# national STaTiSTiCS

# VOORBURG 2003

## SESSION 2: MINI PRESENTATIONS ON PRODUCER PRICE INDICES

## DEVELOPMENT OF A PRICE INDEX FOR COMPUTER SERVICES IN THE UK

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**THE DEVELOPMENT OF A PRICE INDEX FOR COMPUTER SERVICES IN THE UK STANDARD INDUSTRIAL CLASSIFICATION - DIVISION 72**

## Introduction

Development of a UK CSPI for Computer and related activities (division 72 SIC92) was first considered in 1995.  A base-weighted (1995=100) price index relating to a wide range of activities within the sector was made available on a prototype basis a few years later.

In 1999 the circulation of the prototype index was suspended, this was for a variety of reasons.  Some of the problems encountered were discussed in the UK paper presented at Voorburg 1999 in New Zealand.  A new project to re-develop a price index for the sector began in 2000, an update on progress being provided at Voorburg 2002 in France.  The purpose of this paper is to report on progress since 2002, consider the problems being encountered and discuss the short and longer-term development strategies for the highest priority CSPI for UK National Accounts.

## Voorburg 2002

The UK paper presented in Nantes described the development problems being encountered and the strategies being implemented.  In summary these consisted of:

- A framework representing business activity in the sector, it is based on a product list produced by an ONS's Computer Services Survey in 2000 (CSS2000), which collected data on sales by type of service (see Annex A - Industrial framework).

- Difficulties achieving adequate industry coverage as companies with less than ten employment account for nearly 35% of turnover within the sector.

- Due to the high demand for a deflator for software, a pilot survey had been set up and 50 contributors recruited.  These were classified into the software groups of the business activity framework.

- Severe difficulties had been encountered when dealing with quality change, in particular for software services.  The previous methods used meant upgrades had a mainly neutral effect on the price index.

- Longer-term aim was to produce a set of price indices covering all activity in the sector within the next 3-4 years.

- The pilot index would be used to develop further the techniques for dealing with price collection, item specification and quality change.

A full version of the paper is available on National Institute of Statistics and Economic Studies (INSEE) website.

## Current position

The current development progress detailed in this paper is up to and including July 2003. The product list referred to in last year's paper is unchanged and the activity framework is still considered to be representative of business activity of the sector within the UK.

A random sample stratified by employment was selected in November 2002, it used the CSS2000 panel as a sampling frame. In total 200 contributors received forms, to date 130 have been recruited and are supplying over 300 price quotes per quarter.

For the contributors recruited during the software pilot we now have six quarters data. The latest set of recruited companies covering a wide range of activities have provided three quarters. The recruitment form used can be seen in Annex B, it contains example quotes for guidance. An indication of the wide variety of item descriptions for which we are receiving price data is provided in Annex C.

The new indices are calculated using a Laspeyres base weighted (2000=100) method for each branch of the activity framework.

## Quality issues

To date, there is no proven method for dealing with quality change. In particular, the development of software is a dynamic activity by its very nature. It has not been possible to test the various potential methods due to their huge resource requirements, but whilst developing the current set of computer services indices the UK have kept abreast of the methods tested elsewhere. In terms of non-software activity we are concentrating on collecting prices for detailed specifications where the price affecting factors can be pinpointed. For software development activities, the methodologies we have considered are summarised in Annex D.

## Other challenges

During extensive research and development for ONS's CSS2000 survey, it was found that division 72 (SIC 92) did not adequately represent business activity within the sector. Therefore a working group representing trade associations, other government departments, and industry experts drafted an up-to-date and representative product list.

As a result of differences between the product list and division 72 we are encountering certain problems. These were slightly reduced when amendments were made with the move to SIC2003. The limited correlation we have achieved between the CSS2000 product list and SIC2003 and how they compare to the Classification by Product Activity 2002 (CPA2002) can be seen in Annex E.

In particular, a limited correlation is causing problems when calculating item weights. Turnover data is used to calculate an item's weight within a subsection of the industry framework, but an estimation of the non-sampled turnover is also calculated to provide a more accurate picture of the industry. As the calculation of non-sampled data relies on universe data taken from the ONS business register, the lack of correlation between the register's SIC2003 classification and the CSS2000 product list can be problematic. The worst affected industry activity being 'Other software consultancy and supply - 72.220 (SIC2003)' which contributes towards four different activities within the CSS2000 industry framework.

In addition, further research is needed into the wide variety of software licensing terms. Complex and changing terms of sale can make period on period price comparisons redundant.

