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**INFORMATION SYSTEM DEVELOPMENT OVER TIME – MORE LESSONS FROM THE
FIELD**

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INFORMATION SYSTEM DEVELOPMENT OVER TIME – MORE LESSONS FROM THE FIELD

1 INTRODUCTION

This paper presents further results from a longitudinal research study that has been conducted with one organization, the Western Financial Services (WFS) Group, over a six-year period (Barry 2004). They operate in the financial services sector and rely heavily on information systems (IS) and information technology (IT). In the early years from 1986 to 1997 the firm ran its IS/IT function in a manner that responded to business events rather than implementing a co-ordinated, planned strategy. Despite the fact that the financial services it operated were supported by information systems, critical to the orderly operations of the firm, WFS have always been a 'lean' and flexible organization, growing structures organically. While the general posture toward IS/IT investment might appear as a pragmatic and sensible approach (Earl 1992), the reality is that under-investment in IS/IT capacity and resources meant that flexibility and responsiveness were never achieved. Each new project appeared to start from scratch and little organizational learning was being retained or disseminated. The episodic flurry of urgent requirements at WFS for an information system, contrasts significantly with the normative, structured approach to information systems development (ISD), so dominant in the past and outwardly at least at the present time. However other approaches such as problem structuring methods - PSMs (Rosenhead & Mingers 2001), may appear to offer a more realistic assessment of how systems requirements should be gathered. These methods inject a definitive role for people, intimately involved in the development process and usage of the final system. A third, less widely known, approach - the amethodical view - has been put forward more recently (Introna & Whitley 1997, Ciborra 1999, Truex, Baskerville & Travis 2000). It suggests that IS are developed improvisationally and amethodically. An alternative perspective, identifying some problems with the nature of support and analysis of the above approaches (Barry 2005), posits that much can be understood by examining the occurrence of incremental decision-making within the ISD process. This is illustrated within a framework combining differing decision-making styles, the actors involved and the various stages of ISD. The findings of this research suggest that this latter perspective can represent a richer picture of the complexity, and often the messiness, of the systems development process. With this in mind the work presented herein signifies the researcher's reflections about three information systems projects within the same organization, in which he played an involved role. The projects differ in size, scope and their relative importance.

2 RESEARCH APPROACH

The research method most appropriate is that of action research. It has been noted that the discipline of IS lends itself towards the use of action research methods (Baskerville & Wood-Harper 1996). IS is an applied field and IS researchers can make valuable interventions in the development process, particularly those with some industrial experience. Action research gives researchers real world understanding of the practice of IS that itself is, ipso facto, 'experience'. Such closeness between the researcher and the practitioner yields deeper insights and should benefit the organization. The action research cycle used in this study was Susman and Evered's (1978) revised canonical research process model comprising five stages (diagnosing, action planning, action taking, evaluating and specifying learning) and a client-

system infrastructure that provides the authority for sanctioning action and wherein agreement is achieved.

The context for the research was arranged over six years allowing temporal aspects of organizational and IS issues such as change, growth, ISD life cycles and systems degradation be studied. The author's relationship with the firm has been one of occasional, direct involvement, in a consulting role, with the organizational change process. It was expected that this interpretivist, participative research approach (Wood-Harper 1985, Galliers 1992, Baskerville 1999) would produce more elaborate findings than a once off snapshot of organizational issues.

At odds with much academic thought on formal IS planning, the firm in question has considered itself market-driven and use IS and IT as no more than a utility even when looking to exploit IT for business ends. In many respects it has proven to be a sensible business-led approach for the firm that avoids the pitfalls of assuming technology itself delivers benefits (Earl 1992, Howcroft 2001). The firm operates in the financial sector and relies heavily on IS/IT. Over the years it has developed systems to reflect their imminent business needs rather than implementing from a clearly laid out IS strategy.

