Project Terminal Report

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| **Project Title** |  | **Project Number** |
| Knowledge Based Society – Support for the Creation of the Arab Centre for eContent Development. |  | 00072495 |
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| **Project Partners** |  | **Project Budget** |
| eGovernment AuthorityKingdom of Bahrain |  | USD 486,514 |

NARRATIVE REPORT

# I. PURPOSE

Supported by the e-Government Authority of Bahrain (eGA), United Nations Development Programme (UNDP) and United Nations Department for Economic and Social Affairs (UNDESA), the Arab Centre for eContent Development was established to instill best practices and meet the need for a Knowledge Based Society (KBS) in Bahrain and the Arab region as a whole.

The Centre was tasked with:

* Setting industry standards and accreditation for Arabic eContent development;
* Managing and coordinating the creation of Arabic eContent;
* Developing a strategy for improving Arabic eContent search capability; and
* Encouraging capacity building of e-Government across government agencies.

This initiative will help promote private/public partnerships in knowledge-based business services, which will, in turn, generate employment opportunities in this emerging field. In addition, the Arabic KBS model breaks down barriers and opens access to knowledge to a far wider audience of Arabic speakers, thereby empowering citizens to realize their true potential.

# II. ASSESSMENT OF PROGRAMME/PROJECT RESULTS

The agreement to establish the Centre was signed in November 2009; however, the Centre began operations in May 2010 due to difficulties in hiring qualified personnel to lead operations.

## Below are the highlights of the Centre’s accomplishments.Establishment of the Centre

The Centre was established and the required personnel were recruited in accordance with the plan. A leading consultant was recruited to develop a detailed plan for the project, oversee the day-to-day activities to ensure the Centre’s objectives are met. Whenever required, the Centre recruited international consultants to carry out short-term consultancies. Details of the Centre’s establishment and activities are provided as part of each accomplishment.

## Expert-Level Workshop

The Centre organized an expert-level workshop titled “Towards a Knowledge Based Society” in cooperation with the eGA, UNDP and UNDESA on 13 and 14 February 2011.

Within the overall vision of contributing to the building of the aspired for Knowledge-Based Society (KBS), the Centre invited leading intellectuals and industry experts from around the Arab world to discuss the challenges facing individuals, organizations, and government entities building Arabic electronic content and their attempts to bring it through effective and accessible online services and sustainable channels.

High on the list of objectives of the workshop was the need to assess the current status of Arabic content (electronic and non-electronic) and the overall crisis of Arabic content in general and Arabic e-content in particular. Workshop participants attempted to identify the knowledge gaps that threaten to negatively impact the presence of the Arabic language on the Internet as well as the many efforts that are underway in the Arab world to increase Arabic e-content online.

During the two day workshop, the experts, through presentations and open discussion, sought to address the following key areas:

* Identify challenges currently facing the Arabic language as more of the world moves online (technical and non-technical).
* Identify legal issues and copyright challenges faced by e-content developers, publishers, and distributors.
* Define the potential market for Arabic online e-content and services.
* Map efforts in the region underway to address these challenges.
* Identify ways to improve searching for Arabic e-content online.
* Approaches to enhance/increase and stimulate e-content innovations in the Arab world.
* Approaches to step up youth participation in Arabic e-content development and utilization.
* Assess the impact of technological advances on the Arabic language (how technology can handle character recognition, speech, and semantics).

The Centre invited speakers from the United States, Bahrain, United Arab Emirates, Saudi Arabia, Egypt, Syria and Lebanon as well as industry experts, government officials and potential investors in the e-content sector.

The workshop began with opening statements from H.E. Sayed Aqa, United Nations Resident Coordinator and UNDP Resident Representative, Dr. Zakareya Al Khaja, Director of Policies and Business Processes Re-engineering at the eGA, and Mr. Richard Kerby, Inter-regional Adviser on E-Government & Knowledge Management at UNDESA.

The UN Resident Coordinator and Resident Representative of UNDP in the Kingdom of Bahrain, H.E. Sayed Aqa, welcomed the participants and highlighted the cooperation between UNDP, UNDESA and eGA that lead to the establishment of the Arab Centre for eContent Development. He pointed out the deficiency in knowledge capabilities in the Arab region and the need to acquire the knowledge and the technological capacities that will be indispensible for the prosperity of Arab countries in the new millennium and inferred that it can only be achieved through cooperation both within Arab countries and with their regional and global partners. He underlined the Centre’s efforts to break barriers of access to knowledge for millions of people in the region that will in turn provide employment opportunities and enhance growth and development.

