AWS
re:Invent

AIM367-S

Data is out, knowing is in: Applying AI to automate cloud operations

Dave Anderson
SVP, Marketing
Dynatrace

Andreas Grabner
DevOps Activist
Dynatrace

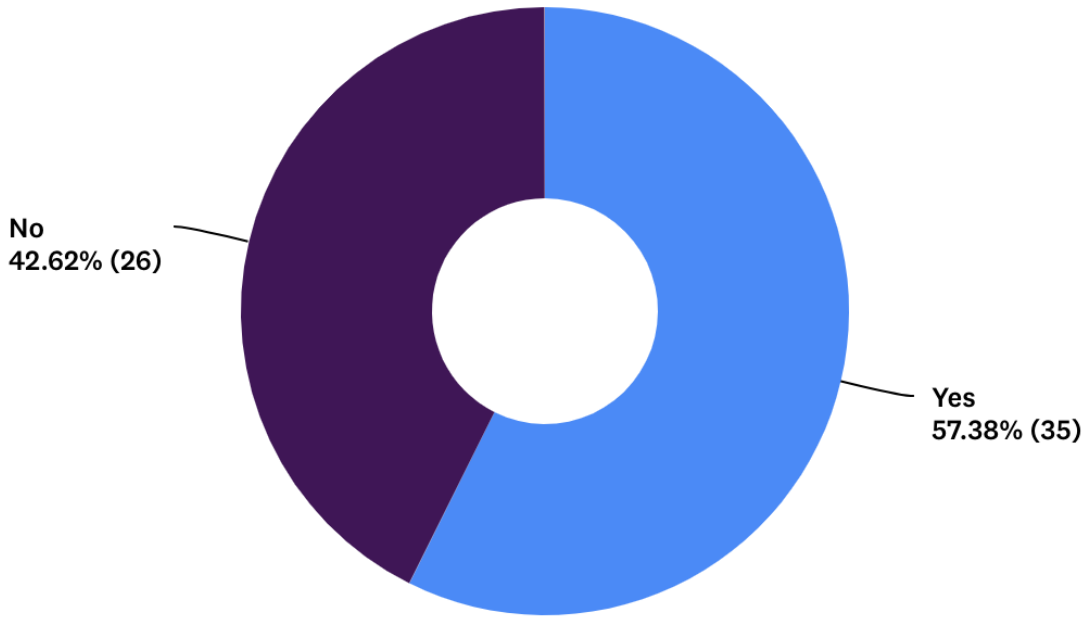
© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

$n(B \cup C) = n(B) + n(C) - n(B \cap C)$
$f(x) \leq 5$
$x^2 - 4x + 5 \leq 5$
$x^2 - 4x \leq 0$
$[f(x) \pm g(x)] = \ell \pm m$
$[f(x) \cdot g(x)] = \ell \cdot m$
$\frac{1}{f(x)} = \frac{1}{\ell}$
$\sqrt[n]{q^m} = a^{\frac{m}{n}}$
$\sqrt[3]{a\sqrt[3]{a}} = \sqrt[3]{a \cdot a^{\frac{1}{3}}}$
$= \sqrt{a^{\frac{3}{3}} \cdot a^{\frac{1}{3}}}$
$= \sqrt{5 + \sqrt{4 \cdot 6}}$
$z_1 = a \begin{vmatrix} D_1 & B_1 \\ D_2 & B_2 \end{vmatrix} - b \begin{vmatrix} D_1 & A_1 \\ D_2 & A_2 \end{vmatrix}$
$a^2 + b^2 + c^2$
$\frac{g_1}{g_2} = \left(\frac{R_2}{R_1}\right)^2 = \left(\frac{R_1 + h}{R}\right)$
$E = mc^2$
$\frac{1+3+3+6+8+9}{6} = 5$
$2+4+4+8+12 = 30$
$126 = 6xy$
$2x + 2y = 20$
$a_n = \frac{}{2^{n-1}}$
$= \frac{1}{2^9} = \frac{1}{512}$
$A = \pi r^2 h$
$\cos(B) = \frac{y}{x}$
$\sin B = 4\sqrt{3}$
20
6
x
y

Fear or embrace AI?

Were you sceptical about an AI engine's ability to transform or help improve your IT/Cloud operations?

