

# **CSE651 APPLICATIONS**

## **Seminar on Mobile Computing for Informal Economies**

**Professor Anita Wasilewska**

**Professor Jennifer Wong**

- **MEETS** Thursdays, 7:15 pm
- CS Conference Room, 1441

# Seminar Goal

- Our main goal is to develop Mobile Phone applications for businesses connected with the Women Business Center (WBC) located in Saint Louis, Senegal.
- In general, we will also look into development of mobile phone prototypes that target as many informal economies as possible.
- Students will use J2ME, develop prototypes on emulators and install them on some phones I will provide, or on their own phones.
- The prototypes will then be tested in January 2009 with WBC clients.
- There are too many languages in Africa (200 in Kenia alone), not to mention other regions of the world to cover them all.
- Also some of targeted users are illiterate but own and know how to use basic mobile phones.
- So we will also be looking into developing prototypes that are natural language independent.

# SENEGAL



# SENEGAL: Short History



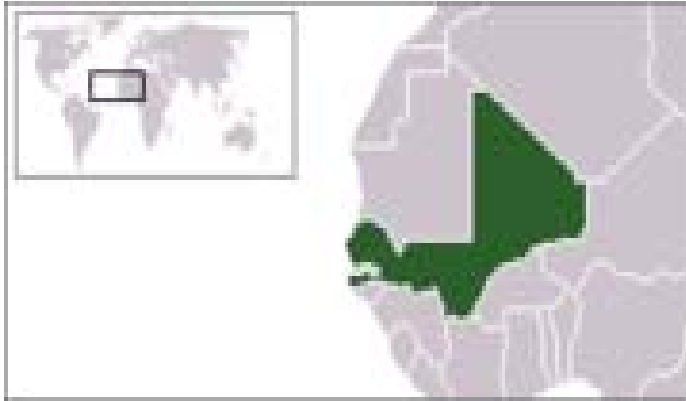
- [Senegal](#) was inhabited in prehistoric times. [Islam](#) established itself in the the [Senegal River](#) valley in the 11th century.
- In the 13th and 14th the [Jolof Empire](#) of Senegal also was founded.
- In the 16th century, the Jolof Empire split into four competing kingdoms: the Jolof, [Waaló](#), [Cayor](#) and [Baol](#) kingdoms.

# Colonialism



- [Portugal](#), the [Netherlands](#), and [England](#) - competed for the **slave trade** in the area from the 15th century
- in 1677, [France](#) ended up in possession of what had become an important slave trade departure point - the infamous island of [Gorée](#) next to modern [Dakar](#).
- in the 1850s that the **French**, began to expand their foothold onto the Senegalese mainland, at the expense of the native kingdoms.
- **Total of 12,000,000 slaves passed all together through the [Gorée](#) island**

# Independence



- In January 1959, **Senegal** and the **French Sudan** merged to form the **Mali Federation**, which became **fully independent** on **June 20, 1960**
- **August 20, 1960**. **Senegal and Soudan** (renamed the Republic of **Mali**) proclaimed independence
- **Fula and the Wolof language of Senegal** are the most populous Atlantic languages, with several million speakers each
- **French** remains official and educational language



# Senegal: Mobile Phones and Internet

- Senegal counts 3.37 millions of mobile phones subscribers - representing 28% of the country population.
- Mobile phone subscribers have risen to more than 200 millions in Africa in 2006 (compare to 185 in India).
- The access and presence of Africa on the Internet and Web is limited due to infrastructures, education, and language issues.
- In 2007, Internet World Statistics counts more than 1 billion Internet users.
- Only 3.5% of them are in Africa – compared to 12.4% in Asia, 41.7% in Europe and 70.4% in North America.

# Saint Louis: National Council of Negro Women Incubator



- **NCNW (National Council of Negro Women)** is a US NGO that was established in 1935 with headquarters in Washington DC.
- **NCNW** has been operating in Senegal (Dakar, Thies and Saint Louis) since 1975.
- Main areas of activities are education, health and economic empowerment of women.
- Saint-Louis office houses the **Women's Business Center (WBC)**.

