datanomers
ACTIONABLE INTELLIEGENCE

Fintech Platform – Powered by Big Data

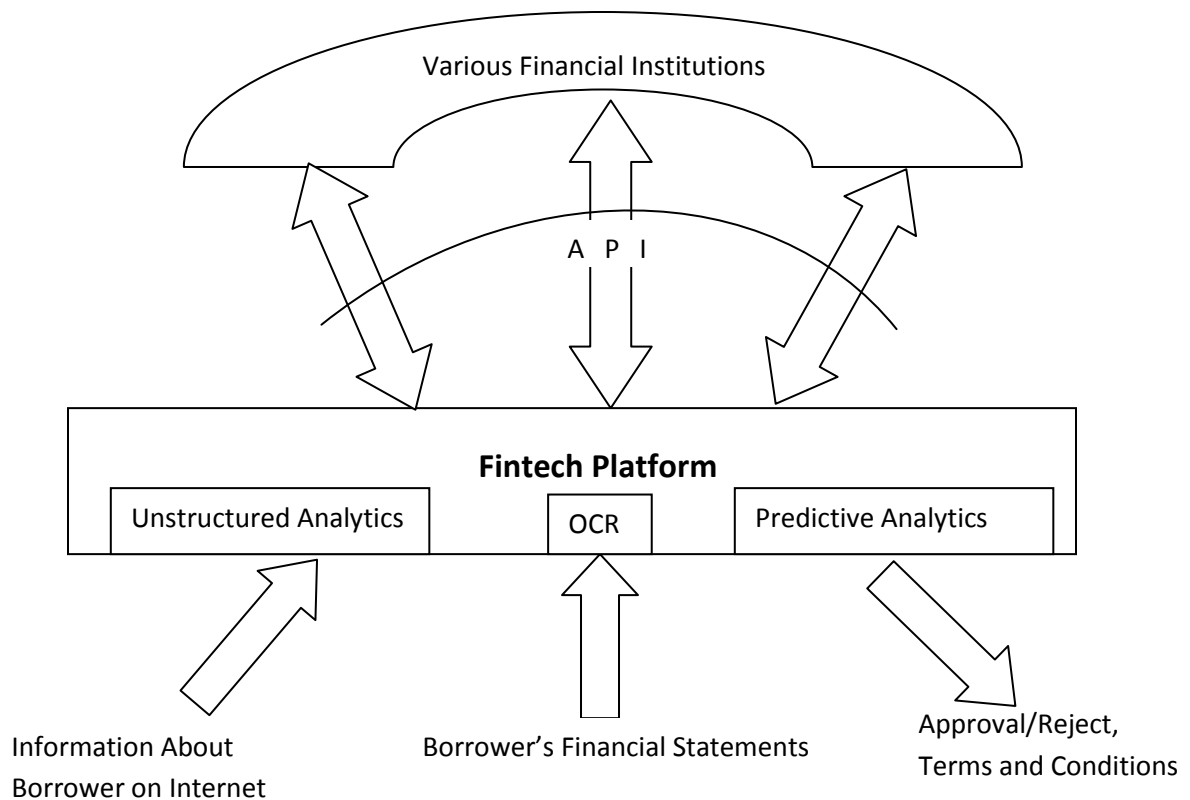**How to enable digital banking**

November, 2015

White Paper on Big Data

What is Fintech Platform

Ever submitted a mortgage pre-approval request? You need to call the broker, fill out an application, fax your bank statement and pay stubs, and then wait for a couple of days while your records are entered into the system by the underwriter for approval – a tedious process that takes a couple of days before you get your pre-approval. What if it just took a couple of minutes! That's the promise of Fintech platform.

How to Build a Fintech Platform

Please consider the figure below.

Various Financial Institutions

A P I

Fintech Platform

Unstructured Analytics

OCR

Predictive Analytics

Information About
Borrower on Internet

Borrower's Financial Statements

Approval/Reject,
Terms and Conditions

The end user – a consumer for home mortgage, a commercial borrower for small business, many others – submits the applications electronically. Not all records are available electronically. More often than not, the bank statements are paper copies. They are scanned in. The APIs for receiving the information must automate the process. For instance, the paper copies must be read by the machine, digitized via OCR, relevant records extracted, and then dispatched to the platform for processing.

There are many other pieces of information that are required. Underwriters routinely scan the Internet for public information about the borrower and his assets. This is unstructured information, typically in natural language like English. The system has to crawl the Internet to access the information, execute natural language processing to extract the pertinent details, quantify it and then feed to the platform for processing.

Once all the information is gathered, the platform evaluates the application:

- As a broker, it just relays the information to various big lenders via APIs for approval, or
- As a funding company, runs a statistical model on the data to see if the applicant qualifies, and if so, what should be the terms of the loan.

Clearly, the requirements are considerable.

