A DIGITAL LOAN PLATFORM

Technical field

[001] The present invention relates generally to the field of financial technologies applied in supply chains from end to end through a mobile phone software application and more particularly, relates to a loan guarantee system for providing a digital loan platform to a user of a supply chain especially agricultural supply chain.

Background

[002] During recent years, with rising economy lending practice has been on the rise where residential properties or gold items are used as collateral demands to provide an amountof money and the amount of money is termed as loan. The market value of residential properties be validated by some means and on basis of market value, the loan amount is sanctioned to borrower by lender. Basically, the banks and the credit card companies are the loan provider. The borrower incurs a debt, and is usually liable to pay interest on that debt along with the principal amount borrowed. The process of applying and obtaining loan is very complicated and time consuming as it involves number of variables, regarding the loan, the lender, the borrower, and the number of parties involved in the loan process.

[003] However, banks or financial institutions are unwilling to offer loans to the underserved communities (like farmers) due to the lack of credibility of borrowers. Generally, credibility is defined as transparency, trustworthiness, and moral predictability established by borrowers before banks or any financial institution. The credibility is measured in terms of current financial datasheet of borrower, or the value of collateral and sometimes a guarantor solve the purpose. Therefore, based on the credit score or credibility loan is sanctioned and rate of interest is further decided. Due to failure of credibility parameter as demanded by banks,

borrowers in especially underprivileged or underserved communities resort to informal loans with exceptionally high interest rates from their lenders.

[004] The credibility parameter has hit farmers severely. The farmers who are more prone to file loan applications before banks have to secure credit lines. The credibility of borrowers is based on various parameters like capacity, capital, conditions, character, collateral etc. Even if farmers secured loans from banks, banks are located too far away (few hours' drive), bringing inconvenience to farmers to travel just to cash out their loans. The other participants of agricultural supply chain also encounter various challenges like financial Institutions e.g. banks are unable to expand into the untapped markets due to the higher default risk of underserved communities, buyers of agricultural products (e.g. FMCGs) that purchases the agricultural products for manufacturing of their products are aware of the rising sustainability concerns from consumers and they want the assurance that their suppliers stick to sustainable behaviour and practises. There is an emergent need of a banking system which can provide smooth banking process in order to provide loan to underserved communities especially farmers.

[005] Virtual banking was the only solution to counter problems faced by farmers. But virtual banking did come up with less paper work formalities but credibility was still matter of concern. In and of the art, US'947B2 discloses a computer-implemented interactive virtual banking system and method for connecting a user environment with a banking environment for facilitating banking transactions. The system includes a computer memory storing a plurality of banking application programs and an interactive virtual environment generator for generating an interactive virtual banking environment, the environment including visual and audio components. The system additionally include a user input sensing mechanism for accepting and interpreting user voice input received in the interactive virtual banking environment and computer processing components for accessing the stored banking application programs and executing the stored banking programs within the generated interactive virtual banking environment enabling the user to perform banking tasks through voice input to the interactive virtual banking environment. However, measurement of credibility was not disclosed.

[006] Moreover,the farmers have no access to transparent and reasonable interest rates for financing as banks have little information about these farmers and their livelihood, giving rise to higher default risk that banks are unwilling to take. As a result, farmers resort to informal loans with exceptionally high interest rates from their buyers. However, in one of the relevant art, AU'423B2 discloses a method that comprises the steps of displaying a plurality of documents to a credit applicant, receiving a plurality of credit data sent from the credit applicant; matching an electronic credit application to a filter comprising a plurality of selection criteria; transmitting the credit data to a plurality of lending institutions via one of four methods; and responding to the credit applicant via a computer network. The documents sent to the credit applicant include a series of questions pertaining to their desired loan, followed by the appropriate type of loan application. This solution provided by above art does not address problems faced by farmers. The loan process has become simple and faster but still farmers are not able to receive loans.

