



**CLARITY**  
HUMAN SERVICES

# Usability and the HMIS

The Role of HMIS Configurability in Coordinated Assessment Systems

## White Paper

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(702) 605.6870  
(888) 866.1533  
[www.clarityhumanservices.com](http://www.clarityhumanservices.com)



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## EXECUTIVE SUMMARY

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With the implementation of Coordinated Assessment in full swing, Continuums of Care (CoCs) nationwide are still finding their footing in this new landscape of homeless service provision. New protocols and procedures, and not to mention changes to street outreach, have drastically altered the way agencies carry out daily tasks.

As such, CoCs are looking for ways to minimize the impact of these substantial changes in order to best support their case managers and other agency staff. However, the most important source of simplification is often overlooked - the HMIS.

The Homeless Management Information System (HMIS) is the one element that can simplify Coordinated Assessment the most - as long as the HMIS is user-friendly.

HMIS software applications should be user-friendly in order to provide enhanced user experience. Any HMIS that is too complex and cumbersome will frustrate the end-user, reduce data quality, and ultimately affect service provision.

However, an HMIS with an effective and simple user interface design will be of immense help in achieving the objectives of Coordinated Assessment. A user-friendly HMIS not only increases the software's usability, but also leads to the smooth completion of any task at hand, thereby making everything enjoyable and flexible as per the requirements of users.

But what constitutes 'user-friendliness'? Software usability extends far beyond navigation, buttons, and font type. A user-friendly software application is developed by merging psychology with engineering in a way that customizes the software to the cognitive, psychological, and ergonomic aspects of the end-user.

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***"It's all about people. I find the most important thing is the emotional state of the people when they are finished."***

- Donald Norman, Human Computer Interaction expert, director of The Design Lab at University of California, San Diego, and author of *The Design of Everyday Things*.

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## Purpose

The purpose of this White Paper is to present the concept of software usability in the framework of cognitive psychology and the User-Centric Design Paradigm. It explores the role of configurability in the development of a user-friendly HMIS software application. This discussion includes how software configurability has a direct impact on the success of a Coordinated Assessment system.

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# WHAT IS USABILITY?

## The User-Centric Design Paradigm

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Usable software, sometimes referred to as 'user-friendly' software, is software that can be used to help the end-user achieve specified goals with effectiveness, efficiency, and satisfaction.\*<sup>[1]</sup> According to Jakob Nielsen, renowned Human Computer Interaction expert, usability is an attribute of quality, measuring how easy a software interface is to use.<sup>[2]</sup>

Usability has five quality components:

### 1. Learnability

How easy is it for end-users to accomplish basic tasks the first time they encounter the software?

### 2. Efficiency

Once end-users have learned the software, how quickly can they perform tasks?

### 3. Memorability

When end-users return to the software after a period of not using it, how easily can they reestablish proficiency?

### 4. Error Tolerance

How many errors do end-users make, how severe are these errors, and how easily can they recover from the errors?

### 5. End User Satisfaction

How pleasant is it to use the software?

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\* The International Organization for Standardization (ISO) is an international standard-setting body composed of representatives from various national standards organizations.

Taking these definitions together, it is possible to create a list of features that make a software application, such as the HMIS, user-friendly.<sup>[3]</sup>

1. Simple to install
2. Easy to update
3. Intuitive
4. Efficient
5. Pleasant, easy-to-navigate GUI
6. Easy to remove
7. Easy Data Migration
8. Easy to troubleshoot
9. Adheres to standards
10. Effective error handling

### The User-Centric Design Paradigm

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Process in which the needs, wants, and limitations of end-users of a software are given extensive attention at each stage of the design process.

The User-Centric Design Paradigm emphasizes that software should be designed with the cognitive psychology of the end-user in mind.

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## The User-Centric Design Paradigm

In short, user-friendly software is created with the end-user in mind. This approach, termed the User-Centric Design Paradigm, is a process in which the needs, wants, and limitations of end-users of a software are given extensive attention at each stage of the design process.

