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A Giant Leap Toward Privacy of Customer's Personally Identifiable Information

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Abstract

Traditionally, a service provider needs to and does know the Personally Identifiable Information (PII) of his customer, e.g. a telecom service provider knows his customer's telephone number, a banker knows the balance in the account and the insurance company knows the details of the premium and sum insured. In this paper, we challenge the necessity of this point with the bank as a concrete case for the said point. The paper begins with the early mode of banking that was more like safe custody operations. Obviously the trust was of paramount importance. Subsequently the formal notions of money and currency evolved necessitating the book keeping and hence the banker was aware of the balances in individual accounts. We then underline the need for privacy of account balance and demonstrate how the automation has made it possible that banking could go on without need for the banker to know the balance.

Banking Evolution

Banking originates in Babylonia out of the activities of temples and palaces which provided safe places for the storage of valuables. Initially deposits of grain are accepted and later other goods including cattle, agricultural implements, and precious metals [1]. In that era the main purpose was safekeeping of the goods and commodities and the notion of interest as a rent for the money. Many deposits consisted of valuables stored in jars, leather bags or bronze drawers, much like safe-deposit boxes today [2]. What objects are placed in a sealed pot were not known to the person whom it was entrusted.

As the money was conceptualized as a means of a standard, an exchange and a store, formal procedures were designed for counting the incoming money and its receipt. Lending that was initially limited to the festive occasions or construction of civic infrastructure became wider in its purpose. The concept of money then developed further, the clay tablets came into being as the tokens that then transitioned

through several forms like metal coins, paper currency, cheques, plastic money and finally e-wallets.

Accounting

It would be pertinent to trace the relevant accounting practices that originated from the sole trust and went through editions of manual and electronic records. We will then demonstrate how it is possible to come full circle to a point where a banker need not know his customer's balance, at least in a routine set of transactions.

In the ancient times, a trading plaza used to be a sort of market place where merchants from the villages in the vicinity would assemble to sell the produce they have fetched from their hometowns and to buy the goods they could vend to fellow people of their village.

Having come from distant places fighting against all the odds of travel, these petty merchants would then make a round in the plaza to judge the cost and quality of the goods to be traded. Moving around with the money on-person would involve an obvious risk that was averted by depositing it with some rich wholesaler/ respectable figure in the market place who would simply keep the custody of the money bags of such merchants without even knowing, let alone counting the contents. This original act – based on absolute trust – was a trigger for subsequent banking transactions.

The origin of the banks found in these trusted deposits and safe keeping later on took another form of exchanging such deposits with a written receipt. Down the line, instead of merely maintaining the physical custody of the contents – most of the times it would be money – these wholesalers started a system of using the money for a limited and agreed period. Later on the notion of interest also got developed that served as a rent for the money used. This is where banking profession got into book keeping for all the transactions.

Need For Privacy

Privacy has been a burning concern in respect of personal data handed over by a layman to his service provider like bank, telephone company, electricity supplier, etc. It requires a delicate balance between limited disclosure that is necessary to facilitate the service provisioning and secrecy essential to guard against undesired data leakage. Snooping and gaining access to such private data has now become a big business. Moreover, it also poses direct threats like ransom, black mail and extortion and indirect infringement threats like unsolicited advertisements.

Needless to say that if data like bank balance is compromised it will invite some troubles ranging from appeal for investment to intriguing advertisements encouraging spendthrift to extortion to hacking to spear phishing to ransom-ware and so on. It may be pertinent to recall that all staffers are not above the bar all the times as numerous surveys have time and again pinpointed that two out of three embezzlements are outcome of an insider defrauding the organization.

Given all this, How I wish that none other than me should know my balance! Not even my banker! But is it possible? Assertion by automation is affirmative!

Cloak of Automation

Having introduced the relevance of the topic, let us now turn to the core of our discussions. As put forth in the foregone sections, initial banking had one of its services as merely custody keeping; Not book keeping. Later on, as we moved to record maintenance, posting the debit and credit entries and casting the balance was imperative. It needed paper in the form of ledger, scroll etc. and tools like ready-reckoners, mechanical ledger posting machines, electronic calculators, etc. From the standpoint of our present subject, a common denominator across all these gears is the human intervention of banker. And on this backdrop, the present automation in the form of computers, mobile phones, ATMs or Internet has a strikingly different unique feature, viz. minimal human intervention of the bank!

