

APPENDIX B

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REPORT ON OVERALL RECOMMENDATIONS RELATING TO INFORMATION TECHNOLOGY (IT)

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1.0 Introduction

This report presents the findings and recommendations of the IT Expert with respect to the formulation of common guidelines for the Development of Statistics of International Trade in Services.

The findings and recommendations outlined herein are based on a series of country visits which comprised in-depth interviews, review of software and hardware environments as well as interaction with other Specialist Consultants.

While the present consultancy was unable to develop the proposed system (a possibility that was highlighted in the scope of work) it provides some insight into the success of a relatively similar initiative undertaken by the Eastern Caribbean Central Bank (ECCB) and outlines some of the critical requirements that must be fulfilled as prerequisites to developing a standardised automated Trade in Services database system.

2.0 Statement of Work

The IT Expert was required to perform the following tasks over a period of 32 person days:

1. Travel to member states to formulate a common approach;
2. Provide an analysis of data collection issues;
3. Automate the questionnaire format;
4. Provide system/database design; and
5. Explore the computerisation and extraction of FDI data by Type, Country of Origin and Sector.

3.0 REPORT ON Activities outlined in statement of work

3.1 Travel to Member States

Exploratory visits were made to Belize, St. Lucia and St. Kitts and Nevis. The primary objective of the visits to Belize and to St Lucia was to obtain details on the information systems used (hardware and software) by the relevant agencies in these countries in the compilation of Balance of Payments (BOP) and Foreign Direct Investment (FDI) statistics. With respect to St. Kitts and Nevis the visit was geared primarily towards visiting the ECCB to further investigate the Computerised Extended Balance of Payments System (CEBOPS) used in the compilation of BOP statistics in the Organisation of Eastern Caribbean States (OECS).

In addition to the primary objective identified above, the country visits provided opportunity for direct interaction with the other Specialist Consultants and afforded the IT Expert several opportunities for team meetings, exchange of information and ideas and for problem resolution.

The IT Expert participated in three regional workshop held in Barbados and two country workshops conducted in St Vincent and the Grenadines and in Belize.

Data obtained from the country visits revealed that within the OECS countries the ECCB was responsible for compiling and publishing BOP statistics. To facilitate this process the ECCB

financed the development of a computerised BOP application which was deployed in the statistical departments of all OECS territories.

The CEPOBS application was used by member states to enter data obtained from the establishment surveys into a computerised database. The data file generated was then exported and sent to the ECCB for validation and publishing of the final BOP statistics.

From an end user perspective, members states used the CEPOPS application solely as a data entry interface and were able to professionally navigate through the various data input screens provided. There was however limited knowledge on the technology and database structure of the application. All users interviewed express a high degree of satisfaction with the application.

Outside the OECS, all of the other member states on whom data were obtained, relied on Excel spreadsheets to compile their BOP data. The diagnostic visits reinforced therefore the importance an significance of developing a standardised application that could be leveraged by all CARICOM member countries for compiling Trade in Services Statistics.

3.2 Analysis of Data Collection Issues

The identification of issues related to data collection inevitably attracted the attention of all team members. From an IT standpoint the issue that appears to impact most significantly on the quality of the data BOP statistics generated relates to the general poor quality of the Establishment Register.

Most territories have a listing of establishments (in Excel format) instead of a properly designed database with specifically defined data field that could facilitate conducting structured queries by sector, size of establishment and other key variables during the sample selection exercise. To the extent that the establishment data are not properly organized to facilitate proper sample selection, it invariable impacts on the accuracy of coverage obtained from the establishment survey and introduces unacceptable levels of sampling errors into the overall process.

The Central Statistical Office, Trinidad and Tobago, has developed an Access database of registered companies which, though not fully comprehensive in terms of content, suggests the path that should be taken by other territories.

Other general data collection issues are discussed in the contributions of other team members.

3.3 Automation of Questionnaire

The questionnaire is arguable the most significant starting point in designing a common system for producing Trade in Services Statistics. The entire database schema is informed by the questionnaire(s). The success of the EBOPS system can be attributed primarily to the fact that all OECS territories utilise the same BOP questionnaires.

One critical requisite for developing a functional computerised system for this project is therefore standardising the questionnaires used by member states. While there is the recognition that this initiative is by no means a simple task, it requires special attention generally and more specifically with regards to its implication for leveraging information technology.

To the extent that the questionnaire can be standardised across territories, one database can be designed to support one common user interface. As part of the standardisation process there will be the need to:

- identify all the **required** fields for generating EBOPS and FDI data; and
- ensure that these fields are present in **all** questionnaires even if questionnaires cannot be fully standardised.

