

March 18, 2021

# IIoT World's Manufacturing Day

The largest Industrial IoT virtual event in the world



Send your questions using:  
**#IIoTWorldDay #IIoTWorldDays**

## Augmented Reality and 3D Visualization Use Cases in Manufacturing

2:00 PM – 2:45 PM ET



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The Augmented Reality  
for Enterprise (AREA)



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Vertex



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IIoT World



# Introduction to the AR for Enterprise Alliance

March 18, 2021

# The Enterprise AR Ecosystem

## Enterprises

Primarily in risk-averse industries with high numbers of employees designing, producing and servicing complex physical goods, in situations that require dexterity and decision-making

## Providers

Developing and offering AR-enabled services, software and hardware products/technology for enterprise use cases



Becoming aware of the benefits of AR through research, piloting or implementing projects

## Non-commercial

Universities, public research institutes and agencies who conduct research, develop policies and push the boundaries of enterprise AR technology



# Supports Growth of the Enterprise AR Ecosystem



## Thought Leadership

The AREA creates, collects and curates neutral, up to date enterprise AR content, created by thought leaders and experts



## Networking & Marketplace

The AREA facilitates an environment for the AR community to connect, sharing experiences, partnerships and insights related to AR adoption



## Educate

The AREA supports programs that will close the AR skills gap by promoting continuing education and job openings



## Reducing Barriers to adoption

The AREA Research, Security, Requirements, Safety Committees and Measuring Impacts of AR working group focus on barriers to adoption



# Key Questions to Consider for AR in Manufacturing | AREA



## Important Trends

Certain Industries and geographies have adopted - or are exploring AR - most actively as part of their operations.



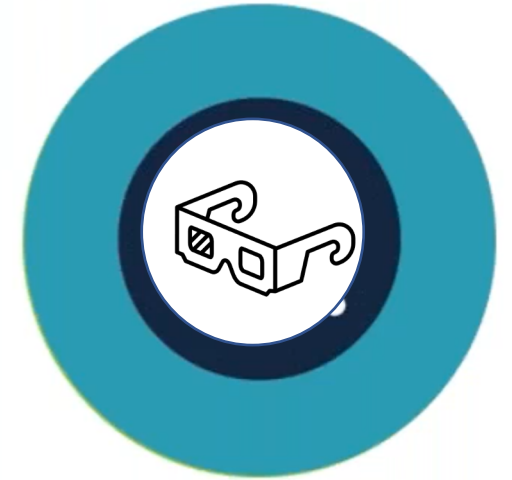
## Why These and When?

Why are those industries or geographies more likely to implement AR and when do we expect significant increases in this market?



## Which Business Models?

What business models are most likely to be successful (who will provide what and who will pay in what increments) when introducing AR-assisted manufacturing?



## Adoption Challenges

What are the principal barriers to Augmented Reality adoption in advanced manufacturing?

# What does this data tell you?

	A	B	C
1	Entity	Day	daily_vaccinations
2	Alabama	2021-01-13	5906
3	Alabama	2021-01-14	7083
4	Alabama	2021-01-15	7478
5	Alabama	2021-01-16	7498
6	Alabama	2021-01-17	7509
7	Alabama	2021-01-18	7517
8	Alabama	2021-01-19	7523
9	Alabama	2021-01-20	7880
10	Alabama	2021-01-21	10517
11	Alabama	2021-01-22	14107
12	Alabama	2021-01-23	16202
13	Alabama	2021-01-24	18294
14	Alabama	2021-01-25	18196
15	Alabama	2021-01-26	17738
16	Alabama	2021-01-27	18178
17	Alabama	2021-01-28	16153
18	Alabama	2021-01-29	14514
19	Alabama	2021-01-30	17271
20	Alabama	2021-01-31	15748
21	Alabama	2021-02-01	15381
22	Alabama	2021-02-02	16703
23	Alabama	2021-02-03	17414
24	Alabama	2021-02-04	18491
25	Alabama	2021-02-05	18526
26	Alabama	2021-02-06	16105
27	Alabama	2021-02-07	15480
28	Alabama	2021-02-08	15622
29	Alabama	2021-02-09	17012
30	Alabama	2021-02-10	18209
31	Alabama	2021-02-11	19258
32	Alabama	2021-02-12	20074