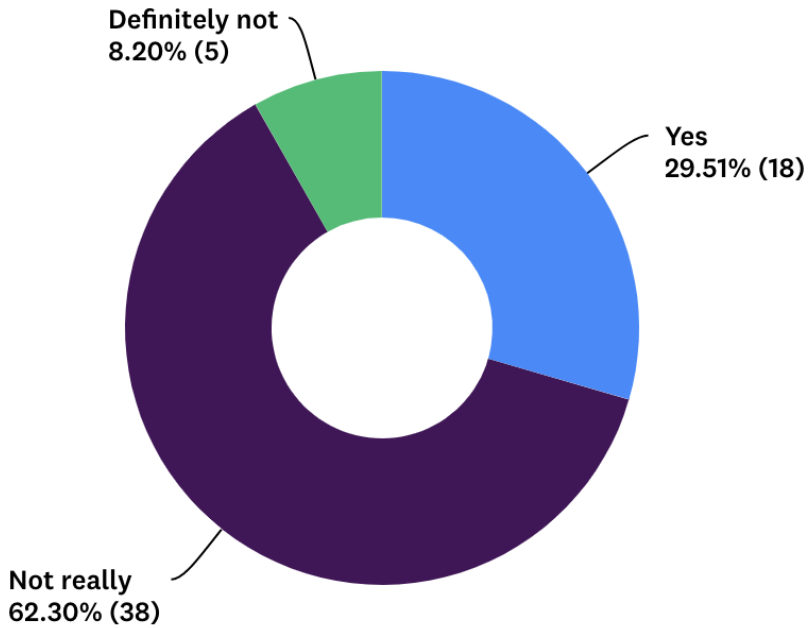
Answered: 61 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	57.38%	35
No	42.62%	26
TOTAL		61

Did you believe it was possible to instantly pinpoint the precise root cause of a problem before using Davis?

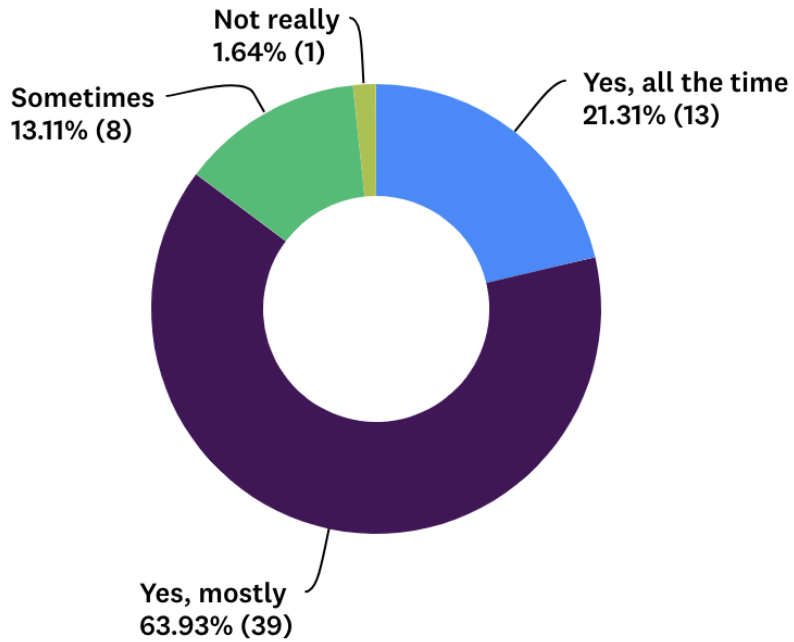
Answered: 61 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	29.51%	18
Not really	62.30%	38
Definitely not	8.20%	5
TOTAL		**61**

Do you trust the answers that Davis provides?

Answered: 61 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes, all the time	21.31%	13
Yes, mostly	63.93%	39
Sometimes	13.11%	8
Not really	1.64%	1
TOTAL		61

So let’s recap

- We are skeptical of AI engines being able to help IT/cloud operations
- Specifically, we don’t believe it’s possible to be able to find the precise root cause of issues
- Those that tried it, then did trust the answers

Whether you believe it or not

You have no choice but to change.

WORLD ECONOMIC FORUM

We are going into the fourth industrial revolution and facing “transformation” unlike anything humankind has experienced before.

