

# Personalization:

## Reducing Complexity for Easier, More Intuitive User Experience.

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### **Abstract**

*Digital content, communications, commerce and community are all converging onto mobile devices, adding more capabilities and thus playing an increasingly important role in people's lives. Motorola aims to ensure the additional features and functions will be readily accessible and valuable to users. The approach Motorola is taking is personalization, which provides key benefits to users and service providers. The former obtains a positive, intuitive user experience. The latter gains an important point of differentiation on which to market their services. This paper presents Motorola's vision of personalization as a cornerstone of converged communications and Seamless Mobility. It defines basic personalization models and the standards required to achieve a pervasive solution. And it introduces some exciting personalization technologies being developed by Motorola Technology.*

### **Introduction**

Not so long ago, a cellphone was simply a cellphone – it was easy to define and use. But now, capabilities such as voice recording, music playback, navigation, still image and video capture, email, and more are built in to many of today's mobile devices. What's more, technologies such as a business card reader, bar-code reader, Internet radio-to-go and bilingual talking dictionaries are being added, soon to be followed by mobile TV and video blogging.

As functionality increases, the interaction, content and applications associated with mobile devices must intuitively accommodate the individual user's preferences. Motorola is committed to developing

# It is the integrated set of user interaction, service and content delivery technologies that will enable an easier, more rewarding user experience.

## PERSONALIZATION DEFINED

Simply put, personalization is about providing unique and intuitive experiences with a user's devices. It requires understanding a user's individual preferences while providing the appropriate interaction modalities, applications, services and content. This requires understanding the intent of users and mapping that to software-based models that understand the types of choices people make. Personalization requires technologies that are adaptive and dynamic so that day after day, devices can learn what users like to do. They can learn in what situations, calls should be answered, how users prefer to interact with their devices, how often users prefer certain functions and what types of content they access. Over time, devices become easier to use because they present the user with options that are most likely needed to achieve the user's goals.

personalization technologies that put the user at the center of an interaction, application or service while ensuring that user experiences remain consistent and coherent across activities, devices, services, locations and networks.

As Gartner states, "It is the ability to access an application on a device of choice, and in a manner that is independent of the network platform. It is as much about the accessibility of a service or application on the move as it is about the availability of the network. The application or service needs to be available over a device or platform of the user's choice, offered in a manner that is chosen by the user and with the content that is dictated by user demand."<sup>1</sup>

## Getting Personal

When user interaction, service and content delivery technologies are integrated with personalization technologies, complexity is reduced and experiences are more enjoyable, productive and safe. Moreover, the consistency across devices and environments dramatically simplifies the learning curve associated with devices.

## Personalization Models

Motorola sees three key personalization models emerging to enhance user experiences with mobile and fixed communications devices: user interaction personalization, content personalization, and applications and service personalization.

**User interaction personalization** ensures that a user can always experience their preferred interaction behavior with a device, application or service. These preferred behaviors of interaction include the order of interaction operations, the human modalities used, and a specific set of circumstances – environment, device capabilities and task to be accomplished. These behaviors are learned and captured in such a way that they can be reused by any compliant device, application or service, enabling users to leverage historical interactions on other devices, as well as on higher performance replacements of their current devices.

Examples of interaction personalization that anticipate a user's wants or needs include:

- Recognizing a preferred input method, such as text, speech and gestures
- Recognizing a preferred output method, such as text, graphics and speech
- Handling implicit ambiguity and understanding what a user intends; for example, knowing from context that a user means Paris, France and not Paris, Texas
- Managing context-aware choices, such as when a mobile phone switches to vibrate mode because the user is in a theater or sends calls directly into voice mail because the user is operating a vehicle

<sup>1</sup> Gartner "Network Operators Must Embrace Personalization and Mobility." July 6, 2005

**Content personalization** means meeting a user's expectations by anticipating the content a user may want. The best example is eCommerce, where technologies such as cookies and advanced Web personalization engines recall consumers' previous purchases, and make new recommendations based on those transactions. Another example is digital video recorders (DVRs), which can track viewing habits and proactively record similar programs.

