

Characteristics of Health IT that Aid Workflow and Patient Care

(Reference: Russ et al, HIJ 2010)

VIReC Sept 13, 2011

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Background

EHR advantages:

Centralized information, readability, decision support

EHR challenges:

Logins, interruptive alerts, computer downtimes

Electronic information => support clinical workflow

- Limited knowledge of what factors can aid this goal

Objectives:

1. Identify characteristics of electronic information that support workflow
2. Derive these systematically

Audience Poll

What is your primary role in the VA?

1. Health IT development, support, expertise
2. Clinician/provider/patient care
3. Research
4. Administration
5. Other
6. Not applicable/work outside the VA

Methods

- Major VA Medical Center
- Motivation: paper use (Saleem et al, 2009)
 - 30 min, semi-structured interviews (Campbell et al., 2006)
 - Handwritten notes, audio recording
 - Data collected Oct 2007 – March 2008
- Primary focus:
Computerized Patient Record System (CPRS)

Participants

Registered nurses	4
Physicians	3
Pharmacists	2
Nurse practitioners	2
Dietician	1
Health technicians	2
Administrators	3
Local IT specialists	3

20 VA employees

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Analysis

Secondary analysis:

What characteristics of electronic information are important for workflow?

Inductive/emergent themes (Campbell, 2006; Patterson, 2002)

- 2 independent researchers (AR, JS)
- Paper/non-paper examples
- Positive/negative
- Consensus process

Results

Characteristics of Electronic Information

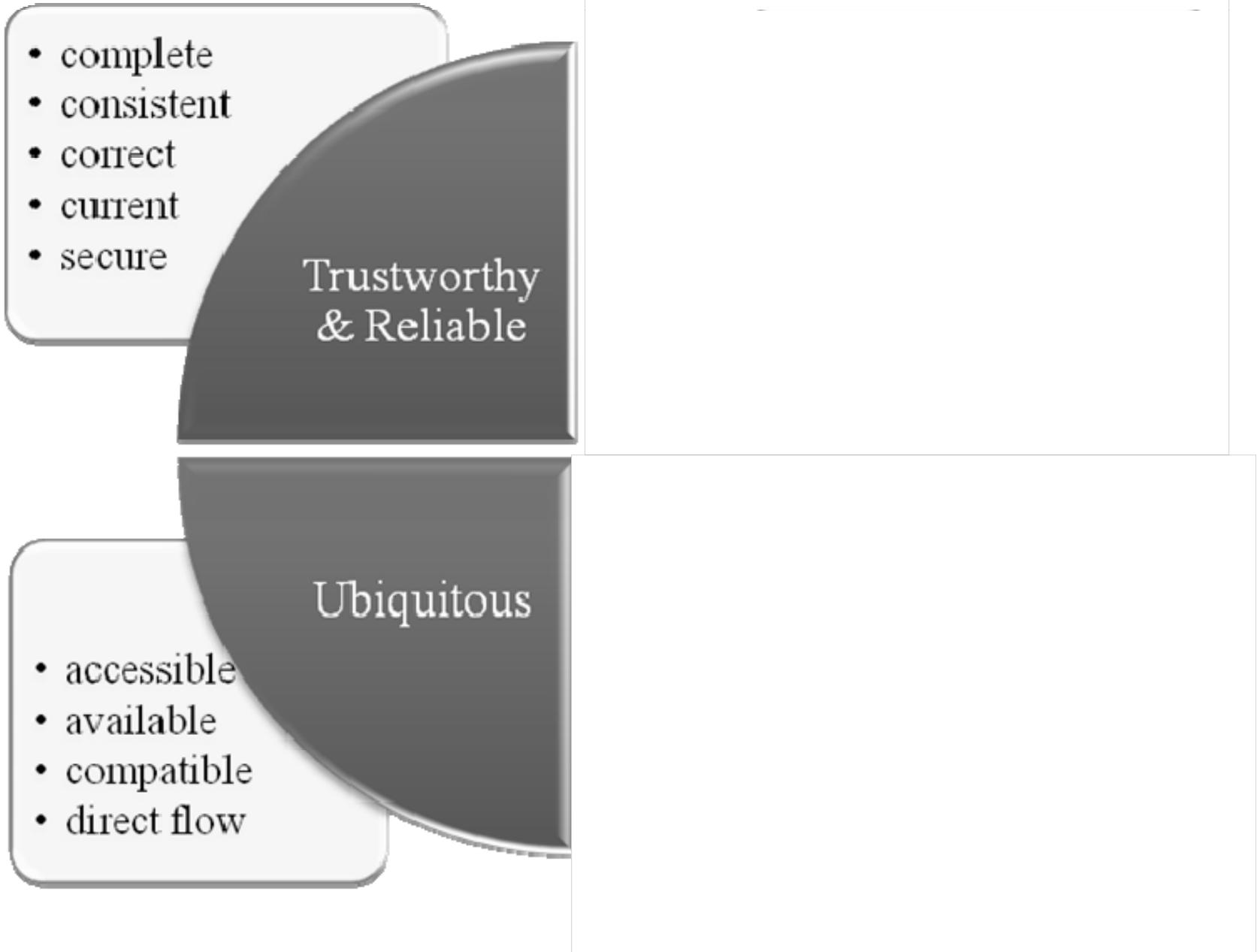
- 199 examples (45+/154-)
- 17 characteristics
- 4 primary domains

