

Business Intelligence and Sinta Analytics to Improve Indonesian National Research in Education 4.0 Era

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Abstract

The Industrial Revolution 4.0 has been disturbed and penetrated into various core sectors of the life of society, not only in education as the heart and reflection of the progress of the integrity of a nation. Indonesia through the National Research Master Plan (RIRN) issued by the Ministry of Education and the achievement of industrial development goals is the development of innovation and technological advancement which is largely determined by the speed of accumulation of science that begins with research. However, the lack of equal distribution of education that is still in the conventional education system as a comfortable zone and the lack of attention of lecturers in the Tridharma research has become a weakness. This can be demonstrated through a track record of a global reputation journal. The existence of this 4.0 education challenge made the opportunity to discover the innovation of education 4.0 with research in Indonesia. The research method used is Data Collection consisting of Observation and Library Study and mind mapping method. In this research analyzes the business intelligence implemented at the SINTA (Science and Technology Index) as a measure to measure the increase in research in Indonesia as well as the indexation issues that exist in education 4.0 era.

Keywords

Business Intelligence, Education, SINTA

1. Introduction

The dynamic changes of the Industrial Revolution 4.0 have been disrupted and stretched into various core sectors of the life of society, not only in the field of education as the heart and reflection of the progress of the integrity of a nation (Sudaryono et al., 2019). The educational system can be modernized by imitating the industrial revolution. In particular, from internships which are the dominant educational practices in the 50'-60s decade, through the university have begun making online-based teaching and personalized digital teaching content (Rahardja, Hariguna, & Aini, 2019) (Aini, Rahardja, et al., 2020). Despite the other side, On the other hand, Industry 4.0 is predicted to bring negative impact, especially from a social and economic point of view (Rahardja, Hariguna, & Baihaqi, 2019). This impact is particularly vulnerable to developing countries where the social and economic gap levels are still relatively high (Sukmana et al., 2019). New learning patterns in Industry 4.0 can provide greater flexibility, achievement recognition through various learning pathways and enable transfer of knowledge between various learning provisions (Aini, Rahardja, et al., 2019). Dynamically changing environments and the advancement of professional careers in personal life will increase the importance of lifelong concepts, informal and informal learning (Rahardja, Aini, Graha, et al., 2019).

The focus of teaching and learning provisions, as well as the character of student achievement assessments should reflect specific things and can bring substantial changes in curriculum development and research (Khasanah, 2020). In order to realize Industry 4.0, academic involvement is needed in the form of research (Watini et al., 2020).

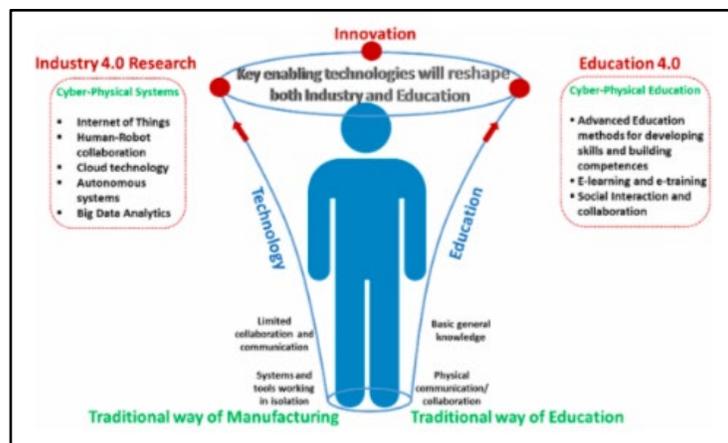


Figure 1. Definition of education 4.0

Source: Mourtzis, D

The digital transformation from Industry 4.0 is conveying towards Education 4.0. In Education 4.0, learning is connected with students, focused on students, shown by learners and led by students (Rahardja, Hidayanto, Hariguna, et al., 2019). Based on recent student-based innovations both inside and outside the educational context, this era brings new responsibilities to learners and teachers to offset the change to be innovative and competitive (Zarlis et al., 2019). This is a new challenge to redefine new education 4.0, to identify those who are intelligent, who are creative and innovative (Arora & Bist, 2020). In accordance with Law No. 12 Year 2012 Tridharma of the University hereinafter referred to as Tridharma is the obligation of the University to conduct education, research, and devotion to society (Watini et al., 2020). In addition, strategically through Government Regulation (PP) RI no. 14 of 2015 on the National Industrial Development Master Plan (RIPIN) 2015-2035 states that one of the goals and stages of industrial development achievement is the development of innovation and technological advancement (Chandra et al., 2020) that is highly determined by the speed of accumulation of knowledge that begins with research. In line with the RIRN vision of 2017-2045 "Indonesia 2045 Competitive and Sovereign-Based Research", every university is expected to boost Tridharma's activities in particular research in this regard as a reputable journal publication (Rahardja, Harahap, & Dewi, 2019). According to data obtained from Scimagojr, the number of scientific articles, quotations, and H index Scopus from the ASEAN countries is Malaysia, Singapore, Indonesia, Thailand and Vietnam in 2017.

2. Research methods

Table 1. Countries Ranking on Asiatic Region in 2017

Country	Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
Malaysia	31043	29606	11293	3656	0.36	249
Singapore	20803	19012	17565	3997	0.84	492
Indonesia	19098	18683	4059	2134	0.21	196
Thailand	15666	14664	6476	1625	0.41	289
Vietnam	6393	6031	3490	947	0.55	183

Source: <https://www.scimagojr.com/countryrank.php>

Table 1.1 explains that Indonesia with Scopus's scoped public outreach in 2017 with the H index of 196 achieving the third rank compared to Malaysia and Singapore's superiority. This is certainly a reference to being able to continue to improve the publication and the role of the lecturer is the key to the success of the research Tridharma (Lukita et al., 2020) (Royadi et al., 2019).

