

Assessing the Workplace Remotely: Is it Possible?

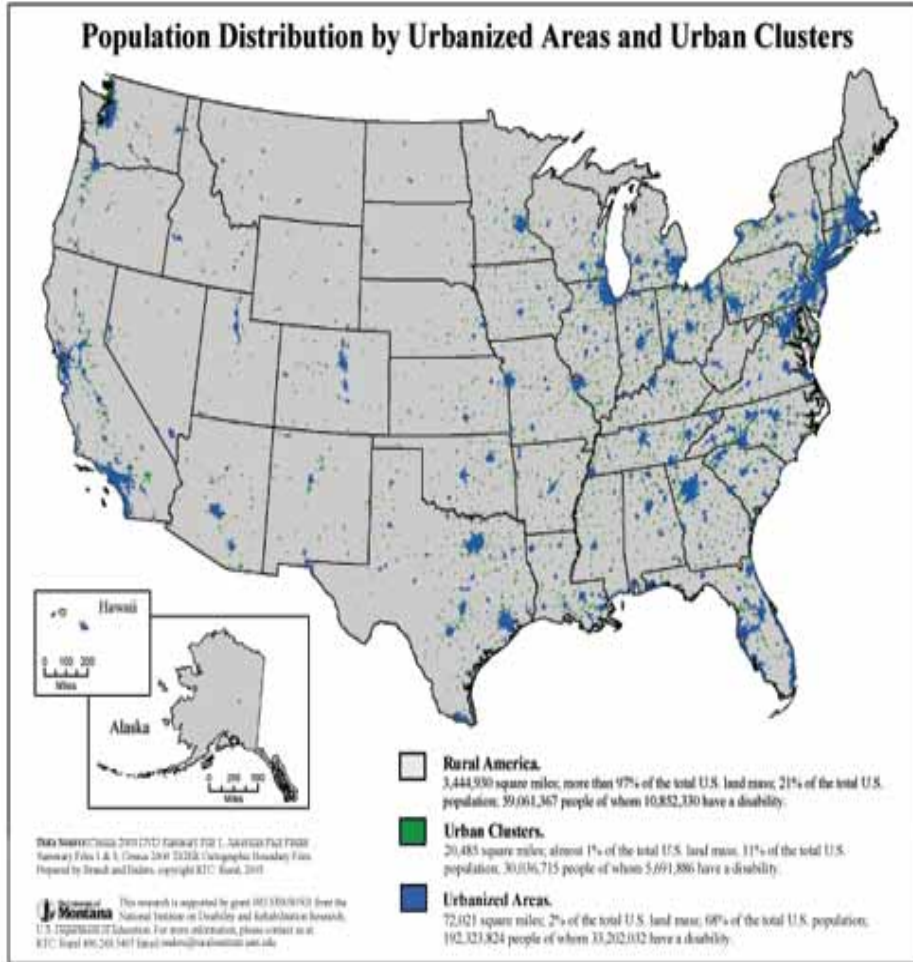
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Issue



- Workplace accommodation is an effective strategy to enable those who are ageing or individuals with disabilities to work, however implementation on a broad basis has not yet occurred
- Lack of workplace accommodation experts in rural areas to perform assessments
- Increased time and cost required for on-site assessments

Purpose of the Project

- Develop an alternative and innovative workplace assessment method for individuals with disabilities and/or ageing workers as opposed to the traditional on-site assessment
- Project focuses on the use of tele-technologies to allow an assessment of the workplace to be conducted remotely by a workplace accommodation specialist



Project Objectives

- Combine the unique aspects of the Work RERC (GA Tech) and the RERC-TR (University of Pittsburgh) to develop a new comprehensive remote workplace assessment
 - based on 2 prototype methodologies
 - utilizes real-time, interactive tele-technologies
- Evaluation of the new assessment protocol
- Refinement of the protocol based on data collected



Benefits of Assessment / Remote Assessment for Ageing Workers

- Assessment enables continued participation of ageing workers
- Assessment assists with maintaining safety and productivity of ageing workers
- Expert evaluators can cover wider geographic area with remote assessment
- Remote assessment enables collaboration between greater number of disciplines
- Remote assessment decreases need for travel to worksite, therefore being more timely, efficient, and cost-effective

Methods

- Review of existing instruments
 - to evaluate comprehensiveness and applicability/adaptability for use with the remote teleconferencing technology
- Pretest of assessment with tele-technology
- Modification of assessment to fit strengths and limitations of technology
- Evaluation of effectiveness of tele vs. on-site assessments



Conceptual Framework for Assessment

- More than 50 existing instruments were analyzed to determine usefulness for assessments conducted remotely
- Concluded that none of the 50 instruments were sufficiently comprehensive to guide a remote workplace accommodation assessment
- Resulted in the development of a conceptual framework of essential assessment information based on the ICF's constructs of person, environment, activity and performance
- This framework is being used to guide construction of the WRAP