Specific content personalization types include:

- Filtering massive quantities of content to identify items that best match a user's tastes or needs
- Recommending new content that may be of potential interest to a user
- Proactively discovering content with certain attributes; for example, a certain language soundtrack or multiple audio channels

**Application or Service personalization** adapts services to user goals according to context. This type of personalization is one way service providers are differentiating their offerings by tailoring their services to the specific wants and needs of their customers. Two examples are *personalized call routing*, which enables a device to understand the user's environment and determine if a call should go through or be held for a more appropriate delivery time, and *user-authorized, location-based advertising*, which enables mobile ads to be sent to the user's device based on the user's location – for instance, an ad for a pizza restaurant along with driving instructions could be delivered when the user reaches a specific geographic radius of the restaurant.

Other examples of service personalization include:

- Selecting the appropriate network based on a user's needs and preferences; for example, providing a high-bandwidth channel when the user needs video conferencing capabilities, while providing a data-optimized link to contain costs when broadband isn't required
- Launching the necessary services to handle an unexpected user context; say for example, a traveling user is stuck in a traffic jam; a personalized service could serve up alternate route maps while notifying others that the user will be late to a scheduled meeting
- Launching the device's short message service message creation screen, when the user says, "Send a message"

## Key Motorola Initiatives in Personalization

Motorola is developing advanced personalization technologies that work on behalf of the user by discreetly and unobtrusively gathering information about services and content use, contextual awareness of the user's current situation, location and task, and choice of interaction behaviors. By establishing when and how users interact with their devices, and what content choices they make, Motorola's personalization technologies will use that information to support user activities and provide better experiences in new circumstances.

## Personalization of User Interaction

Motorola's Intelligent User Interaction<sup>2</sup> framework architecture, with basic research and intellectual property dating back to the late 90's, officially launched as part of the corporate-wide Seamless Mobility<sup>3</sup> initiative in 2004. The intelligent user interaction vision of moving from user-directed interaction through goal-oriented interaction to intuitive, transparent user interfaces is built on fundamental human interaction research in domains such as goal-orientation, user interaction, multimodality, context awareness and user adaptiveness.

<sup>2</sup> See "Intelligent Interaction: Adapting Device Capabilities to User Goals" white paper for more information at [http://www.motorola.com/mot/doc/6/6115\\_MotDoc.pdf](http://www.motorola.com/mot/doc/6/6115_MotDoc.pdf)

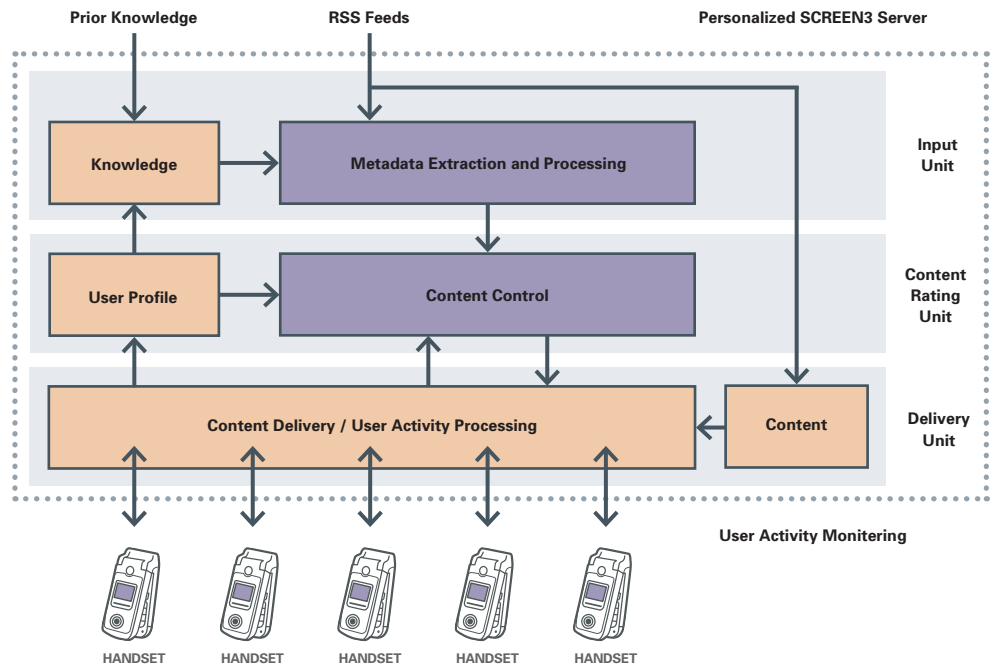
<sup>3</sup> See "Seamless Mobility: A Continuity of Experiences Across Domains, Devices and Networks" white paper at [http://www.motorola.com/mot/doc/5/5764\\_MotDoc.pdf](http://www.motorola.com/mot/doc/5/5764_MotDoc.pdf)

