Microfinance White Paper

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1.0 Overview

Micro finance is the process of providing financial services such as credits, savings, insurance, pensions and remittances to the under banked and under insured. It is not a new concept and has been practiced for millennia. Most recently a shift has occurred that has taken the source of financial services away from charity and donor organizations to commercial banks and insurers who see both commercial value and corporate social responsibility in providing products and services to this global affinity group of under financed people. The key performance indicators in this process are outreach, sustainability and profitability in that order and as many of the customer base are in rural or semi urban areas, low entry cost technology is required to gain outreach in these areas to keep the cost of transaction low. Once the outreach is obtained the financial services must be sustainable and renewable and again low entry cost technology is required to achieve this permanent status which takes people from the bottom of the pyramid to a higher status of wealth often through the establishment of small and medium size enterprises built by small loans and risk mitigated by insurance. Because of the size of the growth market here and repeatability of services in the customer base commercial players in this space stand to make good profits while at the same time benefiting the under financed communities. As more regulations and regulators commit to compulsory financial services to rural areas in Asia, South America and Eastern Europe the pace of development here will not abate as politicians also quest to alleviate global poverty in conjunctions with non profit organizations encouraging them to work in tandem with the commercial organizations. The activity in this meso-layer is vital to the success.

The key things to consider here is how can technology be used to achieve this multiple quest and not just to say utilize cell phones in rural areas but to provide a nascent architecture built on security and best practices on which to build a pervasive layer of end user devices and programmable based cards in order to bring the outreach required. Just using traditional business services downscaled for this sector has proved not to be effective and the same applies to technology. The financial products have to be specifically designed for this sector to meet the needs of the customer and as such the technical architecture and transactional approach has to be tailored as well to make “penny” transactions happen. At the same time we need to look at the effects of global warming and catastrophes on this rural sector and apply risk mitigation wherever possible.

This white paper shows how SUN Microsystems innovation can service this sector moving forwards by utilizing its network infrastructure core competence, strong telecommunications knowledge and by leveraging the FOR (Finance On Request) solutions as outlined in another white paper FORWP distributed with this paper. As can be seen this front end distribution based solution supports micro finance and alternate micro finance into the Syariah compliant area of Islamic Finance. A special section is included on micro pensions as these are a major part of future financial sustainability. Please apply any questions to the author on david.piesse@sun.com.
2.0 History and Trends

Micro finance dates back hundred of years and essentially came out of burial groups where people grouped together as an affinity in order to provide money to bury their relatives with dignity. This was the basis of the Scottish Widows assurance company in Scotland over two hundred years ago and much of the United Nations micro finance program in Africa conducted in last 50 years. Although the UN and the World Bank still provide useful services in this area things have move forward into the commercial world from the charity arena by an emerging meso layer of micro finance institutions (MFI) acting as agents for banks and insurers. This meso layer sells financial products to the urban, semi urban and rural sectors whilst the banks remain as aggregators though securitization. Non profit MFI’s such as Planet Finance have paved the way for micro finance crossing the chasm into the commercial world. Grameen Bank Bangladesh and Bank Rakyat Indonesia have provided poster child business models on how to make micro finance both a commercial and social success. The Life Insurance Corporation of India and the MFI’s in India such as Spandana and Shepherd aided by sound regulations in this area have made a major contribution to the micro finance sector.
The meso layer is responsible for technological innovation by increasing security, regulatory transparency and scalability. It must reduce repetitive tasks and remove costly processes and move the function to point of sale which is the first lesson in lowering cost of micro finance. Then following outreach success it must provide data warehousing capabilities to achieve sustainability and subsequent profitability. So we are looking at capacity building, credit rating and access to wholesale finance arising from this layer. We will look at this white paper at how the meso layer can be technologically advanced and how in the long term this layer will get absorbed into the very institutions that now securitize the loans.

