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Assessing Digital Opportunities: Finding Current Human Technology Integration Pain Points?





Project Goals

1. Establish Columbia's current digital status for work processes
2. Identify candidate process for digital treatment with supporting success metrics
3. Help INL learn how to assess digital strategy for any organization

Nuclear power contains 1000s work processes each day

Physical Plant Work	Tool Checkout	Work Package Closeout	Work Package Creation	Work Package Use	Equipment Failure Evaluation	Plant Database Management and Security
Plant/Component Health	Surveillance Management	Technical Specification Review	Employee Observation and Coaching	Employee Timekeeping	Job Briefings	Plant and Department Meetings
Procedure Use and Revision	Plant Projects Management	Plant Access Processing	Safeguards Information Administration	Security Equipment and Zone Management	Security Rounds	Clearance and Tagging
Training and Qualification Verification	Outage Schedule Use and Update	Work Management Performance Indicators	Work Schedule Use and Update	Confined Space	Controlled Documents	Critical Digital Asset Administration
Operator Rounds, Log Keeping, Turnover	Plant Audits and Assessments	Plant Drawings and References	Regulatory Interface/Commitment Tracking	Sampling and Monitoring	Budget Management	Action Items Tracking

- **Problem:** one reason digital innovations fail is incorrect candidate selection
- **Solution:** creation of plant-wide crowdsourcing tool that captures digital health and HTI of current work processes

Technology Innovation projects fail... often.

According to a 2017 study,
40–90% of innovation projects fail,
depending on the nature of the innovation.¹