- Russ et al, HIJ 2010

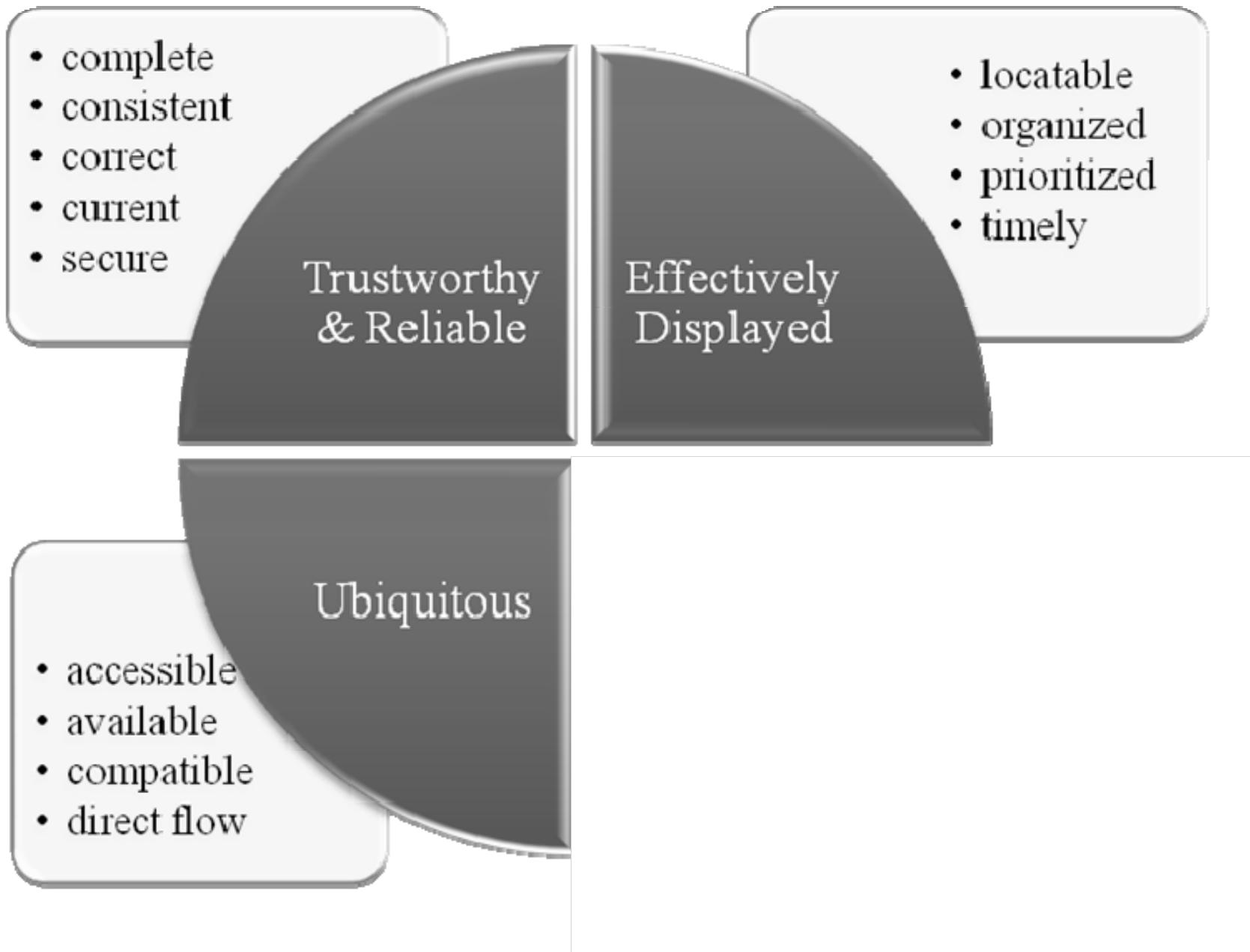
- complete
- consistent
- correct
- current
- secure

Trustworthy
& Reliable

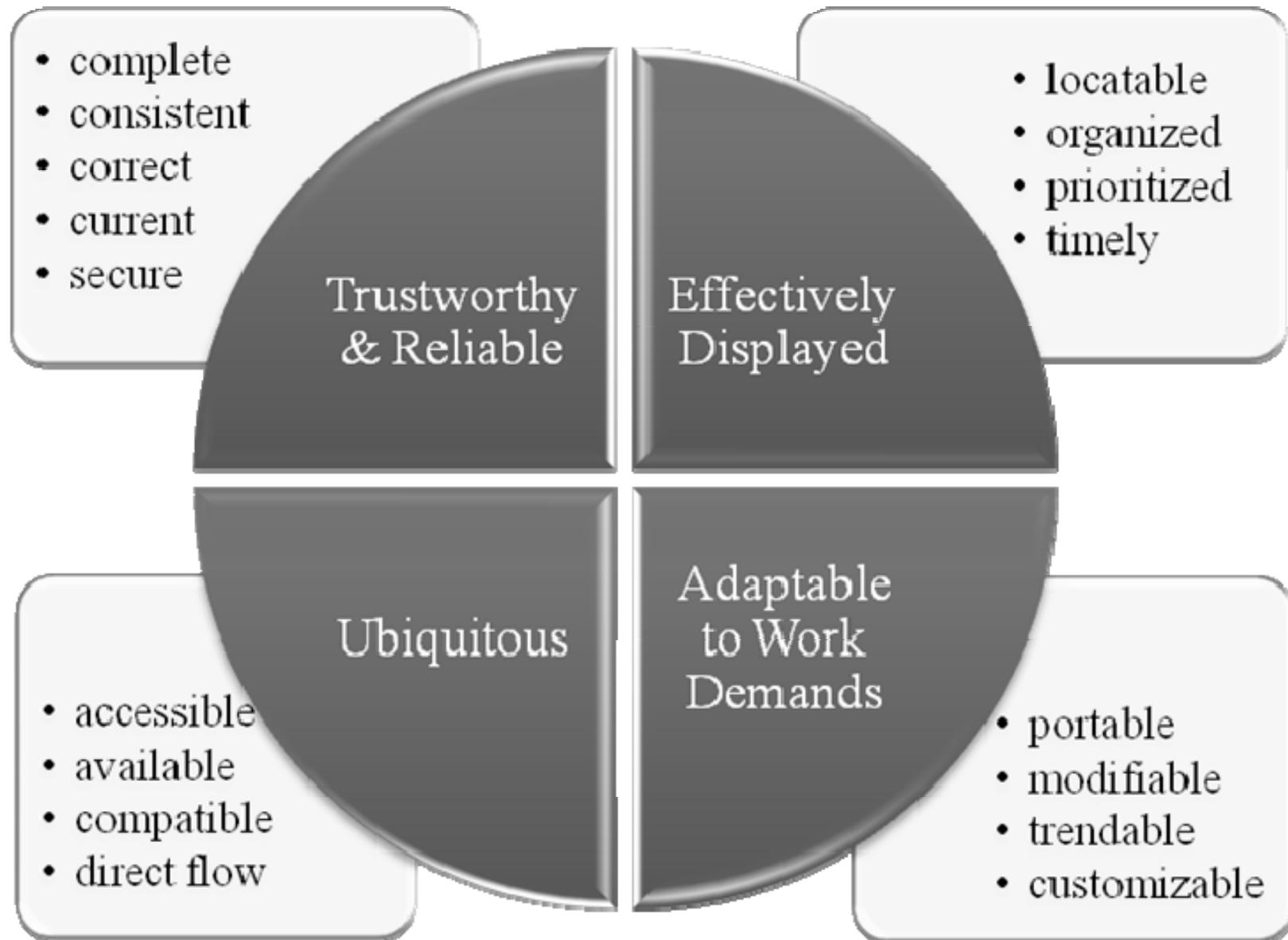
(Figure adapted from Russ et al, HIJ 2010)