## What are the Challenges for the Technology

Several challenges confront the technology that powers the Fintech platform. We exemplify some of them:

- How can the technology transition to a paperless transaction? How can paper copies be digitized? Optical Character Recognition (OCR) is used to digitize, but its accuracy is suspect – imagine the error if digits are read incorrectly from a balance sheet! Further, the information is in different formats for different banks. Semi-structured processing must extract the correct information.
- How does the system retrieve the pertinent information about the borrower from the Internet? It must have a web crawler, backed by a search engine to retrieve relevant information and then feed it into a natural language processor to extract the relevant details. This is a very challenging assignment.
- How good is the statistical model that processes the collected information for approval? Does it have high accuracy (doesn't approve loans to potential defaulters) and coverage (doesn't miss out and not recommend loan to a good borrower)? The legacy rules-n-thresholds models are simple, but can fail for those who fall on the boundaries of the thresholds.
- A good model approves loans correctly. But it ages over time. The predictive model has been derived from training data that belongs to a time period in the past. Business is dynamic. It'll morph as its environment changes. The model ages, not able to predict as accurately for the new business environment. The trust disappears. Gains in efficiency and cost savings to be realized through automation are not possible.

How Datanomers Overcomes These Challenges

Let's examine the key points raised above.

We discussed how a reliable model predicts accurately, but ages over time, losing its accuracy and coverage. What if the model could adapt itself automatically to changing environment? - A self-adaptive intelligent machine that not only predicts from analysis of new data but also studies it carefully to adjust its statistical model to perturbations. Please consider the figure below.
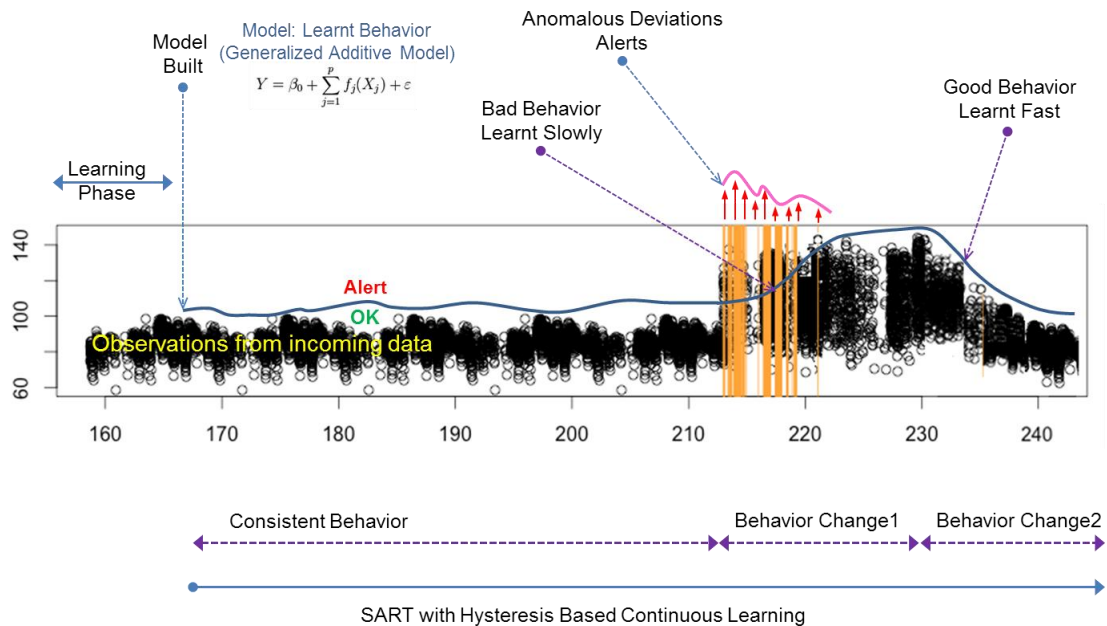
The machine has self-derived the statistical model; its threshold is the varying blue line. It's breached towards the end – around day 215, prompting the machine to alert vigorously. Over the next fortnight, the machine notices that its alerts go unheeded. The machine wonders if its alerts are false positives. Very grudgingly, over several days, it adapts its model to this new norm and stops alerting. The machine self-learns from the feedback!

If the behavior returns to old normal, the machine automatically adapts again to this perturbation – this time quickly, with low hysteresis, because it's learning a good behavior.

For the Fintech platform, the feedback is the underwriter's decision. If they continuously over-rule the machine for a class of borrowers, the machine automatically learns and adapts from this.

There are many such marvels of Datanomers' advanced technology:

- Proprietary statistical machine for OCR (morphological operators tied to network of NNs for accurate digitization of financials),
- Processing unstructured analytics for semantics (sophisticated ensemble learning) of information in public and private domain to detect fraud and build an accurate risk profile,
- Transparency of prediction by the model (how to dashboard visually the reasoning that went into predicting approvals or disapprovals of loans, underwriters understand and trust it), and
- Alignment of the solution with the workflow of the underwriters (it adds immediate value, without extensive training).

These make Fintech platform possible.

In Summary – A Vision for the Future

The whitepaper offers compelling reasons of why self-adaptive machine learning from Datanomers can power tomorrow's Fintech platform – like no one else can. Specific examples – risk profile analysis, automation of workflow with OCR, and others – are provided.

There is a strong strategic vision for Datanomers' Fintech platform. In closing, we briefly discuss this.

Imagine if banks could have intelligent machines mine their database of clients, determine the ones with low risk profile, do business intelligence on their enterprise to develop a story of how they can grow their business, then offer them loan to achieve this growth! A win-win situation: banks lend with low risk, create a sticky customer, and the customer grows their business. All this - proactively, not reactive lending as is the norm today. And all of this done by machine, automatically, with human oversight.

Datanomers' Fintech will help banks realize this vision.