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Teaching case

Saving costs using smart call routing: aligning business and IT through finance

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Abstract

This case describes the effective information technology (IT) business alignment considerations that led to the successful implementation of a telecommunication platform designed to efficiently route cell phone calls in a financial institution in Chile. The company had several branches throughout the country, including its headquarters in Santiago. This initiative was part of a Technology Cost Savings strategy generated in response to the 2008 crisis. The idea behind it was to align internal business leaders with the IT team in order to optimize these costs, realizing a more efficient telecommunication platform, and to work together, as several cost-reducing initiatives were being executed at the same time. Achievements were thoroughly reviewed by the board of directors, and thus pressure to clean up the house was high. At that time, when users called a cellular phone from a landline, the call was charged using a fee much higher than a mobile company rate. The goal of the project was naturally to optimize these charges. An automatic call routing was designed, discussed and executed with the participation of the business leaders, based on each branch's demand and projected growth. The case relates the project lifecycle: the mistakes made at the beginning, the initial platform tests and bottlenecks, the rejection and frustration of the business, and a posterior crisis control and recovery phase. IT alignment and sponsorship from the directors were crucial, as there was no way back. All these factors, plus the additional IT activities competing for business attention, made this project both a challenging and learning experience.

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Prudencio Méndez and Sergio Villares had just finished a long day of work. They were exhausted, both physically and mentally, after discussing the first results of the Celulink project, launched 2 days earlier. This project aimed to drastically reduce the expenses of cell mobile calls for the entire company by enabling a technology that smartly routed fixed line phone calls to cell phones and selected the proper telecom company.

The mood in the company was not at its best, with sales teams and managers experiencing a lousy service. Users of the new system were not pleased at all, and they had already contacted the Corporate Technology Vice President to ask for the cancellation of the project and rollback to the previous schema. The CEO and the main board of directors were put on the alert as the new system was causing several issues.

This was a difficult situation for Sergio's team, who had been successfully deploying Technologic Infrastructure projects over the past 2 years with a good rate of success, achieving goals on time and on budget. This was the first comeback, so to speak, and the situation presented more questions than answers.

Before the new system, salespeople and the company in general had direct access to call to cellular phone calls with a simple authorization and an access code handled by the Help Desk. As regular landlines in each branch were used to call, there were no bottleneck situations, with costs skyrocketing. With the new system, every call was routed through the main telephone system, gaining control over costs, but with the risk of generating a call bottleneck. Unfortunately, that was the current situation.

Prudencio, the Project Manager, reviewed the capacity planning design with the technology provider several times and everything looked fine. Traffic numbers were thoroughly analyzed, as well as outbound calls. Everything appeared to fit, technically at least. Calls were being made, but at the same time there were several reports of calls being missed.

Among the main options analyzed by Sergio and Prudencio were: (1) terminating the project, and looking for new savings opportunities; (2) holding off the implementation, increasing the capacity and in the meantime permitting the employees to use the old calling schema; and (3) continuing with the project, aligning the managers and making the company adopt the new technology as savings were top priority, whatever the costs involved. There were no clear winners among them, and a decision had to be made in 2 days, at the most.

The 2008 crisis effects in Chile

The US mortgage crisis quickly exported its effects to Chile. One might think that a country situated thousands of miles away from what was the epicenter of a financial meltdown would not be greatly affected. The truth is that the United States and Chile had a successful history of international trading, sealed with the first free trade agreement signed back in 2004. The US Department of Commerce (2006) reports that, since then, the trading volume grew from US$6.43 billion in 2003 to $11.8 billion in 2005 and $16.36 billion in 2006.

When the crisis detonated in 2008 with the fall of Lehman Brothers, the bankruptcy and rescue of AIG, and the credit freeze of the mortgage markets, the effects did not wait to appear. All the interconnected networks once used to decrease trading friction were now transferring crisis.

With the United States being Chile's second largest goods trading partner and the largest foreign direct investor, as noted by the White House, Office of the Press Secretary (2011), impact in Chile was twofold: exports to the United States decreased 29%, while imports decreased 26% the next year, according to the Office of the United States Representative. Its biggest revenue source, copper, which accounted for almost 50% of the total country exports, decreased its production from $40 billion in 2007 to $30 billion in 2009, according to Mac-Lean (2011). In addition, several US-owned companies with presence in Chile suffered a sudden stop in their plans, having to refocus their businesses and holding investments, in several industries. Further impacts were found in the international market liquidity and, in general, translated into a greater aversion to risk.

Local consequences started to appear: the gross domestic product decelerated and real economy started to suffer. Vial (2009) noted that new vehicles sales decreased more than 20%, household sales diminished 20% and interest rates were quickly adjusted. All this happened in a relatively short period of time, with Chile being one of the countries to apply counter-cyclic policies, leveraging its high level of money reserves. Long-term repercussions were unknown at the moment, but the forecast was nothing but desolating: infrastructure investment projects put on hold, expansion plans interrupted and an uncomfortable level of uncertainty, which stalled decisions (see Figure 1, showing the different effects of the crisis on both GDP and exports).