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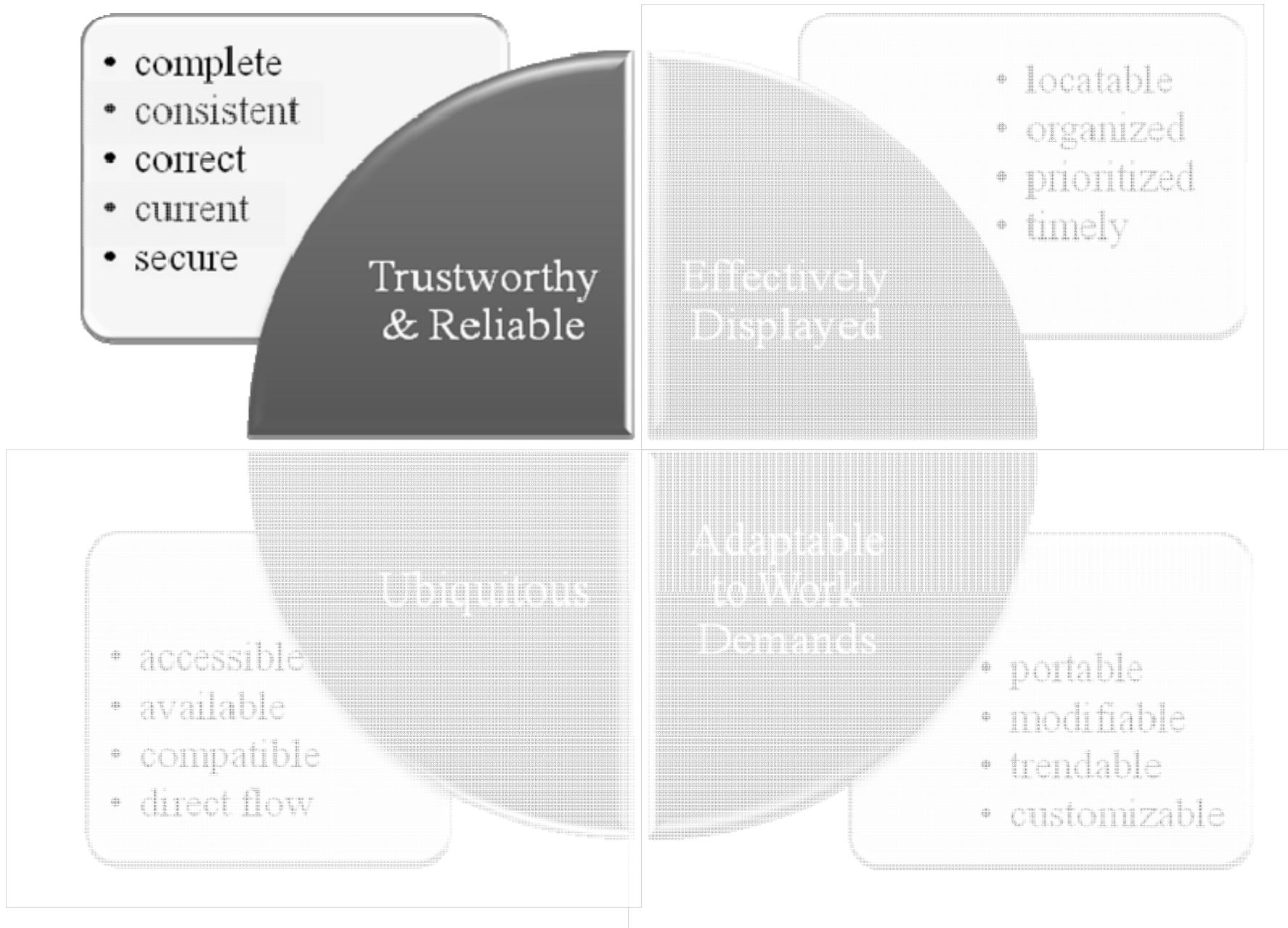


(Figure adapted from Russ et al, HIJ 2010)

Audience Poll:

Which of the 4 domains interests you the most?

1. Trustworthy & Reliable
2. Ubiquitous
3. Effectively Displayed
4. Adaptable to Work Demands



(Figure adapted from Russ et al, HIJ 2010)



