NATIONAL ENTERPRISE ARCHITECTURE FRAMEWORK
KINGDOM OF BAHRAIN

Technology Standards and Guidelines

Social Media Domain

Kingdom of Bahrain
eGovernment Towards a Better Life

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1. Introduction

This document covers tools, technologies and standards used in the Social Media domain. The process of arriving at these standards has been outlined in the NEAF - Technology Standards Methodology & Process document in Section 3 - Methodology and Approach. The following standards have been base lined after considering their acceptance across ministries. Some of the tools, technologies and standards have been identified as potential requirements and hence been incorporated in this document. These may be considered as recommendations for current and future use.

This document shall be considered for revision in conjunction with the NEAF - Technology Standards Methodology & Process document at appropriate intervals of time as decided by the ICT Governance Committee. Any addition or upgrade to these tools and standards may be incorporated by following the process described in the NEAF - Technology Standards Methodology & Process document in Section 6 - Review and Maintenance of Technology Standards and Guidelines.

2. Summary of Technology Standards/Specifications and Tools

This section contains a summary of standards and tools applicable to the Social Media domain. These have been grouped into sub-sections (categories), with each category addressing one aspect of the related standards and tools. Further details and links to these standards and tools have been provided in the following sections of this document.

The rationale for selection of these standards and tools are:

- Based on the usage across ministries as captured in the internal survey.
- Technology best practices.
- References from international standards bodies.

2.1. Social Media Technologies

Introduction to Sub - Category	▪ Social media includes web-based and mobile based technologies which are used to turn communication into interactive dialogue among organizations, communities, and individuals. Social media has been defined as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content." Social media is ubiquitously accessible, and enabled by scalable communication techniques.
Applicable Standard(s)	▪ AJAX – (Details) ▪ REST – (Details) ▪ Open APIs – (Details) ▪ Microformats – (Details)
Remarks	
Exceptions	

2.2. Social Media Tools

Introduction to Sub - Category	▪ Social media technologies take on many different forms including magazines, Internet forums, weblogs, social blogs, microblogging, wikis, podcasts, photographs or pictures, video, rating and social bookmarking. By applying a set of theories in the field of media research (social presence, media richness) and social processes (self-presentation, self-disclosure) Kaplan and Haenlein created a classification scheme for different social media types in their Business Horizons article published in 2010. ▪ Technologies include: blogs, picture-sharing, vlogs, wall-postings, email, instant messaging, music-sharing, crowd sourcing and voice over IP, to name a few. Many of these social media services can be integrated via social network aggregation platforms.
Applicable Standard(s)	

	▪ Blogs – (Details) ▪ Wikis – (Details) ▪ Jive Engage – (Details) ▪ IBM Connections – (Details) ▪ Microsoft Sharepoint – (Details)
Remarks	▪ Refer - Kaplan, Andreas M.; Michael Haenlein (2010) "Users of the world, unite! The challenges and opportunities of Social Media". Business Horizons 53(1): 59–68.
Exceptions	

2.3. SOCIAL NETWORKING	
Introduction to Sub - Category	▪ According to Kaplan and Haenlein there are six different types of social media: collaborative projects (e.g., Wikipedia), blogs and microblogs (e.g., Twitter), content communities (e.g., YouTube), social networking sites (e.g., Facebook), virtual game worlds (e.g., World of Warcraft), and virtual social worlds (e.g. Second Life). ▪ Social media network websites include sites like Facebook and Twitter. ▪ The honeycomb framework defines how social media services focus on some or all of seven functional building blocks (identity, conversations, sharing, presence, relationships, reputation, and groups). These building blocks help understand the engagement needs of the social media audience. For instance, LinkedIn users care mostly about identity, reputation and relationships, whereas YouTube's primary building blocks are sharing, conversations, groups and reputation. ▪ Enterprise social software (also known as or regarded as a major component of Enterprise 2.0), comprises social software as used in "enterprise" (business/commercial) contexts. It includes social and networked modifications to corporate intranets and other classic software platforms used by large companies to organize their communication.
Applicable Standard(s)	▪ Facebook – (Details) ▪ Twitter – (Details) ▪ LinkedIn – (Details) ▪ YouTube – (Details) ▪ Google Plus (G+) – (Details) ▪ Pinterest – (Details) ▪ Instagram – (Details)
Remarks	▪ Refer - Kaplan, Andreas M.; Michael Haenlein (2010) "Users of the world, unite! The challenges and opportunities of Social Media". Business Horizons 53(1): 59–68.
Exceptions	