The company

This case is based on what happened in one of the main actors in the financial industry in Latin America. It had its regional office in Santiago, with local operations in Chile, Brazil and Mexico. In Chile, the institution had 13 branches, aside from the Santiago headquarters, employing hundreds of employees.

The company had a reputation for being very conservative, with no aggressive business or risky turnarounds. Empowerment policies were fostered and productivity achievements obtained. An orientation to technology was one of the main pillars of its competitive advantage, and there was openness toward new, innovative technologies.

For overall business alignment, the company relied on the Balanced Scorecard methodology, developed by Kaplan and Norton (1996). The Human Resources department had successfully deployed a well-organized framework in which the company's objectives were cascaded down to each one of the departments and individuals, at every level. All the members of a team had as their main objectives part of the objectives of their supervisor, their supervisor's supervisor and so on, with each employee having his own scorecard. The company had quarterly goal-review processes in which each supervisor had direct conversations with each member of his team, aligned and reviewed the objectives, set percentages of advance and

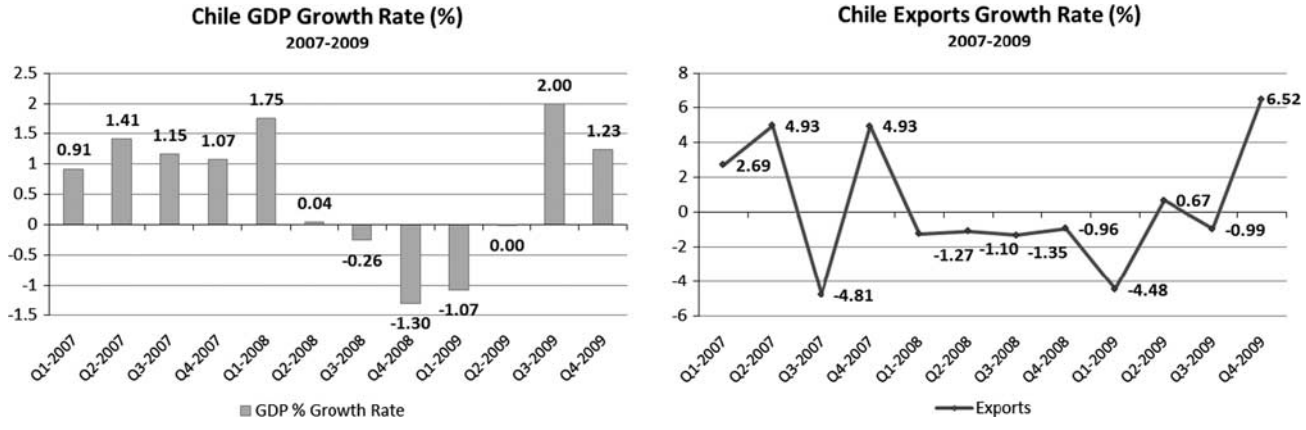

Figure 1 Impact of 2008 crisis on GDP and exports, OECD.
Source: StatExtracts (http://stats.oecd.org).

defined the goals for the next quarter. It was a transparent and effective process, which worked well in the information technology (IT) department.

The budget and project planning processes were done once a year in September and they involved the company as a whole, including the presentation of investment projects and expenses forecasting. It was the opportunity to set the goals for the team and define the level of activity for the year to come. Sergio's team usually got at least 70% of their projects approved, and the expense growth forecasted was usually trimmed to half, to prevent comfort zones in the users, they said.

Because of the 2008 crisis, the company decided that the main guideline for the next year's projects would be cost savings, at a horizontal level. This meant that each area had to prepare several initiatives – hopefully self-sustained – in order to cut costs and gain productivity. This would reduce layoffs and maintain the company's health.

Technology was an important factor in the overall management process of the company, with the CIO playing an active role in the General Management Committee of the Chilean and Mexican branches.

The IT department and its governance

Internally, the IT department was divided into two teams: software development and technologic infrastructure. Within the latter, a general manager (Mario) supervised Mexico and Chile, while Sergio was responsible for Chile (see Figure 2).

The decision-making hierarchies were being upgraded, partly as a consequence of the company being part of a mother company that was required to comply with Sarbanes–Oxley regulation, partly because of budget pressure and cost reduction, and partly because the local market was effectively maturing. These three arguments are supported by Brown and Grant (2005); De Haes and Van Grembergen (2006)in their Drivers for IT Governance section; and Alves (2012) in his conclusions.

One could say that the application of one of the most cited definitions of IT Governance, '… specifying the decision rights

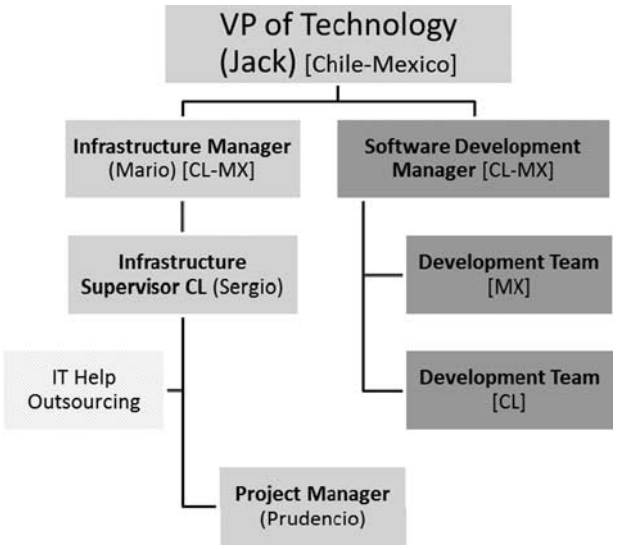

Figure 2 IT organizational chart.