Trustworthy
& Reliable

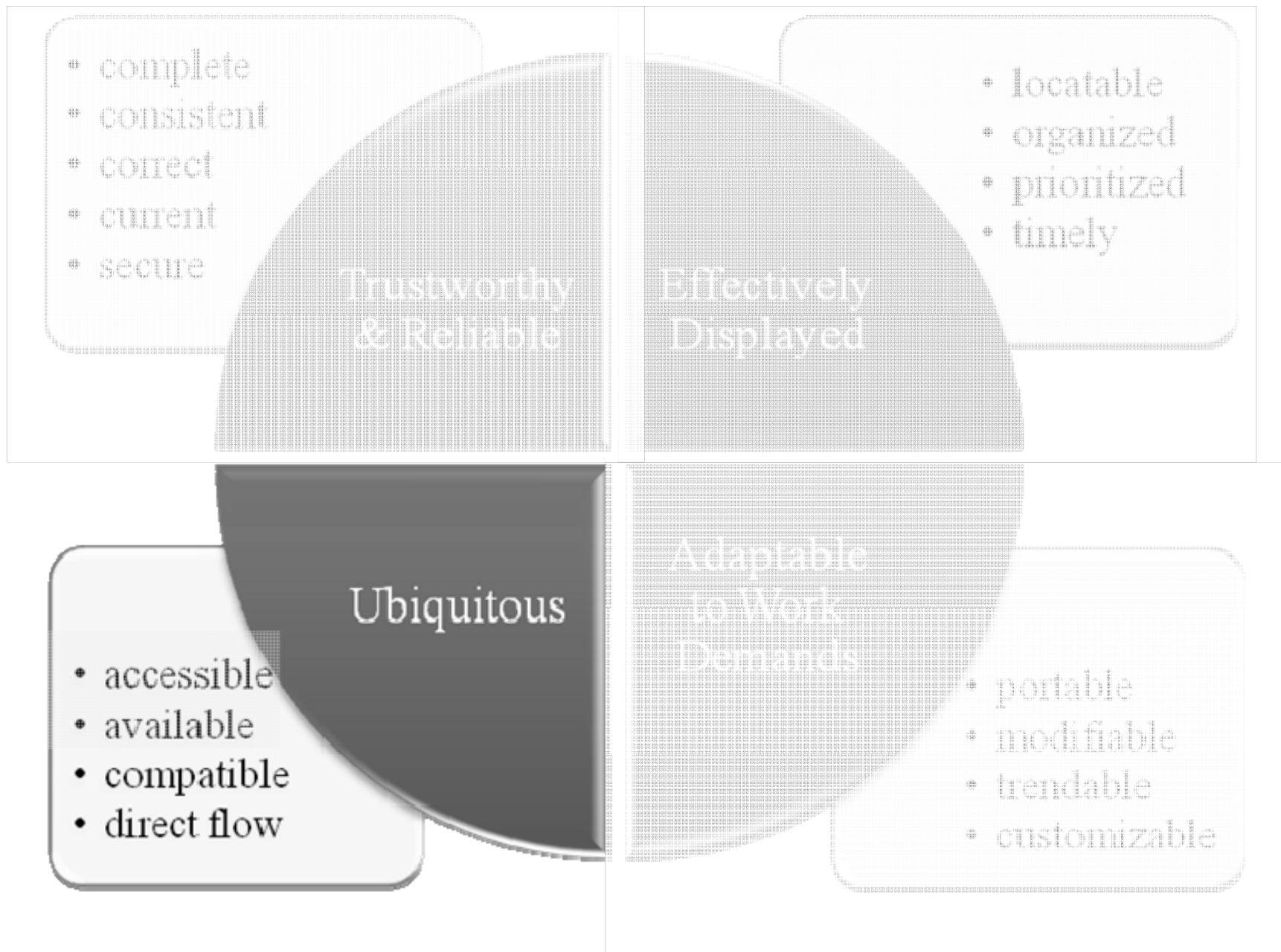
Consistent

- MRIs in the EHR are scheduled automatically
- but CAT scans are not
-
- Health tech: “Doctors don’t [always] realize this, and order a CAT scan using the same type of process they [use to] order the MRI. For the CAT scan, they put the order in but it never gets scheduled.”

Trustworthy
& Reliable

Current

- Nurse: “Another [positive] example - I used to run the flu shot clinic. An 89-year old guy requests the flu shot and doesn’t remember things very well. In one case his daughter might be with him and says, ‘But dad, you just had the flu shot last month’. But what if his daughter is not there to remind him? [CPRS has this information.]”



(Figure adapted from Russ et al, HIJ 2010)



Ubiquitous

Accessible

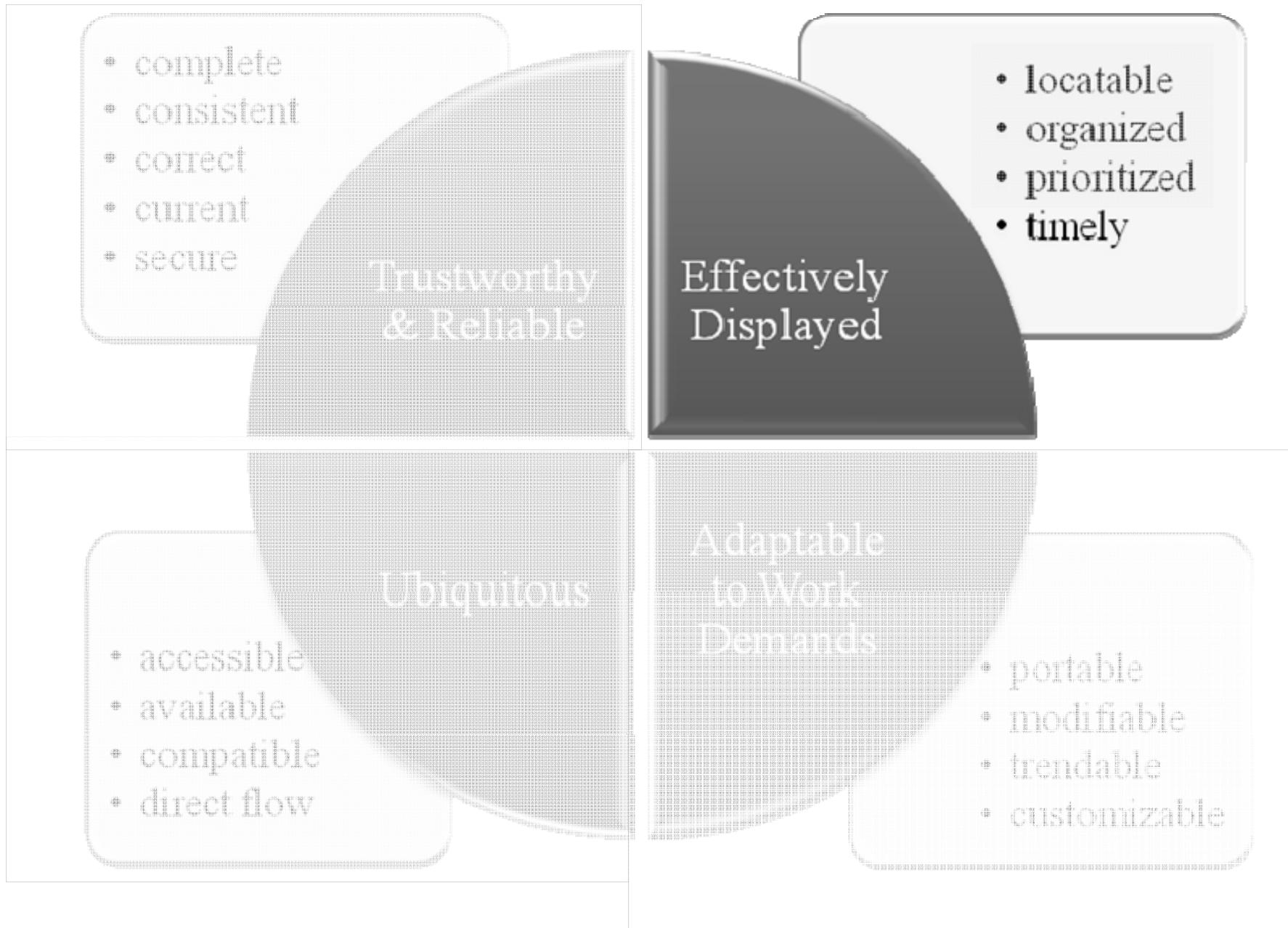
- electronic & physical factors
- Office manager: “When CPRS is down, it’s like flying blind. Everyone forgets how to do things without CPRS. Some neurologist said, ‘Well, I’ll wait until it comes back up.’”



