

Peer-to-Peer Lending Performance Improvement: Learn from Lean Principles

Mousumi Munmun¹, Dongli Zhang² & Charles C. Luo¹

¹ College of Management, Metro State University, USA

² Gabelli School of Business, Fordham University, USA

Correspondence: Dongli Zhang, Information, Technology, & Operations, Gabelli School of Business, Fordham University, Hughes Hall 510, Bronx, USA. E-mail: dzhang@fordham.edu

Received: November 10, 2023

Accepted: December 12, 2023

Online Published: December 19, 2023

doi:10.5539/ijbm.v19n1p101

URL: <https://doi.org/10.5539/ijbm.v19n1p101>

Abstract

While experiencing robust growth in recent years, Peer-to-Peer (P2P) lending still faces the serious challenge of a high default rate. This study argues that it is beneficial to analyze P2P lending from a process improvement perspective. Adopting an integrative literature review method, this study identifies and summarizes the characteristics of P2P lending and then maps them to the fundamental lean attributes. Furthermore, this research proposes detailed application suggestions for reducing loan default rates in terms of understanding customer needs, value stream, information flow, pull approach, and continuous improvement. As an early attempt, mapping P2P lending characteristics and lean principles allows P2P lending to learn the well-established quality improvement practices from lean management. This study contributes to both P2P lending performance improvement and applications of lean management.

Keywords: Peer-to-Peer (P2P) lending, Service quality, Lean principles, Process improvement, Integrative literature review

1. Introduction

The past decade has witnessed a rapid growth of the Peer-to-Peer (P2P) lending industry. P2P lending as a financial service enables lending or investing in different loans for individuals or institutional borrowers and lenders. It involves borrowers' evaluation, loan risk evaluation, matching borrowers with investors, funding, financing, servicing, and regulatory compliance. However, P2P lending usually faces significant challenges due to high investment risk for the investors, which might lead to systemic risk for the P2P platform (Kumar, 2020; Nisar et al., 2020).

While reviewing the relevant literature, this study finds that there is a lack of studies that examine P2P lending from a process improvement perspective. The process of P2P lending is essentially different from the process of traditional lending (Akkizidis and Stagars, 2015). Through systematically examining the characteristics of P2P lending, this study finds that the nature of P2P lending and lean principles share several similarities, for instance, high emphasis on customer needs, eliminating unnecessary steps in the process, fast processing of information, and continuous improvement of algorithms. As such, this study reasons that P2P lending can be benefited from adopting lean principles. Through the lens of process improvement, this study categorizes the P2P characteristics and maps them to relevant lean principles. Drawing on the rich theoretical and practical knowledge base on lean principles and process improvement, this study proposes a set of guidelines for reducing the loan default rate in P2P lending.

This study is an essential first step in this direction of theorizing the P2P lending business model. Theoretical themes are crucial for organizing the scattered research considerations of the new industry (Gentner, 1983). The study develops a robust theoretical approach that links lean management themes with the P2P lending operation process. The practical implication will come when the established lean's strategy, tools, and technique can improve P2P lending business processes. By thoughtfully considering the established lean's strategy, tools, and technique, P2P lending managers will develop operational decision strategies and quality management approaches and thus make the industry sustainable.

The rest of the paper is arranged as follows. Section 2 reviews the practices, advantages, and limitations of

current P2P lending. Section 3 first maps P2P lending characteristics with lean principles based on an integrative literature review. After the successful mapping, Section 3 continues the discussion on improvement suggestions. Section 4 includes the implications of the research's findings. Section 5 provides the conclusions and a discussion on possible future research.

2. Practices, Advantages, and Limitations of Current P2P Lending

2.1 A Brief Introduction of P2P Lending

The P2P lending platform matches individual borrowers and small business borrowers with individual investors and institutional investors. The P2P lending process usually starts with the application from borrowers. Then, the lending platform assesses the borrower through its proprietary credit model. When accepted by the platform, the loan will be posted on the platform's website for approximately two weeks. In the case that a loan receives sufficient investor commitments, the originator bank transfers funds to the borrower's account. Meanwhile, the lending platform purchases the loan from the bank and takes full administrative responsibility. The authors depict the P2P lending process in Figure 1. Figure 1 is created by authors based on USA leading P2P lending company's Prospectus and literature review (Prosper Prospectus, 2019; Wang et al., 2015).

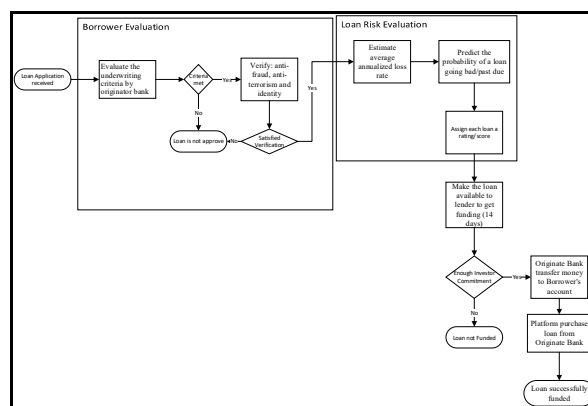


Figure 1. The process of P2P lending

Traditionally, a lender provides all kinds of financial services such as depositing, money withdrawal, and credit cards. In P2P lending, the service provider (i.e., the platform) focuses on loans only. The entire process of P2P lending platform's operation is automated, which provides significant time and costs advantages over the traditional lending process. Compared to a lengthy, complicated, and expensive process in traditional lending, P2P lending is much more efficient, which usually can be done within 24 hours (Segal, 2015; Akkizidis and Stagars, 2015). Furthermore, traditional lending incurs high operating costs due to the requirements of maintaining its bank licenses. For P2P lending, only Securities and Exchange Commission (SEC) approval is required, but not bank licenses. As such, the operating cost of P2P lending is significantly lower than that of traditional lending. Typically, the lender earning rate from traditional lending ranges from 0.04% to 5% (Akkizidis and Stagars, 2015), while the earning rate from P2P lending ranges from 5.75% to 34% (Personal loans made easy, 2021). A lower level of operating cost, easier and faster application process, and higher lender earning rate make P2P lending a fast-growing business.

2.2 Sources of P2P Lending Default

Due to the unsecured nature of loans in P2P lending, loan default is the most vital challenge faced by individual investors, who have to conduct their own evaluation of loan risk. In matching the lenders and the borrowers, P2P platform only passes on the borrower's loan information to the lenders, but not ensures the authenticity of loan information (Prosper Prospectus, 2019). Identifying the sources of P2P loan default would be helpful to further understand the P2P lending business.

2.2.1 Borrowers' Fraudulent

Borrowers' fraud behavior is one reason for P2P loan default (Fujii-Rajani, 2018). Fraud usually happens when the borrowers intentionally avoid paying back the loan. In traditional lending, borrowers need to put collateral before getting the loan. When a borrower fails to pay back the loan, the lender can take the collateral from the borrower. Collaterals are not required in P2P lending. The cost for the borrow when defaulting a P2P loan is only

the credit score. In developing countries, the loan default problem is even more severe since credit score systems are not in place.

2.2.2 Quality of the Data Source

Loan prices and risks in P2P lending are determined based on big data analysis and data modeling (Akkizidis & Stagars, 2015; Munmun & Booker, 2021). Therefore, data quality plays a significant role in loan assessment. In P2P lending, data is collected from the internet. Borrowers are unaware of what information the lending platform collects, which makes the borrower not responsible for the wrong or half-true data (Akkizidis & Stagars, 2015). Issue of poor data source quality arises when P2P lending platforms use different data sources and are not able to verify them thoroughly. Data quality issue leads to miscalculation of default risk for the lenders, who invest in high-risk loans without knowing it.

2.2.3 Credit Quality

A lot of times, borrowers using P2P lending services are those who were rejected by the traditional lending institutions (Akkizidis & Stagars, 2015). The P2P platform compensates for such potential credit quality issues with high interest.