and accountability framework to encourage desirable behavior of using IT' (Weill and Ross, 2004), was indeed taking place. Perhaps not at the pace required, but as the company used to remind the IT department members and vice versa, little steps count toward a big step.These authors also state that IT Governance is not about making specific decisions, but about determining who makes and contributes to them. According to the Governance Archetypes proposed by Weill and Woodham (2002) and Weill and Ross (2004), these decisions are classified as follows:

- *IT principles and high-level definitions*: They were decided by an IT Steering Committee, composed of all C-Level executives, including the CIO and the Software Development Manager. This could be considered a *Business Monarchy*.
- *Infrastructure strategies* and *architecture*: These decisions were decided by an IT Steering Committee, following the guidelines defined by the executive committee (*IT Monarchy*).
- *Investment and prioritization*: Investment policies and fund allocation were also regulated by the C-Level committee, with participation by each IT Project Manager in the input information.
- *Business application needs*: Decided by C-Level executives and business executives from all groups, with some participation by IT Project Managers (*Federal*).

There was indeed a very *centralized dependency* for decision making, consolidated in the Business and IT Monarchies archetypes, while high participation by the IT teams preparing the supporting documentation was business as usual. Some parts of the structure clearly followed the IT Governance Form of centralized decision making, mentioned by Brown and Grant (2005) and Alves (2012) (decision rights are shown in Table 1).

In the case of Infrastructure projects, high-level executives usually remained informed, but not heavily involved, which was going to be the case for this project. IT-related committees were organized and gathered together as shown in Table 2.

The aforementioned committee was also focused on accomplishing recommendations from ITGI (IT Governance Institute, 2003) and ITIL's Change Management best practices, referenced by Carlidge *et al.* (2007). There was an alignment among the business stakeholders and the IT team; it was an ongoing process that had started several years earlier, and it was finally working fine (Figure 3 shows the framework's structures, processes and relational mechanisms applied, following De Haes and Van Grembergen (2006)).

For monitoring purposes, Key Performance Indicators (KPIs) from the area were reviewed on a monthly basis by the IT Steering Committee and weekly by the IT Strategic Committee. KPIs included services health heat maps, Help Desk ticket trend analysis, investments and expense deviations from budget, and project status. Furthermore, each Wednesday a Change Control Committee was held, where all the software project managers and Sergio discussed possible changes to the platform and patches to install, necessary to improve applications in production, following ITIL's Change Management recommendations.

With the crisis, monthly reports and the technology area itself gained even more visibility as it generated high

Table 1 Decision Rights Map Based on Weill and Ross (2004)

Decision/archetype	*IT principles*	*IT architecture*	*IT infrastructure strategies*	*Business application needs*	*IT investment*
Business monarchy	✓				✓
IT monarchy		✓	✓		
Federal				✓	

Table 2 IT Groups/Levels

Group	*Level*	*Members*	*Frequency*	*Activities*
IT Steering Committee	Strategic	CEO, CFO, CIO, Business' VPs, Software Development Manager	Monthly	Review IT Indicators, progress in projects Define IT budget
IT Architecture Committee	Management	CIO, Software Development Manager Infrastructure Manager, Software Development Project Managers, IT Architect	Monthly, per-project	Define and agree on the architecture of a particular project and its interaction with the current ecosystem
IT Strategy Committee	Operational	CIO, Software Development Manager Infrastructure Manager Software Development Project Managers Infrastructure Project Manager	Weekly	Project execution and progress
Change Control Committee	Tactic	Infrastructure Manager Software Development Project Managers Infrastructure Project Manager	Weekly	Change requests review for the platform

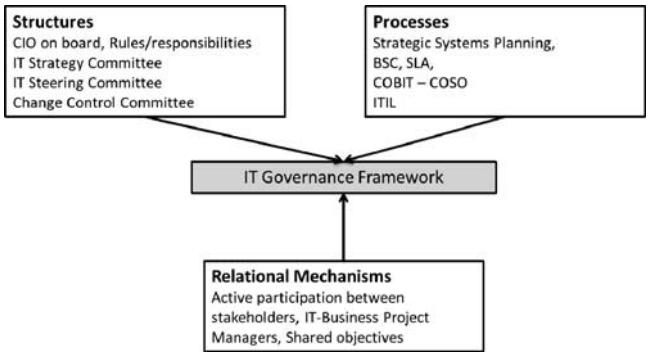

Figure 3 IT governance framework.

expectations. The report was defined as the artifact to monitor the cost-saving opportunities found and it was carefully prepared to show the area's main indicators in an executive and easy-to-read format. This is a common practice recommended by Lutchen (2003).

