Evaluating Usability of the Early Hearing Detection and Intervention Information System (EHDI-IS) Audiology Reporting Module

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Disclaimer:

The opinions expressed in this presentation are solely those of the presenter and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Learning Objectives

By the end of the sessions, participants will learn:

1) Evaluation methods used by Early Hearing Detection and Intervention (EHDI) programs to assess usability of the Information System Audiology Reporting Module (EHDI-IS-ARM)
2) Summarize evaluation findings on the usability of EHDI-IS-ARM
3) Provide recommendations that may help improve reporting in EHDI-IS-ARM

Evaluation Overview

Evaluation Overview

- The Early Hearing Detection and Intervention Information System (EHDI-IS) is a dynamic data-based tool that supports jurisdictional EHDI programs.
  - Gathers individual level information about infants and young children who, do not pass hearing screening and receive audiology diagnostic follow-up services
  - Ensure that all deaf and hard of hearing infants and young children are identified early and receive intervention services

Evaluation Overview

- The CDC currently funds 39 jurisdictional EHDI programs to enhance their EHDI-IS and to improve documentation of audiology diagnostic testing for infants who do not pass the newborn hearing screening.

- To support continuous program improvement, jurisdictions conducted evaluation of the **usability of the EHDI-IS** Audiology Reporting Module (EHDI-IS-ARM).

Usability

- Usability is considered a key quality attribute and is an integral determinant of user satisfaction and utilization of health technologies
- Studying the Usability attribute of the EHDI-IS-ARM is essential and is the best way to understand how the product interacts with audiologists and data reporters
- The benefits of usable technology include reduced training costs, enhanced performance, and increased acceptability of reporting

Evaluation Overview

One Year evaluation, to understand how data reporters interact with the EHDI-IS-ARM and make improvements based on the results.