LWRS Digital
Strategy
assessment

REASONS FOR FAILURE TO INNOVATE



FEAR OF
TAKING RISKS



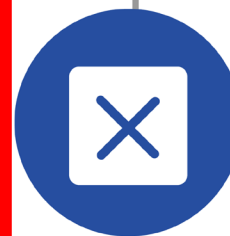
LACK OF
MARKET
ORIENTATION



FAILURE
TO SCALE



POOR
ORGANIZATIONAL
STRUCTURE
& PROCESSES



WRONG
DECISIONS

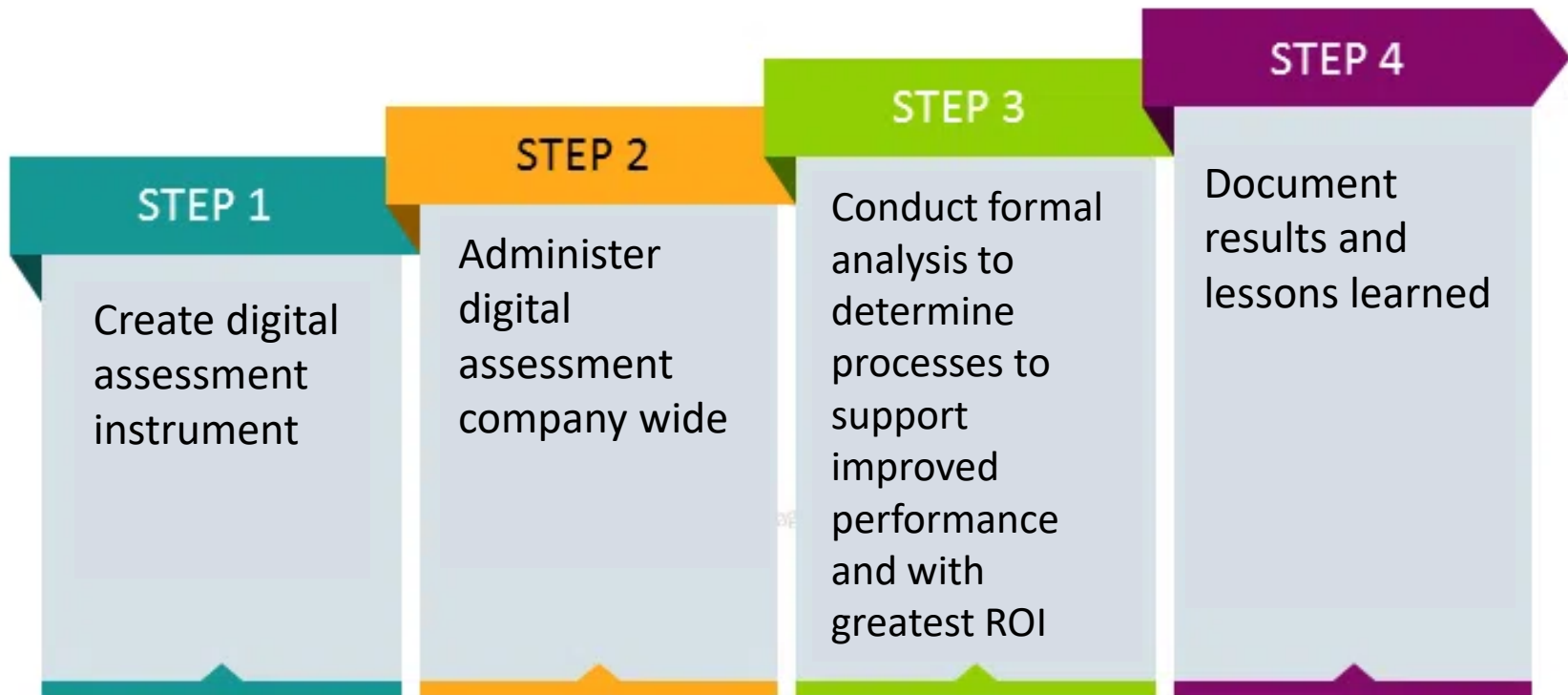


LOW
PRIORITY FOR
INNOVATION



LACK OF
INTERNAL
COMMUNICATIONS

Aligning Work Processes with Digital Technologies



Benefits of online survey assessment

- Review the entire organization's work processes
 - Reach employees far and wide
- Gather info about the digital health of the plant
- Cost effective
- Time efficient (< 10 minutes to complete)
- Customized to each employee
- Quantitative data
- Rapid analysis

7 digital status health indicators

Indicator	Survey Question
Frequency ^a	On average, how often do you perform the activity?
Duration	How much time do you spend performing the activity?
Digital	How much of the activity is digital?
# programs	How many software programs do you use?
Tools	Provide the name(s) of the software program(s)
User-friendliness	Rate their user-friendliness.
Workload	How much effort by you is required to complete this activity?
Reliability	How often does the activity reach the desired outcome on the first attempt?
Effectiveness	How effective is the activity at achieving its intended goal?

^a Frequency is not an indication of digital health, and performing an activity often does not necessarily indicate a problem. However, when considering digital initiatives, it is important to identify and target high-frequency activities.

Survey Deployment Impacts Success

Week prior

- Pre-survey announcement

Day 1

- Survey sent to half the company (489)
- End of day N=27

Day 3

- CNO reminder
- End of day N=89

Day 4

- Last chance email from innovation director

Day 5

- Survey closes
- N=167 (35% engagement)