Ubiquitous

Available

- RN: “Now [with CPRS] all the information is at your fingertips ... [Before, patients] were getting their narcotics from more than one clinic ...[Now], we [can] say to the patient, ‘No, you took your last narcotics on this date.’”



(Figure adapted from Russ et al, HIJ 2010)



Effectively
Displayed

Locatable

Problematic aspects:

MRIs, EEGs,

Scanned documents

Consults

Notes



Effectively
Displayed

Locatable

Problematic aspects:

MRIs, EEGs,
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Consults
Notes

- RN: “[We] can’t search in CPRS. [There is] no help menu. [We] have to know [exact] location in CPRS, especially for consults.”



Effectively
Displayed

Organized

Pharmacist: “[Pharmacists look for] omissions of new medications at discharge, dose changes, new orders, unnecessary medications, [and] make sure [there are] no duplicates. [They] really need two screens to be able to compare [inpatient and outpatient medications]. Instead, they have to go back and forth and scroll down.”

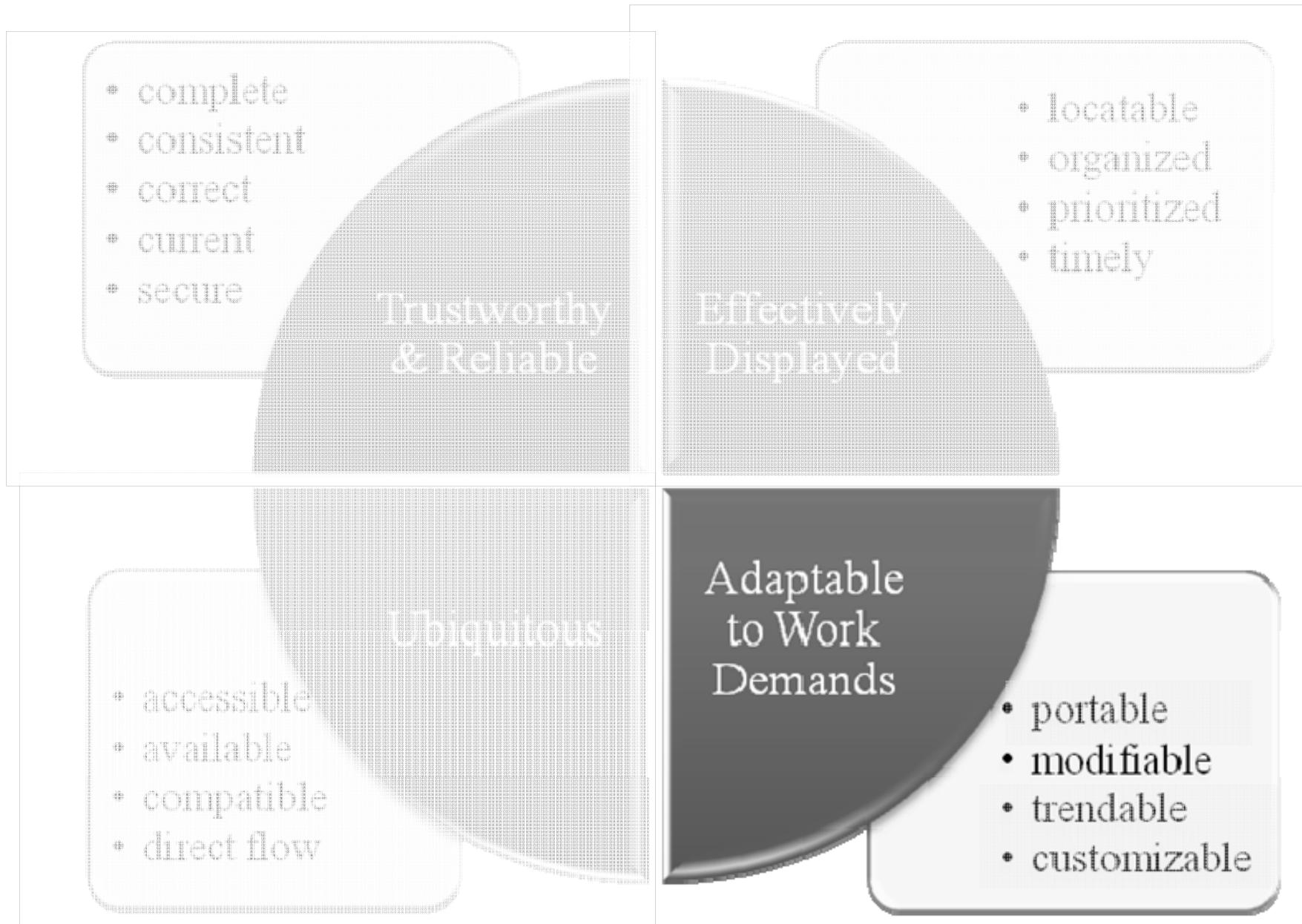


Effectively
Displayed

Prioritized

- All examples from MDs/RNs/pharmacists
lab results
note titles

MD: “There is little marking to say the result is abnormal – not effective. The ‘abnormals’ need to be highlighted more.”