ICF Model

**Health Condition
(disorder/disease)**

**Body
function&structure
(Impairment)**

**Activities
(Limitation)**

**Participation
(Restriction)**

**Environmental
Factors**

**Personal
Factors**

Conceptual Framework for Assessment

Type of Info		Investigation	Interpretation	Intervention
P-E Factors				
Person				
Press	Individual			
	Physical			
	Social			
	Task			
	Organizational			
	External			
Performance				

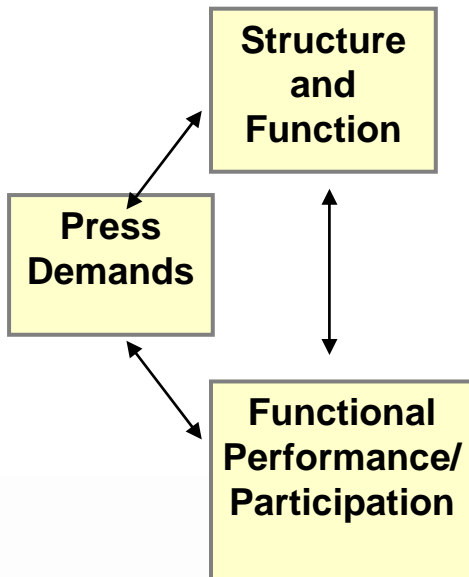
Assessment Process

Investigation

Interpretation

Intervention

Usability Influences

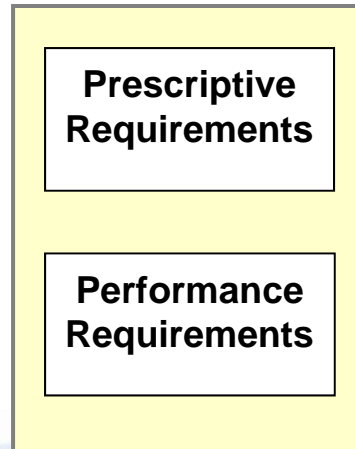


Needs



Reasoning

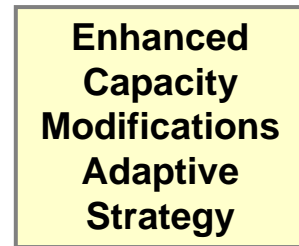
Usability Criteria



Potential Solutions



Best-Fit



Work RERC / Georgia Tech (WRAP)

- Based on the interactive, POTS -(plain old telephone system) based videoconferencing technologies used previously for in-home assessment.
- Uses a wireless transmitter to send visual images from a palm-sized remote video camera to a videophone located up to 985 feet away.
- Images are then transmitted from telephone lines to a “base station” videophone used by the specialist.

Telerehab RERC / University of Pittsburgh (RAAS-VR)

- Focused on the environmental component of the ICF
- Relies on a self-report survey for person and performance
- Collects more precise environmental information
- Utilizes a digital camera and a commercial photogrammetry software package to construct a 3D scaled model (room dimensions can be measured based on still images of an environment)

Current Project Status

- The analysis of more than 50 assessment instruments resulted in the development of a conceptual framework of essential assessment information based on the ICF's constructs of person, environment, activity and performance
- Initial draft of an assessment instrument has been developed detailing specific workplace activities in 7 categories

Current Project Status

- RERC-TR is in the process of categorizing the areas of the draft assessment instrument that are acceptable for use of 3D models
- Draft assessment instrument is being analyzed to determine which tasks/ activities are not applicable for 3D models
- Photos of a variety of work spaces are being used to build an integrated 3D model of the workplace
- Specific areas of the draft assessment instrument are being examined to determine an appropriate method of measurement



Benefits & Limitations of WRAP vs. RAAS Assessment

- The WRAP relies primarily on visual inspection and field documentation of the environment through onsite measurement
- - requires additional staff time to collect data
- - provides a less accurate picture of the actual environment.
- RAAS system emphasizes accurate environment measures, but sacrifices the richness of observational data that documents an individual's abilities and performance of work tasks