Klaus Schwab
Head of World Economic Forum

Pressure

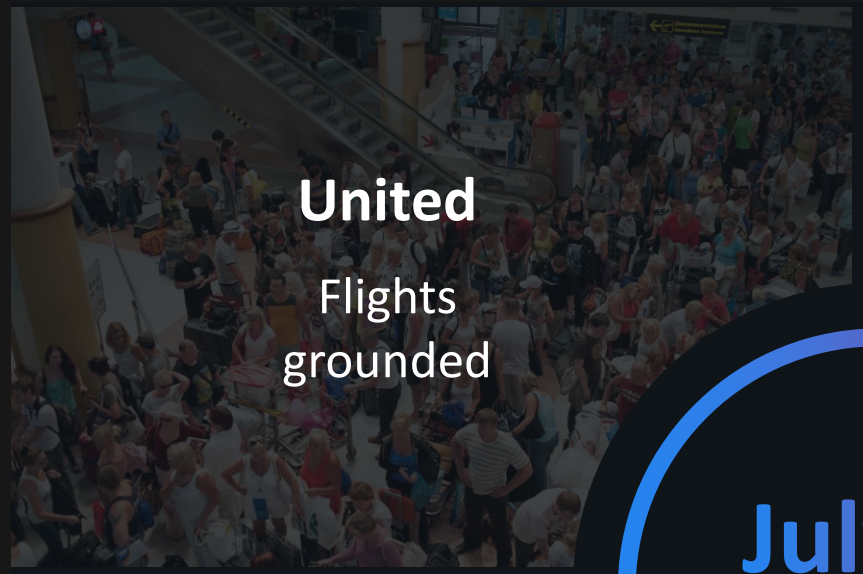
Stakes are high

You have one of the hardest jobs in the world

Unchartered waters

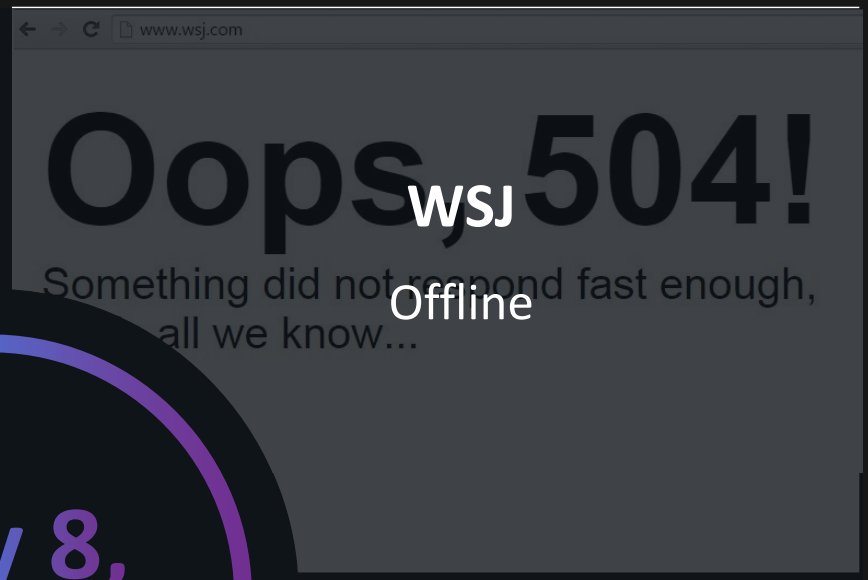
Complexity

The world needs software to work perfectly



United

Flights grounded



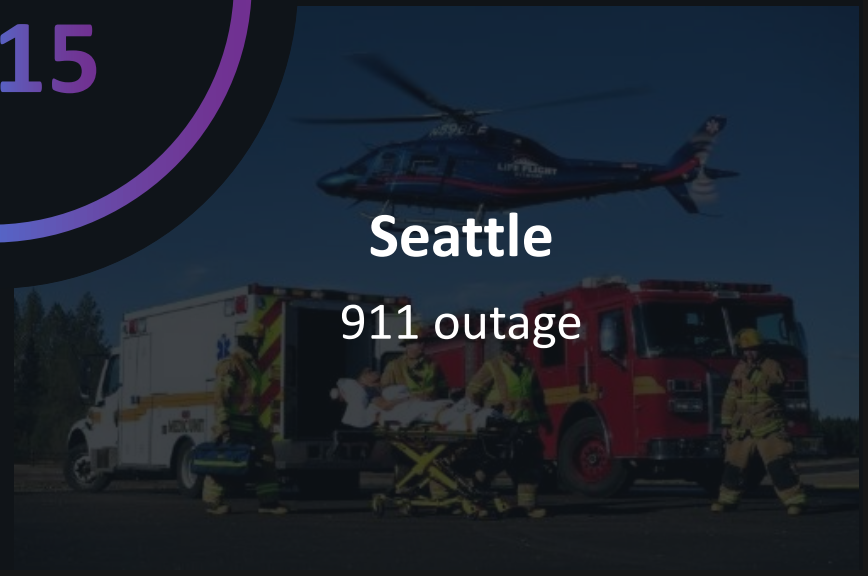
WSJ

Offline

July 8, 2015

NY Stock Exchange

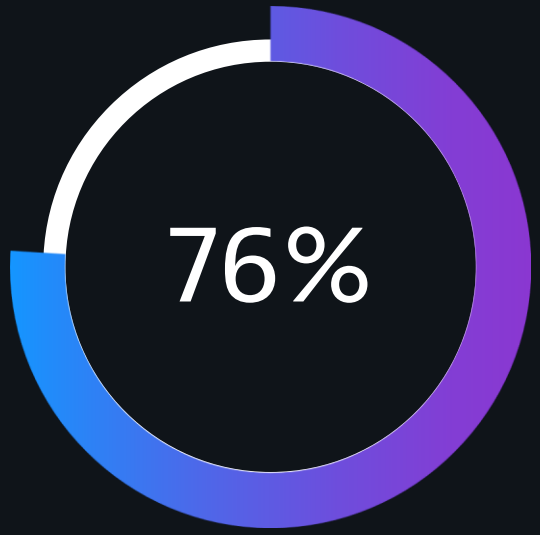
Closed



