

Getting Rid of Registration at the LSE

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ABSTRACT

At LSE we register 8000 students a year at the beginning of October. Registration has been an onerous but necessary task for both staff and students of the School for many years. It has been costly for the School, and time consuming and frustrating for both students and staff. Over the last three years, the process has been changing. Initially the changes were technology led. The success of these changes boosted the registry's confidence in change and technology. They approached Business Systems and Services (BSS) to design systems to support their radical new registration. Working together, the impact of the necessary process of registration has been minimised for students and staff. A more efficient and cheaper process has been devised and the onerous and long period of queuing, form filling and data entry has been all but abolished.

This paper describes the process and changes and the cost savings that they represent. It also details the technical solutions underlying the slimmed down system.

Categories and Subject Descriptors

H.4.1 [Information Systems Applications]: Workflow Management; J.1 [Administrative Data Processing] Education; K.6.1 [Project and People Management] systems development

General Terms

Design, Human Factors, Economics.

Keywords

Staff saving, process automation

1. INTRODUCTION

1.1 British Registration

In the UK, University students register once a year when they come to begin or resume their studies. Some Universities do this mostly by post, and some – like the LSE – require the physical presence of the students to be proved.

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1.2 Changing the Process

Late last year the BSS department at the LSE was requested to provide all necessary technical support and development to radically change the way registration was conducted at the LSE. The process has changed radically over the last two years, but this had been technology led and initiated by BSS. What was exciting about this new project, was that the Registry had taken what we had provided, projected the ideas further and come to us to request support in the changes rather than having new processes forced on them by those responsible for IT. For BSS this was quite a victory, as for some time there has been much effort to try and make IT implementation process led, and this request proved that to some extent there has been success. It has been very positive for two departments to work collaboratively to each of their strengths.

2. HISTORY OF REGISTRATION

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Until 2002, the process of registration was extremely onerous for both students and staff. Cameras were introduced in 1998 to allow credit card type ID cards to be produced and to speed up the process by eliminating the need to produce paper cards. The students' images were captured using cameras at the registration desks and then stored on an image server, the image files were associated with their database references. This initiative made registration as onerous for IT support as everyone else, as the cameras were notoriously unreliable.

From 1998 to 2002, registration took over two weeks with long queues of students who had to turn up at specified times. Students who failed to show up at the required times caused great difficulty, their papers had to be searched for and often they could not be dealt with. With a substantial number of students arriving from abroad, often times could not be met due to the restrictions of flights, immigration and visa requirements. The failure of the system to account for this was an inconvenience to staff and students alike.

Typical registration staffing at this time was 8 registry staff and 10 or more temporary staff taking student information, entering it onto the student record system and collecting signed forms. Also necessary were 4 full time IT support staff doing little other than registration support for 2 ½ weeks – allowing for set up clear up time. The costs for this 'model' of registration are laid out in tables 1-3.

Table 1. Average registration costs 1998 – 2002 (£ sterling)

'98 – '02 registration costing	Costs per hour	Hrs	Daily salary costs	No. days	Total
Temp staff	9.00	763	63.58		6867.00
Clerical staff			814.66	12	9775.96
Supervisory staff			103.20	12	1238.37
Management staff			126.14	12	1513.67
IT support			458.67	15	6880.10
Total			1502.67		26275.10

Table 2. Registration additional costs 1998 – 2002 (£ sterling)

Additional costs	Item cost	No.	Staff daily cost	No. days	Total
Paper	0.03	8000			232.00
Filing			81.47	38	3095.75
Total					3327.72

Table 3. Total registration costs 1998 - 2002

Total Registration costs 1998 – 2002 (£)	29602.82
Total Registration costs 1998 – 2002 (\$)	51804.93

In 2002, a system was introduced where the students sent in signed forms including a photograph with their offer reply notification. We stole the idea, in fairness, from the UK Driving Licencing Authority who had introduced similar forms a couple of years before in order to facilitate photo driving licences¹. The form is scanned using Kofax Ascent software, and the signature and photograph are 'cut out' and 'released' as image files. Up to now these images have been stored on a dedicated server, accessed by the card printing and student record systems. The Kofax software allows us to make multiple releases of the data captured from the document. For further details see the technical changes section (4). The ID cards are then produced prior to student arrival, lessening the burden on registration staff.

