

**Digital  
360  
Summit**

Keynote Address:

# Enabling Advanced Digital Construction Management Systems

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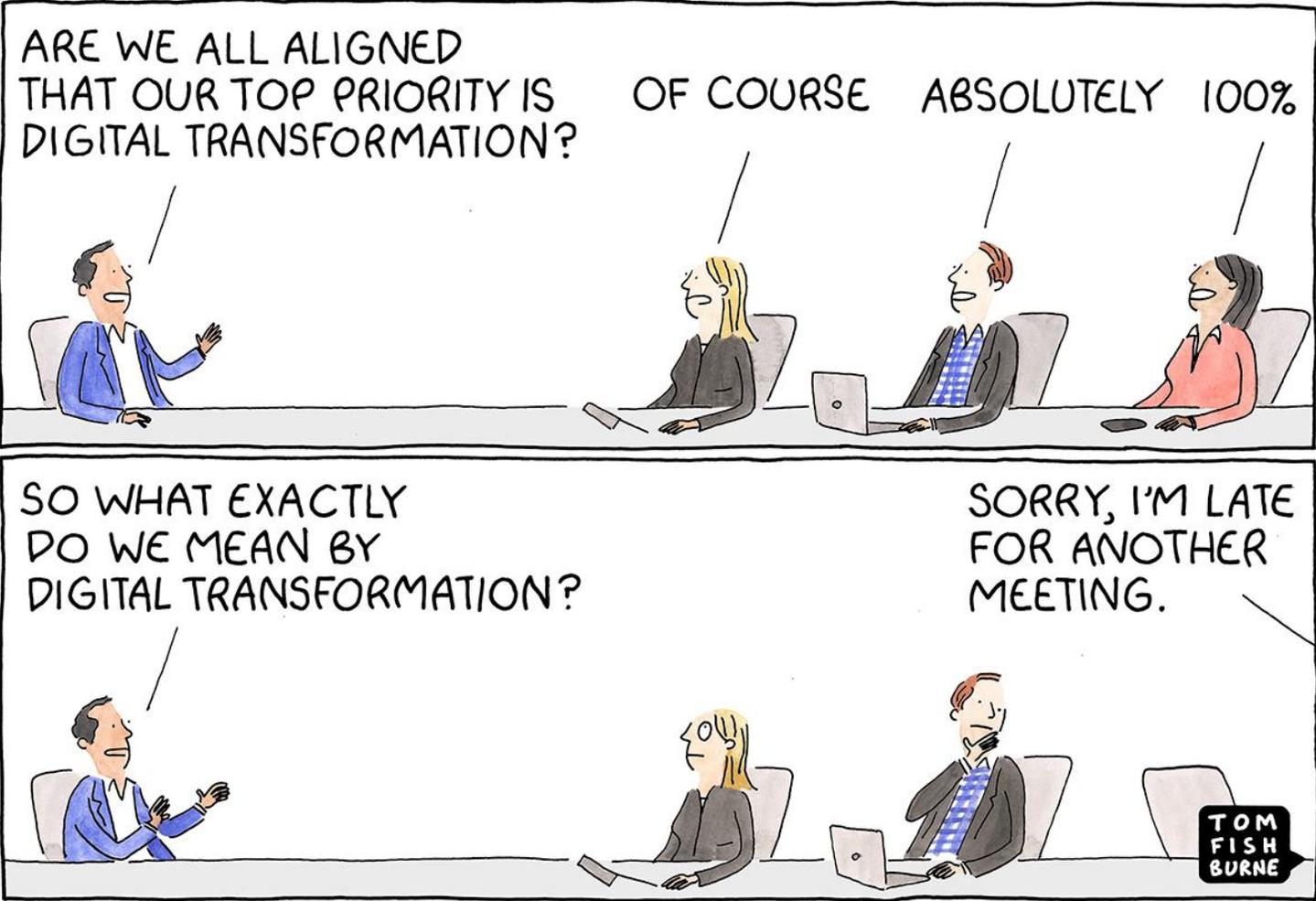


