

Prodia: Disruption in Clinical Laboratory Service System



Dewita Narolita^a
Gede Sri Darma^b

Article history:

Received : 18 September 2019

Accepted : 30 November 2019

Published : 01 January 2020

Keywords:

customer response;

digital services;

disruption;

industrial revolution 4.0;

prodia;

Abstract

The industrial revolution 4.0 has caused disruption in the health care system. The traditional service system into a digital-based service system has shifted slowly. Prodia as the largest laboratory in Indonesia has implemented digital services in an effort to provide the best service for customers and increase customer satisfaction. Digital services developed by Prodia include online results, online order, chatbots, and Prodia mobile apps. This study aims to determine the customer's response to Prodia's digital services and obtain feedback from customers to the digital services currently applied. The methodology used is a qualitative method with a case study approach and descriptively analyzed. The results showed that patients gave positive responses to Prodia's digital services. Some suggestions submitted by customers, including online consultations, online doctor information, added excellence in the application of artificial intelligence, and several policies for patients who already use digital services.

International research journal of management, IT and social sciences © 2020.

This is an open access article under the CC BY-NC-ND license

(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Corresponding author:

Dewita Narolita,

Universitas Pendidikan Nasional, Denpasar, Indonesia

Email address: dewita.nputri@gmail.com

^a Universitas Pendidikan Nasional, Denpasar, Indonesia

^b Universitas Pendidikan Nasional, Denpasar, Indonesia

1 Introduction

Based on Government Regulation (PP) of the Republic of Indonesia Number 47/2016, a health service facility is a device and/or place used to carry out health service efforts, both promotive, preventive, curative and rehabilitative carried out by the government, regional government and/or the community. Republic of Indonesia Decree No. 364/2003 stated that a clinical laboratory is one of the health service facilities needed for routine analysis of patient health and as an important instrument for the disease diagnosis. Prodia is one of the largest health laboratories in Indonesia that provides a variety of health tests.

The revolution in the field of health through instrumentation, computers, information and communication technology has begun in the 20th century and continues until the 21st century (Dhawan *et al.*, 2015; Darma, 2019). The current revolution is the industrial revolution 4.0 which is marked by the unification of several technologies that integrate the physical, digital and biological world, which will fundamentally change the way of life of human work (Hamdan, 2018; Darma *et al.*, 2019; Sari *et al.*, 2019). This revolution caused several business sectors to experience digital disruption (Dewi & Darma, 2019). Ford *et al.* (2017), stated that digital disruption is a phenomenon that occurs in the 21st century and will continue to change or transform from traditional to digital industries. King & Baatartogtokh (2015), identified four elements in disruption theory, namely incumbent players are increasingly in the market and are in the path of sustaining innovation; incumbent thinking goes beyond the needs of patients; incumbents think that they have the ability to face the threat of disruption; incumbent eventually collapses in dealing with disruption.

Health care facilities are the sector that has benefited most from the industrial revolution 4.0 (Tjandrawinata, 2016; Darma, 2018). One implementation is many health care providers exploring the potential of online medical consultations. It can be utilized by non-emergency patients so as to reduce patient costs (Jung & Padman, 2015). Prodia in the industrial revolution 4.0 era also faced disruption challenges, one of which was in the online consultation and registration services. The disruption in the service system will bring changes that lead to *pros* and *cons* where *Hi Touch* is confronted with *Hi Tech* (Rafaeli *et al.*, 2016). Prodia Clinical Laboratory must immediately respond to the disruption phenomenon by making a service innovation, to avoid digital startup, which is ready to take on the Prodia business segment.

Service innovation is the creation of a value proposition. It is produced when companies provide resources such as information, knowledge, and skills to enhance customer value creation themselves (Lehrer *et al.*, 2018; Darma, 2019; Yoga *et al.*, 2019). For centuries, health services have relied heavily on face-to-face interactions (Jung & Padman, 2015; Setyawati & Darma, 2018). The traditional service system will select and provide special training to frontliners with the assumption that the constant display of positive emotions by employees is essential for effective service and positive customer response (Rafaeli *et al.*, 2016; Hendhana & Darma, 2017). Ding & Keh (2016), stated that according to customers, services in the health sector should be personal or custom. Efforts can be made to realize health services that are custom taking advantage of technological developments. Technological progress is both a challenge and a solution for health care systems to transform from traditional health service structures and models (Ford *et al.*, 2017). Changes that can occur in more frontline patient acceptance with the development of digital technology in the service system are the substitution of customer service and frontline with robots (Wirtz *et al.*, 2018).