[007] It is to be noted that a farmer's loan credibility can be validated or monitored only by physical flow of goods in a supply chain. The physical flow of goods can help in assessment of credit score of a farmer or any participant of entire supply chain. Financial Institutions like banks are unable to expand into the untapped markets due to the higher default risk of underserved communities. Moreover, this method has not been disclosed in any of the related prior arts.

[008] In and of the closest art, WO'0051 discloses a loan application platform for the general public. The platform works by the digitalisation of loan application and provides lending anytime, anywhere. The cited document provides feature of recording the transactional data regarding loan disbursement. The document mainly discloses a loan system utilizing a mobile app applicable to network equipment consisting of a mobile phone, a server, a third party serving server, and a bank server and operating via a mobile communication network and an Internet connection. The loan system utilizing applicant software comprising a group of sub modules designed for specific purposes. A client can fill in application information for a loan and use the

Feidai mobile app system to perform a cash withdrawal operation and a loan repayment operation. The document also provides the feature of face scanning which helps to check whether the operation is carried out by client personally. Thus, the system disclosed by cited document eliminates the paper work, saves the travelling time to bank and provides easy accessibility to loan. However, the relevant art does not talk about a method to make underservedcommunities bankable with end to end supply chain digitisation. Moreover, the cited art fails to verify user information in real time and various financial institutions are unable to reach untapped markets to expand customer base, recording information about how loans are used.

[009] It is quite mandatory to design or configure a system that would overcome the aforementioned problems and shortcomings. Presently, existing systems are merely designed for making loan application simpler and quicker using a network system but they are completely mute on a digital loan platform to assess and validate creditability of underservedcommunities in order to provide loan.

SUMMARY

[0010] Consistent with disclosed embodiments, systems and methods are provided for managing a financial loan application by means of a digital loan platform. The embodiment may disclose a system that constitutes a mobile phone, physical card, a server and third-party server and a bank server linked by using a mobile communication network and Internet. Specifically, a software application can be installed on a mobile phone or any computing device, wherein the application is configured to design a digital loan platform that can be accessed by any user anywhere only when connected to the Internet. Moreover, the above design is empowered by a digital finance using GPS location. Instead of setting up a physical infrastructure or sending manpower to capture data, data of all supply chain participants are collected through the financial transactions as a by-product. However, this data is essential in predicting a more

accurate credit score for banks to decide on the loans and fulfill the sustainability requirements of ultimate buyers/ corporate.

[0011] In one of the preferred embodiments of the invention, a loan guarantee system for providing a digital loan platform to a user using a location of the user has been disclosed. The system comprises of: an online network device communicatively coupled to a third party server and a financial institution server. The online network device comprises of: a user interface, a digital camera and a computer processor for processing a collection of software components. The collection of software components is stored in a computer-readable memory on a single platform. Moreover, a loan card embedded with a machine-readable code may be an integral part of the abovementioned system. The collection of software components comprises a verification module, a credit score module, a digital money wallet module and a traceability management module. The verification module comprises of: a video module configured to allow the user to receive video calls or film a video of himself doing certain actions and key in relevant information about the user in real time, a video verification module designed for digitally checking the received video for any issues hindering verification of the user remotely; and if the issues is detected, the video verification module display a message for a manual verification of the relevant information about the user, a loan approval module configured for approve or reject loan depending upon output of the video verification module and an update module to required to provide information on his farm such as the location of his farm and the mapped area(Know-Your-Farm). The credit score module comprises of: a transaction module configured to receive a transaction data from the user, which is constantly updated and it includes a KYC data, a KYF data, a KYT data and a loan amount; and the transaction data is sent to a credit score generator module, the credit score generator module applies an algorithm to calculate a dynamic credit score of the user, the dynamic credit score is variable and include a set of integrated data points and an assessment module approves the loan amount if the dynamic credit score is above an official credit score set by a financial institution and rejects the loan amount if the dynamic credit score is below the official credit score set by the financial institution and then a manual assessment of the dynamic credit score assessment is initiated. The digital money wallet module

may receive the loan amount in a digital card and the digital card is used for a commercial transaction. The traceability management module further comprises a transaction module receive a location of the commercial transactions done by the user to create a transactional data, the transactional data is updated with every new commercial transactions.