This process has been initiated by the Team of Consultants (TOC) and is spearheaded by the Survey and Sampling Specialist. Further effort is required however with specific input from the various country stakeholders.

As a precursor to developing a second version of the EBOPS application, the ECCB has recently completed a similar exercise geared towards improving the design of the questionnaire. A similar approach should be taken across all countries.

To the extent that some degree of consensus can be achieved with respect to the questionnaire, consideration should be given also to enhancing the data collection and data capture process as it relates to the questionnaire.

During the workshop conducted in St Vincent and the Grenadines, some businesses suggested that the survey form could be distributed in a format that would facilitate electronic completion and submission. This request is indeed reasonable given the availability of appropriate technologies to satisfy this requirement. The design of the proposed system will therefore give consideration to the integrating e-Forms technologies that will assist in the automatic posting of data to the database without requiring manual data entry.

Having mentioned the issue of manual data entry, it should be noted that several member territories (Guyana, Trinidad and Tobago, Grenada, St Vincent and the Grenadines, St. Kitts and Nevis and BVI) used automated data capture software within their statistical agencies. To the extent that the revised questionnaires can be designed in these applications for printing these territories can successfully capture the completed forms via scanning (or via e-Forms) and directly update the database in the proposed application. This will result in fast input of the data collected and may result in higher levels of accuracy in data entry if properly implemented.

3.4 Proposed System Design

3.4.1 Design Framework

In order to successfully achieve the stated objectives of the project, a three tier architecture for the design of the system is proposed, based on the Microsoft .NET Framework.

The .NET framework will provide the tools and infrastructure for building, deploying, and managing the system. Features that traditionally had to be custom built into similar a solutions are now included as standard features in .NET.

Using the .NET framework, the system will be developed as a three (3) tier system. The three (3) tiers of the system will consist of:

1. User Interface;

2. Business logic; and
3. Data store.

The user interface tier will consist of a flexible system that will allow the user to interact with the system via either a standard Windows application interface or a web browser. This tier of the application will contain minimal business logic and will consist mainly of the various questionnaire data entry interfaces, validation checks and user interaction features.

The business logic tier will consist of all of the validation rules that apply to the business and security rules of the system. It will contain all the logic related to the classification system(s) that must be considered in developing the application.

The data store tier will house the relational database which will be stored in Microsoft SQL Server and files stored in the file system store. Microsoft SQL Server is a key component of the .NET Framework and actively supports XML data inter-exchange, replication and scheduled data back up which are all key design features to the overall design of the system.

Figure 1 below presents a graphical illustration of the proposed system design. Each tier of the system is clearly represented in the diagram.

The design architecture is made up of the following components:

- **.NET template file.** This component is a .NET file in which all style and layout properties are set. The template is the primary component used to render and layout content.
- **Browser.** This component is a standard browser, and it shows how the application is accessed through a standard browser. This means that users will not need to have any software installed on their computers.
- **Content Repository.** This component is the Microsoft SQL Server database, including table definitions and stored procedures that are used by the application. This includes information about the structure of the application and its content.
- **Content Server Engine.** This component is used to encapsulate the core engine of the application. This includes the application programming interface (API) that receives and authenticates incoming HTTP requests, and acts the middle tier between what is presented to users and the data storage tier.
- **Security Server Engine.** This component integrates with Microsoft Internet Information Server (IIS) and Microsoft SQL Server 2000 to intercept HTTP requests for the Web site and determine if the request action performed by a user is allowed for that group of users or individual user. This component handles authentication of these requests, creates the context in which the .NET template file will run, and then runs the template file.
- **Application Manager.** This component allows administrators configure/manage various aspects of the application.
- **SQL Server 2000.** This component is the database in which the Content Repository is implemented.
- **Web Author.** This component is the main authoring application for the system.