2.2.4 Information Asymmetry

In P2P lending, borrowers have more information about the loan than the lender. Even though information asymmetries always exist in lending, traditional lending alleviates the issue by using credit checks (Pokorná & Sponer, 2016; Yan et al., 2018). Credit check in P2P lending is much less comprehensive, where borrowers can hide certain information or fabricate their loan repayment history.

2.2.5 Lender Opportunism

P2P lending compensates high default risk of loans by providing a high-interest rate. P2P lending's interest rate is much higher (5.75% to 34%) than traditional lending (Personal loans made easy, 2021). Many inexperienced lenders are attracted by the high-interest rate without a proper understating of the high associated risk.

2.3 Current Practice in Reducing Loan Default Rate

The following practices are commonly used by P2P lending platforms to address the challenge of the high default rate.

2.3.1 Screening

To provide protection for the lenders, platforms increase their efforts in the screening process. The lending platforms used to focus on only hard financial information such as credit scores, which was one of the reasons that caused a high loan default rate in the early stage of P2P lending. Currently, both soft and hard information of a borrower is used for screening practice (Chen *et al.*, 2016). Soft information usually includes textual information such as opinions and ideas. Effective screening reduces the adverse selection of loans and resulted in a lower default rate (Weiss *et al.*, 2010).

2.3.2 Algorithm-Based Assessing

P2P lending platforms depend on algorithms to assess the credit risk. Algorithm-based loan assessing is much cheaper than details traditional screening (Havrylchyk & Verdier, 2018). Platforms continually update algorithms for loan evaluation based on previous loan performances. Each lending platform has its proprietary credit algorithm model, which uses both public and private data of borrowers to assess credit risk (Prosper Prospectus, 2019).

2.3.3 P2P Regulation

In 2008, U.S. Securities and Exchange Commission (SEC) required peer-to-peer companies to register their offerings as securities and follow the Securities Act of 1933 (Tracy & Elaine, 2012; Renton, 2012). This strict registration process creates high barriers to the entry of this industry, which helps to reduce the default rate.

4. Mapping P2P Lending Characteristics to Lean Principles

Although several practices have been exercised to reduce the default rate in P2P lending, the risks faced by the lenders and the platforms are still significantly higher than traditional lending. To address the challenge of high default rate risk in P2P lending and to improve its service quality, it becomes imperative to improve the lending process. However, our literature review shows that there is still lack of studies that examine P2P lending from a process perspective. A search of the article titles and abstracts for the phrase "P2P lending" or "Online lending" or "P2P lending" or "Peer to Peer lending" in several leading journals in the operations management (OM) field

(Journal of Operations Management; Manufacturing & Service Operations Management; Foundations and trends in technology, information, and operations management (Online); Journal of Information Systems & Operations Management; International Journal of supply and operations management; Journal of marketing and operations management research; International Journal of Quality and Reliability Management) reveals that "Zero" article appears across all the journals. Although this does not incorporate the entire breadth of OM research, it indicates the inattention to "P2P lending" in the OM field. It should be noted that P2P lending is only fifteen years old new lending phenomenon; this remains an area where OM can make a significant contribution to the theoretical domain of P2P lending.

4.1 Lean Principles

Lean principles are proven to have profound impacts on the performance improvement of different industries (Liu et al., 2020; Lins et al., 2021; Madhani, 2021, Rafique et al., 2019), and financial service is one of them (De et al., 2008; Chauhan et al., 2022; Biswas et al., 2022). Womack and Jones (1996) developed five fundamental principles for lean management. Abdi et al. (2006) added core attributes to these five principles for the service industry: (1) Understanding the customer needs is the key to lean management (Bicheno & Holweg, 2000). Core attributes related to this principle include customers' accessibility, customizing product, satisfying customers' needs, and customer participation. (2) Value stream-based strategy is the second fundamental principle of lean management (Duggan, 2018). The principle of value streams emphasizes process mapping, process time, necessary procedure, and interaction and participation. (3) Efficient information flow reduces process time and plays a significant role in lean management (Dave et al., 2014; Tribelsky & Sacks, 2011). The core attributes of this principle include clear sight through the process, focusing on the bottlenecks, information accessibility, and reliable information. (4) The pull approach facilitates the introduction of lean management in an organization (Haque & James-Moore, 2004). By encouraging an organization to respond to the end-users/customers, it helps the organization meet specific personal needs and gain customers' confidence. (5) The principle of continuous improvement encourages organizations to pursue perfection by controlling and improving their operating processes (Abdi et al., 2006).

Lean management is an important Operations Management theory that focuses on more benefits to society and value to individuals while eradicating waste (Womack and Jones, 2003). Adapting this theory will decrease operation costs, increase efficiency, and increase customer satisfaction (Dahlgaard & Dahlgaard-Park, 2006). Lean principles are well established and widely used; Southwest Airlines and Taco Bell are the two successful examples of lean implementation in the service sector, which shows lean implementation can deliver values in different industries and increase customer satisfaction (Abdi et al., 2006). Furthermore, implementing lean management improves companies' sustainability (Dey et al., 2020); as P2P lending is a new industry, sustainability is crucial for this sector. In addition, the lean approach brings several established tools and techniques to successful business performances (Sharma, 2003).

4.2 Mapping P2P Lending to Lean Principles

The authors systematically examined three databases, including ProQuest, IEEE Digital Library, and Ebscohost. Scholarly articles, books, reports, and conference proceedings are all considered. This study applied two layers of filter to identify relevant studies. The first layer of the filter uses the keywords of P2P lending and its synonyms such as fintech lending, peer-to-peer lending, and internet lending. The second layer of filter applies keywords such as 'business model,' 'operation,' 'process model,' 'characteristics,' 'proprietary,' 'criteria,' 'function,' and 'principles.' The keywords were searched in the abstracts and keywords of the articles. There is no limit set up for the publication date. The results are 181 studies (details are listed in Table 1). Eliminating duplicate articles results in a total of 50 studies (listed in Table 2).

Table 1. The distribution of P2P studies based on keywords search

Keywords	Database		
	EbscoHost	ProQuest	IEEE Digital Library
Business Model	7	16	0
Operation	9	15	10
Process/Business	3	1	1
Characteristics/ proprietary criteria/Function/ Principles	63	35	21
Subtotal	82	67	32
Total (including duplicate)	181		

