

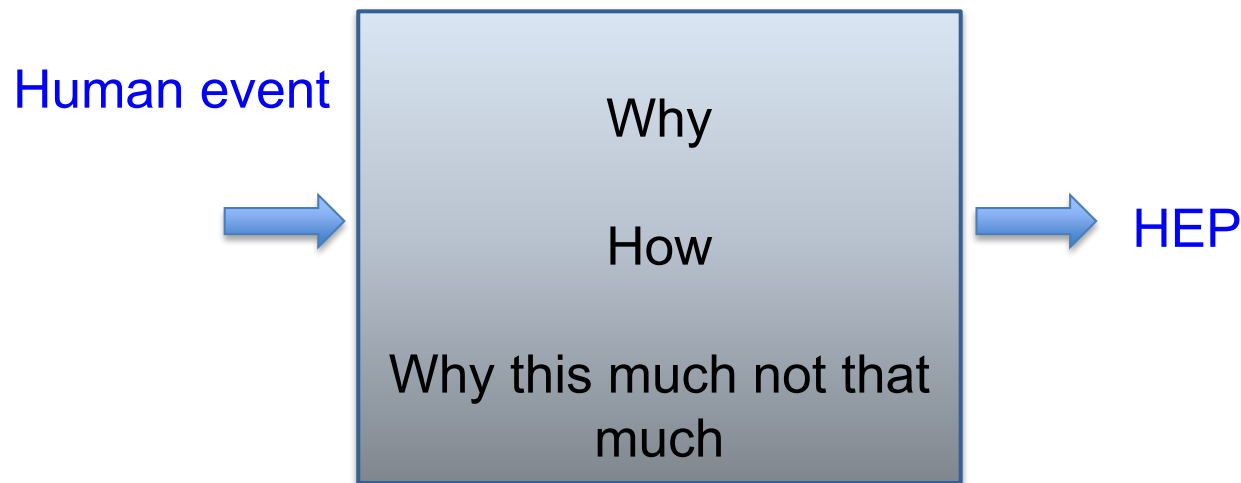
The NRC's Proposal on Use Data for HRA

– 2020 HRA Data Workshop Roundtable Discussion

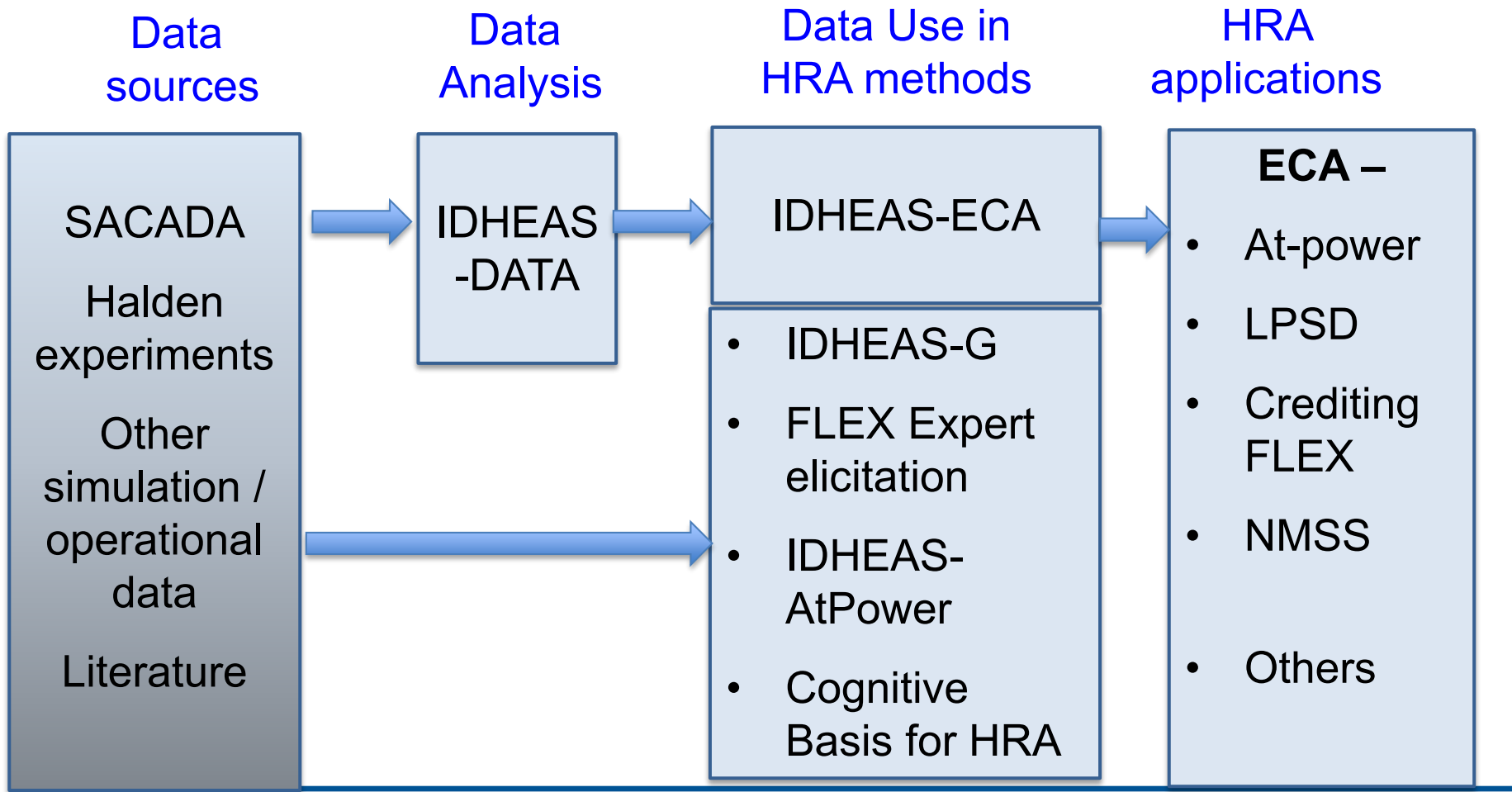
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NRC/RES/DRA/HFRB