	A	B
1	Entity	SUM of daily_vaccinations
2	Alabama	1,180,845
3	Alaska	294,863
4	American Samoa	22,782
5	Arizona	2,330,100
6	Arkansas	900,044
7	Bureau of Prisons	65,131
8	California	10,960,243
9	Colorado	1,624,251
10	Connecticut	1,228,788
11	Delaware	286,379
12	Dept of Defense	1,305,311
13	District of Columbia	231,015
14	Federated States of Micronesia	18,993
15	Florida	6,186,660
16	Georgia	2,493,253
17	Guam	59,499
18	Hawaii	483,011
19	Idaho	497,830
20	Illinois	3,682,929
21	Indian Health Svc	665,535
22	Indiana	1,907,003
23	Iowa	974,935
24	Kansas	773,925
25	Kentucky	1,317,503
26	Long Term Care	6,947,587
27	Louisiana	1,295,547
28	Maine	424,517
29	Marshall Islands	14,988
30	Maryland	1,775,091
31	Massachusetts	2,285,914
32	Michigan	2,910,709
33	Minnesota	1,757,957



# How about now?

## US: Daily COVID-19 vaccine doses administered

Shown is the rolling 7-day average. This is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).



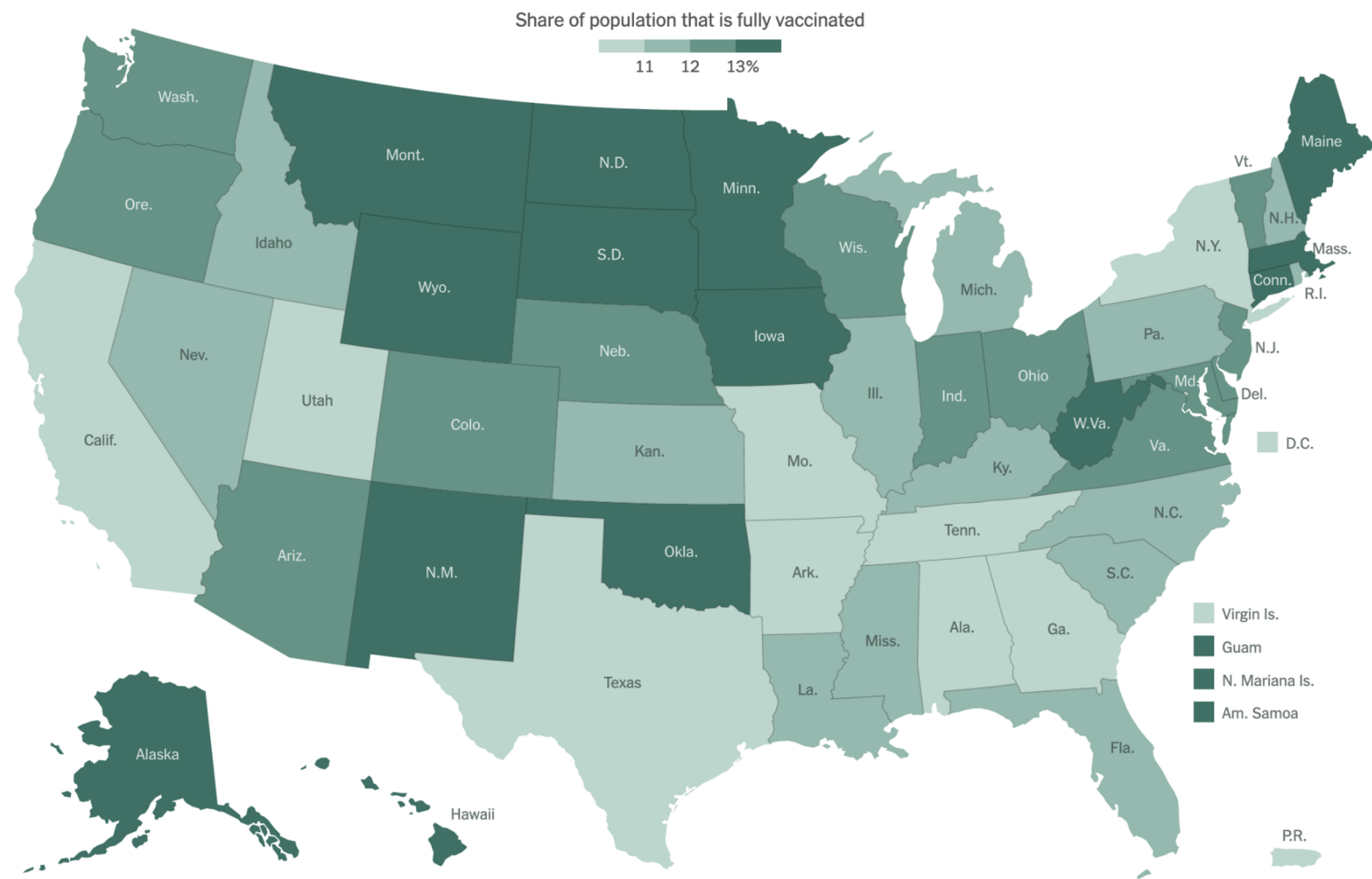
Source: Centers for Disease Control and Prevention – Last updated March 15, 14:50 (Eastern Time)

