Society (2021) 58:189–195
https://doi.org/10.1007/s12115-021-00592-w

ORIGINAL ARTICLE

Financial Technology with AI-Enabled and Ethical Challenges

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Accepted: 21 May 2021 / Published online: 8 June 2021

Abstract

Financial Technology (FinTech) has become a disruptive innovation. Being one form of FinTech financing, peer-to-peer (P2P) lending has been widely developed and has grown rapidly for the last few years. The main challenge for P2P lending is on managing risks. FinTech with artificial intelligence (AI) can be used as a strategic tool in mitigating risks for FinTech companies in assessing creditworthiness of a potential customer. However, AI-enabled assessment has created several ethical issues and dilemmas for the stakeholders in the industry. This paper aims to examine the ethical issues and dilemmas by deploying theories of consequentialism and deontology in assisting an ethical decision-making process. An AI-enabled risk assessment will automate processes in understanding potential applicants for P2P lending. The automation process can potentially mitigate any ethical shortcomings as well as the negative impacts in mining the potential customer's data.

Keywords Financial technology · Artificial intelligence · Business ethics · P2P lending

Introduction

Artificial intelligence (AI) is a field in computer science that focuses on developing computer-based systems that would function like humans. AI enables computers to emulate human abilities and perform coordinated physical tasks (robotics) as well as decision-making (expert systems). Over the years, AI is experiencing a massive acceleration that is driven by the ingredients of its breakthrough via high computer power, rapid evolution of algorithms, and most importantly, the vast amount of data generated in the world (Waele, 2016). Nowadays, artificial intelligence is positioned to unleash the succeeding wave of digital disruption which many companies are starting to prepare for (Bughin et al., 2017).

AI was developed to use stored information in making valuable decisions. It is important to ensure data availability extracted from social networks and analytics components for the success of the operation. Adoption of AI in Financial Technology (FinTech) can greatly benefit the decision-makers. For instance, AI has been used for automation processing of instant credit scoring in P2P lending platforms for potential customers (Mulyani et al., 2019; Anshari et al., 2019). It speeds up the process of measuring creditworthiness of the potential applicants. P2P lending relies on data to serve financial inclusion unbanked at speed and scale (Tan & Phanm 2016), while Social Network Site (SNS) data can be incorporated to enrich reliable credit scores by delivering deeper insight into each potential customer in coming up with credit scores.

The paper attempts to examine and address the ethical challenges of AI for FinTech companies in assessing creditworthiness. A brief explanation of the role and process of AI with particular reference to its adoption as creditworthiness assessment strategies is provided. In addition, the theoretical framework of business ethics is also discussed as it is pivotal for ethical compliance and making sound ethical decisions. The paper also highlights and explores utilitarianism and the ethics of duties (deontology); both theories can be used as guidelines to examine and address chosen issues related to AI-enabled P2P lending. Based on these ethical theories, the investigation

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one can better articulate the issues and evaluate whether the applicability of AI on assessing creditworthiness is in line with or contradicts the proper ethical business conduct.

Literature Review

P2P lending has been growing exponentially as a platform of FinTech. P2P lending is reflected as "social lending" or "marketplace lending." P2P platforms assist the borrowers in accessing credit served by a lender group (Mateescu, 2015). In essence, the P2P lending model provides an option to credit facilities associated with the conventional banking systems (Gan, 2017).

Unlike conventional banking, the P2P lending approach provides a direct link between the lenders and the borrowers. Moreover, because the P2P platforms enable involved parties to interact with minimal associated overhead costs, the platforms allow for profits with modest administration fees (Gan, 2017). In the conventional banking system, the process could be lengthy and too much information is required. P2P also enables people without access to conventional financial sources to get their required funding (Anshari et al., 2021).

The first process of P2P lending is the registration stage. Before the borrower can submit for a loan, they have to sign up online and become a member of a particular P2P platform (Ahad et al., 2017). After signing up, the P2P platform requires the borrower to provide the necessary personal and financial information. In normal cases, P2P lending platforms verify whether the borrower can afford to repay his or her loans by checking the employment history and the associated credit history (Aveni et al., 2015). If the borrower has existing fraud records, for instance, the platform automatically rejects their loan requests and marks them as a risky case (Gan, 2017).

