

An Analysis of Lessons Learned by Resourcery in the Provision of Information Technology Solutions to Nigerian Universities (With Comments on the University of Jos Experience)



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Introduction

Resourcery was recently invited to highlight some of our experiences in the provision of information technology solutions to various universities. In this paper, we have tried to do so in a succinct manner. We have broken our revelations into three general categories: The Pre-Award Phase, The Contract Implementation Phase, and the Post-Installation Phase. First, though, is a brief introduction of Resourcery Ltd., and the work we have carried out for the University of Jos.

Background

Incorporated in 1985, Resourcery (Nigeria) Ltd. is one of the largest network systems integrators in West Africa. With more than 150 staff on board, Resourcery currently operates from two offices (Lagos and Port Harcourt), with a third office soon to be opened in Abuja. However, Resourcery has built over 400 networks in virtually all the 36 states of Nigeria (and the F.C.T.), as well as in a couple of foreign countries. The overwhelming majority of our client base is in the financial, manufacturing, and service sectors. We do however count a few universities –including the University of Jos- amongst our customers.

For the University of Jos, we have: installed a number of SYSTIMAX-certified structured cabling networks; built campus-wide high-speed fibre-optic backbones connecting local networks in ten different buildings; and provided a series of intelligent Fast Ethernet data switches for supporting end-users and servers at the various buildings. As these projects were just the foundation for more complex services, we anticipate the bids for, and delivery of, additional solutions in the months to come.

Pre-Award Phase

Job Opportunity

More often than not, Resourcery hears of opportunities at universities when they come knocking at the door. The overwhelming majority of these are because of personal recommendations from institutions for which we have done good work in the past. However, in line with the new guidelines for contract bids from the federal government, we expect to see more invitations to tender in the pages of national daily newspapers.

After some harsh experiences in our early years where we spent many hours –and money- chasing after every possible contract, Resourcery now picks and chooses the jobs it wants to follow up on. Most of the time, we stick to the areas where we believe we have considerable competence and the value-added content (and thus profitability) is significant. We rarely bid for what are considered “commodity” items unless the bid is a respectably large turnkey project.

Pre-Qualification Exercise

Many of the bids we work with have a pre-qualification phase. This phase attempts to weed the wheat from the chaff. The process for doing so can range from responding to a single sheet of questions, to preparing a full-blown proposal including paraphernalia such as: original reference letters, multi-year tax receipts, and financial statements.

In our experience, though, the best method –after narrowing the field down through a basic process- is to actually spend some money and time visiting the actual companies



in person. A one-hour face-to-face discussion at the vendor's site will often tell far more about their capabilities than some anonymous documents.

Response to RFP (Request For Proposal)

Request for Proposal (RFP) documents are often as unique as the individuals or committees that draft them. Some are thoroughly researched, while others are thrown together in a scanty jumble.

However, there are two distinct hallmark of most RFPs issued by universities. The first is that –as even with RFPs from the private sector- many RFP issuers are not quite certain of what they want or the implications of their requests. They often leave out relevant components or don't cater for some foundational requirements, without which the solution will be unable to work effectively. Also, should a major component fail, there are no provisions for system redundancy or rapid-response support coverage.

The second characteristic is that of requesting for archaic or outmoded technology. From one angle, Resourcery understands that the time from conceptualisation to defense before a university or government committee to approval for general funds commitment to authorisation to draw up an RFP to the actual RFP preparation and dissemination can even be years in the making. From another, with modern technology changing so fast, and without access to the same breadth of information resources (including direct vendor relationships & regular excursions to international conferences) as Resourcery has, it is difficult for university project designers to keep up to date.

As Resourcery has identified over time, the answer for both issues is to advise that the universities initially brainstorm on their core requirements with a handful of vendors. Before issuing any RFPs, prominent systems integrators should be invited to make recommendations as to holistic solutions based on criteria determined by the university. Such IT specialists are to also visit the client university and have extensive talks with both the project sponsors, as well as with an assortment of targeted end-users. This will give them a clearer picture of what is required. The system integrators are then to submit their recommendations. (Note: Universities gain significantly from the variety of views that using such system integrators offer, more so than a single "consultant" who may or may not be actively involved in the day-to-day flow of IT developments.) It is based on an evaluation of these recommendations that the university (with its internal / external consultants) will then issue an RFP. Such an RFP will certainly be more in tune with the university's expectations.