The pie of branch level transactions across the counter show a steep decline from 94% to 12% over the last decade [3]. This has paved way for banking transactions without banker's intervention! If that seems to be a pipe dream, here is how that is feasible; across all the stages of data life cycle.

Privacy Across Data Life Cycle

Data input, which used to be from paper to computer via key punching by the banker, has now advanced to a stage where most of the data inputs (barring few exceptions like account opening) are reaching the bank directly in computer-ready form, e.g. salaries and dividends via electronic credit clearing, retail payments via NEFT, bulk settlements via RTGS, foreign inward remittances via SWIFT, etc. Self-initiated transactions of the customers are also keyed in by the individual account-holders themselves via modern delivery channels described above.

Data processing within a bank like interest posting in deposit as well as advances accounts, commission on remittances like demand drafts and levy of other service charges are by and large automatically calculated and posted. Even the stop payment cheques are also taken care of by automated systems.

Data output in the form of periodic statement of accounts is an automated process triggered at regular intervals by the system and the dispatch is largely through emails, again without human intervention at a bank. If a customer requisitions an extract, that also follows the similar un-manned process. Some other reports have to be filed with the government and/ or regulator like Reserve Bank of India for monitoring and compliance. Many of these reports are essentially statistical compilations that do not reveal individual balances or transactions. A few reports do have individual balances listed, but interestingly these en-mass reports are generally in the computer-readable media like tapes; they hardly travel in a human-readable form.

Controls

Although most of deposit accounts and transactions would thus need no banker intervention, it is not denied that there would be some exceptions where a banker still needs to step in, e.g. loan to be raised against deposit, court orders, regulatory submissions, high net worth individuals, etc. An exhaustive treatment for each such scenario cannot be described here for the sake of brevity, as each case would need process assessment, risk evaluation and control design. However, based on the

context, these cases could be subjected to the managerial and/ or technical controls to be deployed to tackle these transactions.

Technical controls of advanced nature could be designed to do away with perceived necessity of banker intervention and such controls in the form secure authentication, cryptography-based delivery, sophisticated automation, etc. could take care of the cases like loan against deposits, regulatory submissions, etc.

Managerial controls would be required in some other cases where a banker needs to know the balance for some reason or other. These cases could possibly be tackled with controls like access privileges, prior approvals, audit logs, periodic checks, etc.

Conclusion

After weighing the trade-off between the existing relaxed privacy & its implications on clientele on one hand and the feasibility of the enhanced privacy made possible with the controls to be deployed, it could be asserted that a banker no longer needs to know the balance of his depositor! That privilege is a past as Bill Gates' quote, 'World needs banking, not banks!' started getting discussed on social media websites like Linked In [4], FaceBook [5], etc.

Future Enhancements

Having discussed the need for privacy of bank balance and having outlined the ways and means to achieve it, now we turn to extending it to other bits of personal data that a depositor discloses to her banker. Such fields include, date of birth, address (both physical one i.e. postal address and the logical one i.e. email address), landline telephone number, cell phone number, etc. Typically, all such details of the spouse/ partner of the depositor are also handed over to the banker while opening a joint account. Isn't it possible to make the privacy of these details also more robust? Answer is affirmative and its broad sketch is given in the next section where we extend the problem to other sectors.

It is not just a bank whom a citizen declares some of his personal details, but the list goes on to cover few more organizations like insurance companies, hospitals, landline/ cell phone service providers, utility service agencies, local municipal corporations, government offices like income tax, etc. One needs no prophet to underscore the need for data privacy across all these organizations. Like bank balance, the relevant pieces of data that need secrecy could be taken up for computation. Next, secure software modules could be designed, coded and tested to handle the decisions around these fields. A few examples of these so-called decisions are: tax computation by the government, premium computation by the insurance company, property tax computations by local municipal bodies, etc.

Some specific limitation of the software might be encountered in regulatory or judicial cases. There a generic solution could be developed around the nucleus of digital signatures. Needless to say, it may not be possible for every single citizen to enjoy this specialized service as it presupposes basic requirements on the part of the

willing citizen who wishes to avail this higher degree of privacy. These requirements are:

- A certain level of knowledge about basics of cryptography so that the functionality is clearly understood
- Capacity to pay subscriptions of the certifying authorities (CA) that are empowered to offer digital signature capabilities under the cyber laws of the land

Given this, it is technologically feasible to ensure an informed consent from such citizen to those cases where revealing her personal data is necessary. The complex solution would embrace both technological as well as managerial elements. Deliberation on such a composite solution would be subject matter of a separate paper.

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