The team

Sergio was the leader of the infrastructure team. He was a systems engineer with several years of experience in databases, data centers and service delivery. He also managed the administrative part of the job, handling resources, controlling expenses and reporting to Mario and Jack. He has been involved in strategic projects in the past such as the new Data Center implementation, the server virtualization project and the electrical savings initiative. He usually had a great deal going on: inter-departmental committees, authorization approvals, strategic project coordination and the responsibility of coordinating all the IT critical mission operations.

Prudencio was part of the Infrastructure team and was responsible for executing all the projects in the area. He was an industrial engineer, his job being mainly to coordinate internal and external resources, orchestrating the changes the company required to keep up with innovative and productive technology. He had a very good way of handling people; he was sympathetic and liked things to happen the way they were planned. Because of his success in a relatively short period of time, he began to take on more and more projects. It seemed his productivity was beginning to slow down.

Mario was Sergio's boss and responsible for Chile and Mexico's Infrastructure teams. He lived in Mexico, and from there he coordinated the team, with frequent trips to Santiago. He trusted Sergio and Prudencio, and gave them all the decision power in strategic matters. Distance made things a bit more difficult for Mario, as he could not be involved in the day-by-day operations with the level of detail he would have liked. He had several years of experience handling teams and deploying large projects.

Jack was Mario's boss and the Technology Vice President (CIO equivalent) for Chile and Mexico. He was in charge of the whole IT department and had a good relationship with the board of directors in the Chilean office. He was also responsible for obtaining funding for all the technology projects. He had a tough character and liked things to go smoothly and according to schedule and cost.

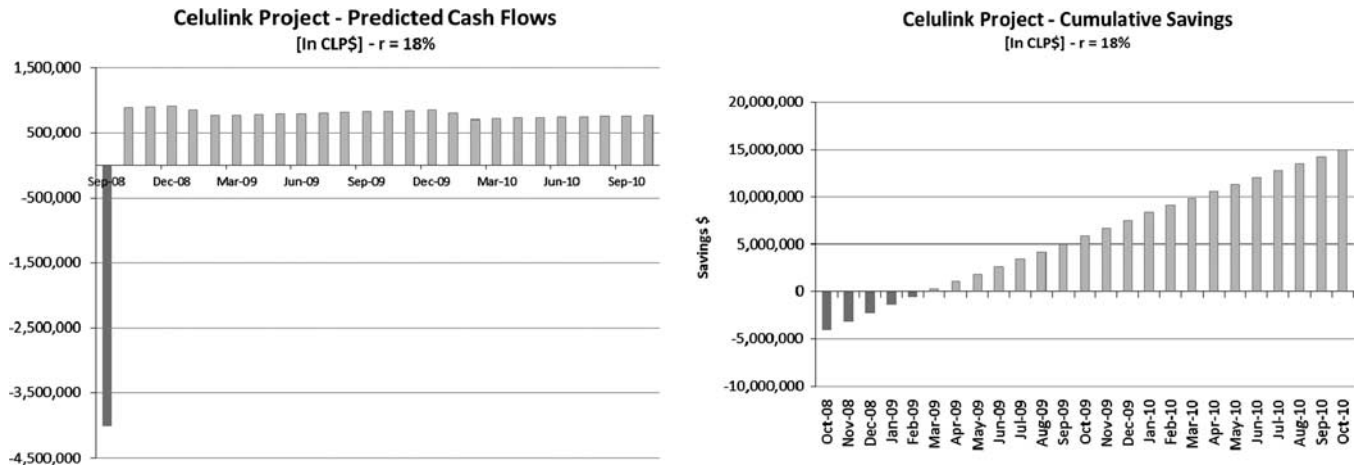

Figure 4 Celulink predicted cash flows and cumulative savings.

IT Help Services was the Help Desk and IT Operations outsourcing company, very close to the Infrastructure department. They supported all IT services for the company: installing applications, configuring machines, solving operating systems issues and so on. They were a very good team who used established procedures, all based on ITIL processes. They increased the level of professionalism for the entire team and lent formality and transparency to traditionally empiric approaches. The relationship among the members was cordial and professional, with objectives carefully measured and achieved as a team. Alignment of IT Help Services was one of the toughest and most fragile topics, as it was very difficult to act as one team having different bosses, and sometimes different internal measures. The scorecard mentioned earlier was not shared with IT Help Services.

Taking into consideration this background regarding processes, structures and people, it could be said that the IT Governance Maturity Level – proposed by De Haes and Van Grembergen (2004) – ranged between 2 (Repeatable, but Intuitive), 3 (Defined Process) and even 4 (Managed and Measurable), depending on the area of analysis and the process, with Infrastructure and Help Desk leading the scores.

The project

With the crisis at the door, the Infrastructure team came up with a list of initiatives, some of them oriented to reduce telecommunication costs, identified as a fertile area for potential savings.

One of the first opportunities found was the Celulink project, which aimed to reduce the cost of cell phone calls from landlines. Technology was already proved and installed in other institutions in Chile, and investment costs seemed reasonable. The principle was simple: why are you wasting so much money on landline-to-cell phone calls, when you have the technology to route them intelligently and make mobile-to-mobile calls, saving that money for the company?