The User-Centric Design Paradigm emphasizes that software should be designed with the psychology of the end-user in mind. The design of user-friendly software puts the user, rather than the system, at the center of the design process.

Generally speaking, usability problems are caused by a mismatch between the end-users' cognitive and perceptual abilities and the required abilities that the software system requires. Humans have serious limitations when it comes to information processing and other tasks such as decision making, searching, and scanning.<sup>[4]</sup> <sup>[5]</sup> The field of cognitive psychology gives a theoretical and practical background on these matters.

There are countless psychological aspects that should be taken into account when designing software for usability, and the following page lists several of these.

## Aspects of Cognitive Psychology for Usability

### **End user memory**

End-users rely heavily upon their short term memory when navigating a software application. Software designers should minimize the end-user's memory load by making objects, actions, and options visible. This prevents the end-user from having to remember information within the software. Instructions for use of the system should be visible or easily retrievable whenever appropriate (e.g. tooltip integration, uniform icon/button styles, etc.).<sup>[6]</sup>

### **User Control and Freedom:**

When the end-user makes a mistake, they need a clearly marked 'undo' option or the ability to reverse their action (e.g. retrieve deleted data, edit past forms, etc.).<sup>[6]</sup>

### **Cognitive Load**

Our mind holds only about 7 pieces of information at any given moment, which fade from our brains in about 20 seconds. This means that software must be created with this fact in mind. For example, the software must be responsive (pages must load swiftly, forms must auto-populate, etc.), so that that users don't forget what they're doing while waiting for the next page to load.<sup>[6]</sup>

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# USABILITY & COORDINATED ASSESSMENT

## Usability Directly Affects Coordinated Assessment

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### Usability and the HMIS

What does software usability mean to homelessness services and the HMIS? A user-friendly HMIS software application can enhance a CoC's efforts:

- Improve data integrity
- Ensure effective service provision
- Increase reporting accuracy
- Enhance end-user satisfaction and staff morale

The following are three examples of how user-friendly software design features can improve data quality, service provision, reporting, and staff morale.

### Example: Tooltip Explanations

Tooltip explanations are prompts that appear when the end user mouses over a data field. Tooltip explanations enhance end user understanding, improve data quality, and streamline intake and data entry processes, not to mention the convenience of having answers to common user questions automatically available on the screen.

**Scenario:**

A volunteer is entering data into the HMIS application when they come across a data element with which they are not familiar. Two common scenarios would typically unfold: a.) The volunteer has to interrupt their data entry in order to seek assistance from a caseworker, or b.) The volunteer enters the data incorrectly, resulting in inaccurate reporting.

The tooltip integration usability feature enables the volunteer to learn the meaning of the data element. They can then seamlessly continue their data entry task, saving time while also maintaining data integrity.



### Example Auto-Complete Functionality

AJAX autocomplete toolkits/widgets allow for auto-complete functionality, making client search easy and accurate. For example, a client record can be located easily if the user is unsure of the exact spelling of a client's name. This feature also catches instances of duplicate entry.

#### Scenario:

Client Jaymes Smith enters the emergency shelter. A caseworker begins to search the database for the common spelling of the name: "James Smith". However, unbeknownst to the caseworker, the client has already been entered into the system under "Jaymes Smith". The common result of such a scenario would be a duplicate file for the same individual, one with the name James Smith, and the other with the name Jaymes Smith.

The auto-complete functionality feature eliminates this risk of duplication. The caseworker would have seen the alternative spelling of the name ('Jaymes') within the dropdown below the search box. They would then have the opportunity to clarify the spelling with the client, and subsequently enter the new client information into the correct client record. This preserves data integrity, decreases time and resources lost to troubleshooting, and contributes to accurate reporting.

### Example: Real-Time Data Entry

HMIS software applications developed with HTML5/AJAX based technology are ideally equipped with real time data intake functionality, which enhances service provision (non-duplication of services, immediate documentation of expense items, etc.), streamlines referral processes, and allows for accurate bed availability information for precise reservation management.

