

A construction worker wearing a white hard hat and a safety vest is looking down at a tablet computer. The image is overlaid with a semi-transparent dark blue filter. The text "Digitizing Pipeline Construction: How to Predict the Future" is written in white, sans-serif font across the middle of the image.

# Digitizing Pipeline Construction: How to Predict the Future

The Science of How™

# Outline

- Limitations of Typical Reporting
- Components of a Digital CM Solution
- Benefits of Digitization
- Digitization to Prediction
- Barriers to Adoption
- Moving Your Organization Forward
- Moving Our Industry Forward



# Limitations of Typical Reporting

- Data Errors
  - Missing / incomplete data
  - Incorrect stationing (overlaps)
  - Incorrect material description
  - Typos / errors
  - Incorrect filenames
- Systemic Weaknesses
  - Overwriting data / reports
  - Cybersecurity / email transmission
  - Disaster recovery
  - Scanned image quality
- Slow and Expensive!

**FOREIGN UTILITY CROSSING REPORT**

Spread No.: 518 Contractor: SHASHAN Date of work: 9-28-13  
Crossing Location (Alignment): 3307+60 Tract No.: \_\_\_\_\_ Legal Desc. (S/TR): \_\_\_\_\_  
Type of Utility: U.G. STEEL Product: UNKNOWN Utility Size: 2"  
Utility Name: RED HELL DEVELOPMENT Utility Rep. Name: ART BAUER  
Utility Office Address: \_\_\_\_\_ Telephone No.: 330-342-9571  
Did Contractor make necessary "One-Call" notifications? ☒ Yes ☐ No  
Did Foreign Utility Rep. inspect completed crossing? ☐ Yes ☒ No  
If yes, was installation accepted? ☐ Yes ☐ No  
Test Sta.'s Installed? ☐ Yes ☐ No Type: C.P. Locations: 3310+59 / 3310+60 / 3310+61

Depth of Cover = 8'-1"  
Type = STEEL  
Size = 2"  
Distance of Clearance = 4'-4"

NEW PIPELINE  
Direction of Flow →

Upstream Weld\XR No. 1BTR-0276 Station No. 3307+91  
Downstream Weld\XR No. 1BTR-0275 Station No. 3307+19

Remarks: \_\_\_\_\_

Inspector's Name (printed): BRAD WHEAMS Work Date: 9/28/13  
Inspector's Signature: Brad Wheams Report No.: 10  
Distribution: OCM/Office Mgr. (file) Chief Inspector Survey Supervisor Form C14

