

## A Digital Gateway

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## A Digital Gateway

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**Abstract.** Passerelles numériques (Digital Gateway) has an ambitious goal – to find students from impoverished backgrounds a long-lasting career in the information technology (IT) industry. Currently located in Southeast Asia – namely Cambodia, the Philippines and Vietnam – Passerelles numériques has developed and implemented a program that prepares students with the knowledge and the skills necessary to work in the industry. The program, lasting 2-3 years depending on location, consists of IT education, English courses, business life training, and values formation. The students graduate from the program fully prepared and motivated to take their IT careers to the next step.

The results of Passerelles numériques have been inspiring. Students who have graduated have been doing well in their jobs and their companies are happy with their work. However, some challenges and obstacles still remain.

**Keywords.** Education, information technology, soft skills, behaviors, experience, qualification, employability

Access to higher education in developing countries is very difficult, especially for those who can not afford it<sup>1,2</sup>. Additionally, few organizations are present that can help. Currently, educational organizations focus mainly on helping children get through primary and secondary instruction<sup>3,4</sup>. However, to escape from poverty, what these children really need are the skills and knowledge that one acquires during higher education, in order to get a qualified job that will support them and their families in the long term<sup>5</sup>.

Passerelles numériques (PN) has identified this need and aims to provide these students with the necessary skills and qualifications to properly enter the job market. Their main objective is to find their students long-term and qualified jobs at the end of their stay with the organization. Additionally, they have observed that the information technology (IT) industry is one of the fastest growing industries today and will continue to grow in the coming years all over the world, including developing countries. However, in some parts of the

world, the industry is finding it difficult to fuel this growth due to the lack of human resources. PN is therefore focused on providing the IT industry with more capable employees.

### 1. Background

PN is a French-based organization that aims to prepare students from poor families in developing countries to find jobs that will eventually lead them (and their families) out of poverty. They train students to be IT technicians who will eventually work in the growing IT industry. The reasons they train them for the IT sector are mainly the following:

1. The IT industry's growth will ensure these students' long-term employability<sup>6,7,8</sup>.
2. The entry barriers for this business are relatively low compared to other industries<sup>9</sup>.

1 Education in Developing Countries – Federal Ministry for Economic Cooperation and Development, Germany: [http://www.bmz.de/en/what\\_we\\_do/issues/Education/hintergrund/bildungssituation/index.html](http://www.bmz.de/en/what_we_do/issues/Education/hintergrund/bildungssituation/index.html)

2 International Human Development Indicators – UNDP, <http://hdrstats.undp.org/en/indicators/default.html>

3 Millennium Development Goals 2 and 3 on education

4 National Education Support Strategy (UNESS): Cambodia, 2010-2013 – UNESCO

5 International Issues Monitor – March 2011, volume 2 – KPMG

6 ICT skills readiness for the emerging global digital economy among small businesses in developing countries: Case study of Botswana – Stephen M. Mutula, P. Van Brakel, 2007

7 ICT job numbers to climb while skills shortage deepens: ACS – Hamish Barwick (Computerworld), 28 February 2012

8 Technology Insights 2011: Summary report – e-skills UK: <http://www.e-skills.com/research/research-publications/>

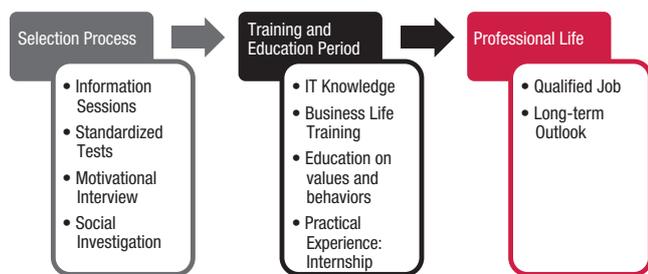
9 How ICT helps developing countries – some Kenya case-studies– Neelie Kroes, September 28, 2011: <http://blogs.ec.europa.eu/neelie-kroes/how-ict-helps-developing-countries-%E2%80%93-some-kenya-case-studies/>

3. The training period required is relatively short, thereby allowing these students to enter the job market as quickly as possible.
4. Developing more skills and qualifications in this sector could contribute to the overall development and growth of the country, especially in areas where the training centers are located<sup>10,11</sup>.

