

## Neath Port Talbot Pay Roll

When a person works for a company, he or she is called an employee. Employees have to be paid. So when an employee joins a company, they are put on the pay-roll. This is like a register and lists all the employees working in the company.

The details on the payroll are then used to help the company work out every employee's pay. If an employee has the pay paid directly into a bank account then the company gives the employee a pay-slip every time the company pays money into the bank account. Some employees have a wage packet. Very few people have wage packets these days. They prefer the money to go directly to their bank account. Of those who do have a wage packet still, few will have cash in their wage packet, most will opt for a cheque .

The first application package used was a payroll package called LEO. It was written for Lyons Teashops, in London in 1953.

Computing has come a long way since then. In these notes we are going to look at the way Neath Port Talbot Authority processes its pay roll.

Neath Port Talbot is a County Borough in South Wales. Its southern areas are industrial, with a steel works and an energy centre . The valleys to the north were all mining areas but the mines have for the most part closed, though a few private ones remain. There are spectacular waterfalls in the Neath valley and a greater percentage of the County is woodland or forest than any other County in England or Wales. Few people realise that there are some breathtakingly beautiful walks in the area.

In computing, we have what is called a system cycle. This means that , in general, any computer system installed will have to be improved within a few years. This is happening at Neath Port Talbot in 2003. The system in January 2003 will be replaced by a web technology based system but the configurations in these notes will stay very similar. Configuration is a word that means the way things are put together in computing. The differences will be explained in the section on future developments.



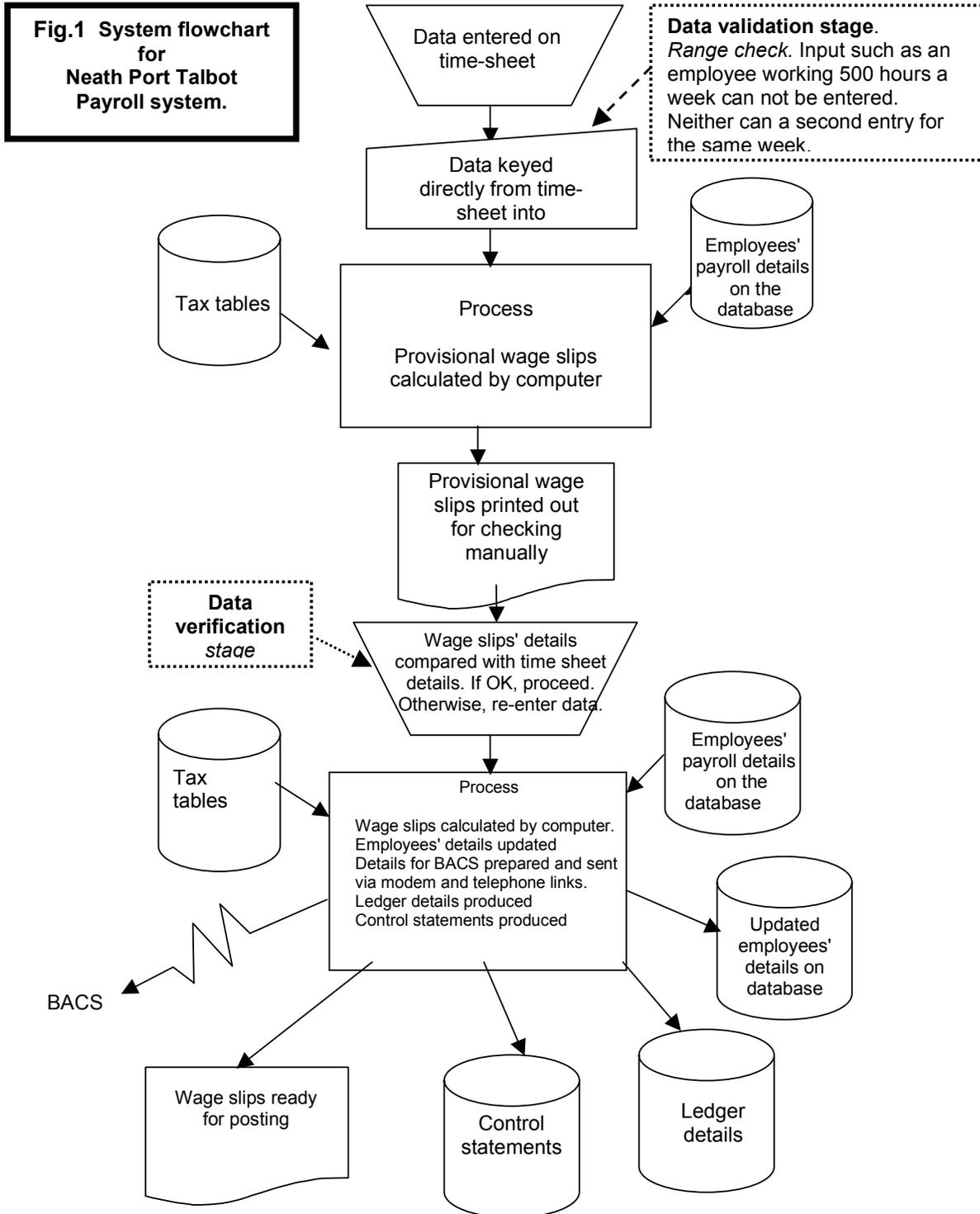
Keying in the times worked.