In the approval stage, the lenders classify the borrowers according to their risk status, which the lenders can use to determine how much they should give out. On top of that, a given platform's investors or lenders browse the available loan requests and decide which applications to invest in and how much they can fund. Because the borrowers fill their platform profiles with details such as employment history, lenders can decide whether they are willing to risk lending to a particular borrower. The lenders will release the loan if all the requirement and risk calculation has been matched with their criteria (Gan, 2017).

However, the most challenging part of P2P lending is managing risks. Risks in P2P lending are generally caused by default and bad credit (Bella, 2020). The absence of provisions can cause bad debts at a FinTech company. Furthermore, since there is no collateral object in the initial agreement, a FinTech Company might be at risk of getting a bad credit if the borrowers are unable to pay their loans (Hamdan & Anshari, 2020). Although the P2P lending framework provides an alternative to traditional financing from banks, it is susceptible to issues, such as a lack of protection by regulation authorities. The growing popularity of P2P finance has created unforeseen risks for both the customers and the regulatory authorities. For instance, the model has introduced fragmentation into the finance sector, making it more difficult for regulators to formulate the necessary policies at an acceptable rate. On the other hand, the P2P lending approach offers low barriers to entry, which exposes the borrowers and lenders to dishonest activities (Käfer, 2018).

Credit scores usually consider long-term behavior, focusing on payment history, the total amount owed, length of credit history and new credit, and type of credit in use. The evaluation of these categories allows lenders to forecast the future behavior and risk of the applicant. The traditional credit scoring method uses demographic and past performance information to determine future risk. These methods remain at the core of credit scoring and have shown strong separation performance when the required information is available to be scored. At the same time, lenders have constantly been seeking other methods to enhance their ability to assess creditworthiness (Tan and Phan, 2016). When a borrower succeeds in getting a loan, the P2P platform charges the lenders some administration fees until the borrower settles the full loan amount. The P2P lending company usually employs a third party, such as a bank or a debt-collection agency. Whereas banks assist the P2P companies in handling the money, the debt collectors follow up on cases where borrowers default on their repayments (Aveni et al., 2015).

AI-Enabled and P2P Lending

How to assess personal or small and medium businesses (SMEs) of their creditworthiness when they have no credit histories? AI plays a critical role in the development of various businesses (Polak et al., 2020; Guo & Polak, 2021); this includes P2P lending which uses social media as a platform to understand their potential customers or their existing customers. Figure 1 shows how AI performs the advisory process especially in calculating credit scoring for each applicant by using social media data that can be incorporated to enrich reliable credit scores. It delivers deeper insight into each customer as an individual, instead of a number; the lending company can leverage social media to calculate credit scores. Instead of collaterals and financial histories, borrowers are encouraged to share their SNS accounts with the lender to obtain better credit scores tidying up their accounts and demonstrating responsibility and reliability. However, there are no magic formulas or quick fixes for credit scoring, and different lenders have varying thresholds (Tan and Phan, 2016).