3 STUDY BACKGROUND

The company was formed in 1986. Collectively known as the Western Financial Services Group, a pseudonym, it had by 1997 grown to operate VAT Refunding services to non-EU Visitors in several European countries. It has since expanded its corporate structure so that today there is an Irish Head Office and a number of European subsidiaries (known as Country Head Offices). Most of the data processing takes place in Ireland. It now employs over one hundred and fifty persons worldwide. WFS have always been a 'lean' organization, growing, expanding and changing its Group structure organically. While larger organizations typically find structural change difficult, WFS has witnessed many such changes but managed to remain fluid and dynamic, focussing on individual rather than inter-company relations. This organizational flexibility has been one of WFS great strengths, allowing it to operate effectively and competitively despite its moderate size. The Group, up until 1997, operated two major information systems. Since then it has developed more than ten significant applications.

Three IS projects are discussed and analysed in this paper (see Table 1). The projects span 1997 to 2003. The author's occasional involvement with the firm has uncovered a rich picture of how ISD has changed over time in reaction to improved organizational structure, in-house IS skills and the demands for more robust systems. Each IS project: a simple data entry system for their Italian Office; a complex currency conversion application; and a point-of-sales design specification, reveal insights into the decision-making process during systems development. From interviews and observation, each system is analyzed using the five stages of the action research cycle. This second study of the WFS Group systems development process reveals that much of its IS activity has involved incremental decision-making growing in line with organizational needs. The propositions that: different actors in ISD can hold different decision-making paradigms; overt and covert postures toward development co-exist; and that actors can change their decision-making approach during an IS project, are all supported by the study.

IS Project	Year
Italian Data Entry System	1997
Multi-Currency Cheque Payment Processing System	1999
Point of Sales (POS) Design Specification	2003

Table 1: Selected IS projects developed from 1997 to 2003

In their seminal work on decision support systems (DSS), Keen and Scott Morton identified five models of decision-making (Keen & Scott Morton 1978). The models range from the wholly normative to entirely descriptive. They are: the Rational View; the Satisficing Process-oriented View; the Organizational Procedures View; the Political Process View and the Individual Differences Perspective. The approaches are not mutually exclusive and some will be relevant for certain participants in the ISD process and others will not. Each view suggests important issues that should be understood by the development community, particularly management. The viewpoints of participants are articulated for each project.

4 THE IS DEVELOPMENT PROJECTS

4.1 Italian Data Entry System

4.1.1 Project Background

WFS conduct data entry activities for associated group companies who provide VAT Refunding services to non-EU Visitors. In 1997, the countries serviced in European countries were Ireland, UK, France, Germany and Italy. Data entry systems already existed for each country. The principal system was originally developed in 1990. It had since then been ported to each of the other countries with some modifications. At that time WFS were undergoing change in several key respects. These were:

- Growing their business into new markets and strongly competing in existing ones;
- Conducting a critical analysis of their data processing activities;
- Examining strategic information systems issues and;
- Considering the introduction of new technologies.

The Italian system was a first tentative step to reduce the reliance on the original data entry application and its associated operational headaches. The approach of 'cloning' the original system had been only moderately successful as the systems required different treatment of data and had distinctive functional requirements. Consequentially problems inevitably arose. It was decided that the new Italian system would start from a clean sheet.

4.1.2 Identifying Problems, Risks and Action Planning

In Italy voucher numbers were, at that time, small but a contract with a new retailer was to significantly increase voucher processing. For the new contract, vouchers would require processing in a few weeks. The senior salesperson that arranged the contract was not familiar with the technical and organizational obstacles that would be involved in producing a bespoke data entry system in an extremely tight time frame. The focus was on acquiring a 'trophy' client. With anticipated throughput of 150,000 to 200,000 vouchers in the first year the

rewards were high. However, the risks of aggravating the new client with delays in the capacity of WFS to process voucher was not assessed. The principal software provider in France, Systèmes Internationaux, who normally be called on to develop such a system was backlogged with over 100 person days of work for WFS. Following brief discussions they were not unhappy with another software company looking after this application. WFS wanted an Irish software house to deliver the system to begin the process of development closer to home. They did not consider the longer-term relationship between WFS and multiple software houses. The author did bring to senior management his concerns over rushing a development project, even a 'lightweight' data entry application. While these were noted the urgency of the required system was to dominate the development process.

