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Jamaican Information Services Sector Study

Analysis of the Jamaican Capabilities and Competitive Advantages

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JAMPRO



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Jamaican Capabilities and Competitive Advantages

This report was prepared by Intex for Task 2 of the information processing industry segment study, to analyze the local Jamaican capabilities, evaluate the Jamaican competitive advantages, and highlight areas where the Jamaican information processing sector needs to improve. This report also includes model business plans and strategic recommendations, which are part of Task 3 of this project. This report was completed by Intex-USA and ALLWAT, a local Jamaican consulting firm.

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Appendix 1. (Business Plans)

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Executive Summary

The two parts of the study covered the US market and the ability of Jamaica to expand its information services to capture more of that market. A brief description of the information service niches covered in the document is included.

This report constitutes the second part of a study commissioned by Jampro concerning the US market for information services and Jamaica's capacity to service these needs.

- The first part of the study viewed the US market, changing and expanding technologies and was conducted in the United States.
- The second part of the study, as represented by this report, looks at the Jamaican information services industry and its capacity to service this market.

The following niche markets which were selected by the US section of the report were also examined in this study:

- **Data Entry** - in the Jamaican context, data entry is largely traditional keyboard capture. However, on the global scene, new technologies such as imaging and bar coding are rapidly overtaking keyboard entry of data, with significant implications for the data entry industry which exists in Jamaica.
- **Programming** - the market for pre-packaged and custom programmes was examined. Programming is the largest and fastest growing single market in the information service sectors reviewed.
- **Imaging**- is an emerging technology which has the potential to replace many of the traditional paper record systems. It was found not to exist either as an internal or export service in Jamaica.
- **Geographical Information Systems (GIS)** - is the application of databases to geographic locations or coordinates. Offering many advantages in resource management and the presentation of data, GIS services are new to Jamaica, and are not yet being exported.

Executive Summary (cont...)

Niche descriptions of CAD/CAM and Telemarketing; total market and offshore market sizes and growth.

- **Computer Assisted Drafting/Computer Assisted Manufacturing (CAD/CAM)**- is the application of computer power to the design of items as varied as software programmes through architectural structures to computer chips and automotive parts; and to the design and control of manufacturing processes. CAD/CAM exists in Jamaica as a support service for the architectural and engineering industries, and is not an export-oriented service.
- **Telemarketing** - is the sale of goods and services by inward or outward phoning; sophisticated computer controls may be involved to channel calls, record orders and speed goods delivery. The market is extremely large as it is defined by quantity of goods and services sold. Experience in Jamaica is limited, but geographic proximity and English as the native language favour the growth of this niche.

All of the above niches are part of an enormous US market of over US\$150 billion, of which approximately US\$7 billion may be outsourced, that is purchased off shore. It is the provision of services to this outsource market which is of interest to Jamaica as a foreign currency earning industry.

Executive Summary (cont...)

Labour availability, quality and costs are information sector 'drivers' which were examined in this study. A brief status report follows.

The growth of the local industry and its capacity to capture a share of the US market were examined. The following information sector drivers were identified and examined in depth:

Labour availability and competence

- **A highly educated and trainable labour force**

Jamaica has been recognised, borne from its historical connections, as possessing fine and modern educational institutions, and consequently a highly educated and easily trained labour force. This, together with an innate manual dexterity, ensures a rate of productivity equal to or better than that prevailing elsewhere around the world.

- **Available training courses and facilities**

Subsequent to the development of the Information Services industry the government has instituted specialized training programmes to ensure availability of sufficient labour. However, no formal training is done in CAD/CAM or imaging, a limitation which must be remedied if Jamaica is to develop a well rounded information service industry.

- **Competitive wage rates**

The high cost of in-house information processing in so far as maintaining and upkeeping a workable data collection, entry or analysis centre increases the feasibility of contracting these services to a centre such as Jamaica where cost savings may be realised due to cheaper modes of production and economies of scale. Jamaica's international competitiveness with regard to wage rates has been significantly enhanced by the recent rapid depreciation of the Jamaican dollar against most other currencies. However, turnover rates are high, in some cases over 25%. This rate is related to wages and potential develop within the industry.

Executive Summary (cont...)

Recommendations related to labour follow.

The main recommendations related to the labour force are the following:

- * That the Jamaican government and industry make **substantial investments in training** by improving entry levels, the range and the depth of courses, especially through the HEART institutions.
- * That the industry **improves its general working conditions** and remuneration to workers especially at the lower levels, and **develop career paths** which include training for work with newer technologies.

Executive Summary (cont...)

Infrastructure and Amenities

The information services industry needs support from essential infrastructure. With some qualifications, the infrastructure was found to be adequate to support a growing highly technical and technological industry.

Availability of infrastructure and amenities

The basic infrastructural requirements for the industry, transport, power, water and telecommunications are all available in Jamaica:

- * the public transportation system is generally adequate but may be a problem for labour intensive niches, especially those located in Montego Bay.
- * Power - this is supplied by a centralised statutory authority. Power supply is generally fair, although there are occasional power outages and fluctuations in voltage. Data sensitive niches should invest in back-up power supplies and voltage stabilisers. The power in Jamaica is 110 volts at 50 cycles.
- * Water - a reliable water supply is available, which is important in labour intensive niches such as data entry.
- * Telecommunications- there is a fully digital network. Communications with mainland USA are reliable and reasonably priced. Availability of services is becoming more widespread and effectively organised. High speed data transmission is available to support niches such as programming imaging, and data entry when it requires fast turnaround times.

No major recommendations were made in regard to infrastructure. However, the consultants noted the extra needs for water and transport in labour intensive niches such as data entry.

Executive Summary (Cont...)

Government incentives

The following incentives are offered by the government to new information services firms that are set up in the free zone in Montego Bay:

- The Export Industry Encouragement Act (EIEA)
- The Industrial Incentives Act (IIA) (currently inoperative)
- The Jamaica Export Free Zone Act (JEFZ)
- Moratorium of Duties (MD)

Incentives have had a positive influence on investment in information services in the past.

A summary of recommendations for this section are that the government should provide:

- * Incentives for employers to train personnel;
- * elimination of import duties on hardware and software;
- * a GCT zero-rating for hardware and software;
- * extension of Free Zone incentives to all investors.

The above are recommended to encourage industry to purchase, train with, and use new technologies, leading to both internal market efficiencies and increased export potential.

Executive Summary (Cont...)

Advances in Technology and Demand for Services

Technological change is a major driver in the growth of information services, allowing low end entry at moderate cost, and high end entry of enormous power. The availability of technology stimulates demand for new services, creating new and dynamic niche industries such as GIS and imaging.

Technological advances allow more cost effective entry into niches such as data entry, but those same advances will dramatically change the nature of information capture, manipulation, transfer and presentation.

No specific recommendations are made beyond the policy ones mentioned under government incentives to allow the more rapid uptake of new technologies, and under labour to ensure that trained personnel are end users of the technologies.

Demand for Services

The table below summarises the total and offshore demand for the various niches.

Information Service Niche	Total Market US \$	Offshore Component US\$
GIS	5 billion	900 million
Imaging	1.5 billion	310 million
CAD/CAM	5 billion	140 million
Programming	35 billion	5 billion
Data Entry	31.2 billion	600 million
Telemarketing	78 billion	178 million

The total offshore market for information services is over US\$7 billion.

Executive Summary (Cont...)

The Information Services Market

The recommendations are aimed at increasing awareness of the vast information service market, with the intent to capture a growing share of it, based on Jamaica's geographic, language and capability advantages.

In regard to this sector driver, we have identified certain weaknesses and we recommend the following:

- that Jampro work to **increase local awareness** of the tremendous information services market that exists;
- that **government improve training levels** to reach standards of skills and experience comparable to US levels, while broadening the scope of skills to include market niches for which there are presently no training programmes;
- that **government and industry work together to boost management training** to ensure efficiency in the industry;
- **use data entry skills as a springboard to entry into the other niche markets**, since many of them, notably GIS and telemarketing, have high data entry components;
- **form a joint marketing unit** to develop a unified approach to marketing Jamaican information services: a model of such a unit is offered.
- though the offshore programming market is by far the largest of the niches examined, we recommend that **programming be used first and foremost as a support service for the other niches** until such time as UWI provides a Masters degree in Computer Sciences. Project management skills will also be needed if Jamaica is to take on major programming developments.
- We also recommend that Jamaican development planners consider an integrated approach to development of the whole industry. Information technologies will develop most stably if **applied to current production processes of other Jamaican economic sectors, to enhance their productivity and foreign exchange earnings** while strengthening the base of the local information services sector.

Executive Summary (Cont...)

Language and proximity to the US market; brief re-cap

The natural advantages of a common language with, and proximity to the US market should be marketed in the development of the other market niches. A brief end note.

- English speaking and geographical proximity to the client base.

Jamaica enjoys significant advantages in its most developed information service market, data entry by way of its nearness to the US and the ease of communication in English. No specific recommendations are made, though both attributes are marketable assets in the drive to capture a growing share of the information services market.

In Brief

If two detailed studies of a multi-billion dollar, highly dynamic and diverse market can be encapsulated for maximum brevity, these were the findings:

- the US offshore information services market is vast and offers Jamaica a major opportunity;
- Jamaica has most of the pre-requisites to capture part of that market;
- a coordinated approach by government and industry is needed to develop and sell Jamaican information services;
- investments in human and technical resources have the potential to repay the investment in both overseas earnings and the creation of efficiencies within the local economy.

Methodology

The current report represents the second part of a study on the export of information services which assesses Jamaica's ability to satisfy the demands of the U.S.A market.

The first part of the study examined the U.S.A. market demand for off-shore information services.

The first part of the study achieved the following:

- *Selected six major segments of the U.S.A's information services market in which there is a large potential demand for off-shore services: these segments are:*
 - * *The Geographic Information System (GIS) market*
 - * *The Imaging market*
 - * *The Computer Aided Design and Manufacturing (CAD/CAM) market*
 - * *The Outsource Programming market*
 - * *The Data Entry market*
 - * *The Telemarketing industry*

 - *Provided a profile of each of the above mentioned segments. Each profile included:*
 - * *An overview of the segment*
 - * *A discussion of major drivers for growth*
 - * *An outline of major users/customers*
 - * *A description of major products*
 - * *A discussion of critical success factors that determine whether a particular service can be carried out off-shore*
 - * *An estimation of the market demand for those services identified as suitable for off-shore contracting*
 - * *A ranking of these potential off-shore services by second level criteria based on Jamaican resources*
 - * *An analysis of future growth trends*
 - * *A profile of competitors.*
-

Methodology (Cont...)

The remainder of this report focuses on the Jamaica-related aspects of the study and includes the following:

- *Background information of the Jamaican information services industry*
 - *Sector drivers in the information services sector in the United States*
 - *Critical Success Factors in the exportation of Jamaican information services*
 - *Jamaican infrastructural capacities*
 - *Market conditions in the United States and Jamaica's capacity to fulfill these*
 - *A series of case studies regarding the capacity of certain Jamaican Information Services firms to satisfy the various critical success factors.*
 - *Critical indicators in each sub-sector*
 - *A summary of recommendations.*
 - *A series of business plans for various sizes of data entry firm, various sizes of programming firms and a GIS firm*
 - *A conceptualisation of the proposed Kingston Office*
 - *A database listing of Jamaican firms involved in the information services industry.*
- *The supporting document consists of a series of recommendations emanating from the study.*
-

Background Information

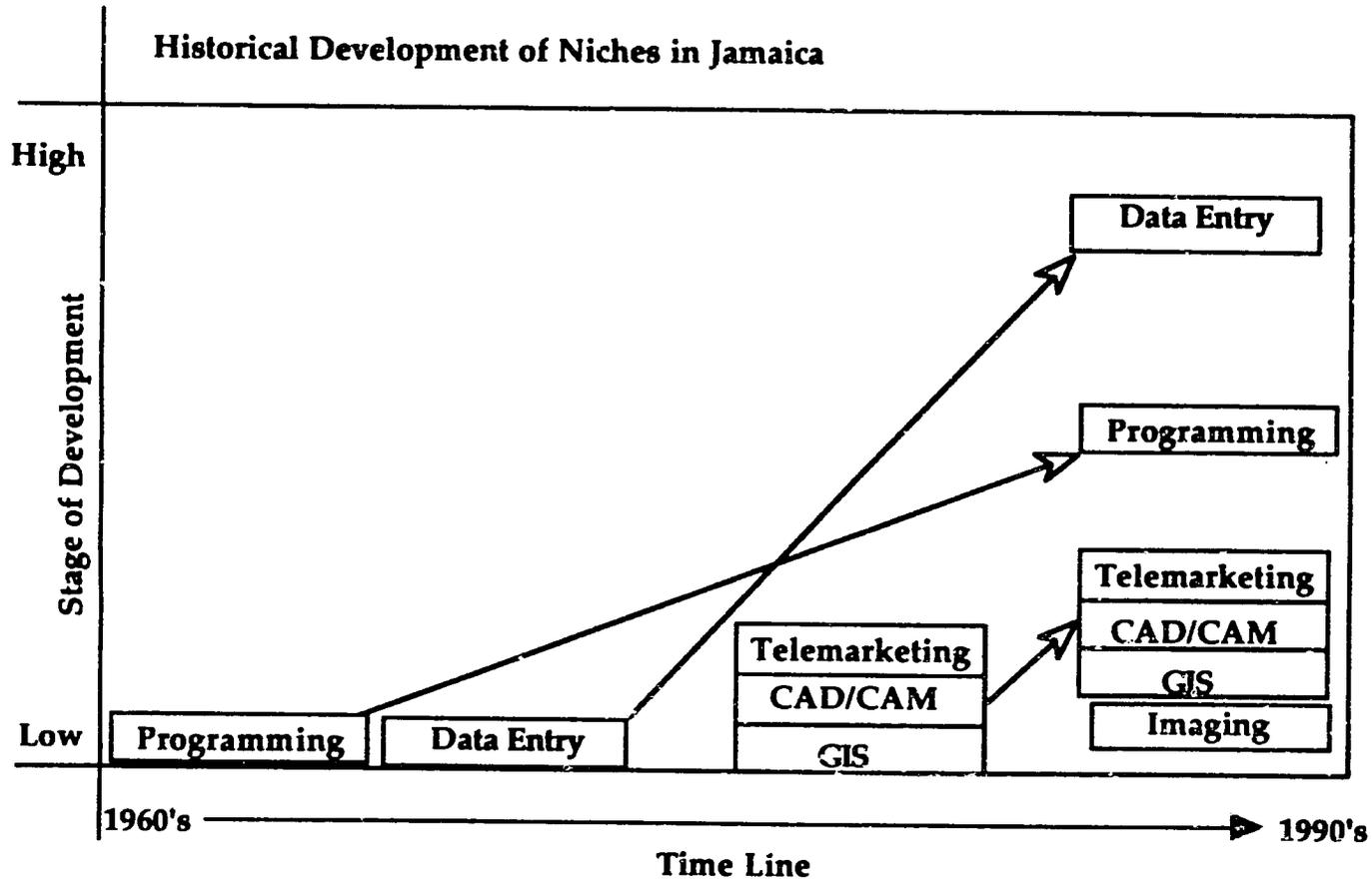
Jamaica has had a fairly long historical experience in data entry and programming and a more recent experience in CAD/CAM, GIS and telemarketing. The sub-sector has had no experience with commercial imaging to date.

- Programming:** Jamaican firms have been involved in programming since the early 1960's, however, very few of these services have been exported. Most local programmers have been fully occupied providing in-house services and fulfilling other local demand.
- Data Entry:** On a large scale, this is relatively new in Jamaica, except for one firm that started operations in the mid-late 1960's. The major growth in data entry operations took place in the mid 1980's as a response to government incentives.
- CAD/CAM:** This is a relatively new niche development in Jamaica, with a couple of firms that started in the mid-late 1980's as support services for architectural and engineering firms. Very little outsourcing work has taken place in the CAD/CAM niche. The niche has grown with architectural and engineering firms installing systems for in-house support services.
- GIS:** This is still in an embryonic state in Jamaica, with five large organisations developing domestic GIS systems. These organisations (two bauxite mining companies, the Ministry of Agriculture, the University of the West Indies, and the Jamaica Public Service Company have recently installed GIS and provide a nucleus around which competence in this area could grow.
- Telemarketing:** This also has a very short history with only a few firms setting up operations in the last few years.
- Imaging:** This niche has little history in Jamaica but is expected to develop in the next few years. The few firms that are on the periphery of imaging use faxed or digitally transmitted documents for data entry by the traditional key-board capture method.

Background (cont...)

Historical development of information services

The chart shows the development of information services in Jamaica from the early 1960's.



Source: AllWat Enterprises Research

Historical Overview of the Export of Jamaican Information Services

The first firm involved in the export of information services from Jamaica was a data entry firm, Jamerican, established about 27 years ago. It provided key entry services for a number of North American corporations. However, this company was the only one in the local industry and on its own was not enough for Jamaica to be considered a recognized off-shore information service destination.

Nothing of any significance occurred in the industry before the decade of the 1980's. Government policies in the mid 1980's stimulated the development and growth of the sector.

The Development of Exports from the Jamaican Information Services Industry

In the mid 1980's the government of the day embarked on a programme designed to:

- diversify the industrial base of Jamaica
- increase employment in non-traditional areas/activities
- increase the export potential of non-traditional goods and services.

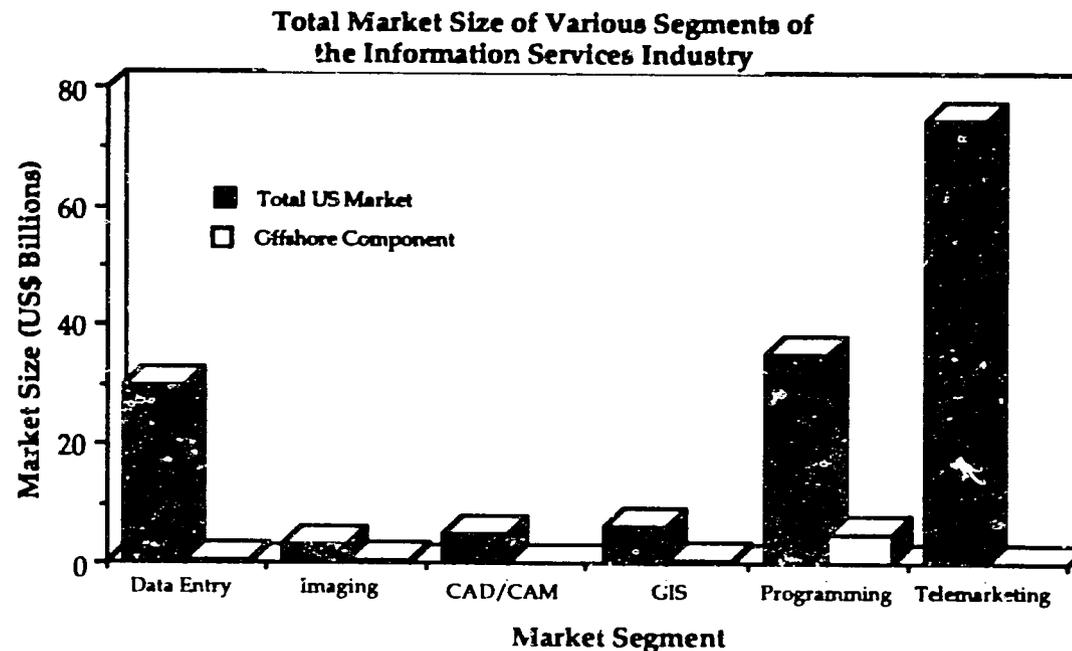
A number of areas were targeted. These included:

- Non-traditional agriculture
 - coffee
 - horticulture
 - vegetables
- Light manufacturing
 - clothing
 - textiles
- Service sector
 - data entry
 - programming

Historical Overview of the Export of Jamaican Informations Services (cont...)

Overview of trends and current status of the local industry

- The mid-1980's saw the industry grow rapidly and then stabilize as it developed and some firms left while others entered. The rapid growth in the mid-1980s was directly related to the incentives offered.
- The 1990's in Jamaica with its deregulated and liberalised economy along with a massive modernisation effort within the communication sector, is well poised to capitalize on the growth in demand for offshore information services and strengthen the local industry.
- The current commitment of the present Government to fuel the growth of the export economy together with the massive rise in competitiveness of Jamaican products and services, augurs well for the likelihood of greater investment and development in the industry both in terms of foreign and local input. This growth is evidenced by the diversification of investment in the sector in the past year.

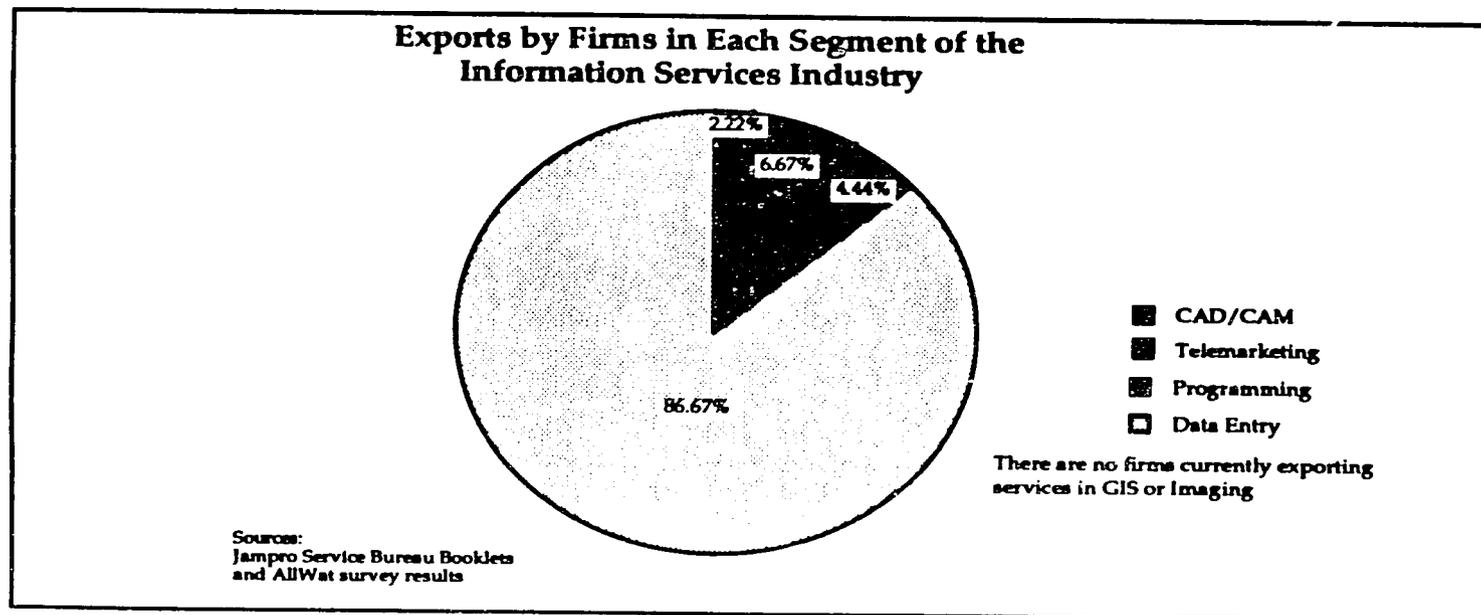


Historical Overview of the Export of Jamaican Informations Service (cont...)