## Short term strategy

The development of an 'A' method deflator for software would be our ideal short-term outcome. An example of the criteria used for grading a deflator for pre-packaged software is shown in Annex F. These were taken from the Eurostat Handbook on Prices and Volumes 2001.

In order to produce an 'A' method software deflator, we need a suitable method of quality adjustment. At the moment it is not feasible to use any of the three methods summarised in Annex C for a software CSPI, the main reasons being:

- **Source lines of code (SLOC) & Function point analysis (FPA)**

  Both of these software measurement methods either expect the relevant data to be already available or to be calculated by the software companies being sampled. The compliance burden placed on contributors would be unacceptable and this is even before the methods have been fully proven as a reliable measure of quality change.

- **Hedonic modelling**

  With this method there is less of a burden on contributors and more of a burden on CSPI. Even so, the necessary research, calculation and maintenance of the regression models would be extremely resource intensive. Currently, this is not a short-term option for CSPI.

For the time being, it has been decided to place more emphasis on activities within the sector activity framework which are less dynamic and can be adjusted without complex, resource intensive methods. In particular, concentrating on producing indices for three activities for which we have collected over 170 quotes from 70 contributors. For those contributors included in the software pilot we now have six quarters data, the contributors recruited in the latest phase have supplied three. In terms of sector coverage, based on CSS2000 data we have nearly 30% by turnover. The activities are:

**IT Consultancy Services** (CSPI framework: 720060000)
The collection method is quite straightforward; the vast majority of quotes received to date consist of either daily or weekly consultant rates. It is possible we may encounter problems correlating this index onto SIC2003 as software consultancy (72.220) and hardware consultancy (72.100) are classified separately.

**Facilities management, outsourcing and data processing** (CSPI framework: 720090000)
This framework category covers a combination of activities; nearly all facilities management and outsourcing are provided on an annual contract basis. Data processing services tend to be priced on a 'per unit' basis (e.g. Data capture key to disk - £1 per 1,000 keystrokes). Data processing (72.300) and database activities (72.400) of SIC2003 fit well into this category of the framework, but facilities management and outsourcing contracts contain a variety of activities spanning several different SIC2003 division 72 categories.

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**Software maintenance and support** (CSPI framework: 720040000)

Generally for the data collected to date, maintenance and support of software is priced by means of annual contracts.  It may be possible to use this index as a proxy for software development as less quality adjustment would be required.  Quality complications could arise though, as some contributors use a percentage of the software development cost to calculate maintenance and support contract prices for it.  SIC2003 does not provide a suitable classification for this activity, the closest match being 'Other software consultancy and supply' (72.220).

## Longer term strategy

In the long term we are hoping to publish a set of price indices covering all activities within the computer services framework.  The research we will be carrying out to meet this objective will include:

- Appropriate quality adjustment for each activity type, in particular the hedonic approach for software development.

- Untangling of the different types of software licenses available and the impact these have on prices.

- Matching of the CSPI activity framework and division 72 of the new SIC2007 classification system.

During this long term development period we will continue to collect data for all activities within the sector  (including any new ones) and will publish indices as each is considered 'fit for purpose'.

## Conclusion

CSPI have collected a large amount of data for this sector since Voorburg 2002, we are still recruiting new contributors and expect to produce sub-indices utilising the vast majority of this data in the coming months.

Even though the various challenges discussed will hinder development progress, particularly software, we are expecting to produce an index for at least one of the business activities discussed in the short-term strategy within the next six months.

Our longer term aims to produce indices for all activities within the sector are extremely challenging, the obstacles to overcome particularly regarding quality change are seeing little progress worldwide.   Even so, if investment is made allowing more detailed research into the methods available our longer-term aims may be achieved.
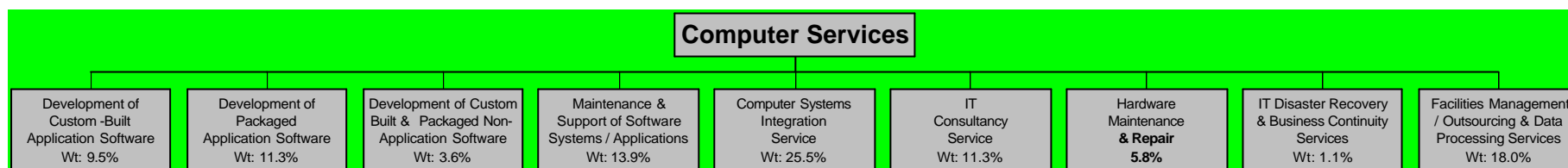
## References

Holdway Michael, 2002, Challenges in Producer Price Index Measurement of Selected Service Sector Industries in the New Economy.  US Bureau of Labor Statistics.

