Global MDTV – The Multi-Standard Approach

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Digital TV is expanding from home to everywhere - the street, cars, buses, trains, restaurants, the beach - as the TV world is changing from a stationary, satellite or tethered paradigm and a typical group viewing experience to include a more personal viewing experience on portable wireless devices.

Although mobile entertainment is still in its infancy, mobile devices have rapidly evolved from strictly communications devices into multimedia-centric infotainment devices with the integration of digital cameras, MP3 players, PDA functionality, GPS services, gaming and video capabilities. Similarly, other mass market devices, such as Apple's iPod, are changing the habits of millions of consumers when outside of the home, and personal video and television capabilities are as close as ever to full realization.

The reality of a fragmented and diversified mobile TV market

Television, the most basic and widely used multimedia application ever, is going through a dramatic change. New standards and technologies, led by a coalition of leading cellular operators, broadcasters, mobile phone makers, software and content providers, have set the stage for terrestrial digital television services optimized to mobile usage.

However, global segmentation of the new standards and the variety of regulated spectrum bands considered in different geographies impose a fragmented market of broadcast Mobile Digital Television (MDTV). DVB-H, DVB-T, DAB, T-DMB, DAB-IP, ISDB-T, Media FLO and DMB-T/H are to be deployed over multiple spectrum bands - VHF, UHF and at least two slices of "L" band. In addition to these terrestrial technologies, some satellite-based technologies are also planned, some already deployed.

For the sake of the industry, it would have been simpler if there were one mobile TV standard over one spectrum band, but the reality is that there are a number of these standards throughout the world. In some cases, as in Germany and China, there is even more than one standard per country. Such a market introduces a big challenge for technology vendors and component providers, and is calling for a multi-standard, multi-band solution while maintaining small size, low cost, low power, high mobility performance and high level of integration.

Flexibility for operators

In a traditional cellular communications market, operators are in charge of the entire operation from A to Z – the network, the infrastructure and everything required for delivering services to the consumer. The MDTV market operates differently. Cellular operators won't install the networks and infrastructure but will instead follow a TV service provider model, where companies such as Modeo and Mediaset will install the mobile TV network, including infrastructure, towers and content aggregation. Operators will then buy the service from the TV service provider to bring it to the end user as a commercial service.

Because of the market structure, operators will have a presence but they still require some amount of flexibility. With the multi-standard reality, even though operators each have a preference for standards, they can have the flexibility to work with two or more

different MDTV service providers to create competition and get a better deal. This also presents less of a risk than if they were only using one standard.

Streamlined multi-standard design for phone manufacturers

Phone manufacturers want the ability to sell their phones in multiple countries or in countries where there is more than one MDTV standard – requiring a multi-standard phone supported by a multi-standard receiver chipset.

For phone manufacturers, the multi-standard approach to MDTV presents an opportunity to streamline hardware and software design while reducing the overall design cycle and R&D costs. With a multi-standard chip, manufacturers can invest in one platform which can then yield several commercial models at different standards.

A multi-standard chip also assists phone makers in managing inventory. If one model for one standard suddenly has less volume, the possible inventory overhead can be offset by using the same chip for other models supporting other standards where volumes may exceed the estimate. The handset maker does not have to bet which standard will prevail. With a simple and single design, they can leverage volume to reduce price.

The long run from the end user's perspective

In five years or so, end users will have access to a collection of TV services carried over various wireless technologies: multiple-standard broadcast TV, IPTV over Wi-Fi, streaming TV over HSDPA, and perhaps also WiMAX or LTE ("3.9G"). For the end users, all of these technologies shall be abstracted behind one simple, easy-to-use application on their mobile device that will access different TV services operated by different service providers.