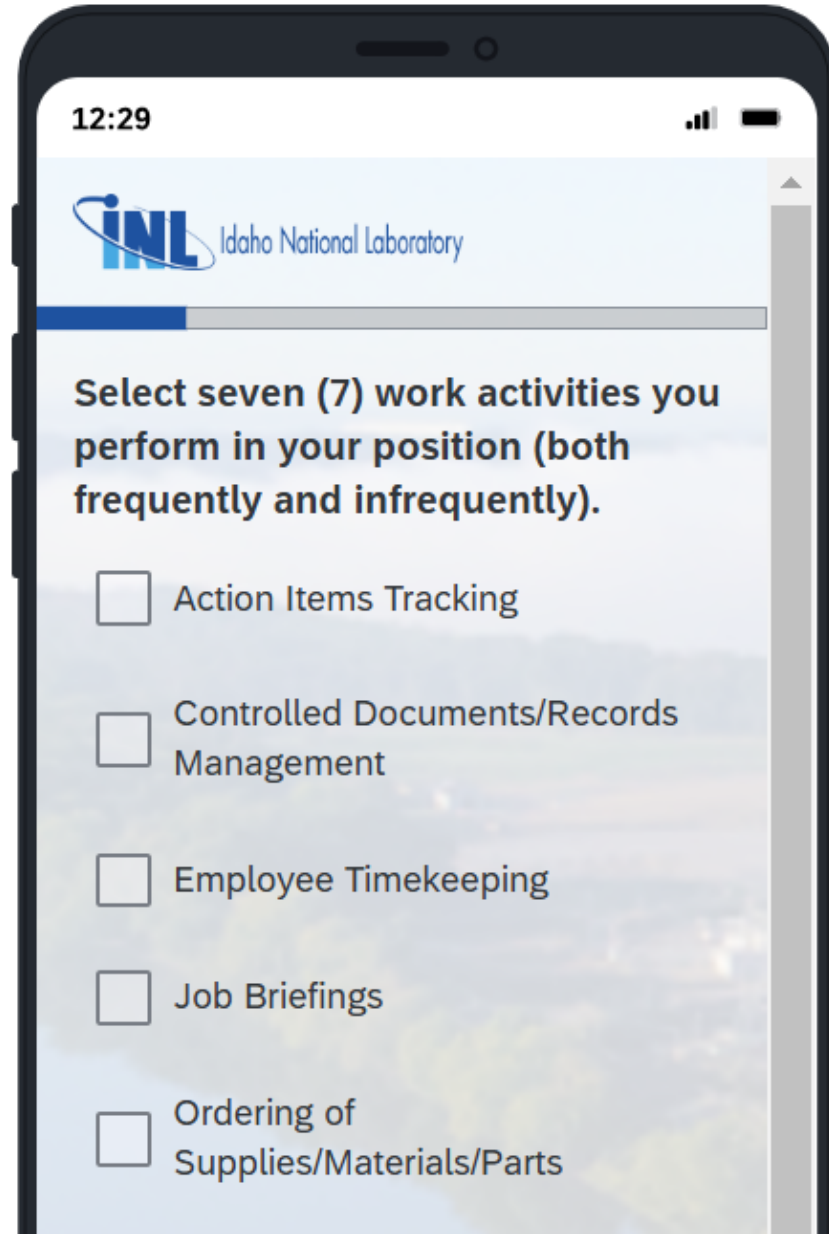
Step 1 Create digital assessment instrument

Step 2 Administer digital assessment

Step 3 Conduct formal analysis

Step 4 Document results and lessons learned

Can be completed on cell phone



12:29

INL Idaho National Laboratory

Select seven (7) work activities you perform in your position (both frequently and infrequently).

- Action Items Tracking
- Controlled Documents/Records Management
- Employee Timekeeping
- Job Briefings
- Ordering of Supplies/Materials/Parts

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DIGITAL QUALITY OF LIFE SURVEY

Welcome to our digital quality of life survey, designed to build a baseline picture of your digital organization. It will take about 10-15 minutes, and you have the chance to win one of four \$20 Starbucks gift cards available! Your participation could help us improve your digital quality of life at work. Please note that your answers are anonymous.

Please select one.

*** Select your department.**

Select one



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Select seven (7) work activities you perform in your position (both frequently and infrequently).

Action Items Tracking

Plant Projects Management

Budget Management

Reporting of Conditions, Equipment, Facility Issues

CAP Program Administration

Technical Specification Review

Clearance and Tagging

Training and Qualification Verification

Employee Observation and Coaching


Work Schedule Use and Update

Please answer the following questions based on **ACTION ITEMS TRACKING** activity.


On average, how often do you perform the activity?


How much time do you spend performing the activity each time?

How much of the activity is digital?

How many software programs do you use for this activity (e.g., SAP + Excel)?