OurWorldInData.org/us-states-vaccinations • CC BY





# How about now?



Source: Centers for Disease Control and Prevention

# What does this data tell you?

	A	B	C	D	E	F	G
1	timestamp	wind_speed_mps	wind_speed_mph	generate_power?	power_output_kw	low_speed_rpm	high_speed_rpm (4
2	3/16/2021 10:59:04	2.41	5.39	FALSE	0.00	6.90	276.17
3	3/16/2021 11:00:04	2.73	6.11	FALSE	0.00	7.82	312.83
4	3/16/2021 11:01:04	2.07	4.63	FALSE	0.00	5.93	237.20
5	3/16/2021 11:02:04	2.56	5.73	FALSE	0.00	7.33	293.35
6	3/16/2021 11:03:04	2.20	4.92	FALSE	0.00	6.30	252.10
7	3/16/2021 11:04:04	2.82	6.31	FALSE	0.00	8.08	323.15
8	3/16/2021 11:05:04	3.21	7.18	FALSE	0.00	9.20	367.84
9	3/16/2021 11:06:04	2.13	4.76	FALSE	0.00	6.10	244.08
10	3/16/2021 11:07:04	2.24	5.01	FALSE	0.00	6.42	256.69
11	3/16/2021 11:08:04	1.62	3.62	FALSE	0.00	4.64	185.64
12	3/16/2021 11:09:04	2.71	6.06	FALSE	0.00	7.76	310.54
13	3/16/2021 11:10:04	3.02	6.76	FALSE	0.00	8.65	346.07
14	3/16/2021 11:11:04	2.54	5.68	FALSE	0.00	7.28	291.06
15	3/16/2021 11:12:04	1.54	3.44	FALSE	0.00	4.41	176.47
16	3/16/2021 11:13:04	3.37	7.54	FALSE	0.00	9.65	386.17
17	3/16/2021 11:14:04	2.23	4.99	FALSE	0.00	6.39	255.54
18	3/16/2021 11:15:04	1.96	4.38	FALSE	0.00	5.61	224.60
19	3/16/2021 11:16:04	1.65	3.69	FALSE	0.00	4.73	189.08
20	3/16/2021 11:17:04	2.08	4.65	FALSE	0.00	5.96	238.35
21	3/16/2021 11:18:04	1.83	4.09	FALSE	0.00	5.24	209.70
22	3/16/2021 11:19:04	3.42	7.65	FALSE	0.00	9.80	391.90
23	3/16/2021 11:20:04	3.30	7.38	FALSE	0.00	9.45	378.15
24	3/16/2021 11:21:04	2.02	4.52	FALSE	0.00	5.79	231.47
25	3/16/2021 11:22:04	2.23	4.99	FALSE	0.00	6.40	255.80
26	3/16/2021 11:23:04	2.63	5.89	FALSE	0.00	7.54	301.47
27	3/16/2021 11:24:04	2.78	6.22	FALSE	0.00	7.96	318.60
28	3/16/2021 11:25:04	3.21	7.18	FALSE	0.00	9.20	367.89
29	3/16/2021 11:26:04	3.27	7.31	FALSE	0.00	9.36	374.58
30	3/16/2021 11:27:04	3.75	8.38	TRUE	15.86	10.73	429.29
31	3/16/2021 11:28:04	4.13	9.23	TRUE	21.21	11.83	473.03