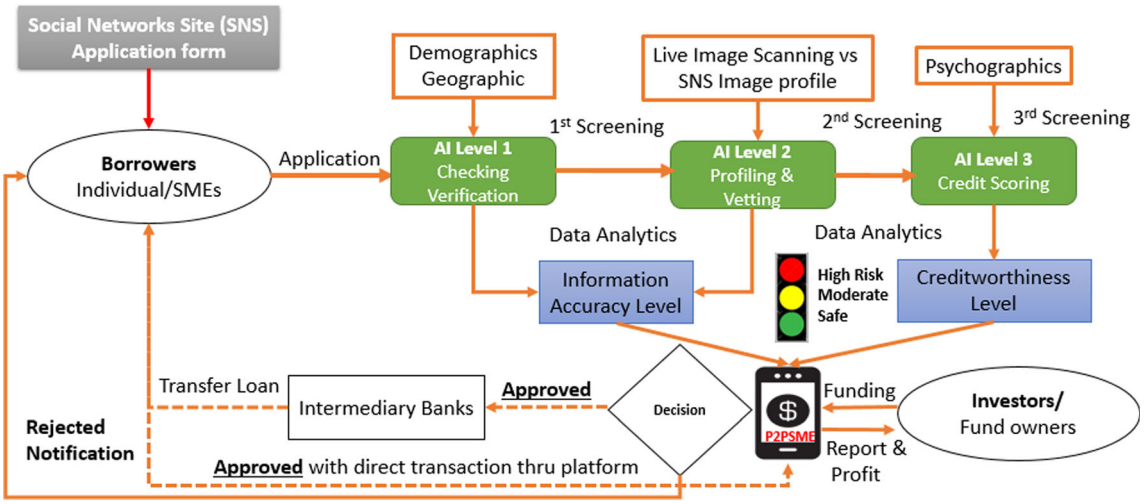

Fig. 1 AI-enabled P2P lending verification for decision-making (source: authors' compilation, 2021)

From the lenders' business process, P2P lending will have different requirements for approving a loan. For personal loans, lenders will check applicants' credit score, debt-to-income ratio, salary, employment status, and credit history. While, for business loans, this includes time in business, personal and business credit score, your debt service coverage ratio, revenue, and profits. In general, borrowers will need to provide the potential lenders with personal information as well as information on housing or mortgage payments, other outstanding debts, employment status and salary, educational history, and details on the loan seeking. The digital platform will verify some of this personal information through a scanned copy of I.D.

AI-enabled Credit Score Engines can generate a good decision. To start the loan application process, the borrower will register on the lender's website. Then the borrower connects the profile with their social networks and grants the lender access to their SNS information. A score will be shown to the borrower, which depends on the information provided in the profile. The score is then used to calculate the interest, or cost, of the loan to the borrower. The process is fully online. Being granted access to the borrower's social media data, the lender can analyze the borrower's social activities directly from their SNS accounts. Furthermore, the borrower's friends are not aware of the borrower defaulting—the borrower can act without fear of retribution. Social pressure is no longer leveraged in our context. As a result, creditworthiness prediction is crucial to the viability of the company.

The P2P lending platform with its AI-enabled features is able to mine large amounts of social media data; this process allows the business to gain insights and better understanding of the risk level for respective customers. AI will analyze demographic, geographic, and psychographic data from potential borrowers' social networks. The outcome of the analysis will verify the identity, calculate the credit score, and determine potential risk (high, medium, low). Psychographics verification may be gathered from many digital footprints given by potential buyers for verifying the level of trustfulness. At the end, AI will advise lenders of the level of risk for each potential borrower. This fact is very important: no one is able to analyze the financial risk associated with lending money as well as AI. The situation, on the whole, is positive for both borrowers and lenders. The next section discusses the business ethics and ethical framework for the case of AI in the P2P lending scenario.

Business Ethics

In terms of business ethics, the concept has a different meaning for different people. Broadly speaking, business ethics study is the study of what is morally right and what is wrong (Velasquez, 2009). It also can be defined more precisely as a relationship of the organization's goals and objectives to its impact on society (Garret, 1970). According to Weihrich and Koontz, business ethics focuses on bringing truth and justice to aspects of business activities such as advertising, customer and public relations, social responsibilities, and corporate behavior within and outside the country of origin (Jalil, Azam, & Rahman, 2010).

Most of the businesses today focus on gaining profit for the growth of their organization and obtaining competitive advantages even when the act is considered to be unethical. This has become controversial in the case of Facebook where they use the user's data to contribute to their revenue. The user data is given to the third business associates of Facebook. This creates potential problems as the data can affect the politics of certain countries, which raises major questions about privacy and freedom. The well-known issues associated with Facebook have contributed to the growing sense of the need to make business ethics a priority for any digitally oriented organization, and to incorporate it as part of the organizational culture (Stodder, 1998).

However, organizations nowadays encounter dilemmas on how to identify which actions are considered ethical and which are not. This is mainly due to lack of standardized guidelines for ethically compliant decision-making. Furthermore, there is the basic structural problem that people are subjected to greed and wealth for their own sake and are even encouraged to do so in a capitalist society, as Adam Smith and Karl Marx agreed. According to the consequentialism theory (egotistical hedonism or psychological egoism), people are motivated by self-interest and all motivations, being essentially selfish, are distinguished only by their results (LaFollette, 2002).