3. Details of Standards / Specifications and Associated Guidelines

This section provides a brief description of the relevant standards listed in section 2 along with links for references to these standards.

3.1. AJAX	
Description	▪ AJAX is an acronym for Asynchronous JavaScript and XML. ▪ The term Ajax has come to represent a broad group of web technologies that can be used to implement a web application that communicates with a server in the background, without interfering with the current state of the page. In the article that coined the term Ajax, Jesse James Garrett explained that the following technologies are incorporated: ○ HTML (or XHTML) and CSS for presentation ○ The Document Object Model (DOM) for dynamic display of and interaction with data ○ XML for the interchange of data, and XSLT for its manipulation ○ The XMLHttpRequest object for asynchronous communication ○ JavaScript to bring these technologies together ▪ XML is not required for data interchange and therefore XSLT is not required for the manipulation of data. JavaScript Object Notation (JSON) is often used as an alternative format for data interchange, although other formats such as preformatted HTML or plain text can also be used.
Applicable to	▪ Social Media Technologies
Reference(s)	▪ AJAX – ▪ http://www.adaptivepath.com/ideas/ajax-new-approach-web-applications ▪ http://www.w3schools.com/ajax/default.asp
Remarks	

3.2. Representational State Transfer (REST)	
Description	▪ Representational State Transfer (REST) is a style of software architecture for distributed systems such as the World Wide Web. REST has emerged over the past few years as a predominant Web service design model. REST has increasingly displaced other design models such as SOAP and WSDL due to its simpler style.
Applicable to	▪ Social Media Technologies
Reference(s)	▪ REST – ▪ http://www.ics.uci.edu/~fielding/pubs/dissertation/rest_arch_style.htm ▪ http://tools.ietf.org/html/rfc2616
Remarks	

3.3. OPEN APIS	
Description	▪ An Application Programming Interface (API) provides a mechanism for programmers to make use of the functionality of a set of modules without having access to the source code. An API that doesn't require the programmer to license or pay royalties is often described as open. Such 'open' APIs have helped Web 2.0 services develop rapidly and have facilitated the creation of mash-ups of data from various sources. ▪ One way of finding out what APIs are available is to look at the Programmable Web website (http://programmableweb.com/), which keeps track of the number of APIs and what people are doing with them (it recently registered over three hundred). One of the key examples is the Google Maps API, which allows Web developers to embed maps within their own sites (http://www.google.com/apis/maps/). Programmable Web claims that over 50% of data mashups use Google Maps. Amazon has also started to allow access to its database through Amazon Web Services (AWS) API.
Applicable to	▪ Social Media Technologies
Reference(s)	▪ http://programmableweb.com/
Remarks	

3.4. MICROFORMATS	
Description	▪ A microformat (sometimes abbreviated µF) is a web-based approach to semantic markup which seeks to re-use existing HTML/XHTML tags to convey metadata[1] and other attributes in web pages and other contexts that support (X)HTML, such as RSS. This approach allows software to process information intended for end-users (such as contact information, geographic coordinates, calendar events, and the like) automatically. ▪ Information based on open data formats (a microformat) is buried within certain XHTML tags (such as 'class' or 'div') or attributes (such as 'rel' or 'rev'). The information is not used by the browser for display or layout purposes but it can be picked up by applications such as search engines. ▪ An example of a microformat is the hCard format which allows personal or organisational contact information based on the vCard standard to be embedded in a webpage.
Applicable to	▪ Social Media Technologies
Reference(s)	▪ http://microformats.org/ ▪ http://microformats.org/wiki/rel-directory