Excellent response rates

- Entries 167 (35%) Complete 115 (25%)
- All departments and all job positions were represented
- Plant production departments were under-represented
- Time spent on survey $M = 10.84$ minutes (excluding $N = 12 > 1\text{hr}$)

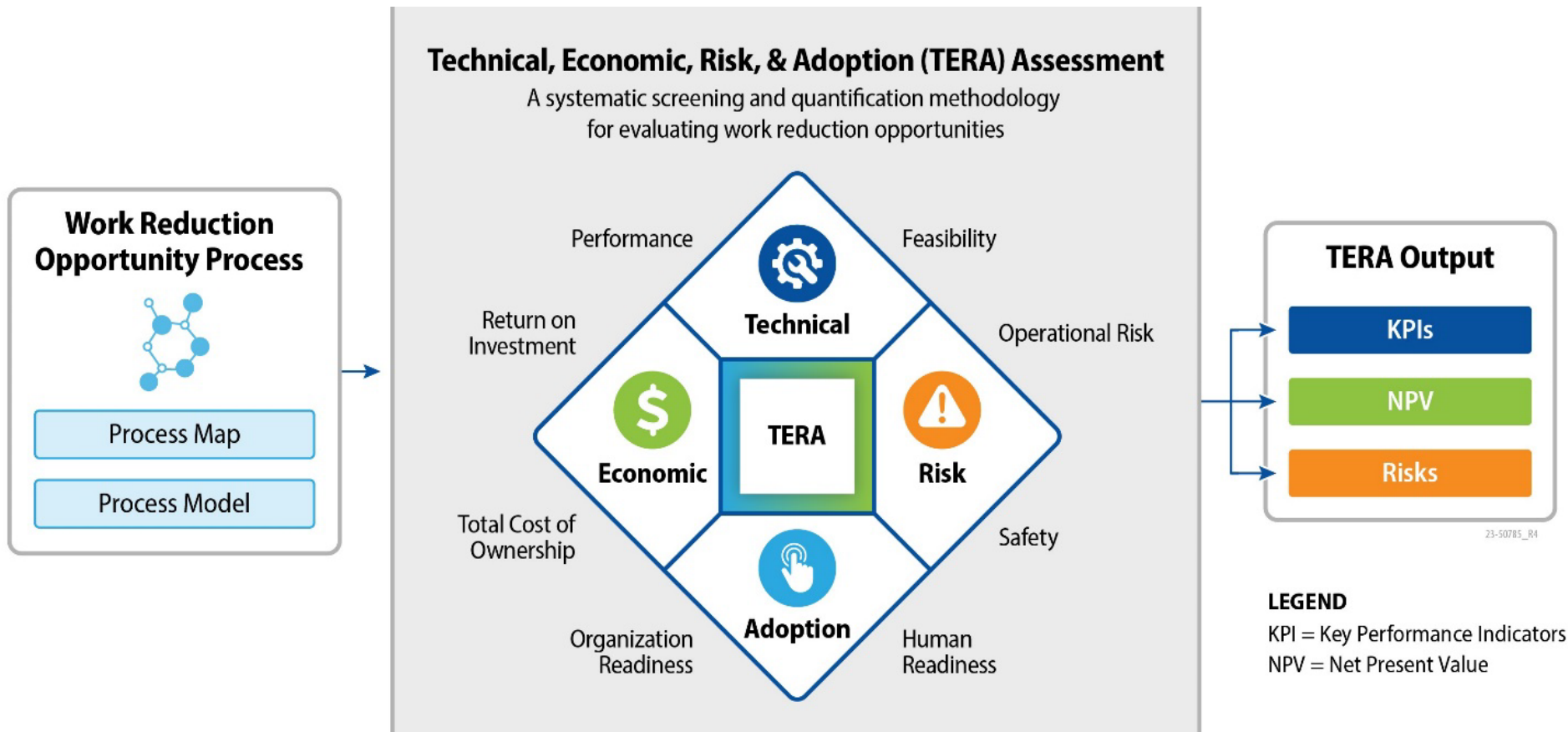
Color chart showing health indicator status for select work processes allowing rapid identification of digital health