Barriers Encountered

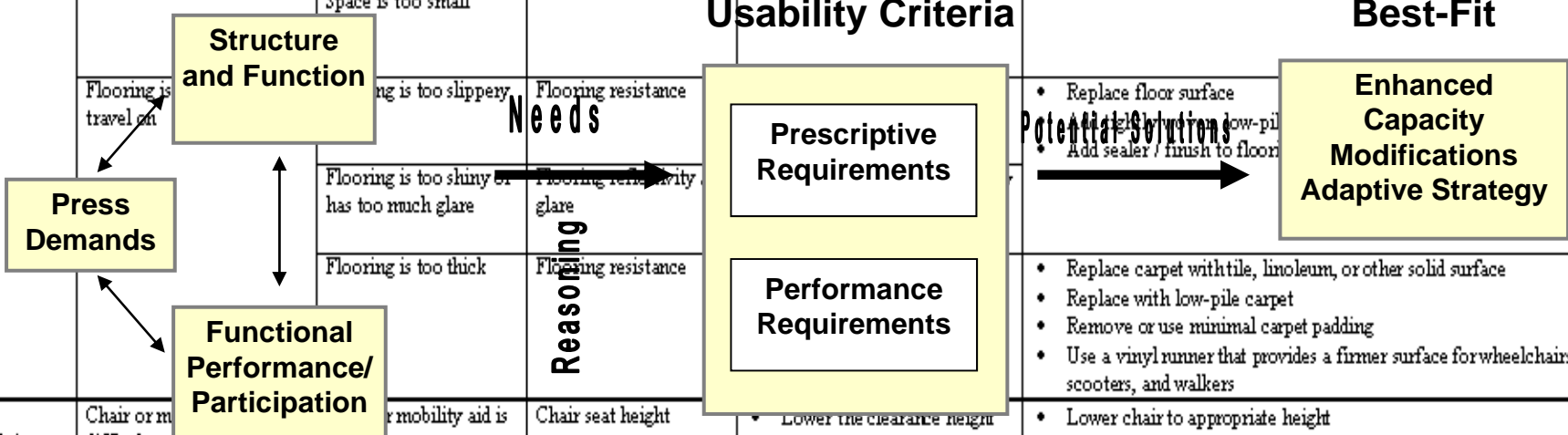
- How to condense assessment instrument while still retaining all relevant and required information
- Determining most appropriate way to measure specific properties (such as color contrast, glare, etc.)
- Learning curve required for using photogrammetry software (PhotoModeler)
- Excessive time required for using PhotoModeler to compile 3D model

Assessment Instrument

Preliminary Drafts

+

PE Transaction Influences (Performance)	PE Transaction Influences (Press)	Attributions of PE Misfit (Specific)	Characteristics of PE Conditions	Performance / Prescriptive Requirements	Alternative Solutions		
Person has difficulty getting close to work surface	Space is difficult to travel in Usability Influences	Space is too cluttered	Length of clear space Width of clear space	Usability Criteria	Best-Fit		
		Space is too small					
		Flooring is too slippery	Flooring resistance			<ul style="list-style-type: none"> • Enlarge clear space 	<ul style="list-style-type: none"> • Remove / move obstacles • Replace large obstacles with smaller obstacles • Move to a larger space
		Flooring is too shiny or has too much glare	Flooring reflectivity / glare				
		Flooring is too thick	Flooring resistance	<ul style="list-style-type: none"> • Replace floor surface • Replace with low-pile carpet • Add sealer / finish to floor 	<ul style="list-style-type: none"> • Replace carpet with tile, linoleum, or other solid surface • Replace with low-pile carpet • Remove or use minimal carpet padding • Use a vinyl runner that provides a firmer surface for wheelchairs, scooters, and walkers 		
Person has difficulty fitting under work surface	Chair or mat difficult to fit under work surface	Person uses mobility aid is	Chair seat height	Reasoning	Potential Solutions		
		Armrests are too high	Armrest height			<ul style="list-style-type: none"> • Lower the clearance height of the chair 	<ul style="list-style-type: none"> • Lower chair to appropriate height • Replace chair seat • Replace chair
		Space under work surface is too short	Work surface clearance height (knee clearance)			<ul style="list-style-type: none"> • Lower armrests 	<ul style="list-style-type: none"> • Raise / lower armrests to appropriate height • Replace with a different chair • Replace armrests
		Space under work surface	Work surface clearance height (knee clearance)	<ul style="list-style-type: none"> • Raise height of work surface 	<ul style="list-style-type: none"> • Use furniture risers • Use taller work surface 		
		Space under work	Width of clear space	<ul style="list-style-type: none"> • Widen space under work 	<ul style="list-style-type: none"> • Remove / move obstacles 		



Assessment Instrument Categories

- Entry / Exit
- Individual Office / Workspace
- Workstation Desk & Chair
- Information Technologies
- General Circulation
- Restroom Sink
- Restroom Toilet

Task (Performance)	Is this a problem?			What device (if any), is used to help perform task? (N/A if no device is used)	If no, go to section:
	Yes	No	N/A or unable		
Employee can visually locate doors or objects					
Employee can open/close exterior doors					
Employee can open/close interior doors					
Employee can lock/unlock doors					
Employee can maneuver through doorways (walking or using wheelchair)					
Employee can turn into rooms from hallways (walking or using wheelchair)					
Employee can maneuver over thresholds (walking or using w/c)					
Employee can turn lights on and off					
Employee can push a button on devices such as telephone and computer					