Remarks	▪ The use, adoption and processing of microformats enables data items to be indexed, searched for, saved or cross-referenced, so that information can be reused or combined

3.5. BLOGS	
Description	▪ A blog is a discussion or information site published on the World Wide Web or intranet, consisting of discrete entries ("posts") typically displayed in reverse chronological order so the most recent post appears first. ▪ A blog can be private, as in most cases, or it can be for business purposes. Blogs used internally to enhance the communication and culture in a corporation or externally for marketing, branding or public relations purposes are called corporate blogs. Corporate blogs can be used is to keep employees informed of various initiatives and invite participation from a larger section of the employees.
Applicable to	▪ Social Media Tools
Reference(s)	
Remarks	

3.6. WIKIS	
Description	▪ A wiki is a website which allows its users to add, modify, or delete its content via a web browser using a simplified markup language or a rich-text editor. Wikis are powered by wiki software. Most are created collaboratively. ▪ Wikis may serve many different purposes, such as knowledge management and notetaking. Wikis can be community websites and intranets, for example. Some permit control over different functions based on levels of access. For example, editing rights may permit changing, adding or removing material. Others may permit access without enforcing access control. Other rules may also be imposed for organizing content. ▪ Wiki software is a type of collaborative software that runs a wiki system, allowing web pages to be created and edited using a common web browser. The content is stored in a file system, and changes to the content are stored in a relational database management system. ▪ Wiki software is primarily based on PHP, Perl, java, JavaScript and .NET.
Applicable to	▪ Social Media Tools
Reference(s)	

Remarks	

4. Details of Tools Supporting Recommended Technologies

This section provides a brief description of the relevant tools listed in section 2 along with links for references to these tools.

4.1. Jive Engage	
Description	▪ The Jive Social Business Platform combines all the enterprise-class capabilities enterprises require. It provides all the capabilities to launch viral social networks that engage employees, customers, partners and the social web. It opens new opportunities for internal collaboration, customer care, social marketing and sales. ▪ The Jive platform gives you comprehensive tools for communication, collaboration, content creation and sharing.
Applicable to	▪ Social Media Tools
Reference(s)	▪ http://www.jivesoftware.com/social-business/platform
Remarks	

4.2. IBM Connections	
Description	▪ IBM Connections is social software for business that lets you access everyone in your professional network, including your colleagues, customers, and partners. ▪ The latest capabilities in IBM Connections, such as Moderation, Ideation Blogs, and the Media Gallery, enable you to embrace networks of people who are engaged and to work in transparent and nimble ways to create business value.
Applicable to	▪ Social Media Tools
Reference(s)	▪ http://www-01.ibm.com/software/lotus/products/connections/
Remarks	

4.3. Microsoft Sharepoint	
Description	▪ Microsoft SharePoint is a web application platform developed by Microsoft. SharePoint

	has historically been associated with web content management and document management, but recent versions have significantly broader capabilities. ▪ SharePoint is a multi-purpose tool designed to cater to web requirements common for most organizations. By default, SharePoint provides a Microsoft Office-like interface, and is heavily integrated with the Office suite of tools. SharePoint's tools can facilitate intranet portals, document & file management, collaboration, social networks, extranets, websites, enterprise search, and business intelligence. It also has capabilities around system integration, process integration, and workflow automation. ▪ SharePoint has support for creating Blogs, through SharePoint Ribbon, and Wikis as well.
Applicable to	▪ Social Media Tools
Reference(s)	▪ http://sharepoint.microsoft.com/en-us/Pages/default.aspx ▪ http://sharepoint.microsoft.com/en-us/product/Pages/Features.aspx
Remarks	