PN started their first training center in Cambodia (2005) and has expanded to the Philippines and Vietnam. In 2011, they had a total of 453 students: 250 in Cambodia, 113 in the Philippines, and 90 in Vietnam. Students in Cambodia and Vietnam undergo a 2-year training program including internship, while students in the Philippines undergo a 3-year program including internship (this is mainly because Filipino students graduate from secondary education very young, 15-16 years old, compared to the other countries).

## 2. Methodology

PN's aims to have a lasting impact on the students they train. It thus follows the procedure illustrated in Figure 1 below:



**Figure 1.** Key elements of Passerelles numériques' value chain

### 2.1 Selection Process

PN selects students for their program through the following process. PN gathers students from the nearby areas and neighboring provinces.

- **Information Sessions:** With the help of partner organizations in the area, PN visits different high schools and presents the program to potential students. PN explains what the IT industry is, what jobs are available, and how PN can help the students. Interested students then submit an application through their respective high schools.
- **Standardized Tests:** Students undergo different standardized tests to ensure that they have the learning capability to succeed in PN's program and work as an IT professional in the future. These tests take half a day and measure their skills in mathematics, logic, and English. In order to proceed to the next phase, the students have to fall within certain thresholds for the following: logic, logic + math, and logic + math + English. The thresholds are calculated using

<sup>10</sup> ICT Skills and Employment Opportunities – Hilal Atasoy, April 9, 2012

<sup>11</sup> New Perspectives on ICT Skills and Employment - OECD, April 22, 2005

algorithms developed by PN and vary amongst the three centers in the three countries: Cambodia, the Philippines and Vietnam. In order to avoid eliminating the students who would benefit the most from the program, PN tries to maintain flexible thresholds, especially with regards to the level in English.

- **Motivational Interview:** After passing the tests, the students have an interview with two employees from PN. Interviews usually take place at the same place as the exams. The interviews are usually conducted in English; however, at least one of the interviewers speaks the local language just in case. The interview assesses the level of English of the student and the confidence the student has in speaking the language, since it will be necessary for him or her to succeed professionally in English in the future. Additionally, the interviews are performed to evaluate the students' level of maturity, gauge their motivation for being in the program and desire to stay in the IT industry, and ensure that they will take full advantage of what they learn and be motivated to provide their family and themselves a more promising future. Examples of the questions asked are: "What did you learn from the information session you've attended?" "What are your dreams?" "What are your interests and hobbies?" "Would you have a problem spending a lot of time with computers for most of your life?"
- **Social Investigation:** In the final step of the process, PN's trained professionals, and a social worker, investigate the financial ability of the families of the short-listed students. The purpose of is to confirm that the families of the students are not financially capable nor have the resources to support their children through higher education (this includes tuition and living expenses). The professionals interview the family, their neighbors, and their community. Based on the interviews, they estimate the family's income and expenses. The main question the professionals have to answer is: "Would the student be able to continue in higher education without the support of PN?" Generally, the family has to meet all the pre-determined social criteria to be considered financially needy. This is an important stage in the interview process, as the organization aims to help only students from underserved social backgrounds.
- **Selection:** The students are then ranked based on their learning capacity (standardized tests + interview) and on their financial need (social investigation). From these rankings, PN decides which students to accept. PN first selects students who have been supported by their partner organizations. Next PN gives priority to girls in order to achieve a 50-50 mix between girls and boys (however, in the Philippines, where girls are more numerous than boys, PN makes sure that no more than 66% of the class consists of girls). Finally, PN selects students by finding a proper balance between the learning ability and financial need.