**Jan Rippingale**  
Founder & CEO



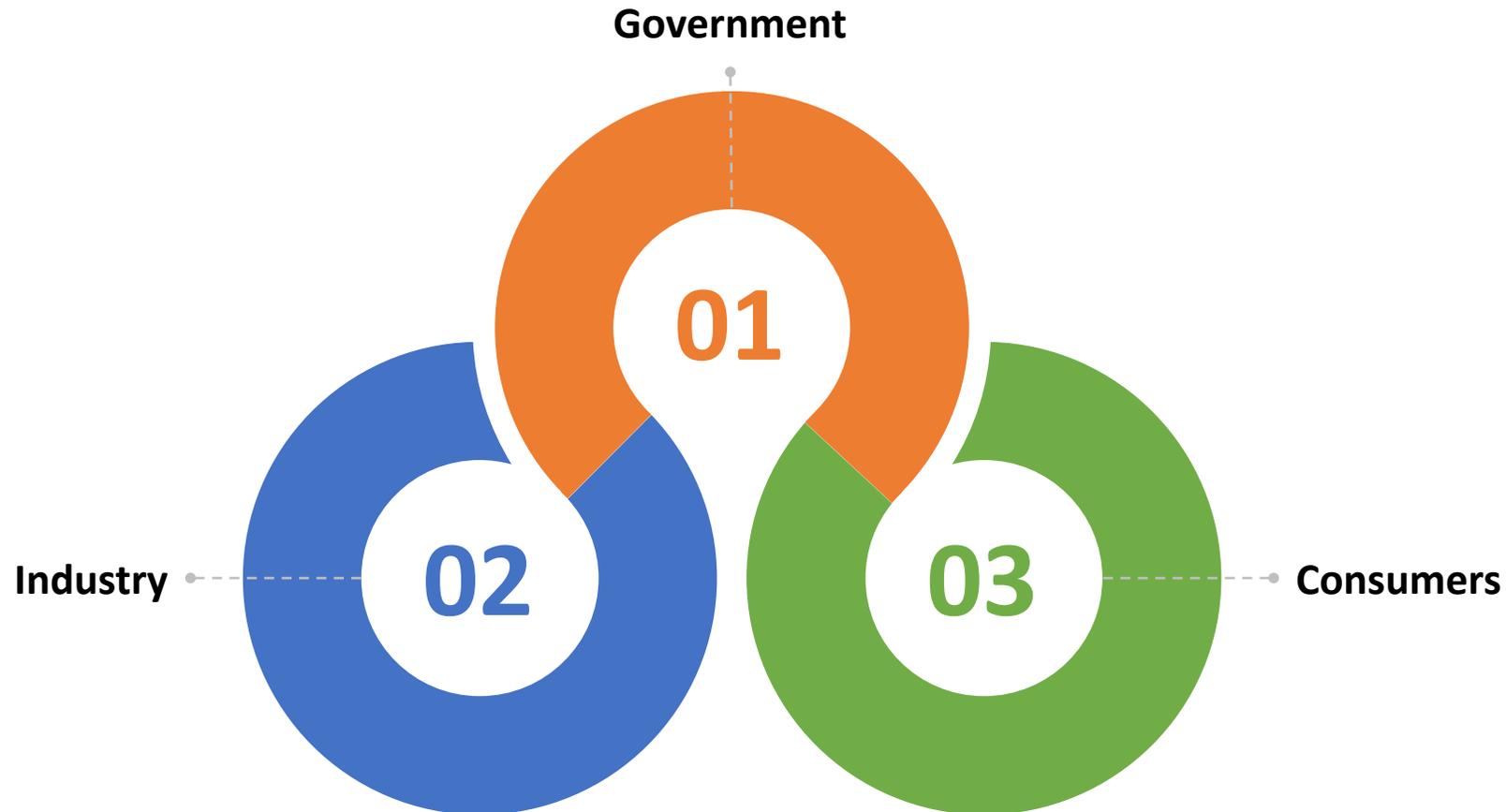
September 7, 2022

# The Digital Transformation discussion has been going on for decades...



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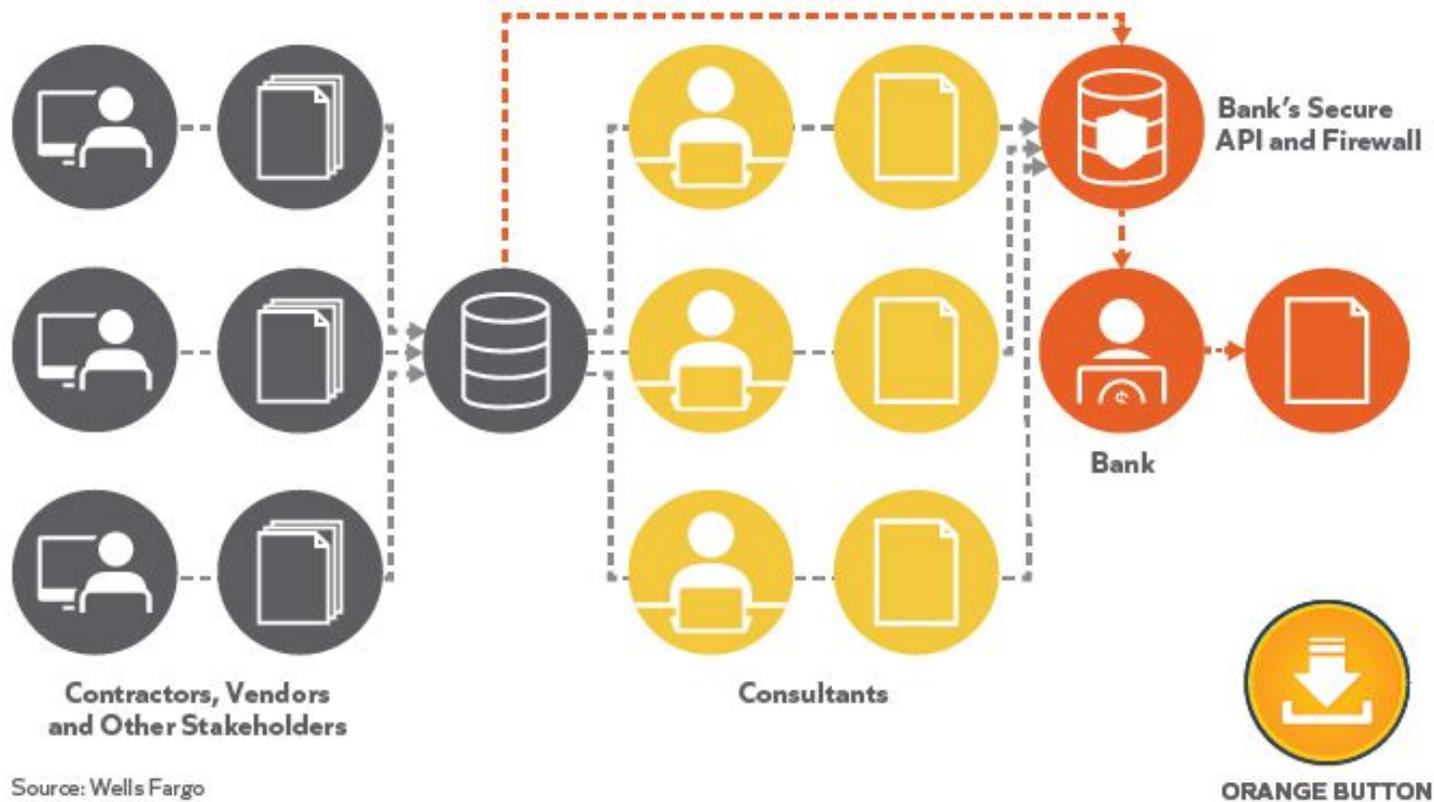
# The holy grail of digital transformation...