	Total	N	Duration	Digital	# programs	UF	Workload	Reliability	Effective	Frequency
Tool Checkout	0.37	1	0.25	0.50	0.17	0.00	0.00	0.50	0.00	0.00
Dose Recording and Reporting	0.40	1	0.50	1.00	0.50	0.33	0.00	0.50	0.00	1.00
Testing Process	0.45	1	0.75	1.00	0.67	0.75	0.33	0.00	0.50	1.00
Plant Rad Monitors	0.57	2	0.75	0.63	0.33	0.42	0.50	0.75	0.75	0.40
Plant Audits and Assessments	0.58	5	0.90	0.65	0.63	0.83	0.53	0.90	0.70	0.48
Surveillance Management	0.59	2	0.75	0.63	0.42	0.50	0.67	0.75	0.75	0.50
Outage Schedule Use and Update	0.59	6	0.79	0.92	0.67	0.62	0.50	0.83	0.75	0.67
Investigation and Evaluation Process Admin	0.60	2	0.63	0.88	0.25	0.38	0.33	0.75	0.75	0.70
Remote Monitoring and Sampling	0.61	4	0.63	0.44	0.42	0.70	0.67	0.75	0.75	0.70
Security Rounds	0.61	3	0.92	0.33	0.33	0.60	0.78	1.00	0.83	1.00
Simulation	0.61	4	0.75	0.69	0.08	0.50	0.44	0.67	0.83	0.80
Vendor Audits and Assessments	0.62	2	0.63	0.63	0.33	0.67	0.50	0.75	0.75	0.20
Security Equipment and Zone Management	0.64	2	1.00	0.75	0.17	0.50	0.67	1.00	0.75	1.00
Operator Rounds, Log Keeping, Turnover	0.67	2	0.63	0.88	0.33	0.42	0.83	0.75	0.75	1.00
Clearance and Tagging	0.67	3	0.42	0.75	0.44	0.38	0.44	1.00	1.00	0.40
Plant Projects Management	0.67	13	0.54	0.67	0.35	0.62	0.64	0.83	0.83	0.66
Modifications, Engineering Changes	0.68	15	0.80	0.77	0.41	0.79	0.56	0.93	0.93	0.65
Plant And Department Meetings	0.69	21	0.65	0.67	0.27	0.81	0.62	0.88	0.76	0.99
Plant Database Management and Security	0.69	4	0.44	0.88	0.33	0.54	0.58	0.88	0.75	1.00
Sampling and Monitoring	0.69	3	0.75	0.67	0.22	0.67	0.67	1.00	0.83	0.87
Equipment Failure Evaluation	0.71	6	0.67	0.71	0.28	0.50	0.73	1.00	1.00	0.47
Procedure Use and Revision	0.71	90	0.53	0.83	0.26	0.63	0.61	0.88	0.83	0.58
Lesson Plan Creation	0.72	6	0.83	0.75	0.42	0.93	0.67	0.92	1.00	0.87
External Operating Experience Use	0.72	56	0.41	0.87	0.26	0.51	0.75	0.84	0.73	0.50
Work Schedule Use and Update	0.72	47	0.48	0.85	0.30	0.58	0.68	0.92	0.80	0.71
Physical Plant Work	0.72	2	0.50	0.75	0.42	0.56	0.67	1.00	1.00	0.70
Budget Management	0.72	17	0.50	0.88	0.26	0.74	0.65	0.81	0.75	0.53
Action Items Tracking	0.73	134	0.37	0.85	0.39	0.61	0.68	0.93	0.81	0.87