Dr. Zakareya Al Khaja, Director of Policies and Business Process Re-engineering at the eGA, described the primary aims of the Centre and the expectation that the Centre will play a major role in fostering the friendly business environment and sustainable economic growth, in line with the objectives of Bahrain’s Vision 2030 catering to both the private and public sectors locally and regionally. He went on to highlight the low contribution of Arabic e-content on the web relative to other languages with far less speakers. In order to meet these objectives and address the challenges facing Arabic e-content, Dr. Al Khaja emphasized that all stakeholders should collaborate to support the development of Arabic e-content as we build the knowledge-based society.

Mr. Richard Kerby, Senior Inter-regional Advisor on E-government and Knowledge Management from UNDESA, presented the issues affecting Arabic content development, described the possible reasons for the lack of content and presented statistics to support them. He highlighted the lack of a standard Arabic language, the presence of a strong secondary language in most Arabic countries (English and French), and the lack of a financial incentive as some of the key reasons behind the current state of Arabic e-content. He emphasized the need to increase investments in order to encourage Arabic content development and to increase youth participation in Arabic e-content development and utilization because the future of Arabic content will be in the hands of the youth.

Throughout the workshop, the experts were eager to share not only their experiences but their outlook and recommendations for the advancement of Arabic e-content. There was unanimous agreement that Arab governments must co-operate more at higher levels in order to develop common strategies and policies that will address the issues facing the Arabic language in today’s digital world. Participants emphasized the need for institutions and universities from across the region to work together in a coordinated effort to create an enabling environment that will address these challenges and issues going forward. Governments were also urged to spend more on research and development, and to collaborate with NGO's and the private sector to ensure the survival of the Arabic language online.

Below is a listing of the recommendations that resonated with the experts the most over the two day workshop:

* Increase co-operation, both at governmental and non-governmental levels, in the development of a long-term strategy to the implementation of knowledge-based services and innovations.
* Adopt Arab-wide intellectual property laws and regulations to protect and encourage investments in Arabic e-content.
* Affirm the right to freedom of speech, which will spur innovations in the field of Arabic e-content and protect developers.
* Modernize the education systems in the Arab world to cope with the new challenges facing the Arabic language.
* Implement reforms in the Arabic language to allow the use of technologies such as semantic web which requires machine text recognition and analysis.
* Build a portal for Arabic e-content development to include all initiatives and facilitate a creative environment that will encourage networking and collaboration among experts throughout the Arab world. The experts agreed that the Arab Centre for eContent Development is well positioned to spearhead the initiative to build such a portal to form a database of e-content projects and programs and facilitate the gathering of experts and sharing of ideas, knowledge, and skills.
* Improve the quality of Arabic e-content by setting industry standards and raising awareness among developers.
* Support and promote research in Arabic Human Language Technologies in areas including but not limited to information retrieval, machine translation, speech recognition, and text to speech.
* Empower women and youth to engage in creating Arabic e-content.
* Encourage the adoption of open source software and resources to develop Arabic e-content.
* Increase investments in e-training.

## Promotional and Marketing Campaign

### Logo Design Competition

The Centre held a public competition to design a logo for the Centre with Arabic themes. The competition was announced using the eGA’s online media channels and was open to all Bahrainis, individuals and companies, professionals and non-professionals.

Fourteen participants submitted 36 logo designs. Using the guidelines we published for the logo design, eight logos were shortlisted for the Competition Committee’s evaluation. The Committee members reviewed the logos without knowing who submitted them and selected the logo design submitted by “itcan Consultancy and Public Relations W.L.L.”, which is a subsidiary of the IDEAS Group. The winner was awarded a prize of 1000 Bahraini Dinars.

The Competition Committee included representatives from the UNDP, eGA CEO’s Office, eGA Marketing Department, and the Arab Centre for eContent Development.

### Centre’s Website Design and Development

The website was designed and developed in accordance to the requirements document. The website was developed to support both English and Arabic e-content simultaneously.

The website will provide visitors with general information about the Centre and its activities. In addition, the site will provide content developers and interested parties with technical information related to standards for e-content development. Developers and content builders will be able to gain access to a searchable Standards Knowledge Base and participate in ongoing discussions as well as submit standards to be reviewed by the Centre.

The website will also enable the Centre to provide information about the website Certification Service and allow clients to submit their websites for Certification online.

