6. Summary and Minimal Functional Set Analysis

6.1 Summary

The development of 3G portal services will benefit from the availability of a standards based open services architecture and application programming interfaces.

A standards based markup language is equally important for an efficient application development. WML and cHTML languages appear to be converging towards a Basic XHTML markup language.

An open service development framework and a unified markup language will allow content development community throughout the world to rapidly develop needed 3G services. Such an approach will help create a mass market for 3G portal services. A summary of key markup languages and their relative usability for a range of portal services is shown in Table 26. The following points were considered in this analysis:

- WML and cHTML markup languages are converging towards a Basic XHTML standard. Some of the existing fixed Intranet, Internet, infotainment content will be converted to XHTML format.
- VXML will be important for a number of services for the safety of the user in a vehicle.

Table 26. Usable life of markup languages in 3G portal services.

Type of Portal	WML	cHTML	VXML	XHTML	HTML
Mobile Intranet/Extranet	◑	◑	●	●	●
Customised Infotainment	○	◑	●	●	N/A
Multimedia Messaging Services	○	◑	○	●	N/A
Mobile Internet	◑	◑	●	●	●
Location-Based Services	○	◑	●	●	N/A

●	◑	○
Long-term life	Medium-term life	Short-term life

Source: UMTS Forum and Telecompetition Inc., August 2001.

A number of critical capabilities have been identified in this handbook for successful development and delivery of 3G portal services. These capabilities include:

- Security
- Privacy
- Billing and Payment
- QoS
- Interoperability

- Content Format/Compression

A summary of relative importance of these critical service development and delivery capabilities for 3G portal services is given in Table 27. The following points were considered in this analysis:

- Security is extremely important for all enterprise Intranet/Extranet portal services. Although the end-to-end QoS is very important to realise the full potential of a service, it may not be available for all services. Billing is targeted towards the corporation rather than the individual user.
- For all other portals, security is very important for protecting the identity of a user. Security may not be available or needed for all services offered by the portal. Although the end-to-end QoS is very important to realise the full potential of a service, it may not be available for all services. Value-added service billing may not be available in all markets.

Table 27. Importance of critical service enablers for 3G portal services

Type of Portal	Security	Privacy	Interoper-ability	Billing and Payment	QoS	Format/ Compression
Mobile Intranet/Extranet	●	●	●	◑	◑	●
Customised Infotainment	◑	◑	●	◑	◑	●
Multimedia Messaging Service	◑	●	●	●	◑	●
Mobile Internet	◑	◑	◑	◑	◑	●
Location-Based Services	●	●	●	◑	◑	●

●	◑	○
A particular capability is of high Importance	A particular capability is selectively Important	A particular capability is of low Importance

Source: UMTS Forum and Telecompetition Inc., August 2001.

6.2 Minimal Functional Set Analysis

To provide guidance to the industry on ways to facilitate the development and adoption of 3G portal services, a set of criteria has been developed to rank and rate the different available options to develop and deliver these services. In this section, these criteria are outlined along with the recommended minimal functional sets based on these criteria.

In order to analyse 3G portal service development and delivery issues identified in this handbook, three functional sets have been defined to cover the following perspectives:

- Timeframe required for issue resolution and commercialisation into 3G portals **(Functional Set I)**
- Role of industry players in capability selection (**Functional Set II)**
  - Mobile operator
  - Content developer
  - Portal Operator
  - Manufacturer

- Status of issues relative to a number of capability considerations **(Functional Set III)**
  - Current Standards
  - Market Decision
  - Terminal Types
  - Technology

Tables 28-30 contain the legends and rankings of various issues.

Table 28 summarises Minimum Functional Set I, the timeframes required for issue resolution and commercial availability of issues discussed earlier in this document. Some important points considered for this analysis are as follows:

- XHTML becoming a universally accepted markup language for content development.
- XHTML will become the presentation language, though XML and XSL may be the source.
- It will take some time and effort before a full set of customised personalised services become available.
- Market factors will decide whether a lead browser or multimodal browsers and operating systems will succeed.
- There are prospects for development of high-processing-power mobile devices and an order-of-magnitude higher life battery technology within five years.
- There are prospects of high-resolution colour displays for mobile devices within three years.
- It will take some time before fully functional, integrated billing systems become commercially deployed for scale applications.
- Multiple payment methods are likely to continue in the foreseeable future.
- It will take some time before end-to-end QoS capabilities become available.
- The mobile industry will adopt content format standards as they are each finalised.

Table 28. Minimal functional set I - analysis of time frames required for issue resolution and commercial availability.

