

PanGenesis: A Creative Costa Rican Approach to the Persistent IT Labor Crunch

"We have an innovative workforce solution for offshore outsourcing," asserted Carlos Apéstegui, head of PanGenesis' Costa Rican operations, speaking to his guest. "We have a unique apprentice program to tap young Costa Rica students and a special approach to importing highly qualified labor into Costa Rica. We have created a formula that allows us to lower charge rates, perform faster development-- and all this in this attractive small nation." He finished his sentence by waving at the many tropical plants all around him in the hotel garden hosting a large technology conference.

His guest was Paul Matzurski, a Deputy CIO at a large American corporation, who was visiting Costa Rica for the first time in search of new destinations for offshore outsourcing. Matzurski sipped his drink and said, "I didn't know the extent of the tight labor market here and even the rest of Latin America." He continued: "You know, "Labor scarcity," "search for talent" and "tight labor market" are all issues we deal with a lot in the USA. We hear about the tight labor markets in India and elsewhere. I was surprised to learn this is the case here in Costa Rica. Even (Costa Rican) President Arias spoke of spending more on education during his keynote address to this conference yesterday."

PanGenesis' CEO Richard W. Knudson was also at the hotel garden table sipping his Murphy's Rum and Coke. "Let me tell you the details of PanGenesis' workforce and pricing plans," he offered to Matzurski. "Do you have a sheet of paper? I will explain." Fifteen minutes later Matzurski had a much clearer appreciation of PanGenesis' ambitious plans.

Matzurski leaned back and pondered the PanGenesis value proposition for offshore outsourcing: this is certainly creative, intriguing and ambitious, but will it work? Will the program provide the apparent substantial improvement in productivity and quality at a lower cost with quicker delivery? Will the plan generate enough skilled employees? How many more years will it take to get the kinks out of this new workforce method?

This **teaching case** is about a Costa Rican IT Services firm exploring the dilemmas of international workforce and growth. The case takes place in 2007. It was developed by Prof. Erran Carmel as a foundation for class discussions and learning. It is based on actual companies and events, though some minor details have been disguised or stylized.

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A Teaching Note is available (for free) directly from Prof. Erran Carmel of the Kogod School of Business at American University, Washington D.C. USA. Please e-mail with a request.

1. Costa Rica – a new tech star

In 1997, Costa Rica President Jose Maria Figueres flew to California to visit Intel's headquarters in Santa Clara, California. This was an unusual visit. The President of this tiny central American country was coming to press his case that Intel, one of the world's most important tech companies, would choose Costa Rica as the next location of its semiconductor plant.

Within a decade the Intel gamble has clearly paid off. Costa Rica is a high-tech star. Intel alone employs 5500 in country. The other major MNC player in country is HP-- employing a similar number. Dozens of other foreign tech companies, including those in the Life Sciences, have set up operations in Costa Rica. Hundreds of indigenous Costa Rican firms have sprouted up selling their products and services to clients in the region – as well as to North America and to Europe.

Up until its rise as a tech center, Costa Rica was best known for its coffee, its bananas, its rainforest, and most interestingly, its abolishment of its standing army in 1948.

Costa Rica has only four million people and so the decade-old boom in high-tech has led to the usual high-tech labor crunch with escalating salaries. Of the labor force, there are about 7500 software professionals (or as many as 25,000 if broader assumptions are used) and another 20,000 employees in a related boom sector: call centers.

Costa Rica has nurtured good schools and universities, both public and private, yielding one of the highest literacy rates in the world. In addition to the major public universities, UCR and TEC, one of its leading a private universities, Universidad Latina, has grown a number of computer-related programs that help train software professionals.

2. The global market for IT workers

By 2007 the global tech boom was in its second decade. Global demand for software professionals continued in both wealthy and emerging nations. Even though global supply was growing in over one hundred nations, "labor crunch" has become a common refrain. This refrain was often accompanied by its close cousin: *turnover*. When markets are hot, people jump from job to job seeking higher salaries and perks. In India, for example, the industry expects to have a shortage of well over 100,000 software professionals by 2010. In 2007 the Wall Street Journal wrote: 'India's software-and-service association puts wage inflation in its industry at 10% to 15% a year. Some tech executives say it's closer to 50%."

At the same time, the baby-boomers in Europe and the United States are racing toward retirement. In the United States alone, the Labor Department estimates that by 2020, there will be a 28 million-person shortage in the labor force. This baby boomer segment of the labor force entered their working careers in the '60's to the '80's and comprise a significant amount of the IT professional workforce in the industrial nations today. As they leave to retire, the United States and Europe will see a continuing and worsening IT labor shortage.

And so, after looking at the overheated markets in India and China, and the upcoming crunch in the USA, many have turned to labor markets in Latin America to fill the void.