An initial analysis showed that more than 40% of outbound calls were made to mobile phones, representing approximately $7000 each month. Celulink technology offered savings in the vicinity of 30%–40% since month Number 1: 10% was because of renegotiation of fees with the providers (as traffic would increase), and the rest was a consequence of the new schema. Total savings represented approximately $45,000/year. With an initial cost of $8000, including the hardware and the telephone system programming, it was a no-brainer, at least economically.

A basic Net Present Value (NPV) analysis was used to support the project and ask for funding. Results were positive, and with a low cost of investment the board of directors quickly approved it. Initial results were: NPV = CLP$15.7 million (~$30,000); payback = 5 months; Internal Rate of Return (IRR) = 20.74%, discounted rate was 18% (Figure 4).

This analysis was first presented to the IT Strategy Committee, who approved it and took it to the IT Steering Committee. As this was an emergency project, it did not have to follow the regular procedure to be analyzed, as the company's strategy was mainly Cost Savings and Productivity, and thus it was rapidly approved and added to the project portfolio of infrastructure. Being part of this portfolio would ensure that the project would accomplish all the necessary documentation and standards that every project required.

The project would use cell phone chips-in-a-box technology, which is a hardware device that contains several chips of multiple mobile companies, which are automatically selected to call the destination mobile number, according to a predefined set of routes. These routes were designed for the project, prioritizing the less expensive access payments first, and then the second and third ones (Figure 5).

Additional benefits presented by the project:

- *Call routing*: The VoIP network between the headquarters and the rest of the branches was going to be leveraged, and therefore the private network routed all mobile phone calls from the branches to the Celulink devices in Santiago.
- *Automatic invoicing*: To underscore the distinction between the headquarters and branches as separate legal entities, the invoicing was automatically set up based on origin as every call was configured to be hosted in Santiago. This represented a productivity improvement for the Infrastructure department.
- *Smart Chip selection*: Once the system recognized the origin of the call, its destination was screened. Using an algorithm designed by the IT team, and having chips of several mobile providers in each Celulink device, the telephone system selected the mobile provider chip to be used to make the

call so that it was made at an optimal cost (see Figure A1 in Appendix).

The Infrastructure team was designated responsible for the project, and asked to thoroughly analyze its impact in the daily operation of the company. The total number of people affected was high and the additional workload for the telephone system had not been tested before.

This last statement was very important as the general architecture of the calls was going to be modified from a decentralized to a centralized one. This was not an easy step, as now all the mobile voice traffic from the branches was going to be sent to the telephone network via the headquarters (a general depiction of the architecture is given in Figure 6).

After the project was deployed, the main support for the platform had to be adequately transferred to IT Help Services through training and documentation. This was an established practice in the company: each new project had to be transferred as a service to the Help Services department so that it could be correctly supported. Sometimes, Prudencio and Sergio wondered whether this company should not be the one deploying the project. Furthermore, it was too late to change plans, they thought.

The project accomplished relatively well the key areas that IT Governance should look for, making reference to the National Computing Center (2005) (Table 3).

Figure 5 Celulink device.
Source: http://www.yx.cl/lyric_lcr.html

The Plan

A Gantt chart was put in place for the execution of the project, with 5 months initially estimated for its duration and approved by the IT Strategic Committee. The deployment looked a little complex in terms of coordination, and from the beginning it was not considered a strategic, high-impact project. Sergio and Prudencio decided that they would get the project executed, without asking for much help from upper management. It seemed unnecessary and at this time and they preferred not to distract them as the project was classified as Low Risk.

This meant that the IT Steering Committee would not be involved as much, only the IT Strategy Committee (the Gantt chart used in the project is shown in Figure 7).

As the chart shows, a dimensioning phase was included, delivering a Demand Analysis report that concluded – based on historical records and growth projections – that four devices would be enough to support calls during the next 2 years. Each device had a capacity for four chips, with a total of