Conceptual Framework of Ethical Decision-Making

A systematic approach helps to decipher the complexity of issues that lead to the best desirable outcomes for most people. The conceptual model illustrated in Fig. 2 presents the ethical decision-making process applied to most of the stakeholders such as local communities, policymakers, organizations, and others. To provide the best decision-making, first a collection of data must be carried out to analyze the case study. Then, the ethical dilemmas are defined in the specific settings with respect to moral intensity; dilemmas or ambiguities occur within each case study. Afterwards, the list of alternative solutions is provided by applying ethical theories to assist in creating better ethical evaluation and decision-making on behalf of related stakeholders. Lastly, better decision-making will be made with a list of possible actions to implement. However, individuals may access the ethical dilemma in a different manner.

Ethical Theory Applied to P2P Lending

This study is exploratory in nature, acknowledging that P2P lending with AI-enabled features is a comparatively new phenomenon and little research available with regard to the ethical issues and their future implications (Zikmund et al., 2013). This exploratory research offers the flexibility recommended by Cooper, Schindler, and Sun (2006) to further explore the area of interest in the future. Typically, exploratory research is qualitatively based which could help to provide a better understanding of the issues (Zikmund et al., 2013; Cooper et al., 2006). Secondary data collection was employed to achieve the objectives of this research.

Analysis

Step 1: Case Scenario of AI-Enabled P2P Lending Referring to the process in Fig. 1, it is with P2P lending with AI-enabled procedures that is able to analyze its potential customer data and forecast their credit scoring to measure a credit risk for applicant. According to Newman (2015), users of Social Network Sites (SNS) tend to be honest in revealing their preferences, likes, and dislikes through the pages they like and

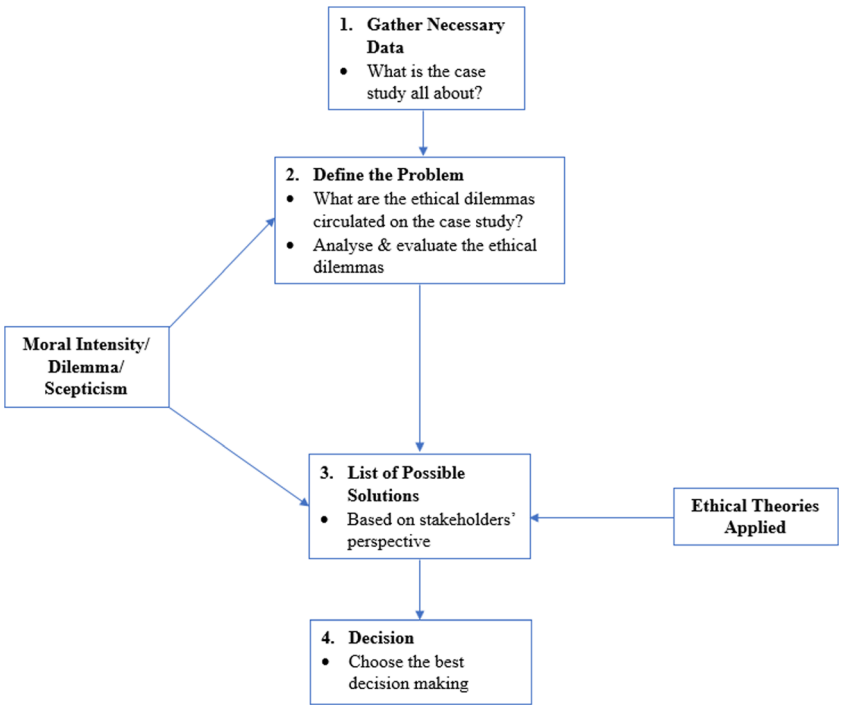

Fig. 2 Conceptual structure of decision-making in stakeholders' perspective (source: authors' compilation, 2021)

posts that they share. Such information is beneficial to the company as they bring insights into what the customer demands and needs. They are able to understand and analyze individual consumers into risk categories through their social media accounts. They get access to information that they may not know about, get promotional offers and other additional benefits. Is it unethical for the P2P lending companies to use AI-enabled in understanding behaviors of their potential customers for mitigating the credit risks? This is a good business strategy for organizations as it allows them to target potential customers based on SNS data mining, storing, and analyzing capabilities. However, ethical issues arise over the privacy concern. This fact leads to a growth of ethical dilemmas that will be discussed in the next step.