4.4. FACEBOOK	
Description	▪ Facebook is a social networking service and website launched in February 2004, owned and operated by Facebook, Inc. As of May 2012, Facebook has over 900 million active users, more than half of them using Facebook on a mobile device. Facebook is built in PHP which is compiled with HipHop for PHP, a source code transformer built by Facebook engineers that turns PHP into C++. The deployment of HipHop reportedly reduced average CPU consumption on Facebook servers by 50%. ▪ Facebook is developed as one monolithic application. According to an interview in 2012 with Chuck Rossi, a build engineer at Facebook, Facebook compiles into a 1.5 GB binary blob which is then distributed to the servers using a custom BitTorrent-based release system. Rossi stated that it takes approximately 15 minutes to build and 15 minutes to release to the servers. The build and release process is zero downtime and new changes to Facebook are rolled out daily.
Applicable to	▪ Social Networking
Reference(s)	▪ http://www.facebook.com/ ▪ http://arstechnica.com/business/2012/04/exclusive-a-behind-the-scenes-look-at-facebook-release-engineering/1/
Remarks	

4.5. TWITTER	
Description	▪ Twitter is an online social networking service and microblogging service that enables its users to send and read text-based posts of up to 140 characters, known as "tweets". It has been described as "the SMS of the Internet." Unregistered users can read the tweets, while registered users can post tweets through the website interface, Short Message Service (SMS), or a range of apps for mobile devices. Tweets are publicly visible by default; however, senders can restrict message delivery to just their followers. ▪ The Twitter Web interface uses the Ruby on Rails framework, deployed on a performance enhanced Ruby Enterprise Edition implementation of Ruby. As of April 6, 2011, Twitter engineers confirmed they had switched away from their Ruby on Rails search-stack, to a Java server they call Blender. ▪ From spring 2007 to 2008 the messages were handled by a Ruby persistent queue server called Starling, but since 2009 implementation has been gradually replaced with software written in Scala. The service's application programming interface (API) allows other web services and applications to integrate with Twitter ▪ Third-party Twitter applications are required to use OAuth, an authentication method that does not require users to enter their password into the authenticating application. Previously, the OAuth authentication method was optional, it is now compulsory and the user-name/password authentication method has been made redundant and is no longer functional. Twitter stated that the move to OAuth will mean "increased security and a better experience".
Applicable to	▪ Social Networking
Reference(s)	▪ https://twitter.com/
Remarks	

4.6. LINKEDIN	
Description	▪ LinkedIn is a professional social networking website. ▪ One purpose of the site is to allow registered users to maintain a list of contact details of people with whom they have some level of relationship. A contact network is built up consisting of their direct connections, the connections of each of their connections (termed second-degree connections) and also the connections of second-degree connections (termed third-degree connections). ▪ LinkedIn also supports the formation of interest groups. Groups support a limited form of discussion area, moderated by the group owners and managers. Groups may be private, accessible to members only or may be open to Internet users in general to read, though they must join in order to post messages. ▪ A mobile version of the site was launched in February 2008, which gives access to a reduced feature set over a mobile phone. The mobile service is available in six languages: Chinese, English, French, German, Japanese and Spanish. ▪ In January 2011, LinkedIn acquired CardMunch, a mobile app maker that scans business

	cards and converts into contacts. LinkedIn plans to integrate this functionality into their services in the near future.
Applicable to	▪ Social Networking
Reference(s)	▪ http://www.linkedin.com ▪ http://press.linkedin.com/about
Remarks	

4.7. YOUTUBE	
Description	▪ YouTube is a video-sharing website, on which users can upload, view and share videos. It uses Adobe Flash Video and HTML5 technology to display a wide variety of user-generated video content, including movie clips, TV clips, and music videos, as well as amateur content such as video blogging and short original videos. ▪ YouTube videos are available in a range of quality levels. The former names of standard quality (SQ), high quality (HQ) and high definition (HD) have been replaced by numerical values representing the vertical resolution of the video. The default video stream is encoded in H.264/MPEG-4 AVC format, with stereo AAC audio. ▪ Some smartphones are capable of accessing YouTube videos, dependent on the provider and the data plan. YouTube Mobile was launched in June 2007, using RTSP streaming for the video. Not all of YouTube's videos are available on the mobile version of the site. ▪ YouTube's videos have been available in Apple's preferred video standard, H.264, for viewing on a range of Apple devices including Apple TV, iPod Touch. In July 2010, the mobile version of the site was relaunched based on HTML5, avoiding the need to use Adobe Flash Player and optimized for use with touch screen controls. The mobile version is also available as an app for the Android.
Applicable to	▪ Social Networking
Reference(s)	▪ https://www.youtube.com/
Remarks	