Department results

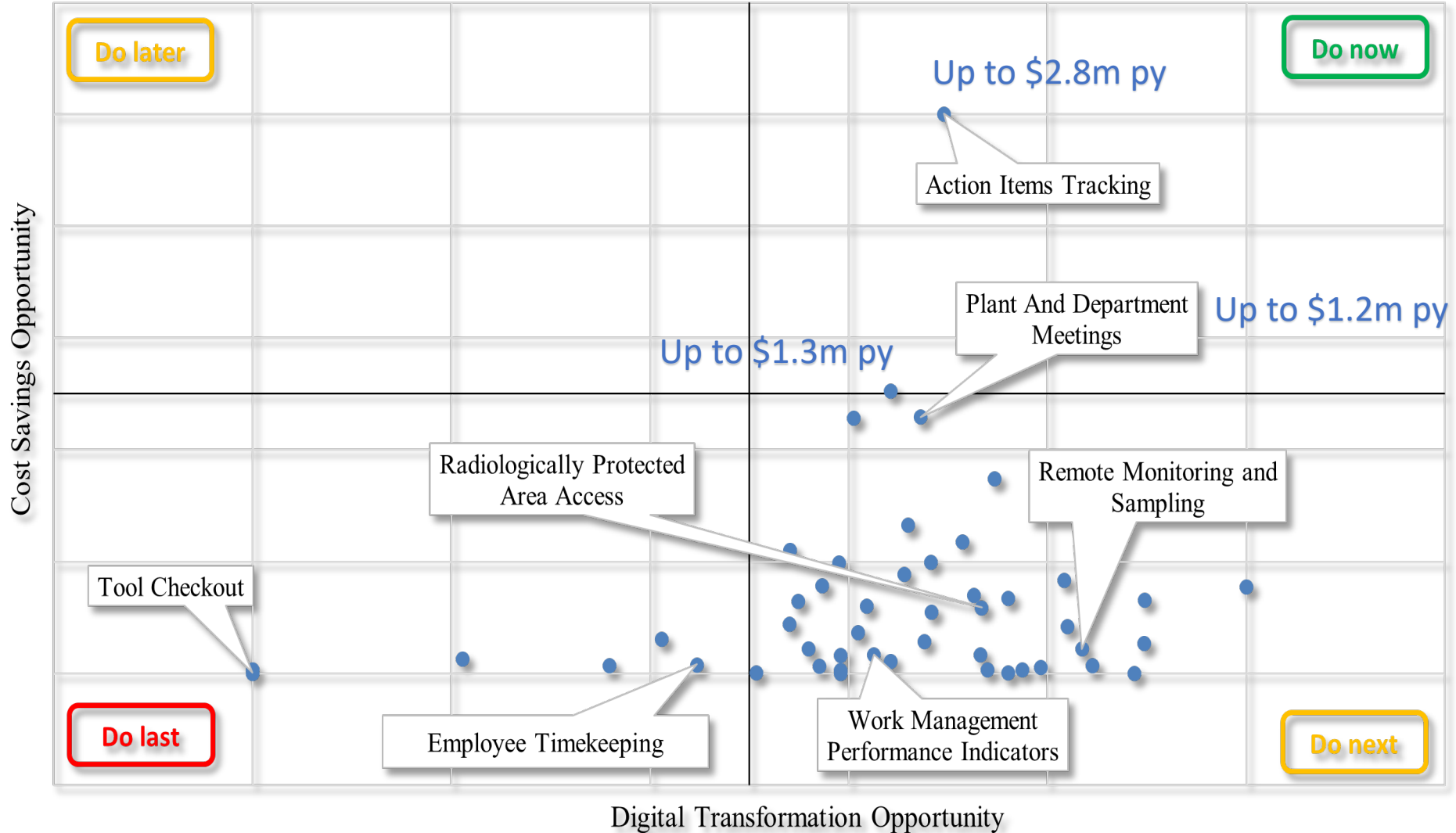
- Most departments scored on the higher end for digital
- Security being a notable standout with a score indicating closer to “half digital/half paper” processes
- Most departments used approximately two programs to complete activities that had adequate user-friendliness
- Action Items Tracking was the most endorsed activity as both a good and not-so-good example of an efficient digital process (depended on the dept.)

The TERA Framework measures several facets of the innovation projects





Identification of cost-savings opportunities



Assessment lessons learned

- Allow protected time for e.g., craft to complete survey
- Don't do incentives for state utility (was a deterrent)
- Be mindful of other surveys that are going out that week
- Mondays and Tuesdays are not good days
- Take great caution to tell plant that the link is safe
- Make it clear the survey can be taken on cell phone

LWRS Program's Digital Strategy project

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INL/RPT-24-80099
Revision 0

Light Water Reactor Sustainability Program

Digitalization Mapping and Assessment Process Supporting ION Strategic Transformation Activities

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Office of Nuclear Energy

Questions?