Development of scientific publications of lecturers and researchers with regard to publishing in journals or reputable

proceedings, accredited national journals, are taking into account the number of quotes, and the author's H-Index (Rahardja, Harahap, & Dewi, 2019) In line with that, the challenge of education 4.0 creates the opportunity to discover the novelty of education 4.0 with research in Indonesia through the SINTA (Science and Technology Index). If viewed from a lecturer's perspective, it should be an opportunity to develop through research as a form of responsibility to run Tridharma College with a scientific publication (Aini, Budiarto, et al., 2020) glow in figure 2 as follows.



Figure 2. Scientific Publication Flow (Lukman 2017)

Source: Lukman 2017

Each journal holds the written guidelines he uses. Each journal uses a different pattern of writing in accordance with the discipline he adopted. For that, only one thing is to follow what the editor has suggested. If you do not pay attention to it, then on the first occasion, the post will be rejected. Based on Figure 2 Research Flow of Scientific Publication as delivered by Dr. Lukman in the seminar Publication Search Publications (Scimagojr, DOAJ, Accreditation, IPI, ISJD) Writing Instructions (Scope) (Format, Writing Template, Latex) Scientific Reference Search (E-Resources: Journal and Cation Database) endnote, Citavi) Scientific Substance (Title, Abstract, Introduction, Methods, Discussion, Conclusions and Suggestions on Public Metrics Google, Scholar, Scopus, Sinta) Promotion (ResearchGate, Academia Edu) Article Review / Editing Grammar Checking (Grammarly) The Ethics of Publication (Plagiarism) (Ithenticat, Iturnitin, Plagscan) The manuscript, passed the editing stage until published and indexed by science metrics such as Google Scholar, Scopus and SINTA (Rahardja, Harahap, & Dewi, 2019).

SINTA is a citation and expertise center in Indonesia, a web-based research information system that offers quick, comprehensive and easy access to journals published by higher education institutions and research articles and journal articles to measure the performance of researchers, agencies and journals in Indonesia. SINTA provides information on agency benchmarking, collaboration, analysis of research trends, and Indonesian expert directories. Through the SINTA information system is packed with a touch of business intelligence (Aini, Harahap, et al., 2019) with a viewboard to evaluate the performance of lecturers, study programs, institutions and journals and become independent indices in Indonesia. Business Intelligence and Analytics (BI & A) is a discipline that seeks to address the demands of this new era, business and analytical intelligence (BI & A), applied data science for business, has also received considerable attention among academicians and IT practitioners for two decades last (Alam, 2020).



Figure 3. Business Intelligence SINTA

Source: <http://sinta2.ristekdikti.go.id/>

From the above image can be seen the SINTA viewboard displays the indexing of Scopus by 48,500 documents, while the indexing of the Google Scholar database is more dominant consisting of 1,100,851 documents. In the midst of competition that is so tight with the presence of SINTA as indexation of journals in Indonesia. Based on data searching from *forlapristekdikti* there are 3,276 Universities with a distribution of 285,104 lecturers who play an active role in implementing the 1945 Constitution, namely "Undertaking the Life of the Nation". However, amidst the rigorous competition and ratings presented through SINTA's viewboard, lecturers are challenged to strategically think and produce scientific papers to get career paths from faculty to professor in this era of education 4.0. In addition, the lack of education distribution that is still rife in the conventional education system as a comfortable zone and the lack of attention of lecturers in the research Tridharma becomes a disadvantage of this matter can be proven through a track record of globally indexed publications.

In order to improve the research, it is important to note what factors influence it, and also how the university is ready to face the 4.0 era education and in line with government policy as one of the factors supporting the success of research in quantitative and qualitative-based 4.0 especially in Higher Education in Indonesia. In the study, there are 2 (two) methods adopted to answer the challenges that will be faced in education 4.0 era, especially in SINTA-based research field; Data Collection consisting of Observation and Library Studies.

1. Method of Data Collection, i.e; Observation Methods and Library Studies

The Observation Method used are a systematic observation and recording of the elements that appear in a symptom or symptom of the research object ". In this study, observation is done by observing issues of journal indexing especially in SINTA in the face of education 4.0 era.

2. Literature Review

Literary study methods or literature review are a series of previous theories, findings and research or have been used as the basis for further research activities in compiling the framework of thinking of the underlying problem. Where in this study, at least there have been 7 (seven) literature studies related to current research:

- a. Research conducted by Ahmar et al in 2018 under the title Lecturers' Understanding on Indexing Databases of SINTA, DOAJ, Google Scholar, SCOPUS, and Web of Science: A Study of Indonesians, This study is descriptive and survey methods. Population in this research is Indonesian lecturer and researcher. The primary data obtained from questionnaires filled by 316 lecturers and researchers from 33 Provinces in Indonesia were recruited by convenience sampling techniques in October-November 2017. Data analysis was performed using table frequency distribution, cross tabulation and descriptive analysis. The results of this study indicate that the understanding of Indonesian lecturers and researchers on the publication of indexing of SINTA, DOAJ, Scopus, Web of Science, and Google Scholar database is, on average, 66.5% know about SINTA, DOAJ, Scopus, Web of Science, and Google Scholar (Ahmar et al., 2018).
- b. Furthermore, the review of Mourtzis's research in 2018 under the title of Development of Skills and Competences in Manufacturing Towards Education 4.0: A Teaching Factory Approach found that the Industrial Paradigm 4.0 manufacturing, apart from the technological revolution also requires the shift from traditional education to a set of advanced methods to develop skills and building digital competence, summarized in the term Education 4.0. Human skills undoubtedly require enhancements to handle the technology as the primary key, including machines as a cyber-physical system, augmented reality, human-robot collaboration, and smart devices (Setiawan et al., 2018).
- c. Research conducted by Chiang, Goes, and Stohr in 2013 under the title of Business intelligence and analytics education, and program development: A unique opportunity for the information systems discipline. Business Intelligence and Analytics (BI & A) are emerging disciplines that seek to address the demands of this new era. Big Data and BI & A present unique challenges and opportunities not only for research communities, but also for Information Systems (IS) programs in business schools. In this essay, providing a brief overview of BI & A, speculating on the role of BI & A's education in business schools, presents the challenges faced by the IS department, and discusses the role of the IS curriculum and program development, in providing BI & A education (Rahardja et al., 2018b)
- d. Further research conducted by Rahardja, Aini and Khoirunnisa in 2017 under the title, Business Intelligence Using Highchart on the YII Framework Based Absence Assessment System. This journal describes the mechanisms that run in an Abatement Assessment System (PenA), harmonization of data collection methods, prototyping methods and system design methods using UML. Shows graphs on web pages with more interfaces Interestingly, the use of the Highchart can help in implementing the Business

- Intelligence Website based on the Yii Framework(Fauziah et al., 2020)
- e. Research conducted by Richard, and Alain under the title of Business Intelligence Effectiveness and Corporate Performance Management: An Empirical Analysis, this journal describes a mechanism that runs in Corporate Performance Management (CPM) using Business Intelligence (BI) and Business Analysis (BA). Analyze the empirical analysis of the survey by e-mail invitations distributed to 1,300 senior managers. A total of 337 complete responses were received and analyzed using Partial Least Squares (PLS) with SmartPIS 3. Software (Richards et al., 2019)
 - f. Research conducted by YaoshanXua, Yongjuan, Feng in 2013 with Pedestrians' intention to jaywalk: Automatic or planned? A study based on a dual-process model in China. This study investigates the determinants of Chinese pedestrian intention to violate law traffic using dual-process models. This model divides cognitive processes from the establishment of intentions into controlled analytical processes and automated associative processes. Specifically, the process is explained by augmented of planned behavior (TPB) theory, while the process based on the past behavior is automatic(Xu et al., 2013)
 - g. Research conducted by Themis Lazaridis with a reputation of having H-Index with the title "Ranking University Departments Using the Mean H-Index" was conducted in 2010. This research uses the Web of Science Method (WoS) used for all data except astronomers in department physics using ADS. There are two interesting things in this study, this ranking refers to the research performance of each department that is most relevant to the performance of the doctoral program so the results appear to be very significant, there are 3 (three) tables to show the University rankings results based on H-Index (Lazaridis, 2010)
 - h. The latest study of literature is the study conducted by Nashihuddin and Aulianto which aims to: (1) describe journals that have been accredited by LIPI and Higher Education, viewed from the fields of science, issuing agents, and urban issues; and 2) to know the effort in preparing the publication of journal managers into an accredited and reputable international journal. The data were analyzed descriptively. The conclusions of this study are: (1) 362 accredited journals, from a total LIPI of 190 journals and a total of 172 Higher Education journals(Nashihuddin & Aulianto, 2016).

Based on 7 (seven) literature studies, it has been concluded that business intelligence can be an important key in improving information system especially in education 4.0 era.

3. Result and Discussion

In this section will be explained about the level of lecturer rating associated with the publication indexed by SINTA.

Author Score Calculation

The following is a calculation and calculation formula for Sinta Score for lecturers / researchers, namely:

Table 2. Author Score

Assessment Components	Code	Rating Weight (not percentages)
Number of Documents Articles Journal in Scopus	A	40
Number of Non-Journal Article Documents in Scopus	B	15
Number of Cation in Scopus	C	4
Number of Cation in Google Scholar	D	1

Source: <http://sinta2.ristekdikti.go.id/>

Based on the table, get the SINTA Score formula as follows:

$$\text{Author Score} = \frac{40A+15B+4C+D}{\text{divider}}$$

Description:

Divider is a figure of result of statistical calculations considering maximum Sinta Score Personal / Lecturer / Supreme Investigator. Currently dividing number is 102

Affiliation Score Calculation

The following is the calculation components and the calculation formula for Affiliation Score for lecturers / researchers, namely:

Table 3. Affiliation Score

Assessment Components	Code	Rating Weight (not percentages)
Number of Documents Articles Journal in Scopus	A	5
Number of Non-Journal Article Documents in Scopus	B	2
Number of Cation in Scopus	C	2
Number of Cation in Google Scholar	D	1