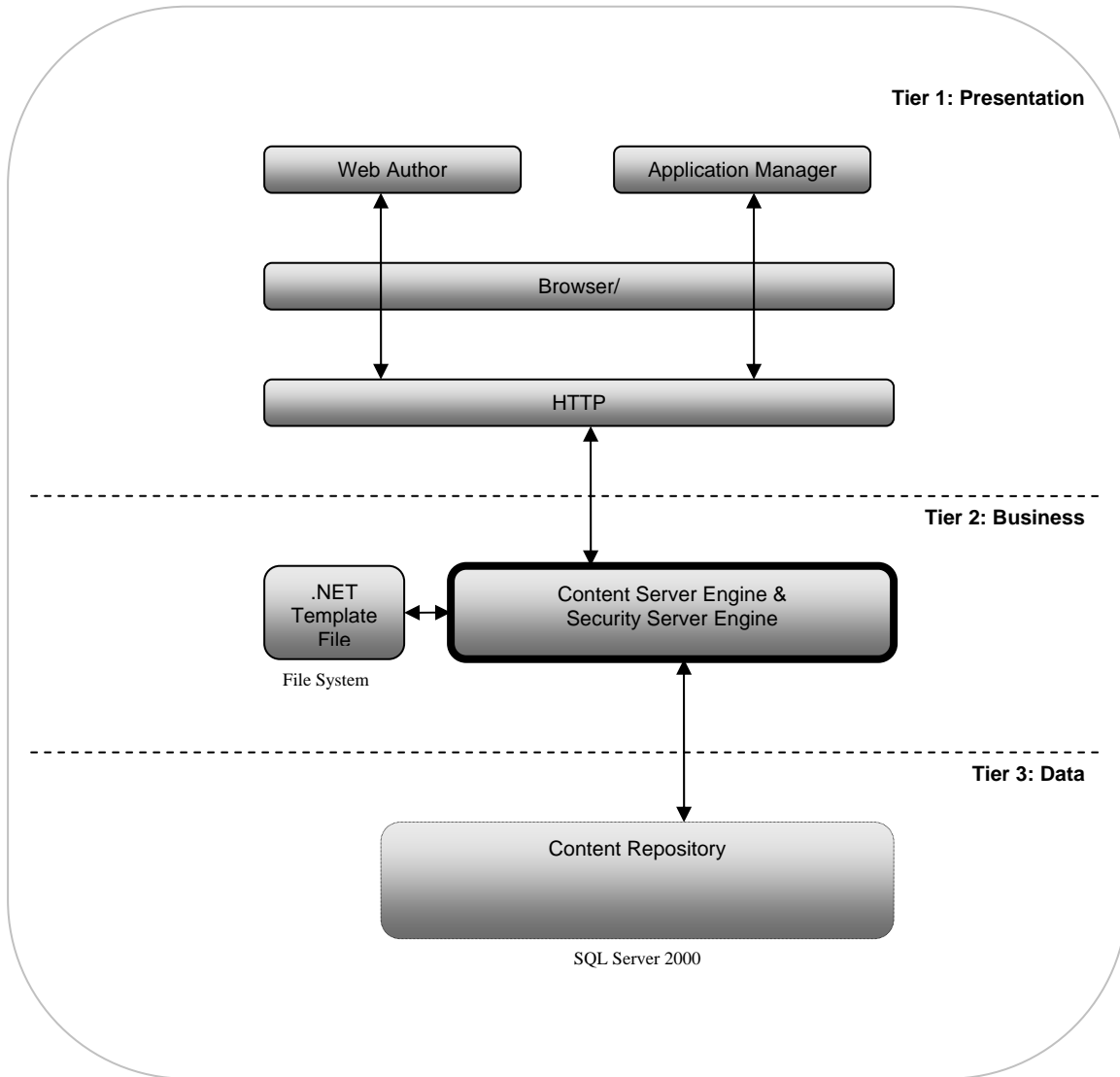


Figure 1 – Architectural Diagram for Proposed System

3.4.2 Other Design Considerations

In addition to meeting the functional specifications required from a business and operational standpoint, several other critical issues must be addressed in the design and development of the application. This section of the document presents details on the proposed approach to addressing security, performance and ensuring scalability and flexibility of the system.

Security

When addressing the issue of security, a distinction must be made between authentication and authorisation. Authentication is the process of accepting credentials from a user and validating those credentials against some authority. If the credentials are valid, one speaks of having an authenticated identity. Authorisation, on the other hand, is the process of determining whether that authenticated identity has access to a given resource.

will develop a single Application Programming Interface (API) around the security base API of .NET. The application can be designed to authenticate users credentials against credentials stored in the SQL Server database. Also, this API will allow CommNett to easily modify the business logic associated with authentication Encryption will be applied to all login information stored in the SQL Server database to ensure that user credentials are not visible to other users via any other external system.

Once the API authenticates a user, the system will determine if the user is authorised to view the requested resource. The Mercantile will establish authorisation roles. These roles will indicate which components/features of the system a particular user or group of users can have access to and the nature of that access.