# Saint Louis: Women's Business Center (WBC)



- Mbarou Gassama Mbaye, PhD, Managing Director,
- **Beneficiaries:** Residents clients and non residents
- **Services:** office space, ICT equipment and services, access to Internet, coaching, mentoring and training based on specific needs
- **Length of stay:** 3 months to 2 years
- **Number of graduates:** 5 to 10 first year, 15 to 25 thereafter

# Saint Louis: Women's Business Center (WBC)



- At this moment Center supports 7 resident clients (women entrepreneurs)
- Women who have never had contact with a computer are learning to use it for their business
- **Resident Training:** use of the computer, access to Internet, accounting, marketing, management, business plan
- **Non Resident training:** Coaching:
- Promotion of clients' products: Fairs and business trips

# Women's Business Center Clients

- We met with all of 7 clients and conducted long interviews
- They are on different level of development; from illiterate fisherwomen (association of 200 of them) to women working with a micro-finance association that got 534 millions of FCFA (\$1,135,953)
- They represent quite a spectrum

# VIDEOS

- Senegal Ecovillage Microfinance Fund
- <http://www.youtube.com/watch?v=oYtfviYA38Q&NR=1>
- Centre D'Incubation des Entreprises de Femmes de Saint-Louis
- <http://www.youtube.com/watch?v=7tzgvOXUa1w>

# C1: Artisanal Village Aminata Diop

- President of the committee of promotion of the Artisanal Village
- Member of different associations
- Nominated entrepreneur of the month
- Created a business to teach dyeing and sewing in 1988 before joining the Artisanal Village
- Speaks and writes good French; she is the **ONLY ONE** with high school diploma
- Started to learn English



# C1: Artisanal Village : Aminata Diop



- **Business 1:** selling Senegalese craft (majority produced by her and her students)
- 2 employees
- Around 10 clients per day – more tourists than local people
- She is very innovative – with unwanted scarves with particular logos she designed pillows and bags

# C1: Artisanal Village : **Aminata Diop**



- **Business 2: Training in dyeing and sewing**
- 43 lessons organized in modules
- Paper forms for inscription to the training,
- Policy forms (e.g., absences, grades...),
- 7 promotions (graduation) a year witnessed by the chamber des métiers, governor. etc
- around 10 students each time from 13 to 40 years old

# C1: Artisanal Village : Aminata Diop



- **Needs:** Management of sales/expenses
- We do it in English; I will translate to French
- Management of the sewing training; finances and organization
- better control of expenses to distinguish between private and business accounting.
- Web site

# iDISC - the infoDev Incubator Support Center

## ARTICLE (September 2008)

- **SUCCESS STORY**
- **A Women's Sewing and Dyeing Enterprise at NCNW in Senegal**
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- **Description of the Company**  
Name of the Company: Mina production  
Main activity: Sewing and dyeing  
Employees: 4 employees and 5 apprentices  
Years in Business: 19 years
- **Description of the Entrepreneurs(s)**  
Names of the owners: Aminata Diop and Astou Coulibaly  
Positions: Director and General Secretary  
Ages: 40 and 34 years old  
**Education:** high school (12th grade) and 9th grade.
- 



# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- *This interview was conducted with Aminata Diop, Director of Mina Production Company, incubated at the National Council of Negro Women in Senegal.*
- **Is this the first company that you have started, and what drove you towards it?**

Yes. I realized that we had the potential. We were trained in sewing and dyeing and wanted to be famous in the field of couture and dyeing. We wanted to create more jobs for the community. Dyeing is a traditional activity in the Saint Louis community and we wanted to value the local culture and tradition while creating new African design.
- *"We realized that before the incubation, we operated in the dark, we were making money on a daily basis, but we have never operated as an organized business. Incubation helped us be visible through Internet, for the first time we have a free space on Internet where we are displaying our products."*
- Anita Diop, Director, Mina Production

# **SUCCESS STORY**

## **A Women's Sewing and Dyeing Enterprise at NCNW in Senegal**

- **How did you finance your start-up operations and how long did it take for the company to become self-sustainable?**

With support from family and friends, we bought a sewing machine and started our activities without a business plan.