Ball Adrian / Allen Andrew, 2003, The introduction of Hedonic regression techniques for the quality adjustment of computing equipment in the Producer Prices Index (PPI) and the Harmonised Index of Consumer Prices (HICP).  UK Office for National Statistics.

Eurostat, 2001, Handbook on price and volume measures in National Accounts.

**Annex A**

**Industry structure based on ONS Computer Services Survey 2000 (Jan 2003)**

| **Computer Services** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Development of Custom -Built Application Software Wt: 9.5% | Development of Packaged Application Software Wt: 11.3% | Development of Custom Built & Packaged Non-Application Software Wt: 3.6% | Maintenance & Support of Software Systems / Applications Wt: 13.9% | Computer Systems Integration Service Wt: 25.5% | IT Consultancy Service Wt: 11.3% | Hardware Maintenance **& Repair 5.8%** | IT Disaster Recovery & Business Continuity Services Wt: 1.1% | Facilities Management / Outsourcing & Data Processing Services Wt: 18.0% |

**PRODUCTS**

| | |
|---|---|
| 7200100000 | Development of Custom Built Application Software Products for customers. |
| 7200200000 | Development of Packaged Application Software Products for customers i.e. programs developed by you and sold as a product. Include Software licences. |
| 7200300000 | Development of Non-Application Software (system software, tools, utilities) for customers, whether custom built or packaged. Include Software licences. |

**PEOPLE**

| | |
|---|---|
| 7200400000 | Software systems or applications maintenance and support. |
| 7200500000 | Computer systems integration service - integration of different computer software products, with or without the associated hardware, to form a complete system. |
| 7200600000 | IT Consultancy Service. |
| 7200700000 | Hardware Maintenance - Repair and/or Maintenance of computing equipment or office machinery. |

**PROCESSES**

| | |
|---|---|
| 7200800000 | IT disaster recovery / business continuity services. |
| 7200900000 | Computer Facilities Management (Outsourcing) / Data Processing Services. (Including: operating the day to day running of clients' computer / network systems, data entry, data capture and imaging, transaction processing, Application Service Provision (ASP), Website hosting, etc.) |

**Annex B**

# national STATiSTiCS

# Quarterly Corporate Services Price Index
# Recruitment of Pricing Information

Notice is given under section 1 of the Statistics of Trade Act 1947

PLEASE USE BLACK INK TO COMPLETE THIS FORM

Write any changes to your name/address **in this box only.**

1

TO BE COMPLETED FOR:

FROM:

**Office for National Statistics**
A Government Executive Agency
NEWPORT
NP10 8XG

YOUR CONTACT FOR HELP AND QUERIES:

PLEASE COMPLETE AND RETURN THIS FORM VIA POST OR FAX BY

Notes are enclosed to help you complete the form or you may telephone your contact named above.

FOR YOUR INFORMATION:

- The number of businesses and questions are kept to the minimum required to produce reliable results.
- Corporate Services Price Indices measure price movements in services provided to UK businesses. They are used by Government (to measure and monitor inflation in the service sector and for compiling national accounts) and by industry. Results are available on our web site www.statistics.gov.uk/press_release/experimental.asp
- The quarterly publication Economic Trends, which is available from the Stationery Office on inquiry line 0870 600 5522.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the Deaf please telephone  01633 812399.

THANK YOU FOR YOUR CO-OPERATION

## IMPORTANT

Please read these notes and refer to the 'family tree' - this is the breakdown of services included in your industry - before you complete the form.

### 1. Coverage

A list of service areas are provided in the family tree diagram. Please provide a price quotation for each service area in which you do business.

Services you select should be:

- Provided by your company in the UK to other UK businesses or government customers
- Representative of your general price trends under the relevant categories
- Services you expect to continue providing into the future

If you have problems selecting a service please telephone us for advice.

If your company does not provide any UK services in the areas shown, please contact this office on the number shown on the front of this form stating your main area of business.