Despite the growth in the export of data entry services (as shown above) most of the activity is in data entry rather than in "high end" activities such as programming, CAD/CAM, and GIS.

It is worth noting that:

- there are over 20 firms involved in programming in Jamaica but very little programming is carried out for the export market.
- CAD is also used by several architectural and engineering firms but mainly to support their main activities rather than for providing export services.
- there are about five organisations in Jamaica using GIS for their in-house activities, however, exports are not yet forthcoming.

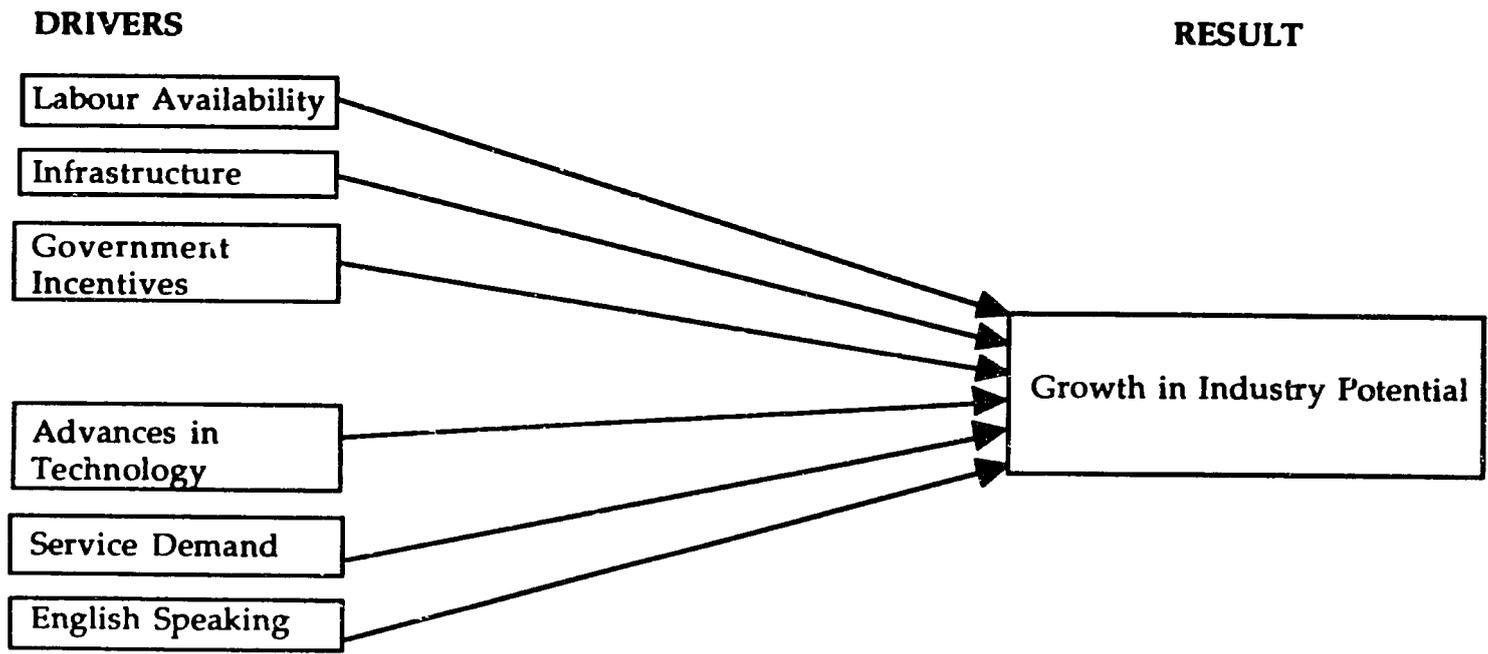


**IN THE FOLLOWING SECTION, THE US MARKET DRIVERS
AND JAMAICA'S CAPACITY TO SATISFY THEM ARE
DISCUSSED.**

Information Services Sector Drivers

The major drivers for the growth of the local Information Services Sector are :

- labour availability and competence
- infrastructural availability
- government incentives
- advances in technology
- increase in overseas demand for these services
- English speaking and geographical proximity to the U.S.A.



Source: AllWat Enterprises Research

These drivers will be discussed in greater detail on the following pages.

Sector Drivers (Cont.....)

Labour availability and competence

Jamaica has a large pool of educated and trainable workers whose wage rates are internationally competitive: training facilities have been set up to help equip them with the required skills.

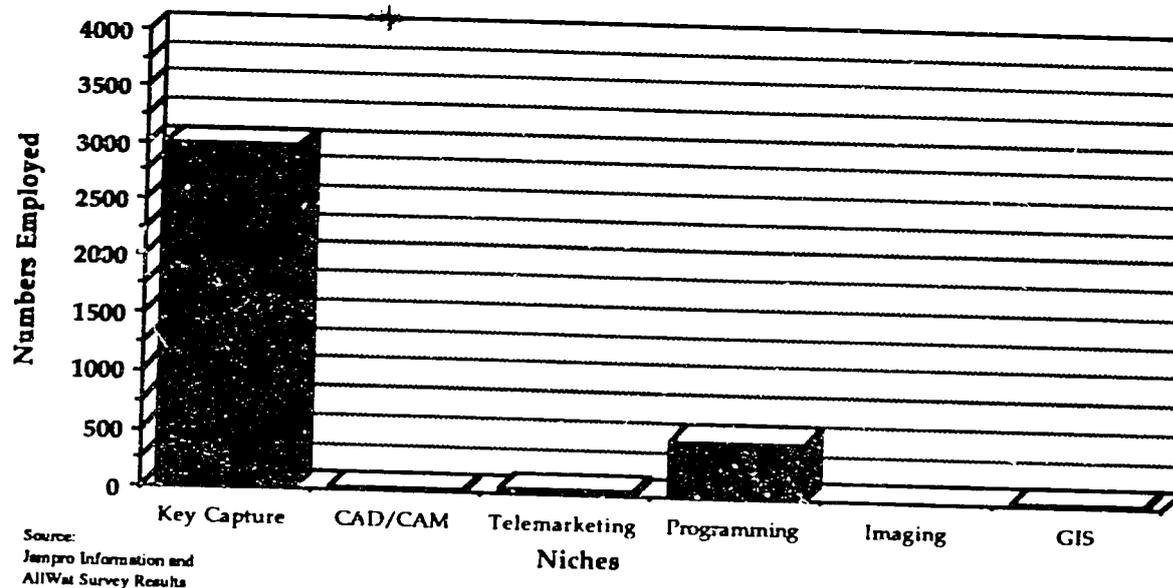
- **A highly educated and trainable labour force :-** Jamaica has been recognised, borne from its historical connections, as possessing fine and modern educational institutions, and consequently a highly educated and easily trained labour force. This, together with an innate manual dexterity, ensures a rate of productivity equal to or better than that prevailing elsewhere around the world.
- **Available training courses and facilities:-** Subsequent to the development of the Information Services industry the government has instituted specialized training programmes to ensure availability of sufficient labour.
- **Competitive wage rates :-** the high cost of in-house information processing in so far as maintaining and upkeeping a workable centre increases the feasibility of contracting these services to a centre such as Jamaica where cost savings may be realised due to cheaper modes of production and economies of scale. Jamaica's international competitiveness with regard to wage rates has been significantly enhanced by the recent rapid depreciation of the Jamaican dollar against most other currencies.

Sector Drivers (Cont.....)

Labour availability and competence (Cont....)

In Jamaica most of the employment created in the information services sector has been in the data entry segment of the sector. However, there is a fairly large complement of programmers.

- There are close to 3,000 people employed in the data entry segment of the sector
- There are about 20 using CAD/CAM
- There are about 30 employed in telemarketing
- There are about 500 programmers working for computing service firms and as many elsewhere
- There are none employed in imaging
- There are about 20 employed in GIS



Sector Drivers (cont.....)

Infrastructural availability

Jamaica possesses all of the features of modern infrastructural developments in so far as utilities, transportation and telecommunications are concerned.

- The requirement for a rapid improvement in communication and turnaround times lead the government in 1988 to form, along with American Telephone and Telegraph (AT&T) and Cable and Wireless Limited (C&W), a company known as Jamaica Digiport International Limited (JDI).

The Facilities of the Digiport include:

- a sophisticated high-technology electronics centre and a fifteen metre earth station which will receive and transmit telecommunications signals via satellites in the INTELSAT system. This will enable data conversion companies within Jamaican free zones to contract their services to U.S. and other overseas clients with the complete assurance that the turnaround time for data is decreased significantly.
- dedicated private lines and/or public two way or one way switched or unswitched voice, data and video communication services. These services are available to companies involved in reservation and telemarketing as well as computer aided design and computer aided manufacturing (CAD/CAM).

SECTOR DRIVERS

Infrastructural availability (cont...)

The facilities provided and being developed by Telecommunications of Jamaica will further improve Jamaica's position with regards to telecommunications

- Apart from the JDI, Telecommunications of Jamaica (TOJ) has a packet switching network with a capacity for 500 lines and these are available in all major towns. Speed ranges are from 1,200 bps to 56,000 bps.

- TOJ also has a capacity for 6,000 international in watt lines in Kingston, Montego Bay, St. Ann's Bay, Ocho Rios and Mandeville, apparently this figure could easily be increased.

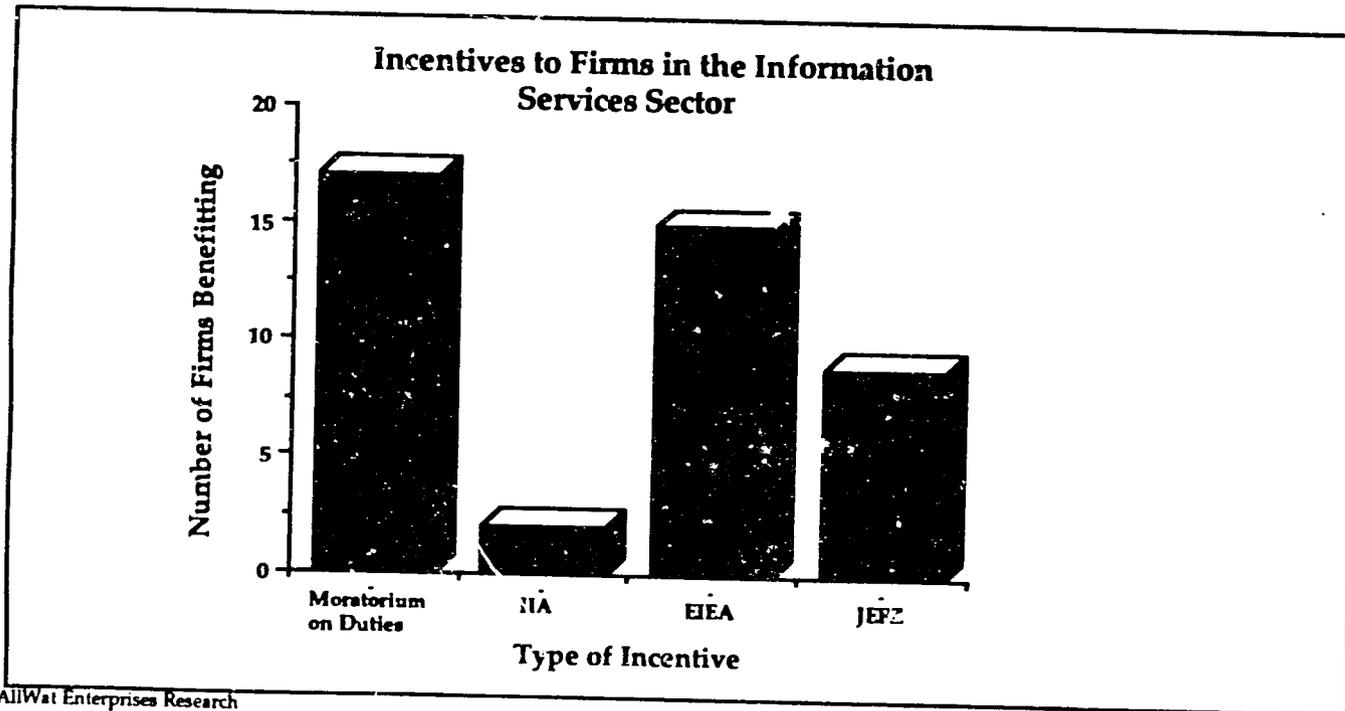
- It is worth noting that recently the Jamaican telecommunications system became **totally digital**.

SECTOR DRIVERS (Cont....)

Government Incentives

The 1980's saw the introduction of a number of incentive schemes designed to create within the industry a climate conducive to investment. Investors responded quite actively.

- The incentives provided include the following:
 - The Export Industry Encouragement Act (EIEA)
 - The Industrial Incentives Act (IIA) (currently inoperative)
 - The Jamaica Export Freezone Act (JEFZ)
 - Moratorium: of Duties (MD)



SECTOR DRIVERS (Cont.....)

Government Incentives (Cont...)

A brief description of the incentives are provided below.

The EIEA was designed to encourage export manufacturing to hard currency markets.

Approved exporters outside CARICOM are exempt from

- *income and dividend taxes for up to 10 years, and*
- *import duties on raw materials and machinery but not on equipment on which 20% additional stamp duty is payable*

The IIA was designed to encourage local manufacturers of goods and services. Formerly under this Act, approved enterprises were entitled to

- *up to 100% duty relief on building materials and articles for equipping the factory premises.*
- *relief from Income Tax for five to ten years from the start of production.*

Since November 27, 1986 this incentive scheme has not been operative because of the I.M.F./World Bank agreement.

The JEFZ has benefits including:

- *income and profit tax exemption in perpetuity*
- *property tax exemptions*
- *duty free import and export of all goods*
- *repatriation of earnings without recourse to the Central Bank*
- *exemption from import licensing.*

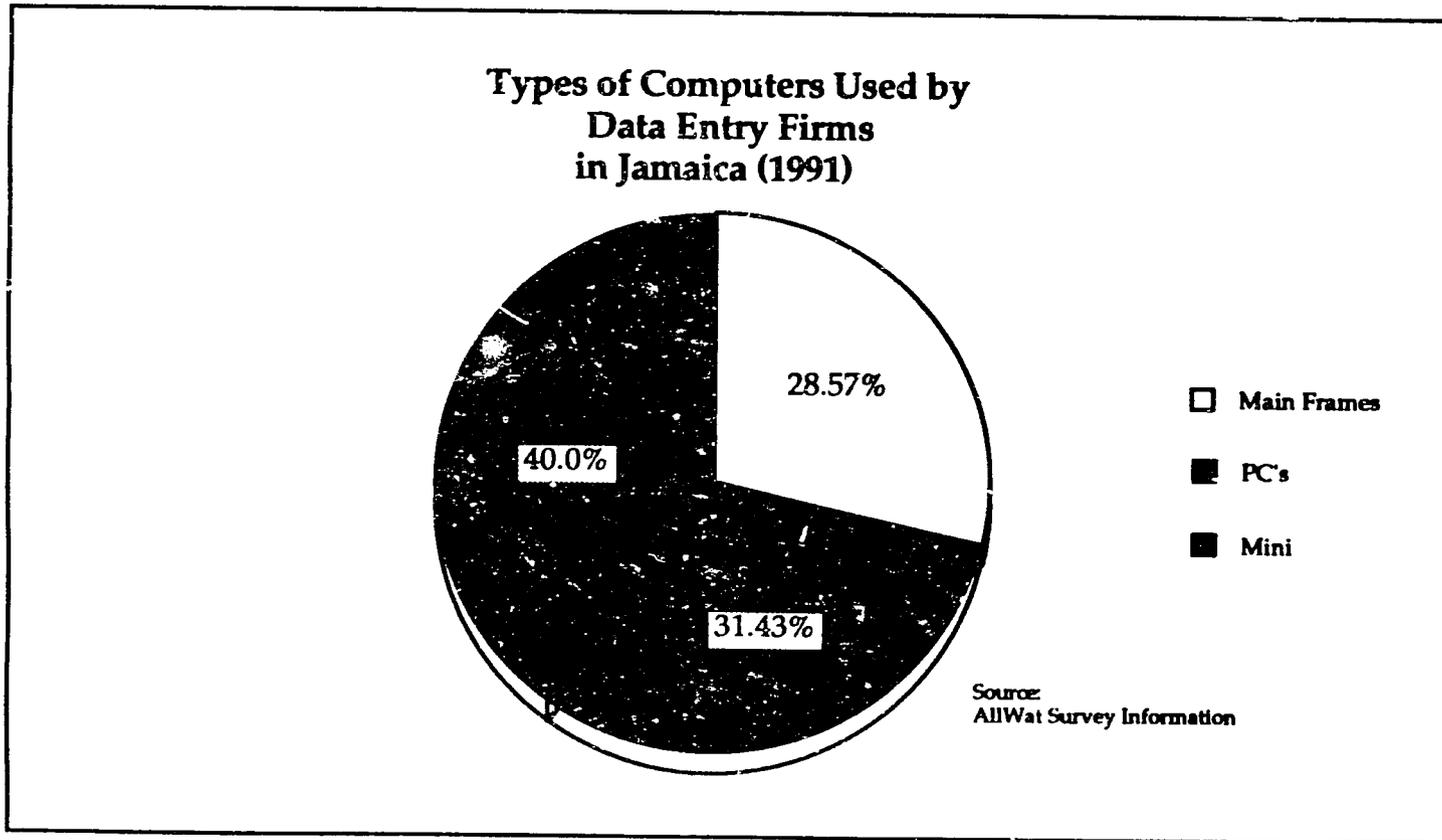
All transactions by the Free Zone company must be done in U.S. currency and these companies cannot sell their finished products on the local market.

Moratorium on duties is granted by the Minister of Finance for up to 3 years. This is usually granted to companies which do not qualify under existing incentives legislations and have the potential to contribute significantly to foreign exchange earnings, employment, etc. The Department of Customs and Excise requires a bond for duties deferred.

SECTOR DRIVERS (Cont.....)

Advancements in Technology

Advancement and availability of computers and peripheral equipment have made the offshore provision of data entry services more cost effective, reliable and secure. It has also improved capture integrity and accuracy.



SECTOR DRIVERS (Cont.....)

Advancements in Technology (Cont...)

The following technological factors are worthy of consideration:-

- **Proliferation of peripheral equipment:-** the introduction of equipment such as optical character recognition (OCR) and bar code readers, have decreased turnaround time and increased productivity.
- **Lower technical cost :-** improvements in telecommunications, advanced productivity and error detection technology have increased the benefit/cost ratio.
- **Increasing demand for timely information:-** Many companies rely on on-line services and large automated libraries to access strategic information hence they have to adopt new office technologies which depend on large volume information capture and processing services.
- **Availability and presence in Jamaica of this advancement in technology:-** Many companies in Jamaica are using leading edge state of the art technology within the normal scope of their business.
- **Data entry is changing in its form, with the rapid advances in technology:-** While data entry will continue to be important, the methods of entry are changing, and will continue to change from purely keyboard capture techniques to other more technologically intensive forms such as bar coding, OCR imaging and voice recognition.

SECTOR DRIVERS (Cont.....)

Increases In Overseas Demand For Services

The regulatory environment (such as the maintenance of client records) and high costs of operations in the U.S.A. have led to firms seeking offshore services to satisfy regulations and promote cost effectiveness.

- **Regulatory Environment in the U.S.A**

The Regulatory Environment has imposed specific requirements for retention, distribution and access to certain documents dependent on the industry and sensitivity of the information. For example, insurance companies are required by Federal Regulations to maintain legal copies of all documents pertaining to clients throughout the life of the policy. This leads to immense problems for storage and retrieval.

- **The high costs incurred by US firms**

The inefficiency of in-house information processing and high storage costs of hardcopy documents have resulted in a more favourable user perception of service bureaux and a greater use of their entry services.