PLANNING

IMPLEMENTATION AND RESULTS

2021

2022

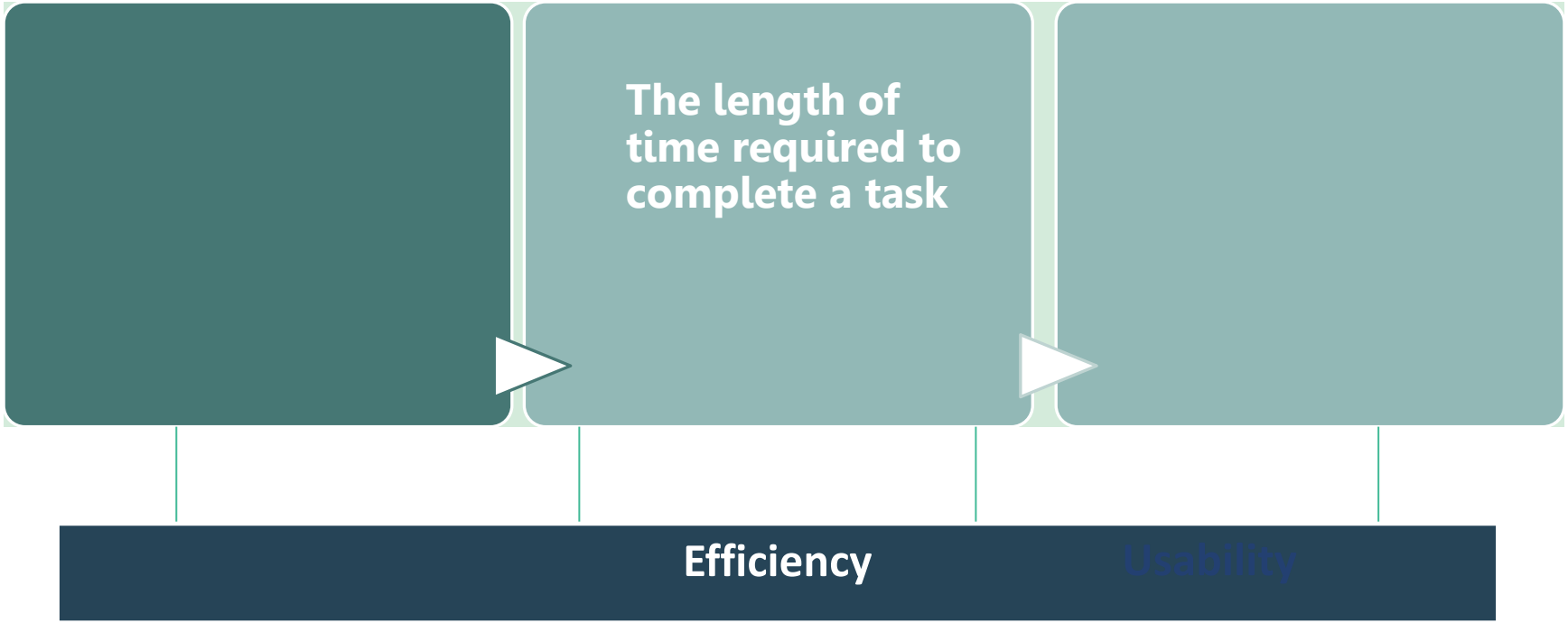
Evaluation Design

USABILITY ATTRIBUTES

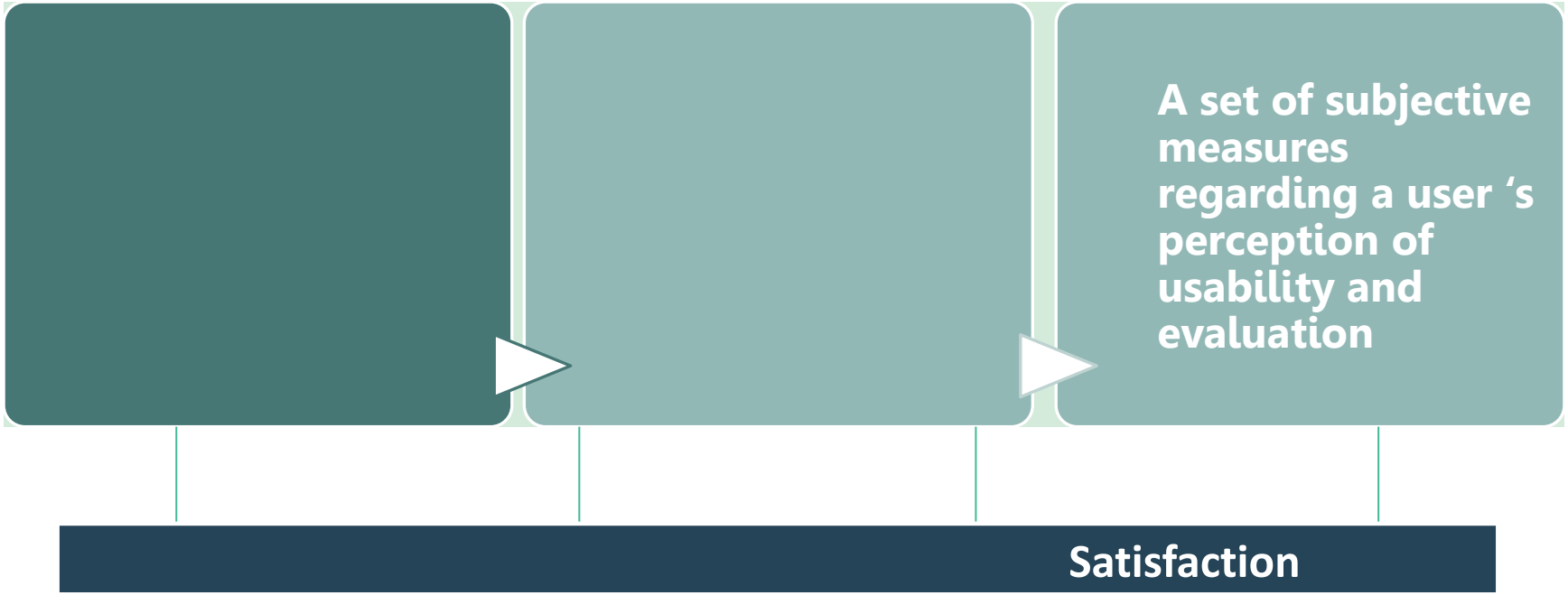
- Effectiveness 
- Efficiency 
- Satisfaction 