4.1.3 Action Taking

To speed the process of developing the system, the author and a colleague used a rapid development approach involving prototyping and informal joint application design sessions (JAD). Interviews were conducted with key persons within WFS. A working prototype and a brief analysis and design specification was developed within a ten-day period. In preparing a prototype we were able to demonstrate the prototype to interested software houses to assist their scoping and tendering process. This strategy meant that systems analysis and design work could be conducted while talking to software houses. The time from first meeting to contract award was seventeen days. This left the successful software house about three weeks to further refine the prototype and develop a final system. Six firms were contacted, three locally in Galway and remaining from Limerick and Dublin. There was a preference for contracting a Galway developer.

The overheated nature of the software industry at that time meant that three companies were unable to respond adequately, while three others expressed interest. At an initial meeting in Dublin, one software house expressed keen interest and made a roughly costed proposal within two days. However once in receipt of a specification they drew back on their initial flexibility and insisted on a five-day workshop before being in a position to tender. It was estimated at their charge-out rate that this would have cost nearly as much as the expected overall systems development cost. The firm was informed that such a strategy was not acceptable to WFS and negotiations were broken off. The remaining Galway-based software houses went on to make costed proposals. Both firms were flexible and eager to be awarded the contract (let them be known as Firm A and Firm B). A normalized, fully attributed entity relationship diagram was developed and a set of data flow diagrams laid out the functionality of the system. The data in the new system was expressed using entity relationship modelling and normalisation. A certain amount of un-normalising of data was required because of the input constraints of the Unix/Oracle system based in Rome. Given the very short timeframe, many detailed procedures were not elicited and the software houses were informed that this was part of their brief.

A short analysis and design specification combining a request for proposals (RFP) was given to each software house. The prototypes and entity relationship diagram were also delivered electronically to assist the speed of their response. The business activities and processes were described and illustrated, and a worked example of the essential procedure was used to improve understanding of how processing of a single voucher was achieved. The RFP included:

- Schedule of events leading to contract;
- Suggested structure of the proposal (for comparative analysis);

- Development and programming guidelines;
- Expectations of the successful developer (telephone support, charging structure, documentation required, etc.);
- Description of Business Activities involved in VAT Refunding.

Proposals from the Galway-based software houses were received. The evaluation of the proposals of Firm A and Firm B involved itemising the advantages and disadvantages of both submissions as well considering the strengths and weaknesses of each firm. Judgements were made and contrasted. Primarily because of the strength of the development team, Firm B was contracted.

4.1.4 Learning Outcomes

As mentioned earlier, to speed the development process, a working prototype and an analysis and design specification was developed. It was then possible to demonstrate the prototype to interested companies to give them some assistance in tendering. This strategy meant that systems analysis and design work could be conducted concurrent with developer negotiations. However the collection of a set of requirements consumes far less time than the detailed design, construction and implementation needed by the developers. Senior management at WFS expected the successful software house to take about three weeks to further refine the prototype and develop a final system. This, not surprisingly, proved impossible to achieve. The slippage of two to three weeks meant that vouchers in Italy had to be hand processed. This was not a substantial difficulty and some vouchers were batched for data entry when the system was operational.

Perhaps, the most significant learning outcome came about when WFS wanted to make changes to the system using their own staff. Firm B claimed that the source code had not been part of the contract and that WFS would have to pay for it. Eventually a substantial, once-off charge was agreed. The haste with which the system was developed was blamed for this oversight. WFS were subsequently careful that source codes were either delivered or placed in an ESCROW account. The post mortem on the Italian System was that the process of development would no longer be rushed to the detriment of the system's functionality, quality or maintenance. Using Keen and Scott Morton's models of decision-making styles, the principal models in the ISD process were political, organizational and satisficing. Depending on the individual different decision-making styles were in evidence. Senior management and marketing personnel were using the political and organizational perspectives, while the General Manager, responsible for IS development, and other developers were using a satisficing approach to keep all parties 'on-board'. Decision-making during that period was incremental and the process lacked structure towards its conclusion. The fluid and dynamic prototyping approach paid benefits in getting the system developed quickly (although not as fast as some senior WFS management required). The General Manager on the other hand felt that a more structured, formal and rationalist approach to systems development was required. While this did not come about for several years there was a growing realisation that as the organization grew, so too did the criticality of information systems in support of business activities.

