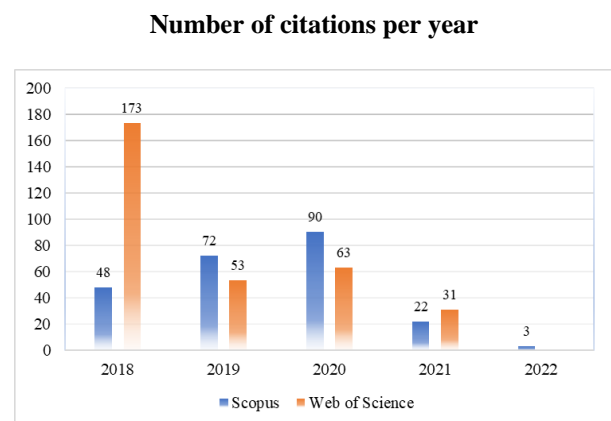


Fig. 4. Citations per year of publication

Selected studies were obtained from 27 sources related to SDLC in software engineering published by Scopus, such as the quantity of papers received for each source. The IEEE takes the top spot in the ranking of the top sources based on the number of articles, with 4 papers. The second position was won by the

Journal of Physics: Conference Series with 3 papers, as shown in Table 1 below.

Table 1. Data from Scopus

Source Title	Articles
International Conference in Software Engineering Research and Innovation (CONISOFT)	1
IOP Conference Series: Materials Science and Engineering	2
International Conference on Internet (ICONI)	1
International Joint Conference on Science and Engineering (IJCE)	2
Journal of Theoretical and Applied Information Technology	1
Cluster Computing	1
IEEE Access	4
Turkish Journal of Computer and Mathematics Education	1
International Journal of Engineering & Technology	1
Journal of Physics: Conference Series	3
Journal of Software	1
I.J. Education and Management Engineering,	1
International Journal of Computing and Digital Systems	1
MDPI Processes	1
International Enterprise Distributed Object Computing Conference (EDOC)	1
Annals of Nuclear Energy	1
Nuclear Engineering and Design	1
International Conference on AI Engineering – Software Engineering for AI (CAIN)	1
Computer Standards & Interfaces	1
Proceedings of the 2nd International conference on Electronics, Communication and Aerospace Technology (ICECA)	1
Journal of Xi'an University of Architecture & Technology	1
Intelligent Automation & Soft Computing	1
International Journal of Advanced Research in Engineering and Technology (IJARET)	1
Association for Computing Machinery	1
Journal of King Saud University – Computer and Information Sciences	1
MDPI Electronics	1

Meanwhile, the selected studies on web of science related to SDLC in software engineering were published by 41 sources, such as the quantity of papers received for each source. ArXiv, which has 4 papers, takes the first spot in the ranking of the best sources based on the number of articles. The International Journal of Scientific Research in Computer Science, Engineering, and the International Research Journal of Engineering and Technology (IRJET), which had two manuscripts, took second place, as shown in Table 2 below.

Table 2. Data from Web of Science

Source Title	Articles
International Journal of Research and Analytical Reviews (IJRAR)	1
International Journal of Computer Science Trends and Technology (IJCST)	1
Thirtieth European Conference on Information Systems (ECIS)	1
Enase	1
IFIP International Conference on ICT Systems Security and Privacy Protection	1
ArXiv preprint arXiv	4
Journal of Computer Science Research	1

