

P E R S P E C T I V E

Adoption of Modern Core Systems in U.S. Banks

An Analysis through the Diffusion Adoption Model



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Around the globe and especially in the Asian regions, banks have taken the decision of moving out of their legacy systems and going ahead with modern core banking replacement procedures. The transformations in these markets are quite rapid and have either reached their final stages of implementation or are up and running on new core banking systems. These have been happening at a slower pace even though the global economy is reeling under a financial crisis of the worst kind.

The same revolution is not the case in the U.S. banking industry. Banks in U.S. have been badly hit by the recessionary wave and have not been keen to replace their IT systems. In fact there was never an intense strategy in U.S. banks to move out completely from their legacy systems. Time and again the decision makers have played safe and kept on enhancing their mainframes to perhaps keep their costs low and avoid the untried risks of modern core systems. But innovation is definitely required in some way to keep pace with the other markets and bear the pressures of a drooping economy.

The business attitude and the barrier to change to new systems have made it difficult for IT vendors with modern core systems difficult to move into the U.S. market. This has been the trend in the past, but now there is a new wave of a potential change,

mainly due to the current banking scenario, economic landscape, technological advantages and a constant need to innovate.

For IT vendors, before making huge investments into newer markets like U.S., it is important to understand the market, the demand for innovation and especially the demand and adoption of newer and modern core banking systems.

This whitepaper is an effort to forecast the market potential of modern core banking systems in the U.S. markets in the present and the future by analyzing the benefits of modern systems and the lacunas of old legacy systems. There are several strategies to analyze this situation, but here the analysis is based on a simple mathematical model called the “Diffusion Model”. The model will eventually quantify the adoption rate and the actual number of customers who may move to the modern core banking system.

Core Banking Adoption in U.S. Market - Factors

The adoption of modern core banking systems in U.S. banks can be depicted by the “Adoption Model” below. The model depicts the factors that influence the adoption rate which can eventually derive the potential customers who may move to core banking replacement.

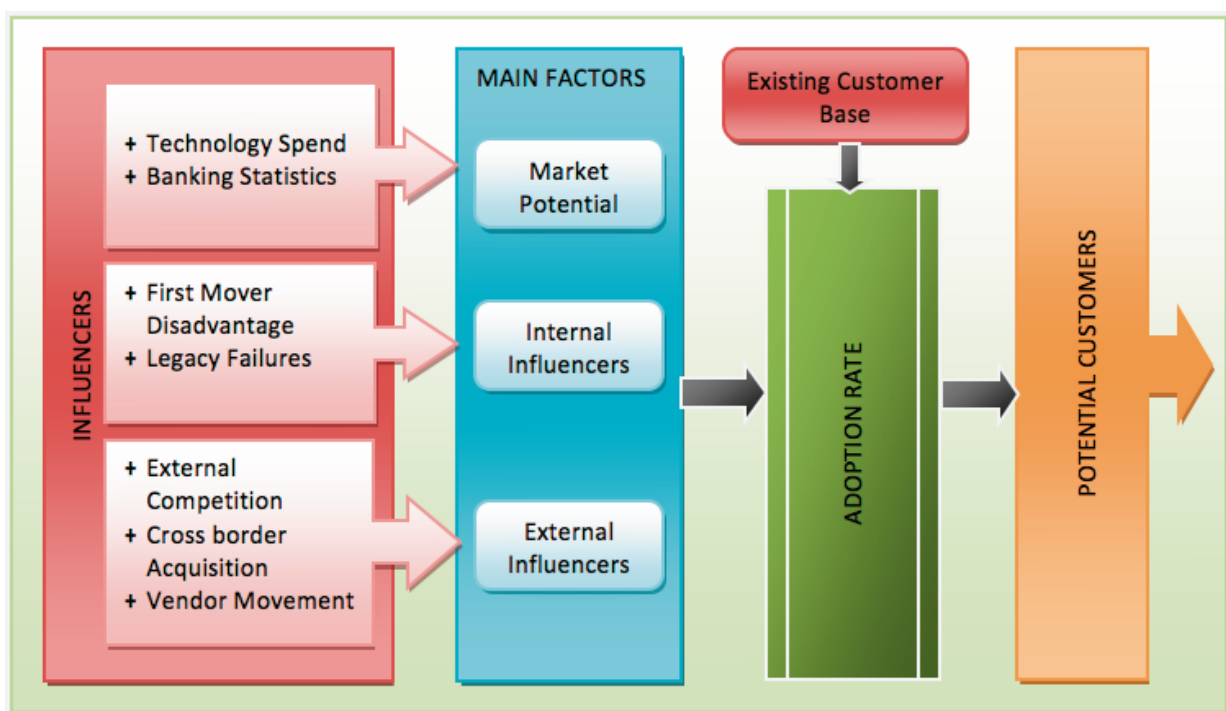


Fig 1- Adoption model

In subsequent sections, each of these factors have been analyzed in detail, and finally a mathematical Diffusion Model is used to analyze the adoption rate and actual customers that will move to modern core banking systems each year.