The system will allow administrators to create user groups that are similar to groups in Windows 2000/2003. The administrator will be able to assign users to a specific group and grant permission to the entire group as opposed to each individual user.

In the present EBOPS application, data contained in the system are accessible from external sources without supplying a username and password and can be modified outside of the application. The security system will be designed such that access to the SQL database can be gained only via the application's user interface.

Scalability and Flexibility and Performance

To ensure a high degree of scalability and flexibility in design of the system it is proposed that the development is done around Microsoft's .NET Framework.

.NET provides a framework for the family of Microsoft application development products, including Windows 2003, Visual Studio, Commerce Server, and SQL Server. At the heart of .NET is a common set of application services including components, Dynamic HTML, Web browser and server, scripting, transactions, message queuing, security, directory, database and data access, system management, and user interface. These services are exposed in a unified way through COM+, which allows the operating system to serve as a foundation for applications that span multiple servers and support a large number of clients.

COM+ is a key component in the .NET strategy and together with XML is the technology that makes Windows or Web applications truly scalable, both in capacity and across a corporate network and Internet. Built into the Component Object Model (COM) is the ability to manage transactions as they relate to business or system functions and not necessarily database functions.

Also, COM+ will ensure that the system can treat certain business logic operations as one complete unit of work. When a transaction is submitted to the system, either the entire transaction will succeed or the entire transaction will fail and roll back. This capability is essential to the system because it will ensure not only the integrity of data in the database but also ensure that all necessary logics are performed at the business and data store layers to complete a particular transaction.

Any application developed in the .NET framework will yield a 48 percent increase in performance over a similarly developed Windows DNA application (traditional windows application). This fact reinforces the decision to develop the application on the .NET framework.

Also, the .NET framework provides a cost effective way of incorporating testing throughout the development life cycle and, more significantly, after deployment of the system.

3.4.3 Key Functional Requirements

This section discusses the functional requirements identified for the proposed system. The IT Expert recognises that there may be inadvertent omissions in the functional requirements which may come to light during the course of the development. The overall approach to the development of the application should cater therefore to these eventualities.

User Access

Given the sensitive and confidential nature of the data provided by business establishments, great and special emphasis must be placed on securing the database from unauthorised access. Persons utilising the system will be required to login by supplying a valid username and password to gain access to the system. User defined roles will also determine the level of access and rights each user have to the system.

Integrated Establishments Register

The establishment register must form an integral part of the database design. Updates to the register must be reflected in the system so that as established are added, removed or modified these data can be easily replicated to the system. This will eliminate the need to manage to separate databases containing the same information.

Data Entry Functions

The data entry functions must be designed to facilitate:

- manual data entry;
- data capture via scanning and Intelligent Character Recognition (ICR) technologies; and
- entry via the submission of e-forms.

Reporting Module

The proposed system must comprise a reporting module capable of generating both pre-defined reports and ad hoc reports. Pre-defined reports will be based on the most common set of information requested by end users. The exact structure and layout of these reports must be defined by users.

Report formats should include the creation of Excel tables, PDF filed and standard charting outputs that can be generated in Microsoft Excel.

Critical features of the reporting must include also the ability to generate time series output and comparative tables across countries.

Data Export and Import Capabilities

From a conceptual design standpoint, data will be collected and processed as individual cases in each country. This means that persons with authorised access to the system can view the individual record of each company in detail. While this is a requirement at the country level, users of the centralized system (which houses data for all member countries) **MUST** not have access to the detailed records of each establishment. The database will be designed therefore such that only the aggregated country data (for each sector) can be exported and submitted to the system at CARICOM.

Automatic Backup of Data

In order to ensure a high degree of data redundancy, the system must be designed to allow for automated scheduled or manual backup of all system data.

This function is standard in Microsoft SQL and can be successful leveraged in this regard.

Transaction Audit

At the country level data are always subject to modification and adjustments. The system should cater for logging changes made to the original data entered to facilitate roll back if necessary.

Web Application Database

There was a high degree of consensus among stakeholders that the system should be designed in such a manner that will allow persons requesting the data to obtain same at a public site without placing additional burden on the limited resources at the various statistical departments. In this regard one obvious solution is to develop the centralized system as a web application that can be access by anyone with Internet access.

Within this framework consideration must be given too to countries desirous of obtaining subscription fees for specific types of information.

3.4.4 Hardware and Software and Personnel Requirements

Hardware

Based on the proposed technical design, existing hardware at the various statistical departments may be adequate to implement the project. Most departments have desktop computers and servers that fall well within the design requirements for the application.