### 2. Price quotation

We need to monitor price changes through time. Depending on the nature of your business it may be appropriate to provide:

- Discounted prices relating to actual transactions in the relevant quarter
- Periodic charges levied under a continuing contract for a given service
- Realistic market estimates

### 3. Current service price

Please quote the transaction price in either pound sterling or Euros (please specify which otherwise sterling will be assumed). Please note that the price quoted should be the price actually charged, that is after allowing for any discounts and **exclusive of VAT**.
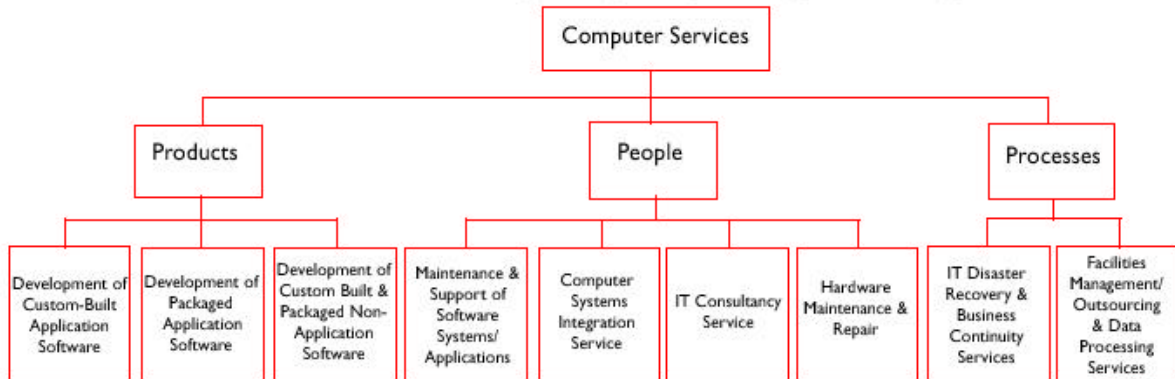
### 4. Description of service

For each price quotation please provide clear details of the service provided. As we are monitoring price movements we therefore need to be able to identify genuine price changes. This means we must be able to distinguish them from change to description or quality of service. Include for example:

- Customer type/name/reference code
- Order quantity
- Speed of completion

- Payment terms
- Length of contract
- Any other important detail (see examples)

If in the future you stop supplying a service for which you have provided a price quotation, but you continue to do business in that service area, please be prepared to provide an alternative example.

# FAMILY TREE FOR COMPUTER SERVICES



Computer Services
- Products
  - Development of Custom-Built Application Software
  - Development of Packaged Application Software
  - Development of Custom Built & Packaged Non-Application Software
- People
  - Maintenance & Support of Software Systems/Applications
  - Computer Systems Integration Service
  - IT Consultancy Service
  - Hardware Maintenance & Repair
- Processes
  - IT Disaster Recovery & Business Continuity Services
  - Facilities Management/Outsourcing & Data Processing Services

## EXAMPLES OF PRICE QUOTATIONS FOR COMPUTER SERVICES

| INDUSTRY SECTOR Please refer to family tree diagram | DESCRIPTION OF SERVICE YOU PROVIDE Please refer to the examples provided and the notes page, section 4. | Price quote for: Q4/2002 | Price quote for: Q1/2003 |
|---|---|---|---|
| **PRODUCTS** | | | |
| 1. Development of custom-built application software | Provision of one travel reservation system to Smith Travel Limited (Customer ref: xd342) for 50 users. Outright sale of system - design, testing and implementation period of 6 months. | £103,000 | £107,000 |
| 2. Development of packaged application software | Provision of One Microsoft office XP software suite (Standard edition) to Henson Supplies Ltd (Customer ref: 54637) - outright sale) | £429 | £415 |
| 3. Development of custom built and packaged non-application software | Provision of one Meridian software toolkit to Spartax Systems Limited (Customer ref: hy65d) for 16 users. Price per calendar year. | £123,000 | £123,000 |
| **PEOPLE** | | | |
| 4. Maintenance and support of software systems/applications | Annual maintenance and support contract of a travel reservation system for Smith Travel Limited (Customer ref: xd343) for 50 users. Annual price charged. | £17,400 | £17,400 |
| 5. Computer systems integration service | Host system software integration contract for Osmaro Call Centres Limited (Customer ref: 4228ed). Includes: sytem modelling, system software, host integrator server, build and implementation. 20 week contract price. | £47,500 | £49,300 |
| 6. IT consultancy service | Provision of Senior Consultant (Weekly rate) 5 days consecutive work. Travel and accommodation expenses reimbursed at cost. | £2,500 | £2,500 |
| 7. Hardware maintenance and repair | Computer hardware maintenance service package (Superior) for Stable Solutions Limited (Customer ref: 786547b). Key features include: guaranteed response time of 4 hours; travelling expenses paid; on-site repair; all components excluding consumables; supply of fully configured equipment at customers premises to enable defective items to be replaced immediately. Package price for one year. | £7,000 | £7,000 |
| **PROCESSES** | | | |
| 8. IT disaster recovery and business continuity services | Co-located server disaster recovery package for Artamay Software Systems Limited (Customer ref: ju45). Key features: 99% reliability guarantee backed by compensation; 24 hours, 365 days a year fault reporting with guaranteed 2 hour response; Filtered power backed by UPS and a generator; 12GB of traffic per month included; minimum contract length of only 3 months. Monthly price of package with co-located server - hardware supplied by customer. | £275 | £275 |
| 9. Facilities management/ outsourcing and data processing services | Facilities management contract for BDB Engineering Ltd (Customer ref: 456321). Main aspects of contract include: monitor/support daily tape back-up scripts of servers; performance analysis of servers, disk performance and monitoring; file system administration; user administration; install operating system patches and upgrades; monitoring of operating system and hardware. Price per financial year. | £173,000 | £182,000 |

