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## The Ongoing Revolution In Personal Finance Services

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## Summary

In this paper we develop a simple hypothesis:

AI is revolutionizing personal finance and the revolution is happening now – not in a few years.

## Industry Scope

To see the scope of the revolution let us quickly survey the current state of the field. It is divided into a number of different services which consumers purchase:

**banking services:** payment accounts, saving accounts, medium term CDs, credit cards and wire transfers

**payment services:** small dollar domestic and international payments, installment purchase plans

**mortgage services:** origination and refinance, servicing

**property insurance:** car and real property insurance, possibly hobby vehicle insurance

**life insurance:** term, disability, permanent and annuity

**health insurance:** primary, supplemental and specialty line

**investment services:** custody, trade execution, financial planning, portfolio management, security loans

**government benefits:** claims for social security, disability, medical, veterans benefits

**tax preparation:** state and federal

**legal services:** wills and trusts (writing and administering)

This list is incomplete. It omits services purchased by consumers who own a small business, real estate services and a variety of niche services (e.g. pet health insurance.)

Even so the list is enough to show that we are discussing a huge array of services collectively amounting to about 20% of the national economy.

## 1. Organizational Structure

Typically each service line is served by a siloed organisation fairly narrowly focused on the particular service. True, some of these silos have been wrapped up into corporate conglomerates which attempt to realize efficiencies in cross marketing or supervision. But even these conglomerates are not highly integrated internally.

Most of these siloes have a common structure. A marketing operation recruits prospects. A sales organization closes prospects and provides an ongoing point of contact. A sales support organization inputs data from the client and organizes it for consumption by an operation department. The operation department reviews the paper work and either nixes the sale or proceeds with fulfillment. A fulfillment organization then does whatever is necessary to actually deliver the service. A compliance department documents the activities of the sales and marketing operations to prevent client abuse. An audit department tracks money and credit flows. A risk management organization monitors firm and/or client exposures. IT and facilities organizations look after firm infrastructure. A management organization keeps all these departments aligned and functioning in approximate harmony.

### **Character of the Industry**

For the most part providers are very mature process driven organizations. There may be some activity in new product development or new market entrance, but at most financial firms these are fairly minor activities. As a result, these firms often lack the internal know-how to respond to environmental change. Instead they rely on consultants and acquisitions to keep the firm up to date with equally slow moving industry peers.

Although they are mature organizations, most financial firms are not impressively efficient organizations. Most of the internal effort has gone into preventing internal theft, delivering service reliably, avoiding regulatory violations or customer liability. In short the primary focus is loss

prevention rather than cost control. Basically each human employee is a possible point of loss and watching these unreliable firm components consumes substantial effort expressed through layers of management and audit and compliance departments. These costs afflict all members of the industry, however, and so the costs may be passed on to clients. As a consequence, firms only need to achieve industry level efficiency. Typical of mature industries, many services exhibit an oligopolistic industry structure which is cost tolerant.

### **Change Agents**

What is changing this industry is the willingness of clients to engage with the industry through computer interfaces. The leader here was the banks which created first ATMs and later online banking services. The public found that these delivered far more convenience than waiting in line for a teller or local branch officer. As a result bank lobbies are practically ghost towns today and banks are actively shrinking their real estate footprint. More importantly, everyone under age 80 has been conditioned to doing their financial business online.

Among financial services there are two great axes of division: transactional versus relationship and professional versus merchant: **Transactional services** are used episodically by clients. Some examples are mortgage brokerage, other loan origination, insurance brokerage, and benefit claiming. **Relationship services** are used either continuously or at least on a regular basis. Examples here are banking, portfolio management and tax preparation. **Professional services** are sold on a fee for service basis. Examples are portfolio management, tax preparation and legal services. **Merchant services** are sold on a bundled product price. Most banking and insurance services, for instance are provided on a merchant basis.