Where we were 10 year ago?

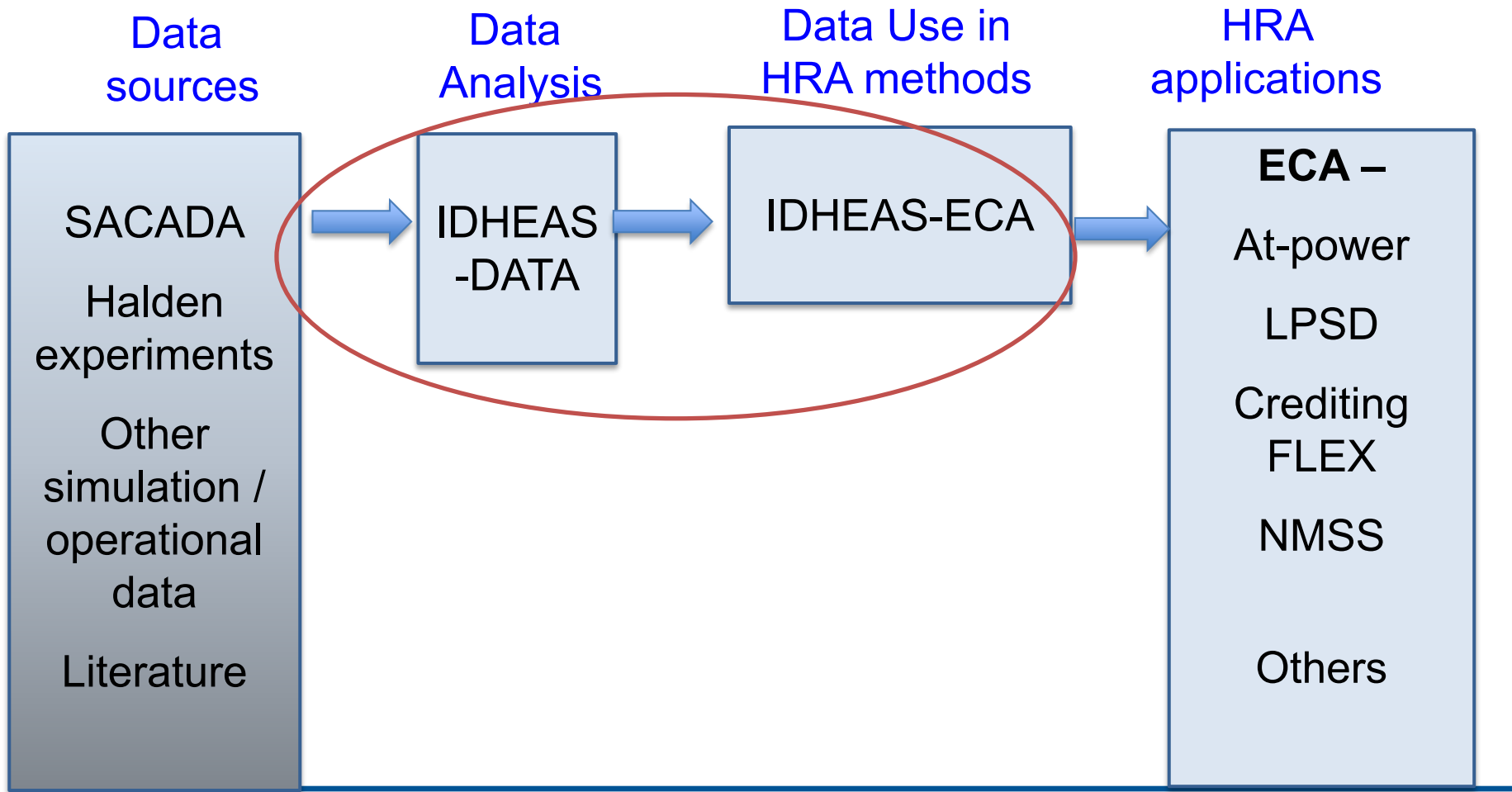
(Jing's HRA gray box diagram for ACRS in 2011-2018)