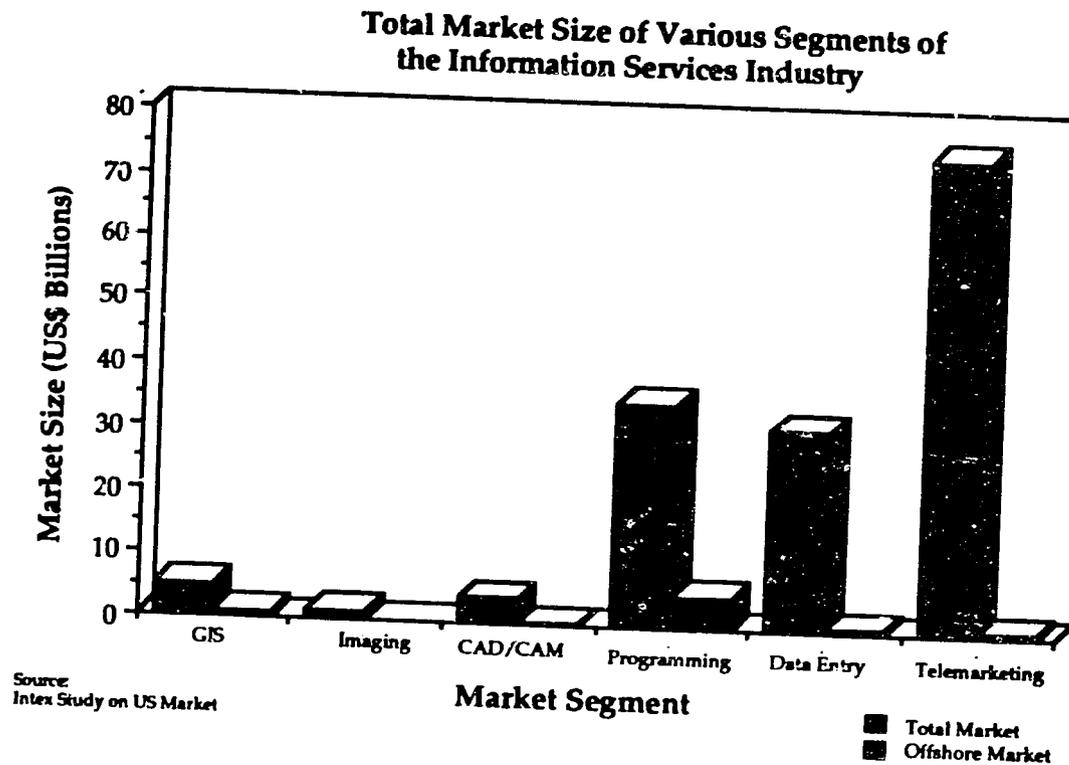
- **Growth of the industry**

Task 1 of this study has provided estimates of the total size of the U.S. market for each segment of the Information Services Industry as well as the total size of the offshore market. This information is summarized in the following tables. It is worth noting that annual growth in the market size of each segment is expected to exceed 16%.

SECTOR DRIVERS (Cont....)

Increases In Overseas Demand For Services (Cont...)

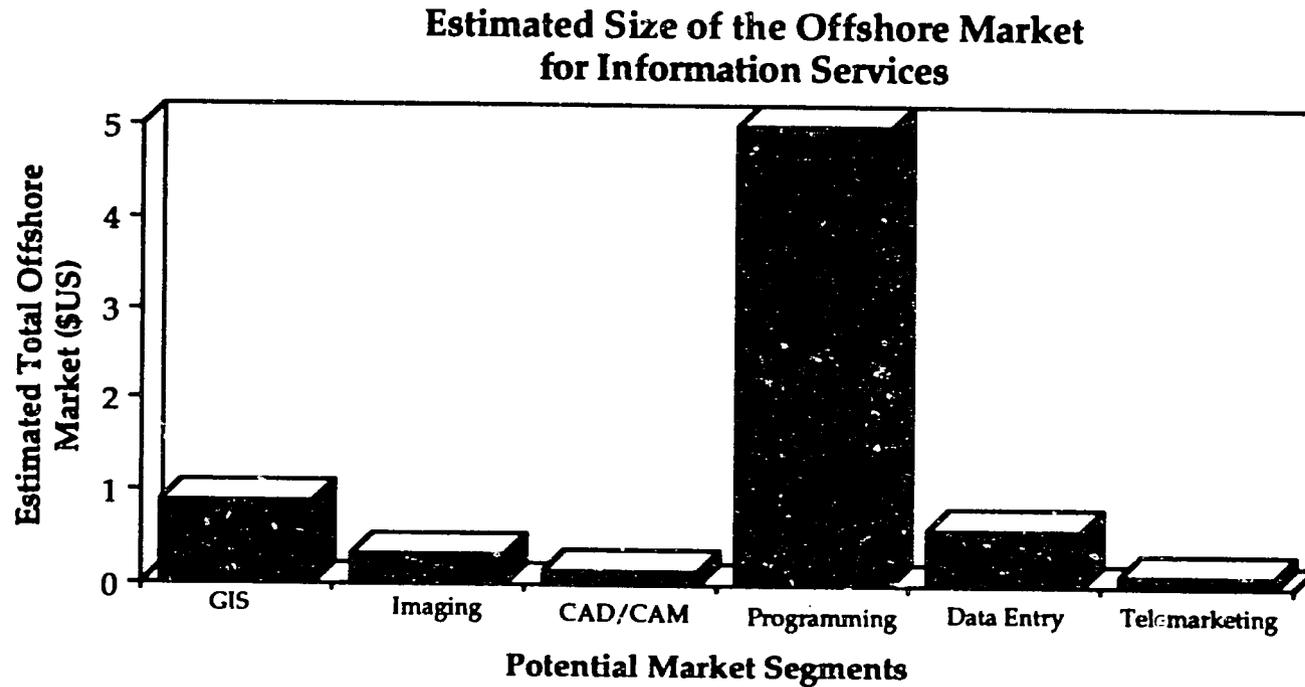
The following chart showing the size of the various market segments shows that programming, telemarketing and data entry have by far the largest segments.



SECTOR DRIVERS (Cont....)

Increases In Overseas Demand For Services (Cont...)

Programming and data entry have the largest offshore markets.



Source: AllWat Enterprises Research

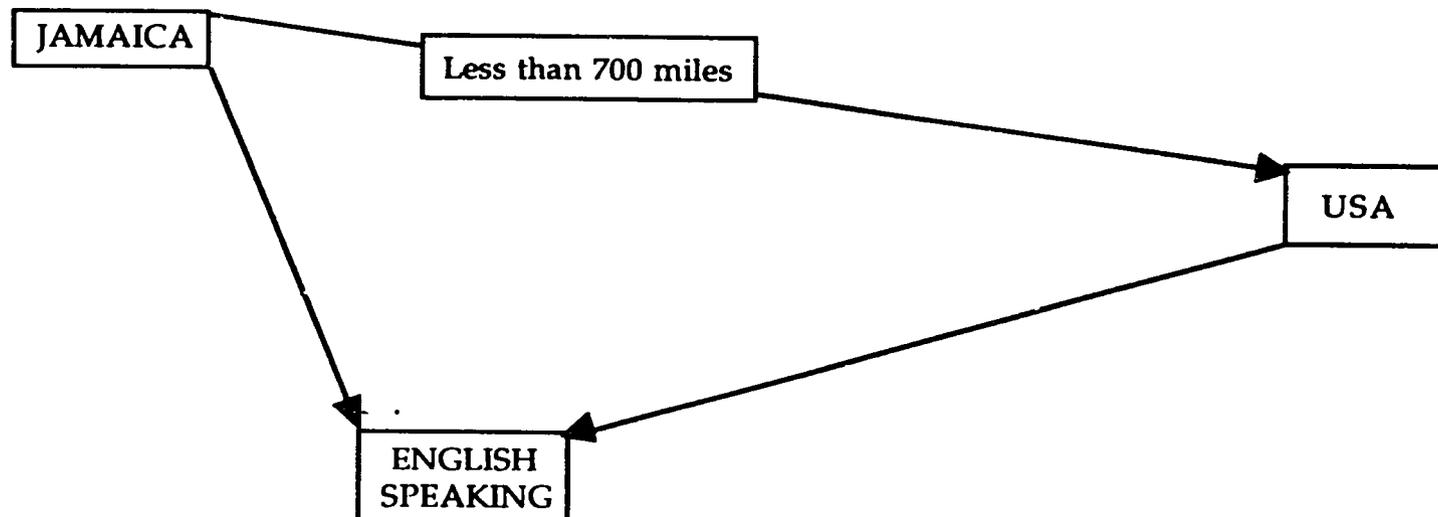
The offshore components in all of these niches have an estimated growth rate of over 15% per annum.

SECTOR DRIVERS (Cont....)

English speaking and proximity to market

Being only 700 miles south of Miami and with an English speaking population, Jamaica is ideally suited to take advantage of opportunities emanating from the USA.

- **Close proximity to the marketplace** :- Jamaica's geographical location, situated on a shipping and airline crossroads makes it an ideal funnel location for the service industry.
- **English speaking culture** :- worldwide standards recognise English as the computer technological language of the world. Comprehension within the service sector becomes even more critical a factor than mere character recognition.



Source: AllWat Enterprises Research

**IN THE FOLLOWING SECTION THE DISCUSSION CENTRES
ON CRITICAL SUCCESS FACTORS AND THE EXPORT OF
JAMAICAN INFORMATION SERVICES**

Critical Success Factors in Exporting Jamaican Information Services

This section of the document examines certain critical factors that determine the likely success of Jamaican efforts to increase the volume of information services provided to the USA market.

The sub-sectors that will be examined in detail in this document are

- **Data Entry**
- **GIS**
- **Imaging**
- **Telemarketing**
- **CAD/CAM**
- **Programming**

The critical success factors that will be examined are

- **Labour , including management
and**
- **Infrastructure.**

Adequate labour and infrastructure are critical if an expansion of any level of information service is to be carried out successfully on a meaningful scale in Jamaica.

In addition to examining issues relating to labour and infrastructure there will be an analysis of other important factors, many external to Jamaica, that determine Jamaica's ability to penetrate the U.S. offshore market in the aforementioned information service niches.

Critical Success Factors in Exporting Jamaican Information Services (cont...)

Labour, infrastructure, and the USA / general market requirements are outlined below:

Labour

With regard to labour, focus is placed on training, cost, availability, turnover, and quality. The requirements and availability of labour and training for each sub-sector are examined.

Infrastructure

With respect to infrastructure, emphasis is placed on:

- the cost, availability and reliability of telecommunications,
- the availability and support of technology,
- the availability of utilities and amenities: power, water and transport

USA / General Market Position/Requirements

In this part of the analysis attention will be on:

• the USA market size in each sub-sector	• geographical proximity
• the rate of growth in each sub-sector	• turnaround time
• USA training and experience requirements	• customer base
• labour substitutability	• quality factors
• information sensitivity	• cost of set up
• technological change and obsolescence within the sub-sector	

Labour

Training

The first aspect of labour that is examined is training. An overview of the training requirements for information services is provided below.

Characteristics of ideal training facilities for information services:

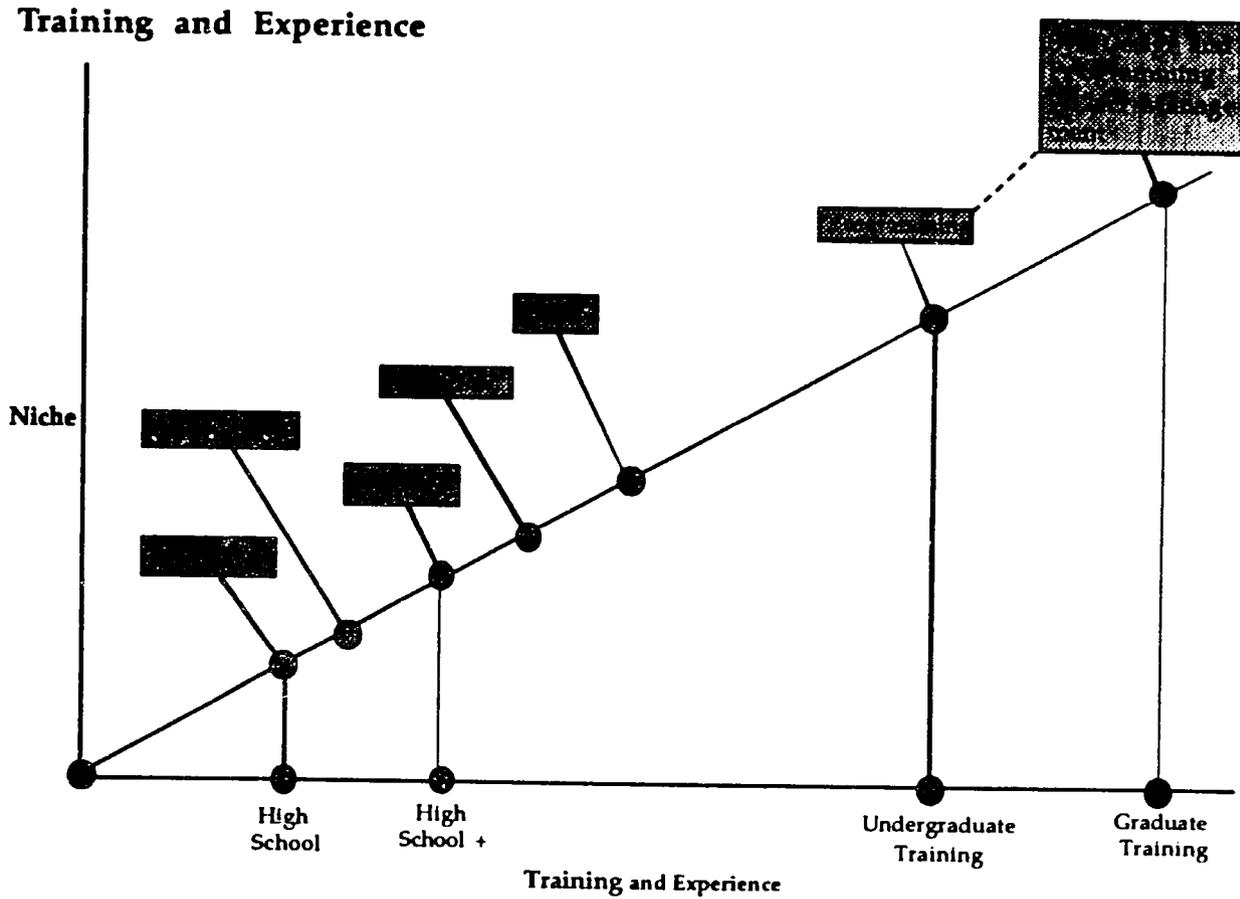
- a) adequate number of institutions depending upon population size and distribution, job market size;
- b) location of institutions within easy reach of major population centres;
- c) range, duration, cost and content of courses produces the right mix of skilled labour;
- d) the qualifications of instructors should be nothing less than that of current experienced information services middle management personnel with some teacher training skills.

With respect to training in information services, Jamaica would be well advised to diversify its training and produce trained people in all niches rather than just in data entry and programming. More intermediate-level trained technicians are required to service the GIS, CAD/CAM, imaging and telemarketing sub-sectors. Trained data entry and programming people will form the foundation and support for the information services sector as a whole.

Labour

Training

The first aspect of labour that is examined is training. The chart below shows a summary of the training and experience needs for each niche.



Source: AllWat Enterprises Research

Labour

Training

Data Entry

There are certain basic training requirements for data entry operators apart from merely training in typing.

Characteristics of training needs for data entry

- typing skills - speed and accuracy
- skills in English
 - for comprehension of tasks and
 - for communication and feedback
- numeric skills
- basic entry comprehension skills which include:
 - field characteristics
 - relationships between fields, records and batches
 - verification skills
- basic computer skills:
 - embedded keyboard
 - alphanumeric skills

Labour

Training

Data Entry Training Facilities

Jamaica has only two institutions specializing in the provision of data entry training. Additional facilities are required.

Actual training facilities for data entry in Jamaica

- There are two data entry training institutions in Jamaica, these are the H.E.A.R.T. academies in
 - Stony Hill and
 - Kenilworth

Each institution accepts about 40 to 50 trainees in each of its 14 week courses. Three 14 week courses are offered per year by each institution. Typically, over 85% of entering trainees successfully complete the course.

Adequacy of Institutions for satisfying training needs

Data entry firms report shortages of labour. Jamaica requires other institutions to offer training in data entry in order to deal with the large population masses in areas such as Portmore. This would assist in providing more trained workers for firms in the Kingston area. It would also encourage investors to set up operations in that area from which many workers are forced to commute long distances to work due to lack of employment opportunities closer to home.

Labour

Training

Data Entry Course Details

The two institutions specializing in data entry training provide a course for operators . The entry requirements and content are described below

Courses available and their content

There is basically one course available at the H.E.A.R.T. institutions, this course is for key operators and lasts for 14 weeks including four weeks for work experience. After this course, trainees can enter the data entry work force with no further entry requirements.

Entry requirements for the course are:

- a pass at the Grade 9 level entrance examination
- the successful completion of an interview with personnel from H.E.A.R.T.

Operators are trained on NIXDORF and Xenix systems and are evaluated based on:

- meeting the required minimum keystroke per hour rate
- attaining the required level of competence in maths, English and social studies
- attendance and discipline

Instructors are usually graduates from either UWI, CAST or Teachers' Colleges

Labour

Training

Data Entry Course Details (cont...)

Though the H.E.A.R.T. course is beneficial, and is complimented by many firms that receive trainees, it does not focus on all facets of data entry.

Most trainees require major retraining once they secure employment in a data entry firm.

In-house training remains the most important form of training received by operators. It must be emphasised that neither institutional nor in-house training aims to produce persons aiming for a long term career in data entry.

Even though the course covers some basic training in mathematics, English and social studies, an enhanced course which covers other aspects of data entry such as posture, fingering, eye screen co-ordination, rhythms, concentration and basic computer skills would improve the quality of trainees.

It is estimated that on average Jamaican operators achieve 8,750 keystrokes per hour compared with 12,500 and 15,000 by their USA and Chinese counterparts respectively.

The Jamaican sub-sector would improve its competitiveness significantly if workers could be trained to achieve greater speed. There would be a concomitant benefit to workers in terms of greater remuneration and an improvement in the perception of their work by other members of Jamaican society.

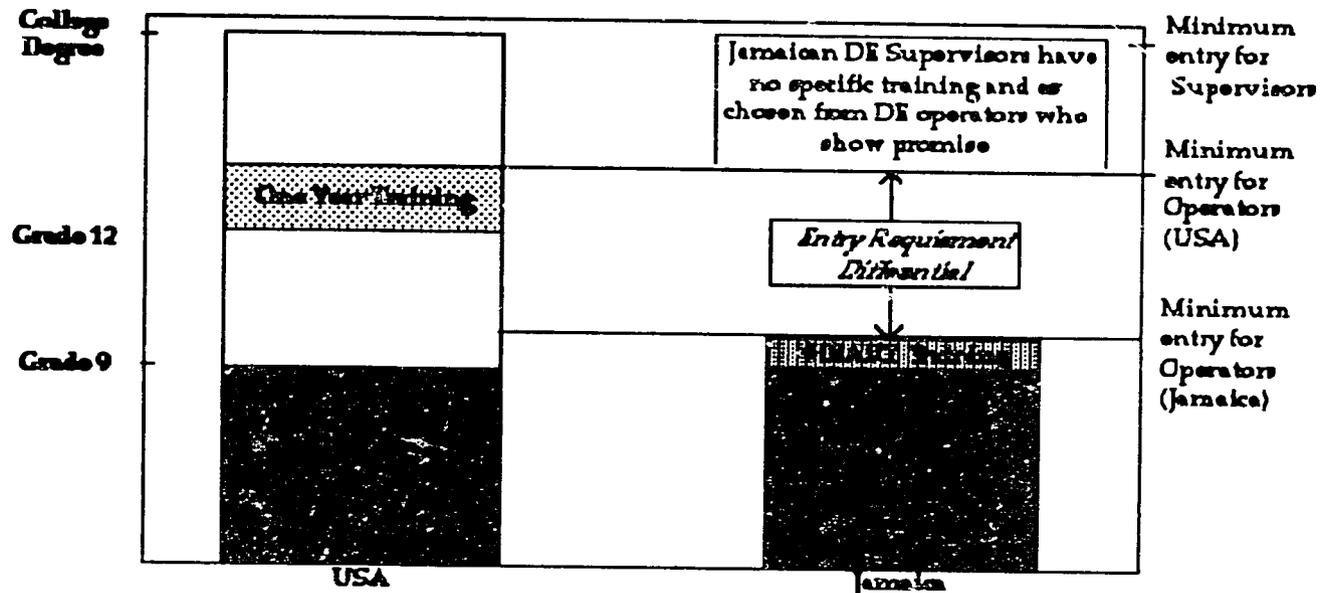
Labour

Training

Data Entry Course Requirements

Minimum entry requirements for data entry operators in the USA are much higher than in Jamaica. Jamaica must raise its entry requirements to improve the standard of its operators.

US - Jamaica Training Differential



Source: AllWat Enterprises Research

The quality of Jamaican data entry operators should be increased to achieve greater output and reduce turnaround time, thereby increasing Jamaica's attractiveness as an offshore data entry supplier. Reducing the training differential between Jamaica and the USA would require the support of the industry which would have to pay higher wages for a better trained work force.

Labour

Training

Data Entry Courses Requirements (cont...)

In order to narrow the entry requirements differential between Jamaican and USA data entry operators, certain positive steps have to taken in Jamaica. These are outlined below.

Steps to Reduce the Training Differential

The Jamaican data entry industry should combine with H.E.A.R.T. and take the following steps:

- industry defines target qualities of graduates, course entry requirements, trainee skills, aptitudes and attitudes needed to maintain competitiveness in the face of higher output of other offshore data entry points; defines weaknesses of present graduates of training system, suggests solutions for them.
- H.E.A.R.T. designs courses to achieve the required levels of proficiency; trains test group under new course regime, links with industry to refine the course content.
- industry monitors output and provides feed back to trainers;
- industry sets wage differential for trainees if new system produces more productive data entry operators.

Labour

Training

Data Entry Course Requirements (cont...)

Neither of the two institutions providing data entry training offer courses for supervisors, quality controllers or programmers with specific knowledge of the requirements of the data entry industry.

Training for supervisors, quality controllers and programmers

A major weakness in Jamaican data entry training is the fact that there are no niche specific courses for supervisors, quality controllers and programmers, all of whom are critical to the production process in a data entry operation.

In the USA supervisors require a college degree whereas in Jamaica a supervisor is usually a competent operator who shows leadership qualities.

While it may not be appropriate or cost effective to hire university graduates to become data entry supervisors in Jamaica, it is appropriate to ensure that all those entering supervisory and quality control work are not merely efficient data entry operators.

Labour

Training

Data Entry Course Requirements (cont...)

Basic management and supervisory courses are needed in the data entry niche. Suggestions for these courses are outlined below.

- To focus industry attention on trained management and begin to focus the work force on the career potential within the industry it is necessary that the work force be offered short courses on:
 - introductory management, supervisory skills, personnel management and motivation,
 - industry specific document management and quality control techniques.
- Introductory management courses are readily available through:
 - CAST, UWI, the Institute of Management and Production (IMP) and Jamaican Institute of Management.
 - The co-operation of data entry firms is essential in the design of courses meeting industry-specific needs.

Labour

Training

Data Entry Courses for Programmers

There is no specific training for programmers within the data entry niche. Some training recommendations follow below.