[0012] In the preferred embodiment of the present invention, the present invention claims a global integrated virtual banking system. The system is constituted with a mobile phone application installed on a mobile phone, a server system, physical card, a third-party service server, and a bank server linked with each other by using a mobile communication network and Internet. The mobile phone application comprises four modules named as Digital On boarding module/Non face-to-face eKYC, AI ESG/Credit score module, Virtual Card in Application module, and Traceability Management module, which all work together to achieve the desired objectives. The agricultural supply chain financing and traceability management system is empowered by digital finance using GPS location instead of setting up a physical infrastructure or sending manpower to capture data. Data of all agricultural supply chain participants are collected through the financial transactions as a by-product. This data is essential in predicting a more accurate credit score for banks to decide on the loans and fulfill the sustainability requirements of ultimate buyers/ corporate.

[0013] In another embodiment of invention, a computer-program product for designing a digital loan platform has been disclosed. The computer-program product may be tangibly embodied in a machine-readable non-transitory storage medium. The storage medium includes instructions executable to cause a processing apparatus to allow the user to receive video calls or film a video of himself doing certain actions and key in relevant information about the user in real time, digitally check the received video for any issues hindering verification of the user remotely; and if issues are detected, a message is displayed for a manual verification of the relevant information about the user. A message is displayed “on boarded” after checking and authenticating the received video and the received video providesinformation on his farm such as the location of his farm and the mapped area (Know-Your-Farm). At the onset, an initial credit

score is digitally computed based on the KYC and KYF data only. The credit score, upon receiving the transaction data streams from the user, will be constantly updated based on an mathematical algorithm or an artificial intelligence based algorithm, where a KYC data, a KYF data, a KYT data will be integrated together to determine the loanable amount, tenor and applicable interest rates with higher accuracy. In summary, the algorithm will calculate a dynamic credit score of the user where the dynamic credit score is variable and includes a set of integrated data points, and then the requested loan amount is granted ifthe dynamic credit score is above an official credit score set by a financial institution and rejected if the dynamic credit score is below the official credit score set by the financial institution. On account of rejection of the loan amount, a manual assessment of the dynamic credit score is initiated so that credit score can be improvised accordingly. The user may receive the granted loan amount in a digital card and the digital card can be used for a commercial transaction and to receive a location of the commercial transactions done by the user to create a transactional data, the transactional data is updated with every new commercial transactions.

[0014] In the preferred embodiment of the present invention, the present invention claims a method of global integrated virtual banking system where any participant/user from agricultural supply chain first selects the loan type and group of people peers as guarantors and then the information related to user is stored by scanning his or her identity card, by carrying out location mapping of farm for KYF verification, taking photos of collateral and initiating a video call for non face-to-face KYC verification in the Digital on boarding/Non face-to-face eKYC module of the mobile application. The information from Digital on boarding/Non face-to-face eKYC module is fed into AI ESG/Credit score module configured with a third party engine which in turn is incorporated with a fixed algorithm that will then generate a credit score. The approval of loan is dependent on the AI credit score generated. After the approval of loan, the user's credit line will be approved in the mobile application. Credit lines are represented by virtual cards in the mobile application, which are tailored such that it can be only used for specific purposes. This ensures that the loan disbursed is used for its intended purpose, closing the loop of lending and spending. For example, one card can only be used to purchase fertilizers while the other can be used only to

purchase crop protection products. Virtual cards also exist in the physical form that allows users to pay and collect money. Physical card can be used whenever there is a lack of/disrupted Internet connectivity in certain location of the rural areas. The mobile application allows banks to restrict the flow of funds to specific entities and control the usage of credit lines for its intended purpose only. Hence, for a user that has indicated the purpose of loan was for the purchase of agriculture inputs, only transactions to agricultural input providers on ecommerce section will be approved when he/she uses the credit line. If the user wants to use the credit line to pay for anything that differs from indicated purpose (for example, paying for his own household expenses), the transaction will not be approved.