Innovations driven by technological advances cannot be avoided by companies (Kasali, 2017). This digital innovation is probably the most powerful innovation for a company's business (Barret *et al.*, 2015), and the distribution of health services will be significantly reshaped by technology. Therefore, the market was physically encountered will turn into a virtual form (Jung & Padman, 2015). Samuelsson *et al.* (2019), explained that there are four incremental and radical health service innovations. Several digital radical innovations have been radically external have been implemented by Prodia Clinical Laboratory in the field of services, such as online results and online order. However, technology as the root of innovation will not be useful without a market (Dewanto *et al.*, 2014; Darma, 2019; Sari, 2019). Service innovation must be open and supported by customer involvement (Storey *et al.*, 2016). Based on this statement, it is necessary to study whether the service innovation that has been carried out by Prodia Clinical Laboratory has answered the needs of customers in the industrial revolution era 4.0.

The introduction of the needs or acceptance of individuals is the initial stage of business innovation. Understanding this will help to find out the factors can encourage individuals to reject or accept a technology (Taherdoost, 2018). *Technology Acceptance Model (TAM)* helps increase understanding of how people are able to accept or reject the use of new technology. The key drivers of such behavior come from the benefits that can be felt by users and the ease of using new technologies (Althuizen, 2018; Adnyasuari & Darma, 2017; Suryanata & Pelayun, 2018). The TAM model described by Davis in Rahimi *et al.* (2018). It is illustrated in Figure 1.

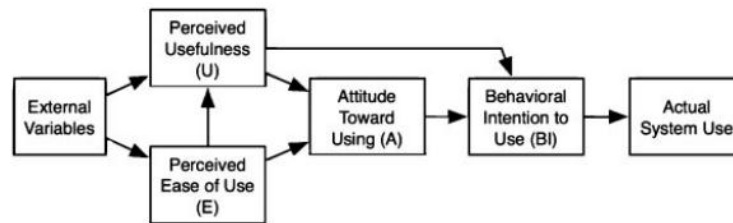


Figure 1. Basic technology acceptance model (Rahimi *et al.*, 2018)

New technology is not necessarily accepted by the market (Darma, 2019). The technology certainly has a certain market penetration. The initial stage for technology to be able to penetrate the market is the stage of technology adoption. Technology requires an adoption process because consumers need adjustments in consuming a new product or innovation (Indrawati, 2015). The segments of the distribution of technology adoption are described in Figure 2.

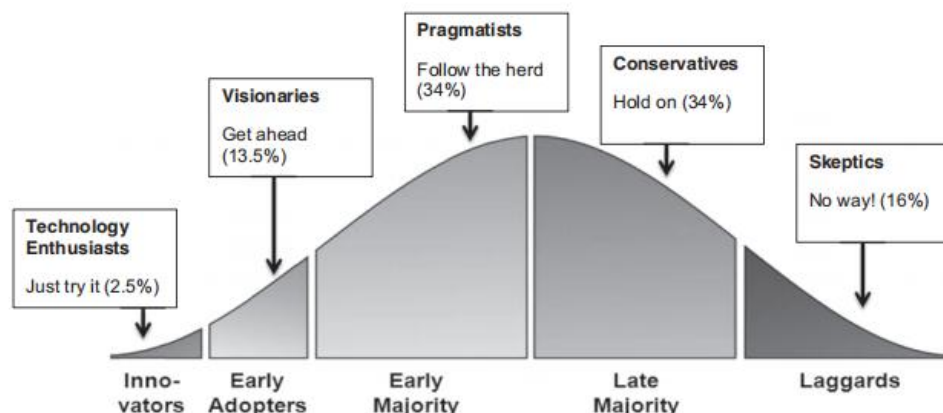


Figure 2. The technology acceptance distribution segment (Althuizen, 2018)

Althuizen (2018), combined smaller segments with adjacent segments to obtain three segments, namely pockets of likely acceptance (technology enthusiasts and visionaries), pragmatist majority, and pockets of potential resistance (conservatives and skeptics). The pockets of the likely acceptance group are the group that receives and uses technology faster than the other two groups. Whereas, pragmatic groups will consider accepting technology if they feel it is needed or important. The most numerous group is a group of individuals who tend to be resistant to new technologies, which are categorized as pockets of potential resistance. According to Taherdoost (2019), factors that can influence the acceptance and use of technology need to be sought to increase the use of technology and user adoption.