Local programmers are trained:

- at the University of the West Indies (UWI)
- at the College of Arts, Science, and Technology (CAST)
- at a number of small training schools
- at some overseas institutions

However, these programmers are not trained specifically for data entry systems. It is recommended that CAST work with the data entry sub-sector to offer a module on industry-specific programming.

Emphasis should be placed on:

- data entry flow programming
- database output to client specifications
- data recovery
- quality control.

Labour

Training

Data Entry Courses for Management

There is only a one-day course for senior management within the data entry niche. Suggestions for senior management training follow.

A deficiency in training for the Jamaican data entry industry is the absence of an in-depth manager's course. At present there is a one-day off shore course offered by DEMA (Date Entry Management Association) in conjunction with its exhibitions which covers the following in a necessarily superficial manner:

- form design
- in-house training methods
- keystroke improvement techniques
- efficiency

Management training should be the basis for an efficient data entry industry which is able to respond to changes in the market place and economic conditions. A training programme aimed at managers for the sector should cover *at least* the following components:

- cost and quality control
- strategic planning
- pricing strategies
- market research and marketing skills
- personnel skills- recruitment, management and training.

Labour

Training

Data Entry Training Outlook

The local industry must join forces with H.E.A.R.T. and other institutions to improve the quality of the training courses for the data entry niche in Jamaica. This will benefit the industry and bring training requirements more in line with those existing in the USA.

Trends and prospects

Trends and prospects for the industry with respect to training are quite good in the medium term because members of the local industry have set in place plans to work with H.E.A.R.T. in order to improve the standard of courses and to increase entry level requirements by guaranteeing jobs with higher wages.

Such new courses will be more intensive and the requirements for certification made more stringent.

While the channels of communication are in place between industry and training institutions, long term planning for up-grading of training to improve the quality of junior, middle and upper management should take place.

• Current overall rating of the adequacy of local Data Entry training

• Good	• Average ✓	• Poor
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• Prospective rating

• Good ✓	• Medium	• Poor
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Labour

Training

GIS

Characteristics of ideal training facilities for Geographical Information Systems

The following GIS data conversion skills should be added to the above list of topics specific to data entry. These are:

- geo-coding skills - to enable entered data to be related to geographical codes.
- database knowledge
- training in imaging
- training in raster to vector conversion
- training in interactive editing.

Actual training facilities for GIS in Jamaica

There are no formal training facilities in GIS skills at present in Jamaica. The only source of training is the system supplier.

Overall rating of the adequacy of local training

• Good	• Average ✓	• Poor
--------	-------------	--------

Labour

Training

Imaging

Characteristics of ideal training facilities for imaging

- In addition to keyboard and computer skills, imaging will require training in
 - high speed scanning techniques,
 - image scrubbing,
 - indexing and, at the high end,
 - optical mass storage devices and data compression.

Actual training facilities for imaging in Jamaica

At present there are no training facilities for imaging in Jamaica. In common with the situation found in GIS, the base level for imaging training is the same as for data entry. Training is not formal but may be supplied by equipment and software dealers.

Overall rating of the adequacy of local training

• Good	• Average	• Poor ✓
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Labour

Training

Telemarketing

Characteristics of ideal training facilities for telemarketing

The following are minimum training needs to build up a telemarketing work force:

- basic computer and keyboard skills
- elocution, recognition of a variety of accents
- product knowledge (in-house)
- sales skills.

Actual training facilities for telemarketing in Jamaica

At present there are no training facilities for telemarketing operators in Jamaica and all telemarketing operations have to provide in-house training. As with other information sub-sectors, the base level for telemarketing training is the same as for data entry.

Overall rating of the adequacy of local training

• Good	• Average	• Poor ✓
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Labour

Training

CAD/CAM

Characteristics of ideal training facilities for CAD/CAM

- In addition to keyboard and computer literacy to certificate level, training should include
 - drafting, digitising and familiarity with 2- and 3-dimensional programmes (CAST diploma)
 - design and presentation concepts (CAD).
 - industrial production process flow concepts,
 - electronic monitoring and feedback mechanisms (CAM).

Actual training facilities for CAD/CAM in Jamaica

At present there are no government training facilities for CAD/CAM operators in Jamaica although one private company does currently provide training in CAD, and another that previously did provide the training is now moving away from general training and concentrating upon in-house training. Other training facilities are, of necessity, provided in-house by those companies (architects, engineers and digitised cartographers) that have installed CAD and CAM for their own use.

Overall rating of the adequacy of local training

• Good	• Average	• Poor ✓
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Labour

Training

Programming

Characteristics of ideal training for programmers

- The following are components of a complete training course for programmers:
 - keyboard skills are a basic requirement;
 - familiarity with operating systems such as DOS, Unix, OS/2;
 - knowledge of a variety of programming languages and tools, particularly CASE (Computer Aided Software Engineering) tools;
 - compiling and debugging;
 - database, Windows and Macintosh GUI (graphical user interface) programming;
 - training in the accurate and understandable compilation of support documentation;
 - training in the presentation of user seminars and training sessions;
 - at the high end, expert systems, multi-media and artificial intelligence concepts.

Labour

Training

Programming

The University of the West Indies (UWI) and The College of Arts, Science, and Technology (C.A.S.T.) are the two main institutions in Jamaica that provide computer programming training. There are courses of less scope at The Institute of Management and Production (IMP), NCR, and Excelsior Education Centre.

Actual training facilities for programmers in Jamaica

University of the West Indies

- The University of the West Indies offers courses in programming and systems analysis. Entrants are selected from secondary school students with A-levels in science and mathematics. This is equivalent to a high school degree with about a grade B average in the USA.
 - The three year course leading to a BSc with a major in Computer Science will give students experience with an IBM main frame, an NCR tower system and personal computers, mostly 386's.
 - A new Sun SPARC station is being installed. Over 55 terminals are available, but there is an increasing demand on the part of students for more usage time.
 - Languages taught and used include Pascal, Cobol, 4th generation (Oracle), Modular 2, Standard ML, C and Prologue.
 - The computer science programme produced 70 graduates in 1991. Lecturers expect to see the programme expand its intake in the future, and staff feel that the UWI administration has a positive attitude toward the sector, as exemplified by the purchase of the Sun station.
-

Labour

Training

Programming (cont...)

CAST training courses are offered in two varieties: either a certificate or a diploma.

C.A.S.T

- The College of Arts, Science and Technology (CAST) offers two modular study programmes leading to a Certificate or Diploma in Computer Studies.
- Entry requirements are at least five GCE 'O-levels' or a high grade pass in the CXC examination. This is equivalent to a good Junior High School Certificate in the USA.
- About 60 terminals are available, used with equipment ranging from 8088 to 386 processors.
- Languages include BASIC, Pascal, (IBM) RPG II, Cobol, and C. A module on assembly is also taught. Thirty five diplomas and eighteen certificates were granted in 1991.

Labour

Training

Programming (cont...)

Local training for computer programmers has reasonable scope and course coverage, although no graduate studies are currently offered in any Jamaican institution

Adequacy of local training

Locally trained programmers are highly mobile, indicating demand for their skills; some migrate to work or take further training in the USA. This would not be possible if the undergraduate training provided in Jamaica was sub-standard and did not meet graduate school entry requirements in the USA.

However, training is not aimed at exporting programming services; instead training is aimed at meeting local needs.

It should be noted that a serious deficiency in training provided for programmers in Jamaica is the lack of a domestic Masters Degree programme. This severely hampers the ability of Jamaica to compete seriously in the export market. A Master of Computer Science degree programme must be part of a long term plan to take full advantage of this market niche.

Project management should also be taught, preferably on a modular basis, for the control of software development projects. Subjects should include: systems design/analysis, client relations, cost and personnel control, systems integration, documentation writing (user manuals), and presentation skills for training clients in the use of software.

Overall rating of the adequacy of local training

• Good	• Average ✓	• Poor
--------	-------------	--------

Labour

Training

Summary

Jamaica's position is generally average in terms of training for data entry, and programming. For CAD/CAM there is minimal local training available, while for imaging and GIS there are little or no local training facilities. However, for all three the trainable labour force is available, so the potential is good. Lack of experience and cultural factors may be a greater barrier in telemarketing.

Training and Experience Requirements and Jamaica's Ability to Meet Them

- Data Entry:** Jamaica has a fairly strong position because an industry already exists and the USA market has already been penetrated. However, better training facilities are required locally.
- Imaging:** Jamaica has an abundance of persons with High School plus some keyboard and data entry training. These people could form the nucleus of an imaging work force.
- CAD/CAM:** There are several Jamaican architecture and engineering firms that are already using CAD/CAM in their practices. These employ trained draftsmen who have further training in CAD/CAM.
- GIS:** The situation is similar to that for imaging. On the job training opportunities are equally scarce.
- Programming:** There is an adequate core of trained programmers, however, graduate training is not available.

Labour

Cost

Jamaican wages in both the data entry and programming sub-sectors are at a level that renders them competitive with other offshore destinations, however wages are not yet at high enough levels to reduce local worker turnover rates. The other sectors are not sufficiently developed for a judgement to be made concerning wages in an export-oriented market.

Ideal labour costs

- competitive with other regional and international producers of the same services
- wages high enough to motivate workers and prevent them from migrating to other activities

Actual labour costs in Jamaica

Jamaica has adequate experience with data entry and programming wages to make comparisons, which show that wages are competitive. However there is little industrial precedent for predicting wages in the new high end activities- GIS, imaging and CAD/CAM and telemarketing.

Each sub-sector is explored in greater detail in the following pages.

Labour

Cost

Data Entry

Wages are competitive, and the recent devaluations make foreign currency earnings from the provision of data entry services very attractive. The decline in real wages for data entry operators may increase turnover rates, if there is no attempt to raise wages by the industry, at least to a par with competing industries.

Actual labour costs in Jamaica (data entry)

- Typical local wage rates for data entry operators are in the range of J\$250 to J\$450 per week. In some companies the best operators can earn up to J\$1,000 per week. The typical worker costs the data entry firm about US\$0.50 per hour in wages but earns for the firm about US\$5.25 per hour.
- Labour costs represent only about 10% of a firm's revenues (workers work for only 45 weeks and are paid for 52 weeks) in Jamaica. The recent cycle of depreciation of the J\$ has greatly benefitted local data entry firms whose earnings from US work have appreciated dramatically in J\$ terms while local wages (and some other local costs) have only risen slightly.
- Data entry firms have therefore made large windfall gains during the last 12 months but workers have not been compensated accordingly.
- Jamaican data entry firms have to be careful that the turnover rate of workers does not increase significantly due to the large decline in real wages during the last year. They should be able to increase their wage rates significantly and induce workers to stay in the industry and not be demotivated. This will stabilize the industry and foster growth.

Labour

Cost

Data Entry

Jamaican wage rates have become increasingly competitive over the last 12 months due to the currency depreciation of over 150%. Jamaican wage rates have fallen from the equivalent of over US\$1 per hour in late 1990 to about US\$0.5 per hour in 1992.

Jamaican Wage Rates Compared with other Countries

Comparative wage rates (estimated) in selected countries can be seen below.

Country	Average Wage (US\$/hour)
Jamaica	0.50
USA	8.00
Barbados	2.70
India	0.15
China	0.10
Philippines	0.35
Mexico	0.42

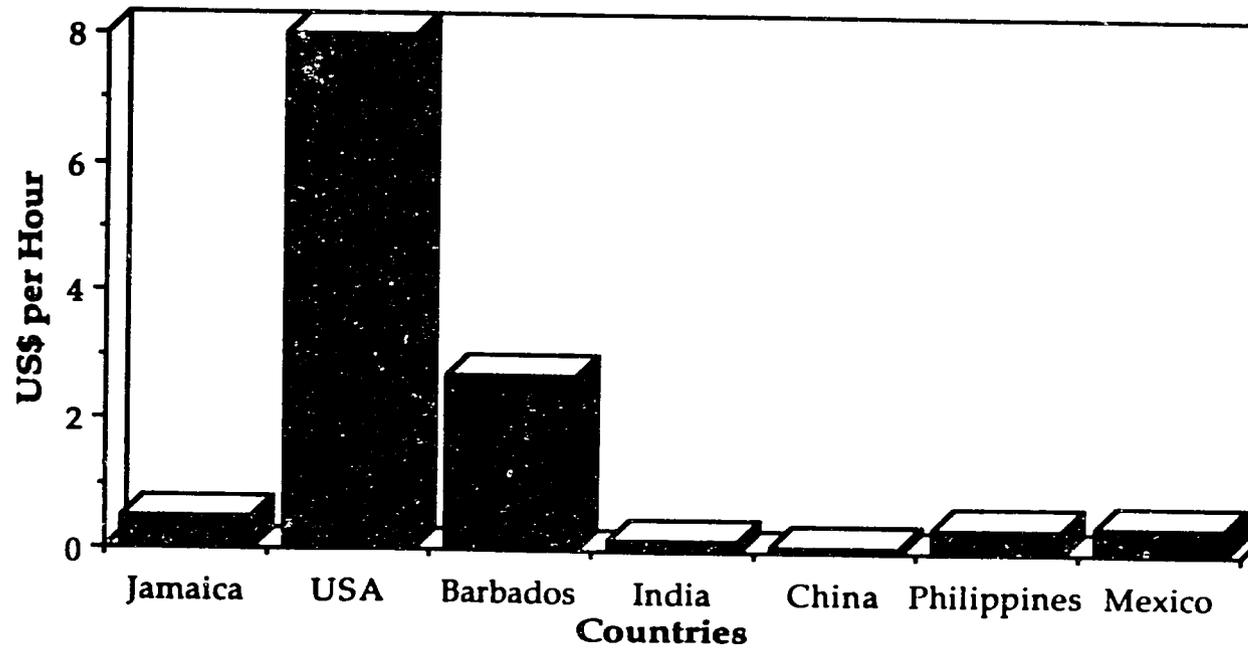
Even though Jamaican wages are not as competitive as those in India and China, the Jamaican data entry person is worse off in real terms because in Jamaica US\$0.50/hour buys much less than US\$0.10/hour in China. This partly explains why data entry is viewed as a low level occupation in Jamaica.

Labour

Cost

Data Entry

The following chart illustrates the comparative wage rates between selected countries that have data entry industries:



Source: AIWai Enterprises Research

Labour

Cost

Data Entry (Cont...)

High labour turnover is a problem that plagues Jamaican data entry firms. Most workers will not generally stay with a firm for more than two years. Turnover rates range from 30-50% per annum.

High turnover rates result in higher costs due to:

- higher total training costs as a result of the continual addition of untrained workers to the work pool
- loss of productivity when workers trained by a particular firm leave and are replaced by inexperienced workers.

The following are some of the main reasons for the high worker turnover in the Jamaican data entry industry:

- workers migrate from one data entry firm to the next in search of higher wages and/or better working conditions
- workers migrate from data entry into secretarial or tourist industry (Montego Bay) positions for higher wages and improved social status
- workers migrate from data entry to some other occupation closer to home.

However, it is worth noting that some data entry firm owners feel that a high turnover rate is good for Jamaica because it means that many workers who previously struggled to enter the labour force are moving upwards on the social ladder.

Labour

Cost

Data Entry (cont...)

Some firms incur additional costs by providing free transportation and lunches for their workers.

Costs of transporting labour and other benefits

Transportation is a serious problem for Jamaican workers attempting to get to work on time in the mornings and to get home safely in the nights after a late shift. Some firms provide transportation for workers to and from central locations where competition for public transportation is great in the mornings but is more readily available in the evenings.

Transportation is poor for workers in Montego Bay, especially in the Free Zone area.

If firms are not prepared to incur the cost of providing transportation, they are still likely to bear the cost in terms of loss of productivity due to:

- workers arriving late, tired, flustered and in no condition to produce a full days work
- evening shift workers worrying about going home and therefore not concentrating fully on the job.

Some firms provide workers with a lunch financed by the firm. Although this is an additional cost to firms, it is likely to produce more productive and committed workers.

The overall rating of Jamaican labour costs is competitive in terms of wage rates, however high turnover rates, costs of transportation and costs of meals, etc., reduce this competitiveness to some extent.

- Overall rating of local labour costs

• competitive ✓	• uncompetitive
-----------------	-----------------

Labour

Cost

Programming

Programmers in Jamaica earn approximately US\$3,000 - 7,000 per annum. This comparatively low income has two major effects - the international cost competitiveness of Jamaican programmers improves but there is a negative effect in terms of high turnover.

Actual labour costs in Jamaica

- Programmers are recruited after graduation at base salaries of about J\$70,000, which increase rapidly to a maximum of about J\$150,000, equivalent to about US\$3,000-7,000 per annum. Comparable rates in the USA are US\$35,000 upward.
 - The depreciation of the exchange rate being experienced in Jamaica at present means that services may be purchased at ever lower US dollar rates. However, inflationary trends will stimulate wage demands, though these will lag behind US dollar costs for skilled labour.
 - Industry information suggests a turnover rate of about 30% for programmers. This high turnover rate increases the cost of local programming operations, however, to retain programmers would require massive wage increases, which may be more costly to firms than recruitment/replacement and training costs resulting from turnover.
- Overall rating of local labour costs

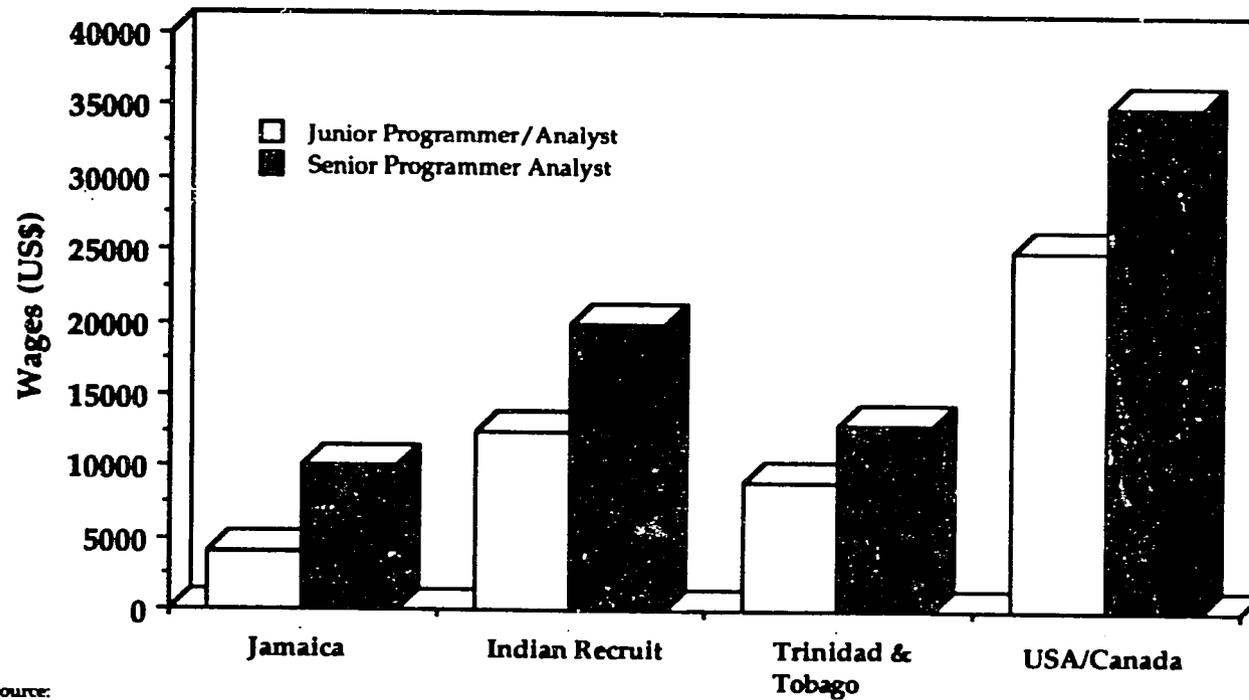
• Good ✓	• Average	• Poor
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Labour

Cost

Programming

The table below compares the salaries of Jamaican programmers and analysts with those in other selected countries



Source:
AllWat Enterprises Research

Labour

Cost

GIS, Imaging, CAD/CAM, Telemarketing

Although Jamaica is not very active in these areas, based on salaries in similar activities, one can estimate likely wage rates.

Actual Labour Costs in Jamaica

The wages paid to GIS and CAD/CAM workers (excluding managers) should be in line with those of draftspersons in architectural and engineering firms which are in the range of J\$50,000 to J\$100,000 (i.e., US\$2500 to US\$5000 per year). These wages are very competitive when compared to those in similar occupations in the USA.

The wages paid to imaging and telemarketing workers should be in line with those of mid- to top-level data entry operators, that is about J\$800 per week or J\$40,000 per year (US\$2,000). These wages are also very competitive with those paid in the USA.

• Overall rating of local labour costs

• Good ✓	• Average	• Poor
----------	-----------	--------

Labour

Availability

Data Entry

An abundance of readily available labour of the right mix is very desirable for this industry if growth is to take place and the problems associated with high turnover rates are to be reduced. Jamaica has an abundance of inadequately trained but eminently trainable labour.

Actual availability of labour

In Jamaica there is an abundance of inadequately trained labour in the age cohorts most suited to data entry. The Statistical Institute of Jamaica's (STATIN's) data shown below, reveal that there is high unemployment in the 14 -19 and 20 -24 age groups in which most data entry workers fall.

Age	No. Unemployed		Unemployment Rate	
	Male	Female	Male	Female
14-19	17,900	27,800	26.2%	59.9%
20-24	14,600	39,200	14.3%	40.7%

The table above shows that unemployment is higher amongst females. A survey of local firms by the consultants reveals that over 90% of workers in the industry are female. It appears that the structure of the Jamaican labour market is well suited for supporting an expansion of the data entry market.

Labour

Availability

Data Entry

Kingston and Montego Bay face different situations with respect to labour availability.

Kingston

Kingston and its environs have an abundance of unemployed labour, close to 50% of the population lives in this part of the country. Labour, in terms of numbers, should therefore not be a problem. However, Stony Hill H.E.A.R.T. Academy has insufficient capacity to satisfy the training needs since it produces less than 165 graduates per year. Furthermore, it is poorly located for those living in the Portmore and Spanish Town areas.

Montego Bay

Montego Bay has a smaller population than Kingston and faces greater transportation shortages. This means it is more likely that there will be problems of labour availability although this is offset by the fact that 480 graduates annually are produced by the Kenilworth H.E.A.R.T. academy.