IT support was the major saving as a result of changing the system to produce ID cards, and this change was led by IT staff. Up to 2003, registration had taken up the total time of 4 IT support staff for more than 2 weeks, (see table 1). In 2003, the same staff received a total of 4 support calls during the registration period of 2002, making a staff saving of £6880.10 (\$12040.18)², all because of prior ID card printing. It was possible to reduce the time over which registration is held to 7 days from 12, representing considerable staff savings. In total, registration in 2003 cost \$8725.82 (\$15270.18) less than in 2002 (see table 7).

¹ The UK has only had photo driving licences for about 5 years, which prior to their introduction made it very difficult to get a drink in an American bar!

² Calculates at an exchange rate of £1 = \$1.75 correct at 4th June 2004

Table 4. Registration costs 2003 (£ sterling)

Registration costs 2003	Costs per hour	Hrs	Daily salary costs	Nº. days	Total
Temp staff	10.16	126	84.00		10247.28
Clerical staff			814.66	7	5702.64
Supervisory staff			103.20	7	722.38
Management staff			126.14	7	882.98
IT support			0.00	0	0.00
Total			1044.00		17549.28

Table 5. Registration additional costs 2003 (£ sterling)

Additional costs	Item cost	No.	Staff daily cost	No. days	Total
Paper	0.03	8000			232.00
Filing			81.47	38	3095.75
Total					3327.72

Table 6. Total registration costs 2003

Total Registration costs 2003 (£)	20877.00
Total Registration costs 1998 – 2002 (\$)	36567.75

Table 7. Savings from 2002 - 3

Savings	Costs 98-'02	Costs 2003	Savings
£ sterling	26902.82	20877.00	8725.82
US\$	51804.93	36534.75	15270.18

Between 2002 and 2003, many significant changes had been made which reduced cost to the School. However, the students saw little improvement in the registration process they were going through. Specific times were still required for students, queues were reduced (but still annoying for all concerned), and there was still a lot of paperwork. There were still signed registration forms to be handed in and manual updating of the student record system as the student sat at a registration desk.

Registry acknowledged the positive aspects of the changes that had largely been forced on them and approached us with a proposition for 2004 that changed the structure of the process completely, making it virtually invisible to the student.

3. THE NEW SYSTEM

The Admissions department and Registry operated their systems largely independently, and because of this, no-one had realised that the information students were signing up to on the form they used to accept or decline their offer – to abide by terms and conditions and to say that their details were accurate – was in large part the same as what they were signing to abide by on the registration forms. Once this was realised, one form could be removed from the process.

We still need to collect the student's photograph, so we needed to physically collect the offer reply form, it was the registration form that was superfluous. So, as it was no longer necessary to take the student's photograph or get them to hand in a signed form, how is it possible to determine whether they have shown up at all?. Master's students, particularly, are very hard to tie down and who is and is not coming is notoriously hard to predict.

3.1 Business Process Changes

What Registry devised was a system where a student's presence is acknowledged, after they have collected their card, with a simple swipe of the encoded card through a card reader. The action of this swipe triggers back office processes that change their registration status in the student record system, notes the date and time of the swipe and activates the card for the School's door entry systems and the library. The new system has become known as 'Swipe and Go'.

Students can now come to register at any time during the registration period, eliminating the problems with appointments. They collect their ID card and, provided they have met their conditions, swipe the card through a reader and go away a registered student with an active id card.

Both the student record and registration systems know whether or not the student has met their offer conditions by a prefix to their student status code. This is either 'E' – no problem they can register – or P, there is a problem.