(Note: Under the scenario above, to achieve the best, while compensating the firms for their "consulting" efforts, RFPs can be divided into two parts: more sophisticated solutions, and commodity ("just supply") goods. The "commodity" RFP would be open to all parties, but the "complex solutions" RFP would be open only to the invited –and probably more qualified- prominent system integrators.)

In any case, when dealing with universities, Resourcery has never been shy about making its heart-felt recommendations known. We rarely take an RFP at face value, and always seek to discuss the intentions of the client university, and evaluate whether what is being proposed for deployment is suitable. Often, we will recommend that, rather than not build an effective foundation, a university phase its implementation. These discussions are especially fruitful, as in the case of the University of Jos, where project sponsors are open and willing to discuss their requirements, and then proceed to revise portions of the RFP to better meet the university's long-term aspirations.



Finally, since many university projects are not executed until long after their RFPs have been designed, Resourcery frequently proposes solutions that are either highly modular or are more sophisticated than what may be needed at the moment. The reason for this is that our experiences have shown that the IT upgrade cycle for universities is often considerably longer than the 3 – 4 years we often encounter in the private sector. In order to be able to forestall obsolescence within a few years – with the prospect of getting another bundle of investment for the same project being remote- we often recommend upgradeable or more capacious solutions.

Software Licensing

One of the most contentious areas in responding to RFPs concerns the issue of software licensing. Resourcery has very strong relationships with major software manufacturers including: Microsoft, Computer Associates, and SAP. We also believe that developers should be rewarded for their investments in software products. As such, we always quote for the full number of user licenses that we believe will be required for the solution.

Oftentimes, this contrasts with the RFP specifications whereby, in many cases, there is a request for only a few original packages of software. The unwritten assumption is that the University will make as many copies as it deems fit.

It is often a battle to get the Universities, with their limited budgets, to accept that proper licensing of software is mandatory. To ease the burden, many software manufacturers - such as those mentioned above- have special “academic” pricing which reflects a substantial discount off of normal commercial pricing. (Note: This special “academic pricing” benefits the manufacturers in that a user of a software package in university is likely to choose to use the same software when he or she begins a formal career.) Where the values of the required bundle of licenses are significant, we often invite the local representatives of the software developers to participate directly in the response process; this helps to ensure that an even greater discount is given.

Bid Evaluation Exercise and Site References

The bid evaluation exercise is often one of the most worrisome parts of the whole bid process. This is because, at least as seen by outsiders, it appears to be a mélange of arbitrary decisions crafted using the most arcane criteria. Sometimes the concern that the bid evaluators –whether internal or external consultants- may not be up to scratch technically on the products or solution designs evokes apprehension in vendors.

Resourcery has found that the best bid evaluation exercises, for both the client and the participating vendors, is one where the evaluation criteria, as well as their weighting, has been both clearly indicated at the onset and rigorously followed. Doing so also provides a level of transparency and professionalism to the process.

Resourcery has always favoured site visits because, unlike elaborate vendor claims, such visits gives the prospective client an insight into what has actually been executed. While none of Resourcery's clients will ever claim that our work is always perfect, they are likely to comment that Resourcery strives to do quality work, and that if there is a problem, that Resourcery is always committed to fixing it. Such words from a satisfied client are worth one hundred times the equivalent of Resourcery's own in our proposals.

Once again, site visits may cost time and money, but they certainly pay off in the end.



Financial Negotiations

By the time Resourcery gets round to the negotiation stage, we are often very glad. Most of the time, it has taken anything from six to eighteen months to get to this stage. We can finally see the light at the end of the tunnel.

However, this last hurdle is one of the toughest. Most commercial ventures that are implementing IT solutions have a business justification for them. They intend to use the investments to generate significant additional income, either directly or indirectly. Universities, on the other hand, are largely interested in stretching their budgets as far as is possible. As a result, the price of the solution is given far greater weight in university-initiated bids. For Resourcery, who is frequently not the lowest-cost provider, being able to justify the higher price resulting from higher quality and better value can be quite difficult.

When Resourcery wins a university-initiated bid, most often it is because we have been able to explain to the evaluation committee that the total cost of ownership (TCO) of our solutions over an expected lifespan is far less than the “cheaper” options we are bidding against. Nonetheless, being able to clarify our strengths is not always possible. In some instances, the lowest bid that meets the general specifications, wins.

However, our margins on university-related solutions are often amongst our lowest. This is probably because we see our solutions for the education sector as being our way of contributing to the development of the nation.