On the web based system this will be done in the schools and the centres and the data will go directly to the payroll server.

Currently this is done by the payroll section of the Authority.

Neath Port Talbot payroll uses batch processing on top of a real time system. For example they have a system DS2 which stands for Direct Services Two Weekly. People paid on this system are paid every two weeks. Neath Port Talbot processes all these employees' pay one after another in the same batch. Teachers are paid monthly so the system is called TFM which stands for Teachers Full Time Monthly. All the teachers' pay is processed in one batch. At the moment the Authority uses seven different batches but this will be changing soon to eleven different batches because of some changes within the Authority.

Fig. 1 gives a simplified version of what happens.



**Remember : A batch processing system is one where jobs to be processed are prepared and collected together in a batch and then submitted to the computer for processing;** it's not unlike baking, any house-wife would tell you it is daft to cook one scone at a time, similarly it's daft to work at one person's pay at a time and then shut the computer down. These days most batch processing systems are actually sitting on top of a real time system.

Different firms and authorities use different processes to produce their payrolls. Some firms use a Computer Bureau to run their payrolls off. A Computer Bureau can handle all sizes of payroll and may even have the occasional firm of over 10,000 on their books. Some firms do their own - with improvements in processor speed, memory capacity and reduction in cost, small firms are turning to small micro's e.g. IBM PC compatibles and buying payroll packages.

**Remember: An application package is an applications program accompanied by the necessary documentation (notes/instructions) to run the program correctly. A good example of an application package is a payroll package.**

**Collection and Input of Data.**

There are two categories of employees in Neath Port Talbot. Teachers for example, don't have to sign in each day but if they are ill, the salary section has to know. Their pay system is called a *negative process* - money is subtracted if person is absent. There are some employees who have to fill in time sheets, the information from the time sheet has to be entered before the employee can be paid. This pay system is known as a *positive process* - must prove you are present before being paid.

**Positive Process**

If an employee signs in, a clerk fills out a time sheet (Fig. 2) for the employee, adding details about overtime, special payments, sickness etc. At the moment, this data is keyed in by the payroll staff. When the Authority uses Web technology, the data will be keyed in by the staff in the schools and the other Authority centres.

NAME <u>A. N. DYHER</u>		Neath Port Talbot County Borough Council Cynfor Bwcastraf Sirod Castell-ach Port Talbot		EMPLOYEE REF NO	
PAY NO. <u>9999</u>	Loc. No. <u>108</u>	DIRECTORATE OF PROPERTY & PROCUREMENT			
TRADE <u>Cleaner</u>	RATE	<b>Time Sheet</b>			
Wk. Ending <u>12 JAN 03</u>	Wk. No.				

DAY	WHERE EMPLOYED	WORK DONE	Hours		CONTRACT	CONTRACT	ELEMENT	HRS	C	REMARKS
			On	Off						
MON	<u>Yopul Gyfau Ystalyfera.</u>		<u>3</u>	<u>1</u>						
TUE	" " "		<u>3</u>	<u>1</u>						
WED	" " "		<u>3</u>	<u>1</u>						
THUR	" " "		<u>3</u>	<u>1</u>						
FRI	" " "		<u>3</u>	<u>1</u>						
SAT										
SUN										
TOTAL			<u>15</u>	<u>5</u>						

CERTIFIED CORRECT

Foreman A. N. Foreman

Employee A. N. DYHER

School Admin. L. O'Brien

For employee use			
Bus Fares	Top-Money	Out Money	Other

Data Protection Act 1984

(1) Information provided to you will be held and automatically processed as data on a computer system. The Council will take all reasonable precautions to ensure its confidentiality and to comply with principles (noted) within the Act.