Students should know whether or not they have met their conditions and given us proof of this, and so a system rather like customs was envisaged A 'green channel' if they had met them and a 'red channel', containing the problem desk, if they knew they had not.

So, there is still the need for problem desks, but the staffing needs are much reduced. Only 2 staff are now required from registry and admissions to deal with problem cases, and 2 staff to hand out id cards as students arrive. This is against 8 in previous years, and the need for temps has been completely eliminated.

How has this been achieved? The business process changes have been led and implemented by Registry, with help where required from BSS as part of our role is to lead in project management. This project, however, has been in no way technology led. Perhaps that's why we have achieved such significant savings!

There are no additional costs for 2004 as there will be no printing and filing.

Table 8. Registration costs 2004

Registration costs 2003	Costs per hour	Hrs	Daily salary costs	Nº. days	Total
Temp staff	0.00	0	0.00	0	0.00
Clerical staff			325.87	6	1955.19
Supervisory staff			103.20	6	619.18
Management staff			126.14	6	756.84
IT support			325.87	3	977.60
Total			881.07		4308.81

Table 9. Savings 2003 - 2004

Savings	Costs 2003	Costs 2004	Saving
£ sterling	20877.00	4308.81	16568.19
US\$	36534.75	7540.41	28994.34

3.2 Student Experience

The biggest win arising from the new system, however, might be argued to be in student experience. Registration is now freer, with no requirement to show up at a specified time, which means you can go away if it's busy and come back when it's not, thus eliminating queues. Students are not required to do much, and only have to remember their passports as proof of identity rather than a whole pile of paperwork. This is illustrated in figures 1 & 2 – both extracts from our use case diagrams.

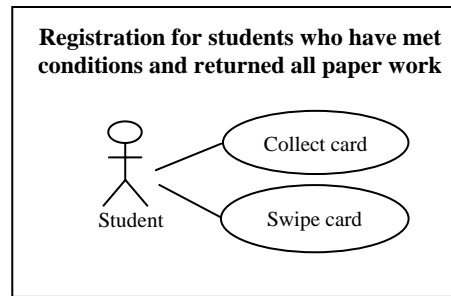


Figure 1. Use case for students meeting conditions

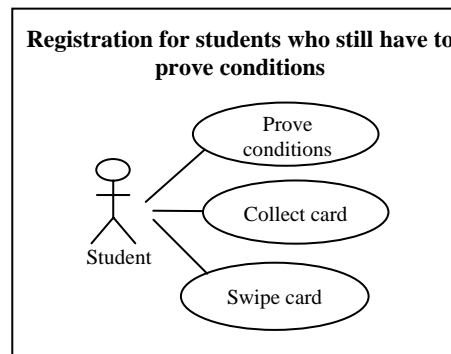


Figure 2. Use case for students not meeting conditions

Thus, registration has been almost done away with in the eyes of the student. Queues, paperwork and sitting with someone at a desk while they input your details has become picking up and activating your ID card.

4. TECHNICAL CHANGES

The first changes were made to the id card system. The image server has been replaced by to Oracle files, enabling us, eventually, to hold the student metadata in the same database row as the image, which is held as a BLOB (Binary Large Object) within the table. The magic of Oracle files lets us address this file as a unc path (so \\server\yyy\zz.jpg, for example) while it is actually held in a table, and so the software that retrieves the image requires little changing.

The scanning software we use retrieves all data required from a single scan and allows to us perform multiple releases from the single scan. Routinely we have 4 releases plus the index, as illustrated in the class diagram in Figure 3 below.