Where are we now?



Where are we going?



What are in IDHEAS-DATA

- IDHEAS-DATA has 27 tables documenting generalized human error data and empirical evidence.
- Human error data are generalized to IDHEAS-G CFMs and PIF attributes

IDHEAS-DATA Tables

Tables 1-5	Environment and situation PIFs	Table 22	PIF interaction effect
Tables 6-9	System PIFs	Table 23	Time factors
Tables 10-14	Personnel PIFs	Table 24	Recovery factors
Tables 14-20	Task PIFs	Table 25	Dependency factors
Tables 21	Lowest (nominal) HEPs	Table 26	Main drivers in human events (Empirical evidence for base PIFs)
		Table 27	No-context human error rates

Where we are in IDHEAS-DATA

- IDHEAS-DATA has 27 tables documenting generalized human error data and empirical evidence on human errors.
- Human error data are generalized to IDHEAS-G CFMs and PIF attributes

IDHEAS-DATA Tables

Tables 1-5 Environment and situation
PIFs

Tables 6-9 System PIFs

Tables 10-14 Personnel PIFs

Tables 14-20 Task PIFs

Tables 21 Lowest (nominal) HEPs

Table 22 PIF interaction effect

Table 23 Time factors

Table 24 Recovery factors

Table 25 Dependency factors


Table 26 Main drivers in human events
(Empirical evidence for base PIFs)

Table 27 No-context human error rates

Which areas are missing in IDHEAS-DATA

Tables	Areas
Env. PIFs	PIF weights on Team Coordination
System PIFs	Digit I&C, Equipment and Tools
Personnel PIFs	Procedures, Training, Work process, Organization factors
Task PIFs	Information, Familiarity
Lowest HEPs	Team coordination
PIF interaction	Lots of data for analysis
Time factors	Data for effects of factors (e.g. environment) on time needed
Recovery	Very limited data
Dependency	No data
Drivers	Lots of data for analysis