## Industry Standards

The Centre staff worked with an outside consultant to deliver the Arabic e-content standards and other essential reports and documents. The consultancy ran from August 1, 2010 to September 30, 2010. The team delivered all the reports and documents ahead of schedule. The deliverables included:

* Standards for E-content Development

The Centre evaluated and rated content-related standards from international organizations based on the applicability and relevance of each standard to Arabic e-content.

* UN E-Government Survey 2010

The Centre reviewed the UN E-Government Survey 2010 and focused on how the Bahrain Government can improve its services and ranking in the next UN E-Government Survey.

* Website Ranking System

The Centre developed internal ratings for evaluating websites objectively. We emphasized objective criteria and shunned subjective criteria to minimize human bias and errors, and allow for the future automation of testing.

* Additional deliverables included:
* Survey for Gauging Acceptance of E-Content Standards
* The Case for Using a SMF to Build the Web Site Ranking Service

The Centre staff reviewed the standards every six months and ensured any updates were reflected in the Centre’s standards for Arabic e-content development.

## Implementation of the Certification Service

Using the Centre’s internal ratings for evaluating websites, the Centre staff worked with an outside consultant to implement the Certification Service. The period of performance for the consultancy was from August 7, 2011 to December 6, 2012. All agreed upon deliverables were produced and delivered within the allotted time frame.

Below are the tasks completed during the implementation of the Certification Service:

* Centre Staff researched Internet broadband connectivity options in the area and selected the best option for the Test Lab. We procured a wireless broadband solution that provided the best performance and allowed the freedom to move equipment around and the flexibility to easily relocate the lab if the need arises.
* The consultant provided the requirements for the certification test lab. We coordinated with eGA’s IT department to obtain quotations and place orders for the lab equipment (PCs, laptops and mobile devices). Received the equipment and ensured all are operational. Configured the lab equipment (PCs, laptops and mobile devices) and connected them to the Internet using the Centre’s broadband connection. Centre staff worked with the consultant to install the operating systems and software configurations required to test websites in varying browsing environments.
* The consultant designed and developed the Certification System that will store the certification results. Designed the workflow to be followed as well as the reports that will generated by the system. We populated the Certification System with rating criteria and other required information.
* Working closely with the consultant, we tested the Certification System and service by evaluating several websites. As a result, we requested the modification of the certification system to simplify entering data and generating the certification report to improve readability and to better highlight the results for the client.
* Developed a Service Level Agreement for the service. The agreement covers the work to be performed from the time we receive the request for certification to the delivery of the Certification Report to the client.

The consultant completed his work on December 6, 2011, in accordance with the contract.

## Best Model to Improve Searching for Arabic Content Online

The Centre commissioned an outside consultant to research and recommend the best model to improve searching for Arabic content online. The period of performance for the consultancy was from August 7, 2011 to November 6, 2012. All deliverables were produced and delivered on time to our requirements.

The documents delivered during this consultancy are as follows:

* **Comparative Analysis of Arabic Support in the Current Search Engine Market**: The report is a systematic investigation that assessed the level of Arabic language support provided by online search engines. The study covered regional and global service providers and attempted to identify their strengths and shortcomings. The consultant came to Bahrain for his first trip to meet the project team and present his report.
* **Feasibility Study for Developing a New Arabic Search Engine**: The consultant delivered the second report in October 2011. This report was a feasibility study for creating a new Arabic search engine. It explains the reasons other Arabic search engines failed and provides the business model for a successful Arabic search engine. The report contains detailed statistics on current Arabic usage on the Internet and the online advertising spending that will be crucial to the success of the business. The consultant came to Bahrain on December 11, 2011, and presented his findings and recommendations during a Project Board meeting. After his departure, the Project Board agreed to have an independent financial consultant review the document and verify the validity of the idea before further the Board can take any further action. An independent financial consultant was commissioned to review the document and determine strengths and weaknesses of the study and make recommendations to the Project Board on how to proceed with it. The independent financial consultant determined that the financial forecast in the study is overly optimistic but the project in itself presents a very good and feasible case for future consideration. The financial consultant suggested a slightly different execution plan than the one proposed in the feasibility study. The plan in the study called for heavy investment upfront on infrastructure whereas the financial consultant proposed hosting the solution using a hosting service until after the search engine and accompanying services are built and have been established in the market. These recommendations can be taken into consideration in the Arab Centre’s Phase II.
* **Recommendations for the Best Model to Improve Searching for Arabic Content**: The consultant delivered the third report which identified three options to improve searching for Arabic content online and the benefits and drawbacks of each along with the consultant’s recommendations. The options in order of preference are to:
1. Develop a new search engine: This option allows us to improve the quality of Arabic support to the best capabilities of our scientist/professionals in addition to being able to add as much cultural/regional services as we need. It is perhaps the most costly upfront, but holds the most promise in terms of future profitability.
2. Build a search portal on top of an existing global search engine through a licensing agreement: This option is practical and not costly and most global large-scale web search engines would welcome the idea and provide free support for this kind of projects. With this option, we can provide custom search based on topics such as Diseases, Soccer Leagues, Future Events, Crime/Catastrophe, Islamic Subjects, Arabic patents, Arabic Poetry, Local News, etc. This sort of partnership can help Arab searchers get more relevant results from their Arabic search queries, however, we would not have any control on the indexing stage or the database and, consequently, we will not be able to improve the quality of the Arabic linguistic support provided by the portal.
3. Partner with an existing global search engine to improve their search capabilities: Global search engines offer partnership in the areas of e-commerce and advertisement but not necessarily in the areas required to help improve Arabic search. They may cooperate on some points and implement them to improve the Arabic support of their search engines, but they may not consider all of the improvements we have identified such as those that require a change in the indexing method or adding cultural/regional services because these might be out of their global strategies.