Although Montego Bay firms report that graduates from the Kenilworth H.E.A.R.T. academy are well trained, the City's data entry industry may still find itself relatively short of labour because:

- it is competing against the tourist sector for workers, especially during the tourist season
 - the H.E.A.R.T. hotel training course attracts many that would otherwise train for data entry
- Overall rating of local availability based on unemployed population and available training

	• Good	• Average	• Poor
Kingston		✓	
Montego Bay		✓	

Labour

Availability

Programming

There are many programmers working in Jamaica. Many work as in-house programmers for firms not in the information service sector, with most of the remainder working in the computer service or sales sector.

Actual availability of labour

- Industry interviews suggest that there are approximately 200 to 250 programmers currently working *as programmers and to export standards* in Jamaica. Estimates of charge-out earnings in the region of US\$ 50,000 per programmer indicate total current market capacity of approximately US\$ 10 million per annum.
- A survey of 25 major computer service companies, recently carried out by The Consortium Graduate School of the Social Sciences, indicates the following mix of relevant and support skills:

Programmers	1
Training personnel	12
Technical support	168
H/ware installation and maintenance	94
Senior management	85

- In addition to the above programming work force, there are in-house programmers in the financial and other industrial sectors plus the annual output of programmers produced by UWI and CAST. Each year over 120 trained graduates enter the work force. Unfortunately, many new graduates as well as experienced programmers migrate to mainland North America to secure higher remuneration which reduces the local availability of programmers. It is possible that this pool of labour could be attracted back to Jamaica given career opportunities and higher wages.

Labour

Availability

Programming

The number of available programmers is probably adequate for present domestic needs. However, the current availability is not nearly sufficient to develop a substantial export market as well as satisfy local needs.

- It must be noted that there are a number of programmers working primarily in hardware/software/systems sales due to higher earnings potential in sales careers.
- There are a few self-taught and 'hacker' level programmers in Jamaica.

Overall rating of local availability of programmers

• Good	• Average ✓	• Poor
--------	-------------	--------

Labour (cont...)

Summary and Conclusions (Data Entry)

Quality and availability of labour resources should not be major impediments to the success of the data entry industry in Jamaica.

The Jamaican data entry industry is faced with a set of highly dexterous non-unionised workers in the 18 to 25 age range. In addition the industry is supported by a large unemployed pool of trainable labour resources. The local industry is still young and will improve (given improved training) in areas of management, supervision and quality control as it matures.

The motivation of workers could be improved significantly if remuneration was increased. This would also improve society's perception of data entry as a profession. Currently it is ranked near the bottom rung of the employment ladder.

If more effort is placed on improving the quality and quantity of well trained workers there will be all round benefits to the industry in terms of:

- more productive and motivated workers
- better paid workers

On the whole, the quality and availability of labour resources should not be a major hindrance to the success of the data entry industry in Jamaica as long as initiatives can be taken to improve and maintain the image of the industry. The industry's image is currently tarnished by the fact that it is perceived as not being a stable employer, as many firms have been forced to close down or lay off workers. Though there is great scope for the industry to benefit further from institutional training, there is above average availability of trainable workers and wages are competitive. Furthermore, labour unions have not played a role in the activities of the industry. This can be seen as a positive factor by many investors and potential investors.

Labour

Summary and Conclusions (cont....)

The level of programming skills in Jamaica is limited by a number of crucial factors outlined below:

The Jamaican programming sector has a group of well trained programmers operating in a variety of activities. The level of programming skills in Jamaica is limited by the following factors:

- there is no graduate degree course in programming in Jamaica
- highly trained programmers often find it more financially rewarding to offer their services in the USA where they can earn 10 times as much in Jamaican dollar terms.

Programming services have typically not been exported from Jamaica, despite the large international demand for offshore programming services. With this factor in mind, the consultants are not targeting programming as a major service export in the short run. Instead, it is recommended that:

- programmers be used to service domestic demand and help to make Jamaican organisations more efficient and productive;
- programmers be used to support all the other niches of the information services sector.
- incentives be given to students to pursue more courses in programming, especially at the post-graduate level, so that eventually more offshore programming activities can be actively pursued.

Labour (cont...)

Summary and Conclusions

Current labour availability is an impediment to the success of the newer information service niches where the industries have limited technical bases. Training needs should be directed towards changing this situation.

Developments in CAD/CAM are taking place due to the fact that architects and engineers are responding to technological advances in their professions. However, architectural and engineering firms view CAD/CAM as support services for their primary activities rather than services to be marketed. These firms have to be made aware of the potential to earn foreign exchange by engaging themselves more actively in the provision of offshore CAD/CAM services.

It is very encouraging for Jamaica that CAST will soon be teaching courses in CAD as part of their architectural course.

The other niches (GIS, imaging and telemarketing) are relatively new to Jamaica, however many Jamaicans (especially those in related occupations) can be trained to take advantage of export opportunities. It is suggested that CAST, H.E.A.R.T. and other institutions offer courses in these newer areas.

**THE FOLLOWING SECTION DEALS WITH THE PHYSICAL
INFRASTRUCTURE FOUND IN JAMAICA-
TELECOMMUNICATIONS, TECHNOLOGICAL
INFRASTRUCTURE, POWER, WATER, AND TRANSPORT.**

Infrastructure

Telecommunications

Availability of telecommunications facilities in Jamaica

Jamaica is very well equipped to provide good quality national and international telecommunications services. The telephone service in Jamaica is now completely digital.

Local telecommunications service is provided through Telecommunications of Jamaica (TOJ) .

□ International service is provided through:

- TOJ
- Jamaica Digiport International (JDI)

TOJ

TOJ has a packet switching network with a capacity of 500 lines in all major towns. Speed ranges are from 1,200 bps to 56,000 bps.

TOJ also has a capacity of 6,000 international in watt lines in Kingston, Montego Bay, St. Ann's Bay, Ocho Rios and Mandeville. This capacity can be readily increased.

The efficiency of TOJ has increased rapidly during the last year and more lines are being made available for users and potential users of telecommunications services.

Waiting periods between request for service and installation are unpredictable and depend on the previous availability of telephone services to the business premises.

Infrastructure

Telecommunications

Availability of telecommunications facilities in Jamaica (cont...)

The quality and availability of telecommunications facilities in Jamaica has improved dramatically in recent years and this is expected to continue throughout the 1990's. This should enhance Jamaica's competitive position (or at least maintain it) in relation to other off-shore destinations. JDI enhances Jamaica's ability to provide information services to the US market.

JDI through its powerful satellite facilities, offers access to high speed lines for firms operating within the Montego Bay Free Zone and the new Office Park in Kingston. Firms in these Free Zone areas can benefit from cheaper rates for high speed and high quality connections with the USA, Canada, and the U.K. Users of the JDI can either use switched lines or dedicated lines.

Free Zone companies have a major advantage over non-Free zone companies in having access to JDI. This will continue until either TOJ can improve its facilities to match those of JDI or the facilities of JDI are made available to non-Free Zone operations.

• Current rating of telecommunications in terms of quality and availability

• Good	✓	• Average	• Poor
--------	---	-----------	--------

• Prospective rating

• Good✓	• Average	• Poor
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Infrastructure

Telecommunications

Cost of international telecommunications using TOJ services varies according to destination. Rates are summarised below.

A one-minute minimum charge is in effect to all nations for ISD calls. Operator assisted calls have a three-minute minimum charge.

There is a system called International Call Authorisation System (ICAS) which demands a 10-digit authorisation code to complete overseas calls. This system may be regarded as cumbersome, but protects the customer from (potentially expensive) unauthorised calls.

Calls to the USA are based on zones. Reduced rates are offered from 6:00 pm to 5:00 am and all day Sunday.

Zone	Full rate (per min)	Reduced rate (per min)
Zone 1 (Florida)	J\$8.63	J\$6.56
Zone 2 (Alabama, DC, Tennessee, S Carolina) Zone 4 (Arkansas, Louisiana, Oklahoma, Texas)	J\$10.24	J\$8.63
Zone 3 (New York, New Jersey, New England States) Zone 5 (Iowa, Nebraska, S. Dakota) Zone 6 (Arizona, California, Montana, Utah)	J\$12.21	J\$10.24
Zone 7 (Pacific Northwest)	J\$15.98	J\$13.12

As can be seen from the above, call rates range from c. US\$0.30 to c. US\$0.70 per minute.

Infrastructure

Telecommunications

Telephone calls between Jamaica and the USA are more expensive than calls within the USA. International calls are also more expensive in US dollar terms, but are still reasonably priced. Jamaica is favourably positioned in comparison to many other off-shore destinations

No discounts are offered on calls to other nations. Typical ISD rates are:

Caribbean	J\$3-17 per minute
South America	J\$17.21-28.63 per minute
Canada	J\$13.86 per minute
UK	J\$15.98 per minute
Other Europe	c. J\$20 per minute
Middle East	c. J\$20 per minute
Asia-Pacific region	\$J20-29 per minute
Africa	J\$20-45 per minute

Rates as outlined above translate to a range of US\$0.14 to US\$2.04 per minute.

Despite having adequate and improving telecommunications facilities, charges are more expensive for connections with the USA than for calls within the USA and calls between Puerto Rico and the USA. It is unlikely that Jamaica will ever be able to change this situation. However, this is not as important a cost for data entry as it is for off-shore telemarketing. In data entry labour cost savings are likely to outweigh the relatively high telecommunications costs.

In comparison to other competing destinations such as the Philippines, Jamaican telecommunications costs for links with the USA are still relatively cheap.

Infrastructure

Telecommunications (cont...)

Cellular phones are available. Charges for these and for installation costs for other telecommunications peripherals are summarised below.

Registration	J\$370
Installation	J\$500-700/unit
Total	J\$870-1070 (c. \$US40-50)
Recurrent charges	
Monthly rate	J\$600
Unit rental	\$235-360/month
Local calls	J\$3-5.50/minute
Overseas calls	J\$3/minute plus international call rate (see above.)

Installation costs

- Installation costs for telephone, fax and modem lines in Jamaica are approximately:
 - J\$185 per main line.
 - J\$100 per extension line
 - J\$ 14 per month for rental charges

Telephone installation waiting periods are variable but improving.

The reliability of Jamaica's current telecommunications facilities compares favourably with those in the USA.

- Rating of telecommunications in terms of cost and reliability

• Good	• Average ✓	• Poor
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Infrastructure

Telecommunications (cont..)

Some Information Services niches are more dependent upon communication cost, quality and reliability than others. The chart on page 77 shows the link between efficient telecommunications and turnaround time for all niches.

Though telecommunications are equally available and costly to all niches of the information services sector they are of greater importance to some niches than to others. Niches which require quick turnaround and frequent use of telecommunications facilities are more sensitive to the supply, cost and reliability of telecommunications.

For the information services industry to grow more efficiently, it is critical that access to telecommunications is improved and costs are contained to the greatest extent possible. If Jamaican telecommunication costs are uncompetitive, a Jamaican telemarketing sector may never flourish. Jamaica should aim at having its telecommunications meet the requirements of the information services niche to which telecommunications are most important.

Infrastructure (cont...)

Availability of Technology

Both the necessary computer technologies and the support services are available in Jamaica

Access to Technology

- Many of the major international computer companies are represented in as fully owned subsidiaries. Consequently, Jamaica has always found itself privy to the leading edge of technology. Geographical access to the USA and its media increases awareness of technological change and availability. Access to technology for all niches of the information services industry is available as long as the customer is willing to pay the going price which is unfortunately inflated by import duties.

Technological support

- Due to a shift in emphasis in the Jamaican education system over the last 20 years towards a more technically-oriented education, and Jamaica's geographical proximity to the USA, Jamaica now possesses, or has available to it, all the competence needed to support, maintain and advance its technology.

Local Support Facilities

- The following list of firms are currently operating in Jamaica and specialize in marketing and supporting the thrust of technology in Jamaica.
 - IBM WORLD TRADE CORPORATION
 - NCR JAMAICA LTD
 - ISLAND MICROSYSTEMS
 - ABACUS
 - GRACE-UNISYS
 - ICL
 - ADVANCED INTEGRATED SYSTEMS
 - WTG/APTEC

Infrastructure

Availability of Technology (cont....)

Support systems are available in Jamaica for the majority of commonly used computer systems. When all factors are considered, the availability of technology and support services is rated as being above average

Support, software and accessories are readily available for DOS, UNIX, OS/2 and Macintosh systems. The nearby US market offers easy access to a vast array of suppliers in the event that a product is not immediately available in Jamaica.

CAST has been turning out between 10 and 20 computer service technicians annually since the mid 1980's.

Rating of technology availability and support

• Good	✓	• Average	• Poor
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Infrastructure (cont...)

Utilities and Amenities

Power

Power (electricity) is available in commercial quantities, though quality is variable.

Power

- A reliable and uninterrupted power supply is of critical importance to computer-intensive work. The absence of such reliable power supply can lead to a host of problems including:
 - damaged equipment
 - lost work
 - contaminated files
 - loss of productive time and subsequent frustration amongst workers
 - failure to meet delivery deadlines

The frequency of power fluctuations and outages in Jamaica poses a real threat to the efficient operation of the information industry since firms are exposed to all the above problems.

To minimize the impact of an unreliable power supply, the base requirement is an adequate UPS system, larger operations might require a backup power supply combined with UPS protection.

Infrastructure

Utilities and Amenities (cont...)

Transportation

Labour intensive niches may need to become self-sufficient in terms of transport in order to circumvent some of the associated problems and ensure labour productivity and stability.

• Transportation

As mentioned earlier in the discussion of labour costs, transportation is critical to the efficiency of a data entry or other labour intensive operation unless workers live within walking distance of the plant. In most cases Jamaican workers have to travel great distances to work. The unreliability and discomfort of public transportation in Jamaica is very stressful for workers who often arrive late for work or are forced to start out for work much earlier than they would prefer. Consequently, workers often arrive at work in a mental and physical condition not conducive to maximum productivity.

Some firms have tried to circumvent or minimize the transportation problem by measures including the following:

- providing transportation for workers to and from some central location
- moving or setting up their operations on or near a good bus route
- adjusting working hours to increase the probability of workers arriving on time

Transportation is probably just as important for a telemarketing operation as it is for a data entry operation. However, in the other niches, transportation may be slightly less important because:

- workers are likely to be more highly paid and can make alternate arrangements
- arriving on time is less critical since working hours can be more flexible
- turnaround times for jobs are less onerous.

Infrastructure

Utilities and Amenities (cont...)

Water

Currently there are few problems with the reliable supply of potable water

Water

A reliable water supply is crucial to a labour intensive firm such as a large data entry or telemarketing operation. Apart from thirst quenching needs, the work force will regularly require bathroom/washroom facilities. Worker morale can be quickly reduced if such facilities are rendered inadequate by problems relating to water availability or quality. Fortunately for Jamaica, water problems are not a regular occurrence so do not have a significant impact on production.

Rating of amenities in terms of what is required to efficiently operate in this industry and compared to that available in the USA

• Good	• Average ✓	• Poor
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**THE FOLLOWING SECTION DEALS WITH
MARKET CONDITIONS IN THE US AND
JAMAICA'S CAPACITY TO DEAL WITH THEM**

Market Conditions in the USA

Market Conditions as Drivers

The market conditions in the USA are very important drivers for the information services market since the USA is the destination of nearly all Jamaican offshore work. Important factors are: the USA regulatory environment; shifts in the USA market; advances in technology and relative labour costs.

□ USA Regulatory Environment

A major reason for the demand for offshore services is due to the fact that the regulatory environment in the USA imposes specific requirements for retention, distribution and access to certain documents based on the particular industry and sensitivity of information. Industries where these requirements are in place include:

- the financial services industry
- the legal services sector
- health care services
- government agencies

□ Shifts in USA Market

Jamaica has to respond to changes taking place in the USA with respect to the usage of information processing. For example, many financial and government offices are now using advanced office automation technologies which rely less on simple key entry and more on sophisticated information capture and verification processes.

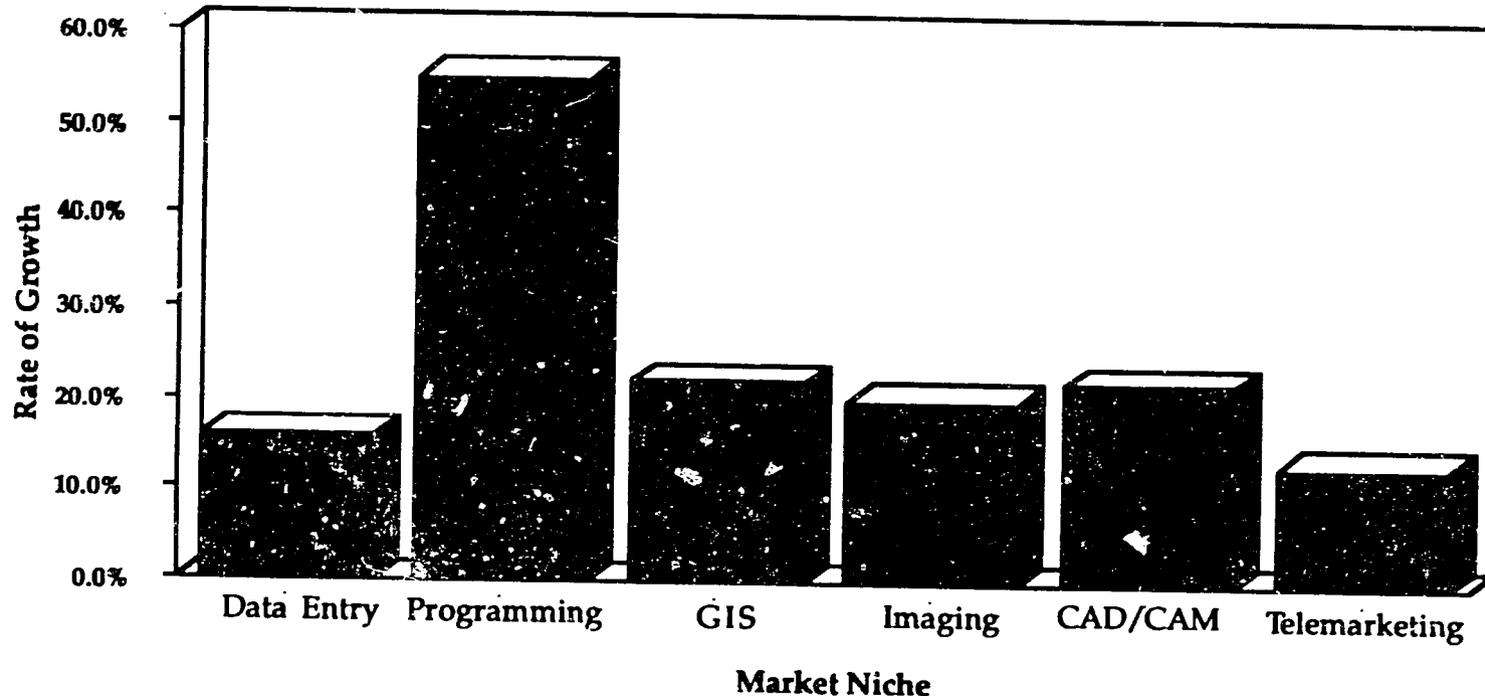
In addition, Jamaica has to respond to the fact that many large hardware and component manufacturing firms in the USA are forming strategic partnerships with service bureaux to promote their own products.

Jamaica will need to adopt more aggressive and imaginative marketing strategies to enhance its position in a changing market. Jamaican firms must also seek new long term partnerships with system integrators, computer manufacturers, and project management firms in the USA.

Market Conditions in the USA (Cont...)

Rate of Growth

The projected rate of growth of all niches is over 15% per annum. This suggests that the prospects for a competitive Jamaican market are favourable in all niches.



As can be seen from the graph above, the rate of growth is greatest in the programming niche - however, there are substantial growth projections in all other niches, with telemarketing and data entry being projected for the two lowest rates of growth. However it should be noted that data entry and telemarketing are two of the largest sectors, as was shown on page 17.

Market Conditions in the USA (cont...)

Technological Advances

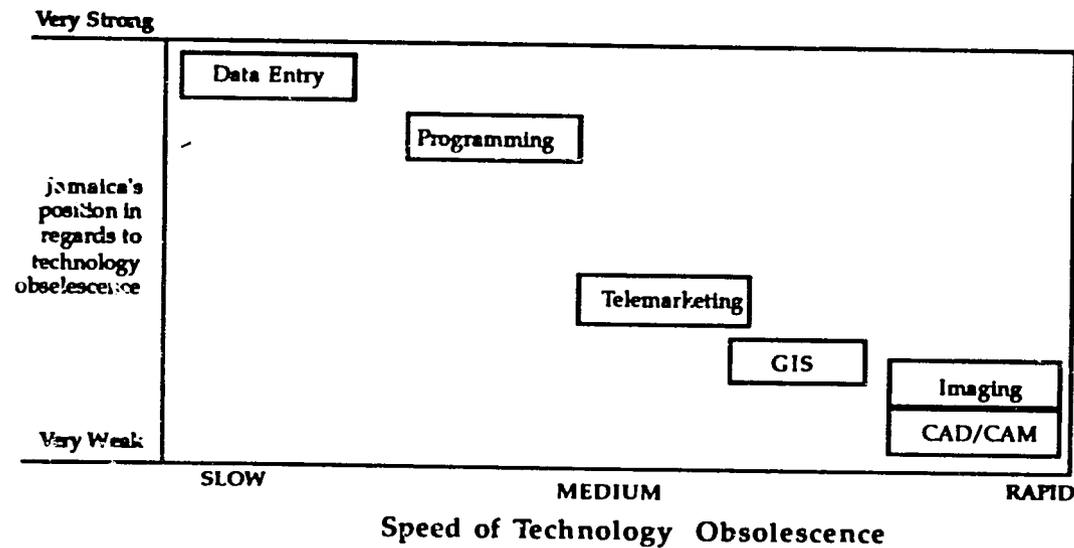
Advances in computer systems and support equipment have rendered data entry more cost effective and reliable. Technological advances combined with lower technical costs and the increasing demand for timely information have made the purchase of data entry services a viable proposition for many users from the USA.