**working together with the same data, making it easy to interact and transact legitimately and seamlessly.**

# Easy Data Exchange - Example

## PROJECT FINANCE INFORMATION FLOW DOCUMENTS • COMMON DATA LANGUAGE

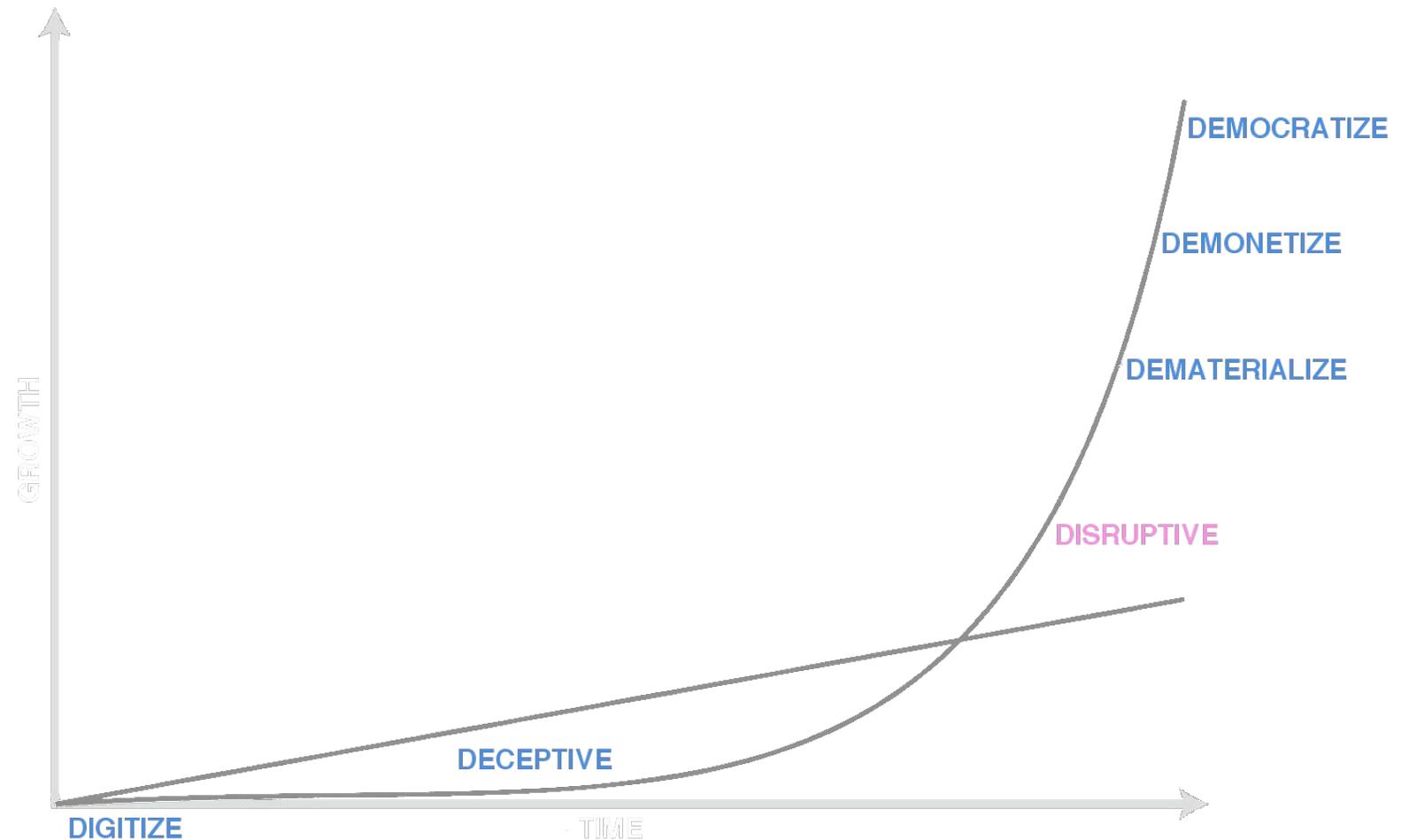


# The 6Ds of Technology Disruptions & Exponential Growth

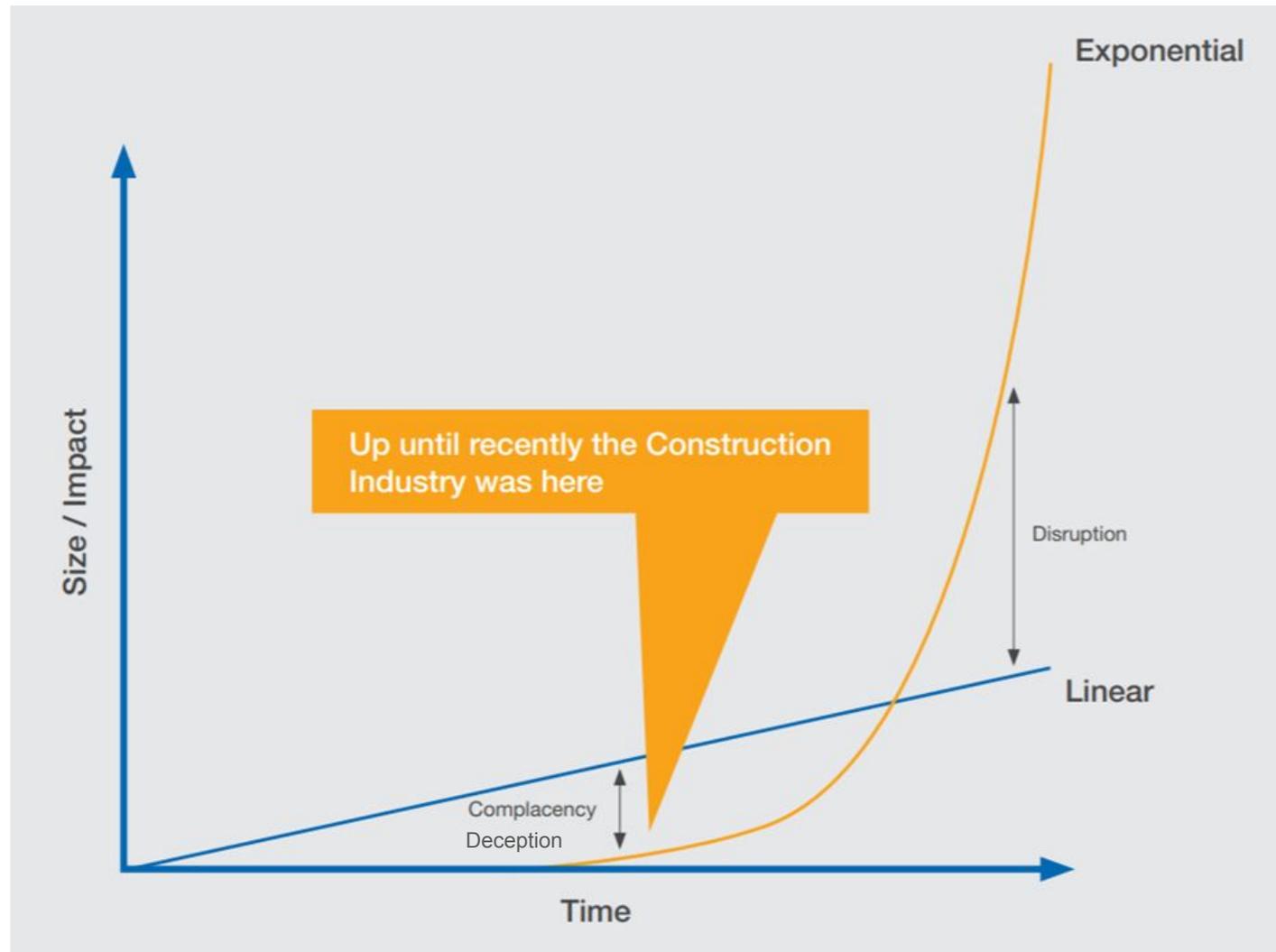


*“The 6 Ds are a chain reaction of technological progression, a road map of rapid development that always leads to enormous upheaval and opportunity.”*