Table 2. List of Reviewed articles

1. Akkizidis, I. & Stagars, M. (2015), *Marketplace lending, Financial Analysis, and the Future of credit: Integration, Profitability, and risk management*, John Wiley & Sons. <http://dx.doi.org/10.1002/9781119099437>
2. Amit, R. & Zott, C. (2015), Crafting business architecture: The antecedents of business model design, *Strategic Entrepreneurship Journal*, 9(4), pp.331-350. <http://dx.doi.org/10.1002/sej.1200>
3. Au, C.H., Tan, B. & Sun, Y. (2020), Developing a P2P lending platform: stages, strategies and platform configurations, *Internet Research*. <http://dx.doi.org/10.1108/INTR-03-2019-0099>
4. Bachmann, A., Becker, A., Buerckner, D., Hilker, M., Kock, F., Lehmann, M., Tiburtius, P. & Funk, B. (2011), Online peer-to-peer lending—a literature review, *Journal of Internet Banking and Commerce*, 16(2), p.1.
5. Baek, H.Y., Cho, D.D., Jordan, R.A. & Kuvvet, E. (2020), The differential effect of social disclosure on loan funding and loan repayment: evidence from fixed-rate peer-to-peer lending, *Managerial Finance*.
6. Berger, S.C. & Gleisner, F. (2009), Emergence of financial intermediaries in electronic markets: The case of online P2P lending, *BuR Business Research Journal*, 2(1). <http://dx.doi.org/10.1007/BF03343528>
7. Borello, G., De Crescenzo, V. & Pichler, F. (1970), The funding gap and the role of financial return crowdfunding: Some evidence from European platforms, *The Journal of Internet Banking and Commerce*, 20(1), pp.1-20.
8. Canfield, C.E. (2018), Determinants of default in p2p lending: the Mexican case, *Independent Journal of Management & Production*, 9(1), pp.1-24.
9. Cao, L., Yuan, G., Leung, T. & Zhang, W. (2020), Special issue on AI and Fintech: The challenge ahead, *IEEE Intelligent Systems*, 35(2), pp.3-6. <http://dx.doi.org/10.1109/MIS.2020.2983636>
10. Chen, G. (2017, December), Exploring parallelism for automatic and scattered investing on P2P lending platform, In *2017 3rd IEEE International Conference on Computer and Communications (ICCC)* (pp. 2479-2483), IEEE. <http://dx.doi.org/10.1109/CompComm.2017.8322981>
11. Chen, J., Zhang, Y. & Yin, Z. (2018), Education premium in the online peer-to-peer lending marketplace: Evidence from the big data in China, *The Singapore Economic Review*, 63(01), pp.45-64. <http://dx.doi.org/10.1142/S0217590818410023>
12. Chen, X.H., Jin, F.J., Zhang, Q. & Yang, L. (2016), Are investors rational or perceptual in P2P lending?, *Information Systems and e-Business Management*, 14(4), pp.921-944. <http://dx.doi.org/10.1007/s10257-016-0305-z>
13. Davis, K. (2016), Peer-to-peer lending: structures, risks and regulation, *JASSA*, (3), pp.37-44
14. Emekter, R., Tu, Y., Jirasakuldech, B. & Lu, M. (2015), Evaluating credit risk and loan performance in online Peer-to-Peer (P2P) lending, *Applied Economics*, 47(1), pp.54-70. <http://dx.doi.org/10.1080/00036846.2014.962222>
15. Fu, X., Zhang, S., Chen, J., Ouyang, T. & Wu, J. (2019), A sentiment-aware trading volume prediction model for P2P market using LSTM, *Ieee Access*, 7, pp.81934-81944. <http://dx.doi.org/10.1109/ACCESS.2019.2923637>
16. Gavurova, B., Dujcak, M., Kovac, V. & Kotásková, A. (2018), Determinants of successful loan application at peer-to-peer lending market, *Economics & Sociology*, 11(1), pp.85-99. <http://dx.doi.org/10.14254/2071-789X.2018/11-1/6>
17. Gomber, P., Kauffman, R.J., Parker, C. & Weber, B.W. (2018), On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services, *Journal of management information systems*, 35(1), pp.220-265. <http://dx.doi.org/10.1080/07421222.2018.1440766>
18. Goukasian, L. & Ullman, B. (2018), Headwinds and Tailwinds for Fintech in Equipment Financing, *Education Journal*, 36(2).
19. Gu, D., Lu, T., Luo, P. & Zhang, C. (2019), The Impact of Venture Capital Investment on the Performance of Peer-to-Peer Lending Platforms: Evidence from China, *Asia-Pacific Journal of Financial Studies*, 48(5), pp.640-665. <http://dx.doi.org/10.1111/ajfs.12276>
20. Guo, L. & Xia, D. (2014), In search of a place in the sun: the shadow banking system with Chinese characteristics, *European Business Organization Law Review (EBOR)*, 15(3), pp.387-418. <http://dx.doi.org/10.1017/S1566752914001189>
21. Guo, Y., Zhou, W., Luo, C., Liu, C. & Xiong, H. (2016), Instance-based credit risk assessment for investment decisions in P2P lending, *European Journal of Operational Research*, 249(2), pp.417-426. <http://dx.doi.org/10.1016/j.ejor.2015.05.050>
22. Hachem, K. (2018), Shadow banking in China, *Annual review of financial economics*, 10, pp.287-308. <http://dx.doi.org/10.1146/annurev-financial-110217-023025>
23. He, F., Li, Y., Xu, T., Yin, L., Zhang, W. & Zhang, X. (2020), A data-analytics approach for risk evaluation in peer-to-peer lending platforms, *IEEE Intelligent Systems*, 35(3), pp.85-95. <http://dx.doi.org/10.1109/MIS.2020.2971946>
24. Hendriyani, C. & Raharja, S.U.J. (2019), Business Agility Strategy: Peer-to-Peer Lending of Fintech Startup in the Era of Digital Finance in Indonesia, *Review of Integrative Business and Economics Research*, 8, pp.239-246.
25. Huang, R.H. (2018), Online P2P lending and regulatory responses in China: opportunities and challenges, *European Business Organization Law Review*, 19(1), pp.63-92. <http://dx.doi.org/10.1007/s40804-018-0100-z>
26. Jiang, C., Wang, Z., Wang, R. & Ding, Y. (2018), Loan default prediction by combining soft information extracted from descriptive text in online peer-to-peer lending, *Annals of Operations Research*, 266(1), pp.511-529. <http://dx.doi.org/10.1007/s10479-017-2668-z>
27. Jiang, Y., Ho, Y.C., Yan, X. & Tan, Y. (2018), Investor platform choice: herding, platform attributes, and regulations, *Journal of Management Information Systems*, 35(1), pp.86-116. <http://dx.doi.org/10.1080/07421222.2018.1440770>