[0015] In the preferred embodiment of the present invention, the present invention claims describe that with the use of virtual/ physical card, three types of information is recorded in the mobile application. The information regarding the funds like payment, collections, loans and repayment of loans are recorded each time a transaction takes place. The exact location of the transaction will also be captured (Know-Your-Transaction), the information regarding goods like exact location of the harvest, agricultural inputs that goes into the harvest and the information about the participants of agricultural supply chain like, who is the farmer, sub agent, lead agent; mill, buyer (Know-Your-Customer), farm size and location (Know-Your-Farm).

[0016] In an another preferred embodiment of the present invention, the present invention claims a traceability management module which keeps the track of location specific data points from end to end supply chain to empower digital finance. Participants can observe the location of harvest. Physical location (using GPS) of transaction will be captured live and regularly in the application with every scan of the QR code or any machine-readable code. With location-specific transactional data, buyers of goods can predict and detect areas of issues of national conservation land encroachment as live capture of the GPS location provides a better understanding of the route through which harvests are transported. In addition, data can be accumulated to analyze the behavior of borrowers. For instance, when a farmer is the borrower, data of their purchase of inputs and harvest yield can be accumulated over the years to analyze

his productivity and buyers can provide suitable incentives to motivate them to produce higher yield. Financial institutions have data on the borrower's income to monitor their default risk. Agricultural input providers have knowledge on the type of agricultural inputs used by respective farmers and can do more targeted marketing on the ecommerce section.

[0017] In another embodiment of invention, generation of a sustainability heat map or a dashboard has been disclosed. The sustainability heat map is prepared using KYC, KYF and KYT data. KYC is Know Your Customer, KYF is Know Your Farm, KYT is Know your Transaction. KYC is created as soon as verification of user or farmer is done by means of video calls or by manual verification. KYF is created as soon as mapping of farm or any land is performed by a farmer. KYT is created to track location of payment transactions between farmers, traders and mills or between any other business owners. The generation of sustainability heat map depends upon transaction location, farm location, agents or traders, farmer certification and land status.

These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating preferred embodiments and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The embodiments herein will be better understood from the following detailed description with reference to the drawings, in which:

[0019] FIG.1 illustrates an exemplary system for creatinga digital loan platform for the user consistent with disclosed embodiments.

[0020] FIG.2 illustrates flowchart of an exemplary loan application process consistent with disclosed embodiments.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0021] The embodiments herein and the various features and advantageous details thereof are explained more fully with reference to the non-limiting embodiments that are illustrated in the accompanying drawings and detailed in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable those skilled in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

[0022] FIG.1 discloses a loan guarantee system **(100)** for providing a digital loan platform to a user using a location of the user has been disclosed. The system comprises: an online network device **(140)** communicatively coupled to a third party server **(102)** and a financial institution server **(104).** The online network device comprises: a user interface **(106),** a digital camera **(108)** and a computer processor for processing a collection of software components **(114)**. The online network device may be any computing device with a configurable processor. The collection of software components **(114)** may be a mobile application. The collection of software components is stored in a computer-readable memory **(110)** on a single platform. Moreover, a loan card **(112)** embedded with a machine-readable code may be an integral part of the abovementioned system. The collection of software components comprises a verification module **(116)**, a credit score module **(118)**, a digital money wallet module **(120)** and a traceability management module **(122)**. The verification module**(116)**comprises a video module **(124)** configured to allow the user to receive video calls or film a video of himself doing certain actions and key in relevant information about the user in real time, a video verification module **(128)** designed for digitally checking the received video for any issues hindering verification of the user

remotely and if issues are detected, the video verification module **(124)** displays a message for a manual verification of the relevant information about the user.