(Figure adapted from Russ et al, HIJ 2010)

Adaptable
to Work
Demands

Portable

IT specialist: “Nursing care plans [are on paper]. It’s something that’s tangible, it can be passed around and referred to right there in a patient care setting - as opposed to walking 20 feet somewhere to use a computer and not being close to the patient – they can have it on a clipboard and be doing patient care...”

Wireless devices may be a solution

Adaptable
to Work
Demands

Trendable

Several clinical areas and tasks:

Dermatology

Oncology

Anesthesia

Dialysis

Anticoagulation therapy

Nurse flowcharting

Continuous quality improvement (CQI) indicators

Adaptable
to Work
Demands

Trendable

- RN: “Dermatology....manually write[s] down the information [for light therapy treatments] *and* enter[s] it into CPRS each time. When this is done manually, it has the format of a spreadsheet. [It’s] easy to compare numbers. [It’s] harder to do this in CPRS – you have to click between notes.”
- Dermatology keeps a book of patient name/dosage

Adaptable
to Work
Demands

Customizable

- Direct patient care staff
- Employees wanted:
 - personal patient lists
 - individualized settings for lab alerts/abnormal labs
 - more options for print settings
 - ability to group quantitative patient data

Adaptable
to Work
Demands

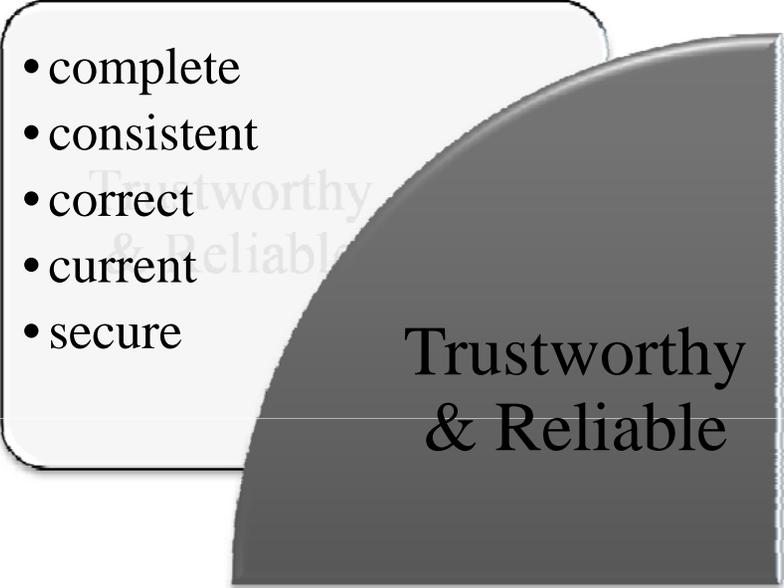
Customizable

- One department wanted reports for ~70 patients
- NP: “We’ve been told CPRS can’t currently do this because we have patient driven data not lab driven data. We can’t make a report in CPRS to give us what we need. It won’t compile the data itself.”

Discussion

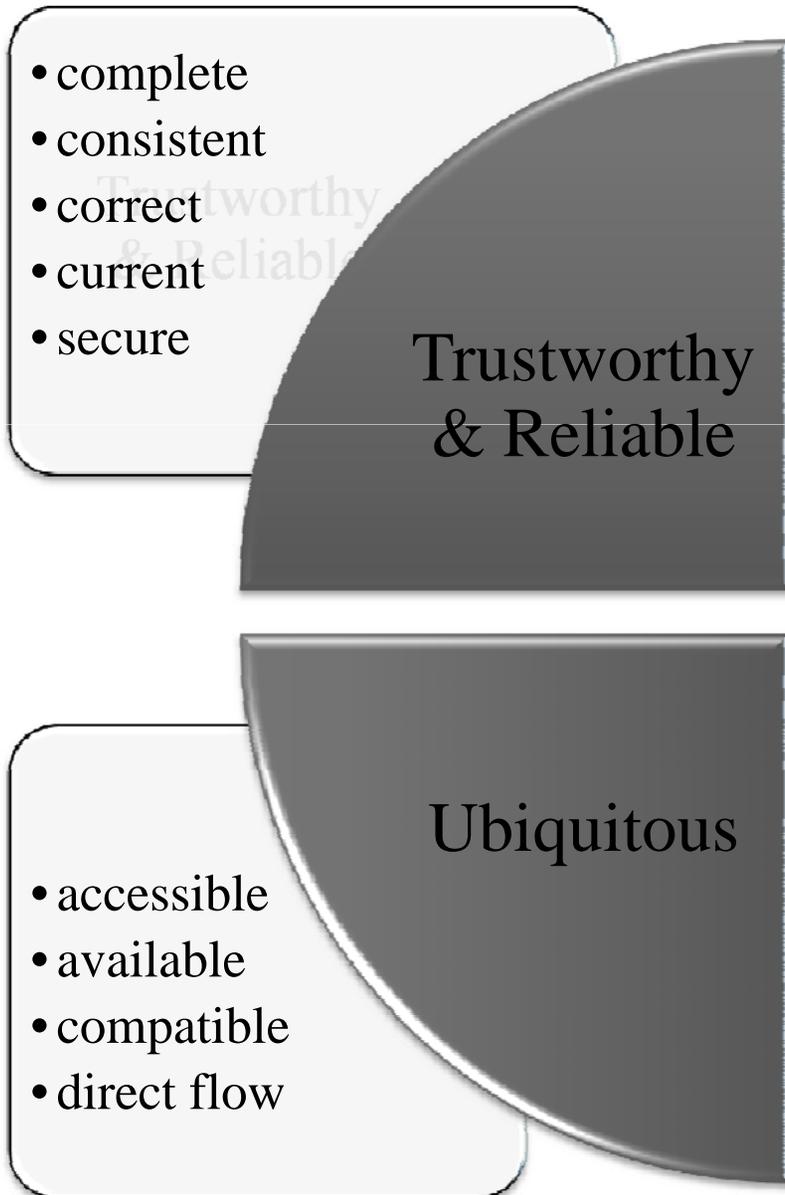
Discussion

- 4 Domains, 17 characteristics of electronic info
- Employees compensating via:
Paper, Microsoft Word, Excel
Closing “gaps”, but may create other problems

