

Rural Technology Lab

Progress Report

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Summary

The Rural Technology Lab is the result of a partnership between Microsoft and the Earth Institute, implemented by the MDG Center for West and Central Africa. It aims at **training local Malian students to be effective programmers**. Computer science training in Bamako, Mali, is extremely rudimentary with not a single comprehensive programming class offered at the national universities.



Mali has a fundamental need for better information management, especially in the fields of education, health and nutrition, where software platforms can be used to help improve monitoring, management and delivery of basic services.

The current project trained 40 local students in object oriented programming and Web programming, then led to select **8 among the best to develop a Web application solving real developmental issues**.

Accueil | Résumé | Toutes les absences | Gestion des rapports

Nombre d'absents en moyenne à Tiby

Par : Semaine Mois Année

Changer de village: Tiby

Écoles	Garçons	Filles	Enseignants
Tiby2	5 / 80	14 / 30	0 / 1
Tiby 1		Aucun appel n'a été fait	
Total	5 / 80	14 / 30	0 / 1

Six months after the first lectures, the students have been able to release a stable and already usable tool which will be used to provide **school enrollment rates and food stocks in schools for more than 40 villages**.

The students are now able to work autonomously are now autonomous and work as a team using best practices in agile programming to add new features and eventually set up the system in production.

The tremendous results of this experiment, especially considering, the **exceptional expense / feedback ratio**, let us believe that this program should not only be carried on, but **scaled-up would benefit to several other projects** that urgently need information management support. This report is a follow-up of the *January Progress Report*.

Last months history

January – End of theoretical training



In early January, Kevin SAMUEL, the second trainer, joined the Lab.

Students were divided in three groups of eight, according to their skills. Theoretical sessions were doubled and groups met in the mornings. Afternoon participation became mandatory and was dedicated to practical sessions. The rhythm of training was greatly improved and the rotation of teachers resulted in a very positive progression.

Students were tested, again, at the end of January. They could choose between two different subjects. Results revealed two groups: 10 more advanced students and 14 less. Of these 14, four it was determined that 4 did not make enough progress to continue further despite being motivated.

End of Training

At the very beginning of February, the RTL hosted a small ceremony to mark the end of the public training. Internships were then offered to 8 students after difficult deliberations with teachers, school managers and Lab Directors: while selection of the six was straight-forward, the four remaining students were equally qualified for the remaining two stops. Final selection was based on motivation and assiduity.

The ceremony also featured presentations of programming projects at the Millennium Villages Project and presentations plus open discussions with local and regional programmers. The feedback on those sessions was incredibly positive and several local professional software developers expressed their interest to join the training offered at the lab.

The ceremony ended with the delivery of training certificates to the 24 students that were able to follow the entire program. Finally, we announced the list of selected interns, then students thanked Philippe, the first teacher who was ending his time at the RTL for his time and efforts.



February – Real world project

As of February 1st, 8 students are now interns of the Millennium Villages Project. They are working from the Lab full time, under the 2nd teacher Kevin Samuel's management.

The first week was dedicated to tools and setup of a professional, collaborative programming environment. The second week started with a trip to Tiby (Ségou area), one of the Millennium Villages site in Mali. Interns met with the head of the project and sector heads and visited the site including school, health centers, agronomic centers. This provided a wonderful opportunity for teaching, with very practical and vivid examples, how to do a proper needs assessment and communicate with the client as a technical team.

From this visit, interns built a report, identifying needs in information management, and described several computing projects MVP could benefit from. After discussions, it was decided to work on a Data Collection/Visualization tool for the education sector. The software would be a Web based C.R.U.D application with a focus on quick feedback and ease of use.

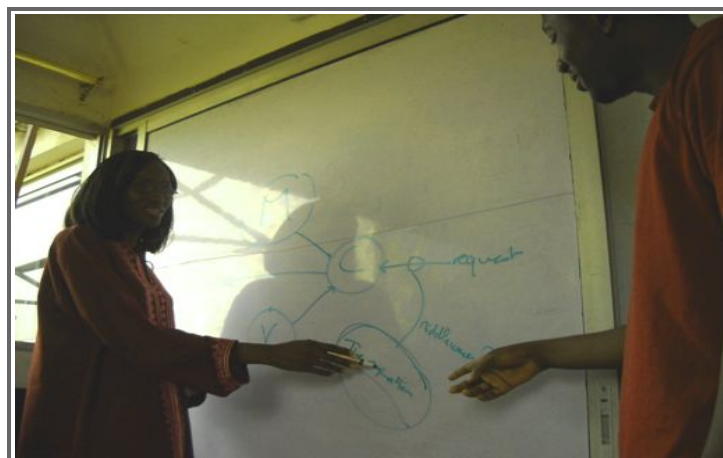
Before starting programming, interns were trained on best practices, giving priorities to communication. They especially learned to work according to agile methodologies such as Scrum and were pushed to perform usability tests from drafts and mock up as well as using version control.

March – From theory to practice

March was entirely devoted to programming. The system they are working on is a web-based (with SMS-input) data visualization tool giving access to statistics on food distribution and stocks at schools (MVP Schools provide food to children) and exposes the statistics of non-attendance for both teachers and children.