# RECRUITMENT FORM: PRICE QUOTATIONS FOR COMPUTER SERVICES

Please provide prices for services or contracts that you expect to continue to provide into the future. We require data for Q4 2002 (covers the period 1st October 2002 to 31st December 2002) and for Q1 2003 (covers the period 1st January 2003 to 31st March 2003).

| INDUSTRY SECTOR<br>Please refer to family tree diagram | DESCRIPTION OF SERVICE YOU PROVIDE<br>Please refer to the examples provided and the notes page, section 4. | Price quote for:<br>Q4/2002 | Price quote for:<br>Q1/2003 |
|---|---|---|---|
| **PRODUCTS** | | | |
| 1. Development of custom-built application software | | | |
| 2. Development of packaged application software | | | |
| 3. Development of custom built and packaged non-application software | | | |
| **PEOPLE** | | | |
| 4. Maintenance and support of software systems/applications | | | |
| 5. Computer systems integration service | | | |
| 6. IT consultancy service | | | |
| 7. Hardware maintenance and repair | | | |
| **PROCESSES** | | | |
| 8. IT disaster recovery and business continuity services | | | |
| 9. Facilities management/outsourcing and data processing services | | | |

| DEVELOPMENT OF CUSTOM BUILT APPLICATION SOFTWARE |
|---|

7200100001   AUTOLINE REV 8 SOFTWARE FOR MOTOR DEALERSHIPS LICENCE COST PER SINGLE USER ANNUAL FEE
7200100006   SOURCE CODE FOR MOBILE PHONES ROYALTY FEE - EACH TIME PRODUCT SOLD. LOWER VOLUME FEE.
7200100007   LEGAL OFFICE PRACTICE MANAGEMENT SYSTEM INCLUDING TIME RECORDING AND CASE MANAGEMENT
7200100028   BESPOKE COMPUTER SOFTWARE. ACHIEVED HOURLY RATE.
7200100029   ENTERPRISE EDITION - NAMED USER LICENCE DATABASE PRODUCT.
7200100031   ORACLE FINANCIAL PACKAGE. PRICE PER APPLICATION USER.

| DEVELOPMENT OF PACKAGED APPLICATION SOFTWARE |
|---|

7200200001   LINE 50 - COMBINATION PACK - FULL ACCOUNTANT FINANCIAL 10-2030 * 015994
7200200008   APPLICATION SOFTWARE - VIA VOICE FOR WINDOWS STANDARD EDITION R10.0 UK ENGLISH. PRODUCT  CODE 45P8709
7200200009   LICENCE TO USE NUMEGA SOFTWARE DEVPARTNER STUDIO ENTERPRISE EDITION LIST PRICE FOR 1 USER.
7200200011   PROVISION OF ONE RESPOND CENTREPOINT SOFTWARE (PER SEAT)
7200200012   OUTRIGHT SALES OF WEEKLY LAW SUBSCRIPTION FOR CUSTOMER 0R001A
7200200013   PROVISION OF AGRESSO BUSINESS WORLD AND UK PROD LICENCES TO NEWCASTLE UNDER LYME B.C (REF 1725) FOR 48 GENERAL
             LEDGER USE RS - OUT RIGHT SALE