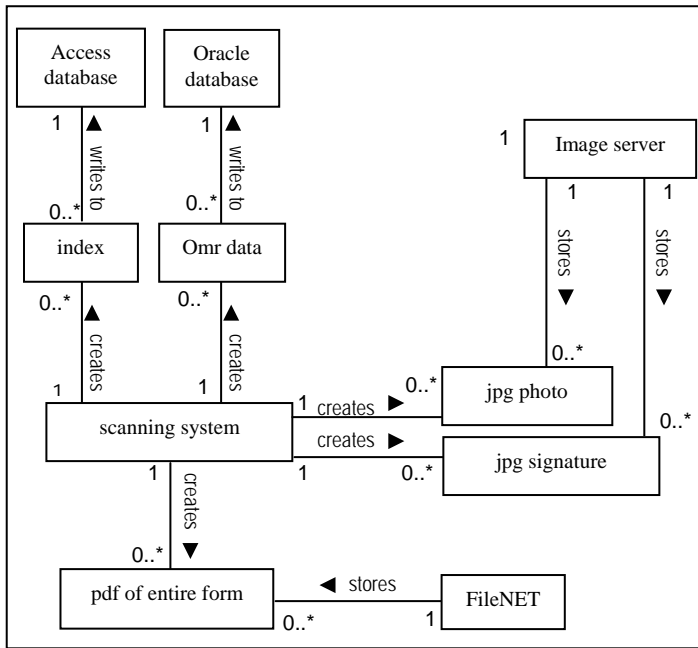


Figure 3. Use case showing multiple scanning releases

Approximately 8000 id cards are printed each year, alphabetically for all students. These have a magnetic strip which is encoded with a unique number. Using this number the student details can be traced back from the tables of the id card system to the student record system. All records in LSE are centralised through ‘LSE central’, a data structure holding a central, unique record for each individual referenced by one or more database systems used within the School. Thus, from the unique card id, the unique student id can be retrieved and because this id is used across database systems, we can retrieve the student record; all from the single swipe.

The business process design requested by the Registry is shown in figure 4. The IT staff’s challenge was to design non-intrusive systems that would make this possible.

There are only two end points in registry’s process, either the student cannot provide evidence of conditions, in which case they are not registered. If they can prove conditions, staff change their current status and they are able to enter the final part of the process which is always to simply swipe the card.

The main technical obstacle was presented by the physical swipe triggering automated back office process of which the student is unaware. There are technical issues around card production, but these are reasonably well rehearsed for us. The solution to the problem is shown in figure 5.

There are two principal elements that make the system possible, LSE central, already described, allowing us to use the same references across databases, and a simplified student status code structure. All Student status codes, once passed from admissions to registry, begin with either ‘P’ or ‘E’. This could be as simple as we have not yet seen proof of their conditions being met. Because of