Report Topics	Key Issues	1-2 Years	3-4 Years	5 Years and Beyond
Markup Language	XHTML Basic	●	●	●
Personalisation	Consumer or Corporate User Capabilities	◑	◑	●
Mobile Terminals	Browsers Operating System Chip Technology Battery Technology Display Technology	◑	◑	●
Security	USIM	◑	◑	●
	Privacy			
Billing and Payment	Billing Flexibility	◑	◑	●
	Multiple payment Methods	◑	◑	◑
Quality of Service (QoS)	End-to-end QoS	○	◑	●
Interoperability	Interoperability	◑	◑	●
Content Format	MP3, MP3PRO, JPEG 2000, MPEG-4, Integrated Media Format	◑	◑	●

Legend – Minimum Functional Set I		
●	◑	○
Issues fully resolved Commercial deployment available	Issues not fully resolved Partial commercial deployment available, based on a mix of proprietary and standards-based solutions	Issues not resolved Commercial deployment not available Not feasible

Source: UMTS Forum and Telecompetition Inc., August 2001.

While all industry players need to co-operate in resolving technical issues, some players have a more dominant role than others do in making the final capability choice. Minimal Functional Set II, Table 29, identifies the role for each type of industry player for the capabilities discussed in this report. Some key points of this functional set are as follows:

- All primary players to work on creating new personalisation services. Enterprises also need to play a big role in deciding the personalised services required for their businesses.
- While software companies and chip manufacturers control development of operating system software and chips respectively, the terminal manufacturer ultimately makes the final capability choice.
- While battery and display manufacturers will lead terminal component development efforts, the terminal manufacturers must drive the process.
- Billing vendors need to develop a phased approach for mobile billing features in order for mobile operators to implement the systems.

Table 29. Minimal functional set II - analysis based on primary industry player's role in capability selection.

Report Topics	Key Issues	Mobile Operators	Manufacturers	Content Developers
Markup Language	XHTML Basic	◑	◑	●
	HTML	◑	●	●
Personalisation	Consumer Capabilities	●	●	●
	Corporate User Capabilities	○	●	●
Mobile Terminals	Browsers	◑	●	●
	Operating System	○	●	◑
	Chip Technology	○	●	○
	Battery Technology	◑	●	○
	Display Technology	◑	●	○
Security	USIM	◑	●	◑
	Privacy	●	○	◑
Billing and Payment	Billing Flexibility	●	○	◑
	Multiple Payment Methods	◑	○	○
Quality of service (QoS)	End-to-end QoS	●	◑	◑
Interoperability	Interoperability	●	◑	◑
Content Format	MP3, MP3PRO, JPEG 2000, MPEG-4, Integrated Media Format	◑	◑	●

Legend – Minimum Functional Set II		
●	◑	○
Industry player to take lead in selection of capability	The industry player will influence selection of capability	Industry player has no role in the selection of capability

Source: UMTS Forum and Telecompetition Inc., August 2001.

Table 30 summarises the issues discussed in this report in terms of several key factors for each topic area.

Table 30. Minimal functional set III - analysis based on standards, market factors, terminal type, and technology capability considerations.

Report Topics	Key Issues	Status of Current Standards	Market Decision	Terminal Types Factor	Technology Capability
Markup Language	XHTML Basic(a subset of WML2.0)	●	●	◑	◑
	HTML	●	●	◑	◑
Personalisation	Consumer Capabilities	○	◑	●	●
	Corporate User Capabilities	○	◑	●	●
Mobile Terminals	Browsers	○	●	●	○
	Operating System	○	●	◑	●
	Chip Technology	○	○	◑	◑
	Battery Technology	○	◑	◑	◑
	Display Technology	○	◑	◑	◑
Security	USIM	◑	●	◑	●
	Privacy	◑	●	◑	●
Billing and Payment	Billing Flexibility	◑	●	○	●
	Multiple payment Methods	◑	●	○	●
Quality of Service (QoS)	End-to-end QoS	◑	●	○	●
Interoperability	Interoperability	○	●	◑	◑
Content Format	MP3	●	●	◑	●
	MP3PRO	◑	◑	◑	●
	JPEG 2000	◑	◑	◑	●
	MPEG-4	●	◑	◑	●
	Integrated Media Format	◑	◑	◑	●

Legend- Minimum Functional Set III		
●	◑	○
Industry-wide issue Widely accepted Most significant portions of an issue are resolved or completed Market issue	Issue relevant to a subset of overall areas of concern Mixed market acceptance Issue only for selected terminal types	A particular issue is not relevant to an area of concern A particular industry segment has no role No solution is available at this time

Source: UMTS Forum and Telecompetition Inc., August 2001.