Springer Nature Switzerland AG	1
International Journal of Humanities, Engineering, Science and Management (IJHESM)	1
DigitalCommons	1
Globus An International Journal of Management & IT	1
International Journal of Computer Science and Mobile Computing	1
International Conference on Software Engineering and Knowledge Engineering	1
International Journal of Electrical and Computer Engineering (IJECE)	1
Pakistan Journal of Engineering and Technology, PakJET	1
International Journal of Forensic Software Engineering	1
Hawaii International Conference on System Sciences	1
International Journal of Computer Applications	1
Sumerianz Journal of Scientific Research	1
International Journal of Science and Research (IJSR)	1
Journal of Applied Engineering and Technological Science	1
IFIP Annual Conference on Data and Applications Security and Privacy	1
International Journal of Scientific Research in Science and Technology (IJSRST)	1
International Research Journal of Engineering and Technology (IRJET)	2
International Conference on Sustainable Computing in Science, Technology & Management (SUSCOM)	1
Journal of Software Engineering Research and Development	1
American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)	1
Journal of Computing Research & Innovation (JCRINN)	1
Baltica Journal	1
International Journal of Recent Research Aspects	1
International Journal of Engineering Materials and Manufacture	1
International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT)	2
SSRN	1
IEEE Access	1
International Journal of Computer Sciences and Engineering (IJCSE)	1
IUP Journal of Information Technology	1
USENIX Association	1
International Journal of Recent Technology and Engineering (IJRTE)	1
International Conference on Knowledge Engineering and Ontology Development	1
International Journal of Creative Research Thoughts (IJCRT)	1
AAAI Spring Symposium: Combining Machine Learning with Knowledge Engineering	1

IV. DISCUSSION OF RESEARCH QUESTIONS

A. RQ1: What research topics are being addressed?

Tables 3 and 4 show that many different topics are being discussed. To have some basis for evaluating the extent of the topic of SDLC in software development, we consider how: SLR has good relevance to SDLC in Software Engineering (see Tables 3 and 4). We believe SLR can be used by scientists to help further research related to sdclc implemented in software.

B. RQ2: Which organizations are most active in SLR-based research?

In our review, the most active organizations regarding SLRs on SDLC in software can be seen in table 4 and 5.

Tabel 3. Data from Scopus.

Authors	Year	Title	Source title
M. Mythily1 · M. L. Valarmathi2 · C. Anand Deva Durai [9]	2018	Model transformation using logical prediction from sequence diagram: an experimental approach	Cluster Computing
Mohd Herry Mohd Nasir, Haslinda Hassan, Aidi Ahmi [10]	2018	The Development of the Web-Based Claim System in Higher Academic Institution	International Journal of Engineering & Technology
D Prasetyo, B Wibawa, and A O Dima [11]	2020	Blended Learning implementation in introduction to artificial intelligence courses using the System Development Life Cycle method	Annual Applied Science and Engineering Conference (AASEC)
Mauricio Cruz-Portilla, Juan Carlos Pérez-Arriaga, Jorge Octavio Ocharán-Hernández, Ángel J. Sánchez-García [12]	2021	Accessibility in the Software Development Life Cycle: A Systematic Literature Review	International Conference in Software Engineering Research and Innovation (CONISOFT)