**ASSISTANT CHIEF INSPECTOR'S  
DAILY REPORT  
PIPELINE CONSTRUCTION  
(FIELD INSPECTION REPORTS ATTACHED)**

REPORT NO.: 009  
DATE: 03-04-2014  
PAGE: 1 OF 1

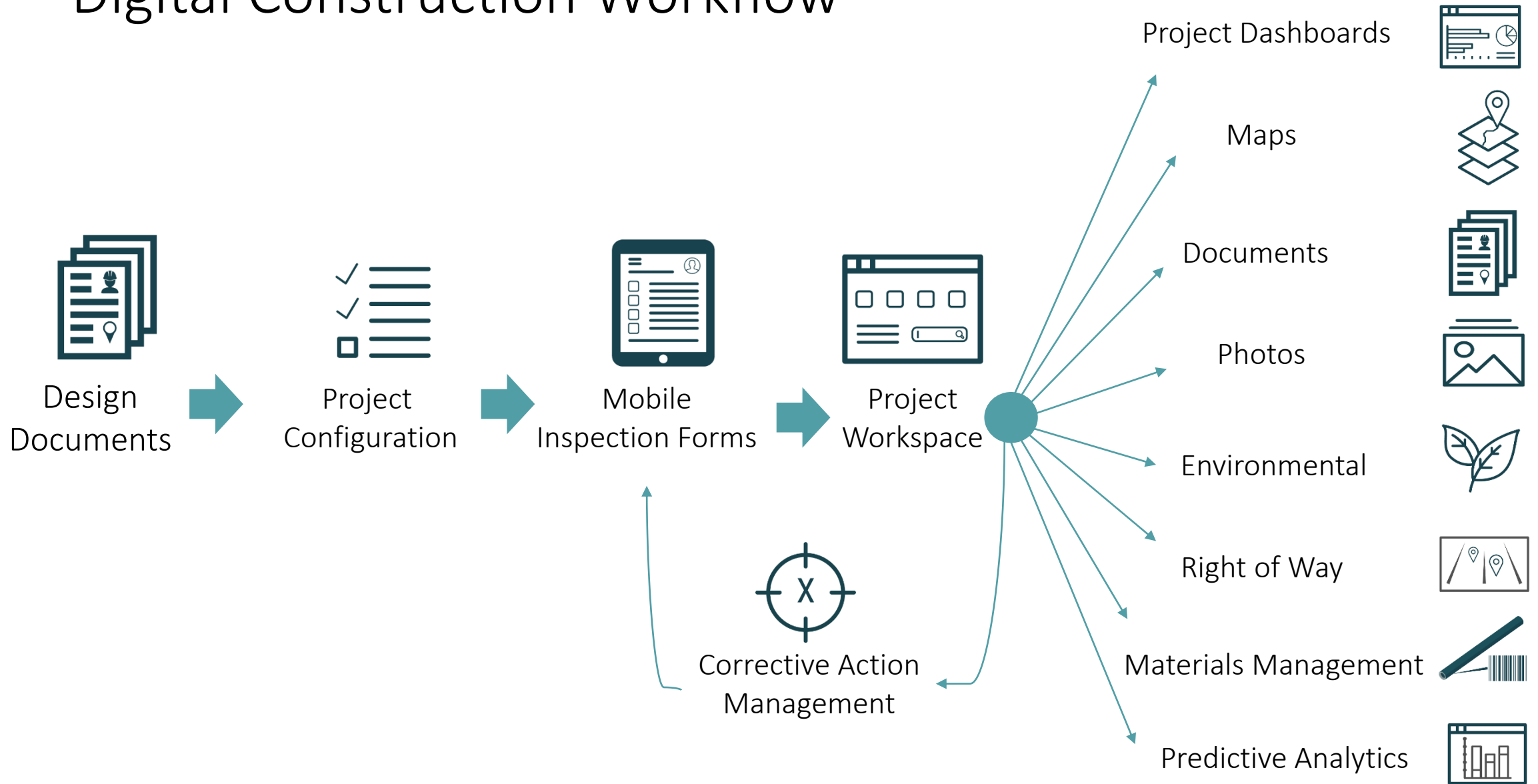
PROJECT: 24" Natural Gas Pipeline CONTRACTOR: Latex  
PROJECT NO.: APC 19980-003 SUPERINTENDENT: Bobby Purdie WEATHER: Cloudy

ITEM NO.	DESCRIPTION	REPORT UNIT	STATION		QUANTITY TODAY	PREVIOUS TOTAL	TOTAL TO DATE	MILES	
			FROM	TO				COMP.	TO GO
1	FENCES	EACH	Hwy 231 south crossing	To Transco meter site	1,600	30,300	31,900		
2	CLEARED and GRUBBED	L FT.							
3	DITCH	L FT.							
4	HAUL & STRING	L FT.							
5	BENDING & LAY	L FT.							
6	MAIN LINE WELDS	L FT.							
6A	ROAD BORE WELDS	EACH							
7	COAT AND JEEPING	L FT.							
8	LOWER - IN	L FT.							
9	TIE - IN	EACH							
10	BACKFILL	L FT.							
11	DRILL & PULL	L FT.							
12	HYDRO & DEWATER	L FT.							
13	CLEAN, DRY & PACK	L FT.							
14	BORE - CASSED	L FT.							
14A	BORE - UNCASSED	L FT.							
14B	CASING INSTALLED	L FT.							
15	CROSSINGS - OPEN CUT	L FT.							
16	TEST LEADS	EACH							
17	GRADE	L FT.	167+00	157+00	1,000	300	2,300		
18	CLEAN-UP	L FT.							
19	ML VALVE ASSEMBLY 1	%							
19	ML VALVE ASSEMBLY 2	%							
20	24"x.375 X65M FBE ML PIPE	L FT.	PIPE YARD		8858'	40,099.20'	48,957.20'	TOTAL JTS	1,007
21	24"x.500 X65M FBE ML PIPE	L FT.	PIPE YARD		0	0	0	TOTAL JTS	0
22	24"x.500 X65M ARO ML PIPE	L FT.	PIPE YARD		0	982.10	982.10	TOTAL JTS	20
23	FAB. WELDS Passed NDE	%							
24	PAINT	%							