USABILITY ATTRIBUTES

USABILITY ATTRIBUTES



USABILITY ATTRIBUTES



Attribute for Usability	Evaluation Questions	Indicators of Success
Effectiveness: Degree to which an interface facilitates users in accomplishing their tasks and goals	Are data reporters able to complete a task error-free?	Percent Task(s) successfully completed error-free without assistance
Efficiency: The length of time required to complete a task	How much time is required to complete a task?	Time to document in EHDI-IS-ARM
Satisfaction: A set of subjective measures regarding a user ‘s perception of usability and evaluation	What is the degree to which data reporters perceive the audiology reporting module to be usable?	SUS (Recommended) ≥80 Above Average 68 Average Okay Usability ≤51 Poor Usability

Preparing Evaluation Results for Analysis

- Thirty (30) evaluation reports were included in the analysis
  - Reasons for exclusion:
    - Different focus and/or indicators used in evaluation (6)
    - Audiologists do not report directly into EHDI-IS (3)

- All reports were reviewed; codes and categories were developed to analyze quantitative data
  - Descriptive statistics were calculated using Excel

Indicator of Success Criteria

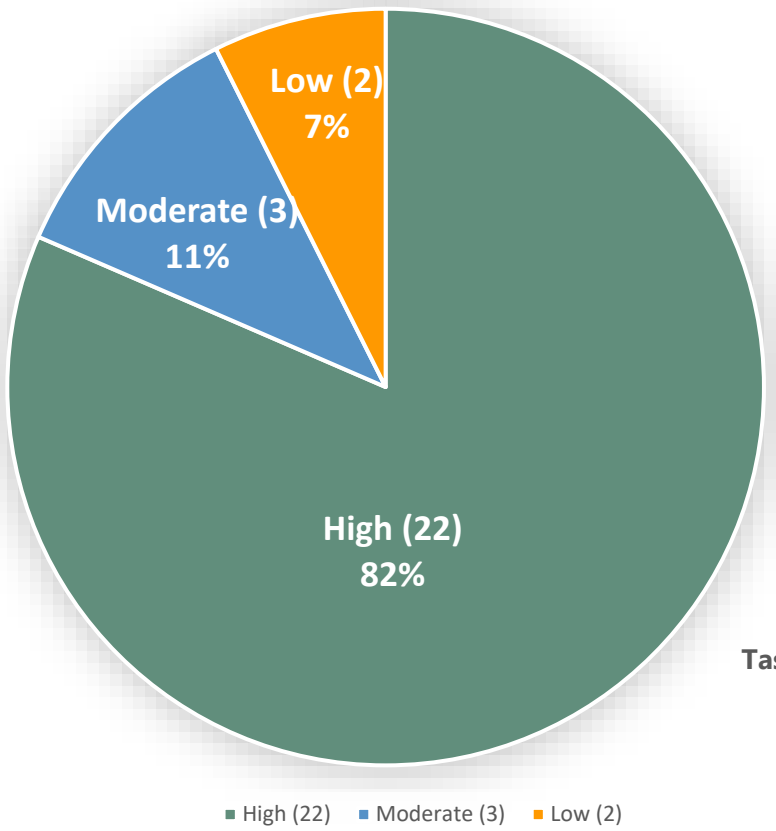
Attribute for Usability	Criteria
Effectiveness Are data reporters able to complete a task error-free?	≥80% 60%-79% ≤59%
Efficiency How much time is required to complete a task?	≤5 min ≤10 min ≤15 min
Satisfaction What is the degree to which data reporters perceive the audiology reporting module to be usable?	≥80 60-79 ≤59

Summary of Evaluation Findings

DATA COLLECTION METHODS USED BY STATE EHDI PROGRAMS

	Effectiveness (n=27)	Efficiency (n=24)	Satisfaction (n=27)
Survey	12	16	24
EHDI-IS Analysis	8	2	0
Observation (Remote and/or Onsite Testing)	3	4	1
Key Informant Interviews	1	1	2
More than 1 Method	3	1	0

Effectiveness Results (n=27)