Mehwish Shaikh, Aaiza Khan, Isma Farah Siddiqui* and Zakauallah Qureshi [13]	2021	Comparative Analysis of Trending Agile Model Tools for Software Development Life Cycle	International Conference on Internet (ICONI)
Siska Wahyu Prasetyani1 Aries Dwi Indriyanti1 [14]	2021	Design and Build Termin Information System at PT Delta Sinergi Prima to Optimize Term Management Using the Method Software Development Life cycle	International Joint Conference on Science and Engineering 2021 (IJCSSE)
Riyayatsyah, Profita Anggriani, Mirwansyah Dedy, Muhid Bahrul [15]	2021	The Development of Web-Based Forestry Management Information System	Journal of Physics: Conference Series
Naveen N Kulkarni a, Prof. (Dr.) K. P. Yadav [16]	2021	Tailoring effective requirement's specification for ingenuity in Software Development Life Cycle	Turkish Journal of Computer and Mathematics Education
Mai Alfawair [17]	2022	INTERNET-OF-THINGS: A SYSTEM DEVELOPMENT LIFE CYCLE (SDLC)	Journal of Theoretical and Applied Information Technology
RAFIQ AHMAD KHAN, SIFFAT ULLAH KHAN, MUSAAD ALZAHHRANI, AND MUHAMMAD ILYAS [18]	2022	Security Assurance Model of Software Development for Global Software Development Vendors	IEEE Access
A. Alzayed, Abdulwahed Khalfan [19]	2022	Understanding Top Management Involvement in SDLC Phases	Journal of Software
A Sugiandi and Y Kerlooza [20]	2018	Competency Assessment Parameters for System Analyst Using System Development Life Cycle	IOP Conf. Series: Materials Science and Engineering
Eraj Laaraib, Zulfikar Ahmed Maher, Zulfiqar Ali Solangi, Muhammad Yaqoob Koonddhar, Mukhtiar Memon, MansoorHyder Depar, Asadullah Shah [21]	2021	A Methodology for Incorporating Quality Assurance Practices during Software Development Life Cycle	International Journal of Advanced Trends in Computer Science and Engineering
N.Rajasekaran and Dr.S.M.Jagatheesan [22]	2021	Lack of SDLC Models and Frameworks in Mobile Application Development – A Systematic Literature Review and Study	Journal of Xi'an University of Architecture & Technology
Samuli Laato, Teemu Birkstedt, Matti Mäntymäki, Matti Minkkinen, Tommi Mikkonen [23]	2022	AI Governance in the System Development Life Cycle: Insights on Responsible Machine Learning Engineering	2022 IEEE/ACM 1st International Conference on AI Engineering – Software Engineering for AI (CAIN)
Avelet Maria Fernandes, Anusha Pai, Louella M. Mesquita Colaco [24]	2018	Secure SDLC for IoT Based Health Monitor	Proceedings of the 2nd International conference on Electronics, Communication and Aerospace Technology (ICECA 2018)
Mr. Madhup Kumar a , Dr Ekbal Rashid [25]	2018	An Efficient Software Development Life cycle Model for Developing Software Project	I.J. Education and Management Engineering
Bowen Zoua, Ming Yanga, Jun Yanga, Jia Guob, Yanqin Suc, Chao Zhangc, Wenlin Wangd [26]	2018	Reliability analysis and allocation: Development of a hierarchical structure modeling platform in I&C system Software Life Cycle	Nuclear Engineering and Design
JOÃO PEDRO DIAS, HUGO SERENO FERREIRA [27]	2018	State of the Software Development Life-Cycle for the Internet-of-Things	Association for Computing Machinery
Soobiasaeed, NZ Jhanjhi , Mehmood Naqvi, and Mamoon Humayun [28]	2019	Analysis of Software Development Methodologies	International Journal of Computing and Digital Systems
Juan de Vicente Mohino, Javier Bermejo Higuera, Juan Ramón Bermejo Higuera and	2019	The Application of a New Secure Software Development Life Cycle (S-SDLC) with Agile Methodologies	MDPI Electronics