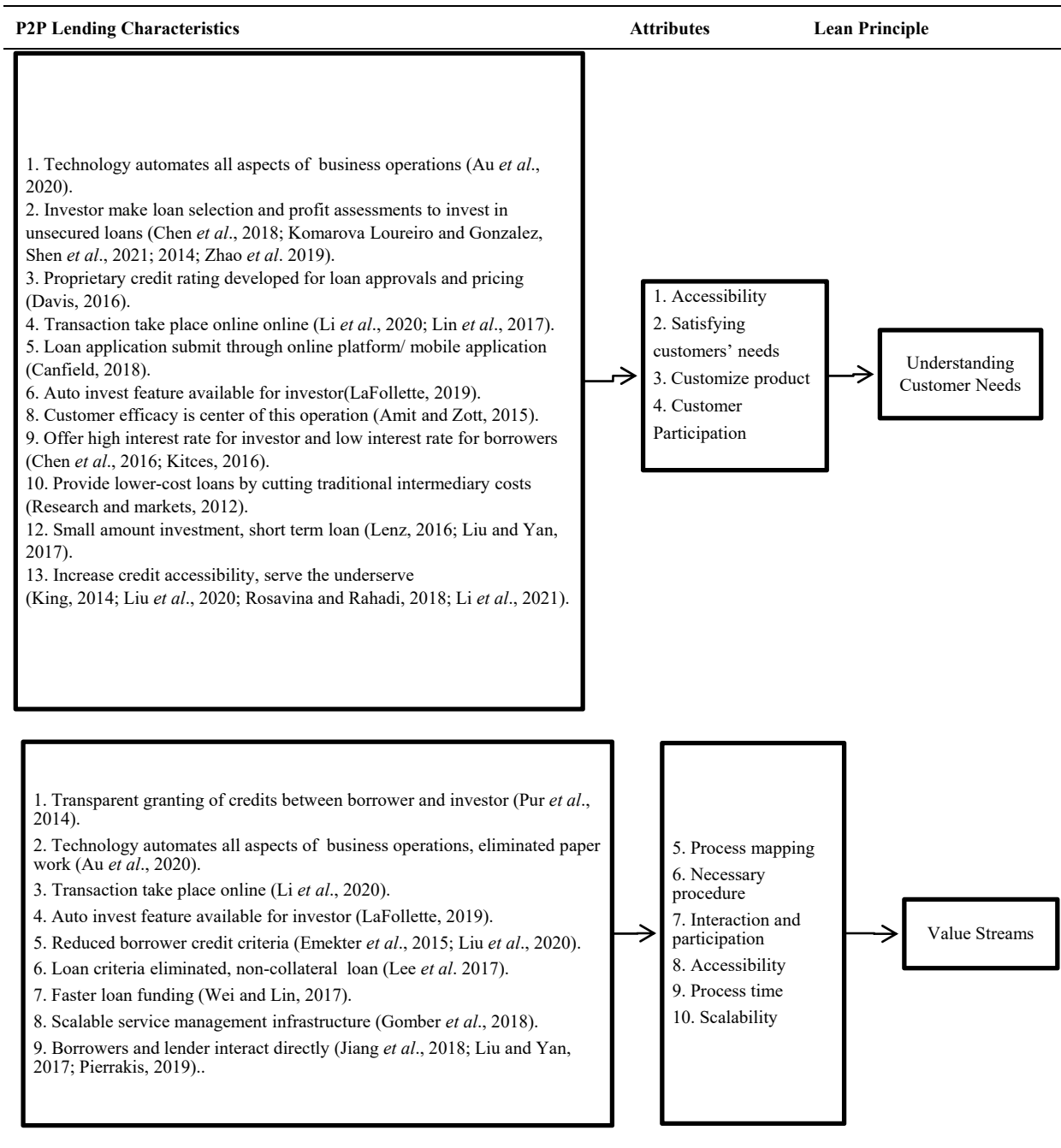
28. King, B. (2014), *Breaking banks: The innovators, rogues, and strategists rebooting banking*, John Wiley & Sons.
29. Kitces, M. (2016), Making the most of P2P loans: In a low-interest-rate environment, these loans are attractive to clients and easier for advisors to pull off, *Financial Planning*, 46, 61-n/a.
30. LaFollette, Greg, C.P.A./C.I.T.P., C.G.M.A. (2019), Tech tools, *Journal of Accountancy*, 227(2), 64, available at: <http://mtrproxy.mnpals.net/login?url=https://www-proquest-com.mtrproxy.mnpals.net/trade-journals/tech-tools/docview/2176180320/se-2?aaccountid=12415>
31. Lee, Y.W., Chen, S.H. & Yu, T. (2017, December), Analysis of the impact of collateral on peer-to-peer lending, In *2017 IEEE/SICE International Symposium on System Integration (SII)* (pp. 77-82), IEEE. <http://dx.doi.org/10.1109/SII.2017.8279192>
32. Lenz, R. (2016), Peer-to-peer lending: Opportunities and risks, *European Journal of Risk Regulation*, 7(4), pp.688-700. <http://dx.doi.org/10.1017/S1867299X00010126>
33. Li, M., Phan, P.H. & Sun, X. (2021), Business Friendliness: A Double-Edged Sword, *Sustainability*, 13(4), p.1819.
34. Li, X., Yuan, J., Shi, Y., Sun, Z. & Ruan, J. (2020), Emerging Trends and Innovation Modes of Internet Finance—Results from Co-Word and Co-Citation Networks, *Future Internet*, 12(3), p.52. <http://dx.doi.org/10.3390/fi12030052>
35. Lin, X., Li, X. & Zheng, Z. (2017), Evaluating borrower's default risk in peer-to-peer lending: evidence from a lending platform in China, *Applied Economics*, 49(35), pp.3538-3545. <http://dx.doi.org/10.1080/00036846.2016.1262526>
36. Liu, C. & Yan, J. (2017), Researches on Risks and Precautions of Chinese P2P Lending, *Management & Engineering*, (28), pp.71-76.
37. Liu, Z., Shang, J., Wu, S.Y. & Chen, P.Y. (2020), Social collateral, soft information and online peer-to-peer lending: A theoretical model, *European Journal of Operational Research*, 281(2), pp.428-438. <http://dx.doi.org/10.1016/j.ejor.2019.08.038>
38. Loureiro, Y.K. & Gonzalez, L. (2015), Competition against common sense: Insights on peer-to-peer lending as a tool to allay financial exclusion, *International Journal of Bank Marketing*. <http://dx.doi.org/10.1108/IJBM-06-2014-0065>
39. Lu, X., Lu, T., Wang, C.A. & Wu, R. (2020), Can Social Notifications Help to Mitigate Payment Delinquency in Online Peer-to-Peer Lending?, *Available at SSRN 3758144*.
40. Pierrakis, Y. (2019), Peer-to-peer lending to businesses: Investors' characteristics, investment criteria and motivation, *The International Journal of Entrepreneurship and Innovation*, 20(4), pp.239-251. <http://dx.doi.org/10.1177/1465750319842528>
41. Pur, S., Huesig, S., Mann, H.G. & Schmidhammer, C. (2014, July), How to analyze the disruptive potential of business model innovation in two-sided markets?: The case of peer to peer lending marketplaces in Germany, In *Proceedings of PICMET'14 Conference: Portland International Center for Management of Engineering and Technology; Infrastructure and Service Integration* (pp. 693-709), IEEE.
42. Research and markets: P2P lending - 2012 report featuring many key players such as zoppa, TrustBuddy and MoneyAuction (2012, Oct 23), *Business Wire*, available at: <http://mtrproxy.mnpals.net/login?url=https://www-proquest-com.mtrproxy.mnpals.net/wire-feeds/research-markets-p2p-lending-2012-report/docview/1114468419/se-2?accountid=12415>
43. Shen, L.H., Khan, H.U. & Hammami, H. (2021), An Empirical Study of Lenders' Perception of Chinese Online Peer-to-Peer (P2P) Lending Platforms, *The Journal of Alternative Investments*, 23(4), pp.152-175.
44. Tang, M., Mei, M., Li, C., Lv, X., Li, X. & Wang, L. (2020), How does an individual's default behavior on an online peer-to-peer lending platform influence an observer's default intention?, *Financial Innovation*, 6(1), pp.1-20.
45. Tao, Q., Dong, Y. & Lin, Z. (2017), Who can get money? Evidence from the Chinese peer-to-peer lending platform, *Information Systems Frontiers*, 19(3), pp.425-441. <http://dx.doi.org/10.1007/s10796-017-9751-5>
46. Wei, Z. & Lin, M. (2017), Market mechanisms in online peer-to-peer lending, *Management Science*, 63(12), pp.4236-4257. <http://dx.doi.org/10.1287/mnsc.2016.2531>
47. Yang, X., Fan, W. & Yang, S. (2020), Identifying the Influencing Factors on Investors' Investment Behavior: An Empirical Study Focusing on the Chinese P2P Lending Market, *Sustainability*, 12(13), p.5345. <http://dx.doi.org/10.3390/su12135345>
48. Yao, J., Chen, J., Wei, J., Chen, Y. & Yang, S. (2019), The relationship between soft information in loan titles and online peer-to-peer lending: evidence from RenRenDai platform, *Electronic Commerce Research*, 19(1), pp.111-129. <http://dx.doi.org/10.1007/s10660-018-9293-z>
49. Zhang, J. & Liu, P. (2012), Rational herding in microloan markets, *Management science*, 58(5), pp.892-912. <http://dx.doi.org/10.1287/mnsc.1110.1459>
50. Zhao, Y., Harris, P. & Lam, W. (2019), Crowdfunding industry—History, development, policies, and potential issues. *Journal of Public Affairs*, 19(1), p.e1921. <http://dx.doi.org/10.1002/pa.1921>