- We started training dropout school girls in sewing and got some money that was reinvested.
- We used to sell their product to neighbours.
- In addition we were selling the local fabric pants to tourists as well as dyeing and selling table clothes and other home decoration items.

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **What are your plans for self sustainability?**
- The enterprise is not yet self sustainable.
- The workshop is located in the "Village Artisanal", owned and operated by the state.
- Entrepreneurs pay a \$10 monthly rent.
- We are not formally getting salaries.
- We have not been able to market our products correctly.
- This is why after more than ten years of operation, we decided to integrate our company into a women focused incubator, which provides technical assistance and office space to help women entrepreneurs grow.
- It is a privilege to be selected among incubator clients and we hope to be self sustainable in the near future.

# **SUCCESS STORY**

## **A Women's Sewing and Dyeing Enterprise at NCNW in Senegal**

- **How do you measure the success of the company?**
- Yearly income has gone from 200 USD in 1989 to 11,212 USD 2007. Furthermore, we have participated in 2 international trade fairs and 10 local trade fairs.
- **Who are your clients and how many do you have? How are you focusing on expanding your user community?**
- Our clients are tourists from western countries who visit Saint Louis, such as France, USA, Spain, Japan, etc. as well as local customers, such as hotels and individuals.
- We serve about ten hotels, 100 tourists annually, and about 700 locals customers annually. We started documenting this when we entered the incubator.

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **What are your major products and services and how are they unique? What is your competition?**
- The uniqueness of our products comes from design inspired by local culture and use of local fabrics.
- . Our main competitors are the boutiques located downtown and others sellers in the “Village Artisanal”, and tailors that make-to-measure.
- China is also a competitor on the international level, as they produce local designs using mass production selling at low prices.
- **How did you first launch the product?**  
We launched our first product by making a direct marketing campaign towards hotels and tourists guides.
- We got support from family members and friends, for example our sisters and aunts assisted in the production.

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **Are you planning to patent your product and do you see any obstacles in doing so?**
- In the field of sewing, patenting is not an issue. Competitors tend to copy others' creations and the legal environment is not severe for copying.
- The main difficulty might be the cost of the patent.
- **What was the biggest challenge in starting an innovative business in your country and how did you overcome that?**
- Access to finance and equipment was and still is still our big issue. The problem is not yet overcome.
- That is why we are participating to the incubation program.

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **How have you benefited from business incubation?**
- First of all we have benefited through training in management, accounting, marketing, computer software, and the Internet.
- We realized that before the incubation, we operated in the dark, we were making money on a daily basis, but we have never operated as an organized business..
- Coaching has also been important.
- The incubator organized weekly coaching sessions, where we were able to discuss the issues and difficulties that we faced in managing our business.
- Finally, access to office space and modern office equipment was also something crucial that the business incubator offers.
- Now in addition to the workshop, which is the shop, we have an office where we do our administrative and accounting work.
- **MY REMARK:**
- **The stay with the Incubator is LIMITED!**

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **Do you have some specific lessons that you know now and wish you would have known when you started your business, and which you would like to share with fellow entrepreneurs?**
- The incubator is an eye opener for us.
- None of us learned management and accounting before integrating the incubator.
- With Microsoft excel, we are able to do our accounting, we have a daily log and the software helps facilitate calculations.
- Incubation has stimulated the desire to learn more and be in contact with the international market:
- Astou is learning French to increase her communication skills, and Aminata is learning English online.