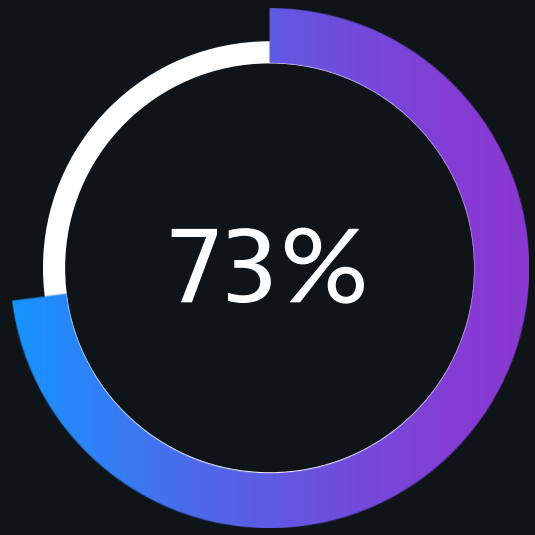
Seattle

911 outage

Running this software is harder than ever

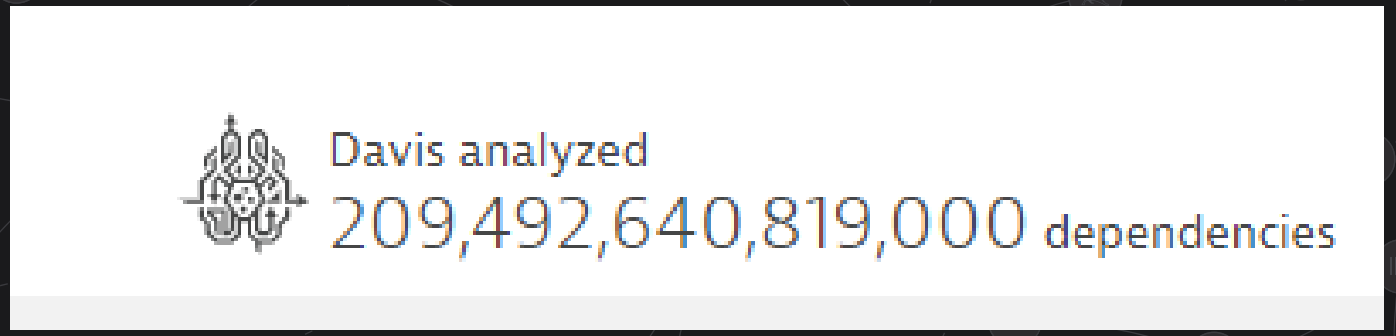


of CIOs say that
complexity will make it impossible
to manage performance



of CIOs say that
complexity will make managing user
experience almost impossible

One customer environment…



Beyond human capability

“I love war rooms”

Said nobody ever

“I like guessing, knowing is boring”