(2) The information may be compared with other personal data held by the Council in order to aid the provision of local or national administration of public services.

PAYROLL		
Calc.	Check	Input

Fig. 2. An example of a time-sheet.. The hours worked and the overtime are entered on this. This person has worked for 3 hours and done 1 hour overtime as well.

Some employees use their own plastic time recording card, which they swipe through a Card Wipe Machine as they enter the building on arriving at work and on leaving. Any amendments to the salary of an employee who uses the flexi-scheme is keyed into the payroll system by the personnel department. An example of an amendment might be a leave of absence without pay.

### **Negative process**

Once the details have been keyed into the database, employees on this system get paid automatically. If for any reason pay should be deducted the information has to be keyed in. This is done by the payroll staff. Again when Web technology is introduced, these details will be keyed in at the schools and other authority centres.

### **Data validation on Input of Data**

**Remember: Data Validation is checking that the data entered is sensible.**

Data validation does occur in the positive process. If for example, a clerk tried to enter 500 hours then the system would reject it, as no-one can. There aren't that many hours in a week, so it would be a silly entry. Another entry that is not possible is keying in the same week's hours twice; this too will be rejected by the system.

### **Data Verification**

**Remember: Data Verification means checking that all the information (data) that has been transferred from one medium (e.g. the timesheets) to another ( the payroll server) has been transferred correctly.**

In Neath Port Talbot, the data verification occurs after the computer has processed the data from the time sheets and produced provisional pay-slips. The printouts of these provisional pay slips are then checked against the data from the time-sheets by the payroll section. If there are no problems the process is allowed to continue. If there are problems, i.e. discrepancies, then the data is re-entered.

**Databases**

**Remember: A database is a collection of data items, which is organised in such a way that it may be accessed easily by a wide variety of application programs.**

Neath Port Talbot use a database application. The database is made up of a number of modules. The application is written by a company called Selima Software Ltd based in Sheffield. The system is known as the Universe RDBMS (Relational Database Management System). The database has a relational structure and can be queried on any item of data held. The database is made up of a number of modules. The payroll system is only one module of the application.

**Files**

**Remember: A file is a collection of records.**

Within the database, there is data about employees including the employee number, name, department, hourly rate, tax code, National Insurance number and tax paid to date etc. This data can be thought of as being held on a file within the database but this isn't strictly true.

**Records**

**Remember: A record is a collection of fields. The fields can be of different data types, e.g text, number, date etc**

An example of a record about an employee called Jones would be:

Employee No.	Employee Name	Department:	Hourly wage £	Tax Code	N. I. Code	Sort Code	Account No.
001327	JONES	DESIGN	5.05	461L	A	01-23-45	0193256

Since a file is a collection of records, a simple file of employees would be as shown below.

Employee No.	Employee Name	Department	Hourly Wage	Tax Code	National Insurance	Bank Sort Code	Account No.
001327	Jones	Design	5.05	3	A	01-23-45	0193256
001359	Smith	Planning	5.20	3	B	11-12-13	7189400
001482	Thomas	Personnel	5.25	2	C	34-21-67	0752463

These are **Fields** : One for:  
**employee number,**  
**employee name** and so on

Every branch in every bank has its own unique bank sort code.

**Remember: A field is the smallest amount of information that can be put into a database.**

There is a file of tax tables from which income tax can be calculated using a person's tax code and pay to date. This file has to be searched quickly; it is directly accessible and is stored on the payroll server.

## Updating

If there are any changes to employee details, the database has to be updated. If the change is about a change of bank or a different address, the amendments will be done by the personnel section.

The changes that occur because the overall amounts paid to the employee per tax year increase as each pay is received are done by the payroll program.

**Remember: To update a file means to alter it, keying in new information or deleting information.**

Updating can involve:

- i) inserting ( adding) new records.
- ii) deleting existing records.
- iii) amending (changing) the items within existing records.

The tax tables file is updated only when the Government changes the tax rules.