# SUCCESS STORY

## A Women's Sewing and Dyeing Enterprise at NCNW in Senegal

- **With hindsight, are there any particular lessons or messages that you wish you would have known when you started up your company?**
- Setting and writing down a business plan should be a first step.
- It helps clarify objectives, strategies and the segment of the market you want to reach.
- You should also have computer skills. It is an essential tool, if we want to compete in the global and local markets.
- Having proper management techniques and tools is also very important.
- Every transaction needs to be documented.

# **SUCCESS STORY**

## **A Women's Sewing and Dyeing Enterprise at NCNW in Senegal**

- **What is your message to funders/supporters and what is your message to the users of your product?**
- Our message to funders is that incubation is a powerful tool to help entrepreneurs that don't have the required skills and they need to create more incubators, especially in developing countries, where access to education is low.
- To our supporters and users of the products we would like to say that buying from us is valuing the local culture and helping us to develop community pride.

## C2: Keur Issa: Nafissatou Ndiaye (1)



- Individual enterprise
- Existence for 4 years including 1 year with NCNW
- Dyeing, sewing, batik, kafkan, table clothes, transformation of fruits and vegetables...
- 2 tailors and 5 people of Nafissatou's family are working and living on the business (including her 4 daughters and herself)

## C2: Keur Issa: Nafissatou Ndiaye (2)



- **MAIN DIFFICULTIES:**
- Business in a location keen to inundations
- Difficult to distinguish between private and business accounting
- No state-of-the-art sewing machines
- With a new electrical sewing machine would be able to do embroideries and compete on the market
- She has family and social duties to respect during working hours (e.g., cooking, children, baptism, funerals, marriages)

## C2: Keur Issa: Nafissatou Ndiaye (2)



- Divorced (husband left her with a son and 4 daughters to care for)
- Only 4 grade education; speaks French very slowly
- Learned to use a computer, Word and Excel
- A lot of HIDDEN costs (do not pay rent but buys presents for the brother, do not pay salary to the children, but buys them extra things...)
- **NEEDS help** in distinguishing private and business expenses and incorporate hidden costs into accounting

# C3: ADD - Neighborhood Association

Fatimata Sow, Aïssatou Siby



- Neighborhood initiative to care for and better educate children
- 5 full timers, 12 volunteers, 24 members (all the neighborhood)
- Located in one of the poorest districts of Saint Louis
- Everybody (24 households) pays a monthly fee
- Association that wants to do a lot with very little funding

# C3: ADD - Neighborhood Association

## Fatimata Sow, Aïssatou Siby



- Located in the house of the president.
- The pre-school is located nearby.
- The store is also situated in another location

# C3: ADD - Neighborhood Association

## Fatimata Sow, Aïssatou Siby



- In the house of the president they created:
- Library for children (books are donated by people in France)
- a space for children from the neighborhood to study and be successful at school
- Cyber café: with 2 computers (old)
- Internet connection is 100 FCF (\$.2) for children and 200 FCF (\$.4) for adults

# C3: ADD - Neighborhood Association

## Fatimata Sow, Aïssatou Siby



- Pre-school program to teach FRENCH
- 3 sections for children between 3 and 6 years old
- Total around 110 children
- Children speak Wolof at home and on the streets with no exposure to French.
- When they go to state school (all schools are only in French) they have to learn French, reading and writing, arithmetic all at the same time. Dropout rate is enormous!
- Only 12% of the population finishes High School ( French baccalaureate).
- They are proud of one girl who successfully passed her baccalaureate (the second time around) while studying at ADD

# C3: ADD - Neighborhood Association

## Fatimata Sow, Aïssatou Siby



- They promote neighborhood support and activities
- Organize Summer camps
- Have Awareness programs (e.g., aids)
- Provide just a quiet place for children to come and read, and draw and study (I have seen them!)
- They also have a Store of art and craft in another location

# C3: ADD - Neighborhood Association

Fatimata Sow, Aïssatou Siby



- **PROBLEMS**
- Did not manage to secure any funding for the association
- Have difficulties to sell art and craft
- Difficult to locate craft fairs in Senegal and miss opportunities