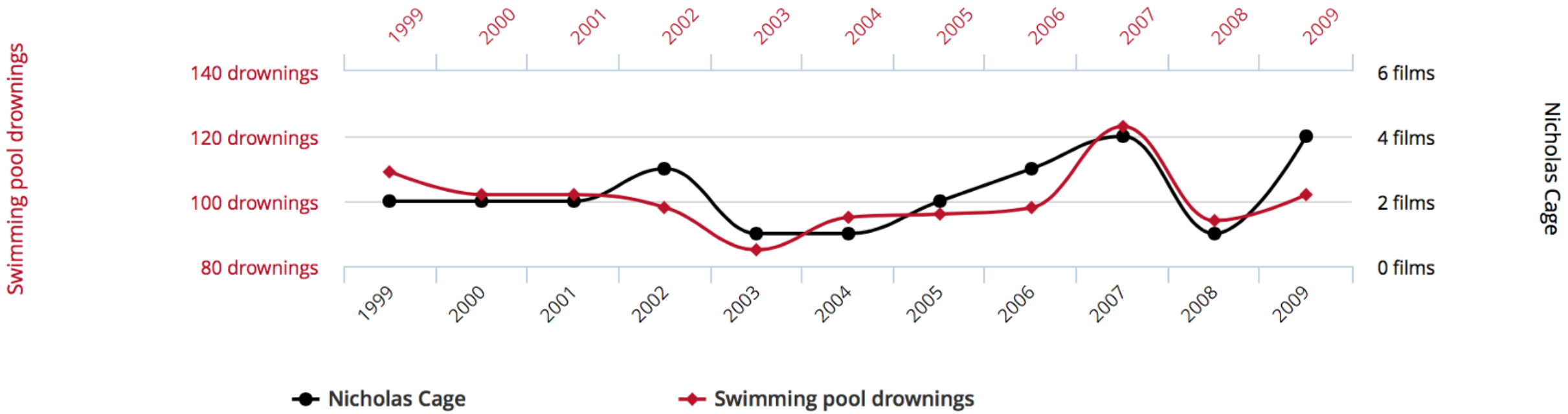
Said nobody ever

Number of people who drowned by falling into a pool

correlates with

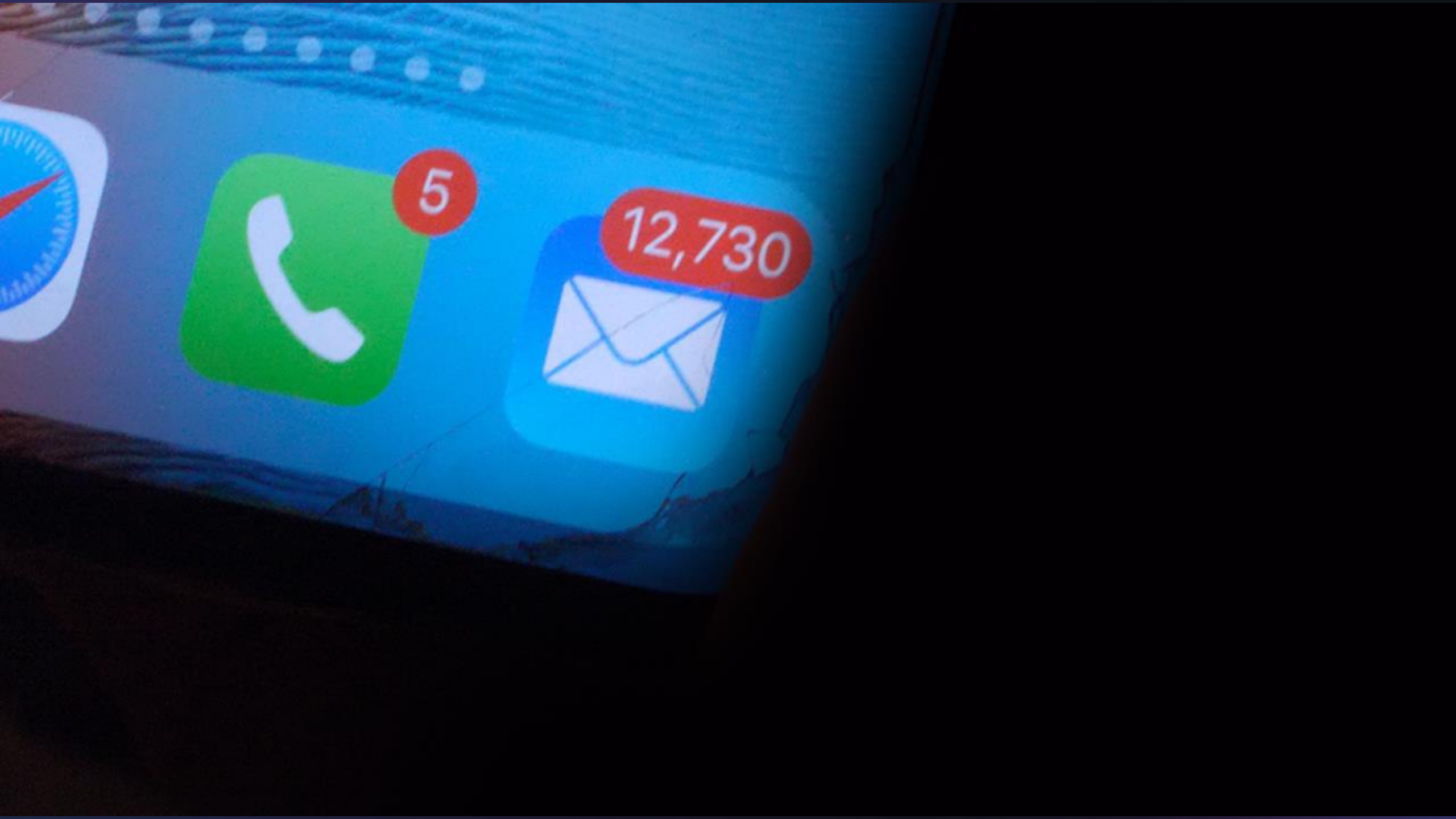
Films Nicolas Cage appeared in

Correlation: 66.6% (r=0.666004)



tylervigen.com

ata sources: Centers for Disease Control & Prevention and Internet Movie Database


5
12,730

Assisted

~~Artificial~~ Intelligence

The Promise of AI

Enable autonomous operations, boost innovation, and offer new modes of customer engagement by *automating everything*.

AIOps

Replace a storm of noisy anomaly alerts with accurate and reliable root cause analysis.