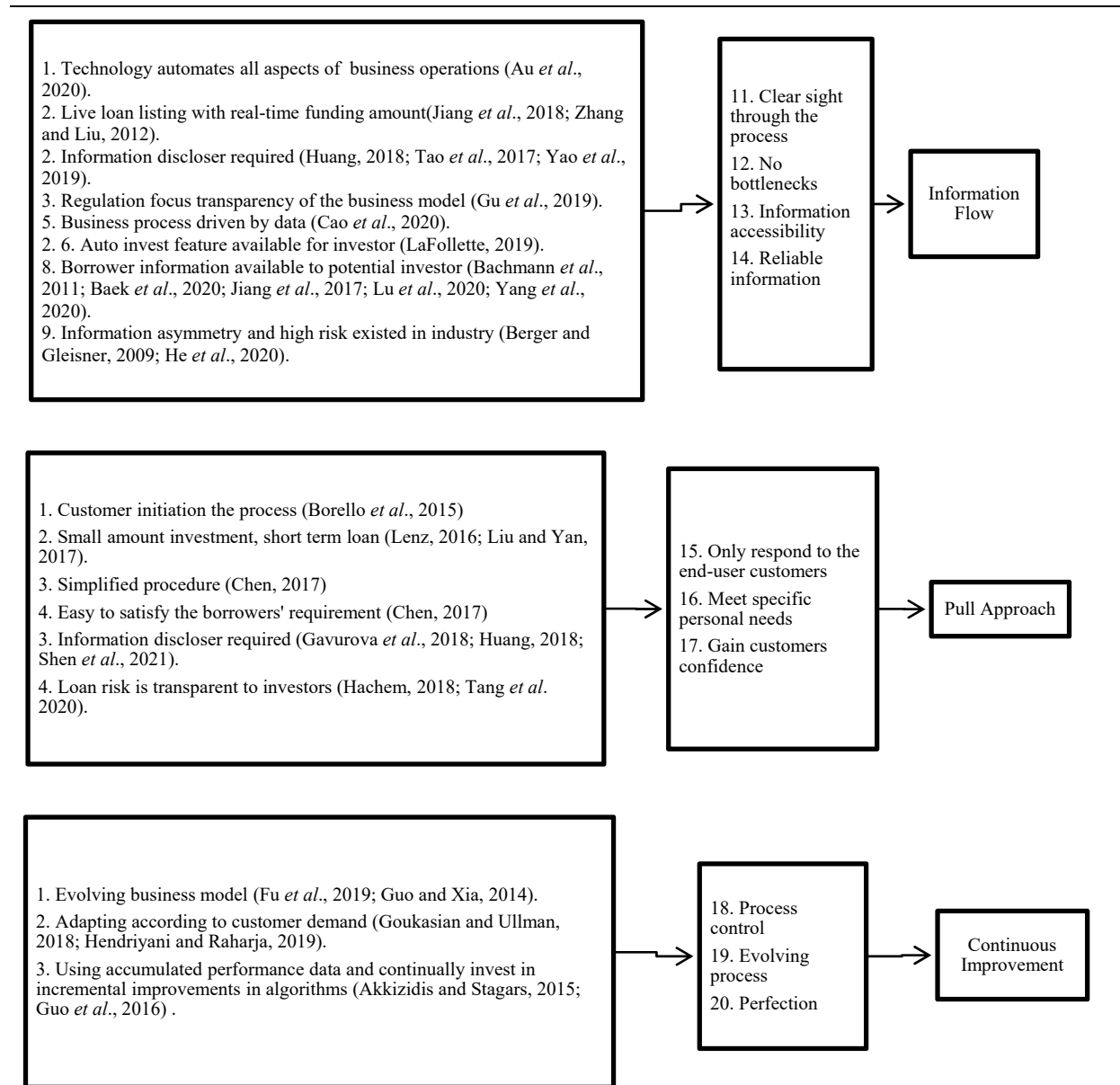
To better understand the P2P lending characteristics that determine the application of lean principles, an integrative literature review methodology was chosen as a suitable method to create a theoretical contribution in the research area (Snyder, 2019). The literature review offers the fundamental information which is an important building block during mapping research to new theory development (Baumeister & Leary, 1997; Torraco, 2005). According to Torraco (2005), an integrative literature review could develop further clarifications, syntheses, and structuring of the domains in the focus study, which support emerging new perspectives and developing frameworks for a new theory.

This study investigates the potential application of lean principles to P2P lending. Adopting the method of integrative literature review (Doty & Glick 1994; Whetten, 1989), authors first identified the P2P lending characteristics and classified them into 20 attributes. Further, the authors mapped the attributes to the five fundamental lean principles. The mapping of P2P lending characteristics to lean principles is established in Table 3.

As shown in Table 3, a successfully mapping between P2P lending characteristics with fundamental lean principles is established through the core lean attributes. Establishing the link between the two allows P2P lending to continuously learn from lean management and principles for the purpose of improvement.

Table 3. Mapping P2P lending characteristics to lean principles





4.3 Understanding Customer Needs

P2P lending serves an underserved population compared to traditional lending through "low cost," "automation," and "a fully online process." Determined by the nature of P2P lending, customer participation plays a critical role in the P2P lending process. Such characteristics align with the attributes of the first lean principle, which emphasizes customer orientation (Au *et al.*, 2020; Li *et al.*, 2020; Research and markets, 2012; Amit and Zott, 2015). Understanding customer needs is the key to lean management. This study reasons that this principle could be further implemented in P2P lending. As customers are the final judges of P2P service quality, the service quality standard of P2P lending should be determined based on the expectations from both borrowers and lenders. Customer orientation should also be reflected in improvement actions to maximize the benefits of both borrowers and lenders. As the lean principle suggested, a top-down approach is preferable to further implement this lean principle (Van, 2018), where top management takes the role and the responsibility to include customer service into the mission and vision of the lending platform. In summary, understanding the current needs of the customers and exploring potential future needs will not only help improving service quality but also contribute to the sustainable growth of the business.

4.4 Value Stream

P2P lending process eliminates "physical presence, borrower credit criteria, and collateral" (Emekter *et al.*, 2015;

Lee *et al.* 2017; Li *et al.*, 2020). These characteristics reflect one important attribute of value stream in the lean principle: keeping necessary procedures only and eliminating all unnecessary steps and actions. The characteristic "transparent" process aligns with the process mapping attribute (Pur *et al.*, 2014). P2P lending's "faster loan funding," "customer interact directly," and "automate process" are associated with the processing time and interaction and participation attributes (Au *et al.*, 2020; Jiang *et al.*, 2018; Liu and Yan, 2017; Wei and Lin, 2017). As a technology-based business model by nature, scalable service management is an inherent characteristic of P2P lending, which matches well with the scalability attributes of lean principles (Gomber *et al.*, 2018). As such, this study reasons that the value stream of the lean principle provides further improvement opportunities for P2P lending. After eliminating all unnecessary steps and activities in the process, the root cause of any problem in the process would be easier to be identified. Root cause identification could be used to address the most critical issue in P2P lending which is the high default rate.

4.5 Information Flow

P2P lending process advocates for openness includes "information disclosure," "transparency," "live loan listing," which promotes the Information Flow's clear sight and no bottlenecks attributes (Gu *et al.*, 2019; Huang, 2018; Jiang *et al.*, 2018). The heavy usage of data in P2P lending associates with information accessibility attributes of the lean principles (Cao *et al.*, 2020). Each step of the P2P lending process involves an information flow. The first step starts with the borrower evaluation, where the borrower self-discloses their information; without the borrower's required information, the lending process will not start, and there will be no funding for borrowers. After prosperous borrowers' evaluation, loan risk evaluation starts. The lending platform evaluates borrowers' self-disclosed information, third-party data, and then completes loan performances algorithms to price the loan accurately. After this step, the loans are posted to the lending platform website as "live loan listing." The lenders could see all kinds of borrowers and loan information, how many people invest on that loan, and how much the loan is funded. All these steps require a clear Information Flow which could be supported by lean thinking. Reliable information flow is necessary for the successful implementation of lean principles, it also promotes communication among all relevant parties in the lending process.

4.6 Pull Approach

P2P lending process is always initiated by customers, which reflects the Pull Approach's key attribute of the lean principle: only respond to the end-user customers (Borello *et al.*, 2015). Additionally, "small amount loan," "satisfy the borrowers," and "transparent risk" characteristics support two attributes, meet specific personal needs and gain customers confidence attributes of the lean principle (Chen, 2017; Hachem, 2018; Lenz, 2016; Tang *et al.* 2020). Responsiveness plays a critical role in the pull approach and provides the direction for future improvement. As such, this study proposes that the lending platforms need to examine not only the time but also the quality of response.