#### Scenario:

A caseworker encounters a homeless single mother with two young children during an outreach assignment. It becomes apparent that the family needs immediate shelter. The caseworker uses a mobile device to reserve a unit with three beds at the emergency shelter for that evening, and assures the mother that she and her children will have a warm place to sleep as well as a hot meal that night. However, once the family arrives at the emergency shelter, they learn that their reservation was not confirmed. Because the client management system was not updated in real-time, the caseworker was unable to see that the unit she reserved was actually already taken – the information had not yet been updated in the system when the caseworker made the reservation.

This real-time functionality eliminates the possibility that such a disruptive event can occur. The reservation system updates in real-time, so when a bed/unit is reserved this information is immediately updated in the system, thus eliminating risk of 'double booking'.

These points taken together indicate how a user-friendly HMIS software application can lead to appropriate allotment of funding (as funding is based on high data quality), effective service provision, accurate reporting, and increased staff morale.

Perhaps even more importantly, an HMIS software application that is user-friendly can enhance a CoCs Coordinated Assessment system.

The practical, hands-on aspects of Coordinated Assessment (street outreach, referrals, assessments, etc) are complicated in their own right. If you combine these challenges with an HMIS that is not user-friendly, then these challenges increase tenfold.

The following section discusses how user-friendly HMIS software applications support Coordinated Assessment.

### User-Friendly HMIS

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- Improve data integrity
- Ensure effective service provision:
- Increase reporting accuracy:
- Enhance end-user satisfaction and staff morale

### User Interface Focused

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The practical, hands-on aspects of Coordinated Assessment are complicated in their own right. If you combine these challenges with an HMIS that is not user-friendly, then these challenges increase tenfold.

## User-Friendly HMIS Software and Coordinated Assessment

CoCs nationwide have worked tirelessly to update their service processes to meet the coordinated assessment requirements set forth by HUD. Ultimately, the primary goals of a Coordinated Assessment system are to simplify service access, track system outcomes to inform and enhance decision-making, and improve overall system efficiency.

Although organization planning is of paramount importance to establishing an effective Coordinated Assessment structure, HMIS software lies at the heart of this service provision structure. The interaction between the software and the end-user must foster fluid service provision as opposed to impeding it, or even inhibiting it all together. As such, end users must be able to interact with the HMIS application effectively in order to establish and maintain cohesive, streamlined service provision. Therefore, the HMIS plays a central role in Coordinated Assessment, but in order to comply with the requirements, HMIS applications must be user-friendly.

## This leads to the question: What makes an HMIS user-friendly?

As mentioned above, user-friendliness is a byproduct of a user-centric design process: cognitive psychological aspects of the end-user experience must drive the design process.

However, there is one thing that is critical to achieving usability – configurability.

A truly user-friendly HMIS is configurable to allow the System Administrator to create a user-friendly environment for their end-users. And the configurability processes themselves must be user-friendly as well. The following section goes into further detail on this topic.

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# THE ROLE OF CONFIGURABILITY

## Why Configurability is Integral to Usability

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### What is Configurability?

Configurability (i.e. the ability to customize the software application) is the primary element of user-friendly software. Configurability and usability share a symbiotic relationship – one cannot exist in the absence of the other. In order for an HMIS to be user-friendly, it must be easy to configure in ways that fit the needs of the CoC and its end-users.

Likewise, each element of the HMIS must be fully customized in order for it to be relevant and highly intuitive to the end-user.

As such, a configurable HMIS offers CoCs endless opportunities to adapt each aspect of service provision to meet their needs.

It is not enough for HMIS software to simply claim configurability - there is one distinguishing factor that defines true configurability - the element of autonomy.

Configurability loses its value if the System Administrator must rely heavily upon IT staff, or even their HMIS vendor, to customize their system. Nobody knows service needs better than the System Administrator. Thus, it is infinitely important that they be empowered to customize their own system with minimal guidance from outside resources.