Some issues are often found in previous studies. *First*, the industrial revolution 4.0 will have an impact on traditional health services. *Second*, in certain conditions, consumers prefer *Hi Touch* compared to *Hi Tech* (Rafaeli *et al.*, 2016). *Third*, health service innovation in the digital world is carried out with the aim of improving the health status of people's lives and increase customer satisfaction, but how capable the innovation is penetrating has not been widely explained empirically. Based on these problems, this study aims to find out how customer responses to digital service innovations that have been developed by Prodia Clinical Laboratory and based on customer feedback, what improvements need to be made to the service system to deal with disruption.

2 Materials and Methods

This research is qualitative research with a case study approach. The study was conducted at the Prodia Clinical Laboratory in Denpasar. This research focuses on two service systems, namely the first stage (pre-analytic stage). It is limited to the process from patient acceptance and the third stage (post-analytic stage). It includes the result validation to the result distribution to customers. While, the second step, the analytic process is not included in the service category. So, in this study, the scope of the intended health service system is the first and third stages.

This study collected two different data types namely primary data and secondary data. The selected informants are top management and customers. The customer's selection as informants is based on the opinion of [Nolte \(2018\)](#), which stated that patients often forget to be considered in the process of adoption, implementation, sustainability, and dissemination of health service innovations. Informants were selected by purposive sampling with the criteria of informants being Prodia customers (already more or the same as two years who have been Prodia customers) and have used Prodia's digital services. The purposive sampling method is combined with a saturated method where data collection is stopped when it has reached saturation ([Creswell & Creswell, 2017](#)). The next analyzed data was descriptive qualitative. The verification of data validity is done by the triangulation method.

3 Results and Discussions

Interviews with Prodia's digital service system were conducted with the leaders of Prodia clinical laboratory Denpasar, supervisors, and customer service assistant managers who are responsible for digital services. Prodia has made efforts to digitize the service system with the aim of facilitating customer access and increasing the speed of the service process. While from the standpoint of the company's interests, this is done for efficiency and increased productivity. This process is challenged by the lack of evenly distributed HR skills in operating IT. This is supported by [Hamdan \(2018\)](#), statement regarding the challenges faced in the industrial revolution 4.0 era, one of which was the lack of adequate skills. Research from [Kruse et al. \(2016\)](#), found that barriers to adopting telemedicine services were mostly caused internally, namely, staff who were less able to accept changes and resistant to change. However, in Prodia during the interview process, it was found that digital service innovation received support from all parties including top management. This challenge was overcome by providing guidelines and work instructions related to digital services to make it easier for HR in the field to operate it.

According to [Samuelsson et al. \(2019\)](#), there are four categories in service innovation which are divided into incremental service innovations, internal radicals, external radicals, and radicals. Service innovations implemented at Prodia do not necessarily change the fundamental structure of the organization. Changes only occur in the issuance of guidelines and work instructions related to digital services. Based on this information, the service innovation applied is classified as a radical external service innovation quadrant because it includes an important issue wherein patients use new services to get a higher quality service effect, create customer value, and customer satisfaction.

Digital services at Prodia began to be implemented in all Prodia in Indonesia in 2017. Based on interviews, several types of digital-based services currently provided by Prodia to its customers include online messaging, online results, chatbot, and Prodia mobile apps. Online ordering is a digital service application that is used to register for health check examinations. After registering in an online order, patients can go directly to Prodia to take samples. Online result is a digital service application for viewing health test results and interpretation of results. Online results can be printed as PDF documents. Prodia Chatbot named Tania who is an AI-based personal assistant virtual developed with the following objectives: reach customers anytime, anywhere; Able to provide information with a good and fast response; able to be a medium for giving or delivering promotions to customers. All customers can be friends with Tania through *line*, *telegram*, and FB with ID @ prodia.id. Prodia mobile apps can be downloaded at play store and apple store, patients can order online and view online results, promos, information on tests carried out by Prodia, Prodia locations throughout Indonesia, and healthy lifestyle tips.