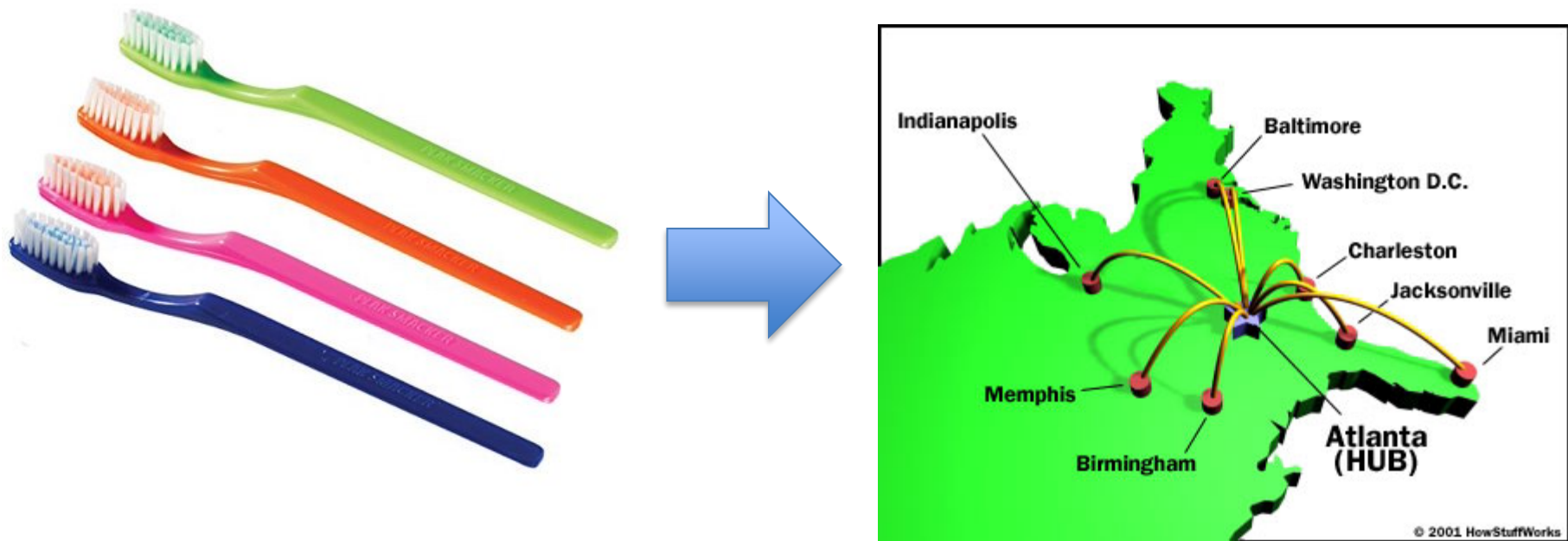
What we are looking forward to

Tables	Areas	SACADA	Halden	Others
Env. PIFs	PIF weights on Team Coordination			?
System PIFs	Digit I&C, Equipment and Tools			
Personnel PIFs	Procedures, Training, Work process, Organization factors	√	√	
Task PIFs	Information, Familiarity	√	√	
Lowest HEPs	Team coordination	√		
PIF interaction	Lots of data for analysis	√	√	
Time factors	Data for effects of factors (e.g. environment) on time needed		√	
Recovery	Very limited data		√	
Dependency	No data		√	
Drivers	Lots of data for analysis	√	√	

The NRC's Proposal on Use Data for HRA

Change of context – “We” means not just the
NRC staff, but this broad HRA community

Mindset on HRA data sharing, exchanging, and using



To fill out the gaps – Vision beyond the NRC

(Notes from 2020 HRA Data Workshop)