Step 2: Ethical Dilemmas from AI-Enabled P2P Lending The most prominent concerns that need to be addressed will be privacy violation and intervention. As seen in Fig. 1, customers must share their SNS to be eligible in getting the service of P2P lending. The utilization of AI in P2P lending has elicited much attention concerning customers and their individual privacy. What does AI do with potential customers' SNS data? P2P lending companies deliberately try to assure the safety of their customer's privacy. However, some doubts may emerge among the customers about the *capabilities or coverage of AI* to assess their creditworthiness or to monitor them without their prior knowledge or their personal data being shared without their consent. It is of course considered unethical behavior to infringe the privacy or intervene against other human rights without their consent (Finn & Wright, 2012).

Step 3: Possible Solutions and Ethical Theories Applied For the third step, ethical theories and principles will be applied to provide alternative solutions for addressing the dilemma on behalf of P2P lending organizations. The two leading theories are discussed below.

Firstly, in fitting into *Consequentialism* theory, one can use the *Utilitarian* principle to understand why P2P lending companies would still use AI-enabled processes as Robo Advisory even though there is still a potential unethical risk. Based on utilitarian moral theory, the morality of an action is calculated by totaling up happiness or well-being created by that action. An action of deploying AI-enabled is considered right if it results in greater happiness over suffering and pain. The advantage of utilitarianism is that the consequences of actions are calculated whereas the disadvantage is that the concern with aggregate happiness neglects the worth of the individual who, although in a minority, may deserve help. Arnold, Beauchamp, and Bowie (2012) view the utilitarian principle in business as driven by how the ethical business decision will provide a greater good for a greater number of people. In viewing AI-enabled risk assessment through the utilitarian principle, we can understand why many companies would take the ethical risk as AI capability does not only benefit the company, but it also benefits many customers in terms of accessing the funding. It is true that the replacement of employees with AI will occur but some argue that technological unemployment does not necessarily cause overall unemployment but rather causes a shift within the labor market due to the demand of technological production change (Anshari, 2020).

Secondly, *Deontology* or ethics of duties are based on moral rules that focus on doing things that are right without considering the consequences. The deontological theory of the use of AI for business use has variable duty ethics in terms of their internal shareholders. In analyzing information privacy or data privacy with this ethical method, there must be corresponding duties for claiming a right to information privacy. Thus, in order to protect the privacy of information, duties that must be determined and imposed are upheld by considering the sources of rights such as privacy. Companies that have viewed AI as the future of their company invest a lot of capital to achieve the opportunities that were created by AI-enabled Robo Advisory systems. By ensuring the maximization of profit, AI utilization is itself the duty ethics for the company toward the stakeholder! The maximization of profit is not the only duty ethics function of AI; the use of AI is to protect employee well-being because the systems are capable of mitigating the risks of the potential loss for the organizations. However, as mentioned earlier, the ethical use of AI as measured by the users of the AI itself (P2P lending companies) may not tend to always ethically benefit the customers.

Step 4: Choosing "Wise" Ethical Decision-Making The fourth step is concerned with choosing the correct ethical decision-making that leads to the possible outcome for overall stakeholders, especially customers. After analyzing the ethical theories such as consequentialist theories in respective of utilitarian rules along with deontologist ethics, organizations must create an action plan to solve these ethical dilemmas. To fully exploit the potential of AI-enabled on P2P lending, there is a need to tackle the ethical issues mentioned above.