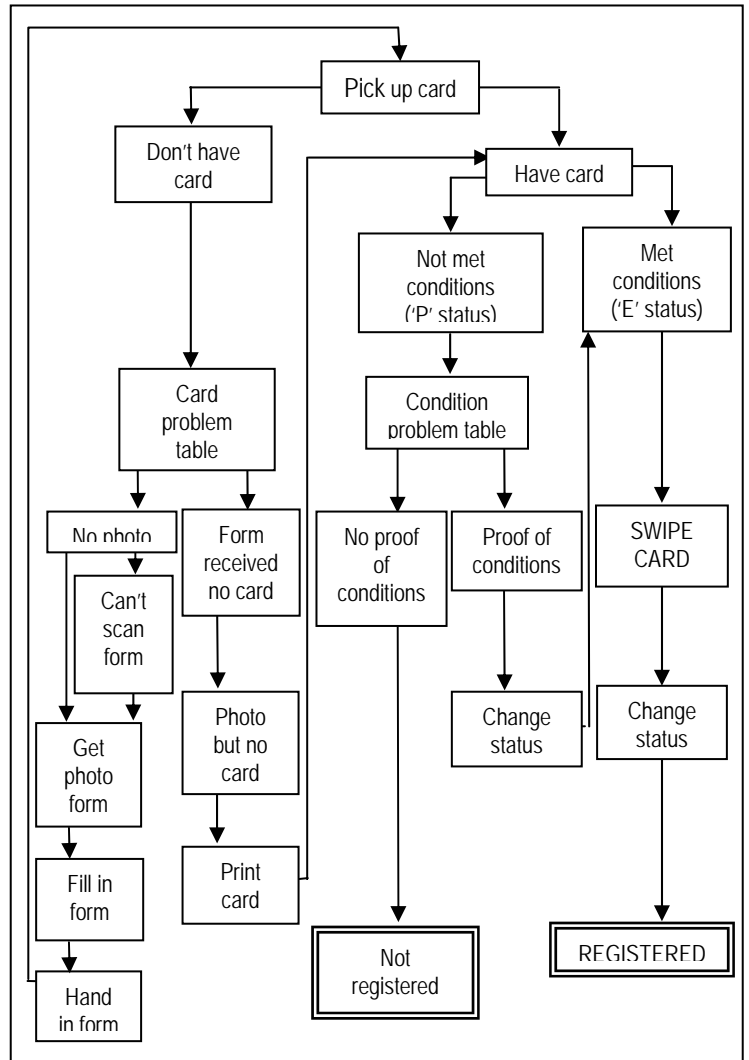


Figure 4. Business process design

this, the database searches on student status in order to automate the process are simple, and need only to look for student status like ‘E%’ or ‘P%’.

Oracle forms is used to trace the swipe actions and run the pl/SQL processes on the Oracle databases. The card swipe activates a query that retrieves the student ID number from LSE central, using the ID card’s encoded information. The student number is not encoded onto the card as the card needs to be unique and one student may have many cards during their time at the School.

Using the student ID number, the student’s status is retrieved from their student record and the system then knows whether or not it can proceed to register the student. If not (i.e. if the status is like ‘P%’) then the student is given a warning screen at this point, the swipe system is terminated and the student must go to the problem desk.

If the status is like ‘E%’, the system retrieves the registration status that this particular student is to be given. There are many of these as