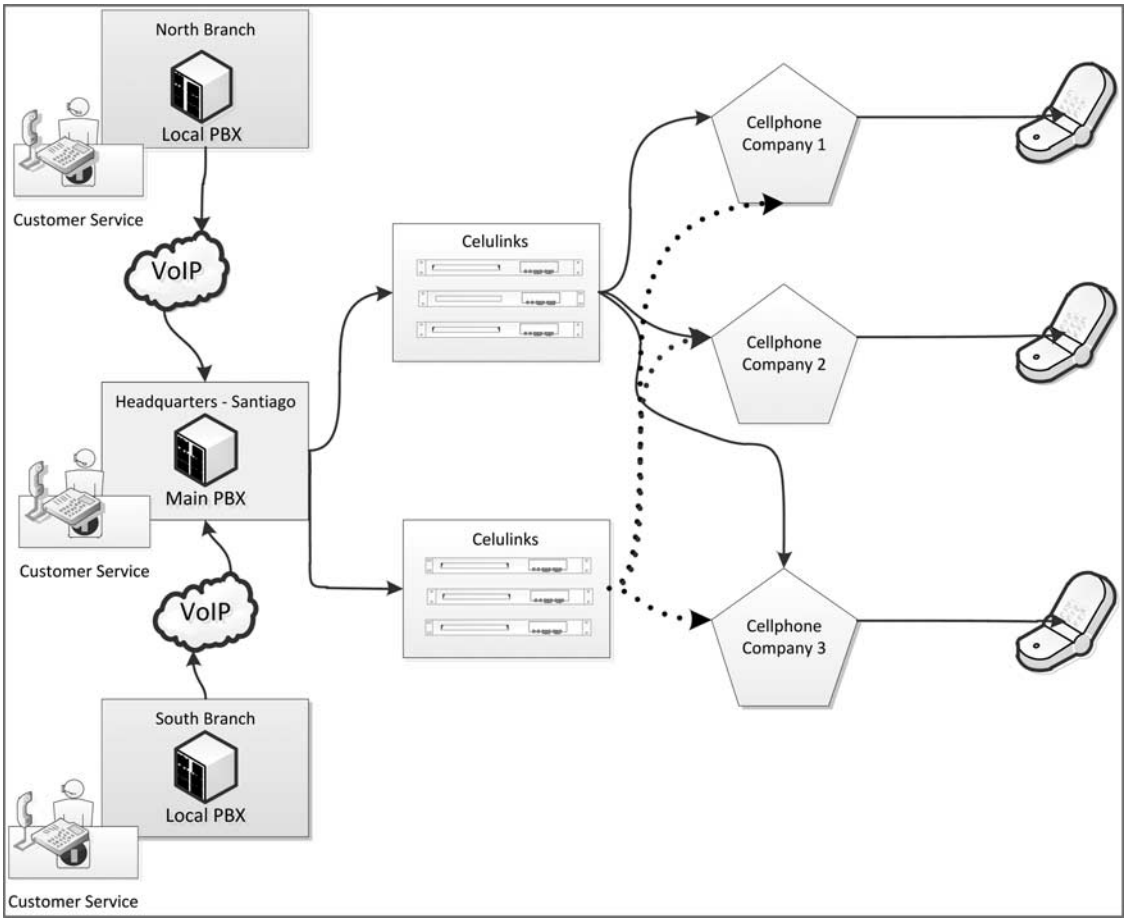

Figure 6 General architecture diagram.

Table 3 IT Governance Factors of the Project

Factor/key area	*Score*
Strategic alignment	*High*: The project was aligned to the overall business objective of survival after the crisis
Value delivery	*High*: In addition to generating cost savings, the project will give the IT team control and measurement of a previously unknown behavior
Risk management	*Low*: The project was initially considered high impact, but low risk, as several types of maintenance were previously done on the telephony system, without any extreme consequences
Resource management	*Medium*: It was business as usual, another Infrastructure project to be orchestrated and executed
Performance measurement	*High*: The consequence of the project would be detailed statistics and measures for the behavior of the branches and the headquarters

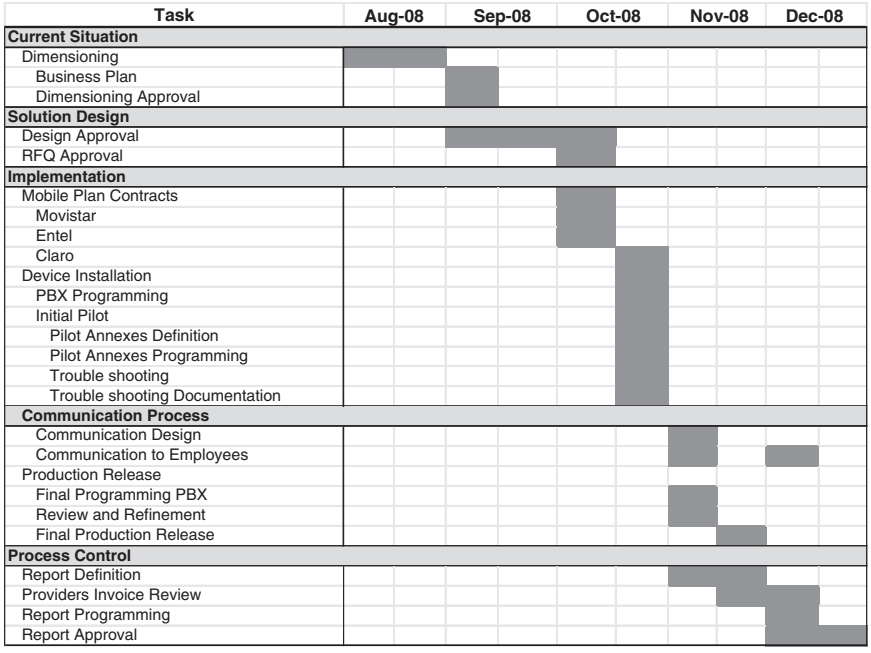

Figure 7 Reference Gantt chart for the project.

16 calls occurring simultaneously. Purchasing more devices would increase the capacity, but at the same time would punish the project's NPV and payback time.

A Communications strategy was also put into place, and handled mainly by Prudencio. He was in charge of aligning expectations and getting people to work toward the completion of the project.