Market potential

There are 2 components of market potential, technology spending and bank statistics.

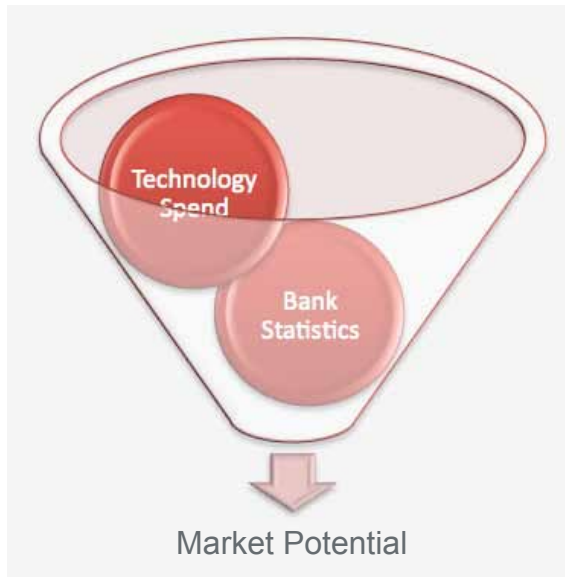


Fig 2- Market Potential

Technology spending

The IT spending in percent terms is definitely declining, but the absolute figures are increasing.

“As per researches conducted in North American banks, IT spending will grow to \$50.3 billion this year, a slight increase from \$49.4 billion in 2008.”

This is a clear indication that banks are still looking to modernize their IT systems. The focus of this spending will mostly be on enhancing their existing system as well as have systems that can do better risk analysis. The spend on risk assessment would be more because of the current economic slowdown, which has made banks more cautious than before. Even though the banks are playing safe on their wallets, the current economic landscape has made the banks realize the need to rely on systems that can churn out ‘intelligent data’ to increase efficiency and reduce risks. IT spending figures also give an indication on the dependency of banks on technological enhancements.

Further, to achieve “Lean IT Management” banks are concentrating on investing more of this IT budget on Lean initiatives. Lean initiatives as per the success factors in Asian banks have mostly been achieved through consolidations and better integrations through core banking replacements.

It is estimated that 60-70 percent of IT budgets within financial services are currently spent on these activities. These costs could be reduced up to 30 percent or more over several years with the right tools and the approach that Lean IT can provide.

Internal influencers

First mover disadvantage

The U.S. economy was into a phase of development much before the other world economies. The banking system in U.S. also went through multiple revolutions and with dollar as the most sought after currency, U.S. banks had enough money to strategize on the technological advancement. In the era of 70’s and 80’s Mainframe core banking vendors encashed this opportunity and this led to the implementation of many legacy mainframe core systems in U.S. banks.

Since then, technology has evolved so has the banking; but the legacy change could never evolve much because of its own architectural issues. The first mover advantage has now become a big disadvantage when there is a plethora of newer technologies and efficient integrated systems available.

Why legacy systems will fail now

The current economic crisis has opened an array of challenges for banks. These can be grouped into 5 major challenges that U.S. banks face today.



Fig 3 - Legacy Failure Factors

Consolidation

Most banks have either closed down their business, or have been taken over, or have merged together. Larger banks will eventually become larger and few smaller ones will fade out. However, small and midsize banks will also have to re-look at newer business avenues or differentiate themselves to survive the competition. The competition is becoming more and more intense and survival will depend on how banks bring more differentiation. Mergers and acquisitions also mean a merger and integration of technological platforms. Legacy systems are not flexible enough to handle such integration capabilities, while modern core banking system is designed to handle complex integration, smooth transition and maintenance of data under such circumstances.

“The key point is that consolidation in this space will be rampant, driven by mergers of necessity where companies combine because the opportunity is compelling and the sellers have to exit.”