Intelligent DevOps

Increase the speed of innovation and software quality through intelligent performance and regression testing.

Auto-remediation

Automate anomaly remediation and performance optimization based on system health and real user demands.

Smart customer engagement

Use business intelligence data to improve customer experience, including automatic remediation of breakdowns and complaints.

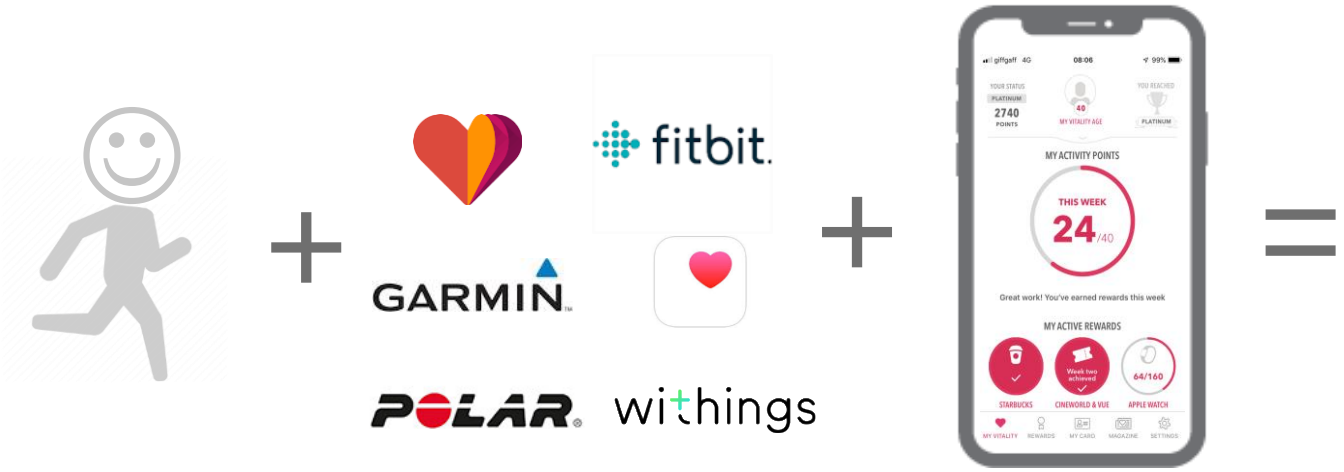
1,000 hours to 50 hours per release.

Release downtime reduced from 32 hours p.a. to 0 p.a.

Zero major incidents relating to change.