Juan Antonio Sicilia Montalvo [29]			
Bambang Sugiantoro, Muhammad Anshari, and Danang Sudrajat [30]	2020	Developing Framework for Web Based e-Commerce: Secure-SDLC	ICCAI 2019 Journal of Physics: Conference Series
Bianca M. Napoleão, Fabio Petrillo, Sylvain Hallé [31]	2020	Open Source Software Development Process: A Systematic Review	2020 IEEE 24th International Enterprise Distributed Object Computing Conference (EDOC)
Shokhista Ergasheva, Artem Kruglov [32]	2020	Software Development Life Cycle early phases and quality metrics: A Systematic Literature Review	Information Technologies, Telecommunications and Control Systems (ITTCS), 2020 Journal of Physics: Conference Series MDPI Processes
Varun Gupta , Jose Maria Fernandez-Crehuet, and Thomas Hanne [33]	2020	Freelancers in the Software Development Process: A Systematic Mapping Study	Annals of Nuclear Energy
Sang Hun Lee a, Seung Jun Lee b, Seo Ryong Koo c, Athi Varuttamaseni d, Meng Yue d, Ming Li e, Jaehyun Cho c, Hyun Gook Kang [34]	2020	Optimization of software development life cycle quality for NPP safety software based on a risk-cost model	Computer Standards & Interfaces
Jhon Massoa,b, Francisco J. Pinoc, César Pardob, Félix García, Mario Piattinia [35]	2020	Risk management in the software life cycle: A systematic literature review	International Journal of Advanced Research in Engineering and Technology (IJARET)
Biswamohan Acharya, Prabhat Kumar Sahu [36]	2020	SOFTWARE DEVELOPMENT LIFE CYCLE MODELS: A REVIEW PAPER	Journal of King Saud University – Computer and Information Sciences
Fernando Pinciroli a, Jose Luis Barros Justo, Raymundo Forradellas [37]	2021	Systematic mapping study: On the coverage of aspect-oriented methodologies for the early phases of the software development life cycle	2021 IEEE International Conference on Autonomous Systems
Md Abdullah Al Alamin and Gias Uddin [38]	2021	QUALITY ASSURANCE CHALLENGES FOR MACHINE LEARNING SOFTWARE APPLICATIONS DURING SOFTWARE DEVELOPMENT LIFE CYCLE PHASES	Intelligent Automation & Soft Computing
Fatimah O. Albalawi and Mashael S. Maashi [39]	2021	Selection and Optimization of Software Development Life Cycles Using a Genetic Algorithm	IEEE Access
RAFIQ AHMAD KHAN, SIFFAT ULLAH KHAN, HABIB ULLAH KHAN, AND MUHAMMAD ILYA [40]	2021	Systematic Mapping Study on Security Approaches in Secure Software Engineering	IEEE Access
YASSINE QAMSANE, JAMES MOYNE, MAXWELL TOOTHMAN, ILYA KOVALENKO, EFE C. BALTA, JOHN FARIS, DAWN M. TILBURY, KIRA BARTON [41]	2021	A Methodology to Develop and Implement Digital Twin Solutions for Manufacturing Systems	IEEE Access
RAFIQ AHMAD KHAN, SIFFAT ULLAH KHAN, HABIB ULLAH KHAN, AND MUHAMMAD ILYAS [42]	2022	Systematic Literature Review on Security Risks and its Practices in Secure Software Development	IEEE Access