Source: <http://sinta2.ristekdikti.go.id/>

Based on the table, get the SINTA Score formula as follows:

$$\text{Affiliation Score} = \frac{5A+2B+2C+D}{10}$$

Years Score calculation

This score is used to measure the performance of the author or the affiliates in the last 3 years. For example, if the current year is 2018 then the score is calculated based on the document published in 2016 s.d. 2018. By using both the above formula then the explanation of components for A, B, C and D is as follows:

$$\text{Author Score} = \frac{40A+15B+4C+D}{\text{divider}}$$

$$\text{Affiliation Score} = \frac{5A+2B+2C+D}{10}$$

Tabel 4. Affiliation Score

Assessment Components	Code	Rating Weight (not percentages)
Number of Documents Articles Journal in Scopus in 3 years	A	5
The number of Non-Journal Articles Documents in Scopus in 3 years runs	B	2
Number of Cation in Scopus in document published in 3 years running	C	2
Number of Citation in Google Scholar published in 3 years	D	1

Source: <http://sinta2.ristekdikti.go.id/>

Implementation

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<html class="uk-notouch">
  <head>...</head>
  <body class=" pace pace-inactive">...</div>
  <!--NAVIGATION-->
  <div class="top-bar uk-grid uk-grid-collapse blue-gradient">...</div>
  <div class="toggle-search orange uk-hidden" id="toggle-search" aria-
  hidden="true">...</div>
  <!--HEADER / STATISTIC-->
  <div class="uk-width-large-1-1 header">...</div>
  <div class="uk-width-large-1-1 content">...</div>
  <div class="uk-width-large-1-1 links-area blue-logo-grad uk-text-center">...
  </div>
  <div class="uk-width-large-1-1 footer blue-gradient">...</div>
  <div class="best-viewed">
    Best viewed in resolution 1024x768 and higher
  </div>
  <!--<button class="uk-button" data-uk-offcanvas="{target:'the-
  team'}">Team</button-->
  <div id="the-team" class="uk-offcanvas">...</div>
  <!--jAVAScriptS-->
  <script src="/assets/js/pace.min.js"></script>
  <script src="/assets/js/jquery.js"></script>
  <script src="/assets/js/uikit.min.js"></script>
  <script src="/assets/js/components/tooltip.min.js"></script>
  <script src="/assets/js/chartjs2.js"></script>
  <script src="/assets/js/responsiveslides.min.js"></script>
  <script>...</script>
  <script><!-- ACADEMIC GRADE PER AFFILIATION PIE -->
  </script>
  <script><!-- ACADEMIC GRADE ALL -->
  </script>
    