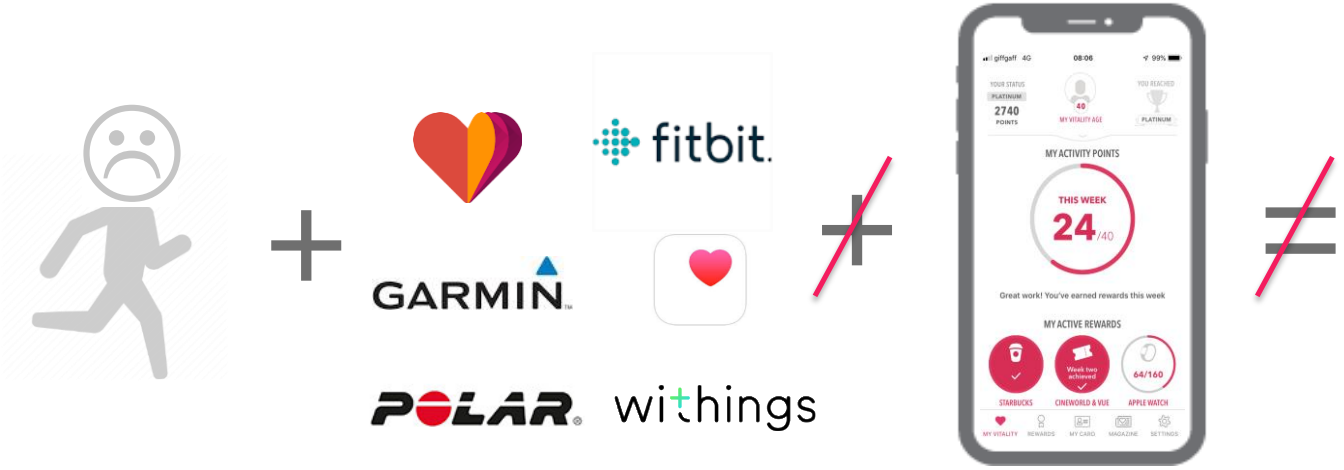
If we spend less time troubleshooting, we can **spend more time using our grey matter**

Vitality rewards



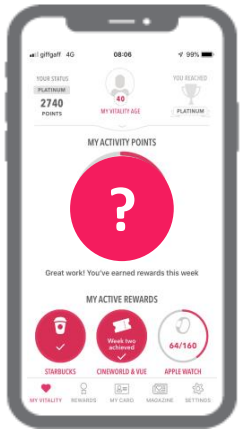
WATCH
prime
parkrun
cineworld
VUE
Vitality Kids
INSPIRED BY Disney
weight watchers
BRITISH AIRWAYS
CHAMPNEYS
THE HEALTH SPA
HEADSPACE
GARMIN
Virgin active
ocado
unicef
David Lloyd
CLUBS

Our reward program



The technology behind proactive servicing

User experience data



dynatrace

15-second delay

Raw data connected with ML platform

APACHE nifi

aws

Apply predictive model
A couple of seconds

Predictive model

python

Dynatrace_access_v1.ipynb

```
[1]: import pyodbc
     import pandas as pd

[3]: "DRIVER={ODBC Driver 17 for SQL Server};SERVER=rdsdatasciencetrainingmssql.cfng8enpkk9j.eu-west-1.rds.amazonaws.com;DATABASE=ds_p

[5]: sql = 'select top(1000) * from [ds_platform].[dbo].[dynatrace_usersession]'
     df = pd.read_sql(sql, conn)

[15]: df.head()
```

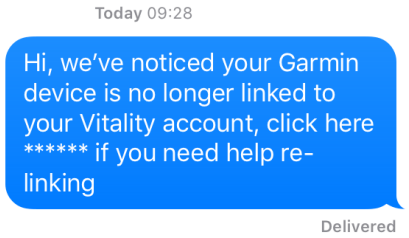
[15]:

	tenantid	usersessionid	starttime	endtime	duration	internaluserid
0	None	CMJHUPKNBQJJDIICCIKGBOTCPKGJJOKL	1557837850253	1557838117809	267556	15574924558971DETP0H71G4GA4FJ7B7LV96M3O97V23K
1	None	HNNHSHANBOAFACCLGACPJMJOBFCMNEOB	1557837484386	1557838076805	592419	15553259470728?BIVAVHIMV3J5HOCJE7VF13GHHHMN4O
2	None	HNNHSHANBOAFACCLGACPJMJOBFCMNEOB	1557837484386	1557838076805	592419	15553259470728?BIVAVHIMV3J5HOCJE7VF13GHHHMN4O
3	None	FJJPLFIAPBKEFBMEHAPLPPONICNEIGOH	1557836623717	1557838072687	1448970	15578366237078B0N3UQVIE5U3ELIOSACLVR9F5A9P6GC5
4	None	EABOTDOPMOHCCKAFDMONLOPLCHCBAAUI	1557837945505	1557838060659	115154	15578379472147LGJ9VOPMJTES2UNOLK5SLHIR1T7J0L5

5 rows × 76 columns

The technology behind proactive servicing

Push notification and/or text



Entity number	1227175674
Action	Touch on CINEMA REWARDS
User experience category	FRUSTRATED
Profit rank	Green
Lapse probability	23%
Model recommended action	Send email communication

“Dynatrace’s deterministic AI allows us to be confident in its answers and automate remediation without human interaction, paving the way for autonomous cloud operations.”