With respect to the centralised system at CARICIOM, the application can be hosted externally via a dedicated hosting server or ideally hosted within the Secretariat provided that the appropriate Internet connectivity and network infrastructure can accommodate the system. In this scenario a database server and an application server will be requires. Final hardware specification must be determined when all functional and technical features are finalised and documented.

Software

The only software requirement for end users of the system will be a web browser.

On the server side, the following software/services will be required

- Windows 2003 Server;
- Microsoft SQL Server Standard Edition;
- Adobe Acrobat or DocuCom PDF Driver ; (optional)
- IIS Web Server 6.0; and
- SSL Digital Certificate.

Personnel

It is recommended that consideration be given to deploying the following resources to the development phase of the project:

- 1 BOP Economist/Expert;
- 1 Database Administrator (DBA); and
- 1 Developer.

In addition to these resources end users will be required to function as testers during special stages of the development cycle.

3.5 Computerisation and Extraction of FDI

Consideration for this item are integrated into the discussions provide in 3.4 above.

4.0 A review of CEBPOS

Although it stops short of meeting all of the functional requirements of this project, the CEBOPS application provides an excellent model of what must be done to successfully develop a standardized system for all member countries. This section provides some details on the flow of the CEPOBS application and identifies where it stops short of meeting the present requirements of the project.

4.1 The Current Version

The CEBOPS application was developed in Microsoft Visual Basic (VB) and leverages Microsoft access as system database. Survey Forms are developed in Microsoft Access to facilitate data entry. The application runs in a Microsoft windows environment and can be deployed on a single computer or alternatively on the client application can be installed on one machine and the database placed on another machine (ideally a centralised server).

Users are required to supply a username and a password to access the system. Once these credentials have been authenticated users are able to choose a the year for which data are to be entered.

Once the year is selected the user can ten choose the appropriate BOP Form required from a **B.O.P. Forms** menu (see figure 4.1)

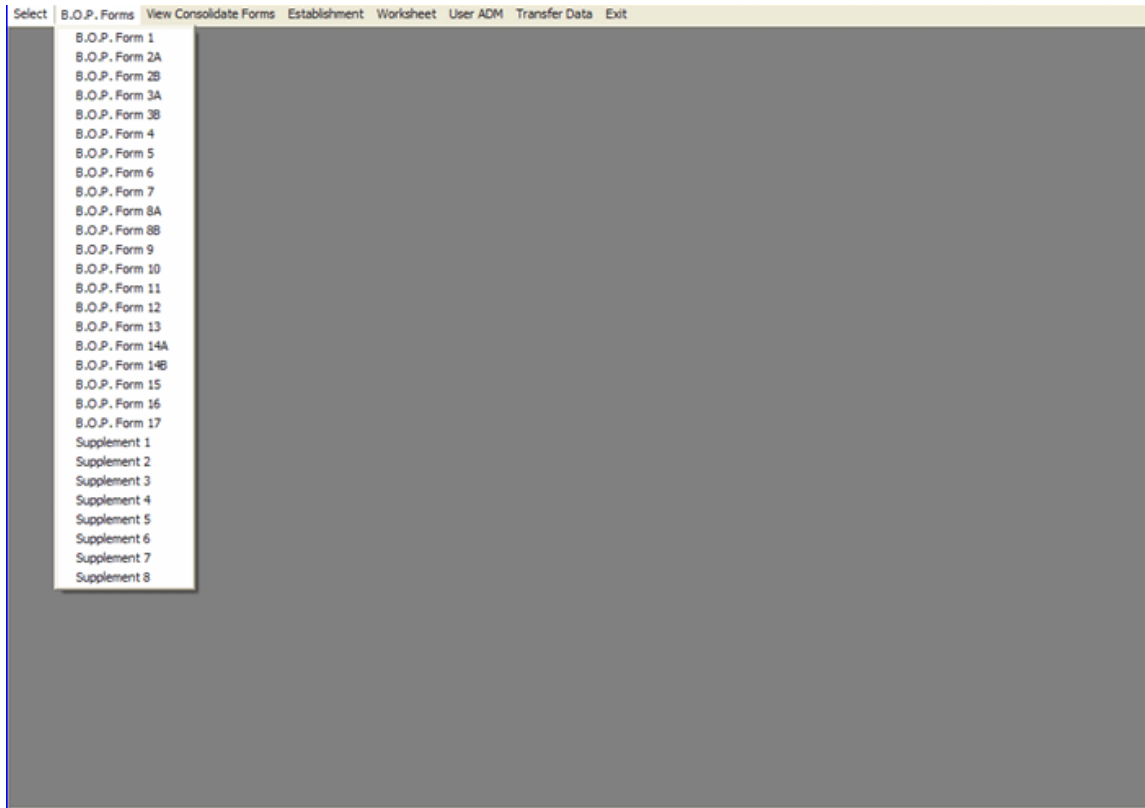


Figure 4.1: Form Menu

The end user then chooses an establishment that is associated with that particular form so that the completed form received can be entered into the system. As illustrated in Figure 4.2, once the establishment is selected the end user is supplied with general details on that sector including:

- the number of firms in the sector;
- the number of firms surveyed;
- the percentage of firms surveyed;
- the number of reported verses estimated cases
- the date the data were entered and
- the person entering the data.

In addition to the **General** tab presented on the upper left hand corner of the screen, two other tabs **A** and **B** are also available. These tabs correspond to the data entry screens that are defined for the type of establishment chosen.

Once the user has selected whether the values to be entered are **Estimated** or **Reported** values, he/she can proceed to the other tabs and enter the appropriate data.

File

General | A. | B. |

ESTIMATED:	0	NUMBER IN SECTOR:	24
REPORTED:	10	NUMBER IN SURVEY:	10
SURVEY RESPONSE:	100%	PERCENTAGE DONE:	41.67%

Last change: St Lucia
Date: 26/07/2000 06:31 PM
User Name: joan

ACCOMMODATION ESTABLISHMENTS

Name of establishment: Code:

Status:

Estimated Reported

Figure 4.2: Interface for Selecting Establishment

Figure 4.3 below presents a view of the data input screen for form A. Each of the line items displayed (a to i) corresponds with the questionnaire (A sample form that matches this screen is presented in Annex 1)

A. OVERSEAS EXPENDITURES		EC\$
		5,918,284.40
(a)	Management Fees	2,373,960.00
(b)	Overseas Interest Costs	
(c)	Credit Card commissions	137,813.00
(d)	Other Commissions	
(e)	Loan Repayments	
(f)	Dividends Repatriated	
(g)	Advertising and Marketing Expenses	3,406,511.40
(h)	Royalties, Franchises	
(i)	Other Overseas Expenditures (exclude imports)	0.00
(j)	Items related to Expansion and Refurbishing	
(k)		
(l)		

Figure 4.3: Data Input Form

Once all the data are entered into the system, a number of Input worksheets are generated in Microsoft Excel (see Figure 4.4). Each worksheet contains detailed Credit and Debit entries for the respective category along with additional details on:

- reported or Estimated values;
- the date of data entry;
- the source of the date (specific form);
- any adjustment made to the original data entered; and
- the reason for the adjustment.

Input Worksheet 7				Country:						
INSURANCE SERVICES								All Figures in EC\$ (000's)		
Ref.	Freight Insurance	Reported	Estimated	Date	Source of data	Adjustment	Reason for Adjustment	Adjusted	Date	
	CREDITS	Amount	Amount	Entered				Figure	Adjusted	
7A	Premiums collected on shipment of exports	10.82	0.00	11/12/2004	BOP 2A A.1.(a)			10.82		
	(Less Claims paid on shipment of exports)	0.00	0.00	11/12/2004	BOP 2A A.2.(a)			0.00		
	Claims paid on shipment of goods to the country	8.31	0.00	11/12/2004	BOP 2B B.2.(a) (iii)			8.31		
								0.00		
								0.00		
	TOTAL	19.13	0.00			0.00		19.13		
	TRADE with other OECS Countries							0.00		
7A	Adjusted TOTAL							19.13		
Ref.	Freight Insurance	Reported	Estimated	Date	Source of data	Adjustment	Reason for Adjustment	Adjusted	Date	
	DEBITS	Amount	Amount	Entered				Figure	Adjusted	
7B	Insurance on imports @ 2% of CIF	16,989.06		11/12/2004	Supplement 7			16,989.06		
								0.00		
								0.00		
	TOTAL	16,989.06	0.00			0.00		16,989.06		
	TRADE with other OECS Countries							0.00		
7B	Adjusted TOTAL							16,989.06		

Figure 4.4: BOP Input Worksheet

In addition to the 35 input worksheets generated by the system a summary sheet is generated for each form outlining the **Reported** or **Estimated** amount for each line item, the number of firms in the sector, the number surveyed and the overall survey response rate (Figure 4.5).

Finally the data in the various worksheets are aggregated into a master worksheet to generate the Balance of Payments tables for the country. (Figure 4.6).