4.7 Continuous Improvement

Certain characteristics of P2P lending such as "adapting," "evolving," and "continually improving" match well with continuous improvement of lean principle. As a key element of the lean principle, practices of continuous improvement can benefit P2P lending through examining its processes and identifying possible improvement actions. Further actions can be taken to sustain the achievement from continuous improvement. For instance, the standardization in P2P lending process can facilitate its continuous improvement, where changes and improvements discovered through various projects are routinized and standardized into new routines (Spear and Bowen, 1999). Standardization can also establish a finance lending sector with specific characteristics to prevent unlawful activities (Huang, 2018). In addition, standardization of improvement practices is also necessary for all the participating parties of P2P lending to establish a common understanding of the basis on which changes are made (Bateman, 2005). Finally, establishing a standard set of steps for process improvement projects would promote systematic organizational learning through continuous improvement initiatives (Garvin, 1993; Spear and Bowen, 1999).

5. Implications of the Research

This research has both research and practical implications. This study is an essential first step in this direction of theorizing the P2P lending business model. Theoretical themes are crucial for organizing the scattered researched consideration of the new industry (Gentner, 1983). The study develops a robust theoretical approach that links lean management themes with the P2P lending operation process. There are two research implications. First, this study introduces quality management to a new sector and shows how an emerging industry could learn from the established quality management theories, strategies, and tools. This contributes and extends the research on quality management. Second, this study contributes to the research on P2P lending industry. It opens a new

venue for empirical verification. Future research could utilize this paper's findings by employing quantitative research methods to measure the degree of P2P lending characteristics and verify the effectiveness of lean management principles on improving P2P lending performance.

The practical implication will come when the established lean's strategy, tools, and technique can improve P2P lending business processes. By thoughtfully considering the established lean's strategy, tools, and technique, P2P lending managers will develop operational decision strategies and quality management approaches and thus make the industry sustainable.

One practical implication of the study is related to improved information transparency. Lean management fosters a high degree of information transparency (Christopher & Towill, 2000). For example, in a P2P lending platform, one source of loan default is information asymmetry, where borrowers hide their credit history or fabricate their financial background to receive funding. Lean's information transparency and tools will help the platform make all the borrower's information transparent to lenders to calculate their funding risk accurately. Lean's knowledge creation tools and strategy can also be used to educate P2P lending customers, including both borrowers and lenders. An educated lender will have a wide range of knowledge of high-risk-low-risk loans and the consequences of investing in high-risk loans. Educated borrowers will have a clear concept of fraud and fabrication, making them accountable for incorrect information presentation or sharing.

Organizations in P2P lending industry will also be able to benefit from the results of this study. Organizations could improve the P2P lending platform's learning through implementing Lean's knowledge creation tools such as Plan-Do-Check-Act (PDCA) and the 5 Whys (Tyagi et al., 2015), which can facilitate knowledge creation and improve organizational learning. Every P2P lending platform has its algorithm to accept and reject loans; the algorithm is based on their past data of loan success and failure, most of the time depending on a machine learning algorithm. Knowledge creation tools can help P2P lending platforms develop a more effective algorithm for loan risk detection, reducing the default rate. P2P lending platform can also improve the quality of the data source through lean's Plan-Do-Check-Act tools. Low-quality data sources will provide inaccurate data, which would impact loan quality evaluation and increase default rates. The implementation of PDCA tool in P2P lending includes making a plan for all the possible data sources, implementing those data sources, evaluating the quality of sources, and acting based on the evaluation. If the data sources quality does not maintain a standard, it will be removed from the system. The 5 Whys tool could be used to understand the root cause of a problem. P2P lending platforms could use this tool and ask "why" multiple times in order to delve into the problem deeply enough to identify the root cause of a defaulted loan. In summary, implementing the Lean tools such as PDCA and the 5 Whys helps P2P platforms to reduce the loan default rate, which is the most practical implication of this study.

6. Conclusion and Future Research

This study recognizes the robust growth of the P2P lending industry as well as the challenges faced by the P2P operating process. By conducting an integrative literature review, this study maps the characteristics of P2P lending to the five fundamental lean principles. High emphasis on customer needs in P2P lending reflects the lean principle of customer focus. The effort to eliminate unnecessary steps and documents in the P2P lending process indicates the lean principle of emphasis on the value stream. Fast processing of information in P2P lending fits the idea of emphasizing information flow in lean management. P2P lending process is initiated by customers, which reflects the pull approach in lean principles. Furthermore, the evolvement of the P2P lending process and the improvement in algorithms show a good example of the lean principle of continuous improvement.

The successful mapping between P2P lending characteristics with the fundamental lean principles opens the window for P2P lending businesses to learn from the rich knowledge base of lean management. The implications of lean management for P2P lending proposed in this study provide directions and tools to continuously improve the lending process, which will result in reduced default rates and provide better service to customers.

There are several venues for future research. First, the scope of the literature review in this study is limited to three databases. Future research could expand literature search to more databases. Second, in-depth case studies can be conducted to explore further details and successful practices of applying lean principles to P2P lending. Third, an empirical study can be beneficial to validate the performance advantage gained by adopting lean principles in P2P lending.

Authors contributions

Dr. Luo and Dr. Zhang were responsible for study design and revising. Dr. Munmun was responsible for the comprehensive literature review. All authors contributed to draft the manuscript and the revision. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Canadian Center of Science and Education.

The journal and publisher adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

Not commissioned; externally double-blind peer reviewed.

Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

Open access

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

References

- Abdi, F., Shavarini, S. K., & Seyed Hoseini, S. M. (2006). Glean lean: how to use lean approach in service industries? *Journal of services Research*, 6.
- Akkizidis, I., & Stagars, M. (2015). Marketplace lending, Financial Analysis, and the Future of credit: Integration, Profitability, and Risk Management.
- Amit, R., & Zott, C. (2015). Crafting business architecture: The antecedents of business model design. *Strategic Entrepreneurship Journal*, 9(4), 331-350. <http://dx.doi.org/10.1002/sej.1200>
- Au, C. H., Tan, B., & Sun, Y. (2020). Developing a P2P lending platform: stages, strategies and platform configurations. *Internet Research*. <http://dx.doi.org/10.1108/INTR-03-2019-0099>
- Bachmann, A., Becker, A., Buerckner, D., Hilker, M., Kock, F., Lehmann, M., Tiburtius, P., & Funk, B. (2011). Online peer-to-peer lending-a literature review. *Journal of Internet Banking and Commerce*, 16(2), 1.
- Baek, H. Y., Cho, D. D., Jordan, R. A., & Kuvvet, E. (2020), The differential effect of social disclosure on loan funding and loan repayment: evidence from fixed-rate peer-to-peer lending. *Managerial Finance*.
- Bateman, N. (2005), Sustainability: the elusive element of process improvement. *International Journal of operations & production management*. <http://dx.doi.org/10.1108/01443570510581862>
- Berger, S. C., & Gleisner, F. (2009). Emergence of financial intermediaries in electronic markets: The case of online P2P lending. *BuR Business Research Journal*, 2(1). <http://dx.doi.org/10.1007/BF03343528>
- Bicheno, J., & Holweg, M. (2000). *The lean toolbox* (Vol. 4). Buckingham: PICSIE books.
- Biswas, A., Jaiswal, D., & Kant, R. (2022). Investigating service innovation, bank reputation and customer trust: evidence from Indian retail banking. *International Journal of Quality and Service Sciences*, 14(1), 1-17. <https://doi.org/10.1108/IJQSS-03-2021-0042>