Contract Implementation Phase

Advance Payments

Once a formal letter of award has been issued to a vendor, most project administrators assume that the vendor should begin work right away. In the Nigerian experience, history has taught us that this is almost never the case. The money (the negotiated advance payment or “mobilisation fee”) needs to come first.

There are two major reasons for requesting for advance payments. The first is the issue of commitment. If a payment has been made, at least that shows that the client is willing to go ahead, and not postpone or re-award the contract. The second is the issue of financing. Unlike what obtains overseas, project financing by Nigerian banks is very expensive. Given low margins as a result of competitive pricing, and calculating the penalties of inflation and exchange rate variation over time, in order to lock down costs, it is best to get paid as much as possible up-front.

Unfortunately, the body that issues the letter of award in university projects is normally not the body that issues and signs the advance payment cheques. In Resourcery's experience with universities, we may have to wait for three to four months after the contract award letter has been received before we receive the mobilisation cheque. The project vote may be available, but the need to fulfil bureaucratic processes as well as extricate the actual funds out of the financial quagmire takes patience and skill.

Project Contacts

One of the first steps in executing a project is ensuring that the project co-ordinators assign contacts that will liaise between the vendors and the appropriate university authorities. This is preferably somebody of at least mid-level seniority who knows his or



her way around the university and its processes. It is also desirable that there be at least one secondary contact who can deputise when the main contact is indisposed.

In the case of the University of Jos, as well as with a couple of other universities, Resourcery has been pleasantly surprised by the industrious efforts of the project contacts to prepare the ground for work to be done. It has made a significant difference to the productivity (& quality) of our work. If only all projects could boast such contacts!

Site Readiness

One would be surprised at the number of times that Resourcery has arrived on site, having been assured that everything planned for is in place, only to find out that no progress has been made concerning necessary preliminaries. The result: wasted time (& cost to Resourcery) waiting for the work to be completed before we can commence.

At a cost to us – and indirectly to the client- Resourcery has now begun a simple process of sending an engineer to inspect and verify that a site is ready for us prior to despatching the installation team. Oftentimes, the engineer also goes along with some of the installation materials, to minimise the load on the main team.

From a separate angle, “site readiness” for Resourcery now includes ensuring that there are secure – yet easily accessible by our installation teams- storage facilities at the university, where all the various project materials can be kept pending their use. Especially for large jobs, this simplifies the logistics of deployment.

Related, we also now insist on physical security for certain installed components prior to handover and commissioning. This requirement was underscored in an unfortunate incident involving one of our clients. The bank was constructing a new headquarters building and Resourcery was responsible for the local area network, including the structured cabling. As part of those tasks, we installed over 300 data access points including faceplates and wall jacks. The weekend after we finished, some nefarious persons entered the building and stole more than half of the faceplates and wall-jacks. We were fully exonerated from any involvement; but they never found the culprit. The bank had to purchase –and we install- replacements.

Implementation Schedule

Probably the third greatest mountain in any project (after those of completing project documentation, and getting paid) is establishing a mutually acceptable project timeline and executing it on schedule and to budget (Resourcery's and the university's).

While the “Nigerian factor” (fuel scarcity, blocked ports, civil and student unrest, lack of a critical component, etc.) appears to be a permanent characteristic of all projects, Resourcery has learned that proper planning can greatly mitigate its effect. One aspect of this planning is to ensure that all deliverables (from both parties) are clearly identified and acknowledged (signed off on paper) prior to the commencement of the project. A second is to ensure that regular project meetings are scheduled to provide updates on progress. A third is to use project-planning tools such as Microsoft Project to manage resources and operations. If well done, it is possible to slot in the effect of a delay and automatically see the result on the expected completion of any stage of the project.

The use of a closely monitored project schedule also helps to discipline both parties.



Project Supervision

As aforementioned, Resourcery expects there to be project contacts that will liaise between Resourcery and the project coordinators at the university. However, unless the project contacts and the project coordinators are one and the same, Resourcery has found that the university is best served if the coordinators themselves participate actively in overseeing the project, especially in areas where there are direct interface requirements between the installers and the end users.

Such oversight is particularly beneficial in reassuring appropriate departmental heads that their concerns are being met. It also helps to prevent "feature creep" -where the users are asking for more than was contracted- as well as serve as an avenue where user demands can be registered and considered for inclusion in subsequent projects.