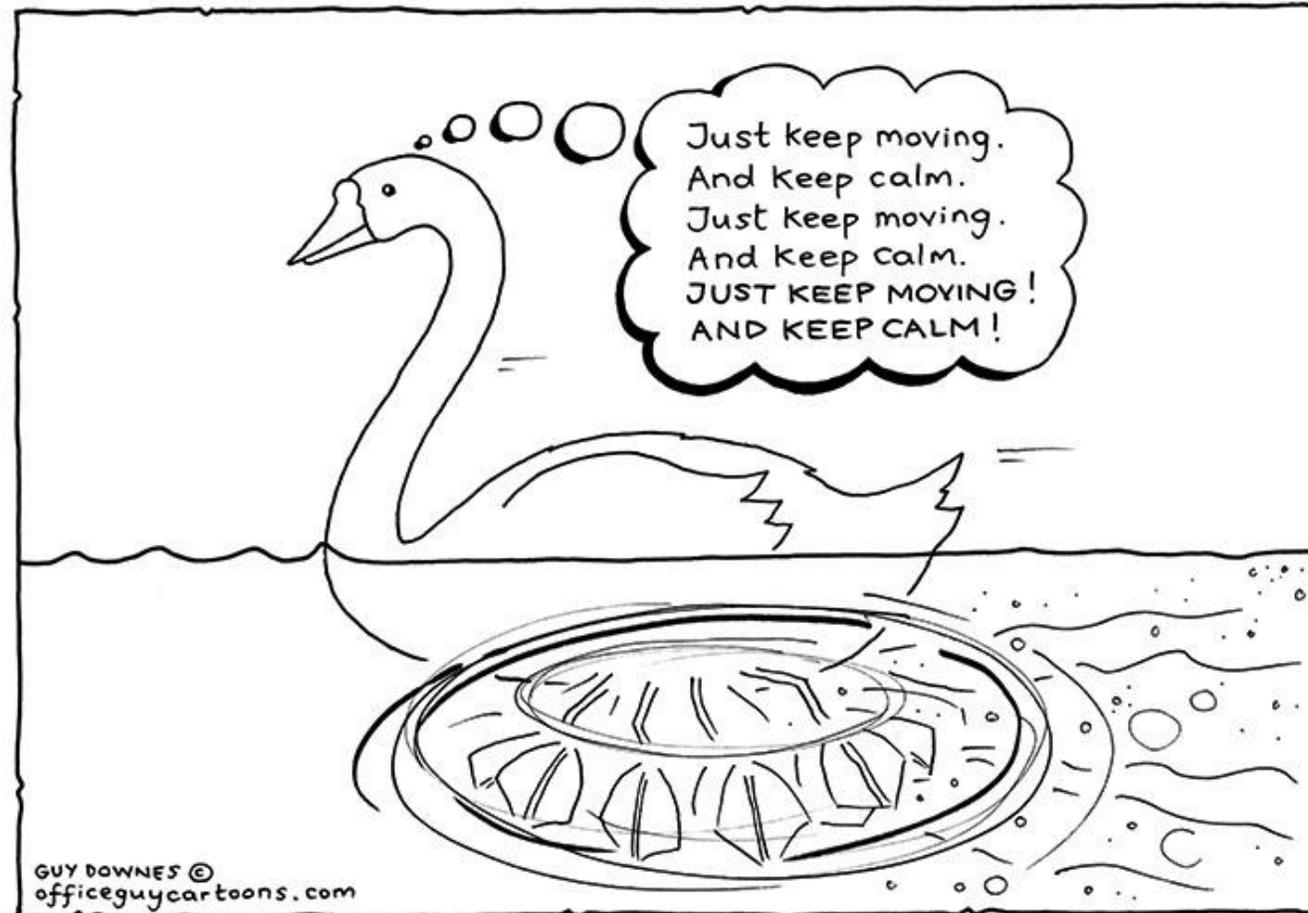
– Peter Diamandis and Steven Kotler, Bold



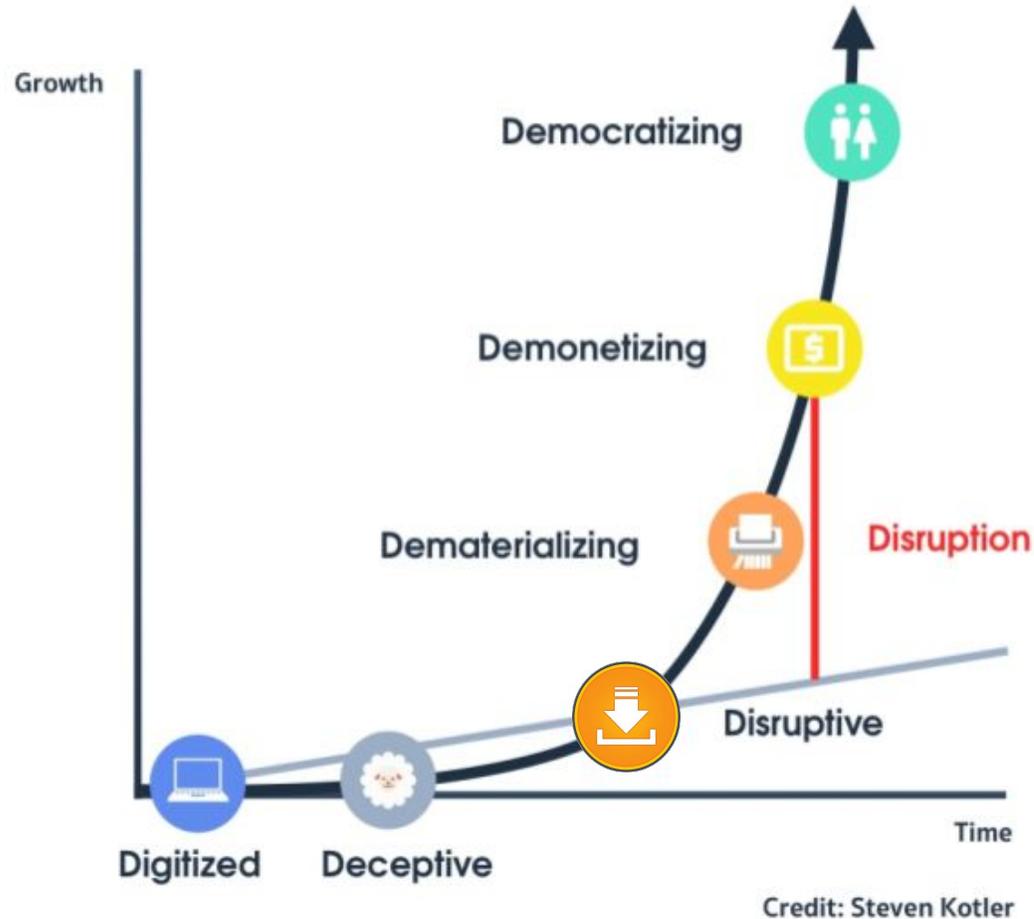
# Where we were...



# Public-Private Partnership is building momentum...



# Beginning of the Disruption phase in the Solar PV industry...

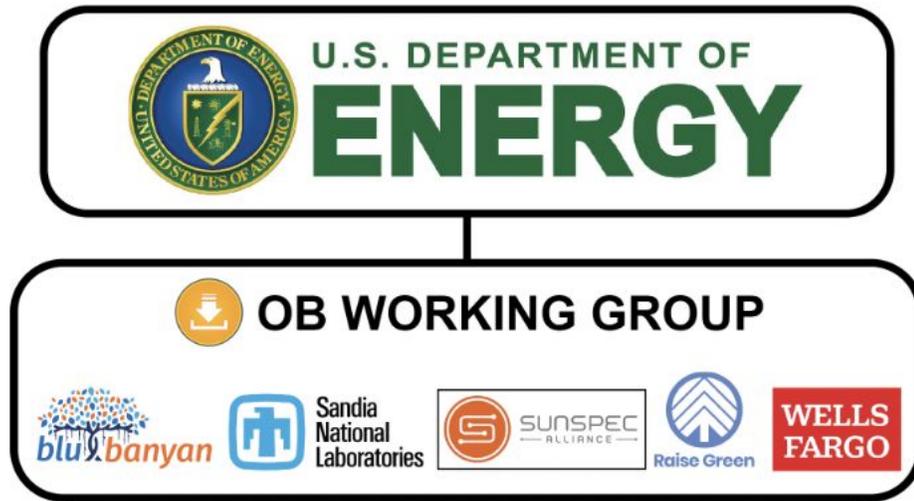


 The DOE Orange Button (OB) Initiative

# Digital transformation in the Solar PV industry with Public-Private Partnership...



## The Orange Button (OB) Initiative



The OB Working Group (chaired by Blu Banyan, SunSpec Alliance, Sandia) seeks to create an **open data exchange standard** for the distributed solar PV industry.