It is known in the field study with interviews that all informants are accustomed to using smartphones. So that, it is not difficult for customers to adapt to digital service innovations. After the data collection process, it was found that some informants belong to the pockets of likely acceptance segments and some others belong to the pragmatist majority. In accordance with the opinion of [Althuizen \(2018\)](#), the pockets of likely acceptance group are the fastest to accept and use technology while the pragmatist majority is a group that considers accepting technology if it feels the technology is needed or important. The interview results reflect that not all informants made use of all available digital services even though they already knew that the service was available. Service providers can encourage customer participation by explaining the benefits and drawbacks of technology and the importance of direct customer participation ([Yoon & Lee, 2018](#)).

The interviews identified that although informants were technology-friendly, there were a number of cases that caused informants to prefer traditional services. This finding is supported by research from [Rafaeli et al. \(2016\)](#), wherein customers are more likely to choose to interact with humans in certain conditions. The reasons are to meet the emotional needs and to get the best solution from the advice of experienced employees. Personalized service is also a customer's need. The existence of services is personal will cause comfort for customers in the transaction. In this case,

examples are provided by customers through face-to-face meetings or virtual discussions with health practitioners. The desire of customers to use digital services is due to time efficiency and convenience. Time efficiency because customers can complete transactions in one visit or do not need to come back just to get results, do not need a long time to wait for results, and do not need to get out of their current location because transaction activities can be done digitally. The results of interviews with patients to see perceived ease of use of digital services, perceived usefulness of Prodia digital services customer feedback on Prodia digital services is shown in Table 1.

Table 1
Key informant interview results and interview feedback

No	Response	Feedback	Types of digital services			
			Online results (web)	Online order	Mobile apps	Chatbot
1	Using online results is convenient, doesn't have to go anywhere, and the results are recorded	Radiology results can be online	v		v	
2	It's easier to see the results if it is a pdf print out	-	v			
3	Display results with pdf better than email because it does not break the results	-	v			
4	It doesn't matter if the layout of the pdf results is different from the results on the mobile apps	There needs to be further explanation (online) and details of the abnormal results and suggestions for further investigation	v		v	
5	The results are easy to carry everywhere, no risk of loss and damage	Results can be delivered via an online motorcycle taxi	v		v	
6	Very good because there are charts for certain checks				v	
7	Find it faster to register via the telephone than register yourself (order online)	Need to add doctor information on mobile apps Need to add doctor information on the Prodia website Can order Home Service via the online order Display a more informative and attractive panel or inspection package on the online order dashboard		v	v	
8	Do not dare to use online order for fear of choosing the wrong examination and sometimes the scribble from the doctor is unclear	Synchronize Prodia examination forms with doctors		v	v	
9	Will do a test check if it has already been paid in advance, as happened when ordering online	For e-payment, you can work with more banks		v	v	
10	Prefer direct registration because it can request information from	There is a need for a live chat with a doctor 24 hours		v		

	CS or advice from health workers			
11	In some cases, prefer to talk directly with staff because they feel served more personally	Online consultations are needed: pre and post-tests	v	v
12	Ordering online makes it easy for patients because they don't need to go anywhere	Suggestions that customers who have ordered online do not need to go back to the counter but go directly to the specimen collection section Creation of a new system for online messaging customers Separate public customer queues from online order	v v	v v
13	Use Tania according to its urgency	There is a Customer Service Assistant that can be contacted via WA		v
14	The answers to Chatbot are limited	AI-equipped with foreign languages (English) To answer the patient's questions, a reliable HR is prepared AI needs to be prepared that can answer questions as detailed as possible		v v v
15	Time efficiency, no need to go back or wait at Prodia		v	v
16	Promo information is better on mobile apps than via SMS			v
17	Digital services can not be avoided in the current era because of part of the needs		v	v v
18	Just use the results online and have not tried other services because of busyness and feel not too necessary		v	v

Digitalization allows information to be reproduced and distributed quickly, easily, and in a wide range. Nevertheless, each individual still hopes that their privacy can be protected (McLoughlin *et al.*, 2017). Only one of the informants was worried about the security of the data, but the informant realized that digital services were able to meet their needs, especially for individuals who had high mobility. While, this was not found in other informants. This is supported by the results of research by Kim *et al.* (2019), which revealed that privacy is not a critical point on the user's intention to utilize *m-health* services.

Through technology, patients can perform health services instantly because there are no queues on virtual transactions (Jung & Padman, 2015). Based on the interview results, it is known that one of the motivations of the informants to use digital services is because digital services are able to facilitate patients in queuing and accessing records of examination results. In the case of the online order, barriers felt by informants were concerns about errors in the selection of tests and the need to get immediate answers to questions related to complaints or types of examinations. The results of a study conducted by Lu *et al.* (2018), found that perceived ease of use had a stronger relationship with the intention to continue. Ease of use is one of the factors that influence technology acceptance in the basic technology acceptance model (Rahimi *et al.*, 2018).