The use of service bureaus for data entry

- reduces the high costs of in-house data entry
- reduces the cost of storing hard copies of documents
- enables a company to streamline its activities and focus on its main line of business

Technology Obsolescence

Market niches in which the technology becomes obsolescent rapidly are more difficult for Jamaica to penetrate and/or sustain a strong position. In most cases, with the exception of data entry and to a lesser extent programming, technology obsolescence is relatively fast.

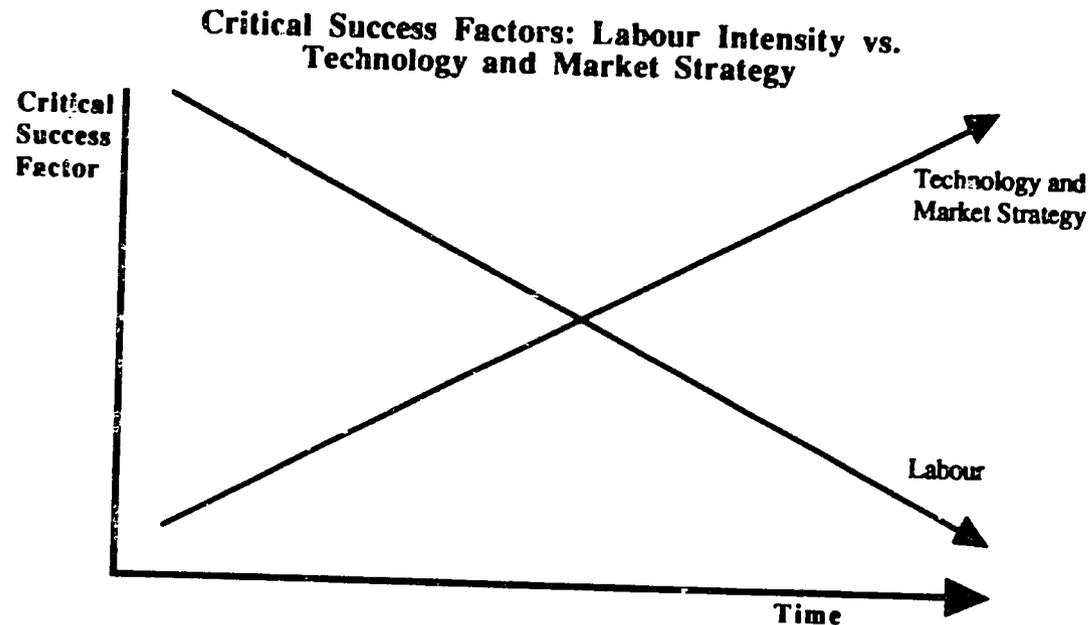


Market Conditions in the USA (cont....)

Labour costs

Although competitive wage rates is an area in which Jamaica has a competitive advantage over the USA and is currently a major driver of the demand for offshore services, the Jamaican data entry industry has to prepare for the fact that labour alone is becoming less of a critical success factor as technology and market strategies change.

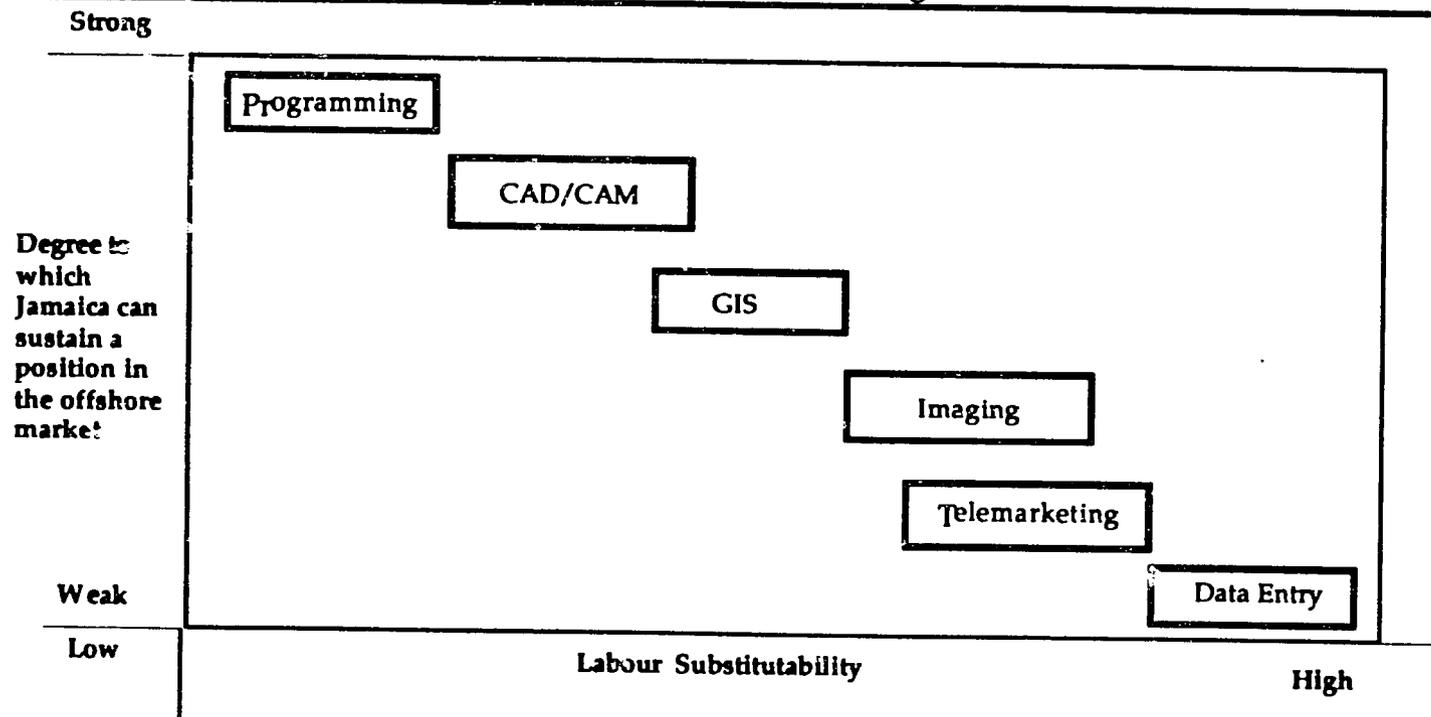
The Jamaican industry must make sure it develops a dynamic marketing strategy and ensure that it retains a track record and sound business/financial support to secure the confidence and commitment of large clients.



Market Conditions in the USA (cont...)

Labour Substitutability

The degree to which labour can be substituted for technology is a very important factor in a global environment where technology is changing rapidly and decreasing in price. Labour expense, especially in the United States, is an ever increasing cost. In some cases, such as data entry, it is possible that technological advances will lead to the replacement of labour through technological substitution. Niches in which there is a high substitutability are not ideal for Jamaica in the medium to long term.

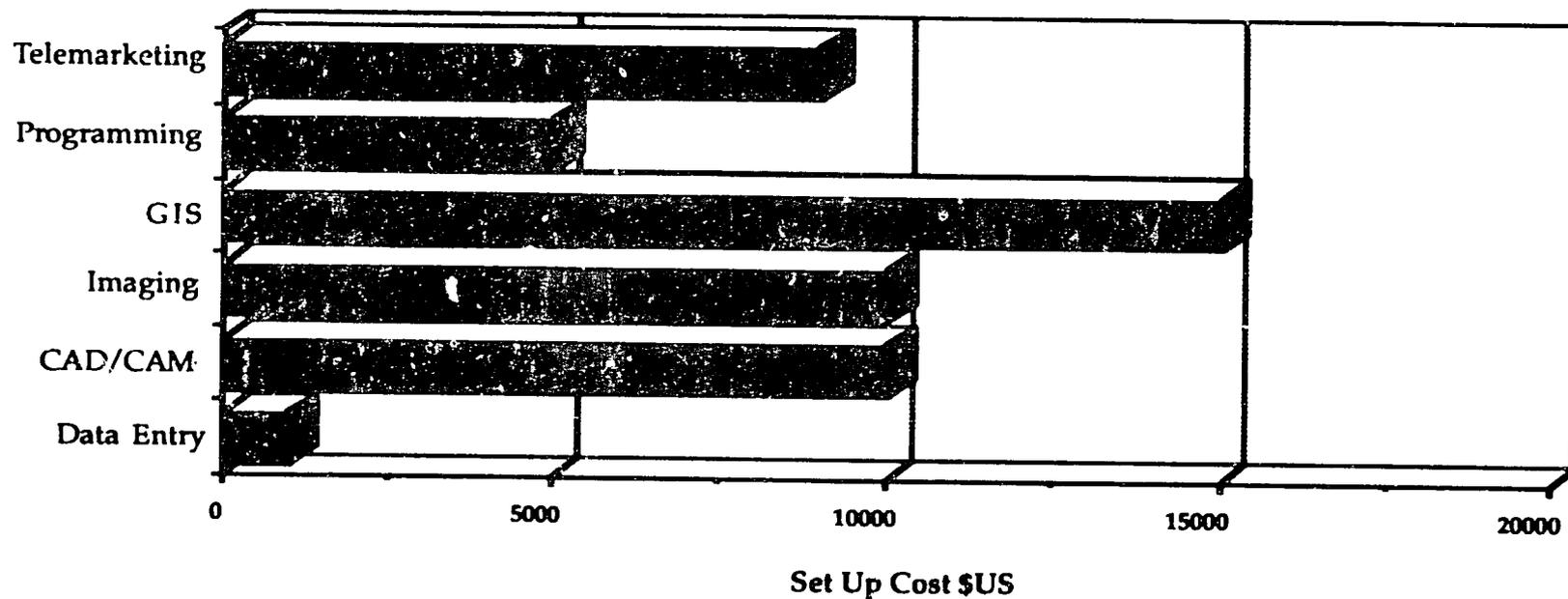


The chart indicates that Jamaica should make plans to minimise the national impact of technological changes that result in the loss of employment of a large portion of data entry operators. Plans should include the development of a training strategy that enables upward mobility of DE operators to the more technologically intense niches.

Market Conditions in the USA (cont....)

Set up costs

The chart below gives comparative estimated set-up costs in all of the niches examined. This estimated cost is per work station.

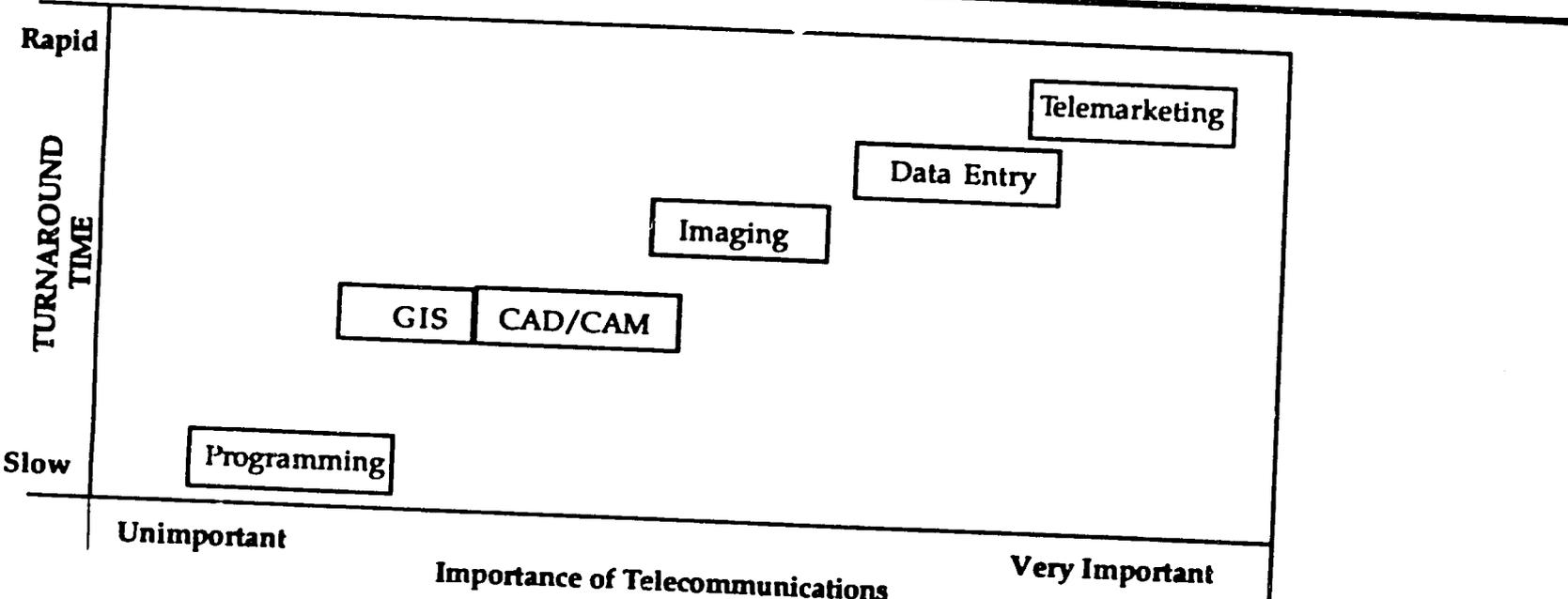


It should be noted that these costs are approximate, and that the systems costs vary, depending upon the make, model, operating system, power of the system and the cost of the software. Prices are generally declining, especially as more high powered MS-DOS based machines, capable of performing high end functions are released onto the market.

Market Conditions in the USA (cont....)

Turnaround Time

It can be seen from the chart below that turnaround time and the availability of good communications are intimately linked.



Efficient telecommunications becomes more and more critical as the turnaround time demand becomes more important. Because of its sound telecommunications infrastructure, Jamaica is in a strong position to satisfy this US market condition.

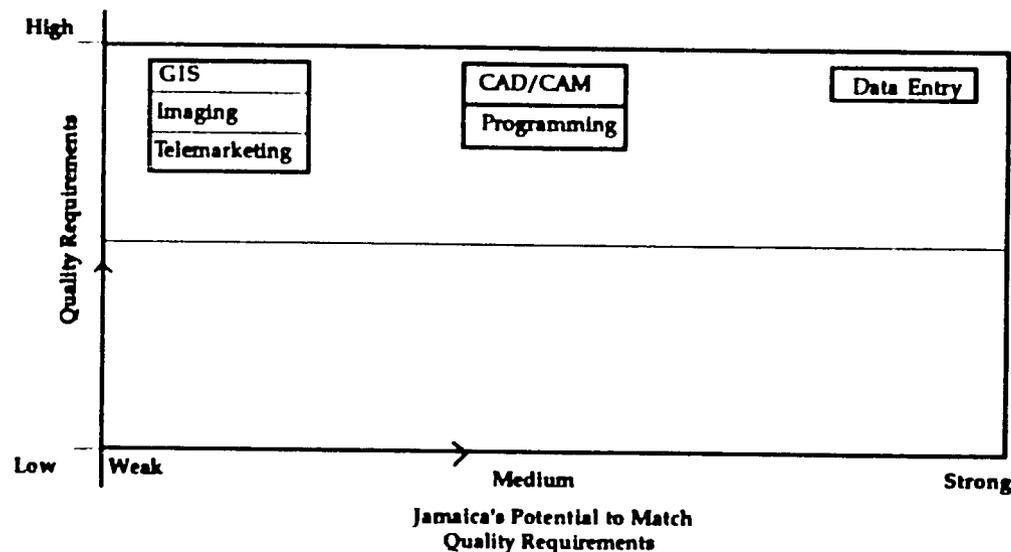
Market Conditions in the USA (cont....)

Quality Importance

Quality is a critical variable in all of the information services sub-sectors. However, due to Jamaica's lack of experience and training in niches such as imaging, GIS and telemarketing, Jamaica may be less favourably placed to match the necessary quality requirements.

Quality Maintenance

- It is important that the quality requirements of the US market are adhered to, especially as Jamaica moves into the more technologically intensive and sophisticated niches.
- Quality must also be a major consideration for any joint marketing organisation promoting the export of information services.



Market Conditions in the USA (cont...)

Despite the current recession and the "buy American" campaign in the USA, Jamaica should be able to maintain a favourable position with respect to US clients, with appropriate marketing strategies.

Jamaican firms must continue to market aggressively and stay abreast of market changes in the USA and hope that the nationalist focus seeping through the USA does not become too far reaching

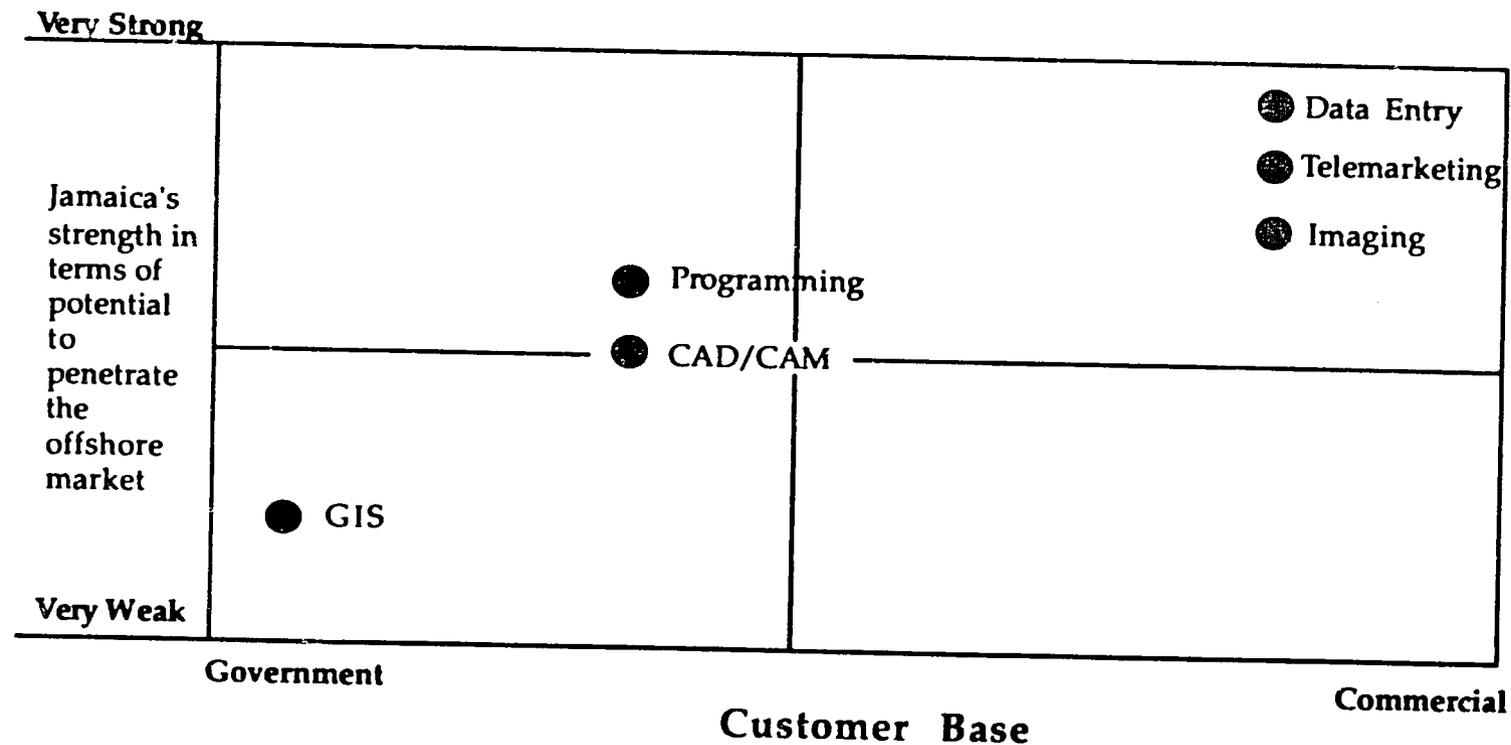
A possible factor that could seriously affect the export of data entry services to the USA is the "buy American" campaign which is going on in the USA at the moment. If the economic recession in the USA is protracted, it is possible that US firms may be forced or persuaded to reduce their consumption of offshore services because of the claim that American jobs are being exported. This could have a strong negative effect on Jamaica's information services industry.

Market Conditions in the USA (cont....)

Customer Base

The customer base for certain activities has changed over time and there is more commercial demand for these services in the United States.

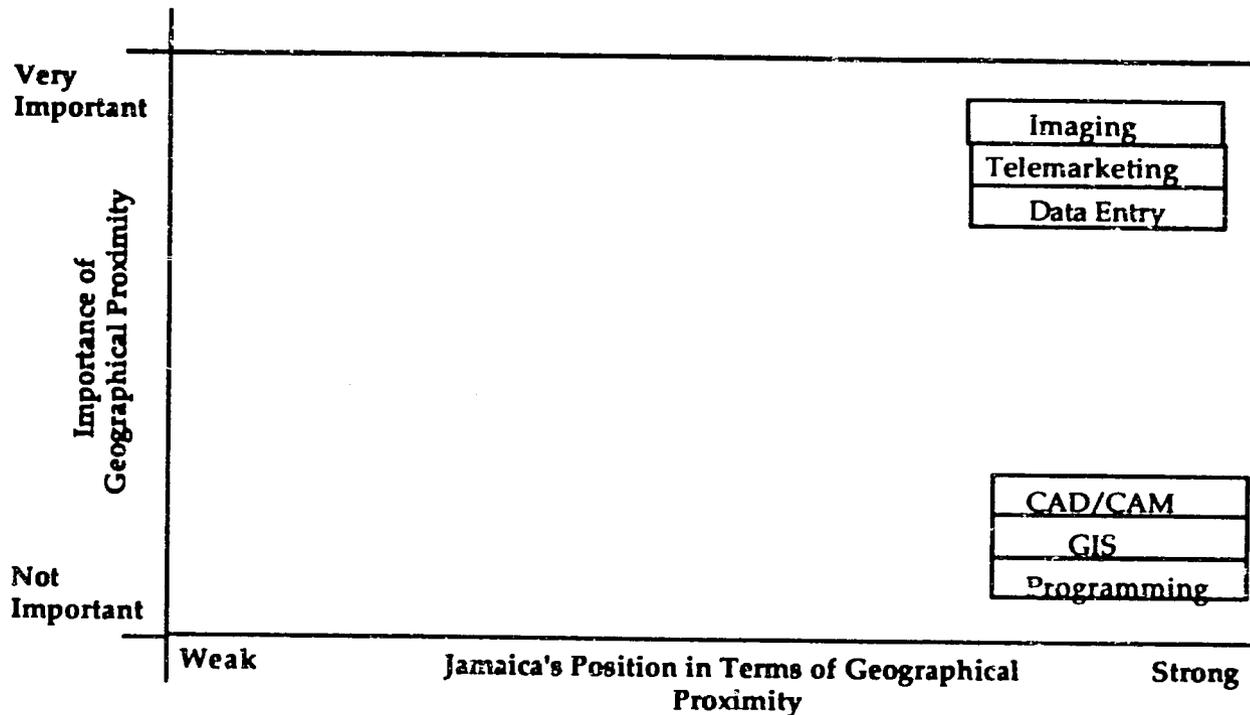
The greater the degree of commercial demand the greater is Jamaica's opportunity to penetrate the market. Government information is usually both sensitive in content and insensitive to cost considerations.