## 2.2 Training and Education Period: A comprehensive approach

A high priority of PN is to make sure that the students obtain qualified jobs. Therefore, the organization has created a rigorous training program that develops all the skills necessary for the students to succeed in their professional careers.

When it was about to start the program in the Philippines, PN had assumed that it could easily replicate most of what was done in Cambodia. Unfortunately due to differences in culture, stages of country development and maturity of the IT industry, this was not possible and the program had to adapt to its new surroundings. The same happened when the program was going to be implemented in Vietnam. Eventually the programs in the three countries have evolved to be significantly different programs. However, the core concept of the program has not changed and remains the same in all three countries. What differs is the execution of the core concept. For the purpose of this article, we will focus more on the program in the Philippines. Unlike in Cambodia and Vietnam, where the program lasts 2 years, the program in the Philippines lasts 3 years. This is mainly because the primary and secondary education system there lasts only 10 years, thus the children finish at a younger age.

To give some time for the students' emotional intelligence (EQ) to increase, PN decided that the Philippines program would last 3 years. The first 1½-years are devoted to building the skills and qualifications needed to work in the IT industry, while the second half is devoted to the students' gaining work experience through a work-study program.

In order to provide the students with everything needed to succeed in their professional life, PN focused on five areas that the students would need to develop, which are illustrated below in Figure 2:



**Figure 2.** The five areas of professional and personal development targeted by Passerelles numériques

- IT Training and Development

PN wants to train their students in the shortest time possible in order to have them start their professional careers right

away. Thus it provides students with very specific IT knowledge that address specific needs within the industry. This is contrary to what is normally taught to university students, where they are given a broader background on IT functions.

In the Philippines, PN had decided to partner with a local university in Cebu City, the University of San Carlos (USC). Together with the university, they developed a curriculum that prepares the students for job profiles currently needed in the IT industry. The curriculum combines the aims and objectives of the organization and the core subjects of the university. At the beginning of the program, students were only trained to become Systems and Networks Administrators (SNA). However, based on more recent market studies, it was determined that the industry also needs Web Programmers and Software Developers. Therefore the incoming group of students this school year (2012) will choose whether they want to be trained as an SNA or a Web Programmer and Software Developer.

The majority of the IT curriculum (roughly 80%) is taught in USC, while the rest is taught in the training center where the students are housed. In the center, there are computer laboratories where the students can practice what they learned at USC. Trainers, who help them when the students can not progress by themselves, supervise these study hours. Lastly, before the students go to USC to receive their IT training, they undergo a “pre-training” course in the Center to make sure that all of them are at the same level of computer knowledge.

- English Training

English is the language used by most IT professionals globally. Therefore, PN also ensures that the students reach a minimal level of English proficiency so that they can fully integrate themselves into the IT world. Additionally, this helps them in their long-term career progression. The English classes are also taught at USC.

- Business Life Training

Students that undergo this program come from backgrounds very different from what is familiar in Western countries. Being from very poor families, the students have not been exposed to the behavior necessary to work in the corporate world. PN's main goal is to provide these students with a qualified job that will eventually allow them to escape poverty. Thus, they also teach their students the soft skills and values needed to assimilate into the IT work environment. Every Saturday, volunteers from Accenture Cebu come to the training center and teach the students how to be professional and work for companies. They are taught the following:

- General knowledge:

History  
Geography (relating to global business)  
Finance

- Business culture:

What is a business and how is it organized? What are different departments and their functions? What impacts the students have in the company and how their performance is

linked to salary. How to answer the phone, take notes, make reports, present talks to groups. How to write CVs and do well in interviews.

- Higher-level skills:

Problem-solving and critical thinking. Questioning how things are done, daring to ask, and eagerness to learn. Taking the initiative rather than waiting for things to happen.