Task(s) successfully completed error-free
High: ≥80%
Moderate: 60%-79%
Low ≤59%

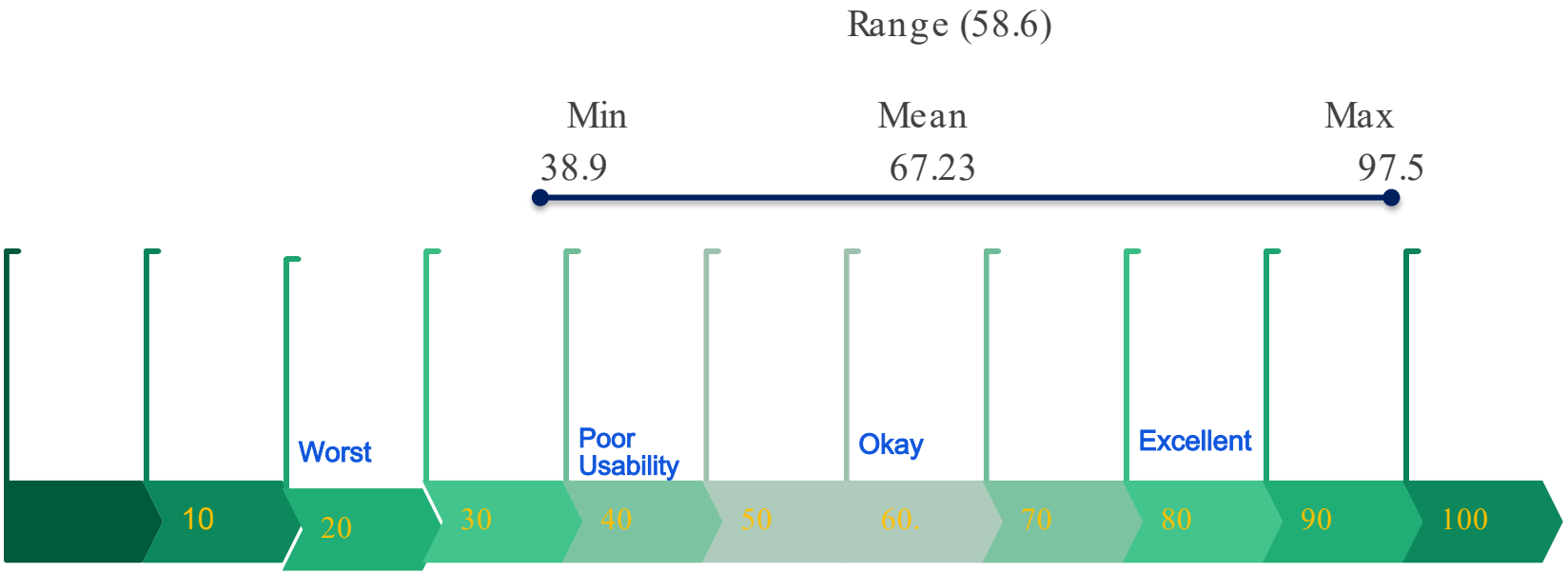
Efficiency Results

Time to Document in EHDI-IS-ARM (n=24)	
<5 min	6 (25%)
<10 min	8 (33%)
<15 min	10 (42%)

Other Responses:

- The inability to rapidly find the child was reported as a barrier to efficiently reporting results
- Concerns with timeliness of reporting
- "Reasonable"

Satisfaction Results, System Usability Scale (SUS) [n=12]



Satisfaction Results

System Usability Scale (SUS) Results [n=12]	
Average	67.23
Minimum Score	38.9
Maximum Score	97.5