- 
- complete
 - consistent
 - correct
 - current
 - secure

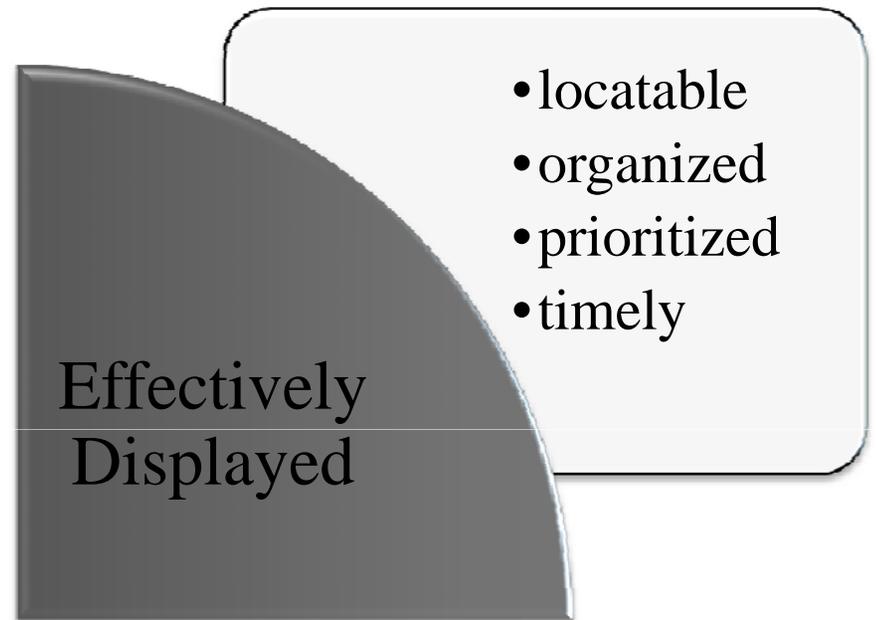
Trustworthy
& Reliable

- fundamental characteristics
- likely influence EHR reliability/credibility
- patient safety risks

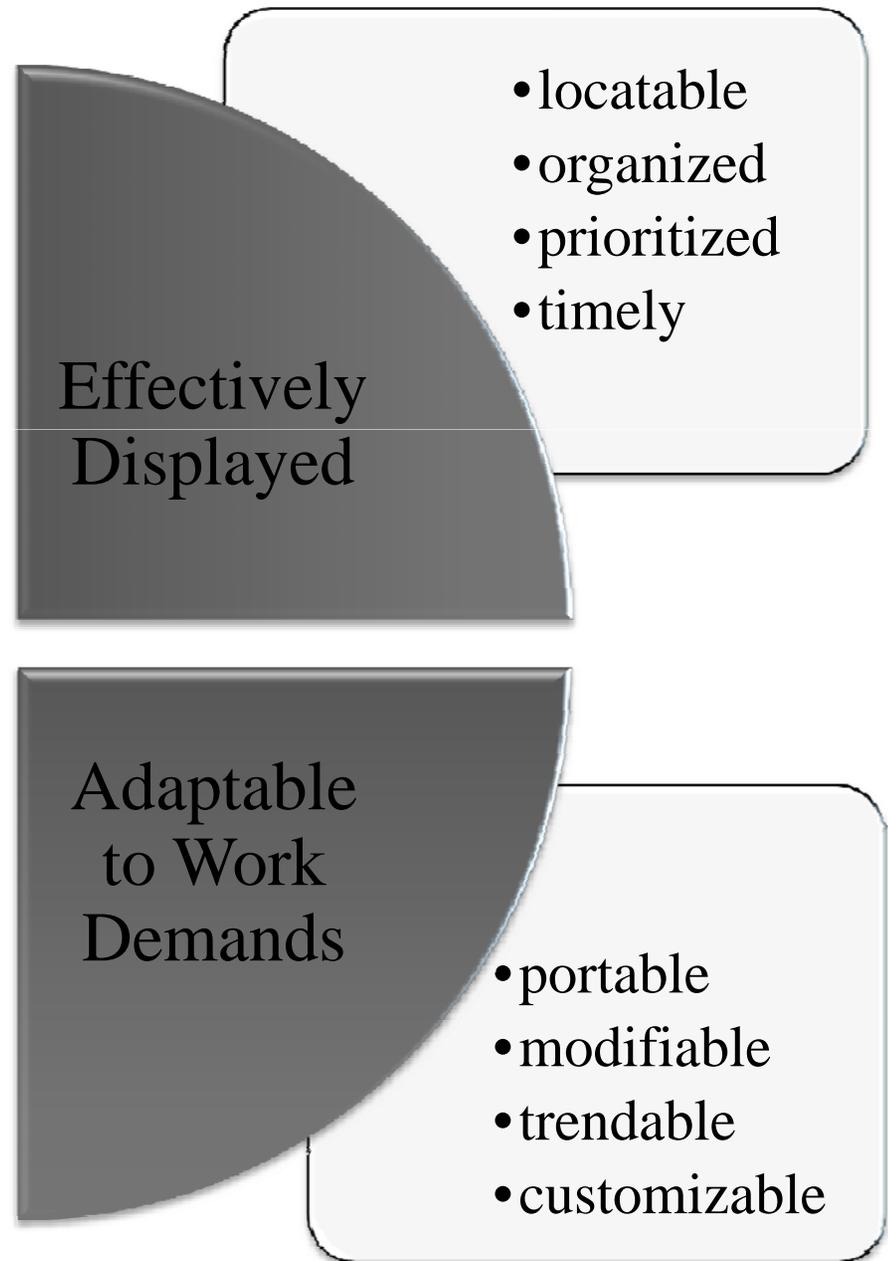


- fundamental characteristics
- likely influence EHR reliability/credibility
- patient safety risks
- ubiquitous: motivating factor for EHR adoption