4.8. GOOGLE PLUS (G+)	
Description	▪ Google+ (pronounced and sometimes written as Google Plus, sometimes abbreviated as G+) is a multilingual social networking and identity service owned and operated by Google Inc. Google+ makes sharing on the web more like sharing in real life. It consists of multiple

	Google apps like Circles, Messenger and Hangouts. It allows users to share messages, photos with a defined group. It also enables video chat. These features are available both via PC and mobile connected to the internet. ▪ Google Plus uses Java servlets for the server code and JavaScript for the browser-side of the UI, largely built with Google's Closure framework, including the JavaScript compiler and the template system. They use the HTML5 History API to maintain good looking URLs in modern browsers despite it being an AJAX app. To achieve fast response times Google often renders the Closure templates on the server-side to render it before any JavaScript is loaded; then the JavaScript finds the right DOM nodes, hooks up event handlers etc. The backends are built mostly on top of BigTable and Colossus/GFS, and other common Google technologies such as MapReduce.
Applicable to	▪ Social Networking
Reference(s)	▪ https://plus.google.com/
Remarks	

4.9. PINTEREST	
Description	▪ Pinterest lets you organize and share images with others. Pinboards created by other people can be browsed. Browsing pinboards enbale discovery of new things and get inspiration from people who share your interests. ▪ Pinterest is written on the Django python web framework
Applicable to	▪ Social Networking
Reference(s)	▪ http://pinterest.com/
Remarks	▪ Pinterest Service is a public platform, and that other Users may search for, see, use, and/or re-pin any User Content that you make publicly available through the Service. ▪ Pinterest needs to be used with care due to the following clause in the Terms & Privacy on use of Pinterest – "*Pinterest may retain your User Content for a commercially reasonable period of time for backup, archival, or audit purposes. Furthermore, Pinterest and other Users may retain and continue to display, reproduce, re-pin, modify, re-arrange, and distribute any of your User Content that other Users have re-pinned to their own boards or which you have posted to public or semi-public areas of the Service*." ▪ Data shared on this site should be only that which has been classified as "unrestricted" and/or "open to all".

4.10. INSTAGRAM	
Description	▪ Instagram is an online photo-sharing, video-sharing and social networking service that enables its users to take pictures and videos, apply digital filters to them, and share them on a variety of social networking services, such as Facebook, Twitter, Tumblr and Flickr. ▪ Users are also able to record and share short videos lasting for up to 15 seconds.
Applicable to	▪ Social Networking
Reference(s)	▪ http://www.instagram.com/
Remarks	

5. APPENDICES

5.1. APPENDIX A: ABBREVIATIONS AND ACRONYMS

Abbreviation / Acronym	**Collaboration And Productivity**
OS	Operating System
AJAX	Asynchronous JavaScript and XML
REST	Representational State Transfer
IM	Instant Messenger
XMPP	Extensible Messaging and Presence Protocol

5.2. APPENDIX B: RELATED DOCUMENTS / LINKS

Acknowledgement of major references for international technology standards and Specifications:

- Internet Engineering Task Force (IETF)
  http://www.ietf.org
- International Standards Organization (ISO)
  http://www.iso.org
- World Wide Web Consortium (W3C)
  http://www.w3c.org

Acknowledgement of other references for international technology standards and specifications:

- American National Standards Institute (ANSI)
  http://www.ansi.org
- Institute of Electrical and Electronics Engineers (IEEE)
  http://www.ieee.org
- National Institute of Standards and Technology (NIST)
  http://www.nist.gov
- Object Management Group (OMG)
  http://www.omg.org
- Organization for the Advancement of Structured Information Standards (OASIS)
  http://www.oasis-open.org