System Architecture of a Unified Mobile TV Application – Multiple-tuner Single Application

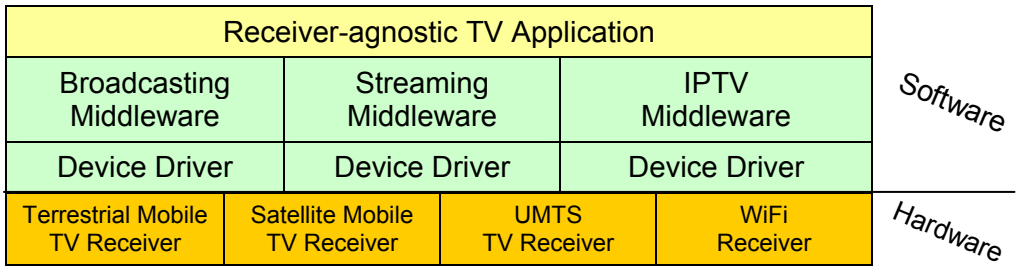

Figure 1: *System architecture of a unified multi-radio mobile TV system*

The user will be agnostic as to the technologies and how they work and will enjoy a rich user experience and fast deployment by providing access to all available content. This combination of software and chipset is designed and packaged in a way that users can access all types of services anywhere they are in the world while roaming with one phone. The end user can receive his selected channel through countries with different standards or more than one standard, providing the full mobile phone TV experience in a fast deployment.

Challenges of multi-standard

There are a multitude of technical challenges associated with providing a multi standard chip and phone for MDTV. Supporting multi-standards might require more silicon which increases the costs of the chip, as well as the phone and the operator's services. The larger silicon also consumes more power. The challenge to silicon providers and phone manufacturers is how to still support all of the standards without using larger silicon and be able to bring a low-cost, low-power solution.

Siano's SMS1010 - a milestone toward MDTV convergence

The challenges of MDTV have been addressed with the creation of a multi-standard chip that is smaller in size than competing solutions that support only one or two standards, The multi-standard chip is also lower in power consumption while maintaining a high level of performance in reception, securing good reception even with weak signal strength such as in an elevator or garage.

The multi-standard approach - eventually to be expanded to "multi-technology" approach – is aimed at solving the challenges that all these emerging standards and technologies and spectrum bands have created. Without this approach, this enormous diversity might place a huge obstacle that will keep mobile DTV handsets and services from reaching the mass market.

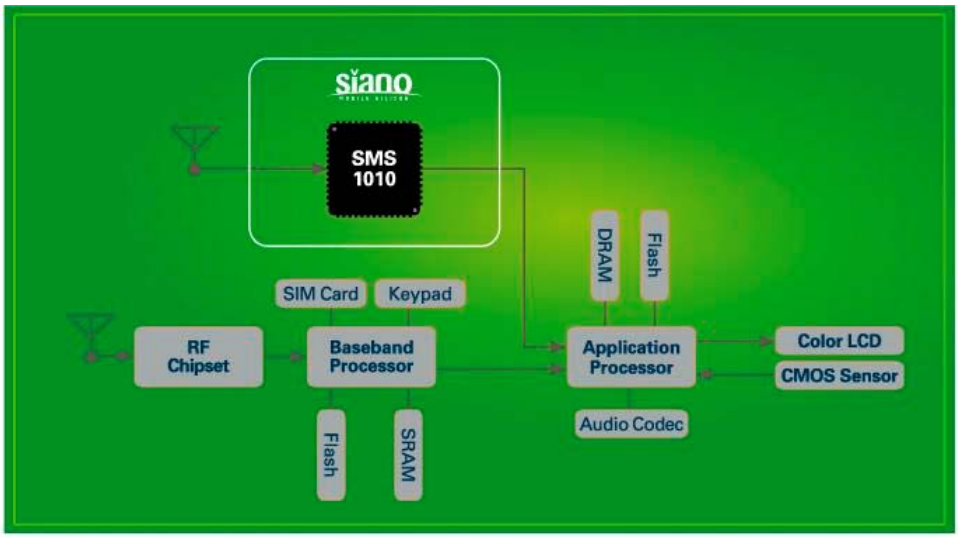

Figure *2: SMS1010 – multiple spectrum bands, multiple TV formats, single chip*

The penetration of MDTV is an evolution. The industry is now at its beginning, bringing the software and chipset together to enable end users to easily access any type and standard of TV services available no matter where they are in the world. In the future this convergence will continue and allow end users to seamlessly move their entertainment from the home TV to the mobile phone to the laptop, enabling mass deployment and ramp-up of Mobile TV and allowing globalization of the mobile device and its owner.

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