## Backups and Security of Data

At Neath Port Talbot the payroll server is backed up by a Robotic Tape Drive on to magnetic tape. The data backup cartridges are always kept **off** the premises in safe storage locations and one copy in a fire safe.

The Authority intends to use RAID technology soon with the Selima system. RAID stands for Redundant Array of Inexpensive Disks. Sometimes the definitions say Independent is used instead of Inexpensive. The RAID system copies data automatically. The application running is not aware that copying is continually taking place. RAID technology uses two or more disks to store the copied data. It makes it almost impossible to lose data due to disk failure. RAID technology is frequently used to backup servers. There are different levels of RAID, the higher the level number the more secure the backups are.

The Authority also gives different levels of access to different employees so that important data cannot be accidentally over written or viewed by an authorised user.

## Software

### Operating Systems

The Operating system used for the current system is UNIX. The new operating system that will be used for the web technology approach will be Windows 2000. See Future Developments, Page 13

**Remember: An Operating system is the software that controls the overall running of the computer. It handles Input/Output operations, interrupts, user requests etc.**

```
216 READ allowance.data FROM allowance.file,ALLOWANCE.CODE
THEN
217 pay.descriptions<PP>=allowance.data<2>
```

Fig.3. A very small sample of the code currently being used in the application program.  
Thanks to Selima Software Ltd.

**Computer Languages for the Application packages**

The current system is written in Data BASIC. This language is similar to BASIC and Pascal. See Fig.3. The new web technology based application which the Authority is about to install uses a web front end using pSYGN which is a web development tool.

**Remember: An application package is an applications program accompanied by the necessary documentation (notes/instructions) to run the program correctly. A good example of an application package is a payroll package.**

The software can calculate the wages for each type of employee.

The stages are as follows:

- a) Calculate the employee's gross pay (i.e. pay before deductions).
- b) Calculate tax and other deductions and hence calculates the actual pay which is called the nett pay. N.B. The tax file has to be opened here.
- c) Print provisional wage slips for the payroll department to verify the input of hours worked.  
**Data Verification stage**
- d) If verification OK, then update the accumulative details, the gross pay, the tax etc on the database. Prints wage slips and details for Wages Department.

N.B If verification is not alright, then the data has to be re-input into the payroll server.

- e) BACS details are transmitted to BACS. BACS (Banks Automated Clearing System) is used by all banks to sort out payments.
- f) If needed, cheques for the employees are printed.
- g) Produce the interface from the payroll to the ledger. The ledger keeps the Authority's accounts.
- h) Produce, if needed, a hard copy for the directorates, the different parts of the Authority of the expenditure on wages.
- i) Produce a series of control statements. For example, the payments made to the Inland Revenue, the payments to the Pension funds, the payments to the Unions, the payments to the Council for Council Tax.

See Fig.1 Page 2 for a simplified version of this in diagrammatic form.

### Computer Configuration

Neath Port Talbot uses a WAN, a Wide Area Network. There is a server dedicated to the payroll on the network, called the payroll server. **Remember: A server is a computer on a network that has a resource on it that all the other computers on the network can access.**

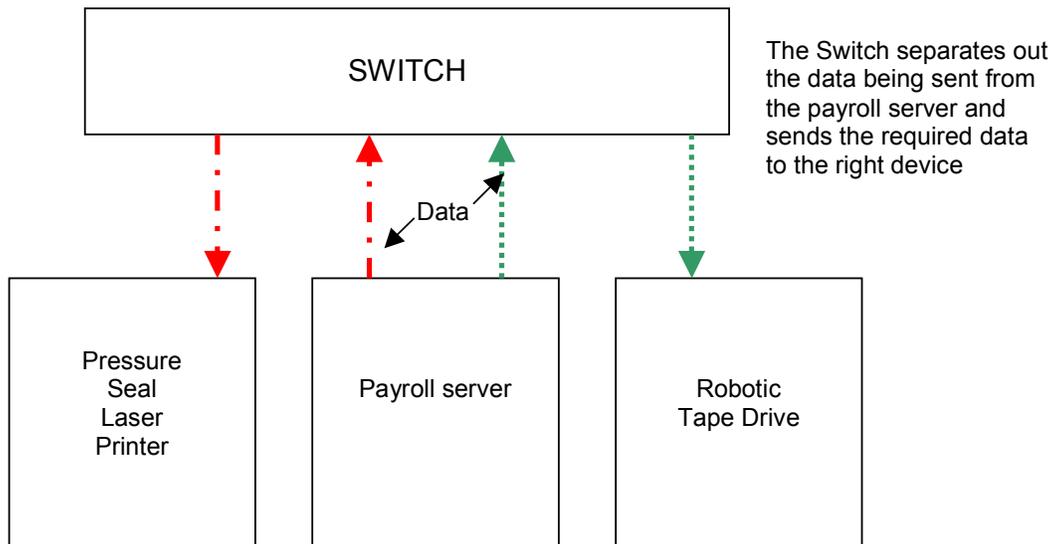
The network is made up of telephone lines and internal cables all linked together by switches.