At the University of Jos, for the various phases, the project coordinators were fully involved. They helped to ensure that the rollout went smoothly to the benefit of all.

Problems During Implementation

Like death (but not taxes), unforeseen problems are a factor of every implementation. Some of these are a consequence of miscommunication between parties: others, the result of teething pains of working with new solutions or new people to the process.

Over the years, the two most important lessons Resourcery has learned concerning implementation problems are: one, always communicate as clearly as possible (and preferably back it up in writing); and two, escalate promptly if the problem appears to be beyond you. Focusing on these has helped Resourcery and its client universities so ride out some potentially damaging storms.

Variations

Even after going through an extensive RFP definition process, proposal defence, and subsequent contract award, it is very possible that there may be potential variations to the contract due to modification of the scope or unexpected exchange rate fluctuation.

What Resourcery recommends, and has worked with in the past, is to ensure that any requirements for contractual or financial variations are clearly stated and signed off by both parties, before any additional work is done in the affected areas.

Furthermore, since getting additional funding for variations can be a bureaucratic (and sometimes political) nightmare, a number of Resourcery's clients have arranged with their financial authorities to budget for a 5 – 10% contingency fee that can only be drawn on under specific guidelines. For fixed allocations from external authorities (e.g., the Federal Government), the stated project budget is reduced by that 5 – 10% figure.

Training

One of Resourcery's favourite adages is: the best equipment in the world is for naught, if the users and administrators have not been trained to effectively use and manage it.

As a matter of principle, Resourcery includes training with all of its solutions. Some of the training, notably solution familiarisation is conducted at various times of the installation and is usually free. More formal courses attract fees.



In order to meet the needs (and pockets) of the university community, Resourcery often suggests that we train a handful of bright end-users and administrators in formal courses. In turn, using training materials that we have supplied, these disciples train other students and mentor them.

Where possible, Resourcery tries to arrange for refresher and update courses for key personnel after a period (3 – 6 months) of actual field experience. By then, the users know better what they want to achieve.

Documentation

The bane of many projects is the installation's documentation. Yet, documentation serves as the lifeblood of all installations: without it, effective management of the project will soon be frustrated.

Documentation, including: product manuals, training handbooks, "as-built" diagrams, installation schematics, equipment inventory, certification results, and the like, form the basis upon which relevant parties are able to understand, manage, and troubleshoot the supplied solution. For their projects, the university must ask vendors for multiple copies of complete documentation on all supplied components. These are required in both hardcopy (paper) format and in electronic form.

As modifications are made to a project, it is imperative that the university ensures that documentation for the system reflects all changes. Updates should also include the dates of the changes and the details of those who carried out the same.

While Resourcery itself sometimes falls short in fulfilling this mandate in a timely fashion (field engineers hate to do documentation – it appears to be a genetic trait), we have learned that it is essential. We have discovered the hard way that failure to document a system unnecessarily drastically increases the time for another third party (or even a different engineer) to identify and resolve problems, or for them to build extensions to existing infrastructure.

A secret hint for the universities: tie a percentage of payment for the job (say 5%) to the completion and submission of appropriate documentation. It works every time.

Commissioning

For a university, the commissioning stage is doubtless more important than it is for private sector clients. This is partly because the project has probably cost a great deal of scarce money and effort. Given factors highlighted above, it has often exceeded the timeline that was anticipated when the project was first conceived. As such, everybody is eagerly waiting to see the new "baby" after many months of tense expectations.

Resourcery has learned to work with the project administrators to ensure that much fanfare accompanies the commissioning. Sceptics (including such people as bursars – who wonder where all the money they have released has been going to) are invited to witness the launch, as are current and potential users of the new systems.

The commissioning process is notable, not only for the visibility of both the university (and the project coordinators) and Resourcery, but also because it is a milestone of momentous accomplishment that serves as an evident justification for similar projects and project extensions in future.



Post Installation Phase

Financial Closure of Project

While a university may consider a project completed once the last user PC has been installed, configured, and connected to the network, and the last vendor training conducted, there is still at least one critical (at least to the vendor) stage left: that is receiving the outstanding payments on the contract. Unfortunately, as highlighted earlier, most project co-ordinators have little power within the finance divisions of their institutions. That means that although every bolt may be in place, it may take anything from three to six months (or more) to get paid for a job once it is completed.