# C3: ADD - Neighborhood Association

## Fatimata Sow, Aïssatou Siby



- **NEEDS:**
- Management of the membership, activities and finances of the association
- Management of the library
- Management of the pre-school
- Management of the cyber-café
- Software for children (on mobile phones)
- introduction to computers for small children
- Tracking craft fairs in Senegal
- Web page with the list of events to help giving visibility to the association and secure funding
- **Investment:** Would like to rent a unique location for all activities
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## C4: Takky Liggey Fish: Fati Binta Sarr



- Fati Binta Sarr is a president of GIE
- Association of over 100 fisher women
- 20+ very active
- Women speak only Wolof – not French - and may not be able to read/write

## C4: Takky Liggey Fish: Fati Binta Sarr



- Business:
- They buy fresh fish, produce dried fish out of it and sell it.
- They buy fish from fishermen's boats by cases for 300-400 FCFA
- (\$.6 -\$.8) a kilos
- sell processed and dried fish by kilos for 700-2000 FCFA (\$1.5 - \$4.2)
- Often sell with losses

# Dried Fish Production



# Production: old and new



- 20 women were selected to participate in a Pilot Project supported by
- ADF (African Development Foundation)
- Japanese built a processing plant named after Binta Sarr
- The 20 women can use it and work faster and in better conditions (including hygiene) and
- produce high quality fish
- Price could be increased from 700 (\$1.5) to 3000 FCFA (\$6.3)

# C4: Takky Liggey Fish: Fati Binta Sarr



- **Needs:**
- Management of sales and expenses
- some analysis of their business effectiveness,
- knowing the price of the fish on the market in real time (sms messages?)
- web site
  
- **Investment:** produce dry fish in a cleaner environment

# C5: Unite de Transformation de Fruits et de Legumes Xee Ak Naak



- **Business:**
- Neighborhood association
- Fruits/Vegetable transformation
- micro-credit
- training
- They have their own office
- The members are also working with a micro-finance association that got 534 millions of FCFA (\$1,135,953 )
- They work with the ITA ([Institut de Technologie Alimentaire](#))
- 17 women
- They have a [cyber café](#)

# C5: Unite de Transformation de Fruits et de Legumes Xee Ak Naak



- Fruits and vegetable transformation: Syrups and juices (e.g., syrups of ditakh, tamarin, bissap).
- A jar sells for \$5.3 !!
- I didn't buy!
- Conservation of fruits and vegetables in brine water (e.g., onions, gombo, cabbage, pickles).
- The interest is that for example onions cost 25 FCFA/kg (\$0.05) in the summer but 100 (\$0.2) in the winter.
- Offer free training – sponsored and certified by the ONFP (Organization Professionnelle de Formation)
- They are part of a broader association dealing with soap manufacturing, dyeing and micro-finance.

# C5: Unite de Transformation de Fruits et de Legumes Xee Ak Naak



- Needs:
- technical training
- Web page
- Software for micro-finance management (groups, individuals, products)
- Kiosks/carts sells management

## C6: Artisanal Village - Khalifa Ababacar Sy



- **BUSINESS:**
- Batik, sewing, dyeing
- Most popular items: clothes, patchworks (the Mourids, religious group of Touba are famous for wearing patchworks),
- bags, wall decorations,
- table clothes, paintings
- started this business after finished the sewing school in 1998
- She was at the Sor market before
- 2 employees

## C6: Artisanal Village - Khalifa Ababacar Sy



- **Types of clients:**  
Tourists and local people
- in particular participates in Tabaski and other important festivals in Senegal
- **Her asset are sales.**
- **Goes to hotels** to deposit business cards and get the calendars of tourists arrivals
- **Work with guides** to attract clients (guides get a commission of 10%)
- **She earns** more than businesses in the front of the Artisanal Village because she has a real aptitude as a sale person
- **Very energetic and outgoing; real talent**
- **Competition** does not seem to be a real difficulty even if several businesses are doing the same thing at the Artisanal Village
- **Difficulties:** only one sewing machine for the time being
- Small space limits training possibilities