Comments: Pipe yard received 180 joints of 24"x.375 X65 FBE coated pipe and 0 joints of 24"x.500 X65 ARO pipe. Latex continued burning, piling, clearing, grading and potholing along the ROW. Also Latex installed fence gaps and goal post along the ROW and environmental crews installed silt fence, hay bales, and hay logs along the ROW in needed areas. Survey worked on surveying ROW limits and access rds. Latex welders are qualifying procedures in Bessemer, Alabama with PCS and senior welding inspector at American Test Laboratory Inc.

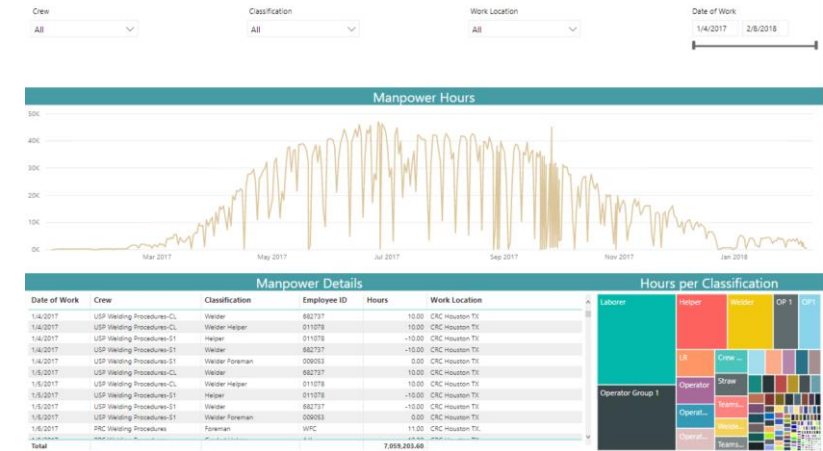
QIS Inspection Document 03  
SIGNED: Brad Wheams  
Assistant Chief Inspector

# Digital Construction Workflow

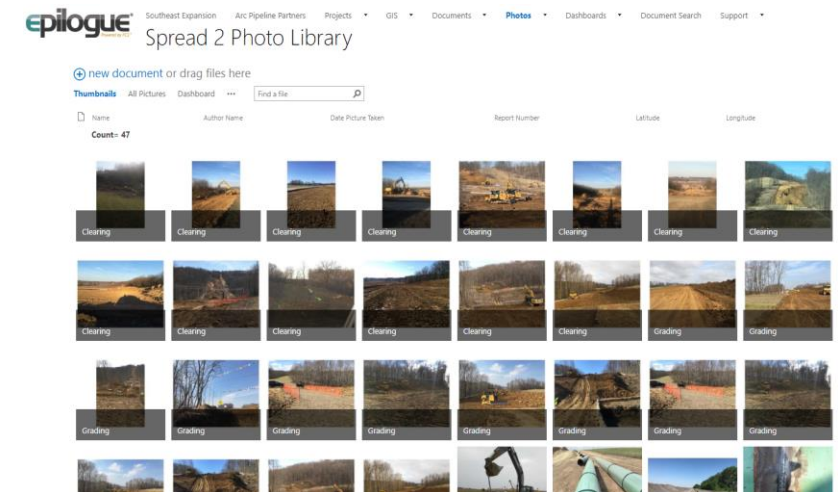


# Benefits of Digitization

- Data Standardization
  - Mats, ROW Mats, Install Mats, Matting, etc.
- Data Accuracy
  - Avoid transcription, pre-fills, validations
- Data Analytics
  - Aggregate, compare, combine, trends
- Building Digital Twin
- All the above contribute to improved safety, quality and compliance



