

Generative DevOps

How the Rise of 10x Operators Threatens the Cloud Providers



Can AI driven access to expertise overcome cloud provider moats?

Rob Hirschfeld, CEO of RackN

 @RobHirschfeld

 @Zehicle



The rise of 10x Operators?

Who is RackN?

Infrastructure as Code Automation Software
DevOps Scaffolding (aka Digital Rebar)

We empower operators



What's holding operators back?

SURPLUS OF

- Equipment types
- Equipment vendors
- Documentation
- Tooling silos
- Architecture



Photo by [Riccardo Pitzalis](#)

What's holding operators back?



Photo by [Wendy Wei](#)

LACK OF

- **Reusability**
- **Validation & Linting**
- **Backwards compatibility**
- **Resilience**
- **Shared state**



Sure, here's an example Ansible playbook that installs containerd as the container runtime on an Amazon Linux instance:



yml

Copy code

```
---
- name: Install containerd
  hosts: all
  become: true
  tasks:
    - name: Install required packages
      yum:
        name: "[{ item }]"
        state: present
      loop:
        - yum-utils
        - device-mapper-persistent-data
        - lvm2

    - name: Add Docker CE repository
      yum_repository:
```

Can ChatGPT generate DevOps scripts?

Yes, and...



Expected :

Writes scripts

Prompt to improve

Easy Refactoring



If you already know DevOps, it enhances your productivity

Yes, and...



Expected :

Writes scripts
Prompt to improve
Easy Refactoring

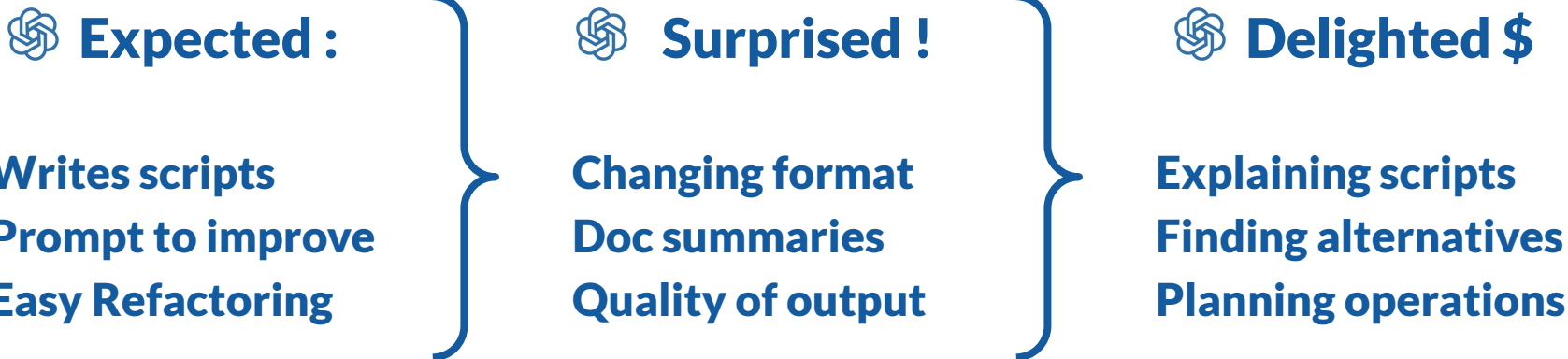


Surprised !

Changing format
Doc summaries
Quality of output

**If you already know DevOps,
it enhances your productivity**

Yes, and...



**If you already know DevOps,
it enhances your productivity**

Replatforming is powerful



Terraform X

```
terraform
Copy code

# Sure, here's an updated version of the Terraform configuration file that uses the same
# 'aws_instance' resource for both worker nodes:

# Define provider (e.g. AWS)
provider "aws" {
  region = "us-west-2"
}

# Define variables
variable "ami_id" {
  description = "ID of the AMI to use for the instances"
  default = "ami-0c55b199c9fafe10"
}

variable "instance_type" {
  description = "Type of EC2 instance to launch"
  default = "t2.micro"
}

variable "key_name" {
  description = "Name of the key pair to use for SSH access"
  default = "my-key-pair"
}
```



into CLI & Bash

```
bash
Copy code

# Sure, here's an updated set of AWS CLI commands that create a three node cluster with one
# main and two worker machines, and use a larger instance type and an AMI based on
# AlmaLinux 8:

1. Create a VPC with CIDR block '10.0.0.0/16':
$ aws ec2 create-vpc --cidr-block 10.0.0.0/16

2. Tag the VPC with a name:
$ aws ec2 create-tags --resources vpc-xxxxxx --tags Key=Name,Value=my-xxxxxx

3. Create a main subnet with CIDR block '10.0.1.0/24' in the VPC:
$ aws ec2 create-subnet --vpc-id vpc-xxxxxx --cidr-block 10.0.1.0/24

4. Tag the main subnet with a name:
$ aws ec2 create-tags --resources subnet-xxxxxx --tags Key=Name,Value=my-xxxxxx
```