| CUSTOM-BUILT AND PACKAGED NON-APPLICATION SOFTWARE |
|---|

7200300006   OS/2 WARP. V4.0 CD US 65 H10 31.
7200300007   VISUAL BASIC STD 6.0 32.BIT. WINDOW. REF :046-00379
7200300008   VISUALAGE JAVA PROF ED.V4.0 PKG FOR ACADEMIC ENG/US LANGUAGE. SHRINKWRAPPED. (NO  MAINTAINANCE) PART
             NO 20P4347 PRODUCT ID 5724-B13
7200300011   LICENCE TO USE FILE-AID\MVS LIST PRICE PER 1000 MIPS
7200300013   PROVISION OF ACCESS TO THE FOCUS ON-LINE COMMERCIAL PROPERTY DATABASE TO KING ST URGE  CONTRACT 1
             YEAR PRICE IS FOR YEAR
7200300015   PROVISION OF SYBASE SQL SERVER V8 WINDO WS 32-BIT LICENCE

## MAINTENANCE & SUPPORT OF SOFTWARE SYSTEMS / APPLICATIONS

7200400001     SYSTEM MAINTENACE AND HELPDESK SERVICES FOR AUTOLINE REV8 SOFTAWARE PER SINGLE USER ANNUAL FEE
7200400002     MAINTENANCE OF CANTATA++ FLOATING LICENCE ON STANDARD PLATFORM
7200400006     SUPPORT OF BESPOKE SYSTEMS TO CLIENTS PRICES QUOTED ARE PER CONSULTANT/ENGINEE R - AVERAGE DAILY  RATE
7200400007     ANNUAL MAINTENANCE OF SNAP PROFESSIONAL SOFTWARE
7200400008     MAINTENANCE AND DEVELOPMENT OF INSURANCE MANAGEMENT SYSTEM PRICE PER YEAR
7200400012     LOCAL GOVERNMENT TIME RECORDING SOFTWARE SINGLE USER COPY - ANNUAL CHARGE


## COMPUTER SYSTEMS INTEGRATION

7200500001     SYSTEM INTEGRATION PROJECTS. PREMIUM RATE. PRICE PER DAY.
7200500004     ONE DAY ON SITE FOR INTEGRATION CONSULTANT (PER DAY)
7200500007     FULL SITE IMPLEMENTATION CHARGE PER STONE INC CABLING COMMISSIONING INSTALLATION AND DELIVERY
7200500009     PROV OF PRO MAN TIME FOR IMPLEMENTATION OF RECONCILIATION SOOFT TO BARCLAYS STOC KBROKERS. NO  PRO MAN TIME SUPPLIED IN Q1 SO ESTIMATED NO CHANGE (PRICE PER DAY)
7200500011     DEV OF NEW EPOS SYS FOR OTTAKERS PLC RETAIL UNIT (3 MONTH CONTRACT)
7200500021     APPLICATION SOFTWARE INTERFACE DEVELOPMENT. TYPICALLY TAKES 2 DAYS WORK @ £650 PER DAY.


## IT CONSULTANCY SERVICES

7200600008     PROVISION OF SENIOR CONSULTANT TO BOURNEMOUTH LIBRARIES FOR 5 DAYS (REF:BL101/0001)
7200600009     PROJECT SERVICES FOR ENDEVA (REF ENDASH) FOR IMPLEMENTATION OF WMS TOTAL 80 DAYS
7200600011     PROVISION OF SENIOR CONSULTANT (DAILY RATE) TRAVEL AND ACCOMMODATION EXPENSES REIMBURSED AT  COST
7200600012     DAILY RATE FOR ABM CONSULTANT (NUMBER OF DAYS VARY PER IMPLEMENTATION)
7200600014     PROVISION OF SENIOR CONSULTANT TO CONSTRUCT SPECIALIST LTD FOR 2 DAYS WORK INCLUDING TRAVELLING  TIME BUT NOT TRAVEL COST
7200600016     PROV OF SENIOR CON (5 DAYS) INC. INVESTI GATION ANALYSIS & RECOMMENDATIONS FOR SOLUTIONS AT OPTIONS EMPLOYMENT TRAVEL COCSTS & REIMBURSEMENTS INCLUDED
7200600017     DAILY RATE PROJECT MANAGER
7200600021     PROVISION OF CONSULTANT (WEEKLY RATE) 5 DAYS CONSECUTIVE WORK ALL EXPENSES REIMBURSED AT COST.  PUBLIC SECTOR CLIENT