Dashboard Reporting



Easily Searchable Photos & Docs

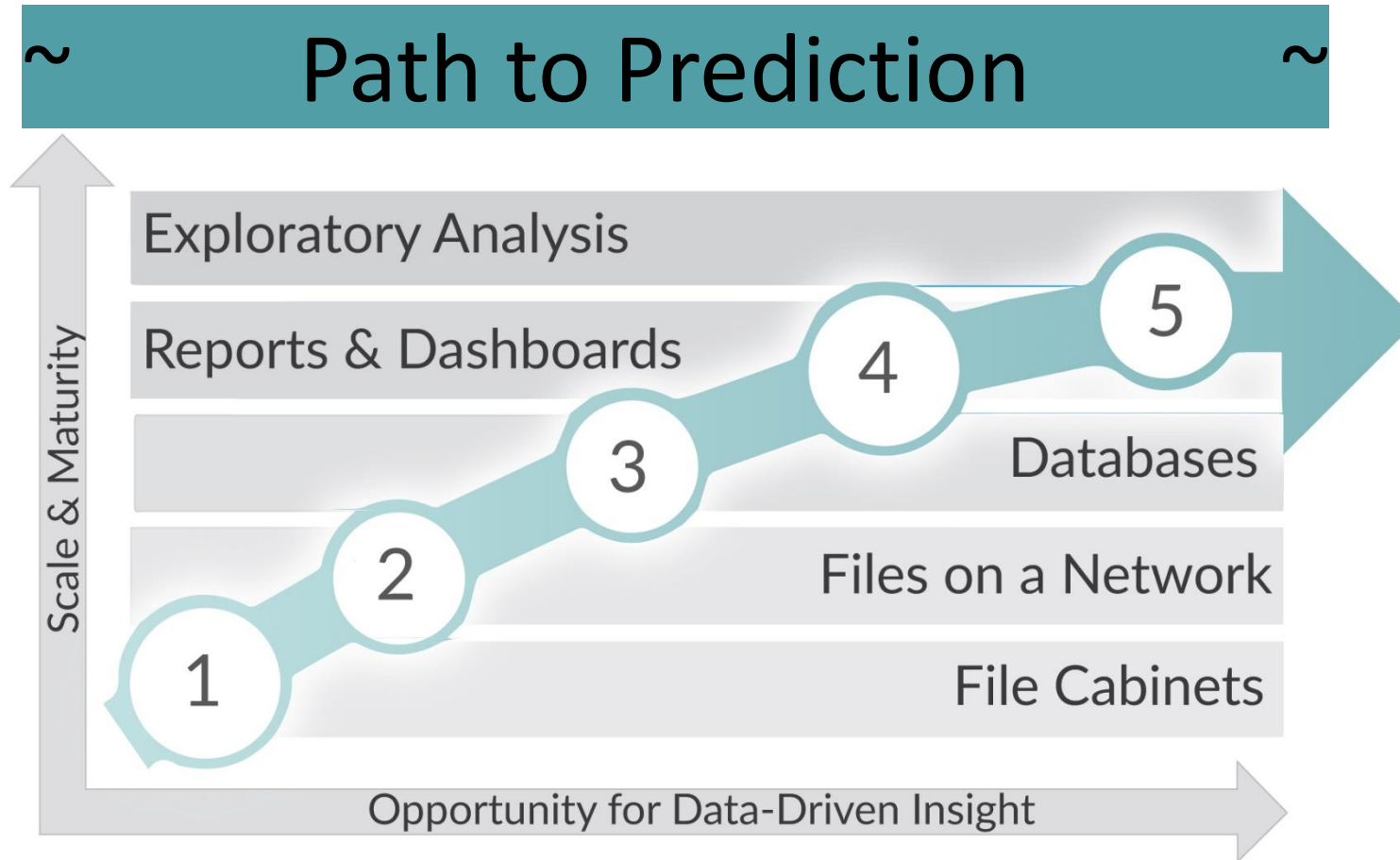
# Barriers to Adoption

- Near-term investment. Long term benefits.
- Pipeline construction culture.
- Effort required to use the solution.
- Inexperienced technical support.
- Expecting a home run at your first at-bat.
  - Start small and iterate (hit for singles)
  - Be agile