## C6: Artisanal Village - Khalifa Ababacar Sy



- **NEEDS:**
- Management of **direct/indirect costs**
- Tracking of **hidden expenses** like guide (10%), cabs to hotel, advertising,
- **rent: 6000 FCFA (\$12)**
- **electricity: 9500 FCFA (\$20)**
- Tracking system for craft fairs in Senegal

## C7: Association **Jom ak Ngor** (Courage and Pride)



- **BUSINESS:**
- Art gallery
- Dyeing, batik, sewing
- Training offering
- The association exists since 1996 and the store since 2000 (a store at the artisanal village closed because of the lack of tourists)
- **President, vice president, secretary, 15 people**
- **contractors when necessary**
- Store in Saint Louis center.
- Personal houses as art studios
- **The employees are artists and sell their creations.**
- They use fabrics from different countries – Mali, Ivory Coast...

## C7: Association **Jom ak Ngor** (Courage and Pride)



- **CLIENTS:**
- Local people and tourists
- Different prices for local people and tourists
- Hotels and Guest houses (e.g., table clothes)
- International clients who are travelling to St. Louis
- Periodic sales take place in the store
- Accepts business cards

## C7: Association **Jom ak Ngor** (Courage and Pride)



- **INCUBATOR HELP:**
- Management of the accounting of the store with Excel
- Improvement of writing skills (e.g., writing to customers)
- Compute manufacturing cost and margin for local and **international sales:**
- Zoo in California, Belgium, Finland, Spain stores
- Arrange items in the store to maximize sales and improve customer experience

## C7: Association **Jom ak Ngor** (Courage and Pride)



- **PROBLEMS:**
- Limited number of customers in slack season (around 20 customers per day)
- Compute manufacturing cost and margin to fix the prices of items to sell locally and internationally
- Get funds and strategic partners for growth
- Combining store management and customers at the same time

# C7: Association **Jom ak Ngor** (Courage and Pride)



- **NEEDS:**
- Artistic e-commerce Web page
- Count the number of customers for planning purposes and analysis (e.g., human resources and stock management)
- Stock management
- Orders and customers management (e.g., Spanish customer buying lots of products to sell in Spain)
- Sales and expenses management per day, month and year (e.g., salary, rent, art products)
- Training management
- Products that sell and do not sell and at what prices
- For example: the batik clothes and table clothes sell very well
- Products that are wasted because they get degraded by the sun and dust
- They don't (and will not have) a computer
- They depend on Incubator computer

# Anita and Christelle



# Students and Colleagues



# General Remarks

- **1. All incubators clients stay there for a limited time;**
- They usually have access to the computer there and none after.
- They are far too poor to be able to think about buying their own computers.
- **2. Mobile Phone IS a computer** they have in their hands and they will be able to
- continue to run their businesses the way they were taught- and got accustomed to while collaborating with the Incubator.
- Our applications will hence improve the sustainability.
- **3. DATA accumulation and use.**
- Mobile Phone can't hold too much data; we will write applications for data
- Transfer to the whatever is the center (Incubator, but can be University or other center) where it will be kept.
- **4. Learning Patterns of Informal economies**
- We will use Data Mining Techniques to learn patterns (and rules)
- governing these "smallest" and poorest of all informal economies.
- **5. We want OUR applications to be NATURAL LANGUAGE independent (or almost) so they will be easily implemented and used in all countries of the world.**

# Next Meetings

- Thursday, September 18
- We will have a talk-presentation of an application by James Mony (summer project)
- He will discuss with you all technical problems!
- I want you to read carefully description of all our clients businesses and CHOOSE one or two you want to think about.
- You can work with somebody.
- Thursday, October 2
- We will start presenting your ideas and discuss them.
- One by one. Make 1-2 slides.
- I want our seminar to be working seminar; we all will contribute.