Managing risk

Due to the recession there has been a huge wave of regulatory changes in the banking domain. The regulatory bodies are empowered with more authority to keep a control on exaggerated banking activities that led to the biggest housing crisis, and eventually led to a global economic depression. The changes in regulations requires banks to rapidly change their operations and technology that support the operations. Even further, banks have learnt a lesson and have been investing in better risk management and analysis solutions. There is a shift from “aggressive volumes banking” to “intelligent banking”. Enhancing legacy systems to accommodate such rampant changes require tedious coding and constant maintenance. With skilled resources and documentation shrinking on the legacy front, banks are facing stiff technological challenges. On the other hand, modern core banking systems are mostly built on latest technologies and definitely provide an infrastructure for easy enhancements, maintenance, availability of skilled resources and customization features. Not only have they provided proactive transparency but also intelligent data for detailed analysis. With complex integration

capabilities such data can easily be fed to multifaceted risk analysis systems to better manage risks.

Cutting costs

The current situation in U.S. banks demands cutting costs to the minimum. Some may argue that under such circumstances investment in modern technologies like core banking systems is not viable. But there is an advantage in terms of total cost of implementing such modern core systems and other long term benefits. The flexibility, customizations, scalability, maintenance, training, resources, hardware and software costs turn out to be much lower than old legacy systems. In the recessionary environment banks are fast realizing that they need such modern systems which have known advantages, and which will eventually bring about efficiency and lower costs.

New business avenues

Banking in the U.S. has become more competitive and there is a struggle to survive. Under such conditions differentiation through new product innovation is the most desired way. But banks are finding it increasingly difficult to launch new products as the legacy systems do not support the flexibility for quick time-to-market or scalability. Supporting new initiatives, bringing new products to the market, entering new geographies and restructuring operations are not easy with old legacy solutions. U.S. bankers have realized the success of such elements in Asian markets where modern core systems have been implemented. The numbers and volumes that new core systems can support, along with time-to-market advantage is definitely a winning point.

Customer focus

In times of crisis, retaining and acquiring customers has become more competitive. There is now an increase in customer focus and security. Integrated channel connectivity, 24x7 capabilities, unified CIF, customer response time, transaction response time and enhanced customer security are the call of the day. Legacy systems, if not impossible, have huge complexities in achieving such features. A modern core system is the way to go to achieve such efficiency and service levels.

External influencers

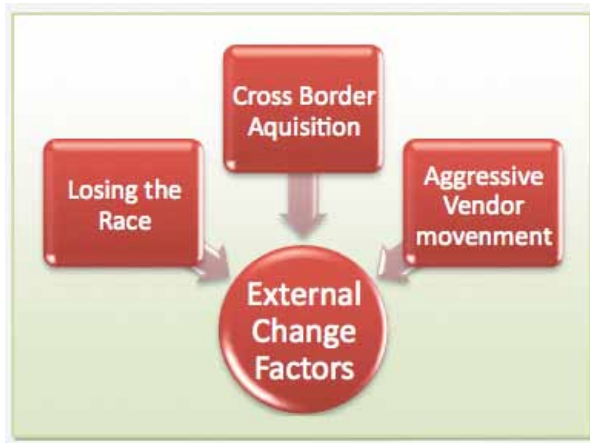


Fig 4 - External Factors

Losing the race

Many non-American and non-European markets have already moved to modern core systems and have displayed efficiency and cost reduction. Recent surveys have indicated that economic slowdowns have not affected many Asian banks as in the U.S. and technology support to survive the competition and recession is huge in such markets. U.S. banks are realizing and closely watching the success points of Asian banks and considering modern core banking system replacements.

Cross border acquisitions

The recession in U.S. is an opportunity for global non-U.S. banks to acquire U.S. Banks. Emerging Asian markets will see more growth and there is a likelihood of banks in such markets acquiring U.S. and European banks. The sellers will definitely want to move out and there will be opportunities for some buyers during this recession. This will require standardization of technology platforms in the U.S. market, because most Asian banks run on modern core systems.

Aggressive vendor movement

Since long, modern core banking vendors have been trying to get a share into the U.S. banking market. The economic slowdown and growing importance of modern core systems have pushed the vendors more aggressively into the U.S. market now. There is also saturation in Asian markets, economic benefits in the middle-east and African markets is not huge, while comparing the investments in core banking systems. Vendors under such circumstances have pushed harder into newer and rich markets where there is a huge potential for aggressive strategies.

Deriving the Potential Market

Diffusion Model to predict core banking adoption in U.S. market

The model for modern core banking adopters in the U.S. market can be built on two basic assumptions:-

- 1) External influencing factors
- 2) Internal influencing factors

Logic

The logic is that banks will adopt a new core banking replacement because of:-

- 1) Market forces or internal problems due to poor technology or benefits to banks with new technology. Within the same competitive market or internally within the U.S. market that leads to imitate a technology or change a technology to achieve better results. These are the internal influencing factors
- 2) Banks will adopt new core banking systems because of influencing factors, that are external in nature, as described in the sections above. Since the influence is not internal, any external influence leads new technology innovations in that market

Diffusion Models specify the probability of adoption i.e. $P(t)$ at time t , as a linear function of M which is the total potential market, p being the coefficient of innovation (external influence) and q being the coefficient of imitation or internal influence.