All of the worksheets generated are protected to guard against unauthorised changing of the data.

Once the data entry exercise is completed, the data file is exported via an export menu and submitted to the ECCB for further verification following which the data are officially published.

Country:	Data entered date: 11/12/2004				All Figures in EC\$ (000's)			Today:	5/12/2005		
Year:											
BOP1	Reported Amount	Estimated Amount	link Ref.	Num. in sector:	24	BOP 2A	Reported Amount	Estimated Amount	link Ref.	Num. in sector:	2
1A.(a)=	6847.42	0.00	8H	Num. in survey:	16	2A A.1(a) =	10.82	0.00	7A	Num. in survey:	2
1A.(b)=	3342.87	0.00	12B	% Done:	66.67	2A A.1(b) =	14.38	0.00	7E/17C/D	% Done:	100.00
1A.(c)=	1586.69	0.00	9B	Reported:	16	2A A.1(c) =	0.00	0.00	7G	Reported:	1
1A.(d)=	790.38	0.00	9B	Estimated:	0	2A A.1(d) =	0.00	0.00		Estimated:	0
1A.(e)=	2608.77	0.00	22D	Survey Res.:	100	2A A.1(e) =	0.00	0.00	15K	Survey Res.:	50
1A.(f)=	0.00	0.00	11D			2A A.1(f) =	0.00	0.00	15K		
1A.(g)=	12154.48	0.00	9B			2A A.1(g) =	0.81	0.00	7I		
1A.(h)=	237.64	0.00	8L			2A A.1(h) =	0.00	0.00			
1A.(i)=	170.39	0.00	9B			2A A.2(a) =	0.00	0.00	7A		
1B.1.(a)=	168.71	0.00				2A A.2(b) =	0.00	0.00	17C/17D		
1B.1.(b)=	1525.41	0.00				2A A.2(c) =	86.20	0.00	7H		
1B.1.(c)=	107.89	0.00				2A A.2(d) =	0.00	0.00	8H		
1B.1.(d)=	33381.86	0.00				2A A.2(e) =	0.00	0.00			
1B.2.i(a) =	738.09	0.00				2A A.2(f) =	0.00	0.00	15L		
1B.2.ii(b) =	4764.46	0.00	11F	Debit		2A A.2(g) =	0.00	0.00	7J		
1B.2.ii(b) =	4764.46	0.00	21A	Credit		2A A.2(h) =	0.00	0.00	9B		
1B.2.ii(c) =	0.00	0.00				2A B.1(a)col1 =	0.00	0.00	29C	Col2-Col1: 0	
1B.2.ii(a) =	3499.70	0.00	20D			2A B.1(a)col2 =	0.00	0.00	29D	Col2-Col1: 0	
1B.2.ii(b) =	30059.93	0.00	22C			2A B.1(b)col1 =	0.00	0.00	23C	Col2-Col1: 0	
1B.2.ii(c) =	0.00	0.00	22C			2A B.1(b)col2 =	0.00	0.00	23D	Col2-Col1: 0	
						2A B.1(c)col1 =	0.00	0.00	30C	Col2-Col1: 0	
						2A B.1(c)col2 =	0.00	0.00	30D	Col2-Col1: 0	
						2A B.2(a)col1 =	0.00	0.00	25D	Col2-Col1: 0	
						2A B.2(a)col2 =	0.00	0.00	25C	Col2-Col1: 0	
						2A B.2(b)col1 =	572.18	0.00	35B	Col2-Col1: 0	
						2A B.2(b)col2 =	572.18	0.00	35A	Col2-Col1: 0	