```

Figure 4. Query To Displays data

Based on figure 4 is the query to display the chart on the home menu, SINTA's academic rank using chartjs. The chart is a simple and functional graphic that currently supports the bar chart (Handayani et al., 2019). Implementation is performed above the HTML5 canvas element. in NPM chartjs library charts are the easiest and most beautiful way to find the collected data. Available to provide several types of graphics with a very intuitive UI.

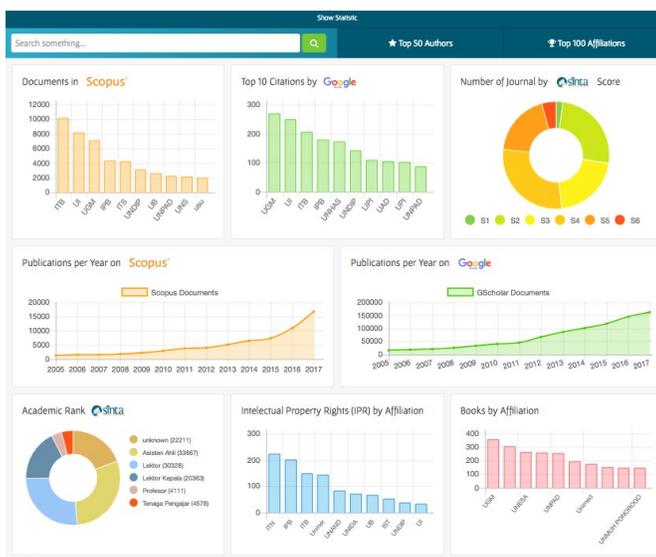


Figure 5. Home View SINTA
 Source: <http://sinta2.ristekdikti.go.id>

In Figure 5, the utilization of information system based on Business Intelligence is seen starting from the main page with the viewboard which is divided into 10 (ten) menu ie; Top 50 Authors, Top 100 Affiliations, Top 10 Documents in Scopus, Top 10 Citations by Google Scholar, Number of Journal by SINTA Score, Publications per

Year on Scopus, Publications per Year on Google Scholar, Academic Rank SINTA, Intellectual Property Rights (IPR) by Affiliation and Books by Affiliation.
 In more detail, there is a menu that displays SINTA ranking viewboard based Journals as described in Figure 3.3 below:

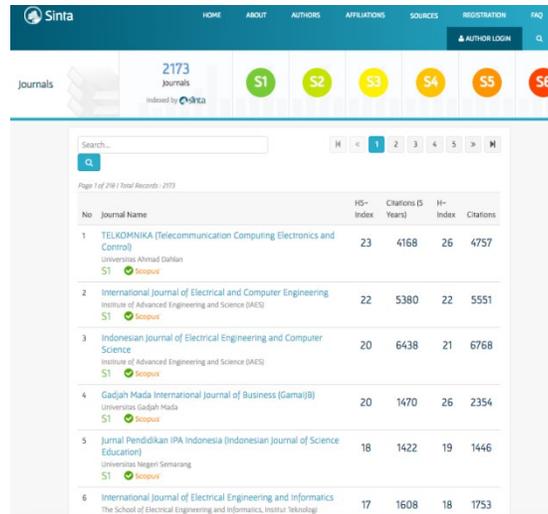


Figure 6. Journals Index
 Source: <http://sinta2.ristekdikti.go.id/journals>

Based on Figure 6 there are 2,173 journals categorized SINTA S1 to S6 spread across Indonesia as a container of scientific articles in line with the Regulation of the Directorate General of Higher Education (Dhaniarti et al., 2018) The scientific impact of this scientifically published issue is measured from the high frequency of molding to the writing it contains, and its role to serve as the driver of the next research activity. For the credentials of scientifically published issues it must attach evidence of scientific impact which includes the recording of the citation number by other scientific periodicals, the impact factor and/or h-index value and its involvement in an international scientifically published periodical indexing institution. This is where one of the benefits of the existence of the internet as an unlimited source of information.

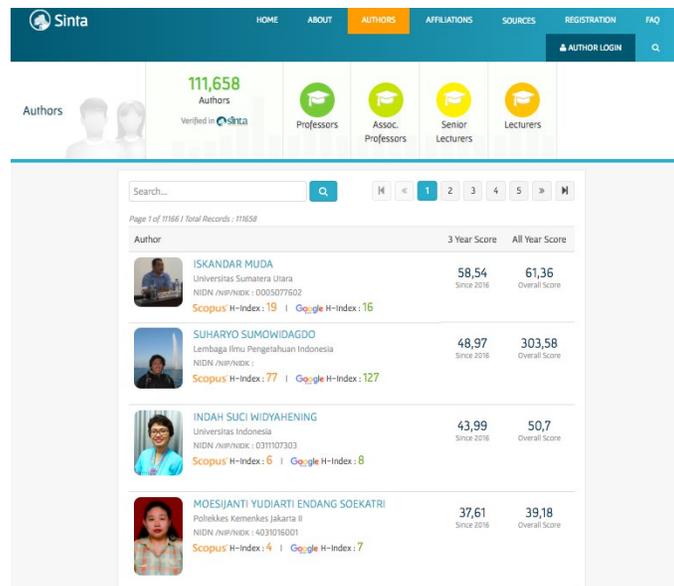


Figure 7. Author Viewboard

Based on figure there is a SINTA rating based on the viewboard that is divided into 4 (four) categories, namely: Professor, Assoc. Professors, Senior Lecturers, and Lecturers. There are 111,829 authors who have been verified from 285,104 lecturers in ForlapDikti. Displayed 3 Years Score and All Years Score. In this metric can be measured who is the lecturer / researcher of Indonesia who contributes most to research that also has a reputable cation reputation.

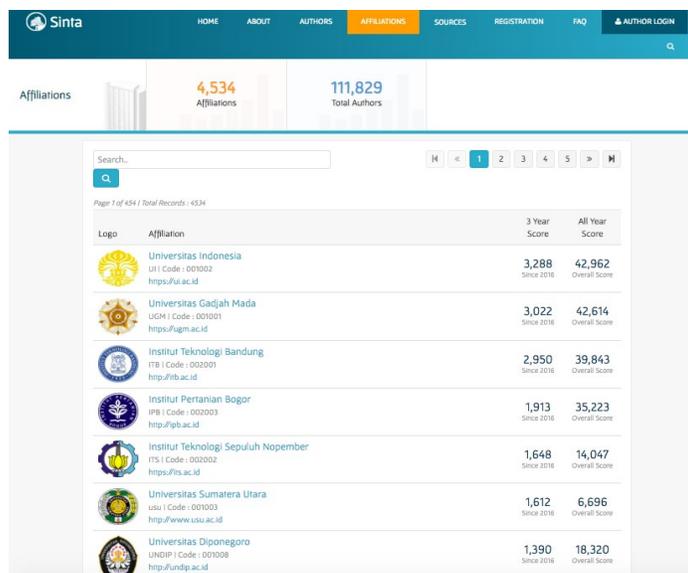


Figure 8. Affiliation Viewboard

Based on figure 8 there is a SINTA ratings viewboard based on Affiliation which consists of 4,534 and integrated with 111,829 Author. Classified according to 3 Year Score and All Year Score. With this viewboard you can find out which university contributes most to journal research. The existence of such metrics will increase the spirit of lecturers and institutions to conduct research Tridharma in order to be competitive in improving Sinta Score. Currently University of Indonesia has a very dominant role by occupying the first rank.(Hariguna et al., 2019)



Figure 9. SINTA in Education 4.0

Based on Figure 2.1, Visualization of SINTA with 3 (three) points is Innovation, SINTA as an innovation from the Ministry of Justice of harmonization of Scopus, Rinfo Scholar and Sinta Score which has enhanced the academic achievement of lecturers so that more competitively this can be proved by the achievement of 78,644,768 visitor Since January 30 - June 17, 2018. Publication and Citation, enhancing the quality of publication and citation of the journal where every journal listed on SINTA will increase its reputation, there are 2,173 journals spread across Indonesia. Competition and Collaboration, In this case SINTA is able to grow competition and collaboration with the existence of Business Intelligence viewboard which up to now has reached 111,829 Authors from 4,534 Affiliations competing to become the most superior.

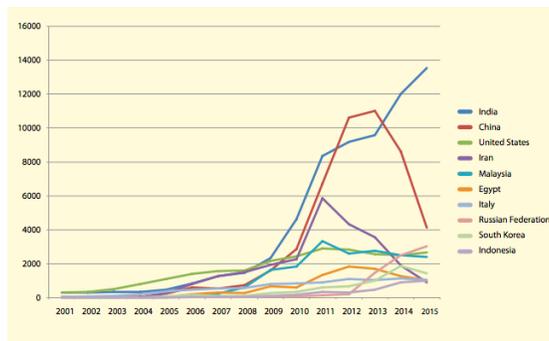


Figure 10. Predator Journal in Scopus by Country

Scopus is not clean from journal predators. Mart, as quoted in Savina and Sterligov, revealed that governments and academics would be disturbed by fake papers claimed to have emerged international journals (Sterligov et al., 2020). The development of fake journals or predators even significantly increased the predator journals also appeared prominently in 2.79% of indexed journals in the Scopus database by 2015. Such information was often socialized by the government to the scientific community or academics so few lecturers fell into the trap the journal of predators, of course with the promise of indexing (Rahardja et al., 2018a; Rahardja, Harahap, & Dewi, 2019).