# Solar Industry's Common Data Standards, Datasets, Tools, Security



## CYBER SECURITY PROTOCOLS

### COMMON TERMS

SCORM



orangebutton.io



### COMMON DATASETS



AHJ REGISTRY



PRODUCT CODE REGISTRY

### COMMON TOOLS



Solar APP+

SolarSuccess™

BuilderSuccess

enerflo

bedhi

GTR  
Get The Referral

Soltell

celigo

## CYBER SECURITY PROTOCOLS



SunSpec  
Modbus



## Drive Down Soft Costs for Residential, Commercial, and Utility Solar Projects

### Easy Data Exchange



Data standards enable investors, project developers, and asset managers to instantly share data without time consuming manual data entry and validation.

### Lower Project Costs

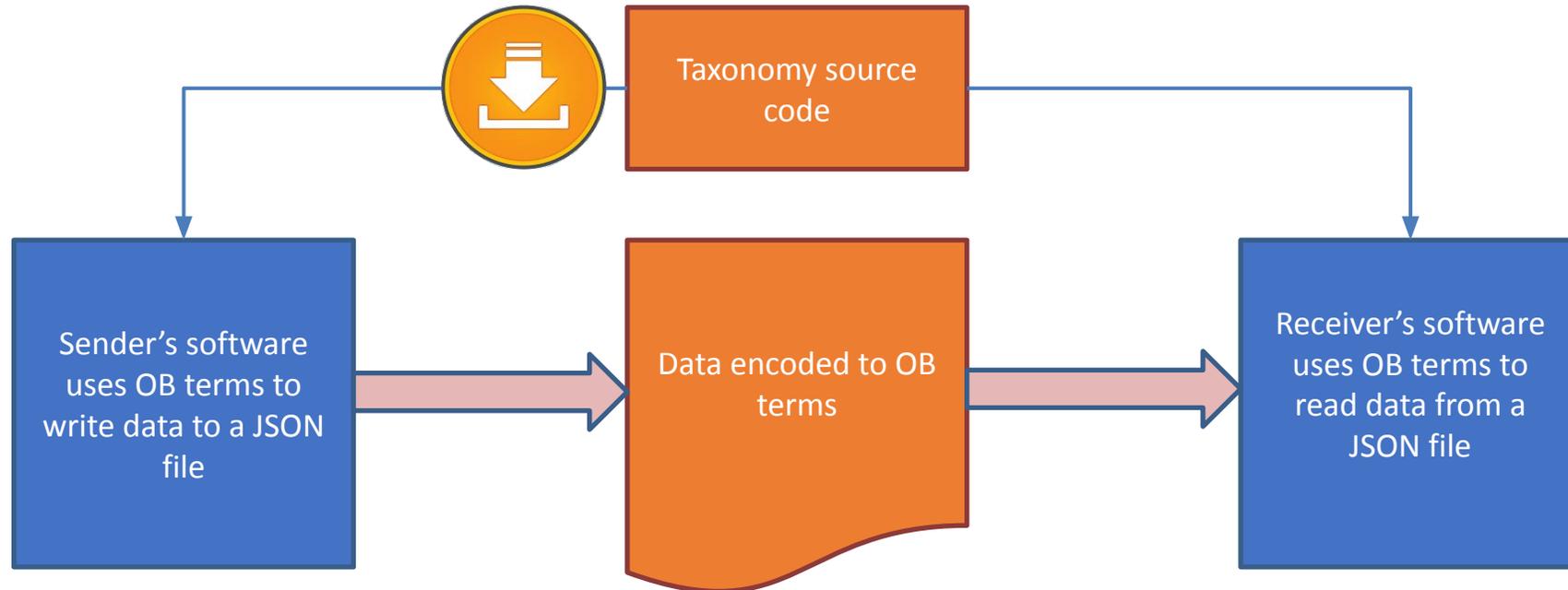
A standardized solar data format significantly lowers the cost of capital by reducing process inefficiency throughout the project development and operational lifecycle.

### Extensible for New Technologies

Stakeholders can add data fields and information models to Orange Button to address new use cases.

# Common Terms - The Orange Button Taxonomy

- Open-source, public, free-to-use
  - JSON compliant with the OpenAPI 3.0 specification
  - Javascript style conventions
  - <https://www.github.com/Open-Orange-Button/Orange-Button-Taxonomy.git>
- Editor at <https://openobeditor.sunspec.org>
- Documentation at [www.orangebutton.io](http://www.orangebutton.io)





# Common Terms - Reusable is Scalable



Primitives enables you to leave "Excel Hell"

[-] EnergyProductions [ EnergyProduction ]
• SiteID
[-] EnergyMeasurements [ EnergyMeasurement ]
• DeviceID
• EnergyAC
Decimals
EndTime
Precision
StartTime
Unit
Value

Field name	Value	Units	StartTime	EndTime	Decimals	Precision
EnergyAC	11.98	MWh	2021-07-20T12:00:00-07:00	2021-07-20T23:59:59-07:00	2	

# Common Terms align Software Vendors...

**SolarSuccess™** – integrates with application providers to deliver a cohesive solar applications' ecosystem that helps reduce solar project costs, grow the addressable market, and scale deployment.



- Legend**
- \* Road Map
  - Orange Button

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<b>Financiers</b> Goodleap * Dividend	<b>Payments</b> Paystand eBizCharge	<b>Site Surveys</b> Eagleview	<b>HOA/Property</b> bluProperty <b>Weather</b> AccuWeather
<b>Customer Engagement</b> Orange Button Bodhi Ipsun Sunvoy MessageMedia (SMS)	<b>File Storage</b> AWS G-Drive SharePoint	<b>Warehouse Management</b> RF-SMART	<b>Equipment</b> BayWa r.e. * Wesco CED Greentech <b>Other Systems</b> Orange Button Celigo Salesforce HubSpot
<b>DOE Orange Button</b> Orange Button AHJ Registry * SolarAPP+ * Product Code Registry * Monthly Operating Report	<b>Monitoring</b> Also Energy SolarEdge * Enphase * eGauge	<b>Asset Monitoring</b> Orange Button * Soltell PowerFactors * PowerHub * 3MW	<b>Field Service</b> FieldAware Shepherd CMMS * Scoop Solar * Salesforce Lightning * Site Capture

