Customer Vendor Intervention Instruction Information

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ABSTRACT
The connotations of the term "user assistance" depend on the context in which it is used. In this paper we propose a user assistance matrix for mobile devices in intelligent environments based on the kind of assistance being offered and the origin of the call for assistance. Creating this matrix makes it possible to understand what issues need to be addressed in order to provide effective user assistance in various scenarios.

Categories and Subject Descriptors
H.5.2 [**Information Interfaces and Presentation**]: User Interfaces – *Theory and Methods, User-centered design, Interaction Styles*; *User Assistance.*

General Terms
Documentation, Design, Theory.

Keywords
Models, Principles, Intelligent Environments, Ubiquitous Computing, Mobile Computing, Intervention, Instruction, Information, User Assistance

1. INTRODUCTION
Our fundamental premises are: a) Mobile devices are ubiquitous; b) Mobile devices are evolving an expanded feature-set; and c) Users and vendors see mobile devices as a desirable way to send and receive personalized information. This paper examines the type of assistance that might logically be offered to mobile device users on their devices.

As mobile devices become more powerful, they also become more complex, potentially leading to greater user confusion and requiring a larger base of learning in order to operate them effectively. This is especially true in the early stages of adoption or during a time of rapid increase in functionality. Usability testing suggests that more powerful devices also lead to higher user expectations for flawless and error-free operation. Users expect to find stored personal information (contacts and phone numbers) and on-demand information (directions and traffic conditions) on their mobile devices. Vendors of mobile content see this as a largely untapped means of promoting their goods and services, but because mobile devices present an equally large target for malicious attack and theft of personal data, individual privacy and security concerns must be considered carefully.

In the Customer Vendor Intervention Instruction Information (CVIII) Matrix, we propose a taxonomy for defining the different kinds of user assistance from the perspectives of the customer (device user) and the vendor (information source).

2. The CVIII Matrix
The active categories in the matrix are spelled out in the title. Columns are headed "Customer" and "Vendor." Rows are labeled "Intervention," "Instruction," and "Information." Table 1, below, describes each intersection of the matrix.

Table 1. CVIII Matrix.

	Customer	**Vendor**
Intervention (Help)	Originates with customer's statement of failure and requires an immediate response.	Originates with vendor's need to get urgent info to the customer; ften regarding a failure not yet recognized by the user.
Instruction (Training)	Originates with customer's question; does not require immediate assistance; customer has time and desire to learn.	Originates with vendor's suggestion offering a reason or motivation to learn more about a service.
Information (Advertising)	Originates with customer's search for information; Results may include paid advertising that gets preferred placement.	Originates with vendor's opportunistic suggestion based on user context, but without a specific user.

The matrix recognizes a difference between assistance in the form of intervention (help), instruction (training), and information (advertising). It distinguishes among these according to who initiates the UA request. The "Vendor" column closely parallels [2]'s "incidental interactions," defined as "where actions performed for some other purpose, or unconscious signs, are interpreted in order to influence/improve/facilitate the actor's future interaction or day-to-day life."[1] Where [2] explores "designed interactions," the CVIII matrix attempts to

[1] "Beyond Intention—Pushing Boundaries with Incidental Interaction," by Alan Dix, Lancaster University, Lancaster, UK.

extend that concept to include broadcast information as well as secondary use of actor (customer) stimuli.

Intervention is always offered when a failure has occurred or is imminent. It is immediate and must be available when the user is in a "non-connected" state. Instruction, on the other hand, is offered at the user's leisure when there is no imminent failure, but a desire to learn. Information is offered opportunistically in response to user requests or location and context awareness.

It is worth mentioning that the "information" row typically does not relate to the device itself. That is, customers seldom initiate requests for information about their mobile devices; they initiate requests for information about the world around them. Similarly, vendors want to push world-related information to the user.

The matrix also differentiates between assistance initiated by the customer and that initiated by the vendor. While help and assistance that address customer-initiated requests are available on nearly every kind of device, there are currently few environments that enable vendor-initiated assistance.

2.1 Customer/Intervention

This scenario typically begins with a failure in expected functionality or in the user experience, which generates a statement of condition. These failures may be widely disparate, but typically the customer knows something is wrong but may not have adequate information to ask a specific question. Some examples include:

- "Help! I'm lost."
- "Help! It didn't work."
- "Help! I can't connect."

Note that these scenarios imply a request for intervention. An immediate task or function has failed and the device is non-operative. The user does not know what kind of question to ask, only that a problematic situation exists.

2.2 Customer/Instruction

This scenario typically begins with an inquiry about a task for which there is inadequate knowledge. Any aspect of the device may be a subject for training, but the key element here is that the customer has a specific scenario in mind when asking. Examples include:

- "How do I use my GPS tracker?"
- "How do I manage music on my device?"
- "How do I send an international text message?"

Note that, in contrast to help requests, customer training requests are typically "how-to" questions. They relate to a scenario, not to a feature; in fact, the user may not know if the scenario is supported at all. In each instance, the user opens a door for exposing functionality.

2.3 Customer/Information

This scenario typically begins with a search query. Through the widespread use of internet search engines, customers have become accustomed to receiving search results that include paid placement, or advertising. This began in telephone directories, where all businesses with telephone service were listed, but a business could pay for various levels of enhanced placement or expanded content. Advertising in this context responds to a customer's request for information. Examples include:

- "What department stores are in this shopping mall?"
- "Where can I buy fresh fish?"
- "Is there a good restaurant near here?"