The ability of lecturers to produce articles according to indexed index standards is still minimal and the lack of information about indexed journal procedures is a problem experienced by some of the lecturers/researchers researched. It's true especially for lecturers who are only interested in the environment and do not want to explore the outside world. Many lecturers conducted research but only when reporting them to the Department of Research and Community Service, they did not dare or lazy to publish their research results. Although, more of their research is used directly for entrepreneurs and stakeholders. In addition, language barriers are also one of the obstinate obstacles to publishing internationally indexed journals at Scopus. Even if the contents of the research are worthy of entry in international journals but because of language barriers, researchers prefer local journals that are not always indexed and reputable.

The real phenomenon suggests that lecturers are too preoccupied with the teaching and paradigm of money sources that are only derived from teaching. One of the right strategies is building knowledge management and through it the culture of collecting, managing, and sharing knowledge publicity. The simple tactical step of knowledge management is to create a schedule of workshops on publications followed by a companion publication.

Furthermore, research reports are received in high-quality internationally recognized journals. the quality level can be contributed by adequate funding. Unfortunately, not all researchers in college can access research funding. Research policy still requires competition so more lectures do not qualify than those who qualify. This is an imbalance that must be rectified, in which all lecturers should be able to access the research funding source. The unpredictability of education facilities and infrastructure in the university is a very strong issue. The most classic example is laboratory facilities and infrastructures among colleges that still show loopholes, as well as reliable laboratory resources. It should be admitted that there is an infrastructure gap between universities in the region (outside Java) with universities in Java Island.

Enforcement of the rules associated with leading international publications for Associate Professor and Professor's functional lecturer is sufficient to have a catastrophic impact. That's because sudden policy implementation is accompanied by "penalties" to terminate the profession of profession's subsidies (including professors). Based on discussions with researchers / lecturers Participating in this study, there is an aspiration for the lecturer's publication policy not to be associated with the threat of dismissal of the certification and honor allowance from the professor. The achievement of scientific publications for lecturers breaking through internationally recognized journals is the time to be motivated by additional gift giving in the form of research without selection, thus motivating researchers and other prospective researchers. The performance of researchers.

4. Conclusion

Industrial Age 4.0 which is in the world of education or education 4.0 era is the challenge faced by the University in improving the quality of education. Where Indonesia needs to improve the performance of lecturers with regard to Tridharma education as the main foundation of nation's progress. This can be seen from the SINTA (Science and

Technology Index) as the ranking of journals indexing metrics and as the identity and reflection of Indonesia's research that creates the harmony of education quality.

SINTA with the information system base available in the Education 4.0 era is a merger between education and industry revolution 4.0 which will be the leading journal rating metrics on the basis of business intelligence and informative viewboard visualization.

References:

- Ahmar, A. S., Kurniasih, N., Irawan, D. E., Sutiksno, D. U., Napitupulu, D., Setiawan, M. I., Simarmata, J., Hidayat, R., Abdullah, D., & Rahim, R. (2018). Lecturers' understanding on indexing databases of SINTA, DOAJ, Google Scholar, SCOPUS, and Web of Science: A study of Indonesians. *Journal of Physics: Conference Series*, 954(1), 12026.
- Aini, Q., Budiarto, M., Hadi Putra, P. O., Khoirunisa, A., Santoso, N. P. L., & Rahardja, U. (2020). Gamified education practice: Designing with e-commerce and ilearning concept. *International Journal of Psychosocial Rehabilitation*, 24(7). <https://doi.org/10.37200/IJPR/V24I7/PR270799>
- Aini, Q., Harahap, E. P., & Faradilla, F. (2019). The Effects of Sales Reports Business Intelligence on Employee Performance. *Aptisi Transactions On Management*, 4(1), 83–91.
- Aini, Q., Rahardja, U., & Hariguna, T. (2019). The antecedent of perceived value to determine of student continuance intention and student participate adoption of ilearning. *Procedia Computer Science*, 161, 242–249. <https://doi.org/10.1016/j.procs.2019.11.120>
- Aini, Q., Rahardja, U., & Khoirunisa, A. (2020). Blockchain Technology into Gamification on Education. *IJCCS (Indonesian Journal of Computing and Cybernetics Systems)*, 14(2), 1–10. <https://doi.org/10.22146/ijccs.53221>
- Alam, T. (2020). Cloud Computing and its role in the Information Technology. *IAIC Transactions on Sustainable Digital Innovation (ITSDI)*, 1(2), 108–115.
- Arora, K., & Bist, A. S. (2020). Artificial Intelligence Based Drug Discovery Techniques for COVID-19 Detection. *Aptisi Transaction On Technopreneurship (ATT)*, 2(2). <https://doi.org/10.34306/att.v2i2.88>