## Training for CIO-level Government Officials

During the August (2011) Project Board meeting, the UNDESA counterpart recommended a program offered by the Boston University. The program was successfully conducted in Saudi Arabia, Qatar and Burma. The Project Board supported the objectives of the program as it addressed some of the challenges the eGA faced when dealing with CIO-level officials at other government agencies. Agreement was reached to research the program and the possibility of holding it before the end of the year.

 The Project Team contacted the Boston University (BU) staff and discussed the program with the Director of Executive Programs. BU submitted a proposal for a three day program to be taught by two faculty members with unlimited number of attendees. The total cost of the program was estimated to be approximately USD 130,000 (one hundred and thirty thousand dollars). The Project Team as well as the eGA CEO felt the cost was excessive for a three day course and an alternative provider was sought.

Discussions were held with Bahrain Institute of Public Administration (BIPA) on partnering together to hold an Executive course to build CIO capacity in the public sector. A proposal from BIPA and their UK-based partner was delivered in December. We met with BIPA representatives in December to review the proposal and agreed to conduct the training in late December or early January at the latest. Due to the difficulty we faced in inviting top officials in government on a short notice as well as in planning the logistics for the course, it was later decided to hold the course on January 11 and 12, 2012.

The organizing team at the eGA sent invitations to the heads of working group for IT at 37 government agencies to attend the training. Twenty six agencies responded positively and the training began with 29 government officials attending the two-day event.

The proceedings began with an opening statement by Mr. Mohammed Ali Al Qaed, CEO of the eGovernment Authority. Mr. Al Qaed welcomed the attendees and provided an overview of the strategic role of the chief operating officer (CIO) in an organization and the overarching goals of the workshop.

Mr. Al Qaed stressed that "the workshop aims at exploring the internal and external consumers' needs, especially after noting the shift in management patterns from the technical/operational role to the strategic vision which focuses on technology."

"After joining the workshop, necessary knowledge such as the human capital management, the organization's technical investment portfolio and risk assessment will each need to be added to handle responsibilities," he added.

"This initiative is only a glance that confirms the national efforts to transform government organizations into platforms for a knowledge-based society and economy."

"We are looking forward to develop the role of the CIO in order to have it noted by the decision-makers in governmental sectors, link ICT resources with the organization's strategy and contribute in the enhancement of customer services," concluded Al Qaed.

In his remarks, Mr. Feras Gharaibeh, UNDP Deputy Resident Representative, pointed out the challenges that were set in the UNDP’s Arab Human Development Report 2003. Mr. Gharaibeh emphasized that "the 2003 UNDP report for the Arabian development entitled 'Building a Knowledge Society' highlighted the lack of knowledge capabilities in the Arab region which caused a barrier in their attempts to meet the challenges of the 21st Century."

"It is impossible to make any significant progress in the long-term without acquiring the knowledge and technological capabilities that are essential for the prosperity in the new millennium. In more comprehensive treatment to the issues addressed by the development report in 2003, the Arab Knowledge report in 2009 stressed on the need of re-activating the Arabic language to enrich the Arabic e-content and e-literacy."