Most information requests can be phrased as a question, though they may simply be based on a keyword search, as in "restaurants, Bellevue, downtown." This topical selection helps customers get results that are more relevant to their actual request.

2.4 Vendor/Intervention

This scenario typically begins with the vendor identifying a potentially disruptive experience, resulting in vendor-initiated assistance. The customer may not be able to see, or even recognize, the system failure. Nonetheless, the vendor/intervention scenario is defined by the timeliness of the intervention. Some examples of vendor/intervention scenarios include:

- "Help! My customer has left my service area."
- "Help! My customer's device is not responding."
- "Help! My customer turned into a blind alley."

Note that these are statements of a situation the vendor feels merits intervention. From the vendor's perspective, the system has failed. This is the vendor's opportunity to intervene on the customer's behalf, and to provide critical information to the customer *before* it becomes a customer/intervention scenario.

2.5 Vendor/Instruction

This scenario typically begins when the vendor identifries an opportunity to optimize device usage. Customers use a fraction of the features and capabilities of their mobile devices. This is increasingly true as customers are presented with a wider range of usage scenarios. This is an opportunity for vendors to push training to the user rather than waiting for the user to ask for it. Some examples of vendor instruction scenarios include:

- "You have used that feature three times recently. Would you like to automate the process? Here's how."
- "Did you know you can send the photos you have taken to other people? Here's how."
- "There are seven others playing this game within 100 meters of you. Would you like to contact them for joint play? Here's how."

We see the pattern here identifying a scenario and offering "how-to" instruction. The vendor instruction scenarios are opportunistic in that they expand or improve the customer's use of the device and/or services. We have learned from experience, however, that users show little patience for unsolicited tips that are imposed on them unless they have "opted in" for such information.

2.6 Vendor/Information

This scenario typically begins with a vendor's unsolicited broadcast of information. This is advertising. It may take ad-

vantage of user context to give actionable suggestions. Information messaging may be highly targeted and individualized. In this instance, messages may be received because of the customer's location. For example:

- Flash: Mariners beat Yankees 6-1. To subscribe to local sports press #618-Send.
- Flash: Did you forget the cat food? Your brand is in aisle seven! (Customer is checking out with kitty litter in basket.)

It is easy to see that such pinpoint targeted advertising might be highly successful, if the customer has elected to receive such offers. If those offers come to the customer by surprise, they may be resented or even feared as an invasion of privacy.

3. USING THE CVIII MATRIX

A clear taxonomy of the problem space will help to define the ways user assistance can be offered. Each cell in the matrix has unique issues that need to be resolved in order to suggest a comprehensive solution. As we compare these issues, we can also see where there are common solutions that can be used across assistance models. We will observe, in fact, that mobile user assistance itself crosses over into user assistance for ubiquitous computing in all its forms. The following table begins the development of the issue matrix but is not meant to be a definitive list.

Table 2. Issues of CVIII user assistance

	Customer	**Vendor**
Intervention (Help)	- On-device footprint - Context sensitivity - Interrupted connectivity - Screen presentation - Updatability	- Privacy/trust - Context sensitivity - Interrupted connectivity - Screen presentation
Instruction (Training)	- Download - Stream - Discoverability - Consistency - Synchronization - Screen presentation	- Push - Media - Discoverability - Consistency - Screen presentation
Information (Advertising)	- Context - Bandwidth/cost - Search - Subscription - Non-interruption of device use - Screen presentation	- Ubiquity - Context - Bandwidth/Cost - Discoverability - Privacy - Annoyance - Security - Screen presentation - Media - Cost of entry

Identified issues like privacy, trust, interruption, and annoyance must be investigated concurrently with the design of user assistance. [4] defines "implicit HCI" as "an action, performed by the user that is not primarily aimed to interact with a computerized system but which such a system understands as an input. It is further identified that perception and interpretation of the user, the environment, and the circumstances are key concepts for implicit HCI."[2] In many cases, however, the actions that set context for interpretation do not need sensing apparatus beyond that which is already present on advanced mobile devices. Both GPRS and WiFi networks can identify location (where the customer is) and presence (whether the customer is available for contact on the device). Technologically, we have the ability to provide user assistance in many intelligent environments; but emotionally, we may find resistance to any "help" that is offered without a request.

It would be a mistake to emulate failed designs for such assistance. A noted example of this is Microsoft Office's "Clippy" assistant which has been removed from their products. We will find that the amount of intervention that customers will tolerate likely will vary by context and by the customer's understanding of what is offered, at what cost (monetary, privacy, annoyance, etc.), and with what benefit (convenience, efficiency, etc.).

Our proposed next steps in this investigation are to 1) identify more completely the matrix of issues, 2) determine user tolerance for vendor-initiated UA in different contexts, 3) recommend contextual designs for UA that satisfy vendor desires and customer concerns.

4. ACKNOWLEDGMENTS

Thanks to the Microsoft Industry Innovations Group for video example of Retail Vision. Thanks to reviewers of this paper for excellent suggestions on references. Thanks to Ethan Casey and Michele Palmer for editing.

5. ABOUT THE AUTHOR

Nathan Everett is the User Assistance Strategist for Microsoft Mobile and Embedded Devices. He is not an academic researcher. He has been the UA Strategist for Microsoft MED since 2004. In that capacity he researches trends in mobile device usage and determines how Microsoft can best provide user assistance for the Windows Mobile platform.

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