Far too many times, Resourcery has found itself waiting for payment on a project. This is detrimental in that the value of the balance is often seriously eroded both by inflation, and by the interest rate charges on funds that were borrowed to cover the delay in payment. As such, the effective price to the supplier is notably lower than what was signed on the dotted line at the beginning of the contract.

As a result, Resourcery has learned to work with the universities to, where possible, break up large projects into smaller chunks. As such, should a single item to be supplied be missing, waiting for it to be delivered doesn't tie down the entire value of the completed portion of the project.

Support Contracts

To budget-sensitive university evaluators, the first things often to be cut from proposals are the support contracts. Support contracts are seen as being "fat" which can be trimmed. It is often felt that with the gargantuan pool of eager young hands to be found in their midst, the university should be able to use these to address any support needs.

While support contracts may be "fat", even fat has an important role to play in the body. Far too many times, Resourcery has found that a university client has cut the support contracts from its budget only to find later on to its detriment that it needs competent hands to help guide and train its own support staff. In such cases, the substantial gains in productivity by having an on-site expert would have quickly erased the costs of budgeting for him.

Nowadays, Resourcery strongly recommends that - depending on the complexity of the solution- universities actually sign for a six months or one-year on-site support contract with solution vendors. These contracts allow the universities' own staff to understudy more experienced hands in the field, while gaining the necessary skills to be able to eventually handle the support on their own.

Maintenance and Warrantees

Practically every RFP includes requests to clarify the vendor's stated warranties. These product warrantees may run from 90 days to "Limited Lifetime". The warrantees are usually against defects created in the original manufacturing process or encountered under normal wear and tear within the manufacturer's stated guidelines

There are several points that universities need to note, and for which Resourcery has had to clarify time and again. First, a manufacturer's warranty is only as good as the vendor who sells you the product; most manufacturers don't provide direct end-user support. As such, it may be better to pay a little more for an identical product from a



more reputable firm, and who will be readily available to help honour the warrantee should it be required.

Second, the warrantees are not guarantees. There are often conditions attached, which lay the responsibility for the cost of certain repairs on the end-user. Universities should request for each partner's respective responsibilities in the most unambiguous terms possible. Related, unless an extended warrantee contract has been signed, the vendor is typically not under any obligation to retrieve a faulty unit from the client's site, loan him a temporary replacement, and return to site to re-install the replaced unit. As such, if a university cannot afford to sign such an extended contract, it is best that it purchase, and keep on site, a few spare units or critical subsystems of its core infrastructure.

The third matter is the issue of maintenance. A lesson, which it appears that Nigerians in general have problems learning (unintentionally or otherwise), is that regular scheduled maintenance of a solution or subsystem is far more cost-efficient than trying to repair or replace the structure once it has broken down. Contrasting the need to regularly maintain supplied infrastructure with universities' persistent budget constraints, Resourcery has found it best to recommend that, concerning complex solutions, the university sign a first year maintenance contract with us, with the proviso that when conducting the exercises, we will train university support staff in the means of doing so, as well as supply them with the basic tools to be able to carry on in subsequent years.

Relationship Management

Once a specific project is over, it is not the end of the association between Resourcery and the university. Often, it is merely the beginning of yet another phase leading towards greater co-operation. A popular aphorism states that: it is far easier to win new business from an existing client than new business from a new client. Universities are no exceptions to the rule. Combined with the fact that many University projects are rolled out in phases – as the University of Jos' have been- Resourcery finds that maintaining the relationship –through occasional correspondence and “social” visits- can prove to be quite lucrative.

Other ways Resourcery endeavours to build on its rapport with universities is to invite them to take part in various seminars that we host throughout the year. We also attempt to honour all invitations to speak or present papers at forums such as this one. In future, with the funding of educational infrastructure projects being a major national priority, Resourcery hopes to organise university-oriented colloquia designed to share new concepts and technologies of benefit to the sector.

Conclusion

As with any good marriage, Resourcery has found working with Nigerian universities –and the University of Jos, in particular- to be a rewarding exercise. Initially, hopes were elevated in the belief that everything would be perfect, but there have been hiccups along the way. Nevertheless, despite occasional steep learning curves, we have jointly overcome all barriers, and been able to achieve our desired goals in the end. We have also learned each other's “habits”. Now, all parties can bask in the relationships and seek fresh ways to work together and encourage one another.

Resourcery foresees many more years of close, productive, and mutually beneficial partnership with the University of Jos, as well as with other leading Nigerian universities.