6.3 Recommendations and Conclusions

The 3G portal study has identified a number of key recommendations for a harmonious development of portal services mass market. The following approaches have been used in addressing identified issues:

- **Convergence** approach works toward a globally accepted open standard combining mobile, Internet, media, and communication concerns.
- **Market Decision** approach where the most dominant player or a small number of strong players create de facto standards, driven by the sheer volume of originally proprietary implementations.
- **Technical Research and Development** approach in which new technology will be developed. This is technology that is not yet available, but necessary to deliver the needed requirements.

Table 31 provides a summary of 3G portal study recommendations and corresponding action needed.

Table 31. 3G Portal Study recommendations.

3G Service Enablers	Key Issues	Recommendation	Action Needed
Markup Language	XHTML Basic (a subset of WML2.0)	Deploy XHTML Basic for all portal content development.	Portal operators and terminal manufacturers to adopt XHTML Basic. Backward compatibility with WML and cHTML browsers needs to be studied.
	HTML	Deploy HTML for mobile business in the public Internet and corporate sector.	Corporate portals and Internet portals shall be extended for mobile Intranet/Internet access.
Personalisation	Consumer Capabilities	Deploy Individual personalised services for consumers.	The mobile industry needs to establish standards for a selected set of personalised services for consumers.
	Corporate User Capabilities	Deploy group-based personalised services for corporate users.	The mobile industry needs to establish standards for a selected set of uniform corporate personalised services.
Mobile Terminals	Browsers	Monitor the development of a lead browser, as this would allow large-scale deployment of 3G portal services.	Promote use of XHTML and HTML micro-browsers. Market forces will determine a lead browser or duel browsers with downloadable options.
	Operating System	Monitor the development of a limited number of lead operating systems, as this would allow large-scale deployment of 3G portal services.	Market factors will determine the number of mobile operating systems.
	Chip Technology	Deploy high performance chips mobile devices for multimedia 3G services.	Terminal manufacturers to adopt recommended content format/compression standards. Terminal manufacturers to specify high performance and low power chips for 3G mobile terminals.
	Battery Technology	Deploy longer lasting batteries would increase the usage of 3G services without interruption between charging periods.	Terminal manufacturers to test high performance batteries and support R&D in fuel cells.
	Display Technology	Deploy higher resolution and lightweight displays on 3G mobile devices.	Terminal manufacturers to test OLED display and support R&D in Electronic Ink display technology.
Security	USIM	Deploy USIM card in 3G terminals. Add IMEI (International Mobile Equipment Identifier) for terminal security.	Mobile operators, terminal manufacturers and financial institutions need to work together to find industry-accepted m-commerce secure solutions
	Transport security	A common security layer protocol should be established for end-to-end security in order to avoid translation of WTLS/SSL.	An industry focus group to study this further with a lead from a mobile operator.
Billing and Payment	Billing Flexibility	Deploy a phased approach towards a comprehensive billing infrastructure.	Billing vendors and mobile operators need to develop a phased approach for mobile billing features toward a comprehensive billing infrastructure. 3GPP and GSMA to lead this effort.
	Multiple Payment Methods	Deploy multiple payment methods with a long-term goal of moving users to electronic payment methods.	Mobile and portal operators need to find ways to promote the use of electronic payment methods.
Quality of service (QoS)	End-to-end QoS	Market factors in QoS specs will be determined by service category.	An industry focus group to study this further with a lead from a mobile operator. 3GPP to lead this effort.

3G Service Enablers	Key Issues	Recommendation	Action Needed
Interoperability	Interoperability	Develop interoperability standards across multiple platforms and mobile terminals.	An industry focus group to study this further with a lead from a mobile operator. 3GPP to lead this effort.
Content Format	MP3, MP3PRO, JPEG 2000, MPEG-4, Integrated Media Format	Use open standards for content development.	Mobile operators, portal operators, terminal manufactures and content developers to support open content format standards.

Source: UMTS Forum.

3G portal services industry is a very young industry with a tremendous momentum for growth. This handbook has identified key trends in technologies that will pave the way for the growth of portal services market. Critical service delivery issues of billing, security, privacy, interoperability, QoS and content format will need a concerted industry effort and resolve to realise the full potential of 3G portal services.

A number of progressive trends have been identified in the processor, memory, battery, display, operating system, and browser technology. Collectively these advances will create a new family of harmonised and user-friendly 3G mobile devices. A richer end-user usability experience on these new devices will promote the growth of 3G portal services.

While the mobile industry has to address all of the technological issues to create a 3G network and marketing infrastructure, it must maintain its focus on the needs of the end-users. It's the end-user who decides the success of a particular service. The end-user needs a simple mobile device and all the complexities of operating system, browser, and media player should be hidden within the technology. Insulating the customer from these technological complexities will provide the ease-of-use and increase the usage of 3G portal services. In the long term an end-user should simply be able to talk to the mobile device and ask for a movie, a song, a selected weather report, customised sports news and/or directions to a restaurant from a 3G portal.