Additionally, the students have company visits once a month. They visit companies such as Accenture and PLDT (the Philippines' main telecom company). These visits allow the students to see what companies actually look like, make them visualize what it would be like to work there, and give them an idea of what companies they would like to work for.

The Business Life Training also gives the students the opportunity to gain confidence that they would actually be able to work for such companies. This training is given to the students in the first 2 years of the program.

- Values and behavior

PN's students do not only come from the city where the training center is located, but from the surrounding cities and provinces as well (PN covers the Visayas region). Therefore, when the students enter the program, it is usually the first time that they have been far away from their parents and are, therefore, under the complete care and supervision of PN. The students are housed in the center where they are cared for by social workers. PN takes this opportunity to ingrain in the students values that are important for their success. The main values are: solidarity, responsibility, and trust. PN believes that these 3 values are necessary for the students' success in the future: responsibility – because without it, nothing can be created, trust – because people would not be able to work together without it, and solidarity – because workers succeed together or not at all.

In the Philippines, PN puts more effort on the value of responsibility because their students are still relatively young. These values are taught to the students in the classrooms, during the activities being held in the Center on weekends, and in the chores and responsibilities that they are given. When the students are in their last year in the program, they have to leave the center. PN gives them a budget for housing, and they find their own accommodation in different boarding houses around the city. This gives them more independence and more responsibilities. Lastly, in the case of the Philippines, where the rate of unexpected pregnancy is high amongst the youth, PN provide their students with sexual education.

- Internship

To complement their academic background, the students also have internships with potential employers. During the second half of the program, PN places the students in IT companies where they can work for 4 days a week. The 5<sup>th</sup> day is used for students to go to USC and continue their IT education. Additionally, the Philippines government encourages the work-study program by making it more attractive for companies to accept these students. Under the dual-training system (DTS) provided by the government, the companies

pay the students at least 75% of the minimum wage and are not obligated to pay social security taxes. The students' salaries are paid directly to PN. Seventy percent of the salary is used to pay a fraction of the students' tuition fees, and the remainder goes back to the students and is enough to cover their basic living expenses. Another benefit of this program is that it involves companies in the development of the students, thereby further ensuring the students' long-term success.

### 3. Professional Life

At the end of the program, the students should be able to do everything in a "Can Do" list that PN has prepared and regularly updates. The goal is to prepare students for professional work, having the necessary skills and qualifications, rather than only having theoretical knowledge. Additionally, they get a certificate from USC stating that they have undergone the PN program. Although the certificate is not yet recognized by the State, it is recognized by future employers. The first group of students from the Philippines program graduated in March 2012. After a few weeks following the graduation ceremony, all these students had found jobs. Since the IT industry in the country is always in demand of employees, and PN has prepared them specifically for the industry, the students of the program should not have too many difficulties in finding a decent job.

Moreover, PN hopes to create a strong alumni network that should be helpful for the students in the future. One of its current projects is to increase solidarity amongst its students through the Solidarity Act Program, where students who have graduated from the program can voluntarily give back part of their salary to help finance the students currently in the program.

#### 3.1 Results

The success of PN is determined by the success of its students. After 6 years of existence, PN has achieved many things. In Cambodia, 97% of the successive groups since 2007 have found jobs within two months after graduating from the program. The students who have graduated also keep in touch with the organization and help out in the center whenever they can. As already mentioned, in the Philippines, the first group of students graduated in March 2012. Most of them have had successful DTS programs with companies and hope to continue working with the same companies.

Feedback from both the companies and the students has been positive so far. The companies report that PN's students are different from the students they receive from traditional universities. PN's students are seen as hard working, motivated to succeed, and with a good attitude in the work environment. Conversely, students are also happy after having gone through PN's program. They have grown to be more independent and responsible and have made close friends within the program.