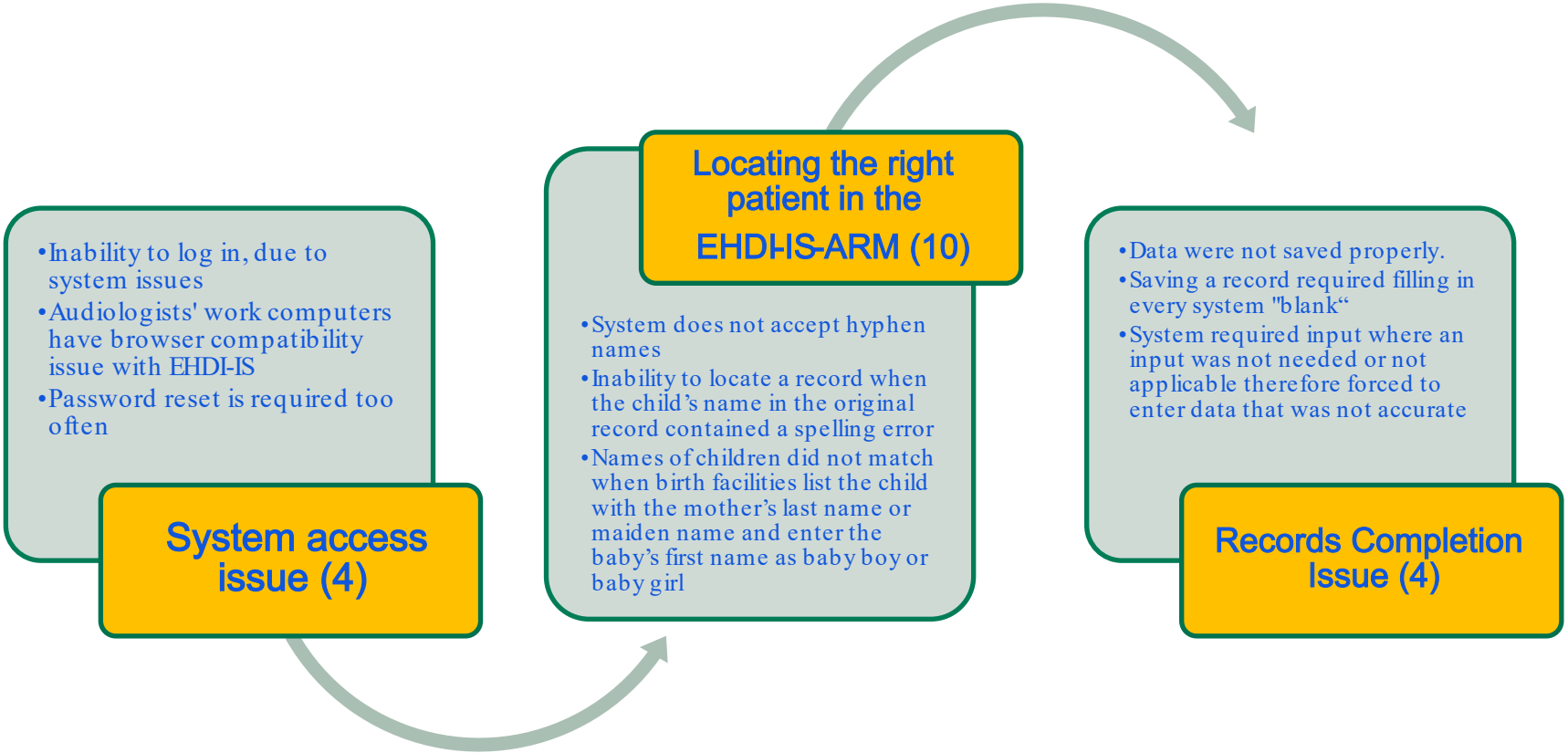
- **Above Average Usability:**
  - 2 State EHDI-IS-ARMs
- **Average Usability:**
  - 7 State EHDI-IS-ARMs
- **Below Average Usability:**
  - 3 State EHDI-IS-ARMs

Satisfaction Results Continued

- **Likert Scale: 5-point scale typically rated from Very Unsatisfied to Very Satisfied**

Percent Overall Satisfied or Very Satisfied with EHDI-IS-ARM Likert Scale Results (n=7)	
Average	59.2%
Minimum	30%
Maximum	94%

Technical Issues in Detail



Limitations

Limitations

- For each attribute, the number one method of data collection was survey (Effectiveness: 45%; Efficiency 67%; Satisfaction: 90%)
  - Survey response rates were often low**
    - Average = 41.2%
    - Median = 31%
    - Range 13-100%
      - **19/30 provided response rates

Limitations

- Differences between states and how they determined “error free” or “without assistance”

- For Efficiency – Audiologists may over/underestimate how long it takes to document if asked via survey or interview
  - Direct observation with timed sessions most accurate
  - The time increments provided for survey responses were often different

Opportunities

Opportunities to Enhance EHDI-IS-ARM

- Improve the usability of the reporting system for users
  - Platforms that operate on all internet browsers
  - Retrieving non-exact matches during child search or allow users to search using other identifiers (e.g., mother's last name)
  - Provide an easy mechanism to report system errors/bugs