These two great axes control how clients interact with providers and thus by extension what sort of online presence is viable for each type of provider. When the service is transactional the online presence is almost entirely about prospect recruitment and generally only minimally about service delivery. Basically its not worth the client's trouble to learn how to interact with a firm online if the client is not

going to have a continuing relationship with the firm. Once the interaction involves a continuing relationship, the online presence can switch to an emphasis on service delivery. Here the key factor is whether the relationship is professional or merchant. In a merchant relationship the client is naturally guarded in what they tell the provider. Information flows are limited to the minimum needed. In professional relationships, the more information the client provides generally the better the service the professional can render and so information flow is both fuller and at a more conceptual level. Thus three different kinds of online presence exist: sales oriented, transaction oriented and professional service oriented.

### **Opportunities For AI**

AI has great potential to contribute to all three forms of presence, but how it can contribute depends on the basic setting. The most basic AI is the chatbot. It delivers stock answers to familiar questions. It contributes most to sales oriented sites where it can help prospects sort through a portfolio of product offerings to find the item they are looking for. However, chatbots are not quite at the point where they can close sales. Clients still want human contact at the point of first sale and firms have to be careful about unreliable chatbots misselling items. Where it is currently possible for the computer to close sales is on repeat purchases and upgrades in service level. As the public gets more comfortable with sales automation, computers may end up taking over most routine sales.

The second application for AI is in customer support. Basically what is required is the ability to translate customer questions (posed in a natural language) into database queries and service requests which can be served through the firm's existing infrastructure. Currently firms accomplish these service requests by having trained users talk to client's on the phone, operate the firm's internal computer system and deliver the results back to the client. Generally customers are dissatisfied with customer support as it exists today. They find it slow and frustrating to interact with and only a minority of support agents have the personality to successfully defuse that frustration. AI will take over this activity fairly soon as matching the quality of the current

experience is not hard. Probably by the second generation of deployment, AI delivered customer support will be a higher quality experience than human delivered customer support.

These first two applications of AI are nice, but they do not represent a revolution. Where the revolution happens is in the delivery of professional services by AI. Most professional financial services are applications of rules and knowledge. Currently these are not implemented as algorithms, but in many cases they can be reduced to algorithms. Once the service is expressed as an algorithm the computer's superior powers of computation come into play. Financial professionals are trained on rules of thumb and other quick heuristics suitable to no compute or low compute environments. High power computing permits deeper analysis and more systematic consideration of possibilities. This deeper analysis results in better decisions with the result that an AI can displace a human professional.

Let us give an example to illustrate this point. A client needs a mortgage. A mortgage broker chats with the client for a bit to place the client in some bucket. From experience the broker knows that the right type of mortgage for people in this bucket is say a thirty year conventional mortgage. Quickly checking a web app he knows the various vendor's current rates. Again from past experience he knows which lending programs this borrower is likely to qualify with and he routes the application accordingly. A to-and-fro occurs with the lender's underwriting department and eventually a firm loan commitment emerges. Possibly there is an opportunity to accessorize the deal with a rate lock and that detail is pinned down. The whole process takes about a week which is quite stressful for the borrower. Eventually the borrower walks away with his loan, possibly with warm feelings towards the mortgage broker and generally high distaste for the whole process.

Now let us think how an AI would do the same process. It will secure input from the client – most likely through an online form as this is a familiar interface most users are comfortable with. It will query other systems to get additional information – e. g. credit ratings and current loan rates. It sorts through many alternatives evaluating which is the best