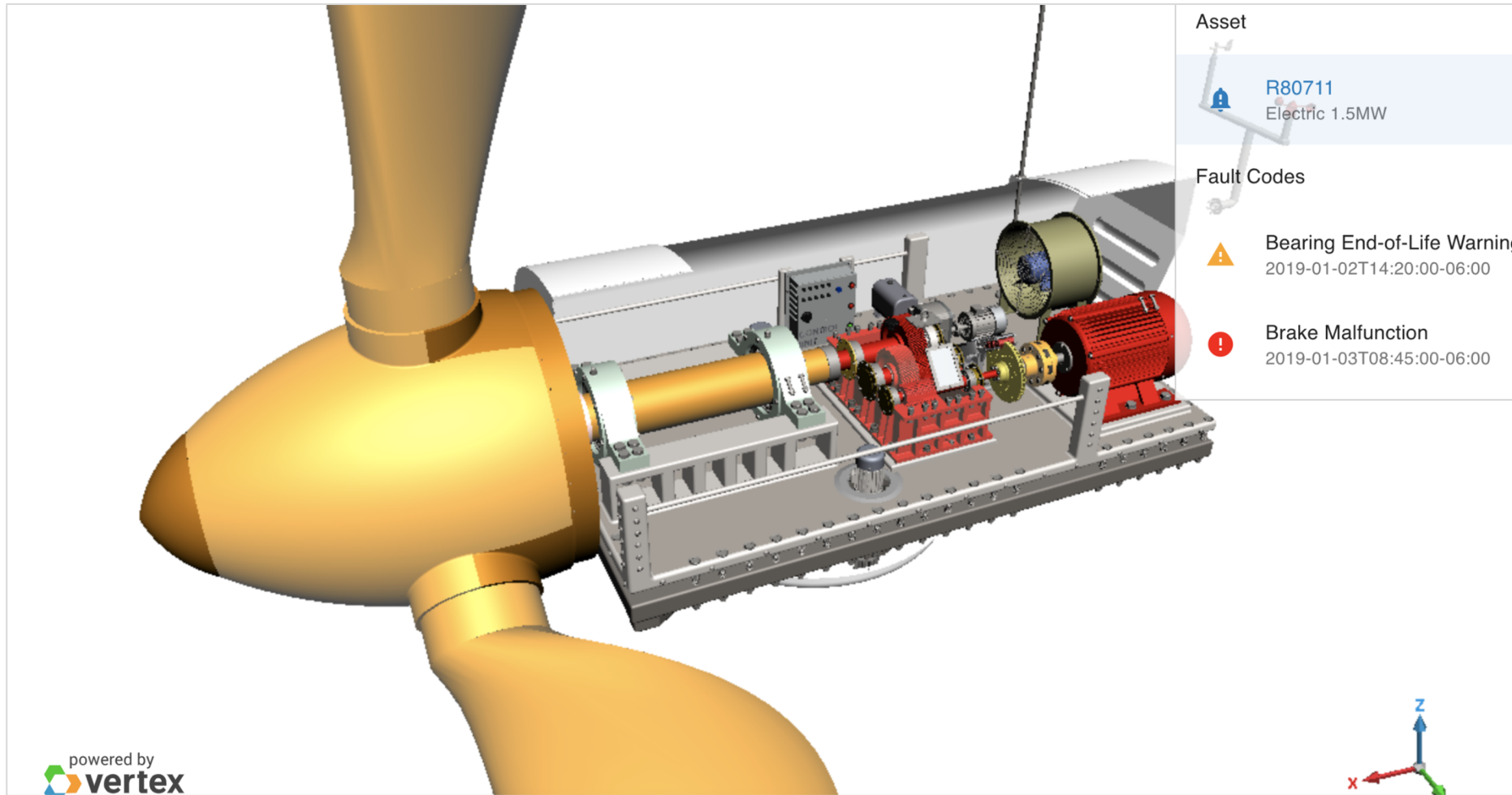
# How about now?

wind\_speed\_mps, wind\_speed\_mph, low\_speed\_rpm and high\_speed\_rpm (40:1)





# How about now?



# Vertex Platform

## 3D VISUALIZATION PLATFORM FOR DIGITAL TWINS

Ultra-low cost **CPU-based** rendering

**High-speed** native multi-CAD import

**Device independent** image streaming

Highly secure cloud-first architecture

Easy to create and deploy 3D-powered applications