- Chandra, L., Amroni, Frizca, B., Aini, Q., & Rahardja, U. (2020). Utilization Of Blockchain Decentralized System In Repairing Management Of Certificate Issuance System. *Journal of Advanced Research in Dynamical and Control Systems*, 12(2), 1922–1927. <https://doi.org/10.5373/JARDCS/V12I2/S20201235>
- Dhaniarti, I., Handayani, I., & Bachri, E. W. (2018). The Utilization Management of Path Analysis Methods to Improve Quality in Writing Research Reports at Higher Education. *Aptisi Transactions On Management*, 2(2), 121–128.
- Fauziah, Z., Latifah, H., Omar, X., Khoirunisa, A., & Millah, S. (2020). Application of Blockchain Technology in Smart Contracts: A Systematic Literature Review. *Aptisi Transactions on Technopreneurship (ATT)*, 2(2), 160–166.
- Handayani, I., Rahardja, U., Febriyanto, E., Yulius, H., & Aini, Q. (2019). Longer Time Frame Concept for Foreign Exchange Trading Indicator using Matrix Correlation Technique. *Proceedings of 2019 4th International Conference on Informatics and Computing, ICIC 2019*. <https://doi.org/10.1109/ICIC47613.2019.8985709>
- Hariguna, T., Rahardja, U., Aini, Q., & Nurfaizah. (2019). Effect of social media activities to determinants public participate intention of e-government. *Procedia Computer Science*, 161, 233–241. <https://doi.org/10.1016/j.procs.2019.11.119>
- Khasanah, K. (2020). The Effect of Lecturer Professionalism and Teaching Motivation on Lecturers Strengthening the Nation's Competitiveness (Survey on XYZ College Lecturers in Central Jakarta City). *ADI Journal on Recent Innovation (AJRI)*, 2(1 Sept), 243–249.
- Lazaridis, T. (2010). Ranking university departments using the mean h-index. *Scientometrics*, 82(2), 211–216.
- Lukita, C., Hatta, M., Harahap, E. P., & Rahardja, U. (2020). Crowd funding management platform based on block chain technology using smart contracts. *Journal of Advanced Research in Dynamical and Control Systems*, 12(2). <https://doi.org/10.5373/JARDCS/V12I2/S20201236>
- Nashihuddin, W., & Aulianto, D. R. (2016). Pengelolaan Terbitan Berkala Ilmiah Sesuai Ketentuan Akreditasi: Upaya Menuju Jurnal Trakreditasi Dan Bereputasi Internasional. *Jurnal Pustakawan Indonesia*, 15(1–2).
- Rahardja, U., Aini, Q., Graha, Y. I., & Tangkaw, M. R. (2019). Gamification Framework Design of Management Education and Development in Industrial Revolution 4.0. *Journal of Physics: Conference Series*, 1364(1), 0–13. <https://doi.org/10.1088/1742-6596/1364/1/012035>
- Rahardja, U., Aini, Q., & Khoirunisa, A. (2018a). Effect of iDu (iLearning Education) on Lecturer Performance in the Lecture Process. *Aptisi Transactions on Management (ATM)*, 2(2), 140–148.

- Rahardja, U., Aini, Q., & Khoirunisa, A. (2018b). The Effect of Rinfogroups as a Discussion Media in Student Learning Motivation. *Aptisi Transactions on Management (ATM)*, 2(1), 79–88.
- Rahardja, U., Harahap, E. P., & Dewi, S. R. (2019). The strategy of enhancing article citation and H-index on SINTA to improve tertiary reputation. *Telkomnika (Telecommunication Computing Electronics and Control)*, 17(2), 683–692. <https://doi.org/10.12928/TELKOMNIKA.V17I2.9761>
- Rahardja, U., Hariguna, T., & Aini, Q. (2019). Understanding the impact of determinants in game learning acceptance: An empirical study. *International Journal of Education and Practice*, 7(3), 136–145. <https://doi.org/10.18488/journal.61.2019.73.136.145>
- Rahardja, U., Hariguna, T., & Baihaqi, W. M. (2019). Opinion mining on e-commerce data using sentiment analysis and k-medoid clustering. *Proceedings - 2019 12th International Conference on Ubi-Media Computing, Ubi-Media 2019*, 168–170. <https://doi.org/10.1109/Ubi-Media.2019.00040>
- Rahardja, U., Hidayanto, A. N., Hariguna, T., & Aini, Q. (2019). Design Framework on Tertiary Education System in Indonesia Using Blockchain Technology. *2019 7th International Conference on Cyber and IT Service Management, CITSM 2019*, 5–8. <https://doi.org/10.1109/CITSM47753.2019.8965380>
- Richards, G., Yeoh, W., Chong, A. Y. L., & Popovič, A. (2019). Business intelligence effectiveness and corporate performance management: an empirical analysis. *Journal of Computer Information Systems*, 59(2), 188–196.
- Royadi, D., Susiana, N., & Khumaida, F. A. (2019). Effectiveness Management of Qualitative Research in Writing Scientific Papers. *Aptisi Transactions On Management*, 3(1), 84–90.
- Setiawan, M. I., Surjokusumo, S., Ma'soem, D. M., Johan, J., Hasyim, C., Kurniasih, N., Sukoco, A., Dhaniarti, I., Suyono, J., & Sudapet, I. N. (2018). Business Centre Development Model of Airport Area in Supporting Airport Sustainability in Indonesia. *J. Phys. Conf. Ser.*, 954(1), 12024.
- Sterligov, I. A., Savina, T. F., & Chichkova, A. O. (2020). A Study of Grant Support from Russian Scientific Foundations to Domestic Publications in Leading International Journals (based on Data from Scopus and Web of Science, the Russian Foundation for Basic Research, and the Russian Science Foundation). *Scientific and Technical Information Processing*, 47, 36–55.
- Sudaryono, Rahardja, U., & Harahap, E. P. (2019). Implementation of Information Planning and Strategies Industrial Technology 4.0 to Improve Business Intelligence Performance on Official Site APTISI. *Journal of Physics: Conference Series*, 1179(1), 0–7. <https://doi.org/10.1088/1742-6596/1179/1/012111>