Therefore, an effective HMIS, one that can withstand the demands of homelessness services (e.g. Coordinate Intake, accurate reporting, etc.) should be built with autonomous end-user customization in mind. This means that the development of all configurability features (i.e. features that enable the System Administrator to configure their HMIS application) must be based on the User-Centric Design Paradigm.

### Configurability

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To "**configure software**" means selecting programmable options that make the program function to the user's liking.

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"**Configurability**" then, refers to the hardware or software's ability to be changed and customized.

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## Customizability Requirements for a User-Friendly HMIS

In order to promote usability, the following HMIS elements and service processes must be fully customizable in the following ways.

It is important to first emphasize that the process of configuring these settings must be based upon the User-Centric Design Paradigm – the features utilized in system configuration must be developed based on the psychological concepts mentioned earlier.

The following table presents several examples of features utilized in system configuration.

## Features Utilized in HMIS System Configuration

### Access/Sharing & Security

#### Agency Sharing Rights and Exceptions

Ability to manage agency data sharing policies and grant 1 to 1 sharing exceptions at the agency, department, program, and end user levels.

#### Access Roles and Rights

Ability to create and manage access roles at a granular level. This limits end users to gain function to only the areas of the system that their role provides them.

#### User Setup and Management

Create new end users, edit existing end users, reset passwords, disable end users, manage client PKI certificate, manage IP Whitelist address, manage PDF user policies, set access roles, create default profile screens, force password changes, grant additional agency access, and other additional user level management functions.

### System Design

#### Screen Designer

Completely customizable and easy to use screen designer to allow for the custom creation of assessment screens and program management screens (i.e. profile, enrollment, status, exit, follow-up screens).

#### Field Editor

Simple interface to allow for the creation and management of custom database fields. Text, checkbox, pick-list, number, dollar, and other additional data formats should be available. The HMIS should automatically create and translate the management to the relational database.

#### General Settings

Full customization of system variables, such as session idle limits, maximum password attempts, Area Median Income (AMI), Poverty Guidelines, email templates, client forms, file categories, and other additional customizations should be available.

#### Report Library Management

Ability to register and modify customized reports for inclusion in a user accessible Report Library. Reports should be able to be assigned to specific agencies, and certain designated access roles that can allow only select users to view specified reports should be available

### Program and Service Configuration

#### Program Template Management

Ability to create and manage Program Templates. For example, the system should be capable of managing any non-HUD programs that use completely separate Enrollment, Status, and Exit screens. These templates should be defined to provide standardized workflow.

#### Goal Template Management

Ability to create and manage Program Goal Templates. The Goals Editor should be highly configurable, and allow for Pass/ Fail of goals to be automatically assigned to client- enrolled programs. Goals can consist of items such as "Receive Mental Health Services within 90 Days," or "Obtain Permanent Housing within 30 Days."

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## CONCLUSION

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Coordinated Assessment poses both practical and technical challenges to CoCs nationwide. A user-friendly HMIS alleviates these challenges, and customization is the cornerstone of usability.

Simply stated, successful HMIS applications should be unintimidating. The way to achieve this is through the User-Centric Design Paradigm -the psychology of the end user must be at the forefront of development. This increases user engagement and confidence, allowing end-users of any comfort level to focus on client services without the hindrance of cumbersome software. This type of approachable HMIS is achieved through customization of the application.

While this usability ensures that all end-users are able to interact with the HMIS application effectively, it goes a step further to also benefit service provision. Thus usability, which is achieved through customization, has far-reaching positive impacts on how effectively your CoC can serve its client population.



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## References

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- <sup>[1]</sup>International Organization for Standardization (ISO) <http://www.iso.org/iso/home.html>
- <sup>[2]</sup>Nielsen, J. *Usability 101: Introduction to Usability*
- <sup>[3]</sup>Tech Republic. *10 things that make software usable*
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