Doors	Entry / Exit	Office	General Circulation / Common Areas	Restroom
Is the door visible to the employee without obstructions?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the door easily distinguished from the wall/surroundings by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the lock or key card reader visible without obstructions to the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Can the lock or key card reader be easily reached by the employee? (no higher than 48 in above the floor)	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Can the door handle be easily reached by the employee? (no higher than 48 in above the floor)	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Are all locks, handles, or other hardware operable with one hand by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Can the door handle be manipulated with a closed fist by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the landing space at door at least 60 x 60 inches (5 ft. turning radius for w/c)?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is an automatic door present?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the swing timing of the door sufficient for safe entry/exit of the employee? (10 seconds or greater)	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Does the door swing path impede entry or exit of the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A

Lighting	Entry / Exit	Office	General Circulation / Common Areas	Restroom
Is ambient lighting in all areas appropriate for the employee to distinguish surroundings? (at least 30 - 50 foot candles)	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is task lighting present in areas where needed by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
If task lighting is present, is it at least 75 foot candles?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the illumination level at elevator controls, the platform, and the car threshold and landing sill at least 5 foot candles? [ADAAG 4.10.11]	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is amount of lighting adjustable by employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Are light switches both visible and easily distinguished from the wall by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Can light switches be easily reached by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is excessive glare present in any area, and does it impede the function of the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A

Signage (Environment)	Entry / Exit	Office	General Circulation / Common Areas	Restroom
Is signage present in all areas where needed?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is signage available in alternate formats such as Braille or audible signage if needed by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the signage easily distinguished from wall, door, or other surroundings by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Are language and symbols appropriate and understandable to the employee? (such as bathroom symbols or signs)	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the text / graphics on signage easily distinguished by the employee?	Y N N/A	Y N N/A	Y N N/A	Y N N/A
Is the signage surface too reflective for employee to distinguish or is excessive glare present?	Y N N/A	Y N N/A	Y N N/A	Y N N/A

E9. Restroom – Toilet	<u>Task performance:</u> Yes, No, Not Applicable			Observe (O) Measure (M) PhotoModeler (P)
Is the toilet easily distinguished from surroundings by the employee?	Y	N	N/A	O
Is there an unobstructed turning space (a 60-inch diameter circle or a T-shaped space with aisles at least 36 inches wide and 60 inches long) in the restroom or toilet stall?	Y	N	N/A	O, M, P
Is there sufficient space surrounding toilet for transferring if employee uses a wheelchair?	Y	N	N/A	O, M, P
Is the top of the toilet seat an adequate height to allow the employee to easily transfer on / off? (between 17 and 19 inches from the floor [ADAAG 4.16.3])	Y	N	N/A	M
Is the flush mechanism easily distinguished from toilet and surroundings by the employee?	Y	N	N/A	O
Is the toilet paper visible and easily distinguished from surroundings by the employee?	Y	N	N/A	O
Is the flush mechanism easily reached by the employee?	Y	N	N/A	O
Is the toilet paper easily accessed from the toilet by the employee?	Y	N	N/A	O
Is the flush mechanism easily activated with minimal force by the employee? (force required to operate the controls no greater than 5 lbf [ADAAG 4.16.5; 4.27.4])	Y	N	N/A	O
Can the toilet paper be easily manipulated by the employee?	Y	N	N/A	O
Are UE supports (grab bars) present around the toilet for use if needed by the employee?	Y	N	N/A	O

Doors	Possible Solutions
If the door is not visible to the employee without obstructions:	<ul style="list-style-type: none"> • Remove obstructions or clutter around door
If the door is not easily distinguished from the wall/surroundings by the employee:	<ul style="list-style-type: none"> • Paint door or cover with another material • Paint door and frame contrasting colors • Paint door and wall contrasting colors • Outline door frame with contrasting tape • Increase texture of door / door frame • Add a wall trail for providing location cues
If the lock or key card reader is not visible without obstructions to the employee and/or is not easily distinguished from surroundings:	<ul style="list-style-type: none"> • Install electric or remote control lock • Remove lock or key card reader • Replace with a different color manual lock • Remove / move obstacle • Change color of lock / key card reader • Add contrast between lock / key card reader and door • Install proximity card reader • Install motion activated system
If the door handle cannot be easily reached by the employee:	<ul style="list-style-type: none"> • Move handle to opposite side of door • Raise / lower door handle to appropriate height • Install automatic door opener • Create at least a 5' turning radius • Remove obstacles • Increase latch side clearance to at least 18" by moving door or removing obstacles

Project Status – Next Steps

- Performance of preliminary test assessment of workplace using 3D models and draft assessment instrument
- Revision of draft assessment instrument
- Pilot test with 2 employees in Atlanta and 2 in Pittsburgh



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