fit for this specific client. In about one minute it concludes that a 25 year conventional loan with no rate lock is what is wanted. It submits a request for proposal to the vendors's systems and gets back the results. It selects the winning vendor, completes the application required by the vendor and submits it. The vendor responds within a minute with a conditional approval. The AI gives the client the good news along with a list of any additional documents required to close. Let us assume the application was complete as submitted and no further documents are needed. At the vendor perhaps the file is reviewed overnight by a human. Or perhaps the vendor's internal systems decide that step is unnecessary. Final approval comes back the next day along with electronic closing documents. The borrower meets with the notary that day to finalize the transaction. This notary visit is perhaps the only time a human is involved in the entire process. Let us stop to appreciate what has just happened. First, the borrower got a loan that fit his needs better and perhaps was at a better rate than what the old process would have delivered. The whole process occurred with minimal time and basically no stress on the borrower's part. Second, the mortgage broker has served his client better and gained competitive advantage against his peers who continue to do business the old way. Third, the lender has avoided a host of internal error points, compliance costs and supervisory burdens. Human costs in the process have been reduced from \$5,000-\$10,000 to \$100-\$250. Cost reduction has come with a reduction in internal errors which implies savings from business not lost and loans not erroneously made. In short, the service is much better.

### **Architecture of an AI System**

Note that we describe this system as an AI. We do so because it passes the Turing test of replacing a human in a specific job. But the system is most likely not a large language model (LLM.) To be sure an LLM is probably present as a component in the system. But the system will engage many other components as well, for instance network tools to communicate with external systems, scenario evaluators to help with product selection, databases to keep a record, report writers to generate needed documents and user interfaces to allow human supervisory personnel to keep an eye on the system. What the LLM will contribute to this total

mix is facilitating easier interactions – particularly with client's who are untrained one time users of the system.

### **An AI-centric Industry**

Hopefully this example has convinced the reader that smarter, friendlier better integrated software can make a place for itself in this particular financial service. Now let us step back and look at the landscape with a wider lens. Clients prefer to deal with one software rather than many different vendors softwares. Let us suppose a client has in front of them an AI which is omniscient about their financial life. Even before the client has asked for a mortgage loan the AI has identified that emerging need. It has already contacted the appropriate mortgage broker system and gotten loan proposals from it. It has evaluated these proposals in the context of the client's financial life. The results have been delivered to the client in some highly digested form such as “With regard to your plan to buy a house you can manage a price up to X without difficulty. If you cannot find anything you like at that price point, you could stretch as far as Y but some modest changes in other spending plans will be required to make this work.” Or perhaps X and Y have already been fed into a real estate shopping program and what is actually delivered to the client is a list of candidate homes to purchase.

We all interact with the financial service industry. Even those of us who work in the industry and understand its functioning do not enjoy the client experience. Everyone can see that the future I have described will deliver a much better client experience at much lower cost than the current industry can.

### **The Road to the Future**

But on what time scale? Is this some Buck Rogers vision that might appear in a generation or is it product that is shipping today? I would submit that most of this way of doing business is already operational. Take my own firm Lloyd Tevis Investments. It already embodies the financial omniscience required. The data links between various providers already exist, for instance in the Plaid tools. The capacity to poll vendors for offers exist in various electronic marketplaces that have been created. The ability to scan a real estate market for houses meeting multiple criteria exists in Zillow



and Trulia. Closing documents are already routinely signed through Docusign. In short, most of the components have already been created and are lying around waiting to be wired together.

Once the new approach is up and running to some extent it becomes for existing vendors just another channel to plug into. Initially the desire to build business leads them to open APIs to internal systems and provide support. Then a network effect takes over. As more firms connect the value of connection rises. The lower cost of this way of business makes this the preferred channel. Eventually the decision to centralize on just this channel is taken and older ways of doing business are sunsetted.

In short, an AI-centric financial service industry can self assemble through the locally optimizing behavior of incumbent firms. As noted, the incumbents are not known as innovators. This process revolution will likely be driven by outsiders – consultants, technologists and VCs – delivering packages that the incumbents can assimilate along side existing business activity.

### **Conclusion**

So I would say the answer to the timing question is this: “The component technology is here now, the integration work is not hard, but financial services is a conservative process driven industry that assimilates change in its own unique way. Ultimately compelling cost reduction will force this through – probably much faster than finance industry insiders would expect, but perhaps not as fast as change makers would wish.