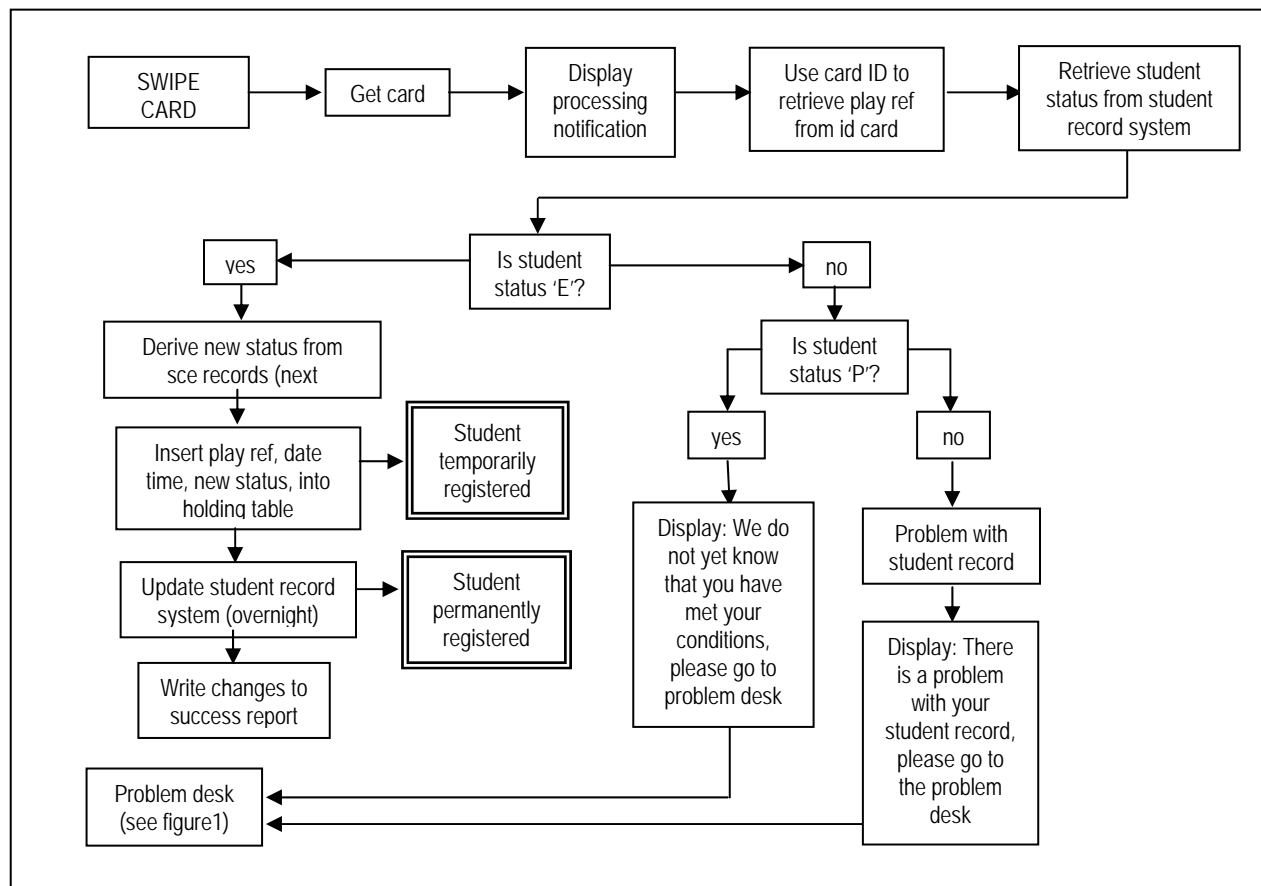


Figure 5. Technical solution to process support request

circumstances such as repeating the year must be accounted for³. However, the use of the expected status field in the student's record is efficient for this system as it only needs to be retrieved and then updated elsewhere rather than calculated.

The Student's details, including their new status, are then inserted into a holding table ready for an overnight update. It was not appropriate or efficient to change this on the live system.

The overnight script updates the live system from that day's data, and writes a summary to a 'success report'. This is then available for scrutiny by registration staff the next day through Oracle Portal. Portal provides them with dynamic data from the live system. It also allows them to scrutinize for error.

Any problem student requires human intervention in the shape of the problem desk, and they only become involved again with the technical system when their status has been changed to like 'E%' and so they can be dealt with as just described. This makes the technical system backing the process changes simple and efficient.

5. Conclusion

The new system has been good for the two departments involved as each has worked to their strengths and in co-operation. Because of the technology led changes, the registry's trust of IT staff's capabilities grew and the potential for cost saving and efficiency out

of system change was acknowledged. It is to their credit that they grabbed the opportunity to change this system with both hands and approached us with such a radical proposition.

In system design – both technical and not – we are forced to focus on the exceptions and, by definition, most students are not exceptions and will now be dealt with by a process requiring no human intervention. The previous system was designed to allow for problems rather than normal cases and so much staff time was wasted on non-problem students. It is because of the imagination of Registry to turn this around that such dramatic staff reductions can be made.

The technology required to make these changes is simple, cheap and mostly unseen and the changes have saved money and time. However, it is the student experience that has changed beyond measure. In the UK we are beginning to experience the financial importance of the student experience in returners, recommendations and alumni contributions in a way that is par for the course in the Unites States. LSE is the first UK institution to use such a registration system. It means we greet our students with a system that shows us to be up to date and efficient and provides a less onerous experience system than our competitors.

6. ACKNOWLEDGMENTS

Thanks to Derek Cook who first proposed the process changes, Registry for backing him and to Stephen Earley for his continuing excellence in uniting all databases with LSE central.

³ LSE does not have exam retakes, a failed student must repeat the year