**Remember: A switch is a network device that selects a direct, fast, point-to-point path or route for sending a unit of data to its required destination.** It can also behave like a router and determine which point in the network requested the data.

Switches improve the management of large networks by dividing them up into network segments. Each device on the system only sees the data that is intended for it.

In Neath Port Talbot when the payroll server is ready for the pay-slips to be printed, it sends a message to the switch. Fig. 4 The switch makes sure the pressure seal laser printer receives all the data needed to print the pay-slips. In practice, there are also control boxes linking the switch which transmits instructions from the payroll server to the printer and to the robotic tape drive. These boxes have not been shown in the diagram.

Fig. 4



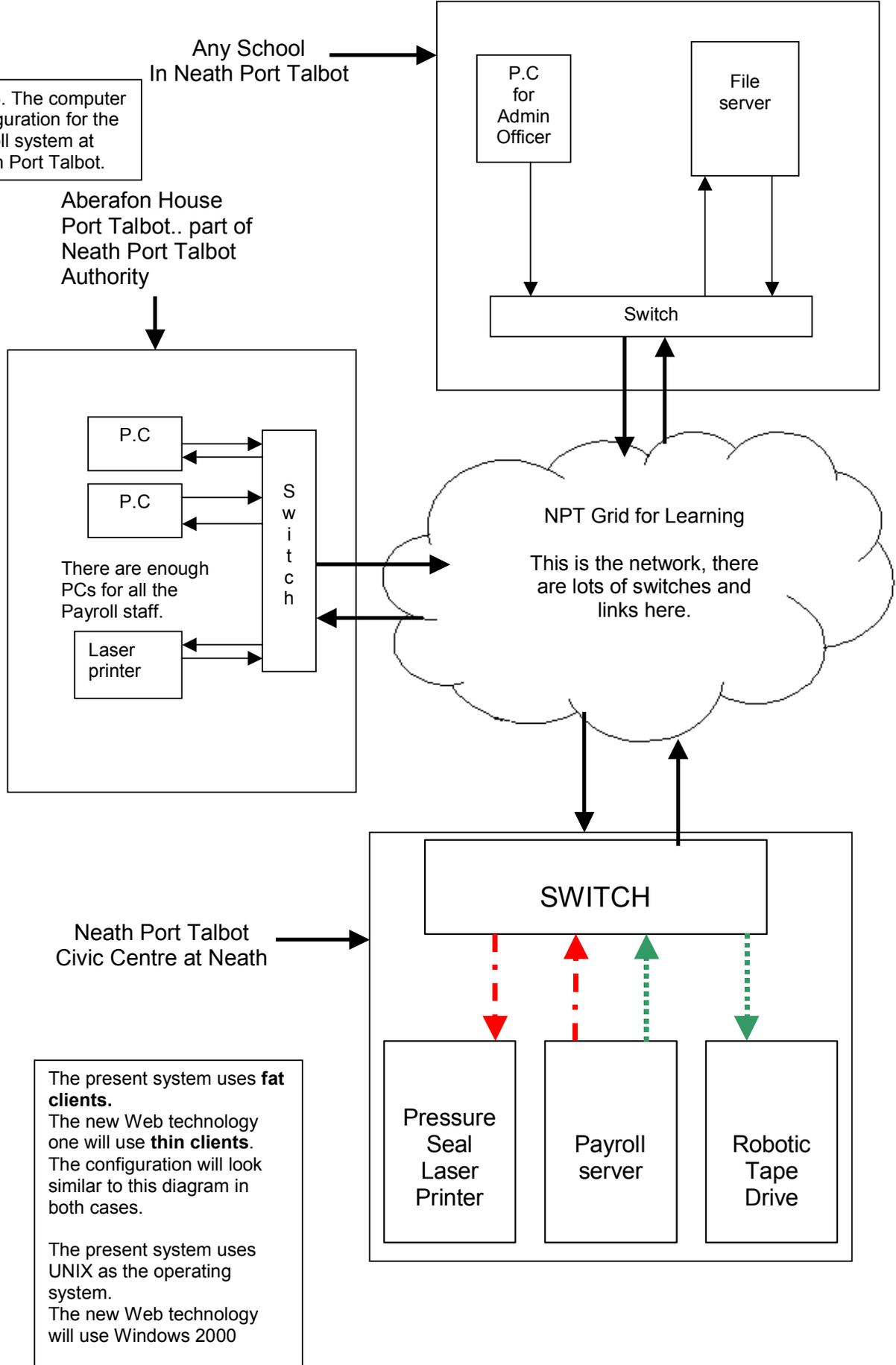
The payroll server in Neath Port Talbot is a Dual Processor PowerEdge 2650. Each has a processor speed of 2.8Ghz.and the RAM (Random Access Memory) is 2Gb. There is a cache that is also 2.8GHz/512K. The Hard Drive is 36GB. This is a fast machine.