Mathematically the simplest formula is described as below:

$$P(\text{Yearly}) = p + q/M (N(t))$$

Where;

$P(\text{Yearly})$ = Probability of adoption at time t (Assumed yearly here)

$N(t)$ = Cumulative number of customers who have already adopted

M = Market potential or total number of banks that will use new core banking

p = Likelihood that someone who is not using the modern core banking systems will adopt it because of external factors

q = the likelihood that someone who is not using the modern core banking systems will adopt it because of internal factors

Logic of formula:

- 1) The left part indicates the change in the cumulative no of units per unit of time
- 2) ' q ' is a factor that represents influence of the penetrated market over the un-penetrated market i.e. $(t)/M$. It's hence the proportion of market already covered by new technology

3) 'p' is a factor that represents the remaining market that will adopt without any influence by installations already in the market place. It is hence a new innovation the market sees and that is why the value is less

Estimating M

The market potential is quite big if we look at the IT spend and bank statistics that we described earlier. It is estimated that almost 10-12 percent of big, mid-size banks will move to core banking in the next few years. This would approximately mean around 100 banks out of the total population of 8000+ (including smaller banks) will adopt this change.

“As per sources, financial insights estimate that core banking consumes more than 12 percent of an average bank’s IT budget. U.S. Banks are projected to spend more than \$8 billion on core banking Systems in 2009.”

“Estimates are that on an average; 200-300 banks consider replacing their core system in a typical year [in the U.S.]”

Estimating p and q values

The external factors and internal factors, as described previously, give a strong and positive position that banks in U.S. will look to move to modern core systems in the coming years. Since no exact data is available to estimate this, many Diffusion Models propose average values to be used in case previous trend of technology diffusion is not completely available, assuming the average values across a wide range of technology products are $p = .03$ and $q = .38$, as prescribed by the diffusion models.

*A proper approach is to list down all internal and external influencers, provide weightages to them and derive the p and q values.

Estimating N (yearly) data

Estimated cumulative number of banks who have already adopted modern core systems as per Forrester Research, 9 percent banks in Europe have completed core banking replacements.
Source - Forrester; European Financial Services Architecture Strategy Survey 2007

Unfortunately not much data is available on the U.S. market. It is also surveyed that the European markets are a little ahead in terms on core replacements than the U.S. market. Hence we can assume some 4-5 percent banks would have undergone modern core banking replacement in the U.S. since 2007. The figures are pessimistic because core replacements may have slowed down due to recession. This would roughly mean that around 20 odd banks would have undergone modern core banking replacement in some form or the other till recent times.

Calculations

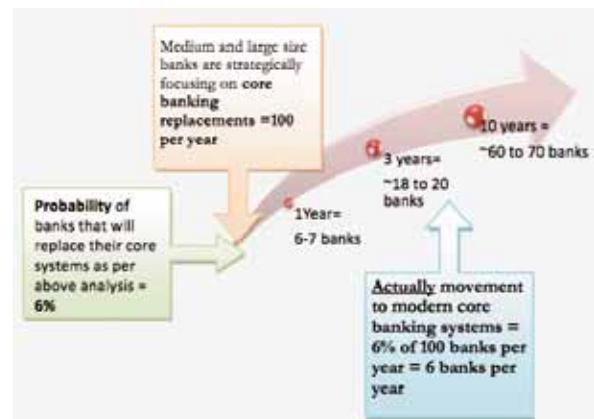
Putting this in the diffusion formula:

$$P(t) = p + q/M(N(t))$$

External Influence Co-efficient	p	0.03
Internal Influence Co-efficient	q	0.38
Market Potential	M	250
Existing Customers	N(t)	20
Diffusion Probability Formula	$P(t) = p + q/M(N(t))$	
Diffusion Probability	6.04	

The model suggests that 6% of the total market base will actually move to modern core banking replacement every year. Assuming if around 100 medium and large size banks are strategically focusing on core banking replacements, then this means around 6-7 banks each year will actually move to modern core banking systems. This figure is huge if we see cumulative value over 8-10 years which is typically the time for market saturation with a new technology.

Outcome



References

The texts market in *ITALICS* and in “QUOTES” are taken from below mentioned sources. All other texts are original concepts and thoughts of the author.

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