[0023] A field officer (checker) will check with user to confirm his details face-to-face and non face-to-face through remote video conferencing before submitting this application to the finance officer that will then decide to approve or reject his loan application. Moreover,a loan approval module **(126)** may be configured to approve or reject loan depending upon output of the video verification module and an update module may be required to provide information on his farm such as the location of his farm and the mapped area(Know-Your-Farm). Moreover, any updates to the user's information can be updated by himselfby means of the update module **(130)**. The farmer may be required to provide information on his farm such as the location of his farm and the mapped area(Know-Your-Farm). From the KYF data, farmers are mapped into low, mid and high risk.

[0024] The credit score module **(118)** further comprises a transaction module **(132)** configured to receive a location of the commercial transactions done by the user to create atransactional data constantly updated based on an algorithm, the transactional data includes a KYC data, a KYF data, a KYT data; and send the transaction data to a credit score generator module (**134**); the credit score generator module (**134**) initially digitally calculates a credit score based on the KYC and KYF data and the credit score is updated to calculate a dynamic credit score of the user using an algorithm, the dynamic credit score is based on the constantly updated transactional data. The dynamic credit score is variable and includes a set of integrated data points and an assessment module **(136)** to approve the loan amount ifthe dynamic credit score is above an official credit score set by a financial institution and reject the loan amount if the dynamic credit score is below the official credit score set by the financial institution and then a manual assessment of the dynamic credit score is initiated. The digital money wallet module **(120)** may receive the loan amount in a digital virtual **(138)** card and the digital card is used for a commercial transaction.

[0025] Prediction of default probability allows banks to make more informed choices about lending. As soon as Know Your Costumer (KYC) and Know Your Farm (KYF) are approved, the farmer or any loan applicant can then conduct transactions that can be tracked by the credit score module. Moreover, there are three factors considered before a loan is approved – the loan amount, the confidence level/credit score generated by a third party engine and the credit score criteria set by lenders. However, the credit score criteria or credibility differs based on the bank's appetite. KYC, KYF, KYT data and loan amount may be fed into a third party engine with a fixed rule algorithm that generates a credit score/confidence level.

[0026] There are different scenarios available to credit the loan depending on the credit score calculated by the credit score generator module. For instance, 1st scenario: loan amount is low and a high confidence level is generated. When this confidence level is above the credit score criteria set by lenders, this loan can be automatically approved. 2nd scenario: loan amount is high and subsequent confidence level generated by engine is low. This loan will automatically be rejected based on credit score criteria set by lenders. In this case, a risk specialist will step in to conduct a manual credit assessment of the borrower, advice on next steps and see through the process so the credit score improves and ultimately the loan is approved. Through this process, the system will learn how the risk specialist assesses the credit and in the long run, conduct risk assessments automatically with higher precision.

[0027] Credit score is dynamic and changes with every new transaction recorded on the updated module. KYC and KYF details tend to be static while KYT is updated with every newtransaction. Moreover, there can be credit scoring for two different purposes: Short term prediction (6-12months loans): for working capital and Long term prediction (2-5 years). A separate ESG score that takes into account Environmental, Social and Governance factors is also generated and this affects the credit score. Previously, FIs only have access to a borrower's personal data such as his income to determine his credit. However, in this system, it is recognised that his income is also largely dependent on his upstream and downstream participants of the supply chain (buyers of his goods and seller/supplier of the harvest), hence the

application makes use of the integrated data points of all participants to derive a more accurate credit score for bank.