The configuration is shown on the next page. Fig.5. The actual links are very complicated. The diagram shows the most important links involved in the Payroll process but there are others within the Network cloud. There are also other servers for other applications which have not been shown.

Neath Port Talbot Pay Roll

GCSE ICT

Fig. 5. The computer configuration for the payroll system at Neath Port Talbot.



**Printed output**

The provisional pay slips are produced on laser printers within the payroll section.  
The actual payslips are produced by a pressure seal laser printer. (Fig. 6)

Fig. 6. A pressure seal laser printer.



This takes the pre-printed stationery, prints on it, then folds it up into a Z shape, squeezes it and then pressure seals it.

Pre-printed stationery is used to save printing time and printer toner. Fig.7 shows a payslip before it has entered the printer

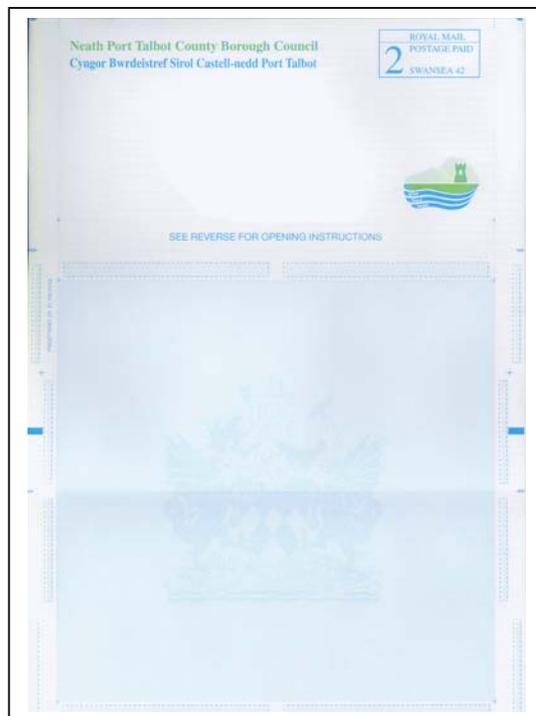


Fig. 7 An example of pre-printed stationery. The wage slip before it is put into the printer.

Once the wage slip is printed it is ready to post. Fig. 8.

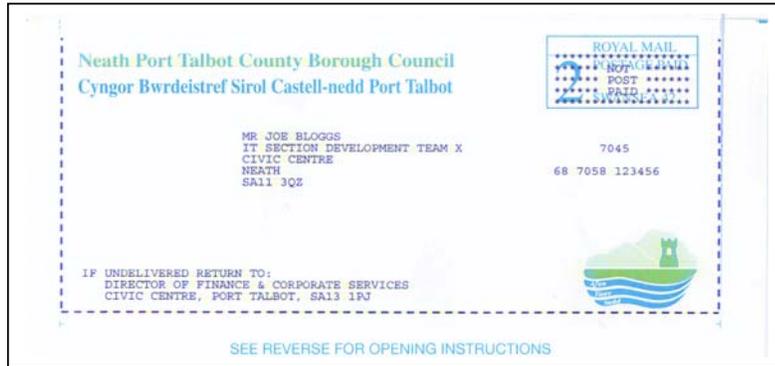


Fig.8.