4.2 Multi-Currency Cheque Payment Processing and Support System

4.2.1 Project Background

By 1999 WFS performed VAT Refunding operations for associated Group companies in seven European countries. The operations included cheque and credit card refunding. At that

time cheque payment processing was outsourced to a major bank (Citibank) in the UK and France. The second action research project was to build a Business Requirements and Design Specification document for a multi-currency cheque payment processing system whose main objective was to provide a revenue-generating service to all Group Country Head Offices and to independent 'in-store' services offering VAT Refunds by way of cheque to Visitors. The sub-objectives were to:

- Improve the process of cheque payments;
- Achieve financial gains in currency purchasing;
- Achieve greater efficiencies;
- Provide improved management information to the Group and Country Offices;
- Improve the image with Visitors by personalising cheques.

When Visitors to the EU complete their VAT Refunding voucher they indicate which refund option they want - cash, credit card or cheque. The procedure for processing the latter option is the subject of this project. A Refund List was the file containing the list of transactions (generally one per Visitor) for which cheque refunds are due. It was sent from the Client (a Group Country Office or an independent Refund Agent) to the cheque processor, Citibank, and effectively constituted an instruction to perform cheque refunding to specified Visitors. The involvement of this researcher in the project was to assist in identifying the risks involved in changing the cheque refunding operation from an outsourced activity to an in-house one and to lead the production of a Business Requirements and Design Specification document. Semi-structured interviews, questionnaires, meetings, e-mail correspondence and observation were used to gather information and progress the project.

4.2.2 Identifying Problems, Risks and Action Planning

The main driver to bring the activity of cheque payment processing in-house was to save costs at an overall Group level and generate a new revenue service that could, itself, be extended to other VAT Refunding operators. The problems and issues associated with the outsourced service were:

- At that time Citibank issued drafts to Visitors rather than cheques drawn on Citibank in their local country - this has been a source of complaint from some Visitors;
- The cost for cheque refunding was rising;
- All of the work of refunding via cheque was already carried out by Group except for the issuing of cheques;
- Management information was being lost to the Group;
- The lack of further information (especially in electronic form) was a loss to Visitor relations and marketing intelligence.

Managers identified a number of risks associated with bringing the refunding activity in-house. These were:

- WFS had no experience in volume cheque printing;
- While estimates of transaction processing costs had been done there were risks that running such an operation would prove more costly than expected;
- Re-running operations when cheques became 'scrunched' in the printer had to be anticipated;
- IT staff, already over-stretched in their data processing activities, were apprehensive about 'another' systems to maintain;

- Ensuring that the correct ‘mix’ and order of pre-printed bank cheques could be handled by the system.

Even though the new system was, in data processing terms, relatively straight forward, because of the risks identified above it was agreed that a comprehensive Business Requirements and Design Specification document would be produced.

4.2.3 Action Taking

The Business Requirements and Design Specification document was put together by this researcher working closely with the General Manager, senior IS staff and an external consultant. Due to the structured nature of the core application (effectively a batch data processing system) a conventional process of requirements determination was conducted using interviewing, questionnaires, meetings and frequent e-mail correspondence. The document took six weeks to produce. The critical basis for the design revolved around using a state transition diagram to represent the treatment of a cheque. It was established that a cheque went through a number of states during its life cycle. It could only be in one state at a particular point in time. Broadly there was a simple sequence of states (fourteen) that represent a cheque’s normal life cycle. The rest of the document was made up of:

- Documentation of the refund process;
- Reconciliation of country codes and unique transaction allocation;
- Functional and operating specifications (using Functional Decomposition Diagrams);
- Data model and relationships (using Entity Relationship Diagrams);
- Data / process matrix;
- Reports;
- Household maintenance.

The document was not sent out to formal tender, rather to the consultant developer (mentioned earlier) who was involved with the production of the specification document from the outset and who had an on-going, close relationship with the Group. The system was developed in VisualBasic and implemented on a Unix platform. It went live about nine months later and was deemed an operational success from the outset. Subsequent observations were that the system lacked formal documentation upon completion and that (as in many organizations) no post-implementation review was conducted. The most dominant problems with the system have been printing related due in large part to an initial under-investment in printing technology.