# Common Datasets – AHJ Polygons are hard for humans...

## Fragmented Regulatory Environment:

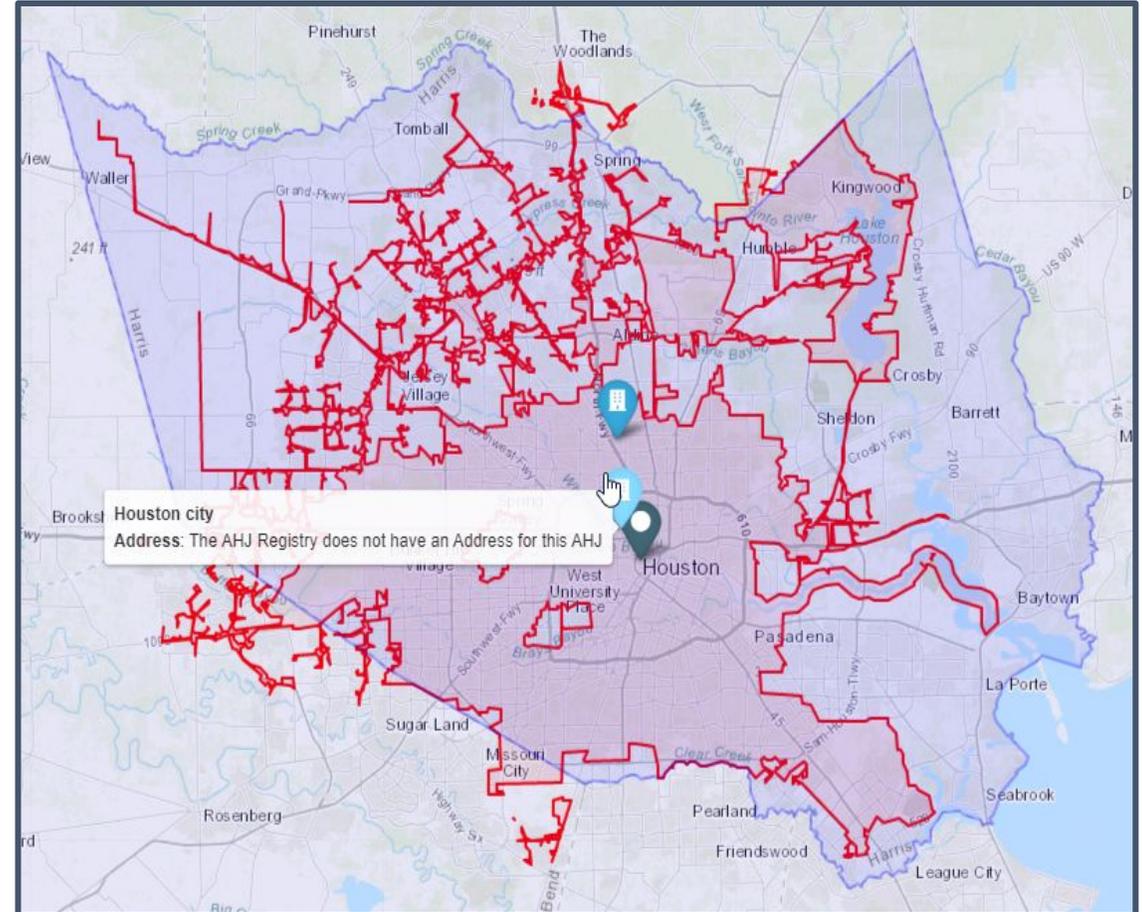
In the U.S., there are **18,000 permitting jurisdictions** and **3,000 utilities** with different rules and regulations for how to go solar.

...hence the need for the **Orange Button AHJ Registry**.

### How the AHJ Registry Works:

- Polygons of AHJs from Census
- Lat/Long “point” from Google
- Point found in Polygon
- Returned by smallest first (Government levels)

I have an address. Which AHJ does it belong to?

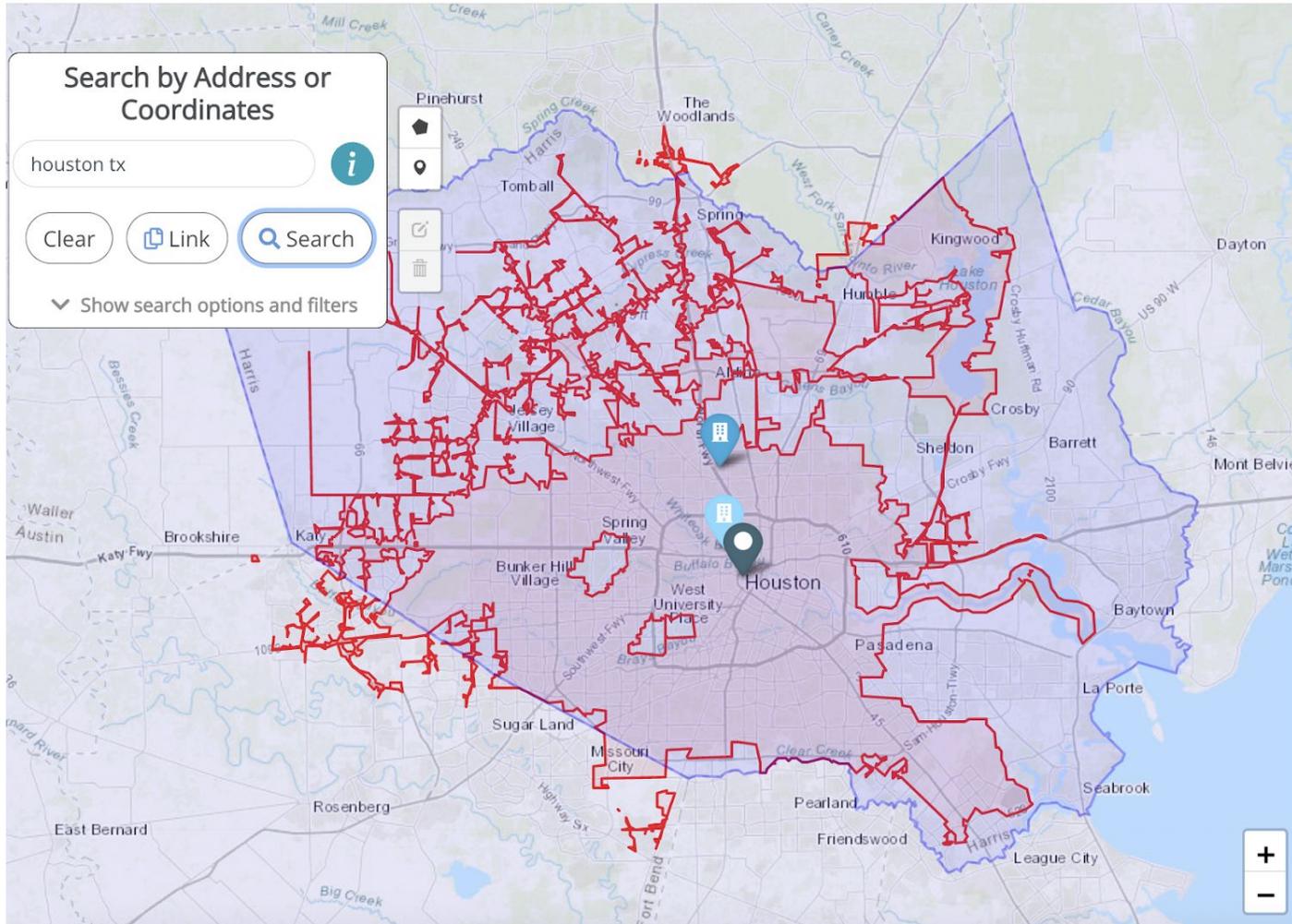


# Common Datasets - The AHJ Registry for construction projects



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« < 1 > »