### The MICROFINANCE MARKET

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<tr>
<th>Governments</th>
<th>Banks</th>
<th>Donors, Foundations</th>
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<tr>
<td>Investors</td>
<td>Insurers</td>
<td>Investment Funds</td>
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<td>NGO’s</td>
<td>Reinsurers</td>
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<td>MFI’s</td>
<td>MFI Networks</td>
<td>Micro Entrepreneurs</td>
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<td>Villages/Urban</td>
<td>Regulators/Rating</td>
<td>Agents/Brokers</td>
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In the regulatory sector it is key that compliance changes be made quickly, across regional borders and not be subject to costly changes in technology and time each time a change is made to the system. A business rules engine is used for this purpose.

**Strong trends fuel the growth of this sector and we will look at the technology required to enable those trends into workable solutions.** The trends we will look at briefly in the paper are:

- Improvements in Regulatory Framework
- Consolidation of Non Profit MFI’s
- Emergence of Banc Assurance Models
- Shifts to Partner/Agent Model
- Introduction of E-Learning
- Mobile banking and other telecommunication advances.

3.0 Sustainability Strategies
The diagram below is the mantra. Clients need to afford the products offered for their needs and organizations offering the products need to work within acceptable operating costs.

In order to achieve sustainability a series of business and technical best practices and standards need to be applied. If the micro finance is based on a loan then credit life insurance needs to be applied to protect the loan. However this insurance only benefits the lender so we need to look at insurance provided on the back of loans and insurance given without a loan being involved. The key to sustainability is also to encourage savings by pensions where savings can be pooled and fund managed.

Product management matching the needs of the customer is critical and use of traditional products not sufficient. By designing products which focus on the bigger issues (e.g. healthcare and surgery), cap benefits to avoid reinsurance costs, targeting certain benefits and forming affinity groups to sell these products rank highly on the sustainability scale. This will enable benefits to be bought in bulk and cross selling to occur inexpensively from other markets with ease of distribution. Introducing alternate micro finance quickly such as Syariah compliant Islamic products is a requirement for many communities and must be provided.

Innovative technology handles these distribution issues inexpensively from one (not silo) source to provide low cost payments for premium collection, claims settling, remittances and lowering costs in general. Low cost of entry and transaction cost is the key objective. The SUN FOR solution allows micro finance to be run relatively inexpensively as another channel off of the main distribution or implemented as a specific channel if micro finance is a mono line business.

4.0 Product Management
Efficiency and take up is achieved by proper product design and the ability to price these products effectively. Without effective pricing and data mining profitability will not be achieved. Thus product managers in the micro finance area take bits of covers from their insurance experience and tailor them specifically for the needs of the micro finance market eliminating complex riders and clauses. This gives different product offerings as outlined below and combined with this with a toned down marketing approach that requires a degree of e-learning about financial services. The sections in the policies are designed to facilitate easy claims handling and it is imperative to design products towards the affinity and schemes group category which means ease of cross sell and automated underwriting. In order to achieve the level of compensation required to sell by the channels the cost of transaction must be kept low to enable realistic incentive based schemes.

### Bank Microfinance Cluster Financing

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<th>Loans</th>
<th>Group Pension Plans</th>
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<td>Asset Management</td>
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<tr>
<td>Life Insurance</td>
<td>With Riders</td>
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<td>Accidental Death</td>
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<td>Healthcare Insurance</td>
<td>Hospitalisation</td>
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<td>Simple Products</td>
<td>Medications</td>
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<td>Outpatients</td>
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<td>Very Simple Products</td>
<td>Credit Insurance</td>
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<td>Term Assurance</td>
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<td>Agricultural</td>
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<td>Personal Accident</td>
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<td>Banked Products</td>
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<td>Loss of Wages</td>
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As can be seen above a variety of different product layers exist for micro finance and this requires an effective front end technology solution controlled by the business users that enables cross sell of products, underwriting rules easily changed, rating parameters changed, on line managed of channels especially in exposed and Cresta areas, on line management of compensation and the ability to handle multiple channels from the same source plus ring fence customer profiles and manage payment collections, claims and remittances. Such solution is provided by FOR and a case study brings this out at the end of the paper.