4.2.4 Learning Outcomes

It was clear that in two years the IT function of the Group had fundamentally changed from one that feared exposure and risk to one that had grown in confidence and was able to contemplate autonomous development without depending wholly on outsourced services. The General Manager was instrumental in developing the IT function beyond mere data processing and into a more professional service within the Group. His vision was also to make Group companies pay for IT services, regularising what was a haphazard request or demand-based service without a strategy or formal relationship with other functions of the Group. It was also evident that the organization was keen to bring new systems development in-house or at least more directly under their control and influence. While the IT consultant worked on a consultancy basis, his close and personal relationship with the Group did not make it feel like a classical client/consultant liaison. Subsequent to the project he effectively became an

employee of the Group, contributing significantly to the expanding skill-base of the IT function.

While the project was not mission critical, the Head Office was signalling a clear movement away from an over-dependence on their principal outsourcer in France. Interestingly, Systèmes Internationaux did not make any attempt to solicit involvement in the development of the Multi-Currency Cheque Payment Processing and Support System, and seemed content to see WFS build up its own systems development expertise. The view of management in the Group was that Systèmes Internationaux was so far behind in fulfilling the needs of their client base that they were unlikely to go looking for more work from WFS, something that had been a concern at the outset of the project. The dominant decision-making style in the ISD process continued to be political and satisficing. However, those closely involved in development were embracing a more 'structured' approach that had outward characteristics of a rationalist philosophy. Decision-making during development was characteristically incremental - rarely neat, predictable or wholly planned.

4.3 Point of Sales (POS) Design Specification

4.3.1 Project Background

The purpose of the specification was to inform software developers of the operation and design requirements for VAT Refunding using a POS device for the WFS Group. In essence, the specification was designed so the Merchant could recognize an eligible VAT or GST (Goods and Services Tax) transaction, capture details electronically, print out a voucher and be assured that the transaction is dealt with efficiently thereafter. Since the specification was designed to be used in different countries it was necessarily generic in certain respects. However much of the functionality and data needs were identical.

The new solution was a mechanism to streamline Tourist refund payments from point of purchase to point of departure. It replaced the then manual, paper based, method of processing Tourist refund transactions, by automating the procedure at POS. A POS-based system enables the Merchant to offer VAT Refunding services to a customer using a credit card and to print a voucher for a Tourist to claim refund on eligible purchases by typically obtaining a Customs Stamp. All stakeholders, including Tourists, Merchants, processors, and government benefit from the solution. Data and requirements were gathered using semi-structured interviews, questionnaires, meetings, extensive e-mail correspondence and a close analysis of the operational UK POS system.

4.3.2 Identifying Problems, Risks and Action Planning

A manual paper-based VAT Refund scheme typically operates in the following manner. The Tourist pays the tax inclusive amount upon purchase and reclaims a refund upon departure from the country or region. The Tourist passes through three steps to claim and receive the refund upon departure.

- a) Merchant: Purchase goods for tax inclusive amount and claim refund voucher for eligible purchases
- b) Customs: Present refund vouchers to Customs Service for verification and authorisation upon departure
- c) Refunds: Present refund vouchers to refund service operator for refund payment upon departure

All are agreed that this method is problematic, costly and inefficient on all parties concerned.

Other problems with the existing system are:

- Loss of competitive advantage to others who might offer a similar POS service;
- Continued problems with the manual system;
- The interaction with the existing Oracle-based host processor will remain problematic as each new country is developed for VAT or GST refunding.

The risks associated with the system relate mainly to the potential for system malfunction and the affect this may have on customer (Merchant) relationships. There were also risks in relying too heavily on the recently operational system in the UK because it was poorly documented and was not adequately generic to form the core of the new specification.

Other lesser risks were the potential downtime of the telecommunications systems and the loss of marketing influence if the system were not developed in a timely manner.