- Borello, G., De Crescenzo, V., & Pichler, F. (1970), The funding gap and the role of financial return crowdfunding: Some evidence from European platforms. *The Journal of Internet Banking and Commerce*, 20(1), 1-20.
- Canfield, C. E. (2018). Determinants of default in p2p lending: The Mexican case. *Independent Journal of Management & Production*, 9(1), 1-24. <http://dx.doi.org/10.14807/ijmp.v9i1.537>
- Cao, L., Yuan, G., Leung, T., & Zhang, W. (2020). Special issue on AI and Fintech: The challenge ahead. *IEEE Intelligent Systems*, 35(2), 3-6. <http://dx.doi.org/10.1109/MIS.2020.2983636>
- Chauhan, S., Akhtar, A. & Gupta, A. (2022). Customer experience in digital banking: a review and future research directions. *International Journal of Quality and Service Sciences*, 14(2), 311-348. <https://doi.org/10.1108/IJQSS-02-2021-0027>
- Chen, D., Li, X., & Lai, F. (2017). Gender discrimination in online peer-to-peer credit lending: evidence from a lending platform in China. *Electronic Commerce Research*, 17(4), 553-583. <http://dx.doi.org/10.1007/s10660-016-9247-2>
- Chen, G. (2017, December). Exploring parallelism for automatic and scattered investing on P2P lending platform. In *2017 3rd IEEE International Conference on Computer and Communications (ICCC)* (pp. 2479-2483). IEEE. <http://dx.doi.org/10.1109/CompComm.2017.8322981>
- Chen, J., Zhang, Y., & Yin, Z. (2018), Education premium in the online peer-to-peer lending marketplace: Evidence from the big data in China. *The Singapore Economic Review*, 63(01), 45-64. <http://dx.doi.org/10.1142/S0217590818410023>
- Chen, X. H., Jin, F. J., Zhang, Q., & Yang, L. (2016). Are investors rational or perceptual in P2P lending? *Information Systems and e-Business Management*, 14(4), 921-944. <http://dx.doi.org/10.1007/s10257-016-0305-z>
- Dave, B., Kubler, S., Främling, K., & Koskela, L. (2014). Addressing information flow in lean production management and control in construction. International Group for Lean Construction.
- Davis, K. (2016). Peer-to-peer lending: structures, risks and regulation. *JASSA*, (3), 37-44.
- De Koning, H., Does, R. J., & Bisgaard, S. (2008). Lean Six Sigma in financial services. *International Journal of Six Sigma and Competitive Advantage*, 4(1), 1-17. <http://dx.doi.org/10.1504/IJSSCA.2008.018417>
- Doty, D. H., & Glick, W. H. (1994). Typologies as a unique form of theory building: Toward improved understanding and modeling. *Academy of Management Review*, 19(2), 230-251. <http://dx.doi.org/10.5465/amr.1994.9410210748>
- Duggan, K. J. (2018). *Creating mixed model value streams: practical lean techniques for building to demand*. CRC Press.
- Emekter, R., Tu, Y., Jirasakuldech, B., & Lu, M. (2015). Evaluating credit risk and loan performance in online Peer-to-Peer (P2P) lending. *Applied Economics*, 47(1), 54-70. <http://dx.doi.org/10.1080/00036846.2014.962222>
- Fu, X., Zhang, S., Chen, J., Ouyang, T., & Wu, J. (2019). A sentiment-aware trading volume prediction model for P2P market using LSTM. *IEEE Access*, 7, 81934-81944. <http://dx.doi.org/10.1109/ACCESS.2019.2923637>
- Fujii-Rajani, R. (2018). FinTech developments in banking, insurance and FMIs. *Reserve Bank of New Zealand Bulletin*, 81, 1-40.
- Garvin, D. A. (1993). Manufacturing strategic planning. *California Management Review*, 35(4), 85-106. <http://dx.doi.org/10.2307/41166756>
- Gavurova, B., Dujcak, M., Kovac, V., & Kotásková, A. (2018). Determinants of successful loan application at peer-to-peer lending market. *Economics & Sociology*, 11(1), 85-99. <http://dx.doi.org/10.14254/2071-789X.2018/11-1/6>
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of management Information Systems*, 35(1), 220-265. <http://dx.doi.org/10.1080/07421222.2018.1440766>
- Goukasian, L., & Ullman, B. (2018). Headwinds and Tailwinds for Fintech in Equipment Financing. *Education Journal*, 36(2).
- Gu, D., Lu, T., Luo, P., & Zhang, C. (2019), The Impact of Venture Capital Investment on the Performance of

- Peer-to-Peer Lending Platforms: Evidence from China. *Asia-Pacific Journal of Financial Studies*, 48(5), 640-665. <http://dx.doi.org/10.1111/ajfs.12276>
- Guo, L., & Xia, D. (2014). In search of a place in the sun: the shadow banking system with Chinese characteristics. *European Business Organization Law Review (EBOR)*, 15(3), 387-418. <http://dx.doi.org/10.1017/S1566752914001189>
- Guo, Y., Zhou, W., Luo, C., Liu, C., & Xiong, H. (2016). Instance-based credit risk assessment for investment decisions in P2P lending. *European Journal of Operational Research*, 249(2), 417-426. <http://dx.doi.org/10.1016/j.ejor.2015.05.050>
- Hachem, K. (2018). Shadow banking in China. *Annual review of financial economics*, 10, 287-308. <http://dx.doi.org/10.1146/annurev-financial-110217-023025>
- Haque, B., & James-Moore, M. (2004). Applying lean thinking to new product introduction. *Journal of Engineering design*, 15(1), 1-31. <http://dx.doi.org/10.1080/0954482031000150125>
- Havrylchyk, O., & Verdier, M. (2018). The financial intermediation role of the P2P lending platforms. *Comparative Economic Studies*, 60(1), 115-130. <http://dx.doi.org/10.1057/s41294-017-0045-1>
- He, F., Li, Y., Xu, T., Yin, L., Zhang, W., & Zhang, X. (2020). A data-analytics approach for risk evaluation in peer-to-peer lending platforms. *IEEE Intelligent Systems*, 35(3), 85-95. <http://dx.doi.org/10.1109/MIS.2020.2971946>
- Hendriyani, C., & Raharja, S. U. J. (2019). Business Agility Strategy: Peer-to-Peer Lending of Fintech Startup in the Era of Digital Finance in Indonesia. *Review of Integrative Business and Economics Research*, 8, 239-246.
- Huang, R. H. (2018). Online P2P lending and regulatory responses in China: opportunities and challenges. *European Business Organization Law Review*, 19(1), 63-92. <http://dx.doi.org/10.1007/s40804-018-0100-z>
- Jiang, C., Wang, Z., Wang, R., & Ding, Y. (2018). Loan default prediction by combining soft information extracted from descriptive text in online peer-to-peer lending. *Annals of Operations Research*, 266(1), 511-529. <http://dx.doi.org/10.1007/s10479-017-2668-z>
- Jiang, Y., Ho, Y. C., Yan, X., & Tan, Y. (2018). Investor platform choice: herding, platform attributes, and regulations. *Journal of Management Information Systems*, 35(1), 86-116. <http://dx.doi.org/10.1080/07421222.2018.1440770>
- King, B. (2014). *Breaking banks: The innovators, rogues, and strategists rebooting banking*. John Wiley & Sons.
- Kitces, M. (2016). Making the most of P2P loans: In a low-interest-rate environment, these loans are attractive to clients and easier for advisors to pull off. *Financial Planning*, 46, 61.
- Kumar, D. P. P. (2020). Money market executive's perception towards peer-to-peer (p2p) lending. *Journal of Contemporary Issues in Business and Government*, 26(2), 585-590.
- LaFollette, Greg, C. P. A./C. I. T. P., C. G. M. A. (2019). Tech tools. *Journal of Accountancy*, 227(2), 64, Retrieved from <http://mtrproxy.mnpals.net/login?url=https://www-proquest.com.mtrproxy.mnpals.net/trade-journals/tech-tools/docview/2176180320/se-2?accountid=12415>
- Lee, Y. W., Chen, S. H., & Yu, T. (2017, December). Analysis of the impact of collateral on peer-to-peer lending. In *2017 IEEE/SICE International Symposium on System Integration (SII)* (pp. 77-82). IEEE. <http://dx.doi.org/10.1109/SII.2017.8279192>
- Lenz, R. (2016). Peer-to-peer lending: Opportunities and risks. *European Journal of Risk Regulation*, 7(4), 688-700. <http://dx.doi.org/10.1017/S1867299X00010126>
- Li, M., Phan, P. H., & Sun, X. (2021). Business Friendliness: A Double-Edged Sword. *Sustainability*, 13(4), p.1819.
- Li, X., Yuan, J., Shi, Y., Sun, Z., & Ruan, J. (2020). Emerging Trends and Innovation Modes of Internet Finance—Results from Co-Word and Co-Citation Networks. *Future Internet*, 12(3), 52. <http://dx.doi.org/10.3390/fi12030052>
- Lin, X., Li, X., & Zheng, Z. (2017). Evaluating borrower's default risk in peer-to-peer lending: evidence from a lending platform in China. *Applied Economics*, 49(35), 3538-3545. <http://dx.doi.org/10.1080/00036846.2016.1262526>
- Liu, C. C., Niu, Z. W., & Li, Q. L. (2020). The impact of lean practices on performance: based on meta-analysis