Market Conditions in the USA (cont....)

Geographical Proximity

Geographical proximity between the local market and the client's market is important for certain information services activities, since transportation and communication costs are cheaper the closer the host and the client countries are. This is therefore extremely important for data entry, imaging and telemarketing. Jamaica is strong in terms of geographical proximity for all niches.

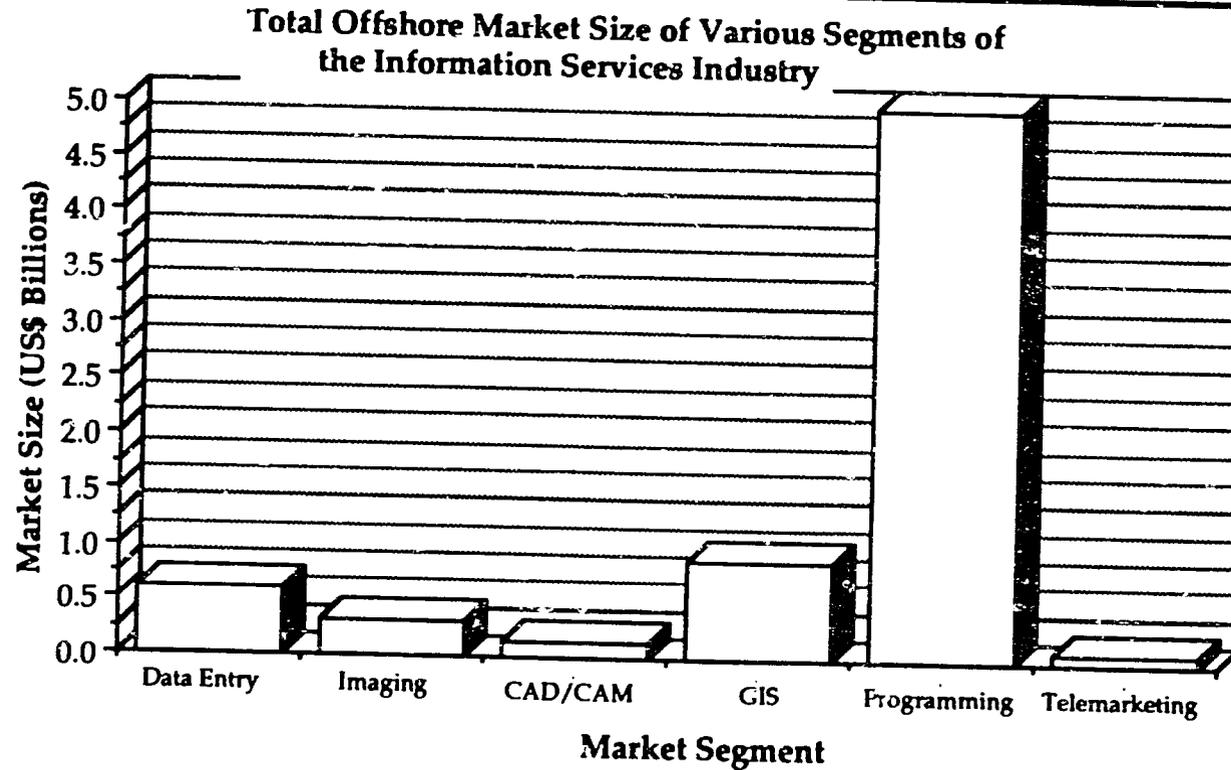


Geographical proximity is very important in imaging, data entry and telemarketing because turnaround time is more rapid and the frequency of communications between the two locations is higher. CAD/CAM, GIS and programming are typically more longer term activities that require less frequent communication between contractor and client. In these cases, geographical proximity is less important.

Market Conditions in the USA (cont...)

Offshore Market Size

In terms of offshore market size, offshore programming, GIS and data entry appear to be the most attractive. However, in absolute terms all offshore markets are large. The extent of market penetration is not a constraint for Jamaica in any of the sub-sectors.



Source: AllWal Enterprises Research

• Rating of US market conditions

• Good	• Average ✓	• Poor
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The previous pages presented the main market conditions prevailing in the United States. In the succeeding pages critical success factor analyses of data entry firms in Jamaica will be presented together with analyses of these factors.

**THE NEXT SECTION CONSISTS OF A SERIES OF
CASE STUDIES OF JAMAICAN INFORMATION
SERVICES FIRMS PRESENTED IN THE FORM OF
A MATRIX. A DISCUSSION OF THESE
FACTORS FOLLOWS THE MATRIX.**

Critical success factors as applied to a sample of Jamaican firms

The following matrix describes the status of a sample of Jamaican firms that have commenced operations over the past 20 years. The matrix shows the firms' abilities to meet the critical success factor. Those that have not are now no longer in operation.

Firm	Operating Status	Ownership	Capitalisation	Management	USA market Penetration	Quality Assurance	Location
Firm 1	Out of Business	Foreign	Poor	Poor	Poor	Poor	Mobay
Firm 2	Out of Business	Local	Poor/Average	Average	Strong	Average/Poor	Kingston
Firm 3	Out of Business	Local	Poor	Poor	Poor	Poor	Kingston
Firm 4	Out of Business	Local	Strong	Average	Poor	Poor	Kingston
Firm 5	Out of Business	Foreign	Poor	Poor	Poor	Poor	Kingston
Firm 6	Out of Business	Foreign	Strong	Poor	Strong	Poor	Kingston
Firm 7	In Operation	Local	Average/Strong	Strong	Average/Strong	Strong	Kingston
Firm 8	In Operation	Strong	Strong	Strong	Strong	Strong	Mobay
Firm 9	In Operation	Local	Average	Average	Poor	Strong	Kingston
Firm 10	In Operation	Local	Average	Strong	Average	Average	Kingston
Firm 11	In Operation	Foreign	Strong	Strong	Strong	Strong	Kingston
Firm 12	In Operation	Local	Strong	Strong	Strong	Strong	Kingston

Critical success factors as applied to a sample of Jamaican firms (cont...)

Several firms have entered the data entry business in Jamaica and have been forced to close due to deficiencies in certain critical success areas. Below these critical success factors are listed and are used to analyse why certain firms have failed and why others are still operating.

CRITICAL SUCCESS FACTOR	COMMENT
Management	Although management is a part of labour, which is in itself the larger critical success factor, non-management labour problems are common to all firms. Adequacy of management, however, has been a major determinant of the success or failure of firms
Capitalisation	Under capitalisation and/or inappropriate capital equipment has been a major reason for the failure of some firms. Inadequate capitalisation has led to some firms being unable to fulfill the needs of their clients.
Quality Assurance	Quality assurance refers to a firm's ability to produce and maintain high quality work and meet client turnaround requirements. A failure in quality assurance is a common factor in data entry firm failure.
USA Market Penetration	Being able to penetrate the USA market is a major key to the success of data entry firms. Market penetration is a function of marketing (amount of money and time spent). A critical success factor in this area appears to be the retention of a large steady client. Failure to attract and retain USA clients has been a major contributor to the demise of Jamaican data entry firms.
Infrastructure base.	Infrastructural deficiencies can be a major cause of problems to data entry firms, especially those operating outside the free zones. However apart from those firms in the free zones, all firms start from the same infrastructural base. This has not been identified in surveys as a major cause of corporate failure.

Summary of activities leading to an expansion in the Information Services Industry

Labour issues

The following matrix summarises recommendations concerning training, availability and turnover of labour

CSF	Activity	Rationale	Agency	Completion Indicator
Training	1. Expand/improve data entry training	Need for competitive output	HEART with industry input	Courses designed, training initiated, evaluated
	2. Encourage improved entry qualifications to data entry courses, with options for upgrading of skills for movement into other niches.	Typical grade 9 leaver needs more training to provide career options and upward mobility	HEART and CAST with industry input	Courses designed, training initiated, evaluated. Data entry operators taking advantage of opportunities.
	3. High end training specifically for Imaging, telemarketing, CAD and GIS	Need for industry expansion into high tech areas offering high growth potential	HEART and CAST with industry input	Courses designed, training initiated, evaluated
	4. Supervisory training for all niches	Need to improve the formal qualifications of supervisory staff in all niches	HEART and CAST with industry input	Courses designed, training initiated, evaluated
	5. Management Training for all niches	Need to improve the formal qualifications of management in all niches	HEART and CAST with industry input. Private training organisation participation.	Courses designed, training initiated, evaluated
	6. MSc in Computer Sciences	Needed to enter the very large and developing off-shore programming market: also to meet local needs in an expanding market	UWI with industry input	Courses designed, training initiated, evaluated
Availability and turnover	1. Improve industry image	Attract career oriented work force, through training opportunities and awareness of career potential	Industry /Jampro/Schools	Availability of enough well-trained labour to satisfy all niches
	2. Improve base level wages in all market niches	Attract career oriented work force through improved pecuniary incentives	Industry	As above
	3. Improve working conditions	Attract career oriented persons through improved working conditions	Industry	As above
	4. Define career paths within industry, with data entry base	Attract career oriented persons	Industry	Entrants moving upward and sideways through niches

Critical Indicators in Each Sub-Sector of the Jamaican Information Technology Industry and its ability to Satisfy US Markets - The Current Situation

Factor	Sub-sector	Data Entry	Imaging	CAD/CAM	GIS	Programming	Telemarketing
Market Size		\$US600 m	\$US310 m	\$US140m	\$US900m	\$US 5b.	\$US 100m
Rate of Growth		16%	20%	22%	22%	55%	12-15%
Training and Experience Requirements		High School	High School +	CAST +	CAST +	Grad., BSc.	High School +
		Medium	Weak	Medium	Medium	Medium	Weak
Labour Sensitivity		High	Low	Low	Low	Low	High
Information Sensitivity		Low	Average	Average/High	Average	Low	High
		Strong	Medium	Medium/Weak	Medium	Strong	Weak
Cost of Set Up		Low	High	Medium	High	Low- High	High
		Strong	Medium	Medium	Medium	Strong	Weak-Medium
Geographical Proximity		Important	Important	Unimportant	Unimportant	Unimportant	Important
		Strong	Strong	Strong	Strong	Strong	Strong
Turnaround Time		Very Important	Very Important	Unimportant	Unimportant	Unimportant	Very Important
		Strong	Weak	Weak	Weak	Strong	Weak
Customer Base		Commercial	Commercial	Comm/Govt	Comm/Govt	Comm/Govt	Commercial
		Strong	Strong	Medium	Medium/Weak	Medium	Medium
Quality Importance/Cost		High	High	High	High	High	High
		Strong	Weak	Medium	Weak	Medium	Weak
Technology Obsolescence		Medium	Rapid	Rapid	Rapid	Rapid	Rapid
		Medium	Weak	Weak	Weak	Weak	Weak

Critical Indicators in Each Sub-Sector of the Jamaican Information Technology Industry and its ability to Satisfy US Markets - The Medium Term (5 Years) Target Situation

Factor	Sub-sector	Data Entry	Imaging	CAD/CAM	GIS	Programming	Telemarketing
Market Size		\$US1.26b	\$US770m	\$US380m	\$US2.46b	\$US 45b.	\$US 184m
Rate of Growth		16%	20%	22%	22%	55%	12-15%
Training and Experience Requirements		Gr 11 High School+ Revised HEART Strong	Gr 11 High School+ Revised HEART Strong	CAST + Specialist HEART Medium	CAST + Specialist HEART Medium	Grad., BSc. MSc. Comp. Science Medium	High School + Elocution + Sales+ Computer Training Strong
Labour Sensitivity		High	Low	Low	Low	Low	High
Information Sensitivity		Low Strong	Average Medium	Average/High Medium/Weak	Average Medium	Low Strong	High Weak
Cost of Set Up		Low Strong	High Medium	Medium Medium	High Medium	Low- High Strong	High Strong
Geographical Proximity		Important Strong	Important Strong	Unimportant Strong	Unimportant Strong	Unimportant Strong	Important Strong
Turnaround Time		Very Important Strong	Very Important Medium/Strong	Unimportant Medium/Strong	Unimportant Medium	Unimportant Medium	Very Important Medium
Customer Base		Commercial Strong	Commercial Strong	Comm/Govt Medium	Comm/Govt Medium/Weak	Comm/Govt Medium	Commercial Medium
Quality Importance/Cost		High Strong	High Medium	High Medium	High Medium	High Medium	High Medium
Technology Obsolescence		Medium Medium	Rapid Medium	Rapid Medium	Rapid Medium	Rapid Medium	Rapid Medium

Assumptions

1. That recommended training programmes are implemented without delay.
 2. That there is continued market growth in each niche.
 3. That this niche growth continues to be greatest in programming and least in data entry.
 4. That no legislation is enacted in the US to prevent export of data for processing in any form.
 5. That the technology will continue to improve in all niches and that present trends in hardware prices will allow lower end entry into any niche at a lower cost.
 6. That data entry will continue as a separate niche, but the divisions between it and some of the other niches will become blurred because of technological advances.
 7. That the cost of Jamaican labour and the other comparative advantages enjoyed by Jamaica currently remain constant.
- NB. Given the exponential growth in the technologies, it becomes apparent that in a 10 year time frame those businesses that have positioned themselves at the high end of current technology will have a considerable advantage over those that elect to remain with purely labour intensive operations.

Summary of Recommendations

Detailed recommendations are presented in the accompanying document entitled "Recommendations for the future of the Jamaican Information Services Industry". The following are a summary of these recommendations.

The future for the expansion of the Jamaican Information services industry appears to be extremely promising due to a combination of:

- a rapidly expanding US offshore market in all niches of the information services industry.
- the decline in the value of the Jamaican dollar *vis à vis* the US dollar, giving Jamaica a greatly improved competitive position regarding the bidding for a proportion of the US offshore market share.

It must be noted that the US market is changing and changing very rapidly. This change is being driven by rapid technological change which is moving the market away from the traditional keyboard capture type of data entry into more technologically intense and less labour intense forms of data entry such as

- Imaging
- Bar coding
- Voice recognition

This trend is one that must be taken seriously by Jamaican information services firms as the logical conclusion is that over a long term, traditional key capture data entry markets are going to shrink in favour of growth in the technologically intense niches.

Opportunities are also being opened up by US market conditions in non-data entry areas such as GIS, CAD/CAM, telemarketing and programming.

Summary of Recommendations (cont...)

In order for the Jamaican industry to take full advantage of this situation the following should be noted:

- The industry must become more aware of the market trends in the United States and elsewhere.
- Capital investment in the latest technologies must be made. These capital investments are generally fairly substantial, although prices are dropping substantially for both MS DOS and UNIX based hardware.
- Jamaican training capabilities must be improved, both in terms of quality and the quantity of trained persons available for the industry. This training should be conducted for all niches and for all levels inside these niches. It would be appropriate for the less skill intensive activities such as telemarketing and imaging to conduct training courses through H.E.A.R.T. institutions, while GIS and CAD/CAM training should be conducted as a major part of the drafting course at CAST. It is essential for the development of the programming industry that the degree course in Computer Science is expanded and that a Masters degree programme in Computer Science is developed to ensure top end expertise in this potentially huge off-shore market place.
- Jamaican information services companies must develop a co-operative marketing strategy. the Jamaican industry is fairly small in comparison to many countries, especially those in the Pacific rim. Jamaica does have significant geographical and linguistic comparative advantages compared to these countries, but size of operation is not one of these. In the detailed recommendations, a marketing co-operative model is proposed and explained.
- Government should recognise the huge potential of the information services market and the potential significance that full and concerted participation in this market has to the earning of large amounts of foreign exchange. As such Government should make every effort to encourage growth in this market. To this end it is recommended that Government:
 - * Invests heavily in training as outlined above
 - * Gives the industry as many concessions as possible. These should include a negation of all import duties on computer hardware and software and a zero rated GCT status for all all software and hardware. This must be done in order to encourage investment in expensive high end technologies.

APPENDICES

APPENDIX A

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APPENDIX 1
BUISINESS PLANS

BUSINESS PLANS

Business Plan For a Small Data Entry Operation: 20 operators (All calculations are carried out in US\$)

No. operators	20				
Price/1000 keystrokes	\$0.60		Exchange rate	22.75	
No. operator hours/day	6				
No. weeks/year	45		Sq. ft of plant	900	
No. keystrokes/hour/operator	8750		Price/sq.ft	\$2.20	
Revenue	Year 1	Year 2	Year 3	Year 4	Year 5
Fixed Costs	141750	159469	179402	179402	179402
Rent	1978	1978	1978	1978	1978
Equipment lease					
Computers	16000	16000	16000	16000	16000
Furniture & fixtures	1266	1266	1266	1266	1266
Equipment maintenance	1920	1920	1920	1920	1920
Vehicle lease (2)	13600	13600	13600	13600	13600
Vehicle maintenance	1632	1632	1632	1632	1632
Auditing fees	2400	2400	2400	2400	2400
Marketing	6000	6000	6000	6000	6000
Insurance	1679	1679	1679	1679	1679
Security	1000	1000	1000	1000	1000
Sub-total	47475	47475	47475	47475	47475
Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5
Electricity	4396	4396	4396	4396	4396
Water	500	500	500	500	500
Telecommunications	5275	5275	5275	5275	5275
Transportation					
Local	2110	2110	2110	2110	2110
Foreign	10549	10549	10549	10549	10549
Payroll Taxes	2898	2898	2898	2898	2898
Entertainment	6000	6000	6000	6000	6000
Office & equipment supplies	2400	2400	2400	2400	2400
Brokerage	3600	3600	3600	3600	3600
Sub-total	37727	37727	37727	37727	37727
Salaries					
Administration Manager (1)	6593	7418	8345	9388	10561
Accounting Clerk (1)	2198	2473	2782	3129	3520
Supervisors (2)	3516	3956	4451	5007	5633
Quality controllers (2)	2110	2374	2670	3004	3380
Programmer (1)	5275	5934	6676	7510	8449
Operators (20)	16000	18000	20250	22781	25629
Office help/messenger (1)	527	593	668	751	845
Total Salaries	36220	40747	45841	51571	58017
Total costs	121422	125950	131043	136723	143219
Profit	20327	33519	48359	42629	36182
Profit/revenue	14.34%	21.02%	26.96%	23.76%	20.17%

BUSINESS PLANS (cont...)

Business Plan For a Plant of 40 Data Entry Operators (All calculations are in US\$)

Operator:supervisor ratio	4				
No. operators	40				
Price/1000 keystrokes	\$0.60		Exchange rate	22.75	
No. operator hours/day	6				
No. weeks/year	45		Sq. ft of plant	900	
No. keystrokes/hour/operator	8750		Price/sq.ft	\$2.20	
	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	283500	318938	358805	358805	358805
Fixed Costs					
Rent	1978	1978	1978	1978	1978
Equipment lease					
Computers	22667	22667	22667	0	0
Furniture & fixtures	1793	1793	1793	0	0
Equipment maintenance	2720	2720	2720	2720	2720
Vehicle lease (2)	13600	13600	13600	13600	13600
Vehicle maintenance	1632	1632	1632	1632	1632
Auditing fees	2400	2400	2400	2400	2400
Marketing	6000	6000	6000	6000	6000
Insurance	1679	1679	1679	1679	1679
Security	1000	1000	1000	1000	1000
Sub-total	55469	55469	55469	31009	31009
Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5
Electricity	5846	5846	5846	5846	5846
Water	665	665	665	665	665
Telecommunications	5802	5802	5802	5802	5802
Transportation					
local	2110	2110	2110	2110	2110
foreign	10549	10549	10549	10549	10549
Payroll Taxes	4628	4628	4628	4628	4628
Entertainment	6000	6000	6000	6000	6000
Office & equipment supplies	2640	2640	2640	2640	2640
Brokerage	3600	3600	3600	3600	3600
Sub-total	41840	41840	41840	41840	41840
Salaries					
Administration Manager (1)	6593	7418	8345	9388	10561
Accounting Clerk (1)	2198	2473	2782	3129	3520
Supervisors (4)	7033	7912	8901	10014	11265
Quality controllers (4)	4220	4747	5341	6008	6759
Programmer (1)	5275	5934	6676	7510	8449
Operators (40)	32000	36000	40500	45563	51258
Office help/messenger (1)	527	593	668	751	845
Sub-total	57846	65077	73212	82363	92658
Total costs	155156	162387	170521	155213	165508
Profit	128344	156551	188284	203592	193297
profit/revenue	45.27%	49.09%	52.48%	56.74%	53.87%

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BUSINESS PLANS (cont...)