#### 3.2 Moving forward

The work that PN has achieved so far is impressive. Both the

students and the companies have seen the benefits of having the program in their area. However, there are certain things that they would have to look out for when progressing in the future.

First is the scalability of the PN project. Although it is possible to scale up (as shown by having 3 centers in different countries), bringing the project to a different location is not as easy as initially expected. Many factors have to be taken into consideration when implementing the program in a new place. The educational and legal structures of the countries play a large part. In Cambodia, the current level of education led PN to decide to set up a Center of its own, while in the Philippines and Vietnam, the quality of education infrastructure was strong enough that it was not necessary to “re-invent the wheel”, and instead, PN could partner with local universities. In the Philippines, the government’s DTS program made it easier for the organization to implement a work-study program, while in Cambodia and Vietnam, PN is working hard to convince companies and the authorities to implement it without similar support from the government. The maturity of the IT industry in the country as well influences the program as the students are taught specific content based on what the local companies need. The curriculum taught to the students is dependent on the way the market evolves. Lastly, the culture of the country also plays a key role in development of the program. Different values from the 3-pillars of values (responsibility, solidarity, and trust) are highlighted in different programs depending on the culture of each of the countries. Because of this, PN has decided not to move into new markets for the moment. PN has decided to focus and develop the programs currently in place, and improve the quality of these programs.

Another challenge is measuring the success of the students. At the moment the only measure for this is whether the students have a job or not afterwards. Since PN works so that the students have a qualified job and long-lasting professional life, other factors would have to be taken into consideration. One factor is the salary that the students earn and checking whether it falls within the range of the IT industry. Another is how the students progress within the companies. Since the organization and its programs are still young, other indicators may not yet be applicable and other more important indicators may also be deemed important.

The certificate that the students receive at the end of the program may also raise an issue in the future. Currently the certificates are not recognized by the state. At the moment, this does not hinder the students from being employed in companies. However, the fact that the certification is not a university degree might hamper the students from moving up the corporate ladder. So far, this has not been the case for the students in Cambodia. Time will only tell if it will be the same for the Philippines and Vietnam.

PN would also have to start thinking about the financial sustainability of its programs. At the moment, most of the funding comes from companies or individuals abroad. However, with the current situation of the European economy, this may not be something that the organization can depend on. The training centers in the countries would have to find more local sponsors. Currently, the companies are not

very involved in the development of the students. The work-study program is a small step towards this. They could actually do even more, especially considering that the companies are the main beneficiaries from the work of PN.

Finally, for centers that have partnerships with local universities (the Philippines and Vietnam), PN may encounter problems when they would need to adjust the curriculum to the market needs. The IT industry is quickly evolving and the IT curriculum would need to adjust to the industry. Unfortunately, the academic world is not very flexible and may not necessarily be teaching the students the skills that they would need to work in the industry. Although not an imminent problem, it is something that the centers would have to keep in mind when coordinating the IT curriculum with the universities.

#### 4. Conclusions

PN’s program is remarkable. PN has managed to create a program that allows students from impoverished backgrounds to successfully integrate themselves into the IT industry in a short period of time. In addition, the business and values training further ensure the ability of the students to work in the industry for a long period of time. The students emerge from the program not only with knowledge and skills necessary to succeed in the workplace, but also with the charisma and personality that allows them to progress further in the industry without too many obstacles. Moreover, the companies are very happy with the students’ performance and seem keen on hiring more of them in the future.

However, the achievements of PN are dependent on the IT industry, and the culture and the educational system in the areas where their centers are located. Thus, in order to safeguard their success in the future, PN would need more cooperation and participation from the local partner companies and would also benefit from the support of government educational agencies. It is also important to realize that the success of PN will also be a success for the companies in need of IT professionals in the area and the development of the city where they are located in. PN’s goal of finding long-term and qualified jobs for the students is also in the interest of the local companies, universities, and government agencies. Therefore, a collaborative effort from all interested parties would guarantee the success of the students in the future.