- and Bayesian network. *Total Quality Management & Business Excellence*, 31(11-12), 1225-1242. <http://dx.doi.org/10.1080/14783363.2018.1471352>
- Liu, C., & Yan, J. (2017). Researches on Risks and Precautions of Chinese P2P Lending. *Management & Engineering*, (28), 71-76.
- Liu, Z., Shang, J., Wu, S. Y., & Chen, P. Y. (2020). Social collateral, soft information and online peer-to-peer lending: A theoretical model. *European Journal of Operational Research*, 281(2), 428-438. <http://dx.doi.org/10.1016/j.ejor.2019.08.038>
- Loureiro, Y. K., & Gonzalez, L. (2015). Competition against common sense: Insights on peer-to-peer lending as a tool to allay financial exclusion. *International Journal of Bank Marketing*. <http://dx.doi.org/10.1108/IJBM-06-2014-0065>
- Lu, X., Lu, T., Wang, C. A., & Wu, R. (2020), Can Social Notifications Help to Mitigate Payment Delinquency in Online Peer-to-Peer Lending?
- Munmun, M., & Booker, Q. (2021). Heterogeneous Ensemble Learning for Default Prediction in Peer-to-Peer Lending in USA. *MWAIS 2021 Proceeding*, 15.
- Nisar, T. M., Prabhakar, G., & Torchia, M. (2020). Crowdfunding innovations in emerging economies: Risk and credit control in peer-to-peer lending network platforms. *Strategic Change*, 29(3), 355-361. <http://dx.doi.org/10.1002/jsc.2334>
- Pierrakis, Y. (2019). Peer-to-peer lending to businesses: Investors' characteristics, investment criteria and motivation. *The International Journal of Entrepreneurship and Innovation*, 20(4), 239-251. <http://dx.doi.org/10.1177/1465750319842528>
- Pokorná, M., & Sponer, M. (2016), Social lending and its risks. *Procedia-Social and Behavioral Sciences*, 220, 330-337. <http://dx.doi.org/10.1016/j.sbspro.2016.05.506>
- Prosper Prospectus. (2019). Retrieved from <https://www.sec.gov/Archives/edgar/data/0001542574/000141626520000156/prosper-20191231.htm>
- Pur, S., Huesig, S., Mann, H. G., & Schmidhammer, C. (2014, July). How to analyze the disruptive potential of business model innovation in two-sided markets? The case of peer to peer lending marketplaces in Germany. In *Proceedings of PICMET'14 Conference: Portland International Center for Management of Engineering and Technology: Infrastructure and Service Integration* (pp. 693-709). IEEE.
- Rafique, M. Z., Ab Rahman, M. N., Saibani, N., & Arsad, N. (2019). A systematic review of lean implementation approaches: A proposed technology combined lean implementation framework. *Total Quality Management & Business Excellence*, 30(3-4), 386-421. <http://dx.doi.org/10.1080/14783363.2017.1308818>
- Renton, P. (2012). Peer to peer lending crosses \$1 billion in loans issued. *Techcrunch*.
- Tracy, A., & Elaine, M. (2012). Mack moves to cutting edge of P2P lending. *Financial Times*.
- Research and Markets. (2012). Research and Markets: P2P lending - 2012 report featuring many key players such as zoppa, TrustBuddy and MoneyAuction. *Business Wire*. Retrieved from <http://mtrproxy.mnpals.net/login?url=https://www-proquest-com.mtrproxy.mnpals.net/wire-feeds/research-markets-p2p-lending-2012-report/docview/1114468419/se-2?accountid=12415>
- Rosavina, M., & Rahadi, R. A. (2018). Peer-To-Peer (P2P) Lending Platform Adoption for Small Medium Enterprises (SMEs): A Preliminary Study. *International Journal of Accounting*, 3(10), 1-14.
- Segal, M. (2015). Peer-to-peer lending: A financing alternative for small businesses. *Issue Brief*, 10.
- Shen, L. H., Khan, H. U., & Hammami, H. (2021). An Empirical Study of Lenders' Perception of Chinese Online Peer-to-Peer (P2P) Lending Platforms. *The Journal of Alternative Investments*, 23(4), 152-175.
- Spear, S., & Bowen, H. K. (1999). Decoding the DNA of the Toyota production system. *Harvard business Review*, 77, 96-108.
- Tang, M., Mei, M., Li, C., Lv, X., Li, X., & Wang, L. (2020). How does an individual's default behavior on an online peer-to-peer lending platform influence an observer's default intention? *Financial Innovation*, 6(1), 1-20.
- Tao, Q., Dong, Y., & Lin, Z. (2017). Who can get money? Evidence from the Chinese peer-to-peer lending platform. *Information Systems Frontiers*, 19(3), 425-441. <http://dx.doi.org/10.1007/s10796-017-9751-5>

- Tribelsky, E., & Sacks, R. (2011). An empirical study of information flows in multidisciplinary civil engineering design teams using lean measures. *Architectural Engineering and Design Management*, 7(2), 85-101. <http://dx.doi.org/10.1080/17452007.2011.582332>
- USA P2P lending platform website. (2021). Retrieved from <https://www.prosper.com/>
- Van Assen, M. F. (2018). Exploring the impact of higher management's leadership styles on lean management. *Total Quality Management & Business Excellence*, 29(11-12), 1312-1341. <http://dx.doi.org/10.1080/14783363.2016.1254543>
- Wei, Z., & Lin, M. (2017). Market mechanisms in online peer-to-peer lending. *Management Science*, 63(12), 4236-4257. <http://dx.doi.org/10.1287/mnsc.2016.2531>
- Weiss, G. N., Pelger, K., & Horsch, A. (2010). Mitigating adverse selection in p2p lending—Empirical evidence from prosper. Com.
- Whetten, D. A. (1989). What constitutes a theoretical contribution? *Academy of Management Review*, 14(4), 490-495. <http://dx.doi.org/10.5465/amr.1989.4308371>
- Womack, J. P., & Jones, D. T. (1996). Beyond Toyota: How to root out waste and pursue perfection. *Harvard Business Review*, 74(5), 140-151.
- Yan, Y., Lv, Z., & Hu, B. (2018). Building investor trust in the P2P lending platform with a focus on Chinese P2P lending platforms. *Electronic Commerce Research*, 18(2), 203-224. <http://dx.doi.org/10.1007/s10660-017-9255-x>
- Yang, X., Fan, W., & Yang, S. (2020). Identifying the Influencing Factors on Investors' Investment Behavior: An Empirical Study Focusing on the Chinese P2P Lending Market. *Sustainability*, 12(13), 5345. <http://dx.doi.org/10.3390/su12135345>
- Yao, J., Chen, J., Wei, J., Chen, Y., & Yang, S. (2019). The relationship between soft information in loan titles and online peer-to-peer lending: evidence from RenRenDai platform. *Electronic Commerce Research*, 19(1), 111-129. <http://dx.doi.org/10.1007/s10660-018-9293-z>
- Zhang, J., & Liu, P. (2012). Rational herding in microloan markets. *Management science*, 58(5), 892-912. <http://dx.doi.org/10.1287/mnsc.1110.1459>
- Zhao, Y., Harris, P., & Lam, W. (2019). Crowdfunding industry—History, development, policies, and potential issues. *Journal of Public Affairs*, 19(1), 1921. <http://dx.doi.org/10.1002/pa.1921>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).