## HARDWARE MAINTENANCE AND REPAIR

7200700001     MAIN CONTRACT TO FEDERAL EXPRESS ANNUAL CONTRACT WITH SLA OF 4 HOUR RESPONSE 4 HOUR FIX FOR SERVERS AND PRINTERS AND 8 HOURS FIX FOR DESKTOP (REF: EX7019)
7200700002     MAIN OF HP SERVERS AND LXE RADIO DATA TE RMINALS BACK TO BACK CONTRACTS WITH 3RD PARTY.   ANNUAL CONTRACT
7200700003     ANNUAL HARDWARE MAIN CONTRACT FOR 1000 USERS AND 220 SERVERS. ANNUAL PRICE CHARGED
7200700004     COMPUTER HARDWARE MAIN SERVICE FOR SGB PLC WITH SLA OF 8 HR FIX INCLUSIVE OF ALL COSTS  BUT EXCLUDING CONSUMABLY
7200700005     COMP HARDWARE MAIN & REPAIR FOR FUJITSU KEY FEATURES: 4 HR GUARANTEED RESPONSE TIME  INC TRAVEL EXPENSES PAID ON-SITE REPAIR EXC CONSUMABLES.
7200700012     BREAK/FIX MAIN SER FOR TAYLOR WOODROW (13676) FEATURES DESKTOP LAPTOP &SERVER  SUPP.PARTS REPAIRS & LOGISTICS INCLUDED (PRICE PER ANNUM BASED ON 3 YR CONTRACT)

## IT DISASTER RECOVERY & BUSINESS CONTINUITY SERVICES

7200800001     CONTINUITY -MANAGED 3RD PARTY D/R CONTRAC T & PERFORM ONE FULL TEST PER ANNUM INCLUDING RESTORE OF SYSTEM AT REMOTE LOCATIO N & EST NETWORK COMMS.PRICE PER ANNUM
7200800004     DISASTER RECOVERY. 1 X AS/400 600#2136. 73.1CPW RATING. 256 MB MEMORY. 40 GB DASD STORAGE. 3 DAYS TESTING. FIXED SITE RECOVERY
7200800006     DISASTER RECOVERY - INSTALL TO SITE SERVICE. 1 ALPHA SERVER. 4100 5/400 (2 CPU)
7200800012     DISASTER RECOVERY PACKAGE FOR TRAVEL AGE NT HQ - 100 SEATS AND 12 SERVERS - ANNUA L PRICE CHARGED
7200800013     BUSINESS CONTINUITY PLAN AT BAPFIM (PART OF BAE SYS PLC) ANNUAL T&M ESTIMATE

## FACILITIES MANAGEMENT / OURSOURCING & DATA PROCESSING SERVICES

7200900001     POLLING OF TRANSACTION DATA AND DOWNLOADING OF DATA FROM CFTPOS. PRICE PER TERMINAL PER MONTH
7200900002     DATA MIGRATION SERVICES PRICE PER DAY PER PERSON
7200900003     SYSTEM SUPPORT - (CHARGED IN BLOCKS OF 12.5-14HRS OR A TIME/MATERIALS BASIS PRICE PER COMPLETE HOUR OF SUPPORT
7200900014     DATABASE SILVER SUPPORT MIN USERS:- 1 NAMED USER PER 20MHZ OR 200 POWER UNIT PRICE PER NAMED USER -  METRIC
7200900017     VIRGIN HOLIDAYS - FACILITIES MANAGEMENT & DISASTER RECOVERY. PRICE PER ANNUM.
7200900021     KEYPUNCHING 1000 CHARACTERS FROM QUESTIONNAIRES

**Annex D**

**Quality Change Methodologies**

**Source lines of code (SLOC)**
Lines of code compares the number of lines of programming code used for an obsolete or predecessor software service relative to a replacement. A price comparison adjusted by lines of code (price per line) could be developed, but the relevance of this approach as a quality measure is still unproven.

**Function point analysis**
The original idea of measuring a size of software from its requirements or functional specifications was introduced by Allan Albrecht of IBM over 20 years ago. At the time it was a genuine breakthrough in thinking by providing the first method for sizing software which was independent of the technology to be used for its development.

The method could therefore be used for comparing performance across projects using different technologies (using measures such as 'productivity', defined as size / effort) and as a first step in methods for estimating effort early in a project's life-cycle. This was a big step forward compared with the use of counts of SLOC, which had been the only size measure up to that point.

Albrecht's model of functional specifications requires the identification of five types of components, namely input, output and inquiry elementary processes, and logical internal and external interface files. Having identified these five types of components in a specification, they are then weighted for complexity and are allocated 'unadjusted function points'. The total of 'UFP's for all components is then multiplied by a Value Adjustment Factor which takes into account the supposed contribution to size of some 14 technical and quality requirements.