3. PanGenesis

PanGenesis is an IT Services firm targeting and servicing multinational clients. Thus, its foreign clients *outsource* IT support offshore (nearshore) to PanGenesis.

PanGenesis was founded in 2002 and is headed by three experienced leaders. American CEO and Founder Richard W. Knudson is an old hand in offshoring having lived in India for 7 years consulting to the Indian IT industry. Among his many accomplishments, Knudson was involved in early CMM evaluations in India and China. The firm's President is Jim Kamenlis, the former CIO of Xerox Palo Alto Research Center (PARC) one of the most venerated R&D centers in modern American history. Carlos Apéstegui heads operations in Costa Rica. He is a "Tico" and has 20 years of successful IT business operations in Costa Rica. (A native of Costa Rica is called a "Tico").

4. PanGenesis's workforce and pricing scheme

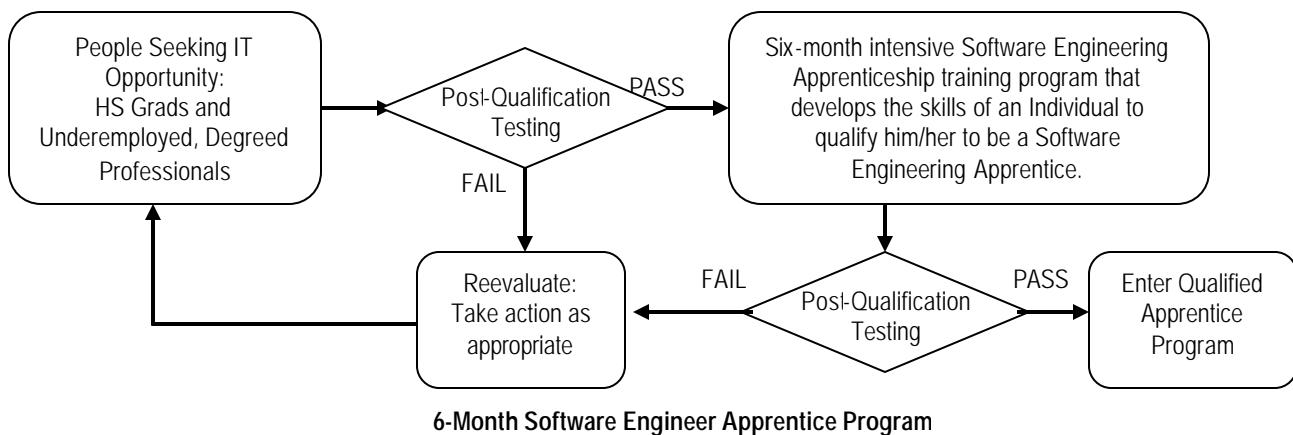
PanGenesis is building several programs for tapping inexpensive but well-trained IT labor.

a. *Apprentice Program*

CEO Knudson and President Kamenelis began working with the newly elected Able Pacheco government to create the apprentice programs in 2002. Working with influential people in Costa Rica and making his case directly to the President of Costa Rica and the Science and Technology Minister, Dr. Pardo-Evens, many of the elements of the program are in place in 2007.

At its core, the program will target young, economically challenged students out of high school. There are many excellent students who are not funneled through career tracks for various reasons. Typically they are busy working to contribute to the family income. Only about 20% of 2500 applicants who apply at the state funded public university Computer Science program get in. The remaining 80% are ripe for an apprentice program. Of those who are accepted into the CS programs, 60% are unable to finish. A related source of apprentices are the 450 students who finish the strong high school IT track—of 2500 hours. In spite of their computer prowess, many seek structure in their computer career plans.

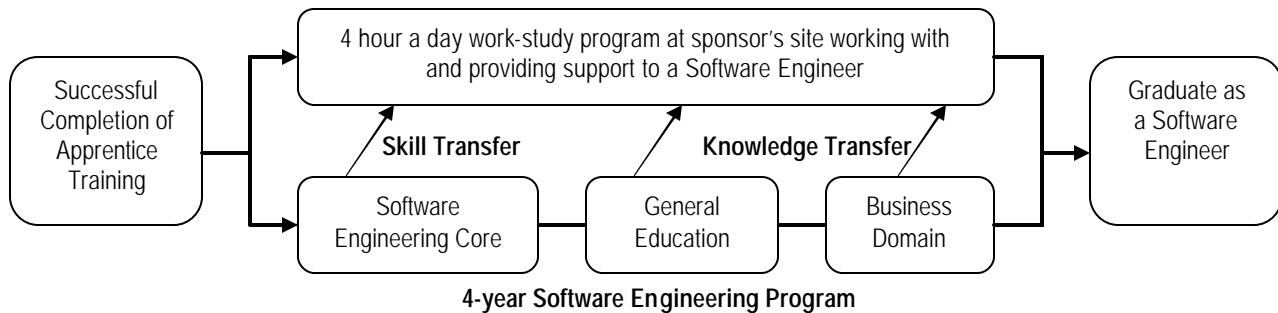
All of these students can be turned into productive software engineering professionals through the apprentice program. The student undergoes a rigorous six-month training program that includes: English immersion; intensive programming concepts; Configuration management using well-known software; quality assurance audits, nightly code reviews; training in documentation; teamwork, scheduling and statistical analysis. Once the training is successfully completed, the graduates become engineering apprentices and will be assigned to support a seasoned software engineer 4 hours a day. This pair will act as a development team. The qualification for an apprentice is modeled in the following diagram.