By pulling along the dotted lines the slip can be opened. Fig. 9. shows an open slip. This is what everybody wants to see!

Staff Number	No. of Payments	Payment for Period Ended	N.I. Number & Code	Tax Coding	Tax to Period	
68 7058 123456	01	31/12/02	AB/12/34/56/D D	461L CUML	09	
<b>Neath Port Talbot County Borough Council</b> <b>Cyngor Bwrdeistref Castell-nedd Port Talbot</b>  J BLOGGS 99 SEA VIEW CLOSE DERWEN FAWR SKETTY SWANSEA SA4 5DX			<b>Memoranda / Cofnod:</b> TAX OFFICE REF. Swansea 615N108 ANNUAL SALARY 31041.00 THIS EMPL. TAXABLE PAY 21742.86 THIS EMPL. TAX PAID 3848.36 SUPERANNUABLE PAY 23130.75 SUPERANNUATION PAID 1387.89 NATIONAL INSURANCE PAID 1601.34 SUPERANNUATION PERCENTAGE 6.00%			
<b>Enquiries to / Ymholiadau i</b> FINANCE & CORPORATE SERVICES NEATH PORT TALBOT CBC CIVIC CENTRE PORT TALBOT SA13 1PJ TEL: (01639) 763585						
<b>Payments / Taliadau</b>		£	£	<b>Deductions / Didyniadau</b>		
37.00	SALARY	2586.75	431.14	TAX		
TOTAL MILEAGE 55 MILES		21.95	155.21	SUPERANNUATION		
			179.64	NATIONAL INSURANCE		
			16.31	UNISON		
<b>Payment Date</b>	<b>Paid By</b>	<b>Total Gross</b>	<b>Total Deductions</b>	<b>Net Pay This Authority</b>	<b>Add Tax Credit</b>	<b>Total Payment</b>
20/12/02	BACS	2608.70	782.30	1826.40	0.00	1826.40

Fig. 9. The pay-slip opened

## Security

Any system involving money is open to fraud. To prevent any fraud, Neath Port Talbot have some sensible rules.

Firstly no-one is allowed to work on the input and the output section at the same time. This means no clerk can type a fantastically high salary level for themselves and then go and collect the cheque. There must be at least two people involved to fiddle the system.

At the end of each run, the top ten payments are printed out and checked. If they are correct, it is assumed that the run is correct.

There are auditors who check the system. They pick employees at random. Then they check up that the employee is still working at the place on the computer's records. All the employees time sheets and payslips are scrutinized for irregularities. The auditors (computer systems auditors) check that the system procedures are tight.

Back up copies of the database are kept along with an extra copy, being stored in a different building from the Civic Centre in Neath where the payroll server is housed.

### Advantages

Calculating payrolls is very tedious and time consuming. In 1970 in a large organisation GEC (General Electric Company) Whetstone, which employed 4000 people, there were 50 or more staff simply adding up wages all day everyday before the arrival of computers. Today in Neath Port Talbot there are 15 people working on the pay-roll for over 9000 employees. This number will decrease further when Web Technology is introduced but not dramatically and the reduction will be done by natural wastage.

All the tedious work is done by the computer. It is faster and more efficient.

### Disadvantages

The only disadvantage is loss of jobs and the need to have employees with different skills.

### **Future developments**

The web based system will use thin clients instead of fat clients. All this means is that the application software will be kept on the payroll server and will not be on the PCs in the payroll section. However the staff in the Payroll section should not see any major difference, apart from the fact they will have to use a web browser such as Internet Explorer to access the payroll application. A PC which has all the software installed on it is known as a fat client. A PC that needs to look at the software through the network is known as a thin client.

One advantage of using thin clients is that the technicians do not have to load the software up onto every PC involved with the payroll. Neither do they have to worry about anybody making a change to the software on one PC that should then be copied to all the other PCs.

The real difference to the staff involved in pay-rolls is that the data will now be keyed in from the centres and the schools by an authorized person, instead of by the payroll staff. The data verification process should still remain the same.

The amount of paperwork will be reduced. This is another advantage.

### **Conclusions**

Computerised payrolls are here to stay. They are fast and efficient and save a lot of paperwork as well as tedious calculations. The new system using web technology will reduce the paperwork even more.

### **Acknowledgments**

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