**Hedonic modelling**
Hedonic regression methods are already being used to compile the UK's PPI for desktop PC's, other countries are utilising this technique for quality-adjusting price indices which cover sectors such as second hand cars, DVDs and microwaves. It is interesting to note that limited research is available relating to the development of service sector price indices using a hedonic approach. The US in particular have considered this approach for pre-packaged software, some of their findings include:

- Assuming that appropriate data were available, then conceptually a hedonic approach could be used to estimate market-determined price or values for disaggregated characteristics that make up a software service. These values could then be used to estimate a constant quality price relative for replacement software by accounting for differences in features associated with quality change. Because output of the pre-packaged software industry is diverse, multiple hedonic models would be required.

- Significant resources would be required to ascertain whether hedonic models (or function points) have operational relevance to quality change valuations.

## Annex E

## Correlation of CSS2000 onto division 72 (SIC2003) and CPA2002

| CSS2000 | Description | Sic 2003 | Description | CPA 2002 | Description |
|---|---|---|---|---|---|
| 720010000 | Development of custom built-application software. | 72.220 | Other software consultancy and supply. | 72.22.12 | Custom software development services |
| 720020000 | Development of packaged application software. | 72.210 | Publishing of software. | 72.21.12 | Publishing services of packaged application software |
| 720030000 | Development of packaged and custom non-application software. | 72.220 | Other software consultancy and supply. | 72.22.12 | Custom software development services |
| | | | | 72.21.11 | Packaged systems and user tool software |
| 720040000 | Maintenance and support of software systems and applications. | 72.220 | Other software consultancy and supply. | 72.22.14 | Systems maintenance services |
| 720050000 | Computer systems integration service. | 72.600 | Other computer related activities. | 72.60.10 | Other computer-related services |
| 720060000 | IT Consultancy service. | 72.100 | Hardware consultancy service. | 72.10.10 | Hardware consultancy services |
| | | 72.220 | Other software consultancy and supply. | 72.22.11 | Systems and technical consulting services |
| 720070000 | Hardware maintenance and repair. | 72.500 | Maintenance and repair of office, accounting and computing machinery. | 72.50.12 | Maintenance and repair services of computing machinery |
| 720080000 | IT diaster recovery and business continuity services. | 72.600 | Other computer related activities. | 72.60.10 | Other computer-related services |
| 720090000 | Facilities management / outsourcing and data processing services. | 72.300 | Data processing. | 72.30.10 | Computer facilities management services |
| | | 72.400 | Database activities. | 72.30.2 | Computer processing services |
| | | | | 72.40.1 | Database services |

**Annex F**

**Methods for deflating National Accounts. (Computer and related services CPA 72)**

**A Method (most appropriate)**

For packaged software, the A method is to deflate with an appropriate PPI. Quality changes play a significant role, so an appropriate quality adjustment procedure (e.g. based on hedonics) is essential. It is doubtful whether a CPI for packaged software can give a reasonable approximation of the output price. The business market for packaged software is quite different from the consumer market. For example, businesses buy licenses in large quantities and can therefore obtain discounts. Hence, although a CPI can be used to deflate household consumption of software, it will be a C method for the deflation of output.

There are also two different groups of business purchasers, those that buy software for inclusion in their own products which is intermediate consumption (e.g. a computer manufacture who bundles software with their hardware) and that purchased for use directly within the business (capital formation). The prices for these business purchases will be different and PPIs need to reflect this adequately for them to be considered suitable as an A method.

**B Method (can be used in case an A method cannot be applied)**

Less appropriate PPIs will be B methods. Also, the use of the US index for packaged software, adjusted for exchange rate effects or different general price changes will be a B method. Care should be taken however to reflect the different timings of releases of new software in the US and in Europe. It could also be envisaged that a price index for software is compiled at the EU level.

For customised services (both hardware and software consultancy) an approach based on "representative pricing" could be explored and has the potential to constitute an A method. Another A method could be an approach based on model pricing, i.e. an approach based on asking producers to price a "standard service", as long as the models are representative.

In practice, due to the difficulties in defining representative models, model pricing will usually be a B method. The result of the model pricing approach could also be used as a proxy for the price of software produced on own-account (B method), if it can be shown that the own-produced software could also have been produced by an external company. For the service of renting out programmers on a per-diem basis, as a B method the charge-out rate could be used.

**C Method (shall not be used)**

In view of the differences in the speed of quality changes, the use of an index for hardware to deflate software should be called a "C" method.