Tabel 4. Data from Web of Science

Authors citation	Year	Title	Source title
Madhup Kumar [43]	2018	A Comparative Study of Universally Accepted SDLC Models for Software Development	International Journal of Scientific Research in Science and Technology (IJSRST)
Prof. Supriya Madhukar Salve, Prof. Syed Neha Samreen, Prof. Neha Khatri-Valmik [44]	2018	A Comparative Study on Software Development Life Cycle Models	International Research Journal of Engineering and Technology (IRJET)
Nosheen Nazir, Muhammad Kashif Nazir [45]	2018	A Review of Security Issues in SDLC	American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)
Taciana N. Kudo, Renato F. Bulcão-Neto, Alessandra A. Macedo, Auri M. R. Vincenzi [46]	2019	A revisited systematic literature mapping on the support of requirement patterns for the software development life cycle	Journal of Software Engineering Research and Development
Guddi Singh [47]	2018	A STUDY ON SOFTWARE TESTING LIFE CYCLE IN SOFTWARE ENGINEERING	Globus An International Journal of Management & IT

AZM Ehtesham Chowdhury, Abhijit Bhowmik, Hasibul Hasan, Md Shamsur Rahim [48]	2018	Analysis of the Veracities of Industry Used Software Development Life Cycle Methodologies	ArXiv preprint arXiv
Mohd Nizam Osman, Khairul Anwar Sedek, Mushahadah Maghribi, Nadia Hidayah Mohd Faisal [49]	2018	ANotify: A Fingerprint Biometric-Based and Attendance Web-Based Management System with SMS Notification for Industrial Sector	Journal of Computing Research & Innovation (JCRINN)
Dr. Maneesh Vilas Deshpande [50]	2019	Associate Software Tester Early In Software Development Life Cycle	International Journal of Research and Analytical Reviews (IJRAR)
Pooja Dehraj, Arun Sharma [51]	2019	Autonomic Provisioning in Software Development Life Cycle Process	International Conference on Sustainable Computing in Science, Technology & Management (SUSCOM)
Mahdi H. Miraz1, Maaruf Ali [52]	2020	Blockchain Enabled Smart Contract Based Applications: Deficiencies with the Software Development Life Cycle Models	Baltica Journal
Gurudev Sawarkar, Dr. Dipesh Rajput [53]	2022	Comparative Analysis of Various Software Development Life Cycle	International Journal of Computer Science and Mobile Computing
AMAEFULE ANGELA ADANNA, OGWUELEKA FRANCISCA NONYELUM [54]	2020	CRITERIA FOR CHOOSING THE RIGHT SOFTWARE DEVELOPMENT LIFE CYCLE METHOD FOR THE SUCCESS OF SOFTWARE PROJECT	IUP Journal of Information Technology
J. I. Olszewska [55]	2019	D7-R4: Software development life-cycle for intelligent vision systems	International Conference on Knowledge Engineering and Ontology Development
Pallab Banerjee, Biresh kumar, Amarnath singh, Arundhati Singh, Rupsi Kumar [56]	2020	Efficiency Analysis of Software Development Life Cycle Models	International Journal of Computer Science Trends and Technology (IJCTST)
Jose María Alvarez Rodríguez, Valentín Moreno, Juan Llorens [57]	2019	Formal ontologies and data shapes within the Software Engineering development lifecycle (TSE)	International Conference on Software Engineering and Knowledge Engineering
LaialiAlmazaydeh, Moath Alsafasfeh, ReyadAlsalamene, ShoroqAlsharari [58]	2022	Formalization of the prediction and ranking of software development life cycle models	International Journal of Electrical and Computer Engineering (IJECE)
Fizzah Sohail, Syed Saood Zia, Rehan Qureshi, Muhammad Naseem and Hira Haider [59]	2021	Impact of Agile Methodology on Software Development Life Cycle	Pakistan Journal of Engineering and Technology, PakJET
P.C. Harish Padmanaban, Dr. Yogesh Kumar Sharma [60]	2019	Implication of Artificial Intelligence in Soware Development Life Cycle: A state of the art review	International Journal of Recent Research Aspects
Samuli Laato, Matti Mäntymäki, Matti Minkkinen, Teemu Birkstedt, A.K.M. Najmul Islam [61]	2022	Integrating Machine Learning With Software Development Lifecycles: Insights From Experts	Thirtieth European Conference on Information Systems (ECIS)
Isaac Chin Eian, Lim Ka Yong, Majesty Yeap Xiao Li, Noor Affan Bin Noor Hasmaddi, Fatima-tuz-Zahra [62]	2020	Integration of Security Modules in Software Development Lifecycle Phases	ArXiv preprint arXiv
Saiful Islam and Nina Evans [63]	2020	Key Success Factors of PRINCE2 Project Management Method in Software Development Project	International Journal of Engineering Materials and Manufacture
Maryam Navaei and Nasseh Tabrizi [64]	2022	Machine Learning in Software Development Life Cycle: A Comprehensive Review	Enase
NICOLÁS SÁNCHEZ-GÓMEZ, JESUS TORRES-VALDERRAMA, J. A. GARCÍA-GARCÍA, JAVIER J. GUTIÉRREZ, AND M. J. ESCALONA [65]	2020	Model-based software design and testing in blockchain smart contracts: A systematic literature review	IEEE Access
Davide Ferraris, Carmen Fernandez-Gago, Javier Lopez [66]	2022	Novel Approaches for the Development of Trusted IoT Entities	IFIP International Conference on ICT Systems Security and Privacy Protection
Kire Jakimoski, Zorica Stefanovska, Vekoslav Stefanovski [67]	2022	Optimization of Secure Coding Practices in SDLC as Part of Cybersecurity Framework	Journal of Computer Science Research
KWADWO KYEREMEH [68]	2019	OVERVIEW OF SYSTEM DEVELOPMENT LIFE CYCLE MODELS	SSRN
Ashim Sarkar [69]	2018	Overview of Web Development Life cycle in Software Engineering	International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT)
Md Saeed Siddik, Md Abdur Rahman, Kazi Sakib [70]	2019	Prioritizing test cases by collaborating artifacts of software development life cycle	International Journal of Forensic Software Engineering