This study identifies that innovations that have been carried out by Prodia are able to solve several problems experienced by customers. Customers feel helped by the existence of digital services that offer convenience in transactions. It can be done anywhere and anytime, the availability of laboratory results, no need to queue for results,

and the existence of information can be seen in applications on smartphones. The customer's decision to use digital services comes from their own desires and comes from external influences through print media and information from customer service.

The results of the study identified a number of things that are currently being suggested and needed by patients.

- a) Pre and post online consultation
- b) Order home service via the online order
- c) Further information or explanation on abnormal inspection values
- d) Doctor information on the Prodia and mobile apps websites
- e) Online radiology results
- f) Collective delivery of results with online motorcycle taxis
- g) Separation of queues for online order with general patients and suggestions for patients who have ordered online to be directly processed for blood collection without returning to the counter
- h) An attractive and informative display for inspection packages on the online order dashboard
- i) Live chat 24 hours with a doctor on the online messaging menu
- j) Collaboration with more banks for e-payment
- k) Customer service with the Whatsapp service system
- l) AI-equipped with foreign languages such as English
- m) The availability of a menu that combines all applications with Chatbot

According to [Um & Lau \(2018\)](#), the most significant factors affecting patient dissatisfaction and other factors affecting dissatisfaction are interactive quality, administrative quality, and environmental quality factors. In this study, interactive quality factors are associated with suggestions at points a, b, c, h, i, k, and l while administrative quality factors are related to points d, f, g, j, and m. After confirming with the service provider, from the 13 suggestions, there were several responses given by Prodia. *Firstly*, the response is about pre and post consultation results online. The mobile apps currently already have an online pre-consultation service with a doctor to help customers determine which examinations will be carried out in accordance with their health conditions. As for the post-consultation results are not yet in the results of online and mobile apps. *Secondly*, regarding live chat with doctors, it is only available during business hours 07.30 am - 5.30 pm. *Thirdly*, the availability of Tania or customer service assistant through Whatsapp media does not currently exist and in the future, it might be able to be developed. So that, they can make friends through Whatsapp. *Fourthly*, it is related to the informant's statement regarding the limited ability of the machine to answer questions if expanded, it was responded that indeed AI system was in a phased development in order to be able to answer patient questions in more detail.

4 Conclusion

Digital service innovations implemented by Prodia have been responded positively by customers. Not all digital services are used by customers because each customer has a different index of interest for services that are already available. Based on responses to perceived usefulness and perceived ease of use, Prodia's digital services are felt to be important because they provide convenience for customers, facilitate customers in terms of time efficiency and search for patient data records. Some constraints and needs during the service process experienced by customers are given in the form of suggestions.

Some customer feedback on this digital service includes the availability of online consultations after the inspection, ordering online home service services, additional explanations for abnormal examination values, doctor information on the Prodia website or Prodia mobile application, online radiology results, cooperation in the delivery of results, separation policy a queue for online order with general patients, an attractive display for the inspection package on the online order dashboard, a 24-hour live chat with a doctor, and advise on the development of Chatbot Prodia. The recommendation for future research is to conduct a quantitative study to measure e-service quality by knowing the gap between expectations and satisfaction with digital services currently utilized by customers. Then, it is proceed with research on digital service models that fit the needs of patients according to the quadrant that needs to be improved and evaluated after the implementation process.

Conflict of interest statement and funding sources

The authors declared that they have no competing interests.