With the new express refund service, the visiting Tourist is automatically recognised at point of purchase, the refund voucher is generated automatically, and the refund information is processed electronically at all three steps of the refund process. This streamlines the service at point of purchase for Tourists and Merchants, enhances efficiencies and effectiveness for the processor as well as Customs administrations, and promotes and increases the automation of Tourist refunds. The new service is adapted to each jurisdiction and it can be tailored from both technical and business perspectives to accommodate marketplace differences. This function of the POS enables non-VAT region issued credit cards to obtain refunds under the refund scheme - the Tourist obtains a refund for the VAT element of goods less an administrative fee. For example under this scheme in the UK, a voucher is automatically printed for submission by the Tourist or credit cardholder to the UK Office. This is a condition that the Tourist or cardholder signs up to. The VAT voucher production process does not interfere with the normal card payment cycle but a voucher needs to be produced and requires completion. Thus payment processing takes place 'independently'.

The specification made considerable use of models and diagrams to both conceptualise and make concrete a number of aspects of the specification. WFS had embarked on an ambitious roll out of its POS device across not just Europe but also the Far East and Canada. They were commencing on a strategic course that was intended to place their POS refund system internationally and generate a central repository for capturing transactions and offering further services to Merchants.

4.3.3 Action Taking

The requirements specification for a POS VAT Refunding System was established in less than two months. This was achieved by:

- Where possible by reverse engineering the system operational in the UK;
- Using existing technical and marketing documentation;
- Having access to key managers and technical developers within the group.

A detailed specification was produced, liberally including diagrams (freeform, functional decomposition diagrams, flowcharts and state transition diagrams) that described:

- The existing manual refund system;
- The requirements for a POS VAT Refunding system;
- POS design specification for the tourist VAT Refund scheme;
- Different operational installations;
- Logic of the application;
- Processing of a VAT-eligible sale;
- Refund options;
- VAT reporting and printing;
- The UK POS application;
- Target environment;
- Security;
- Refunding methodologies;
- Development and programming guidelines.

The appendices contained detailed models and technical specifications such as:

- Data models and relationships;
- Data table specifications;
- Detailed functional decomposition diagrams and state transition diagrams;
- UK EFTPOS terminal operator manual;
- Protocols for file transfer;
- Sample documents;
- ISO currency and country codes.

The UK POS system proved useful in indicating a specific implementation of the POS system. It was used to illustrate both the POS system and payment processing. The two systems were disassembled for the purpose of clarity. Naturally if the business model of the implementation requires that both these have to be re-assembled the POS developer could refer to the models for the logic of each system.

4.3.4 Learning Outcomes

Very positive outcomes were learned from the production of the POS design specification. The author, working as consultant witnessed a much greater maturity in the group's ability, interest and perceived importance of fully engaging with the process. Despite demanding day-to-day work, they recognised their involvement in the requirements determination process was crucial. In previous projects the rush to programming often left the gaps to be filled in later on. For this system it was evident that an incomplete specification would have simply pushed delays further down the development process, causing far worse consequences. The criticality of the new business model fed the creation of an atmosphere of co-operation and assistance.

By 2003 the decision-making style of the Group during the ISD process had changed. The General Manager felt that their general approach to be more rational, less political but still satisficing at times. He felt that each new project was better structured than its predecessor. This was happening for a number of reasons: IS developers were obliged to use more structured techniques; documentation was almost mandatory; software and systems testing was unrecognizable from what it had been six years previously; and improved processes and quality control were expected of them from business partners and clients. Decision-making however remained largely incremental, even when better methods and procedures were used. The trajectory of projects was not considered predictable.

5 KEY ISSUES ARISING FROM THE PROJECTS

Three quite different projects have been described along a timeline from 1997 to 2003. The projects differ in terms of the scale, criticality and degree of structure. Each project is summarized in Table 2 below. In 1997 systems development had generally been done reactively - when a new system or some system's modification was needed it was expected to be delivered within a couple of weeks (although this rarely ever happened). The first project - the Italian Data Entry System highlighted the urgency for system's completion. This reflected the lack of conventional IS planning. The haste with which the system was contracted out and implemented led to problems over the rights to source codes, not covered when signing off on the project. Between the Italian Data Entry System and the next intervention described herein, the Group, as well as conducting a large-scale JAD effort, developed several low-risk, small projects. While all the smaller systems were implemented with varying levels of success, the JAD session did not lead to implementation but yielded unintended benefits. The organization was beginning to come to terms with the importance of the relationship between their business services and the IS systems underlying them.