Motorola currently has a smartphone research initiative that connects via Bluetooth mobile devices to sensors in the vehicle's data bus. Device applications and operations are altered based on the driving context. For example, the mobile device can sense the user's entry into a vehicle and transfer an ongoing phone call into the speaker system of the vehicle. When in a complex driving situation, calls can be routed to voice mail for retrieval at a later time.<sup>4</sup>

## Personalization of Content

Motorola SCREEN3 is a technology that provides intuitive access to preferred news, sports, weather, promotions, entertainment and other media from a user's mobile device. Information regarding items of user's preference is cached to the mobile device whenever it's idle (Figure 1). This information forms a scrolling "ticker" on their phone's home screen, which provides headline information. If more information is desired, single clicks can bring users to more detailed information and images. In this way, Motorola SCREEN3 increases the relevance of information offered to users and enables content providers the ability to better target offers. Motorola Labs has shown demonstrations of mobile SCREEN3 selections transferred from a mobile device to a home digital video recorder (DVR), extending the mobile personalization preferences to the home viewing experience.

**Figure 1: The SCREEN3 server-side solution is a hybrid of content and collaborative filtering.**



## Personalization of Services

Launched in 2004, MobiLife is a European consortium dedicated to defining and developing a new generation of mobile services to enhance everyday life. Motorola has taken a leadership role in MobiLife and is actively contributing to initiatives that include a service discovery mechanism that offers personalized recommendations in an environment where there are multiple options available to the user.

The MobiLife context-aware platform enables contextual evaluation, leading to personalized recommendations in a framework that is application-independent. Applications include multimodal user interaction, location-based information services for families, and health-related services.

<sup>4</sup> See "Nomadic Devices: Toward Simpler, Standardized Integration into Vehicles Via a Nomadic Device Gateway" position paper for more information at [http://www.motorola.com/mot/doc/6/6459\\_MotDoc.pdf](http://www.motorola.com/mot/doc/6/6459_MotDoc.pdf)

## Seeking Standards

Personalization standards are still in their infancy, but Motorola is taking an active role by working with various consortia, university research groups, and standards bodies such as Digital Living Network Alliance, Open Mobile Alliance, 3GPP and W3C. Through these organizations, Motorola is helping to develop the open architectures and standards that will enable true personalization in a world of Seamless Mobility. The goal of this work is to allow personalization profile portability between applications and devices, innovations in multimodal interactions between people and devices, and large-scale personalization of user interfaces.

## Motorola and the Future of Personalization

As mobile devices become more feature and function-rich and digital media proliferates, personalization technologies will become more important to every player in the Seamless Mobility ecosystem. Personalization has the power to lower cognitive overhead, enable greater productivity with mobile devices, provide consistent experiences across devices and environments, and allow users to optimally use many more applications and services. And ultimately, it will make for a more enjoyable user experience and lifestyle.

Personalization helps enable Seamless Mobility to deliver the promise of seamless experiences – a world of easy, untethered, uninterrupted access to functionality, information, communications, and entertainment, where technology doesn't get in the way. Motorola is well on its way to making Seamless Mobility a reality with initiatives focused on enabling personalization of user interaction, applications, services and content.



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