5.0 Emergence of Micro Pensions
Savings are the key to sustainability. In any established micro finance program you will find that a $1 loan generates on average a $1.80 in savings so banks take the savings side of micro credit very seriously. Insurance in general represents the protection side of finance and pensions (plus some life products) the savings side which are used to create annuities to sustain a level of lifestyle in older age. The same issue applies to micro finance and as such micro pensions have recently entered the micro finance arena as part of the sustainability triangle. There is a big difference between pension products and other life products as the premiums are pooled and invested by fund managers to provide a larger return. The challenge is providing fund management for the micro finance sector but this will be seen as the next emerging market in this sector – micro fund management and a lot of major players will be there taking an interest.

There is no doubt micro entrepreneurs must invest for old age and the under financed must invest to beat inflation. Commercial organizations have to increase the formal sector by long term asset building. Pension reforms in developing countries will also add government subsidies in the pension area. This means striking a balance between risk and average return by diversifying a portfolio. The technology administering and distributing the pension must have low transaction cost capital accumulation and a low risk capital appreciation by pooling of resources.

This means we must cater to the outreach category and have a good technical distribution strategy and record keeping. We need to get the correct perception by the meso layer on micro pensions and how they differ to other products in the micro finance sector. This means we need e-learning to convey financial planning concepts to micro entrepreneurs such as differences between lump sum and annuity.

Hybrid schemes need to be built especially for this sector to ensure take up in an area where the questions will say “why would I tie up my money”. That means designing pensions with a shorter minimum term and then roll over once the idea has cemented. There needs to be a facility to withdraw in event of a shock and pay in options to scale at a low cost of premium. Annuity options should be made very flexible in terms of length. There needs to be a degree of flexibility in terms of seasonal cash flows and a degree of add on such as life insurance with defined contribution, access to loans and using pensions as collateral to loans plus lottery options in the pension to enhance value.

The SUN FOR solution handles micro pensions and annuities from the same base as the other products thereby allowing this design to be effective and to cross sell pensions within the product base of loans and life insurance. Interfaces can be provided to fund managers for the management of the pension payments and any subsequent surrenders and withdrawals.

6.0 Distribution Channels
We have looked at sustainability in terms of sound regulation, cross selling of diverse financial services and effective data warehousing and mining for performance. The sustainability triangle stresses this cannot be obtained without outreach so we look at the distribution channel approach in order to achieve this.

As can be seen there are many distribution channels available to the micro finance practitioner in the MFI or alternate and the key is the low cost channels. The FORWP white paper outlines all the channels supported by the SUN solution and new channels are being adopted all the time and can be added without change of software. Such new channels emerging are airline based sales and various new white label options where non financial institutions bring in financial products from commercial providers and offer them as value add around their own products.

In order to achieve delivery there must be an on request service driven by an as needs basis commonly called “pay as you go”. This must a global financial service driven 24X7 with INTERNET browsers and any low cost pervasive device to be able to rapidly create, launch and manage micro finance products via any distribution channel, any currency, any language from anywhere in the world while at the same time managing compliance changes and end to end process control with real time information.

7.0 Payments, Claims and Remittances
This is the area where costs have to be reduced to a minimum using technology on the back of low cost of entry transactional product management and distribution. The following components need to be included and managed by the solution infrastructure and architecture and the list is not exhaustive. Describing each of these in detail is outside the scope of this paper but the technology section elaborates more on their interaction.

- Global Positioning System GPS
- Mobile Banking
- Cell phones
- Electronic Mail
- Secure SMS
- Web Based Sales
- Web Based Financial Services
- Information and Communication Technology
- ATM’s – credit and debit card
- Non ATM – credit and debit card
- Personal Digital Assistants PDA’s
- Credit Scoring
- Solar or Wind Energy
- On Line Market Places
- Speciality Portals
- Instant Messaging
- Satellite telephony Systems
- Electronic Identity Verification
- Virtual training modules
- Web based emails
- Digital Policy Pens
- USB watches and other USB collections
- Off line data capture support
- Vehicle based telematics
- Mobile card readers and document printers

There is no doubt that Personal Digital Assistants (PDA), smart JAVA cards and mobile phone banking are the most relevant and promising technologies for low cost micro finance. PDA’s improve transactional efficiency, reduce data entry error and fraud prevention. This can achieve a 50% reduction in loan processing and a 90% reduction in manual based collection and door to door services. Smart JAVA cards will reduce the operating costs in the rural areas and now they come with fingerprint readers. Mobile banking allows clients to transfer money, withdraw and deposit cash, make loan repayments and pay insurance premiums all from their mobile phones.