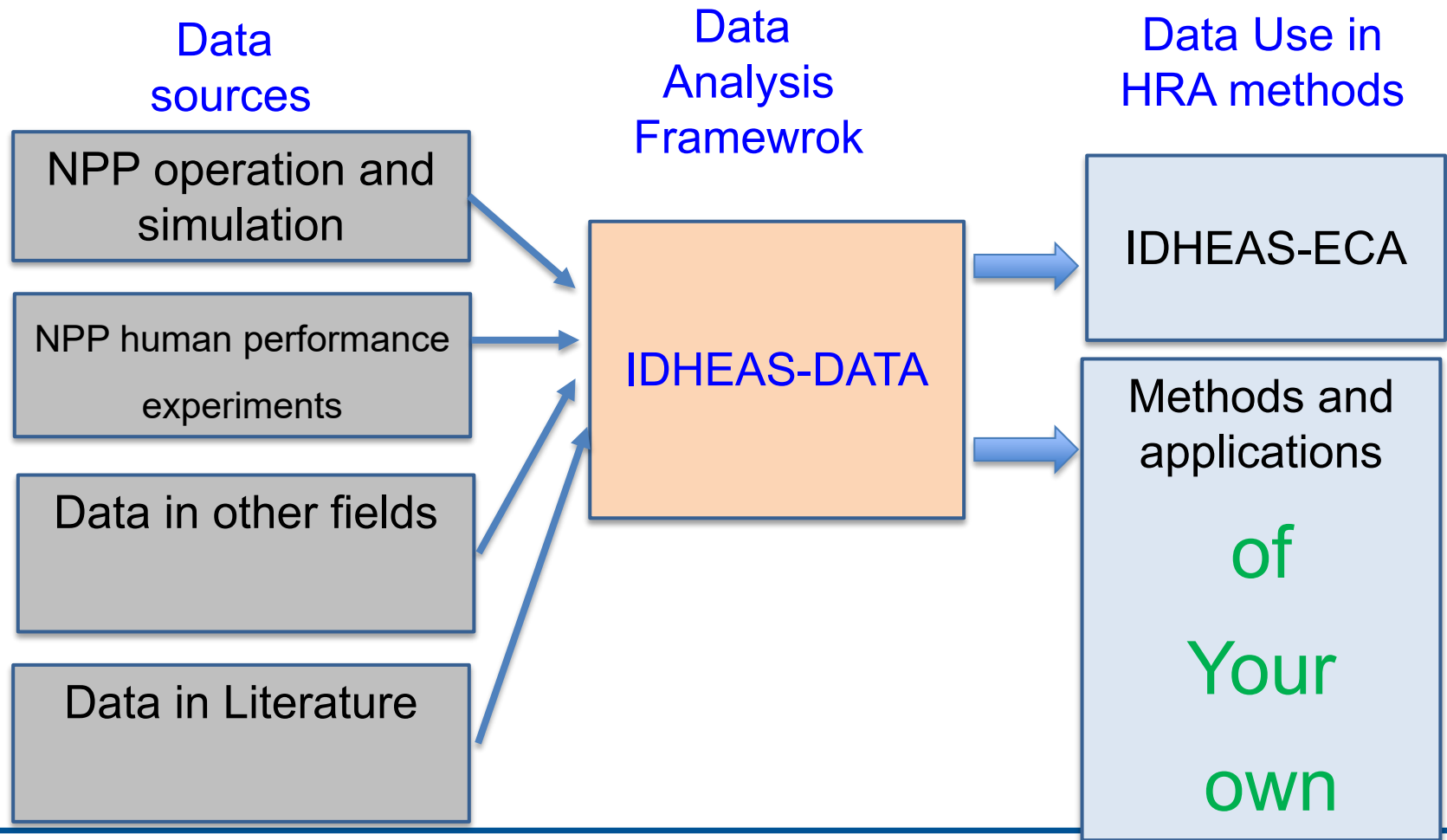
Organization / Program	Data source	Data analysis	Data use
NRC IDHEAS-DATA	All sources of human error data	Generalization to IDHEAS-G taxonomy	IDHEAS-ECA
NRC SACADA	Operator simulator training	<ul style="list-style-type: none"> Statistics IDHEAS-DATA 	IDHEAS-ECA
Halden	<ul style="list-style-type: none"> Microtasks Full-scope simulation 	<ul style="list-style-type: none"> Statistics Insights 	
HuRex	Operator simulator data collection for HRA	<ul style="list-style-type: none"> Statistics Insights 	HEPs and PIF multipliers
Czech Rep.	Operator simulator data collection for HRA	<ul style="list-style-type: none"> Statistics Insights on PIFs 	THERP and others
INL Microworld	<ul style="list-style-type: none"> Microworld NASA HH&P data 	<ul style="list-style-type: none"> Statistics Insights on PIFs 	CREAM, NASA HRA (?)
UMD		<ul style="list-style-type: none"> BBN Dependency 	

HRA Data Proposal - Let's work together



IDHEAS-ECA		SACADA	Halden	HuRex	Czech	MicroW	UMD	EPRI, Others,
Env. PIFs			—	—	—	—	—	—
System PIFs		😊	—	—	—	—	—	—
Personnel PIFs		😊	—	—	—	—	—	—
Task PIFs		😊	—	—	—	—	—	—
Lowest HEPs		😊	—	—	—	—	—	—
PIF interaction		😊	—	—	—	—	—	—
Time factors			—	—	—	—	—	—
Recovery			—	—	—	—	—	—
Dependency			—	—	—	—	—	—
Drivers		😊	—	—	—	—	—	—

Where are we going together?



The Dream-HRA-DATA