Business Plan For a Large Data Entry Operation: 300 operators (All calculations are carried out in US\$)

Operator:supervisor ratio	30				
No. operators	300			Exchange rate	22.75
Price/1000 keystrokes	\$0.60				
No. operator hours/day	6			Sq. ft of plant	4500
No. weeks/year	45			Price/sq.ft	\$2.20
No. keystrokes/hour/operator	8750				
	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	2126250	2392031	2691035	2691035	2691035
Fixed Costs					
Rent	9890	9890	9890	9890	9890
Equipment lease					
Computers	170000	170000	170000	0	0
Furniture & fixtures	13451	1793	1793	0	0
Equipment maintenance	20400	20400	20400	20400	20400
Vehicle lease (4)	27200	27200	27200	27200	27200
Vehicle maintenance	3264	3264	3264	3264	3264
Auditing fees	2400	2400	2400	2400	2400
Marketing	12000	12000	12000	12000	12000
Insurance	12593	12593	12593	12593	12593
Security	2000	2000	2000	2000	2000
Sub-total	273198	261541	261541	89748	89748
Variable Costs					
Electricity	17538	17538	17538	17538	17538
Water	1995	1995	1995	1995	1995
Telecommunications	11604	11604	11604	11604	11604
Transportation					
local	4220	4220	4220	4220	4220
foreign	21099	21099	21099	21099	21099
Payroll Taxes	28793	28793	28793	28793	28793
Entertainment	12000	12000	12000	12000	12000
Office & equipment supplies	10560	10560	10560	10560	10560
Brokerage	10800	10800	10800	10800	10800
Sub-total	118610	118610	118610	118610	118610
Salaries					
General Manager (1)	13187	14835	16690	18776	21123
Administration Manager (1)	6593	7418	8345	9388	10561
Accountant (1)	8791	9890	11126	12517	14082
Accounting Clerk (1)	2198	2473	2782	3129	3520
Supervisors (30)	52747	59341	66758	75103	84491
Quality controllers (30)	31648	35604	40055	45062	50695
Programmer (3)	15824	17802	20027	22531	25347
Operators (300)	240000	270000	308750	341719	384434
Office help/messenger (4)	2110	2374	2670	3004	3380
Sub-total	399912	404901	453514	512453	576510
Total costs	751720	783052	835664	720810	784867
PROFIT	1374530	1606980	1855371	1970225	1906169
Profit/revenue	64.65%	67.18%	68.95%	73.21%	70.83%

BUSINESS PLANS

Business Plan For a GIS Operation: 1 prog, 1 sys an, 2 GIS technicians, 20 DE (All calculations are carried out in US\$)

No. programmers	1			
Chargeout rate	\$50000		Exchange rate	22.75
No. sys analysts/consultants	1		Sq. ft of plant	700
Chargeout rate	\$60000		Price/sq.ft	\$5.00
No. GIS tech operators	2			
Chargeout rate	30000			
Working weeks/yr	45			
No. operators	20			
Price/1000 keystrokes	\$0.60			
No. operator hours/day	6			
No. keystrokes/hour/operator	8750			
	Year 1	Year 2	Year 3	Year 4
Revenue	141750	159469	179402	201828
Fixed Costs	311750	350719	394559	394559
Rent				
Equipment lease	3500	3500	3500	3500
Computers				
Furniture & fixtures	22667	22667	22667	0
Equipment maintenance	4500	4500	4500	0
Vehicle lease (2)	2720	3060	3443	3873
Vehicle maintenance	20267	20267	20267	0
Auditing fees	2432	2736	3078	3463
Marketing	2400	2700	3038	3417
Insurance	6000	6750	7594	8543
Security	1640	1845	2075	2334
Recruitment @ .25*.40*salary	1000	1125	1266	1424
Sub-total	3920	4410	4961	5581
Variable Costs	71045	73559	76387	32135
Electricity	Year 1	Year 2	Year 3	Year 4
Water	4000	4000	4000	4000
Telecommunications	500	500	500	500
Transportation	4500	4500	4500	4500
local				
foreign	1538	1731	1947	2191
Payroll Taxes	8791	9890	11126	12517
Entertainment	3136	3528	3969	4465
Office & equipment supplies	6000	6750	7594	8543
Brokerage	2500	2813	3164	3560
Sub-total	300	338	380	427
Salaries	31266	34049	37180	40772
General Manager (1)				
Sys analysts/consultants (1)	11000	12375	13922	15662
Programmer (1)	10000	11250	12656	14238
Office staff (3)	7000	7875	8859	9967
Technical operators 2 (GIS)	4000	4500	5063	5695
Operators (20)	7200	8100	9113	10252
Total Salaries	16000	18000	20250	22781
Total costs	39200	44100	49613	55814
Profit	141511	151708	163180	128652
Profit Revenue	\$170,239	\$199,011	\$231,379	\$265,907
	54.61%	56.74%	58.64%	67.39%

BUSINESS PLANS (cont...)

Business Plan For a Medium Programming Operation: 20 programmers (All calculations are carried out in US\$)

No. programmers	16		Exchange rate	22.75	
Chargeout rate	\$50000				
No. sys analysts/consultants	4		Sq. ft of plant	1200	
Chargeout rate	\$60000		Price/sq.ft	\$5.00	
Working weeks/yr	45				
Revenue	Year 1	Year 2	Year 3	Year 4	Year 5
Fixed Costs	1040000	1170000	1316250	1316250	1316250
Rent					
Equipment lease	6000	6000	6000	6000	6000
Computers					
Furniture & fixtures	22667	22667	22667	0	0
Equipment maintenance	2000	2000	2000	0	0
Vehicle lease (2)	2720	3050	3443	3873	4357
Vehicle maintenance	20267	20267	20267	0	0
Auditing fees	2432	2736	3078	3463	3896
Marketing	2400	2700	3038	3417	3844
Insurance	6000	6750	7594	8543	9611
Security	1640	1845	2075	2334	2626
Recruitment @ .25*.40* salary	1000	1125	1266	1424	1602
Sub-total	16700	18788	21136	23778	26750
Variable Costs	83825	87936	92562	98332	58686
Electricity	Year 1	Year 2	Year 3	Year 4	Year 5
Water	4000	4000	4000	4000	4000
Telecommunications	500	500	500	500	500
Transportation	4500	4500	4500	4500	4500
local					
foreign	1538	1731	1947	2191	2464
Payroll Taxes	8791	9890	11126	12517	14082
Entertainment	13360	15030	16909	19022	21400
Office & equipment supplies	6000	6750	7594	8543	9611
Brokerage	2500	2813	3164	3560	4005
Sub-total	300	338	380	427	481
Salaries	41490	45751	50120	53260	61042
General Manager (1)					
Sys analysts/consultants (4)	11000	12375	13922	15662	17620
Programmers (16)	40000	45000	50625	56953	64072
Office staff (3)	112000	126000	141750	159468	179402
Total Salaries	4000	4500	5063	5695	6407
Total costs	167000	187873	211359	237779	267502
Profit	292315	321300	354041	345871	387236
Profit/venue	\$747,685	\$848,638	\$962,209	\$970,379	\$929,020
	71.89%	72.33%	73.10%	73.72%	70.58%

BUSINESS PLANS (cont...)

Business Plan For a Large Programming Operation: 40 programmers

All calculations are carried out in US\$

No. programmers	35		Exchange rate	22.75	
Chargeout rate	\$50000				
No. sys analysts/consultants	5		Sq. ft of plant	1800	
Chargeout rate	\$60000		Price/sq.ft	\$5.00	
Working weeks/vr	45				
	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	2050000	2306250	2594531	2594531	2594531
Fixed Costs					
Rent	9000	9000	9000	9000	9000
Equipment lease					
Computers	34000	34000	34000	0	0
Furniture & fixtures	3000	3000	3000	0	0
Equipment maintenance	4080	4590	5164	5809	6535
Vehicle lease (2)	20267	20267	20267	0	0
Vehicle maintenance	2432	2736	3078	3463	3896
Auditing fees	2400	2700	3038	3417	3844
Marketing	6000	6750	7594	8543	9611
Insurance	1679	1889	2125	2391	2690
Security	1000	1125	1266	1424	1602
Recruitment @ .25*.40*salary	31250	35156	39551	44495	50056
Sub-total	115108	121213	128081	78541	87234
Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5
Electricity	5000	5000	5000	5000	5000
Water	500	500	500	500	500
Telecommunications	6000	6000	6000	6000	6000
Transportation					
local	2110	2374	2670	3004	3380
foreign	10549	11868	13352	15021	16898
Payroll Taxes	25000	28125	31641	35596	40045
Entertainment	6000	6750	7594	8543	9611
Office & equipment supplies	3500	3938	4430	4983	5606
Brokerage	500	563	633	712	801
Sub-total	59159	65117	71819	79359	87841
Salaries					
General Manager (1)	11000	12375	13922	15662	17620
Sys analysts/consultants (5)	50000	56250	63281	71191	80090
Programmers (35)	245000	275625	310078	348838	392443
Office staff (5)	6500	7313	8227	9255	10412
Total Salaries	312500	351563	395508	444946	500565
Total costs	486767	537892	595608	602846	675640
Profit	\$1,563,233	\$1,768,358	\$1,999,123	\$1,991,685	\$1,918,892
Profit/revenue	76.26%	76.68%	77.05%	76.76%	73.96%

BUSINESS PLANS (cont...)

Business Plan For a Small Programming Operation: 8 programmers
All calculations are carried out in US\$

No. programmers	6		Exchange rate	22.75	
Chargeout rate	\$50000				
No. sys analysts/consultants	2		Sq. ft of plant	450	
Chargeout rate	\$60000		Price/sq.ft	\$5.00	
Working weeks/yr	45				
	Year 1	Year 2	Year 3	Year 4	Year 5
Revenue	420000	472500	531563	531563	531563
Fixed Costs					
Rent	2250	2250	2250	2250	2250
Equipment lease					
Computers	9067	9067	9067	0	0
Furniture & fixtures	1000	1000	1000	0	0
Equipment maintenance	1083	1224	1377	1549	1743
Vehicle lease (1)	6800	6800	6800	0	0
Vehicle maintenance	316	318	1033	1162	1307
Auditing fees	2000	2250	2531	2848	3204
Marketing	4000	4500	5063	5695	6407
Insurance	726	817	919	1034	1164
Security	700	788	886	997	1121
Recruitment @ .25*.40*salary	7560	8505	9568	10764	12110
Sub-total	36007	38118	40494	26299	29305
Variable Costs	Year 1	Year 2	Year 3	Year 4	Year 5
Electricity	2500	2500	2500	2500	2500
Water	250	250	250	250	250
Telecommunications	2000	2000	2000	2000	2000
Transportation					
local	800	900	1013	1139	1261
foreign	7000	7875	8859	9967	11213
Payroll Taxes	6048	6804	7655	8611	9688
Entertainment	4000	4500	5063	5695	6407
Office & equipment supplies	1500	1688	1898	2136	2403
Brokerage	300	338	380	427	481
Sub-total	24398	26854	29617	32725	36222
Salaries					
General Manager (1)	11000	12375	13922	15662	17620
Sys analysts/consultants (2)	20000	22500	25313	28477	32036
Programmers (6)	42000	47250	53156	59601	67276
Office staff (2)	2600	2925	3291	3702	4165
Total Salaries	75600	85050	95681	107641	121097
Total costs	136005	150022	165792	166666	186624
Profit	\$283,995	\$322,478	\$365,771	\$364,897	\$344,939
Profit/revenue	67.62%	68.25%	68.81%	68.65%	64.89%

APPENDIX 2
THE KINGSTON OFFICE PARK

Introduction

The Kingston Office Park is planned as a major free economic zone facility adjoining the present site of Fiscal Services, the government linked computer organisation.

The Office Park is expected to provide about 300,00 sq. ft. of open planned office space aimed at facilitating the activities of firms in the information sector. It should benefit the following groups:

- existing data entry firms
- existing firms in other niches of the information services sector
- potential investors, both local and foreign, in the information services sector
- other local firms whose main activities heavily use information service, such as architects, engineers and consultants
- offshore banking operations

These entities will be subject to the condition that all of their production will be for **export** purposes only.

Funding

It is expected that the development of this park will be funded by private investors whose income will be derived from rental income paid by Office Park users. Feasibility studies are being conducted at the moment

Interaction with Tertiary Education Institutions

The Office Park is based on models currently in operation in the USA and Canada e.g. in Irvine and in "Silicon Valley" California.

Like these models, the Kingston Office Park will be set up close to CAST and UWI, the country's leading tertiary institutions. It is expected that by combining the activities of these institutions with those of the office park will lead to greater benefits for both.

The institutions will provide training and the Office Park will provide employment opportunities and other benefits. These will include opportunities for UWI to link its proposed super-computer into the Office Park facilities.

The Basic Infrastructure Provided at the Office Park

The Office Park will confer some advantages on those operating within it that are not available elsewhere in Jamaica apart from in other Free Zone areas. These Office Park/Free Zone specific advantages will include:

- Open plan buildings which can be customised according to the users needs
- Access to another Digiport Earthstation that will be erected in the Office Park compound.
- Access to telecommunications connections
- Access to mainframe facilities currently in place at Fiscal Services
- Stabilised power and UPS systems are economically viable for a large central point supplying a number of customers
- Security and maintenance support of the Office Park

Economic Advantages

The following will be the economic advantages conferred on users of the Office Park by its free zone status:

- Duty Free Trade
- Minimal customs procedure
- 100% tax holiday
- Freedom to repatriate profits (for foreigners)

Other Advantages

Other advantages that may result from being in the Office Park but which are not specific to it include

- information sharing as a result of being under one roof with other firms in the same industry, and having highly trained technical people to call on when needed
- greater opportunities for coordinating and executing joint marketing activities.

This impressive list of Office Park/Free Zone specific incentives should put beneficiaries at a great advantage over competitors and others involved in the same activities.

Possible Disadvantages

- The main disadvantage as perceived by possible clients in the data entry field is the potential for headhunting for staff and for lower security or confidentiality, as similar businesses are contained under one roof.
- Related to the above is the possibility of destructive competition arising as similar firms compete for shares of the same markets.
- No link to the local Jamaican market is allowed; this forces firms to rely solely on offshore sources of work, perhaps leading to underutilisation of assets at times.
- Though no rent structure has been proposed for the Office Park, high rents in the free zones have been a disincentive to potential investors or relocatees.
- Lastly, labour problems in one firm have the potential to disrupt the operations of others within the Park, particularly in the case of industrial action.

The above analysis of advantages and disadvantages indicates that it is not necessarily certain that an Office Park will succeed if it is established because the disadvantages may outweigh the advantages from the perspective of some firms. An in depth market research would be required to determine the level of interest of members and potential members of the sub-sector in moving to an Office Park.

Of ten non-Free Zone firms whose managers/owners were surveyed in this study, only one said their firm would not move *all* of its operations to the Office Park. This one exception claimed it would be prepared to move *some* of its operations to the Office Park. This suggests that firms would be interested in moving to the Office Park and is supported by the fact that several firms are already operating in Office Park/Free Zone facilities in Montego Bay and two at Fiscal Services in Kingston. .

Recommendations

A more detailed market research study must be commissioned to see ascertain more accurately the level of interest the Office Park.

If the research shows that the level of interest is low, then it may be advisable to rethink the idea in its entirety

If the market research shows that there is a high level of interest then Jamaica should proceed with the establishment of a purpose built Office Park. However, it should be constructed with the following factors in mind:

- it should be as fully modularised as possible (both internally and externally)
- it should be able to cope with both large and small operations
- it should be able to accommodate both technologically intensive and labour intensive operations.

The consultants have recommended that duty free and all other privileges enjoyed by Free Zone firms should be extended to other information services firms outside the Free Zone. This would take away some of the relative advantages of the Office Park/Free Zone but would provide incentives to a wider base of firms. The Office Park would still have a host of advantages over other locations due to economies of scale and to greater inter-industry co-operation and communication. Some of these advantages include:

- Economies of scale in joint marketing and production
- Savings to Office Park users resulting from sharing expensive back up, power stabilisation equipment, other infrastructural and any technical support facilities. Such expensive equipment must form part of the basic infrastructure of the Office Park, however would normally be available only to large rich information services firms.
- Synergies derived from operating in a highly technical environment with greater access to information and the management skills of others working in the same industry.

APPENDIX 3

A DATABASE LIST OF JAMAICAN INFORMATION SERVICES FIRMS

List of Jamaican Information Services

Company	Skill Base	Type of Service	Ownership	Employee	Location	Legal Form
Central Data Processing Inc. Ja. Ltd.	low	Data entry services	Local	26	Kingston	Limited liability
CFL Ltd	low	Data entry services	Foreign	400	Mobay	Limited liability
Computerprox Ltd	low	Data entry services	Local	75	Kingston	Limited liability
Data Bay Ltd	low	Data entry services	Local	260	Montego Bay	Limited liability
Data Conversion Ltd	low	Data entry services	Local	80	Kingston	Limited liability
Data Entry Services Ltd	low	Data entry services	Local	70	Kingston	Limited liability
Data Key processors Ltd	low	Data entry services	Local	72	Kingston	Limited liability
Datacap Processing	low	Data entry services	Local	100	Kingston	Limited liability
Datagraphics	low	Data entry services	Local	38	Kingston	Limited liability
Datamation	low	Data entry services	Local	78	Kingston	Limited liability
Datatec Ja. Ltd.	low	Data entry services	Local	39	Kingston	Limited liability
Datatron	low	Data entry services	Local	55	Kingston	Limited liability
Digital Logics data Entry Ltd	low	Data entry services	Local	32	Kingston	Limited liability
Digital Services Ja Ltd	low	Data entry services	Foreign	220	St Thomas	Limited liability
DPK Jamaica Ltd	low	Data entry services	Local	89	Kingston	Limited liability
Jamerican Associates	low	Data entry services	Foreign	400	Kingston	Limited liability
MC Data Ltd	low	Data entry services	Local	35	Kingston	Limited liability
Microlink Data Systems Ltd	low	Data entry services	Local	4	Mandeville	Limited liability
MMM Exp. Group Ltd	low	Data entry services	Local	109	Kingston	Limited liability
MRS (JA) Ltd	low	Data entry services	Foreign	300	Mobay ME	Limited liability
Prodas jamaica	low	Data entry services	Local	16	Kingston	Limited liability
Quality key Punch Ltd	low	Data entry services	Local	16	Kingston	Limited liability
Sherwood	low	Data entry services	Local	107	Santa Cruz	Limited liability
Telemar Jamaica Ltd.	low	Data entry services	Foreign	240	Kingston	Limited liability
Trans Data Express	low	Data entry services	Foreign/Local	30	Montego Bay	Limited liability
Transfer Data Ltd	low	Data entry services	Local	135	Kingston	Limited liability
Computer Services & Programming	high	Data Processing (bureaux) services	Local	90	Kingston	Limited liability
Advanced Integrated Systems	high	Full service firms (hardware sales & sys. develop.)	Local	25	Kingston	Limited liability
Business Technology Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)			Kingston	
Computer Business Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local		Kingston	
Dataprox Computer Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local	12	Kingston	Limited liability
IBM World Trade Corporation	high	Full service firms (hardware sales & sys. develop.)	Foreign	98	Kingston	Branch

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Company	Skill Base	Type of Service	Ownership	Employee	Location	Legal Form
Information Technologies Ltd.	high	Full service firms (hardware sales & sys. develop.)				
Innovative Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)			Kingston	
Interface Systems and Consultancy Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local	19	Kingston	Limited liability
International Computers Ltd	high	Full service firms (hardware sales & sys. develop.)	Foreign	34	Kingston	Branch
Management Control Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local	45	Kingston	Limited liability
Vector Design & Applications Systems Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local	22	Kingston	Limited liability
WTG/APTEC	high	Full service firms (hardware sales & sys. develop.)	Local	50	Kingston	Limited liability
Abacus Computing Ltd.	high	Full service firms (hardware sales & sys. develop.)	Local	12	Kingston	Limited liability
Bay Telemarketing Agency Ltd	low	Telemarketing	Local	4	Montego Bay	
Casual Jamaica Holidays	low	Telemarketing	Local	14	Montego Bay	
Computer Hardware & Software Systems Ltd.	N/A	Related services				
Sunny Bay Resort Ltd	low	Telemarketing	Local	3	Montego Bay	
Supreme data Co. Ltd	high	Related services (database host services)	Local	3	Kingston	
Adams Consultants Ltd.	high	Systems consultancy & software development	Local	9	Kingston	Limited liability
Advanced Digital Services Ltd.	high	Systems consultancy & software development	Local	17	Kingston	Limited liability
Coopers & Lybrand	high	Systems consultancy & software development	Foreign		Kingston	Limited liability
Decision Support Systems	high	Systems consultancy & software development			Kingston	
Fiscal Services Ltd.	high	Systems consultancy & software development	Local (State)	210	Kingston	Limited liability
Hitek Software Engineers Ltd.	high	Systems consultancy & software development	Local	24	Kingston	Limited liability
Mercury Information Systems	high	Systems consultancy & software development	Local	14	Kingston	Limited liability
Peat Marwick Mitchell & Company	high	Systems consultancy & software development	Foreign	8	Kingston	Partnership
Port Computer Services Ltd.	high	Systems consultancy & software development	Local	18	Kingston	Limited liability
Price Waterhouse	high	Systems consultancy & software development	Foreign	41	Kingston	Partnership
Related Computer Services Ltd.	high	Systems consultancy & software development				
Touche Ross Ogle	high	Systems consultancy & software development	Foreign		Kingston	Limited liability
B & B Institute of Business	N/A	Training Services			Kingston	
Compulearn Ltd.	N/A	Training Services				
Compututor Ltd.	N/A	Training Services				
Datamac Software Systems Ltd.	N/A	Training Services				
Datrex	N/A	Training services	Local	10 -150	Kingston	
Duff's Business College Ltd.	N/A	Training Services	Local			
Jamaica School of Business	N/A	Training Services				

List of Jamaican Information Services

Company	Skill Base	Type of Service	Ownership	Employee	Location	Legal Form
Microcad Ltd	high	Training services	Local	10	Kingston	Limited liability
Software Training Centre Ltd	N/A	Training Services				
Telecommunications of Jamaica	N/A	Telecom carrier services	Publicly list		Island Wid	Limited liability
Jamaica Digiport	N/A	International Telecom carrier services	Foreign		Montego B	Joint Venture
APEC Consultants		CAD				
Urban Development Corp.		CAD				
Al Adams & Ass.		CAD				
Marvin Goodman & Ass.		CAD				
Design Collaborative		CAD				
Nadine Isaacs		CAD				
O'Callaghan Consulting Engineer		CAD	Mobay			
Proplan Ltd		CAD				
Ruan Enterprise (Pat Stanigar)		CAD				
Microcad Ltd	10	CAD	Kingston	all 3	local	1987
Mapsurv Ltd/EHD Wilson & Assoc.	25	mapping	Kingston	NoelWhite/B		
Jamaica Public Service	5	GIS				
Nuclear Div., UWI		GIS				
ALCOA		GIS				
ALCAN		GIS				
Rural Physical Planning, Min Ag.		GIS				
Total number of data entry firms	26					
Total Employment of Data Entry Firms	3013					
Total number of firms doing telemarketing	3					
Total employment in telemarketing	21					
Number of Organisations using GIS	5					
Number of firms doing programming	11					