Statement of authorship

The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

Acknowledgments

PT. Prodia Widyahusada, Tbk

References

- Adnyasuari, P. A. S., & Darma, G. S. (2017). Technology Acceptance Model and E-Satisfaction in Mobile Banking. *Jurnal Manajemen dan Bisnis*, 14(2), 1-12.
- Althuizen, N. (2018). Using structural technology acceptance models to segment intended users of a new technology: Propositions and an empirical illustration. *Information Systems Journal*, 28(5), 879-904. <https://doi.org/10.1111/isj.12172>
- Barrett, M., Davidson, E., Prabhu, J., & Vargo, S. L. (2015). Service innovation in the digital age: key contributions and future directions. *MIS quarterly*, 39(1), 135-154.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Darma, G. S. (2018). Seuntai Pesan, Menjawab Zaman.
- Darma, G. S. (2019). Kacamata Media, Kesuksesan Bersyarat.
- Darma, G. S., Apollo, A., Rusmanda, G., & Umar, Y. (2019). Digital Education 4.0.
- Dewanto, W., Mulyaningsih, H.D., Permatasari, A., Anggadwita, G., & Ameka, I. (2014). Manajemen Inovasi. Yogyakarta, Indonesia : Andi Offset
- Dewi, M. V. K., & Darma, G. S. (2019). The Role of Marketing & Competitive Intelligence In Industrial Revolution 4.0. *Jurnal Manajemen dan Bisnis*, 16(1), 1-12.
- Dhawan, A. P., Heetderks, W. J., Pavel, M., Acharya, S., Akay, M., Mairal, A., ... & Gerber, M. (2015). Current and future challenges in point-of-care technologies: A paradigm-shift in affordable global healthcare with personalized and preventive medicine. *IEEE journal of translational engineering in health and medicine*, 3, 1-10. <https://doi.org/10.1109/JTEHM.2015.2400919>
- Ding, Y., & Keh, H. T. (2016). A re-examination of service standardization versus customization from the consumer's perspective. *Journal of Services Marketing*, 30(1), 16-28. <https://doi.org/10.1108/JSM-02-2015-0088>
- Ford, G., Compton, M., Millett, G., & Tzortzis, A. (2017). The role of digital disruption in healthcare service innovation. In *Service Business Model Innovation in Healthcare and Hospital Management* (pp. 57-70). Springer, Cham. https://doi.org/10.1007/978-3-319-46412-1_4
- Hamdan, H. (2018). Industri 4.0: pengaruh revolusi industri pada kewirausahaan demi kemandirian ekonomi. *jurnal nusantara aplikasi manajemen bisnis*, 3(2), 1-8. <https://doi.org/10.29407/nusamba.v3i2.12142>
- Hendhana, S., & Darma, G. S. (2017). Service Quality Rumah Sakit dan Efeknya terhadap Patient Satisfaction, Perceived Value, Trust, dan Behavioral Intention. *Jurnal Manajemen dan Bisnis*, 14(1), 37-55.
- Indrawati, P. (2015). Metode Penelitian Manajemen dan Bisnis. Bandung: PT Refika Aditama.
- Jung, C., & Padman, R. (2015). Disruptive digital innovation in healthcare delivery: the case for patient portals and online clinical consultations. In *The Handbook of Service Innovation* (pp. 297-318). Springer, London. https://doi.org/10.1007/978-1-4471-6590-3_15
- Kasali, R. (2017). Disruption: Menghadapi lawan-lawan tak Kelihatan dalam Peradaban Uber. Jakarta: Gramedia.
- Kepmenkes RI. (2003). Kepmenkes RI Nomor 364/MENKES/SK/III/2003 tentang Laboratorium Kesehatan. <http://dinkes.surabaya.go.id/portal/files/kepmenkes/Kepmenkes%20364-MENKES-SK-III-2003-Laboratorium%20Kesehatan.pdf>
- Kim, K. H., Kim, K. J., Lee, D. H., & Kim, M. G. (2019). Identification of critical quality dimensions for continuance intention in mHealth services: Case study of onecare service. *International Journal of Information Management*, 46, 187-197. <https://doi.org/10.1016/j.ijinfomgt.2018.12.008>
- King, A. A., & Baartartogtokh, B. (2015). How useful is the theory of disruptive innovation?. *MIT Sloan Management Review*, 57(1), 77.
- Scott Kruse, C., Karem, P., Shifflett, K., Vegi, L., Ravi, K., & Brooks, M. (2018). Evaluating barriers to adopting telemedicine worldwide: A systematic review. *Journal of telemedicine and telecare*, 24(1), 4-12. <https://doi.org/10.1177%2F1357633X16674087>
- Lehrer, C., Wieneke, A., vom Brocke, J., Jung, R., & Seidel, S. (2018). How big data analytics enables service innovation: materiality, affordance, and the individualization of service. *Journal of Management Information Systems*, 35(2), 424-460. <https://doi.org/10.1080/07421222.2018.1451953>
- Lu, Y., Papagiannidis, S., & Alamanos, E. (2019). Exploring the emotional antecedents and outcomes of technology acceptance. *Computers in Human Behavior*, 90, 153-169. <https://doi.org/10.1016/j.chb.2018.08.056>
- McLoughlin, I. P., Garrety, K., & Wilson, R. (2017). *The digitalization of healthcare: Electronic records and the disruption of moral orders*. Oxford University Press.