# Moving Your Organization Forward



# Moving Your Organization Forward

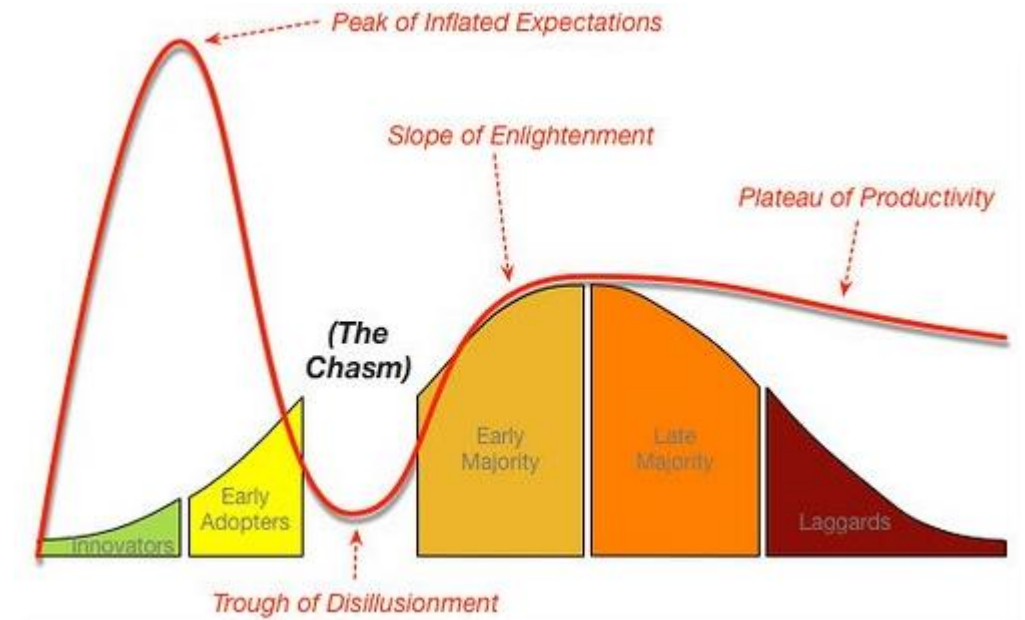
- Take 1 step towards digitization. Don't take 3.
- Learn from those with more bruises
- Plan a pilot project with very narrow focus
  - Live by the phrase “For the pilot and not forever”
- Digitize processes that exist. Don't invent new processes because digitization allows it (that is later).
- Be agile





# Moving Our Industry Forward

- Redefine Construction Management and Operations for Pipeline Infrastructure
  - Ask "How": How can we improve based on new technology and recent discovery?
  - Ask "Why": Are company policies truly best practice or just tradition?
  - Be "Who": We can be the generation of improvement.
  - Utilize proven technology that so many other industries have adopted



# Questions

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Weld As-Built

Project	Inspector Name		CWI Number	Contractor Name	Date
Inspection	3/2/2020		13		

Asset Type	Asset ID	Pup ID	Heat Number	Dia	WT	Grade / Rating	Length	Coating	Upstream Weld #
Pipe	0002214		W9L546	30	0.469	X65	40.10	FBE/ARO	1HD0008

Weld Number	Pipe Dia.	Visually Inspected?	Station Number	Weld Type	Welder Stencils				Date Welded
110004	30	Yes	47+21	Butt	D E	G F			2/29/2020

Welding Procedure WP-1000-X65

Weld Number Photo	Welder Stencils Photo
	

Project Consulting Services®, Inc.

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