

## THE SELECTION AND IMPLEMENTATION OF DEBT MANAGEMENT SYSTEMS

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I would like to preface my remarks by saying I am not a technical person or a systems person, but running a Debt Management Agency, systems always make it to the top of the list of concerns.

I will take you back to when we first started looking at systems. It was in the 1980s when we started from scratch. We had absolutely nothing. The official records of the debt were in leather bound ledgers which looked very impressive but provided absolutely no information at all. Some of the people involved in managing the debt had put together spreadsheets on personal computers to try and help them with the task. But we had no official record of the data that was computerized.

We looked around for official reports at the time but found nothing that could help us. Part of that was because of the wide variety of the instruments that we were managing: many different currencies, a large foreign currency debt portfolio, inflation-index bonds, floating rate notes; and we had started to take on swaps. We couldn't find any systems product that would come near to meeting our requirements when it came to computerization. So our initial ambitions, in terms of systems, were actually modest. We really just wanted something that would produce the reporting within cash-based government financial statements. We wanted to be able to project our daily cash flows, say between now and our longest dated bonds, which I think is something like about 2016. We wanted to bring up files and report the debt sorted by various different fields.

Because we couldn't find any systems, we hired a contractor, a small local software firm. We got the system running within a few months. For those of you with a long memory, we ran this thing on an IBM 640K personal computer, which has very modest computing power by today's standards. Without being seen to be eclipsed by other things that were happening, we started to develop the middle management office, and we had an escalation in the computing needs. What was originally designed as something quite modest on a personal computer was suddenly inadequate and required us to migrate across to a multi-user environment of eighteen users. We also needed to construct within that certain processes and capabilities. By mid-1988 we had moved to a multi-user management information system. The period after that, from 1988–1994, was one involving pretty much continuous development as our needs increased.

Looking back, part of the problem was we had underestimated changes in people's behavior as new tools became available to them. As people became familiar with the tools, new uses were invented and demand just simply outstripped the capabilities of the system. Part of that also was that the same computer was used for office automation systems, including word processing and spreadsheets. There was a similar escalation in the use of that type of product again because people hadn't had experience with those tools in the

past. In 1990, we had a major upgrade in terms of hardware and by then we had expanded that original system to provide daily mark-to-market transactions. We provided daily consolidated credit for counterparts, output for general ledger systems, and some basic performance measurement information. Even then there were signs that the closed database design of the original system would be an impediment in the long run.

I would also note that we did not use our core management information system for risk modeling. We did that on a stand-alone workstation and imported the data across. There was also a growing need by the front office for much more sophisticated portfolio analysis, and more sophisticated performance measurement of the various activities going on in the front office.

By 1993 we realized that we needed to move. We wanted to have a system that could provide sensitivity analysis and analysis of structured transactions. We were also limited by development cost for new instruments under the old system because of its inflexibility and general inability to access and manipulate data. We put together an information systems strategy and part of that was the desire to move to an off-the-shelf system. The main reason for that was to cap the in-house development cost and get something more flexible, reduce key-person dependency (the original management information system had been built and maintained over the years by one individual, and was very much a black box that only one individual understood). We wanted to provide reference benchmark pricing and risk management functionality. The pricing that we were using for our instruments and portfolio was conventional and met market norms; but we wanted greater integrity and flexibility; and we wanted to reduce system maintenance overhead. We also wanted to benefit from upgrades as technology improved and market innovations came along. And we felt we could get that from an off-the-shelf system.

So we moved ahead on that and we looked extensively at systems with consultants. It was a difficult process. We looked at four or five quite closely and the best we found was one that provided 70 percent of the front office functionality. The needs of the front office were the key driver in our information systems. That left us with a gap to bridge in terms of the middle office and back office functionality. I will add that the back office and the accounting needs were pretty well met by the old system because it was pretty stable. We signed up with a vendor in December 1995. At that point in time, the future implementation of the middle and back office was still seen as dependent on developments by that particular vendor and we had some uncertainty around that. Given that, we set a time line of December 1997, about two years, in order to move across and become fully dependent on the new system. By late 1996, it was pretty clear that the vendor was not developing the product in a direction that was helpful to us in terms of the middle and back office functionality and, in fact, there wasn't much discernible development at all. However, we did manage to get them to undertake a key few points of customization to make the middle and back office system work for us, but we still needed a significant amount of customization. This was undertaken in-house through 1997 and we moved across to full dependency on the new official system with customization in January 1998. We were nine days late; however, we were under budget.

What I would like to do now is show you what the system looks like. In this slide, we have users at the top and they all interface through the windows operating system. That is run for us by the Treasury so it is a platform that serves about 300-350 people. Through that, we get access to the Intranet and the Internet. The actual official system that we acquired is there on the left. It runs on Unix. There is a link there between Windows and Unix, which runs on Sybase, where we get direct market feed information from Bloomberg and Reuters. The customization has all been undertaken using the DMS Access application. In terms of reporting, it feeds directly into the official system but it allows us to customize without any changes to the official system.

I would like to run through some lessons we learned along the way. First, we used consultants to help us with the software selection process; however, we had no prior experience with such a process and, in retrospect, not enough time was spent on the study. Therefore, the consultants didn't really get a good enough feel for our business.

Second, as the process evolved, it was difficult to assess the information that the consultants were providing to us. Technically if we were to go through this again, we would spend more time learning what others had done before us, particularly in the areas of dealing with the consultants, systems selections and contracting.

Third, it is important to establish a reasonable estimate of cost early. The price advised by the consultants turned out to be less than fifty percent of the eventual direct cost, which complicated the relationship and reduced our flexibility as the project proceeded.

Fourth, we undertook what we call a business process re-engineering, in other words we looked at the way we undertook our business with a view to being more flexible about the way we transact, both in terms of designing something that could be more efficient using a blank sheet of paper, and also being flexible as to what the eventual product might provide in the way of processing. However, we did that a bit too late and in the end the customization pretty much went back to the existing way the processing was done in the old management information system.

Fifth, the development of the user requirements for customization largely took place group by group, that's front, middle and back office. There was insufficient coordination between those, and management should have taken a more active role in that process. We underestimated the resources that were required as a whole for this project and it had a major impact on the organization, a long period of double entry, a long period of people being diverted from their day-to-day jobs. And so we underestimated the opportunity cost that it was having on the organization. By the end of it, we had quite a backlog of other work that wasn't completed, vacations that had been deferred and displaced training..

It's very important to thoroughly test the product before signing the contract. As I outlined to you, our process was very much front office driven and the other areas did not look at the product as closely as they might have. And with the front office, it was mostly extensively tested by an individual who already liked the product.

Another lesson, the key to the success of the original system and why it lasted so long, was the enduring relationship between the product developer and the debt management office. In fact, that still served as well because he played a major role in the customization that was undertaken. The flip side to this of course is the key-person risks which is one of the reasons we wanted to move to a third party provided system. However, we feel we have assessed the risks this time around because we do have the off-the-shelf system there at the core, and the customization has been well documented so we feel that someone can come in with a good understanding of Access and assist us from a technical point of view as necessary.

A number of points: ensure that deliverables are tightly specified within the contract. As I mentioned we had a loosening there in the sense that we weren't quite sure where we were heading with the middle and back office requirements. Also, attempt to ensure that the system you buy will be updated with market developments. And, finally, it is important to know how all user requirements are going to be delivered beyond those pictured in the system. As I mentioned, our process was somewhat intuitive. We didn't have the full solution in mind when we set off with the new official system. But having said all that, we have a system in place that most users in the organization are broadly happy with. It's stable and the issues from hereon are very much around future requirements which we are thinking about now.