7.0 Payments, Claims and Remittances (cont)
MFI’s need to manage their internal distribution network and have access to both billing and claims information. They need to respond to workflow requests in the automated areas of policy issue and enrollment at point of sale, premium collections, automated billing for group clients, online claim submission and tracking, fast claim processing and payment by ATM or local banks and ability to handle remittances from one person in one location to relatives in another. These are essential work flows built into the FOR solution to manage these events.

Remittances are the area where mobile banking will make the most difference in microfinance. A key part of microfinance is based on relatives who travel to more developed countries and then send home remittances to assist their families in the emerging countries. This is a large market and currently dominated by the remittance companies and banks. As payment facilities now exist on mobile phones at low cost from companies such as PAYPAL the landscape is shifting. This provides a double advantage to microfinance practitioners in that the cost of remittance is lowered by using phones and banks will start to offer low costs value add products around the remittance service which will lower costs in say delivery of brown and white goods to the rural areas and other such innovations. This also has implications on mutual health schemes as villagers can make contributions which are wrapped, boosted by remittances and passed through to central mobile phone points for collection.

8.0 Risk and Catastrophe Management
MFI’s must be able to manage the relevant information and reporting facilities in real time in order to provide the proper operational risk management holistically across the enterprise. Similarly, they need to be able to aggregate exposures to cover areas of natural catastrophe, global warming issues, and acts of terrorism. On the first issue, there are new key performance indicators in micro finance that do not exist in traditional finance and this leads to new MIS (Management Information) issues.

When one is using PDA’s in the field, synchronization between the pervasive device and the back office MIS is a challenge. The FOR solution minimizes this risk by providing real-time information on channel performance, peril exposed area selling such as hurricane/earthquake and bad claim hot spot areas.

For micro insurance actuarial pricing software tools need to be added to the MIS in order to get the profitability issues correct.

As can be seen from the MIS chart here, the imprint of the sustainability triangle can be seen here with technology in the right hemisphere addressing the outreach issues for sustainability in order to achieve low cost of transaction by person and to allow business process outsourcing of key issues.

8.0 Risk and Catastrophe Management (cont)
On the second issue of catastrophe management it should be noted that there is no such thing as micro reinsurance and that transfer of risk is required on a global basis to protect the investment in the micro finance deal. Banks securitize the loan into securities but are unlikely to transfer and securitize the insurance premiums. Current thinking is that regulators should make compulsory a catastrophe premium in each loan as another insurance section. This would be low costs but provide income to government which could be used for risk financing to further protect the investment in event of Tsunami, earthquake, flood, pandemic or any shock event that may hit an exposed region. This could be in the form of any SPV asset to raise capital against a catastrophe.

This has addressed the issues of removing the reliance of post disaster funding where remittance rarely hit the target, the lack of liquidity after disaster inhibits recovery, years of unstable fiscal deficit inhibiting growth and the poorest segments involved in micro finance being the most vulnerable. These are key operational risk takeaways need to be addressed by technology for micro finance to sustain..

9.0 Alternate Micro finance - Syariah Compliance
This paper needs to put an emphasis on alternate micro finance systems namely Syariah or an Islamic Financial system. The insurance part is called Takaful, the bank connections of loan to insurance BancTakaful and the reinsurance ReTakaful.

That there is a nexus of micro finance and Islamic Finance there is no doubt. We see the Takaful and Syariah compliant financial products will greatly aid MFI’s that are trying to reach the low income market. For the various micro finance markets the local religious leaders will be key for micro finance to succeed in these areas. Current Islamic products have concentrated on the upper and middle class wealth sectors of the Muslim affinity group and therefore will have a large impact on the under banked and under financed in Muslim countries and populations as in China. Also the low income market in Muslim communities most likely to resist non Syariah compliant products and non Muslim communities are likely to purchase Islamic Finance products because of their mutual approach and profit sharing.