"This workshop is conducted in line with our project that aims at strengthening the Arabic content on the internet in order to open new horizons for IT managers in the Kingdom of Bahrain. Additionally, provide the necessary tools for them to achieve government strategic objectives through an accurate and comprehensive information in a timely manner to both decision-makers and citizens," concluded Mr. Gharaibeh.

Following the opening remarks, the trainers provided an overview of the workshop that covered the aim of the course, logistics (schedule, breaks, lunch, etc.), and the topics that would be covered. The material for the 2-day workshop was broken into 6 stages:

**Stage 1**: The framework for assessing progress in e-government

* The position of the Kingdom of Bahrain
* E-Government: definitions by the UN, World Bank, and the Organisation for Economic Co-operation and Development (OECD)
* Measurements of progress by Governments

**Stage 2**: Innovation and the Future

* Scenario Planning, a process
* Drivers, trends and outcomes
* Building scenarios
* Forecasting the future

**Stage 3**: Making the CIO voice heard

* Being right is not enough
* Dialogue: A systems solution
* A model by Professor Mark Moore
* The Importance of Public Value

**Stage 4**: A flexible, adaptable technological base

* ICT – the longest lead times in Government?
* Harmonizing setting the baseline
* Harmonizing is not easy
* Benefits of Harmonizing

**Stage 5**: Linking the ICT to the National Strategy

* Through a support function
* Deeper integration into systems
* Wider integration across Ministries
* Building intellectual capital
* Creating National information resources
* Helping the customer deliver in new ways

**Stage 6**: Investment returns in ICT

* Cost reduction
* Efficiency benefits
* Public benefits
* National benefits
* Investment appraisal models
* The portfolio approach

The trainer discussed the topics in detail and provided real-world examples that helped attendees understand and relate with the information being provided. The trainer interacted with the audience frequently and engaged them with case studies and questions that often required cooperation amongst themselves. At the end of each stage, attendees were required to answer questions in their action plan form (handed out at the start of the workshop). The purpose of plan was to consolidate the information and ideas learned during each stage incrementally. This will allow the attendees to transform the learning material and the information and ideas they learned to into actions that they could implement at the office.

The attendees took every opportunity to participate in the in-class activities and exercises. In informal discussions during breaks, the attendees spoke highly of the trainers, their knowledge of the topics being discussed and their ability to quickly establish a rapport with the attendees. In addition, attendees articulated their satisfaction with the content of the course and expressed their desire to attend future follow-up workshops.

To close the event, Mr. Kamal bin Ahmed Mohammed, Minister of Cabinet Affairs, emphasized the importance of this workshop in advancing the capabilities of government officials and decision makers and enabling them to better meet the needs of the Bahraini citizen. The Minister thanked the organizers for bringing together the resources needed to make the workshop a reality and called for follow up workshops in the future.

## Project Extension

When signed, the project was expected to be completed within one year. However, due to difficulty in finding and hiring the desired qualified personnel, there were delays in putting together the project team and work on the activities did not commence until May 2010. As a result of the initial delays and to accommodate some changing priorities in mid-stream, the eGA and UNDP agreed to extend the project on two occasions with the final target of March 31, 2012. The final extension was necessary to allow time to conduct the CIO-level training and complete other tasks related to the Certification Service.

# III. LESSONS LEARNED

These are some of the key lessons we learned during the execution of this project:

1. The Project Board identified recruiting a Project Manager as a requirement for ensuring synergies and co-ordination to get established during the project implementation. Delays in posting the vacancy and the lack of qualified candidates resulted in delays in the implementation of the project activities. It is necessary to ensure that sufficient budget has been allocated, the necessary documents have been prepared, and to allow 6-8 weeks for the recruitment process.
2. Recruiting qualified personnel to support the Centre was difficult and time consuming. The Project was not able to recruit a qualified consultant to perform feasibility studies and cost-benefit analysis in the areas of ecommerce and Web-based systems and services in order to identify and recommend the best model to improve searching for Arabic content on the web. In addition, hiring a Bahraini national to maintain the e-content standards developed by the Centre took much longer than originally expected. In order to avoid these recruitment issues, it is important to develop the TOR to more accurately reflect the skills and expertise the project is targeting as well as the talent available in the marketplace. That is, do not develop TOR based on internationally known skills and expertise when targeting entry level nationals.
3. The Centre successfully launched a public contest to design the Centre’s logo after two rounds of private logo designs did not produce a logo. The contest resulted in a logo and an overall graphic theme for the Centre but there were some areas of improvements that could be taken into account in the future. When inviting the public to participate, use a variety of media outlets to announce the competition in order to maximize the number of participants. In addition, do not limit participation to a small region since that will limit the creative talent needed for a successful outcome. Taking these two points into consideration along with allowing enough time and awarding an appropriate reward will ensure a successful and fruitful competition.
4. The Centre organized a 2-day expert group meeting titled “Towards a Knowledge Based Society” in cooperation with the eGovernment Authority in the Kingdom of Bahrain, the UNDP and UNDESA on 13 and 14 February 2011. The event brought together leading intellectuals and industry experts from around the Arab world to discuss the challenges facing individuals, organizations, and government entities building Arabic electronic content and bringing it through effective and accessible online services. To allow time to follow up with invitees, send invitations 45 to 60 days before the event. This will also allow time to handle cancellations which can be unavoidable. In addition, when sending invitations using email, it is important to avoid sending attachments with the first email to individuals you do not know and avoid sending to more than one addressee at a time, otherwise, the email may be flagged as spam. To ensure the livelihood of the discussions and improve the chances for the event to achieve its objectives, inquire about the invitees and invite experts that are known to be active participants in the events they attend.
5. The Centre procured the services of a vendor to develop the Centre’s website but the vendor was inadvertently paid in full instead of the required 50% first payment. Later on, when delays occurred, the Centre had no leverage and the project team did not feel any sense of urgency on the part of the vendor to deliver. When dealing with outside vendors, be careful not to pay the full amount in advance and when the vendor demands full payment in advance, negotiate for an acceptable payment plan that gives the project some leverage if the vendor fails to deliver.

# IV. INDICATOR BASED PERFORMANCE ASSESSMENT

The team reviewed e-content-related standards published by local, regional and international organizations. The first cut identified 24 standards that qualified for evaluation. Of the 24 standards, 22 were rated as “Accepted” for existing Arabic e-content. Of the 22 “Accepted” standards, 17 were rated as “Recommended” for developing new Arabic e-content. The recommendations were compiled in the Standards for E-content Development and will be used to populate the Standards Knowledge Base that will be an integral component of the Centre’s website.

Using the “Accepted” and “Recommended” standards, the Centre developed 33 criteria to objectively evaluate a website. Most of the criteria focus on the website’s compliance with the Centre’s standards. The Centre later developed the Certification Service using 29 of the 33 criteria with the remaining 4 criteria left out for future implementation.

Through rigorous testing and continuous process improvement, Centre staff shortened the time required by the Service Level Agreement to complete the certification process. The staff was able to cut down the time from 15 to 10 days by optimizing certain processes and combining others. The agreement covers the work to be performed from the time we receive the request for certification to the delivery of the Certification Report to the client.

# V. PUBLICATIONS/REPORTS

The following publications and reports were delivered as part of this project:

**Standards for E-content Development**: the team evaluated 24 content-related standards from regional and international organizations and rated each standard on its applicability and relevance to Arabic e-content.

**UN E-Government Survey 2010**: the team reviewed the UN E-Government Survey 2010 and focused on how the Bahrain Government can improve its services and ranking in the next UN E-Government Survey.

**Web Site Ranking System**: the team developed internal ratings for evaluating websites objectively and minimized and/or eliminated subjective criteria in order to reduce human errors and allow future automation of rankings.

**Survey for Gauging Acceptance of E-Content Standards**: the team developed a short survey that will allow the Centre to evaluate the acceptance of an e-content standard by a developer or user.

**The Case for Using a SMF to Build the Web Site Ranking Service**: this document outlines the need to follow a Service Management Framework when implementing and building a service such as the Centre’s Website Certification Service.

**Comparative Analysis of Arabic Support in the Current Search Engine Market**: The report is a systematic investigation that assessed the level of Arabic language support provided by online search engines. The study covered regional and global service providers and attempted to identify their strengths and shortcomings.

**Feasibility Study for Developing a New Arabic Search Engine**: This report was a feasibility study for creating a new Arabic search engine. It explained the reasons Arabic search engines have failed so far and provided the business model for a successful new Arabic search engine. The report contained detailed statistics on current Arabic usage on the Internet and the online advertising spending that will be crucial to the success of the business.

**Recommendations for the Best Model to Improve Searching for Arabic Content**: The report identified three options to improve searching for Arabic content online and the benefits and drawbacks of each along with the consultant’s recommendations.