Interns are using the following development rules:

- 4 groups of 2 people.
- Peers changes every week.
- Each couple of groups work on a specific topic (ex. Group A works on logic, Group B on U.I)
- Two students swap their seat every week.
- One reporter is picked up every week ; he's the one who writes on the blog and ensure communication with the clients for all the team.
- Interns publish a release every Friday afternoon for testing by MVP staff.



Current state of project

Currently available features

During their internship, the team learned how to develop a real life project, acquiring theory and practice at the same time. In only two months, they manage to release a stable version featuring:

- Input of stock incoming and consumption, number of absentees and corresponding class, schools and village with validation.
- Dashboard for both subjects displaying a global review of the most important events and recent point of interests.
- Ability to get a detailed review of the current state of stock and absenteeism with time and place filtering.
- Very good readability and ease of use, tested on and validated by locals.

The screenshot displays a dashboard titled "Résumé de l'état des stocks" (Summary of the stock status). It features several data tables:

- Villages en période:** A table with columns for village name and stock value. Rows include: Abohou (Riz grain, -1.0 t), Farakou (Riz grain, 7.0 t), Tiby (Riz, 20.0 t), Farakou (Mil, 20.0 t), and Koko (Mil, 30.0 t).
- Derniers mouvements:** A table showing recent stock movements with columns for change, item, location, and date. Rows include: -25.0 t (Riz grain, Babouyou, 2010-03-19), -36.0 t (Riz grain, Tiby, 2010-03-19), -370.0 t (Riz, Farakou, 2010-03-19), -633.0 t (Mil, Wena, 2010-03-19), -54.0 t (Riz grain, Koko, 2010-03-19), +53.0 t (Riz grain, Babouyou, 2010-03-19), +72.0 t (Riz grain, Tiby, 2010-03-19), +227.0 t (Riz, Farakou, 2010-03-19), +865.0 t (Mil, Wena, 2010-03-19), and +388.0 t (Riz, Tiby, 2010-03-17).
- Plus grosses consommations ce mois-ci:** A table showing the highest consumption for the month. Rows include: Babouyou (Riz grain, 3257.0 t), Farakou (Mil, 2436.0 t), Babouyou (Riz grain, 987.0 t), Babouyou (Riz grain, 987.0 t), and Tiby (Riz grain, 987.0 t).
- Plus gros consommation ce mois-ci:** A table showing the highest consumption for the month. Rows include: Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t), Tiby (Riz grain, 987.0 t).

Planned features

There are 3 months remaining and the students are required to add the following features to the project:

- Authentication and access rights.
- Data export.
- SMS data input.

Desired additional features

Clients expressed their desire to see some additional features added to the project. Now that students are on their own, and considering the limited time at their disposal, we did not include them as mandatory:

- Histograms as an alternative way to data visualization (currently, tables are used).
- On the fly table sorting.
- Improved user experience using Ajax.

End of formal training assessment

End of March assessment was very important because from April 1st, Interns are in complete autonomy. This assessment revealed a tremendous progress within the last two months: full-time practical training made a huge difference.

<i>Skill</i>	<i>Level before the training</i>	<i>Level after the training</i>
Procedural programming	+	++++
Object oriented programming	0	++
Project analysis	0	++
Project management	0	+++
Team work	+	++
Communication	+	++
Web development	+	+++
Best practices	0	+

Interns strengths

- Strong determination : hard work, persistence, willingness to find solutions.
- Practical experience and use of advanced development tools : Web frameworks, version control, usability testing.

Persisting weaknesses

- Lack of global vision. As beginners, they have not the experience to see all the sides of a project. They still have a hard time to wrap their head around high level abstractions and can not yet conceive of them on their own.
- Specialized knowledge : no sysadmin skills, English fluency nor multi-paradigm mastery.

We can consider, without exaggerating, that **these students are now on the way to be in the short list of some of the best software developers in Mali**. Even 3 months before the actual end of the project, several interns have begun to receive informal job offers. One of them had an actual job offer we encouraged him to decline, so they can carry on the project as a whole team.

Next Steps

April starts with Kevin's departure. Interns will now work in complete autonomy and report progress and issues during a weekly Friday afternoon meeting. Remote technical support will still be available but is unfortunately limited by budget, while software releases, client (MVP Tiby) communication and support will be their entire responsibility.

You can follow the RTL Interns French blog on <http://rtlblog.mvpafrica.org> and witness the project improvements by looking at the weekly released prototype on <http://rtl.gotdns.org>.

However, please be aware that **the development server is host locally at the RTL and is thus vulnerable to the frequent power outages in Bamako**. Therefore you may experience unexpected downtimes until the production system becomes available.

Senegal Workshop

An exclusive technical workshop will take place in Louga, Senegal (MVP Site) during the first week of May. This 3 days workshop will present the programming technologies used within the Millennium Villages Project and include practical hands-on session. 30 people from across the country are expected.

Two trainers and one intern from the lab will run the event with the objective to initiate a community of modern-techniques-aware programmers in Senegal.