There is however some more work to be done in this area to fully bring an Islamic micro finance strategy to market although the SUN FOR will handle Takaful transactions for the accepted models now and will handle the compliance. The outstanding business issues are to make sure MFI’s charge fees not commission, act as facilitators and not aggregators, train more trained personnel for outreach and satisfy compliance on links to cooperatives rather than links to traditional commercial organizations. This is a significant confluence in the sector.

10.0 Technology and SUN in Microfinance
SUN offers an end to end solution for micro finance in providing the underlying secure network infrastructure from the SOLARIS operating system to a software stack of portal management, identity management, SOA/SaaS (Service oriented and Software as a Service Architecture) for integration plus a vertical application for distribution, product management and insurance life cycle management. This is bundled up into a full hosted service for micro finance with no capital IT expenses and based on a minimum transaction utility based and leased business models. See FORWP white paper. By combining these core competencies with telecommunications experience this is the way delivery can be made to rural areas.

As the financial institutions change their model so IT companies have to change their model as well for these affinity markets to ensure they charge enough by transaction for the commercial venture to be worthwhile but small enough that the process of technology enabled micro finance can take place in rural areas for win situation for all. That means we need to have interaction with devices and a micro finance supported architecture based on the principles of SOA. See below.

![MicroFinance Service Oriented Architecture](image)

10.0 Technology and SUN in Micro finance (cont)
The benefits of SOA technology in micro finance is the flexible architecture which gives a faster time to market, time to volume, time to profit plus the advantage of an end to end pre integrated architecture. The ability to change the workflow processes in the application means that FOR can meet the current and future market conditions at the lowest costs possible. Simplified business integration means seamless integration with MFI MIS, core banking and core insurance applications at the back end plus IT governance and compliance. This means we can align business and IT units and bring legacy products and channels through to point of sale to support the micro finance distribution channel and its specific product range. The benefits of straight through processing or bringing legacy through to point of sale have already been mentioned but are a key benefit of SOA.

Below is a comprehensive look at a micro finance delivery architecture.

The FOR application sits inside the composite application platform and utilises the services in the software stack for portal, identity management and integration. The FOR solution supports PDA, cell phone and JAVA card technology bringing the architecture touch points to the telecommunications. Thus a pervasive device available list is created for multi channel distribution of micro finance products – see below. Security of enterprise data is an essence when using these devices.

10.0 Technology and SUN in Micro finance (cont)
Reducing transaction costs is important for highly dispersed populations, mobile deposit collections reduce costs of policyholders not willing to pay the cost of travel and this can increase policy value, mobile banks and micro payment bundling reduce cost of transaction and electronic innovations drive down the cost providing high tech alternatives to manual processes. Some shift and redefinition of the IT model is required to meet the high volume low cost model of micro finance.

10.0 Technology and SUN in Micro finance (cont)

SUN is creating cost effective, open technologies and innovation for micro finance in terms of an end to end solution. The pre integrated architecture stack means
faster time to market and volume making lower cost transaction available. This very low cost pricing can be priced against employees, gross premium, total new life business, loans and by person/period of time rather than a traditional CPU approach i.e. by a layer predictable minimum transactions. In conjunction with the FOR solution the whole solution solves key pain points, product management through multi channel, back end integration, card applications and a massively scalable hardware approach. A FOR demo is available on request. FOR is ACORD compliant for global standard best practices.

11.0 Case Study

The following sequence show the set up and launch of a micro insurance basket product known as Rural Gold sold on the back of a loan. On this screen the product
is established either as new product, by reusing another micro finance product or pulling through from a legacy environment. All the screens, products, channels and documentation shown are tailored by the business user and branded e.g. can integrate into an INTERNET banking skin if required or any other front end.

The sections that make up the product are exposed and the basket insurance clauses are attached to a loan. It is straight forward to add further covers to the basket.