AHJ Code	AHJ Name	County	Building Code	Electric Code	Fire Code	Residential Code	Wind Code	More Info
TX-4835000	Houston city		2012 IBC	2020 NEC	2012 IFC	2012 IRC	Special Wind Zone	Show
TX-48201	Harris County	Harris County	2018 IBC	2017 NEC	2018 IFC	2018 IRC		Show
TX-48	Texas state		2012 IBC	2014 NEC	2015 IFC	2012 IRC		Show

- Saving time
- Reducing errors
- Lowering costs

Leaflet | Tiles © Esri — Esri, DeLorme, NAVTEQ, TomTom, Intermap, iPC, USGS, FAO, NPS, NRCAN, GeoBase, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), and

# Common Datasets - How accurate is the AHJ Registry?

Higher Quality, Lower Cost solution than any individual business could have supplied...

- **Tested with 17,540 residential solar projects**
- Human-assigned AHJ vs AHJ Registry-assigned AHJ
- 8 States (AZ, CA, CO, FL, GA, NM, NV, TX)
- 669 AHJs in these states
- 17, 283 identical matches: 98.5%
- Investigating 257 misses manually
  - some human-assigned data differed from permit
  - some apparent city-county cross-over despite location
  - some addresses where zip code doesn't match city

*“The ability to automatically assign AHJs eliminates human error and further streamlines our pre-installation process. This allows our teams to potentially install solar systems quicker and ultimately achieve our end goal of a completed project and a happy customer”.*



# Common Tools - SolarAPP+ Is Cutting Through Bureaucracy...



More than half a million residential solar systems were installed in the United States in 2021, representing a **30% year-over-year uptick in installed solar capacity**.

Since its launch in May 2021, SolarAPP+ **saved more than 3,000 hours of staff time** while resulting in projects that are more likely to pass inspections and are completed on shorter timelines.  
(Source: SEIA, Jul 18 2022)

To date, SolarAPP+ has **processed over 7,600 residential solar permits across 13 jurisdictions**, with more than 400 other jurisdictions interested in the tool.

# Common Tools - Pilot analysis results from 5 AHJs...

## 2,000+ STAFF HOURS SAVED

Pilot analysis results from 5 AHJs show that SolarAPP+ saved AHJs over 2,000 staff hours on permit and revision review, compared to less than 400 hours spent for SolarAPP+ implementation.

## AVERAGE PERMIT REVIEW TIME REDUCED TO <1 DAY

By providing instantaneous review, the SolarAPP+ reduced the average permit review time to less than 1 day across all five AHJs.



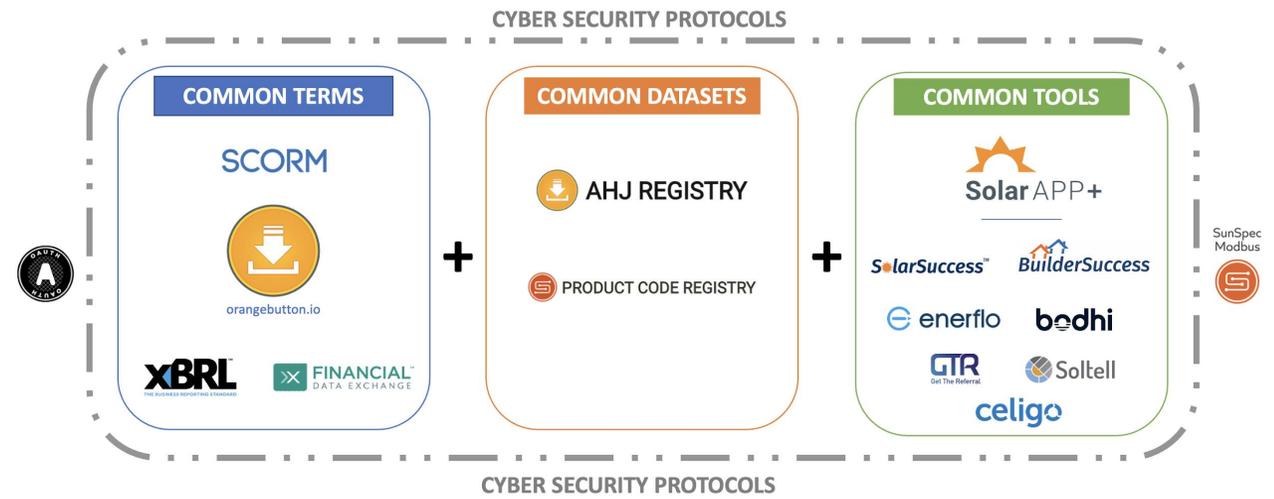
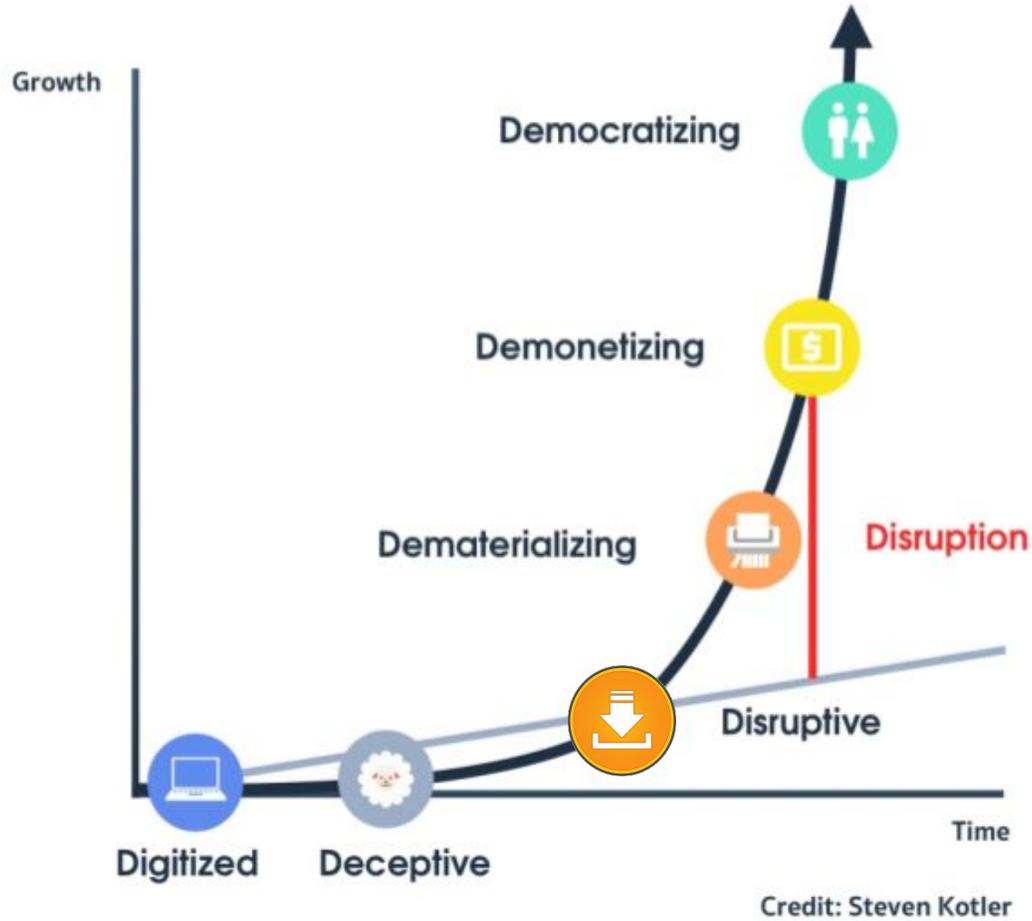
## NO DROP IN INSPECTION PASSAGE RATES