Evelyn Kempe and Aaron K. Massey [71]	2021	Regulatory and Security Standard Compliance Throughout the Software Development Lifecycle	Hawaii International Conference on System Sciences
Alya Hannah Ahmad Kamal, Caryn Chuah Yi Yen, Gan Jia Hu, Pang Sze Ling, Fatima-tuz-Zahra [72]	2020	Risk Assessment, Threat Modeling and Security Testing in SDLC	ArXiv preprint arXiv
Nirali Honest [73]	2019	Role of Testing in Software Development Life Cycle	International Journal of Computer Sciences and Engineering (IJCSSE) USENIX Association
Hala Assal and Sonia Chiasson [74]	2018	Security in the Software Development Lifecycle	
Mamdouh Alenezi, Sadiq Almuairfi [75]	2019	Security risks in the software development lifecycle	International Journal of Recent Technology and Engineering (IJRTE)
João Caldeira, Fernando Brito e Abreu, Jorge Cardoso, Rachel Simões, ToacyOliveira, José Pereira dos Reis [76]	2022	Software Development Analytics in Practice: A Systematic Literature Review	ArXiv preprint arXiv
A.R.V.Anthony, G.M.DilshanPrasad, S.U.Randunuge, S.R.A.M.P.A.Alahakoon, DinukaR.Wijendra, JennyKrishara [77]	2020	Software Development Automation: An Approach to Automate the Processes of SDLC	International Journal of Computer Applications
Gagan Gurung, Rahul Shah, DhirajPrasad Jaiswa [78]	2020	Software Development Life Cycle Models-A Comparative Study	International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT)
Olaturunji J. Okesola, Ayodele A. Adebisi, Ayoade A. Owoade, Oyetunde Adeaga5, Oluseyi Adeyemi, and Isaac Odun-Ayo [79]	2020	Software Requirement in Iterative SDLC Model	Springer Nature Switzerland AG
Dhaya Sindhu Battina [80]	2021	THE CHALLENGES AND MITIGATION STRATEGIES OF USING DEVOPS DURING SOFTWARE DEVELOPMENT	International Journal of Creative Research Thoughts (IJCRT)
Mohammed Nazeh Abdulwahid [81]	2018	The Development of Life Cycle Technique for Software Verification and Validation	Sumerianz Journal of Scientific Research
Irfan Ahmad Khan, Dr. Dipti Kumari [82]	2021	The Role of Analysis Phase of SDLC for Small Scale Business Application-A Review	International Journal of Humanities, Engineering, Science and Management (IJHESM)
Gillian Lemke [83]	2018	The software development life cycle and its application	DigitalCommons
Stephan Jüngling, Martin Peraic, Andreas Martin [84]	2020	Towards AI-based Solutions in the System Development Lifecycle	AAAI Spring Symposium: Combining Machine Learning with Knowledge Engineering
VIPAN KUMARI, SANDEEP KULKARNI [85]	2018	Use of Artificial Intelligence in Software Development Life Cycle Requirements and its Model	International Research Journal of Engineering and Technology (IRJET)
Davide Ferraris, Carmen Fernandez-Gago, Javier Lopez [86]	2022	Verification and Validation Methods for a Trust-by-Design Framework for the IoT	IFIP Annual Conference on Data and Applications Security and Privacy
Patrick N. Kiratu, Felix N. Musau [87]	2018	Web Application Development Issues and	International Journal of Science and Research (IJSR)
Jefril Rahmadoni, Ricky Akbar, Uliya Mega Wahyuni [88]	2022	WEB-BASED COOPERATION INFORMATION SYSTEM AT THE SCIENCE TECHNO PARK TECHNOLOGY BUSINESS DEVELOPMENT CENTER	Journal of Applied Engineering and Technological Science

V. CONCLUSION

Although it is widely acknowledged that the SDLC is evolving quickly in software engineering development, it is unusual to find reviews that summarize the precise trend. This SLR offers a thorough overview of SDLC trends. The literature review we are looking for is 80 papers from 2 databases, namely Scopus and Web of Science related to SDLC in software development. We take from the last 5 years 2018-2022 and cite at least 3 times. 90% of journal articles are a combination of the results of Scopus and web of science, while 10% are conference papers. The final result of our literature review is as many as 48 papers that discuss SDLC as a whole in software development.

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