11.0 Case Study (cont)
Here the product is tied to the bank or MFI involved in binding and enacting the insurance transactions through the various channels. These agents and banks can easily be direct channels, kiosks or retail outlets for example.

Here the basket section maximum/minimum limits and referral limits are set to ensure the agent or channel is operating within the right underwriting risk guidelines and generating real time monitoring alerts if not.

11.0 Case Study (cont)

This shows the ability to vary the compensation or commission values by section against the rural gold product. Similarly rates are varied and added per section.
In line with risk management of catastrophe exposed areas or any moral or physical hazard required to monitor, operational risk alerts are set to manage distribution channel exposure in real time. This process sets an aggregate limit across geographic zones to indicate hurricane or catastrophic zones.

11.0 Case Study (cont)

The next process allows the documentation to be formatted by the business user and can be any kind of documentation required such as loan application, proposal form, warranties, schedule and policy. Any new questions of sections to a document can be configured on line. This process provides contract certainty tied to point of sale.
All of the sections of the basket micro finance product can have specific documentation attached to them for point of sale and distribution.

11.0 Case Study (cont)

Having set up the product, channels, rates, underwriting and documentation the next process switches the focus from the product managers and underwriters to the channel in the field signing on from any device such as a PDA. In this instance some flexibility is shown by allowing the MFI or agent to select basic life and health options from the product.
Simple questions appear on the PDA for the village elder to respond if this is a group scheme or more detailed ones for individuals in the village or group community.

Case Study (cont)

The same process applies to the collection of the healthcare and PA section of the product.
The premium calculation is done from the PDA or any channel.

12.0 Case Study (cont)

Then more general additional questions required as configured from the product managers for standard policy.
The next process shows the additional questions relating to electing term life with pensions. The amount of questions generated is totally configurable and can be changed at any time to suit the needs of the micro entrepreneur.

11.0 Case Study (cont)

The completion process shows the final premium calculation with the taxes brought through for the country of origin. It is at this point that mobile money can be used at point of sale before providing documentation in the field.
The next process is the production of documentation.

11.0 Case Study (cont)

Final process of case study shows the real time bordereau measuring loss ratios and MIS factors in real time and exported to spreadsheets to pass into the data warehouse.
In some instances the existing back office products and processes will be brought forward to point of sale thus reducing operational risks and increasing time to market. If working in emerging markets with new financial institutions then there will be no legacy and FOR can be used for the whole micro finance administration leaving just accounting procedures in the back office.

12.0 Future and Conclusions

SUN will use partnerships in industry to deliver the FOR solution for micro finance thus providing best practice delivery. It is the micro finance strategy taken by the financial organisations that will drive the outreach, sustainability and profitability from such schemes. Increasing regulation in line with political trends will legislate
global commercial entities to do micro finance. It is up to companies to decide whether they meet a regulatory target or make it a profitable business sector alongside their traditional business. It is now understood that just downsizing a traditional business and its products is not a working mantra for micro finance and new skills are required in product design, distribution, data mining and technology. The increase in services to the underbanked and underinsured is not a bubble and will not abate causing a worldwide surge in personal savings. Also similarly global warming and natural catastrophes will not abate either and more catastrophe cover is required for rural areas and micro finance. We have established that a program of e-learning is required to bring micro entrepreneurs education on financial services and savings/pensions in particular. Experienced MFI's have said “5% of micro entrepreneurs become small and medium size enterprises each year from micro finance”. This is a significant seeding of the under financed into middle class where they are then open to buying traditional products from the same institutions.

So we can today that the micro finance sector has a huge growth potential for banks, insurers credit unions, post offices and retail chains. The under financed are all potential clients for banks and insurers through micro finance and even the poorest are eligible through government subsidies. These financial organizations are not leaving these markets solely to NGO's and donors but taking a significant share of this market aided by regulation. In 10 years as a commercially viable model micro finance will become standard for financial systems in emerging countries as affinity finance. Micro finance will enter the market as mainstream especially if combined with Islamic Finance. The holistic model to be achieved for the future is:-