The plan also considered a pilot test to be executed 2 months after the project kickoff. For the pilot, some extensions were selected in the headquarters and in the sales branch located in Santiago. Its main objective was testing the changes made to the central telephone system and the overall performance of the Celulink technology. If the pilot was successful, the configuration had to be replicated to all the branches, in 1 month. The numbers were very optimistic, but at the same time the sooner the project was in place, the greater the savings. And everyone wanted to generate savings in tough times.

In order to monitor and coordinate all the participants, weekly meetings were set up where Prudencio could align each party, review the next steps for the week and coordinate pending issues.

The IT Strategy Committee was informed about the advance of the project, and the Change Control Committee was requested to approve and coordinate each hardware change involved. As Sergio was not part of the IT Steering Committee, it was assumed that the business was informed, as the execution status information of this initiative was always included in the report he sent every week with the project portfolio updates.

The first steps

In October 2008, the initial programming changes to the telephone system began, with no issues. The approval was formalized by the Change Control Committee in its weekly meeting and the whole IT team was aware of the changes. The platform was ready to support the devices, which were bought and installed in the first week of December. The provider deployed the devices and mobile chips, 16 in total: 6 of them for the branches, 10 for the headquarters.

The pilot test ran in December as soon as the equipment arrived, with good results. It is worth mentioning that the

number of extensions used for the testing was less than 10, and stressing all of them simultaneously was not part of the script. This activity was mainly oriented to review whether the technology worked, and whether the invoicing records were being generated as required. The branch managers in charge of the first branches were also informed about the testing results, receiving no comments or objections about them.

Giving priority to faster savings, the three largest branches were selected to start the deployment, accounting for 30% of the total cell phone traffic. The headquarters office was left for last. Distance from headquarters to each branch was not taken into consideration as an issue as the new routing was going to centralize everything through the main system in Santiago, which was already programmed to support the traffic. No one from the Infrastructure team would be on site at these branches as traveling was heavily trimmed.

A few weeks before the change, the branch managers were informed about the project. They received documentation on how to call mobile phones with the new system, and were also asked to review the authorization list for cell phone calling. They decided to keep the lists as they were, with almost 90% of each branch's employees having cell phone access. The Infrastructure team noticed this situation but did not ask for reconsideration, as it was mainly focused on getting the project working.

The Help Desk representatives were trained on how to support the end users properly and the potential issues they might experience because of this change. All the efforts and expectations of the department were being focused on these three branches.

The first change was made on the second weekend of January, and the following Monday calls started during the morning. The majority of people at the branches, it was supposed, knew about the change. A small number of problems were expected, as is usual with technology changes. The reality is that by 10 am, the number of calls to the Help Desk coming from these three branches was far larger than usual, and by noon it was definitely chaotic. Calls were mostly negative, with people frustrated because the system they were told was supposed to be effective and easy to use *did not let them make calls*.

Both Mario (in Mexico) and Jack were updated about the situation by Sergio and the branch managers themselves. A Project Emergency Committee was put in place to solve this situation as quickly as possible. This was not a formalized figure according to Governance, but it was common that after each important milestone for any project, whether it was a system upgrade or an infrastructure change, the committee was prepared for contingencies.

The user experience was as follows The user lifted the phone, entered the authorization code for mobile calling and waited for almost a minute, just to get a busy tone. Then the user tried again, and again, and by the fourth time, they just called the customers from their own cell phones, with respective complaints to both their bosses and the Infrastructure department.

The Help Desk was not sure how many different users had that problem, but they were many of them. Activity logs showed people getting calls made, but there was a significant percentage of people not being able to place them.

The device provider was called and nothing in particular was found after a complete review of the system installation. By the next day, the same story; numerous calls to the Help Desk asking them to 'open' more lines, as they were otherwise calling from their personal phones – not paid by the company – but approved by their bosses until the new system was effective. Getting deals closed was far more important than generating small savings, they thought. It appeared to be a losing battle.

On the third day, the Project Emergency Committee – which involved Jack, Mario, Sergio and Prudencio – had its daily meeting to review whether the number of complaints had diminished, but this was far from being the case. This was the last day they had and together they brainstormed possible solutions: shorten authorization lists, time limits for cell phone calls and so on. One premise they wanted to retain was not going back to the previous, disorganized, costly schema.

The team considered many questions during the meeting:

- Should the project have to be treated as strategic since its start?
- Was classifying this project as Low Risk the main cause of this chaos?
- Did Mario and Jack became involved in the project too late?
- Was it a good idea to ask the outsourcing company that was taking care of the Help Desk to execute the project so the IT Team could focus on communication and crisis control?
- Was the branches' deployment plan the adequate one in terms of order and support?
- Was this a consequence of an erroneous testing plan?
- Taking into consideration the cultural change that the project was bringing, should it be approached in a different way?

This was one of the hardest situations for this Committee to act on, as the impact of a relatively small initiative was becoming far too great to handle in so little time.

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About the Author

Gustavo Vinueza is a Systems Engineer from the University of Cuenca, Ecuador. He also earned an M.B.A. from Torcuato Di Tella University in Argentina and an M.S. in Finance from Adolfo Ibáñez University in Chile. His main areas of interest include financial and operational modeling, including scientific and academic research into business practice as well as data mining relative matters. He has more than 16 years of experience and he has been a consultant for companies in several industries: finance and banking, telecommunications, insurance and IT-related services. His experience includes managing project portfolios of operational and IT-related initiatives such as cost-reduction programs, public purchases processes, operational controls and software development projects, in addition to technological infrastructure implementation. He has also earned diplomas in Project Management, Business Process Management and Business Analytics.