A P2P lending company should consider a *utilitarian approach* in its decision-making process to retain the SNS users' trust and to overcome data privacy violations. However, *transparency plays* an essential role in reducing data privacy concerns. The customers are required to trust the company with their data in order to get benefits or services from P2P lending organizations. In regard to matters on consent, the customers should also be provided with proper and clear guarantees that data will not be sold to other third parties without informed consent. This is because to be perceived as being ethical, the company must ensure that the customers are granted control over their personal data, such as providing them with options to opt-out of the data collection. In addition, privacy violations could be handled if there is *transparency* in

the company's privacy policy by stating clearly how the customers' data would be used by giving them options to manage their data profile as well as their information to remain anonymous when given to the third parties. In short, there is *no real utilitarian approach* in the decision-making if a P2P lending company is not willing to be transparent with their customers' SNS data. Therefore, if the company thought of the cost from these consequences and did not violate their customers' data privacy, they might not encounter any greater loss such as compensation payment in lawsuits and losing customers' confidence and trust in them.

On the other hand, the *deontology approach* should be considered in managing the damage caused by a privacy violation. It is the moral duties of the company to respect the users' privacy and make sure they feel comfortable in sharing their personal information. There is a need to *maintain a balance* between utilizing the users' data and limiting the data privacy concerns. The protection of data privacy becomes the moral duty of P2P lending companies without considering the consequences to the company's performances from these decisions.

In summary, the paper is supplemented with two commonly used ethical frameworks to examine how an action of deploying AI-enabled P2P lending should be justified based on the arguments presented in these frameworks. Both utilitarianism and deontological approaches put emphasis on what determines the goodness and badness of an action. However, their judgments differ from one another as both have different views and perspectives of what makes an action good or bad. Nevertheless, these sound ethical theories can help to inform the mentioned issues related to AI-enabled as Robo Advisory for any P2P lending companies.

AI-Enabled Challenges

The challenges of AI are still attributed to the human-made decision of discrimination on the basis of a data correlation regardless of sex, race, language, religion, social status, etc. However, the data does not lead to this sort of discrimination; it is the algorithms that might be programmed by someone to create the discrimination based on some correlations that are possibly inaccurate and ethically wrong. Detecting discrimination in algorithms is very complex and not an easy task. Nonetheless, despite the complexity, algorithms need to be audited to show that they are lawful and eliminate biases. When there is no more discrimination, then it is ethical according to the *utilitarian aspect* because the course of action brings the greatest pleasure to the society and mitigates the company's personal desire in earning more profit. From the *deontology aspect*, the deontologists believe that it is the duty of the company to prevent any discrimination and treat the people equally; hence, this conduct is considered morally right.

Conclusion

The challenges presented by AI-enabled P2P lending have created an immediate need to regulate information privacy regulations and the principles that underlie them to meet the needs of the new era. This is because responsible and ethical data usage is part of the requirements of using data effectively and efficiently, thus the collected data has to be used in a way that is in the best interests of the customers. Awareness and control of the data collection and its intended use could also minimize ethical issues and public concerns. Besides that, all the stakeholders play a vital role in any organization as they are the key to successfully managing the organization where fairness and trust should exist as well as taking social responsibilities. If the problems of the responsible and ethical usage of AI in the sphere of P2P lending would be successfully solved, very positive consequences for the financing of people and enterprises will come. Some platforms allow the use of P2P financing for the investment in loans from hundreds of other banks and so to support corporate financing and the development of corporate activities. Extending the possibilities of financing companies with additional resources can contribute to their development and thus to society-wide progress, such as the development of employment and the development of structurally disadvantaged regions. Sometimes it is possible also to come across the P2B loan designation. In this case, it is a peer-to-business. And investors, people, lend to businesses here. In this case, a well-developed AI system including well-managed ethical issues could open significantly new opportunities for financing companies with credit resources. Nevertheless, for business loans, AI analysis also includes time in business, personal and business credit score, the debt service coverage ratio, revenue, and profits. This data is important for the lenders to ensure the convenience of lending. If there will be personal data protection assurance, there will be more incentives to lend money to companies. Undoubtedly, loans to entrepreneurs as natural persons will play a special role, because in this case, they are P2P loans, but intended for business purposes.

Declarations

Conflict of Interest The authors declare no competing interests.

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