The apprentice relieves their software engineer from having to perform important, but non-engineering, *housekeeping* tasks that take up a substantial amount of time. This unburdens the engineer to focus on high-impact technical, software engineering tasks.

While fully educated and experienced software engineers are “charged out” at up to \$30/hour, an apprentice is charged to the client at a much lower rate. PanGenesis’ income for the apprentice is used in three ways: (1) It funds the living expenses of the apprentice; (2) It is used to pay the university for the apprentices’ 4-year university education to receive a software engineering degree; and (3) a portion is used for under-privileged students and to support university classrooms and labs.

To remain an apprentice the student must pursue his/her university degree as a software engineer, maintain a high grade point average, properly and diligently perform his/her apprenticeship assignments, and commit to work for PanGenesis after graduating from the university. The apprentice works for 4 hours each day, and attends the university courses for a degree in software engineering during the remainder of the time. This program is modeled in the following diagram.



As shown in the data in Appendix 1, the apprentice model allows PanGenesis to significantly under-bid competitors while substantially reducing project and development costs and delivery times. In addition to schedule and cost benefits, the services and products receive a substantial improvement in quality due to 100% code reviews and frequent quality audits conducted by the well-trained apprentices. This added value to quality and project cost is not factored into the savings already achieved by the apprenticeship model.

The first round of the student apprentice is scheduled to begin in 2007.

b. Tap underemployed university grads

According to the government's estimate, Costa Rica has 47,000 university graduates that are under-employed or unemployed professionals. The Arias Government's Minister of Science and Technology Minister E. Flores, would like to retrain them for IT. PanGenesis has included a fast-track program for these professionals, using the apprenticeship program model. These professionals have experience in business that would add value to their role as a software engineer.

The PanGenesis program is an accelerated 2year program: working while attending the “core” software engineering courses to qualify for a degree in software engineering. The accelerated pace is based on having met prior university general education and elective requirement from the employee’s previous degree. Income from the client for the degreed professional/apprentice is used in the same way as the income from the economically challenged high school graduates.

c. Labor importation

The last element of the PanGenesis model is to build an instant, large, *scaleable*, highly-qualified engineering workforce. This is a tall task. To accomplish this, PanGenesis is augmenting Costa Rican labor with imported foreign labor (guest workers) from other nations. PanGenesis has established an international IT sourcing capability hiring skilled software engineers from Eastern Europe, the

Philippines, and Latin America. This initial workforce will serve clients and will be the first mentors to the apprenticeship workforce being developed.

Of particular interest to the firm is the Philippines, which has a relatively large and mobile IT professional labor pool. Its engineers are well trained and speak excellent English and are also familiar with Spanish.

Filipino employees will enjoy income tax exemption because they are working outside the Philippines. They will be working for an affiliate company of PanGenesis. PanGenesis pays their social security tax due on salary received in Costa Rica, and provides them with room and board expenses.

Appendix A: Costs/ Charges for Apprentice-Supported Teams

Software engineer productivity: The workday breakdown.

Typical Engineering Tasks	Hours
Core engineering work	4.0
Productive Housekeeping Tasks: configuration management, code review, quality audits, scheduling, statistical analysis, etc.	2.5
Social time: Phone calls, long lunch, breaks, talking non-business	1.5

Source: Richard Knudson's internal time-and-motion studies.

Traditional model	Metrics
Assume a typical project with the following parameters	
Total project hours	10,000
Charge rate in offshore outsourcing	\$30 / hour
Skills needed: Engineers experienced in J2EE, web applications	5+ years experience
Number of engineers assigned	5
Effort per week	200h week
Duration	50 weeks
Total charge to customer	\$300,000

PanGenesis Apprentice Model	Metrics
Apprentice takes over some of the software engineer's Productive Housekeeping Tasks.	
Number of total productive hours, (1000 hours added for apprentice management)	11,000
Apprentice daily work hours	4
Engineering Rate	\$30/hr
Apprentice Rate	\$9
Total weekly charge to customer of a team of eng+app	\$1380
Charge rate by PanGenesis (Engineers with 5+ years experience)	\$23 / hour
Effort per week (Engineers and apprentices)	300h
Duration (total hours/ weekly burn rate)	37 weeks
Total cost to PanGenesis of team of eng+app (Hours time avg rate)	\$253K