Inspection passage rates for SolarAPP+ projects are comparable to traditionally permitted projects, with nominal impacts on inspection duration.

## AVERAGE 12 DAYS FASTER INSTALL & INSPECTION

Projects submitted through SolarAPP+ were installed and inspected on average 12 days faster than projects using the traditional process.

# The digital disruption is happening...



# Extending the Energy Information Infrastructure to the broader Construction Industry...



# Why this is important today...

- The need for new homes in the US is surging at an exponential YOY growth rate



Federal legislative & administrative actions are addressing America's housing supply shortfall in 5 years, starting with the **creation and preservation of hundreds of thousands of affordable housing units in the next three years\***

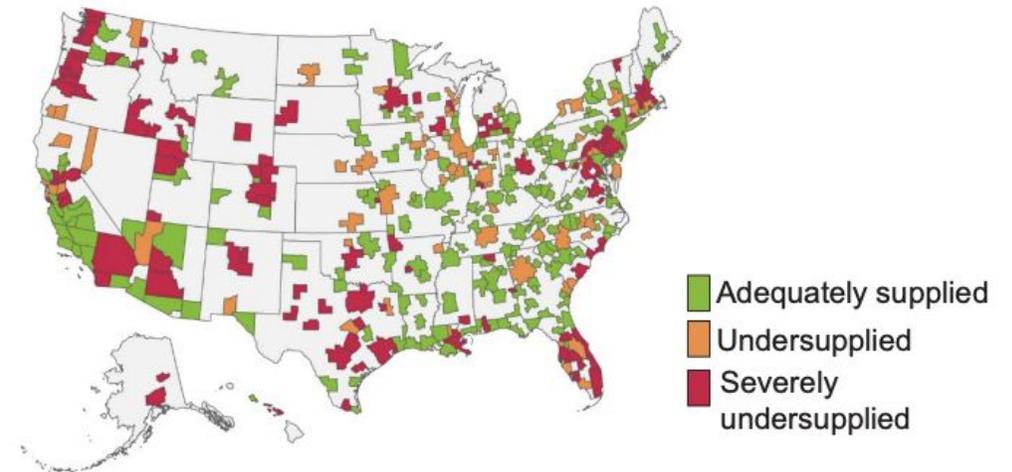
- The market size of the Home Builders industry in the US (\$129.3bn in 2022) has **grown 4.4% per year** on average between 2017 and 2022\*\*



**Legacy systems, data silos, and disconnected processes are driving up costs, increasing project-to-cash timelines, and impacting efficiencies of scale**

- Skilled labour shortages and supply chain disruptions are adding to the woes

## Housing demand in the US:



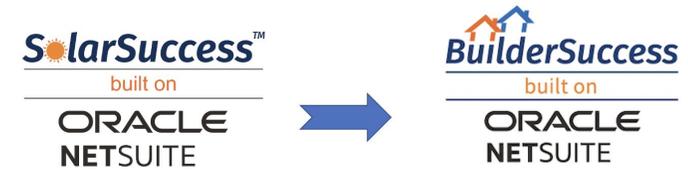
Sources: Census Bureau, Moody's Analytics

Sources: \*<https://www.whitehouse.gov/briefing-room/statements-releases/2022/05/16/president-biden-announces-new-actions-to-ease-the-burden-of-housing-costs/>  
\*\*<https://www.ibisworld.com/industry-statistics/market-size/home-builders-united-states/>

# Blu Banyan is leading the digital transformation drive in the Solar & Construction industries...



- We built **SolarSuccess™** - the **award-winning Business Management Software** for residential, commercial, utility-scale solar installers, and developers.
- Clients gained **50% higher operational efficiency** with single source data from project management & accounting.
- 50+ companies, including the Top 3 Residential Solar Contractors in the US use **SolarSuccess, accounting for 33% of the residential solar installed capacity in 2021.**

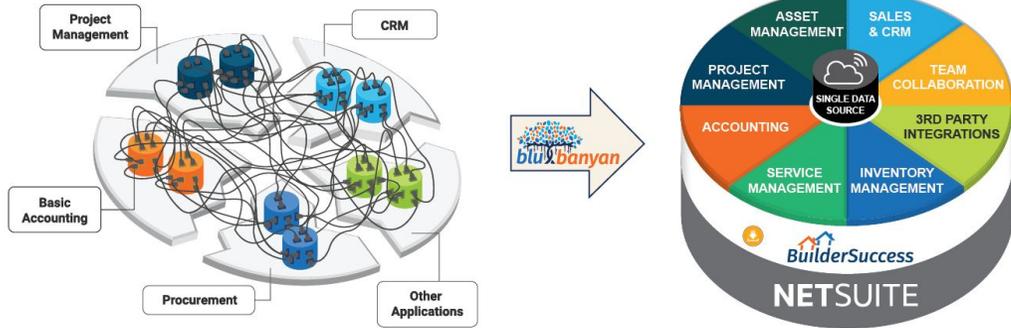


# Digital Transformation

Deploy more projects faster, and more profitably.



# IMPACT

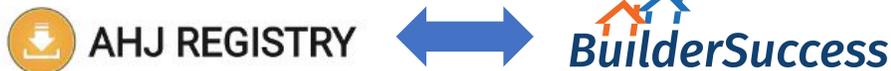


**1. HIGHER PRODUCTIVITY**  
Data accuracy through standard formats and seamless integration will lead to higher productivity

**2. MORE BANDWIDTH**  
Data clarity translates directly to business process scalability creating more bandwidth to take on more projects

**3. MORE FINANCING**  
Increases access to capital by enabling automated risk assessment

**4. HIGHER PROFITS**  
Lower soft costs will deliver higher profits per business.



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<b>Financiers</b> Goodleap Dividend	<b>Payments</b> Payscale eBizCharge	<b>Site Surveys</b> Eagleview	<b>HOA/Property</b> bluProperty <b>Weather</b> AccuWeather
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# Thank You

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Founder & CEO



[blubanyan.com](http://blubanyan.com)