Jonathan Hayes, VP IT Service Excellence

experian™

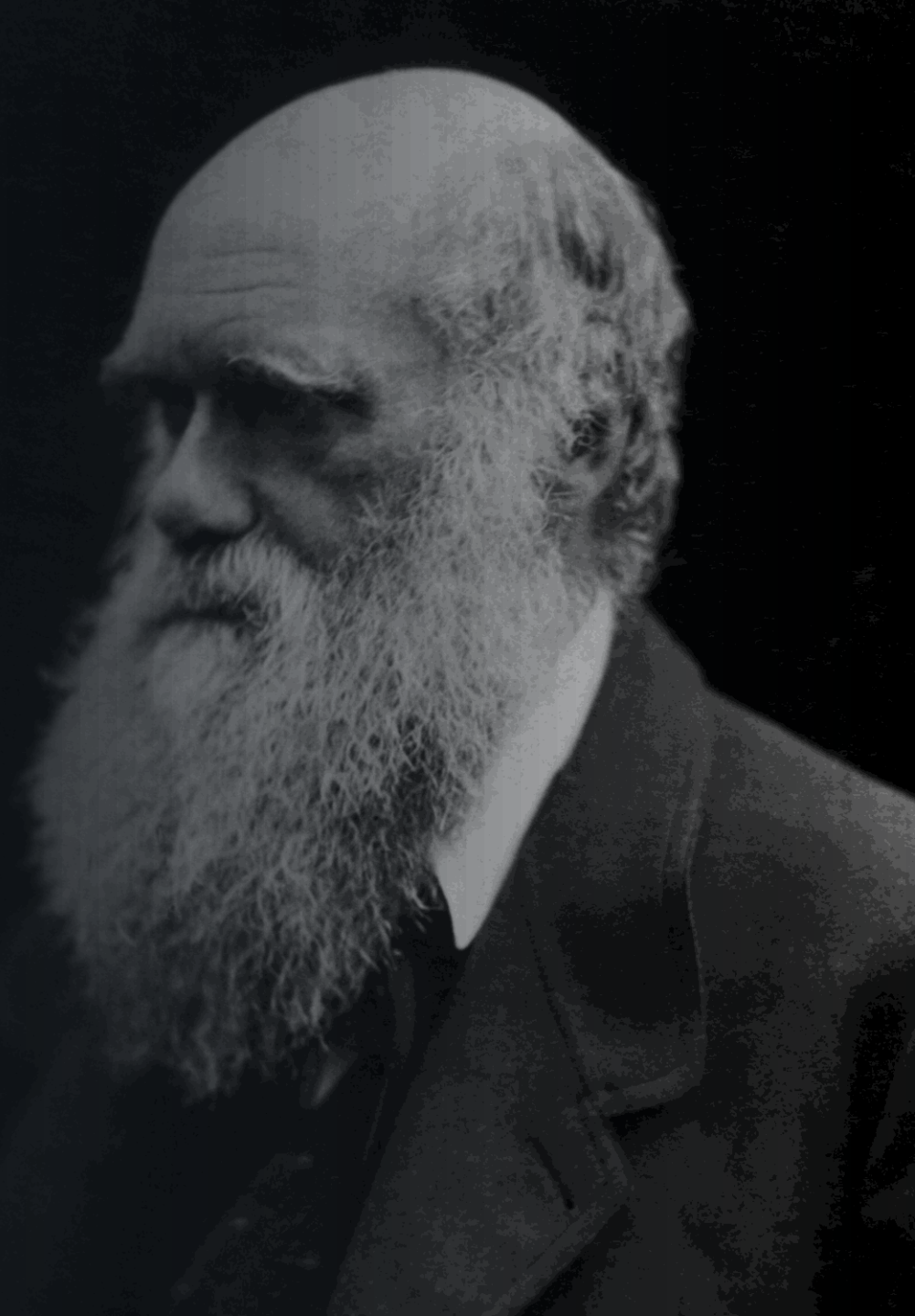
It’s personal

“Dynatrace helps me, and my team, sleep at night. When everyone is struggling to do more with less, Dynatrace picks up the slack, and enables my team to have a better work/life balance.”

barbri

“It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change.”

Charles Darwin, 1809



Demo

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

User Q&A

Sanjay Sankolli
VP, Cloud Center of Excellence
Western Union

AWS re:Invent

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

aws

Thank you!

AWS re:Invent

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

aws

Please complete the session survey in the mobile app.

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.