- Nolte, E. (2018). How do we ensure that innovation in health service delivery and organization is implemented, sustained and spread?. *World Health Organization*.
- Peraturan Pemerintah Republik Indonesia. (2016). Peraturan Pemerintah Republik Indonesia Nomor 47. <https://www.persi.or.id/images/regulasi/pp/pp472016.pdf>
- Rafaeli, A., Altman, D., Gremler, D. D., Huang, M. H., Grewal, D., Iyer, B., ... & de Ruyter, K. (2017). The future of frontline research: invited commentaries. *Journal of Service Research*, 20(1), 91-99. <https://doi.org/10.1177%2F1094670516679275>
- Rahimi, B., Nadri, H., Afshar, H. L., & Timpka, T. (2018). A systematic review of the technology acceptance model in health informatics. *Applied clinical informatics*, 9(03), 604-634. <https://doi.org/10.1055/s-0038-1668091>
- Samuelsson, P., Witell, L., Gottfridsson, P., & Elg, M. (2019). Incremental and radical service innovation in Healthcare. In *Handbook of Service Science, Volume II* (pp. 619-638). Springer, Cham. https://doi.org/10.1007/978-3-319-98512-1_27
- Setyawati, T., & Darma, G. S. (2018). Efektifkah Experiential Marketing di Sebuah Rumah Sakit?. *Jurnal Manajemen dan Bisnis*, 15(1), 160-175.
- Storey, C., Cankurtaran, P., Papastathopoulou, P., & Hultink, E. J. (2016). Success factors for service innovation: A meta-analysis. *Journal of Product Innovation Management*, 33(5), 527-548. <https://doi.org/10.1111/jpim.12307>
- Taherdoost, H. (2018). Development of an adoption model to assess user acceptance of e-service technology: E-Service Technology Acceptance Model. *Behaviour & Information Technology*, 37(2), 173-197. <https://doi.org/10.1080/0144929X.2018.1427793>
- Taherdoost, H. (2019). Importance of Technology Acceptance Assessment for Successful Implementation and Development of New Technologies. *Global Journal of Engineering Sciences*, 1(3).
- Tjandrawinata, R. R. (2016). Industri 4.0: Revolusi industri abad ini dan pengaruhnya pada bidang kesehatan dan bioteknologi. *Jurnal Medicinus*, 29(1).
- Um, K. H., & Lau, A. K. (2018). Healthcare service failure: how dissatisfied patients respond to poor service quality. *International Journal of Operations & Production Management*, 38(5), 1245-1270. <https://doi.org/10.1108/IJOPM-11-2016-0669>
- Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., & Martins, A. (2018). Brave new world: service robots in the frontline. *Journal of Service Management*, 29(5), 907-931. <https://doi.org/10.1108/JOSM-04-2018-0119>
- Yoon, S. N., & Lee, D. (2019). Artificial intelligence and robots in healthcare: What are the success factors for technology-based service encounters?. *International Journal of Healthcare Management*, 12(3), 218-225. <https://doi.org/10.1080/20479700.2018.1498220>
- Sari, P. R. J., Wisudawati, N. N. S., & Yulianti, N. M. D. R. (2019). Selfie tourism promotion to support innovative tourism in the era of disruption. *International Research Journal of Management, IT and Social Sciences*, 6(6), 172-177. <https://doi.org/10.21744/irjmis.v6n6.789>
- Yoga, I. M. S., Korry, N. P. D. P., & Yulianti, N. M. D. R. (2019). Information technology adoption on digital marketing communication channel. *International Journal of Social Sciences and Humanities*, 3(2), 95-104. <https://doi.org/10.29332/ijssh.v3n2.297>
- Sari, P. R. J. (2019). Digital marketing as promotion on Bali jeep adventure products. *International Research Journal of Management, IT and Social Sciences*, 6(5), 204-209. <https://doi.org/10.21744/irjmis.v6n5.729>
- Suryanata, I. G. N. P., & Pemayun, A. G. P. (2018). Sustainable tourism creation as core economy facing the industrial revolution challenges. *International Journal of Social Sciences and Humanities*, 2(2), 279-291. <https://doi.org/10.29332/ijssh.v2n2.175>