- Sukmana, H. T., Hariguna, T., Lutfiani, N., & Rahardja, U. (2019). Exploring the moderating effect of technology readiness of user intention in the context of mobile payment service. *International Journal of Advanced Trends in Computer Science and Engineering*, 8(1.5 Special Issue), 249–257. <https://doi.org/10.30534/ijatcse/2019/4481.52019>
- Watini, S., Aini, Q., Hardini, M., & Rahardja, U. (2020). Improving Citizen's Awareness in Conserving Diversity of Malay Traditional Dances in Malaysia through the Art Appreciation Performed by Students of Early Childhood Education Study Program. *International Journal of Psychosocial Rehabilitation*, 24(8), 2730–2737. <https://doi.org/10.37200/IJPR/V24I8/PR280292>
- Xu, Y., Li, Y., & Zhang, F. (2013). Pedestrians' intention to jaywalk: Automatic or planned? A study based on a dual-process model in China. *Accident Analysis & Prevention*, 50, 811–819.
- Zarlis, M., Harahap, E. P., & Husna, L. N. (2019). Test Appraisal System Application Based on YII Framework as Media Input Student Value Final Project and Thesis Session at Higher Education. *Aptisi Transactions On Technopreneurship (ATT)*, 1(1), 73–81. <https://doi.org/10.34306/att.v1i1.31>

Biographies

Untung Rahrnja or Assoc. Prof. Dr. Ir. Untung Rahardja MTI MM, born in Jakarta, March 31, 1965. First son of the couple Kasarina Sujono and Surya Rahardja, Founders of the Foundation in Tangerang City. Untung Rahardja or often called UR, is a graduate of the University of California Berkeley in America, followed by the Information Technology Masters Study Program at the University of Indonesia. UR completed his Master of Management education at the Persada Indonesia University YAI. This should be used as a measure of persistence in completing the Doctor of Management Science Program in the same year. Darma devotes the Tridharma of Education and Teaching, Research, Community Service amidst the busyness of pursuing further higher education, UR is a formidable figure, with his daily activities in the field of education and teaching as a lecturer as well as a supervisor in the field of Information Management by teaching 15+ courses The 2 subjects include Business Intelligence and Management and Business Basics.

Qurotul Aini or called Ai was born in Tangerang, February 21, 1991. Ai is a graduate of Bachelor of Information Systems and Master of Informatics in Business Intelligence concentration at STMIK Raharja which in 2019 has changed to University of Raharja. Currently Ai is doing Doctoral Studies at Universiti Teknologi Malaysia. Ai lives her daily life to succeed in Catur Dharma Pendidikan through Tridharma. At the Tridarma Research, Ai is active in writing scientific works published in fields that have national and international reputation. Among them are 50+ National Accredited Journals and SCOPUS Indexed International Journals.

Ninda Lutfiani born in Ngawi, February 15, 1996. The first child of Muhtar & Sri Untari and brother of Nanda Septiani. After completing his undergraduate education and at Graduation in 2017, currently it is recorded that he has finished studying the Masters in Informatics with the concentration of Business Intelligence at University of Raharja. In addition, Nin also had the opportunity to become the Teaching Assoc Team. Prof. Dr. Ir. Untung Rahardja MTI, MM, which is a golden opportunity for Nin to be able to carry out Higher Education Dharma Chess well, as a first step Nin is trusted to guide KKP students (under the umbrella of the East) namely SEIHA and Funtastic4 and collaborate with Eka Purnama Harahap S. Kom, MTI is proud to be Raharja's personality, daring to achieve his dreams and open the horizon through Catur Dharma Perguruan Tinggi.

Eka Purnama Harahap born in Baringin Jaya 18 September 1993. Eka Purnama Harahap or often called Hap, is a graduate of STMIK Raharja, followed by the Information Technology Masters Study Program at STMIK Raharja which since 2019 has changed to University of Raharja. He is married to Umar Raharja and currently has one son, Zayn Raharja Siregar. Thanks to his loving support, Hap lives his daily life to make Catur Dharma Pendidikan succeed. Since 2016 until now, he has taught 5+ courses and 2 courses including IT Research and Introduction to Information Technology. At the Research Tridarma, Hap is active in writing scientific papers published in fields that have national and international reputation. Among them, there are 20+ Accredited National Journals indexed by Google Scholars and 2+ SCOPUS Indexed International Journals. They have also been reviewers in 5+ National Journals, namely Aptisi Transactions on Technopreneurship and APTIKOM Journal on Computer Science and Information Technologies (CSIT). There are 1 Patent & Copyright.

Efa Ayu Nabila was born in Cilacap, September 14, 1999. Efa is a graduate of Raharja University Diploma 3 in 2020 who is currently pursuing the Information Systems Study Program at Raharja University. Efa lives her daily life to make Catur Dharma Pendidikan succeed through Tridharma. At Tridarma Research, Efa is active in writing reputable scientific papers. Among them are SINTA Accredited National Journal and 1 Indexed International Journal.