	All Figures in EC\$ (000's)	CREDIT	DEBIT	BALANCE
I	CURRENT ACCOUNT	946,179.55	1,283,185.21	-337,005.67
I.1	GOODS AND SERVICES	858,908.89	1,123,020.21	-264,111.32
I.1.A	A.GOODS	189,037.97	747,518.74	-558,480.77
I.1.A.1	Merchandise (f.o.b.)	167,480.08	747,518.74	-580,038.66
I.1.A.1.i	(i) Domestic	115,857.04	747,518.74	-631,661.70
I.1.A.1.ii	(ii) Re-export	51,623.04	-----	51,623.04
I.1.A.2	Repair on goods	2.62	0.00	2.62
I.1.A.3	Goods procured in ports by carriers	21,555.27	0.00	21,555.27
I.1.B	B.SERVICES	669,870.92	375,501.48	294,369.44
I.1.B.1	Transportation	28,068.27	142,686.68	-114,618.41
I.1.B.1.i	Sea Transport	20,292.14	84,345.31	-64,053.17
I.1.B.1.ii	Air Transport	7,776.13	57,741.37	-49,965.23
I.1.B.1.iii	Other Transport	0.00	0.00	0.00
I.1.B.2	Travel	567,010.31	94,308.55	472,701.76
I.1.B.3	Insurance Services	10,969.77	21,092.48	-10,122.70
I.1.B.3.i	Freight Insurance	19.13	16,989.06	-16,969.93
I.1.B.3.ii	Life Insurance	0.00	1,906.87	-1,906.87
I.1.B.3.iii	General Insurance	0.72	1,755.34	-1,754.62
I.1.B.3.iv	Re-insurance	0.00	441.20	-441.20
I.1.B.3.v	Insurance Agents Commissions	10,949.92	0.00	10,949.92
I.1.B.4	Other Business Services	59,939.12	103,478.82	-43,539.69
I.1.B.4.i	Communications	31,254.71	16,342.72	14,911.99
I.1.B.4.ii	Construction Services	0.00	0.00	0.00
I.1.B.4.iii	Financial Services	0.00	0.00	0.00
I.1.B.4.iv	Management and Consultant	0.00	9,700.67	-9,700.67
I.1.B.4.v	Computer and Information Services	6,572.00	851.75	5,720.25
I.1.B.4.vi	Royalties, Licences and Fees	0.00	2,737.64	-2,737.64
I.1.B.4.vii	Other Business Services	22,112.41	73,846.04	-51,733.63
I.1.B.5	Government Services	3,883.44	13,934.95	-10,051.51
I.1.B.5.i	Resident Government	0.00	7,921.15	-7,921.15
I.1.B.5.ii	Foreign Government	3,883.44	0.00	3,883.44
I.1.B.5.iii	Other	0.00	6,013.80	-6,013.80

Figure 4.6: Cross Section of BOP Table

4.2 Required Modification For Generating EBOPS Statistics

CEPOPS provides an excellent tool for generating standard BOP statistics. The present requirement however, requires the generation of EBOPS statistics, which are collated and presented in a different format to the BOP tables based on a defined classification system. In its present configuration the CEBOPS worksheets have been used to manually generated EBOPS tables for all of the countries studied.

Given the ECCB is about to embark on a redesign of the CEBOPS application, there is an excellent opportunity for the Secretariat to liaise with the appropriate personnel responsible for this activity to ensure that some of the key requirements of the new system can be brought to bear on the project.

Given the present design of the current system modifications will be required primarily to the business logic component of the application to facilitate the generation of an additional worksheet, which presents the required format for Trade in Services Statistics.

Some degree of collaboration with the bank will auger well for ensuring some degree of compatibility can be achieved when developing the system for the other territories, particularly with regards to the transfer of data.

In the short run, subject to final agreement on the classification system, the output from the relevant Input Worksheet can be linked to an external Excel EBOPS formatted table containing the necessary formula to for aggregation of the individual line items in their appropriate categories.

While this is not the best approach it provides a simpler approach that manual tabulation of the data.

5.0 Areas requiring immediate attention

The following areas have been identified for special attention if the IT system is to be successfully implemented:

1. An acceptable level of standardisation of the questionnaire used across the various territories;
2. Identification all mandatory data input fields required to produce statistical information required;
3. Standardising the design of the existing Database of Establishment Registers in either Microsoft Access or Microsoft SQL Server;
4. Within the context of item 3, ensuring that proper distinctions can be made a between FDI and FATS;
5. Standardisation of the classifications system used by member states;
6. Finalising the proposed classification system and agreement on the treatment of potentially contentious items; and
7. Identifying and documenting any other functional (non-technical) requirements of the new system.

6.0 Summary and Conclusion

Generally, given the limited resources with which regional statistical agencies are forced to operate, any attempt initiative geared towards automation and a reduction in the human intensive procedures are welcome. The current initiative is no exception. All stakeholders, while appreciating the challenges of developing a common IT platform, welcome the proposed system.

The key challenge the current exercise faces if not one directly related to Information Technology but relates more specifically to the subject of harmonization. That is, the classification of methods and procedures for data collection and processing that are compatible with each other

To the extent that so level of harmonisation can be achieved, particularly with respect to the items identified in 5.0 above, the IT component will indeed be a relatively simpler exercise.

The ECCB has provided an excellent example of the importance of harmonisation, which must directly influence the future course of this project.