[0028] Take for instance, a mill wants to take a loan to purchase harvest. For a bank to better predict the mill's credibility, they can leverage on the data about his buyers and sellers/suppliers. Sellers/suppliers: Data on the yield of mill's suppliers will be recorded on the application. If the yield of his suppliers is dropping, this translates into less supply and less income for the mill as well. Hence, banks having knowledge of his supplier's yield also helps to predict the mill's future income and assess the possibility of repayment. This information is critical to determine an accurate credit score for banks and minimise default risk. Buyers of mill's final product: Information on the buyer's demand of product and requirements set on mills will determine the mill's income. This in turns affect the credit score of the mills.Hence, banks having information on the demand of mill's buyers will affect the willingness of banks to lend. For instance, due to rising sustainability concerns, buyers of the product requires their products to come from sustainable sources and are not grown on peat or protected land. If the application detects a high frequency of past transactions between mills and collectors occurring on the protected areas, their ESG score will drop and subsequently the overall sustainability and credit worthiness of borrower will drop as well.With every new transaction, the ESGscore will be recalculated and reflected on the sustainable heat map.

[0029] FIG.2 illustrates flowchart of an exemplary loan application process or methodwhich is executed by a processing apparatus. The processing apparatus is configured to allow the user to receive video calls or film a video of himself doing certain actions and key in relevant information about the user in real time at **(202)**, digitally check the received video for any issues hindering verification of the user remotely at **(204)**; and if issues are detected, a message is displayed for a manual verification of the relevant information about the user and then approve or reject after manual verification at **(206)**, approve or reject loan after checking the received video at **(208)**, provide information on his farm such as the location of his farm and the mapped area(Know-Your-Farm)at**(210)**, a transaction module configured to receive a location

of the commercial transactions done by the user to create a transactional data constantly updated based on an algorithm, the transactional data includes a KYC data, a KYF data, a KYT data; and send the transaction data to a credit score generator module.

[0030] The credit score generator module initially digitally calculates a credit score based on the KYC and KYF data and the credit score is updated to calculate a dynamic credit score of the user using an algorithm, the dynamic credit score is based on the constantly updated transactional data; the dynamic credit score is variable and includes a set of integrated data points at **(212)**, to approve the loan amount if the dynamic credit score is above a official credit score set by a financial institution and reject the loan amount if the dynamic credit score is below the official credit score set by the financial institution and then a manual assessment of the dynamic credit score is initiated at **(214)**, receive the loan amount in a digital card and the digital card is used for a commercial transaction at **(216)** and receive a location of the commercial transactions done by the user to create a transactional data, which is updated with every new commercial transaction at **(218)**.

[0031] Each of the steps described herein can be performed using a general purpose computing device, e.g., a personal computer, personal digital assistant, and/or computing device that is in communication with a network, e.g., internet, intranet, or extranet, that includes a memory and a set of instructions, that is, logic, specifically scripted to perform the functions, steps, communications, and data manipulations described herein. As the present invention is not limited to any specific instruction set, e.g., code, usable to implement one or more aspects of the present invention, and as those skilled in the art are well aware of the ways to instruct such a computing device to implement such functions, steps, communications, and data manipulations, further details of such specific instruction sets will not be provided here so as to not obscure the present invention. While one or more of the functions, steps, communications, and data manipulations can be performed by hand or by a computer-implemented instruction set, the present invention is not limited to any one sub combination thereof. Data gathering can be performed manually, in a semi-automated manner (e.g., given to a human person who then

inputs the data into a computing device's memory), or in a fully-automated manner (e.g., the customer interacts directly with a computing device to input the data into a computer's memory). As will be readily appreciated by those skilled in the art, the present invention also includes the use of multiple computing devices on a communications network (including the use of removable memory media to transfer data between devices), including that the computing device via which data is input by any one human user is different from a computing device that implements decision instruction sets.

[0032] As mentioned, there remains the foregoing description of the specific embodiments will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments.

[0033] It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention, the disclosure is illustrative only. Changes may be made in the details, especially in matters of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.