The second project revealed that in a relatively short time the organization was confident enough and had sufficient capacity in management and IT staff time to commit to a non-urgent systems development project. Furthermore they were perusing their business landscape to exploit technology for business opportunities. The last and largest project exposed WFS to their greatest risk yet. Failure, apart from being expensive, would have meant falling back on a system that was old, costly and inefficient. Furthermore, the potential for using the new system to improve their competitiveness and attractiveness to Refund Agents would have been lost.

The final project was a major effort. It was a reflection of the need for the Group to roll out an information processing system across multiple regions. The business requirements of the Group required forethought and planning so that a generic design specification could be 'handed' to developers for countries where the system was being implemented. Each country would demand amendments and additions to the design so that local requirements could be included and implemented. This planning effort constituted a major departure from 'on demand' development that characterised many of the IS projects heretofore. Ironically, while the trend in recent years has been to outsource IS activities to achieve efficiencies, reduce overhead and risk, for all these reasons a process of bringing systems development in-house emerged organically. No fully articulated decision was taken at a strategic level, rather an incremental process led to this outcome.

IS Project	Year	IS Staff	General characterisation of IS development at that time	General IS development approach at that time	Project techniques	IS activity outsourced
Italian Data Entry System	1997	1	Reasonably structured requirements statement; rushed	Ad-hoc; improvisational; little	Informal requirements determination;	85%

			development; no IS planning; IS and business strategy not aligned; minimum cost very important.	documentation; decision-making style political and satisficing and organizational.	basic system's models; design and development not fully documented	
Multi-Currency Cheque Payment Processing System	1999	5	Largely demand-based; significantly reduced backlog; developing value-added applications; informal IS planning; IS and business strategy not aligned; minimizing cost still important.	Beginning to use more structured techniques like DFDs and ERDs; decision-making style political and satisficing.	Closed nature of the system meant an informal life cycle approach using more structured techniques.	50%
Point of Sales (POS) Design Specification	2003	10	Specification an integrated part of the business strategy; developing value-adding applications; cost not considered as the critical factor in development.	Method tailoring evident; nature of the POS design required flowcharts, state transition diagrams and database spec; decision-making style more rational, less political but still satisficing.	Extensive specification required a more formal consultative approach.	20%

Table 2: Summary of WFS action research IS projects

The introduction in this paper focussed attention on how the prescriptive approach is at odds with the way systems are actually being developed. The projects described here, while sharing some of the techniques with the 'structured school', are not methodologically bound and do not conform to any strict normative view of systems development. Having moved from a very undisciplined development environment WFS have not 'crossed-over' to large-scale methodological usage, nor have they adopted CASE tools. Rather they have developed their own in-house, method-tailoring approach to system development. They use structured methods and conventional database technologies where they see fit and object-oriented methods and development environments elsewhere. This 'in-house' methodology and technique usage is consistent with research on methodological usage in Ireland (Barry & Lang 2001) and method-tailoring (Fitzgerald, Russo & O'Kane 2000). The simple but focussed use of process and data modelling analysis and the method-tailoring approach proved a useful combination.

It was established that while management in the Group were unfamiliar with PSM usage the socio-technical nature of systems was well understood. The amethodical 'approach' was evidenced only in that improvisation appeared to be used in the desperate absence of any other guidance. The lesson here is that one needs to be careful presupposing the lack of method as deliberate improvisation or the "hidden rationality of skilled individuals" (Conboy, Lang & Barry 2002 p. 4). The perspective proposed by this researcher mentioned in the introduction offers another dimension: looking at decision-making styles, the actors involved and the various stages of ISD. Observationally and from early analysis of interviews held recently with senior Group managers and IT staff there would appear to be some

substantiation for the view that there exists simultaneity in decision-making styles; changing actor's perspectives; 'espoused postures' and 'postures-in-use'; and the reality of incremental decision-making.

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