Appendix A

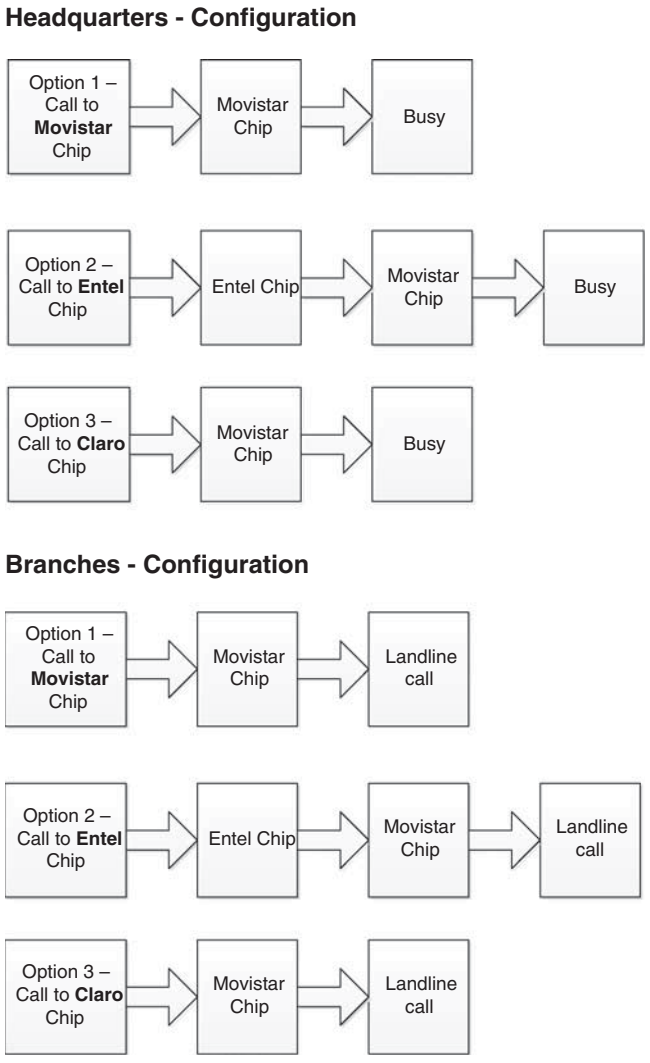

Figure A1 Routing configuration.

Appendix B

Box B1 Text sent to nominate the project globally

Celulink project

Cost reduction is a *must* these days. Chile's Celulink project meets this specific need by leveraging technology that provides complex functionality such as smart call routing and multi-company invoicing without diminishing service quality. Initiatives like this build a culture of sustainable innovation and at the same time push us to build, design and deploy better technology.

With more than 40% of their phone calls being made to mobile phones at a cost of around $7500 per month, IT resources at the Chile branch focused their efforts during the last part of 2008 on identifying a way to significantly cut the telecommunications budget, both in the Santiago headquarters and across its branch offices.

The resulting project primarily involved IT staff in the research and development of the solution and the participation of telecom providers in its implementation. At its heart is the use of the Chile office's existing network with branches and public telephony, which was configured to route calls to cell phones to a device called *Celulink*, which converts local-to-mobile into mobile-to-mobile calls using regular cell phone chips.

YX Wireless' Celulinks, the new technology in this equation, makes the solution possible. Nevertheless, optimizing the devices meant addressing some key challenges:

- *Resources optimization*: To minimize the number of Celulinks that would have to be purchased, IT resources elected to host all of them in the Santiago Data Center and configure the PBX (the internal telephone exchange system) so that any mobile phone call could be made using any chip of any available Celulink.
- *Call routing*: IT resources leveraged VoIP technology in the private network to route all mobile phone calls from the branches to the Celulinks in Santiago.
- *Automatic invoicing*: To underscore the distinction between the headquarters and branches as separate legal entities, IT staff developed a means of routing mobile calls differently based on origin for invoicing purposes, while enabling all calls to be hosted in Santiago.
- *Smart Chip selection*: Once the system recognizes a call's origin, its destination is screened. Using an algorithm designed by the IT team, and with chips of many mobile network providers contained in each Celulink device to choose from, the PBX selects the mobile network provider chip that will be used to make the call so that each call is made at an optimal cost.

Implementation of the seamless-to-users Celulink solution means that charges are now assessed according to a mobile-to-mobile rate, which is far less expensive (around 9 cents per minute) than the former local-to-mobile rate (18 cents per minute).

In its first month of implementation (January 2009), the solution lowered Chile's phone bill by 42.6%. It is expected to consistently reduce the telecommunications budget by roughly half, for a savings of $40,000 per year. And that is not the end of the story. Always on the lookout for innovative technologies that deliver a positive return on investment, the direct mobile-to-mobile calling solution also represents a great achievement for Chile's IT staff.