Opportunities to Enhance EHDI-IS-ARM

- Simplify reporting
  - Reduces burden and possibly loss to documentation
  - Provide opportunities for reports to report details

- Provide tip sheets for users or other quick guides within the EHDI-IS

- Color can influence user satisfaction; if possible, update EHDI-IS platform colors

Opportunities with the Audiology Community

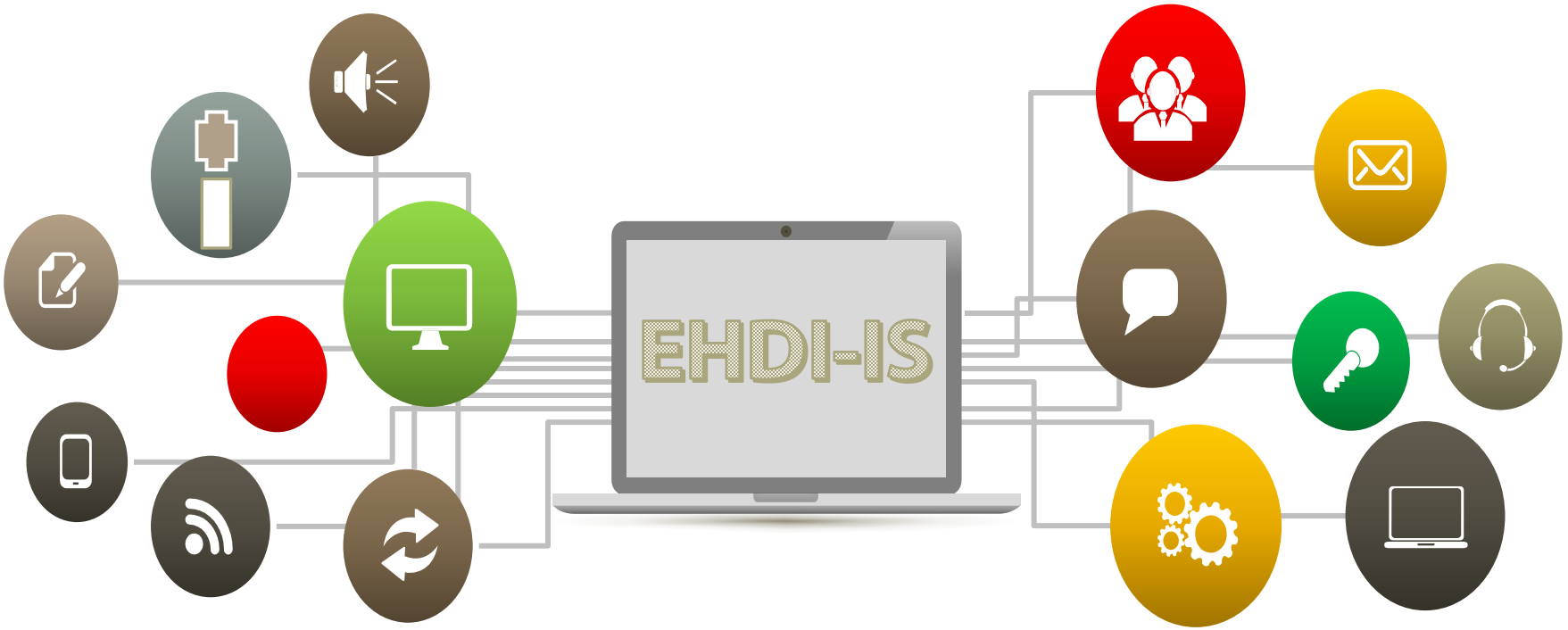
- Increase connection with the audiology community and facilities.
  - Regular communication (e.g., newsletters, blast emails)
  - Conduct focus groups during planning phases of EHDI-IS-ARM or other EHDI-IS enhancements

- Provide reports to Audiologists on performance (e.g., length to report, percent reports error free)

Opportunities with the Audiology Community

- As recommended by audiologists on improving the reporting process, consider:
  - Providing clarity on the why of reporting.
    - How is the information they report being used to improve outcomes?
  - Providing clear and consistent guidance/training to audiologists on how to report.
    - Don’t limit training to audiologists if other staff is reporting on behalf of the audiologist

EHDI-IS Evaluation



Questions?

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