- more advanced
- especially important to combat information overload



- more advanced
- especially important to combat information overload
- work needs vary by specialization, inpatient/outpatient, etc
- too much flexibility increases complexity



Information Overload

- Common finding in results and other studies
- At time of study: CPRS use ~10 yrs
 - What will it be like:
 - in 20 years? 50 years?
 - as patients age/ Virtual Lifetime Electronic Record
 - As information exchange with other EHRs
- • How can we prioritize critical, time-enduring information so that it stands out for as long as it is clinically relevant?
- Challenge for IT designers and leaders

Limitations

- Secondary analysis of paper-use interviews
 - bias towards negative examples
- Characteristics themselves, rather than specific examples, more likely to be generalizable
- Study limited to 1 VA facility

Conclusions

- Study identified 17 characteristics of electronic information that support healthcare work characteristics derived systematically some characteristics likely fundamental example: ‘Trustworthy & Reliable’ domain
- Results provide insight on EHR strengths/weaknesses
- Findings can be translated into questions to assess health IT pre/post-implementation, for example:
 - What information is important to ‘locate’?
 - How can information be better ‘prioritized’?
 - What data ‘trends’ are important for your work?

Study Impact

- Within VA:
 - - distributed to some VA research/IT leaders
 - - other ways?
- Other institutions:
 - - Baylor Health Care System; Dallas, TX
 - IT journal club
 - may use for interviews, surveys, pre-implementation check-list
 -

Primary Reference:

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Acknowledgements

People

- Study Participants
- Project Team
 - Jason Saleem, PhD
 - Connie F. Justice, CISSP
 - Heather Woodward-Hagg, MS
 - Peter Woodbridge, MD, MBA
 - Brad Doebbeling, MD, MSc
- Additional thanks:
 - Kim Zipper, IT specialist

Funding

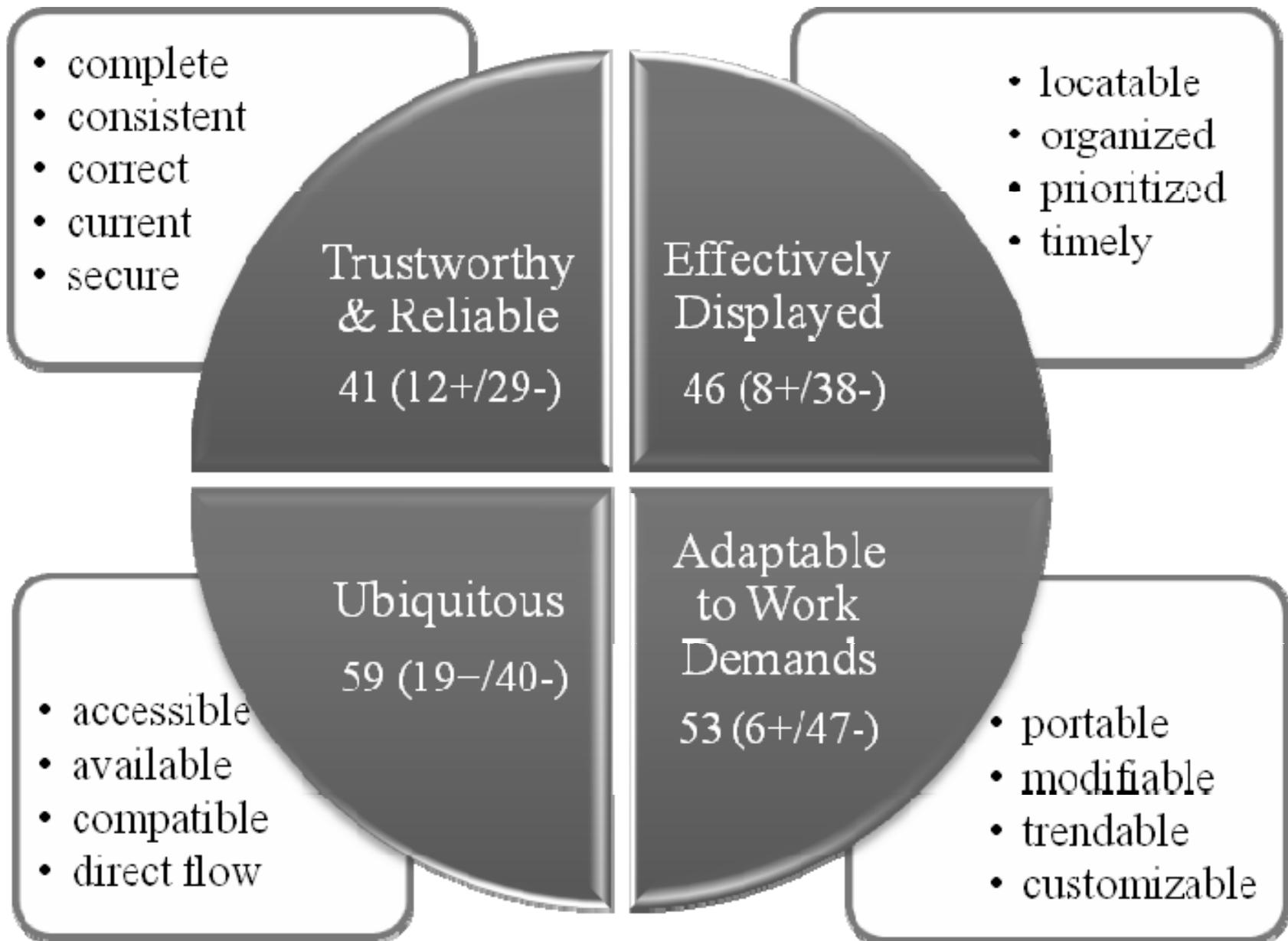
- U.S. Department of Veterans Affairs, Veterans Health Administration
 - Health Services Research & Development (HSR&D)
- HSR&D Center of Excellence on Implementing Evidence-Based Practice (CIEBP)
 - Center grant #HFP 04-148
- U.S. Department of Veterans Affairs, pilot grant:
 - Pilot grant #LIP 87-012.
- Dr. Russ was supported by a VA HSR&D Associated Health Postdoctoral Fellowship

Disclaimer

The views expressed in this presentation are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

Questions?

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