then Templatize

```
bash
Copy code

# Sure, here's an updated version of the script that waits for the instances to reach the
# 'running' state before outputting their IDs to a file:

#!/bin/bash

# Create VPC
VPC_ID=$(aws ec2 create-vpc --cidr-block 10.0.0.0/16 --output text --query VpcId)
aws ec2 create-tags --resources $VPC_ID --tags Key=Name,Value=my-cluster-vpc

# Create subnets
MAIN_SUBNET_ID=$(aws ec2 create-subnet --vpc-id $VPC_ID --cidr-block 10.0.1.0/24)
aws ec2 create-tags --resources $MAIN_SUBNET_ID --tags Key=Name,Value=my-cluster-main-subnet
WORKER_SUBNET_1_ID=$(aws ec2 create-subnet --vpc-id $VPC_ID --cidr-block 10.0.1.0/24)
aws ec2 create-tags --resources $WORKER_SUBNET_1_ID --tags Key=Name,Value=my-cluster-worker-subnet-1
WORKER_SUBNET_2_ID=$(aws ec2 create-subnet --vpc-id $VPC_ID --cidr-block 10.0.1.0/24)
aws ec2 create-tags --resources $WORKER_SUBNET_2_ID --tags Key=Name,Value=my-cluster-worker-subnet-2

# Create security group
SECURITY_GROUP_ID=$(aws ec2 create-security-group --group-name my-cluster-security-group --vpc-id $VPC_ID)
aws ec2 authorize-security-group-ingress --group-id $SECURITY_GROUP_ID --protocol tcp --ports 22 --cidr-block 0.0.0.0/0
aws ec2 authorize-security-group-egress --group-id $SECURITY_GROUP_ID --protocol tcp --ports 80 --cidr-block 0.0.0.0/0

# Launch instances
MAIN_INSTANCE_ID=$(aws ec2 --profile my-profile run-instances --image-id $AMI_ID --instance-type $INSTANCE_TYPE --key-name $KEY_NAME --security-groups $SECURITY_GROUP_ID --subnet-id $MAIN_SUBNET_ID --max-count 1 --min-count 1 --output text --query Instances[0].InstanceId)
WORKER_INSTANCE_ID1=$(aws ec2 --profile my-profile run-instances --image-id $AMI_ID --instance-type $INSTANCE_TYPE --key-name $KEY_NAME --security-groups $SECURITY_GROUP_ID --subnet-id $WORKER_SUBNET_1_ID --max-count 1 --min-count 1 --output text --query Instances[0].InstanceId)
WORKER_INSTANCE_ID2=$(aws ec2 --profile my-profile run-instances --image-id $AMI_ID --instance-type $INSTANCE_TYPE --key-name $KEY_NAME --security-groups $SECURITY_GROUP_ID --subnet-id $WORKER_SUBNET_2_ID --max-count 1 --min-count 1 --output text --query Instances[0].InstanceId)
```

Tool lock-in disappears

Zooming out...

**Not Just Knowledge
This is Expertise**



Photo by [Brady Knoll](#)

Clouds' Operations Excellence Moat

Cloud IaaS is *not* cheaper.

Their pitch is that they do
infrastructure better than you.

Why is that true?



Photo by [Bridgid Johnston](#)

So What is Expertise?

You vs. Cordon Bleu Chef

We have access to the ingredients and tools!

What if the needed expertise was both available *and* contextual?



A woman with dark hair tied back, wearing a green short-sleeved shirt, is smiling and looking down at a young girl. The girl, with her hair in a ponytail and wearing a white shirt with pink overalls, is focused on preparing food. They are in a modern kitchen with white cabinets and a dark countertop. On the counter, there are several bowls of food, including a salad with tomatoes and cucumbers, and some bread. There are also some fruits like avocados and a pink mug. The background shows a window with a view of the outdoors.

Available *and* Contextual

**AI is not just helping
complete tasks**

**It can provide
situational expertise
to improve outcomes**

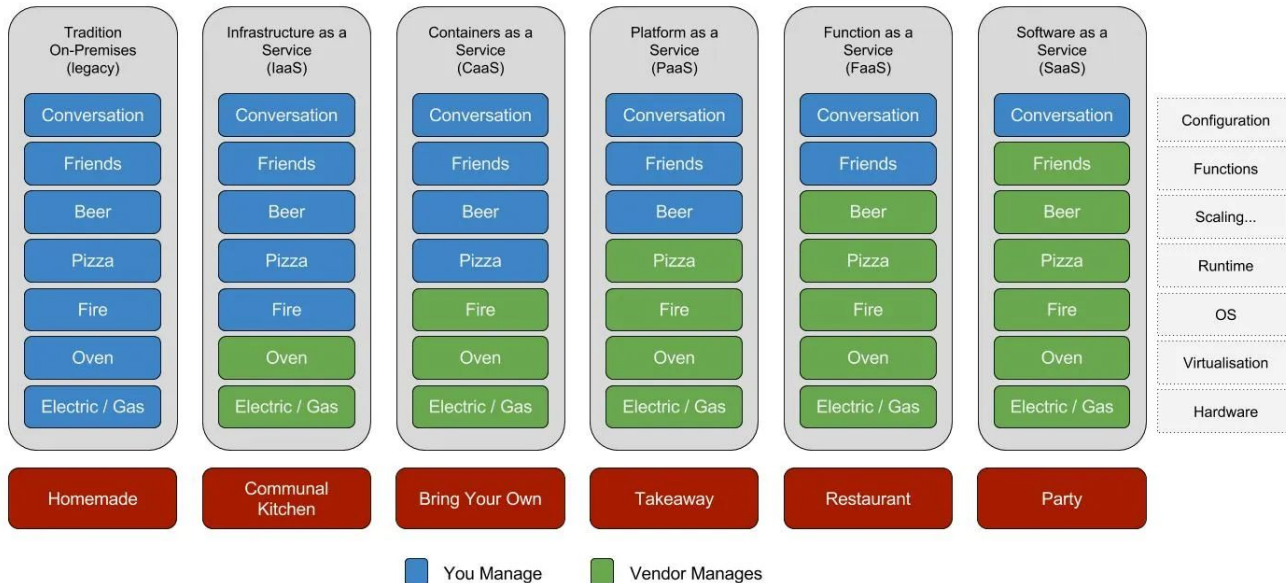
Stacking “aaS” is WRONG

Ops Expertise > Infrastructure \$



Pizza as a Service 2.0

<http://www.paulkerrison.co.uk>



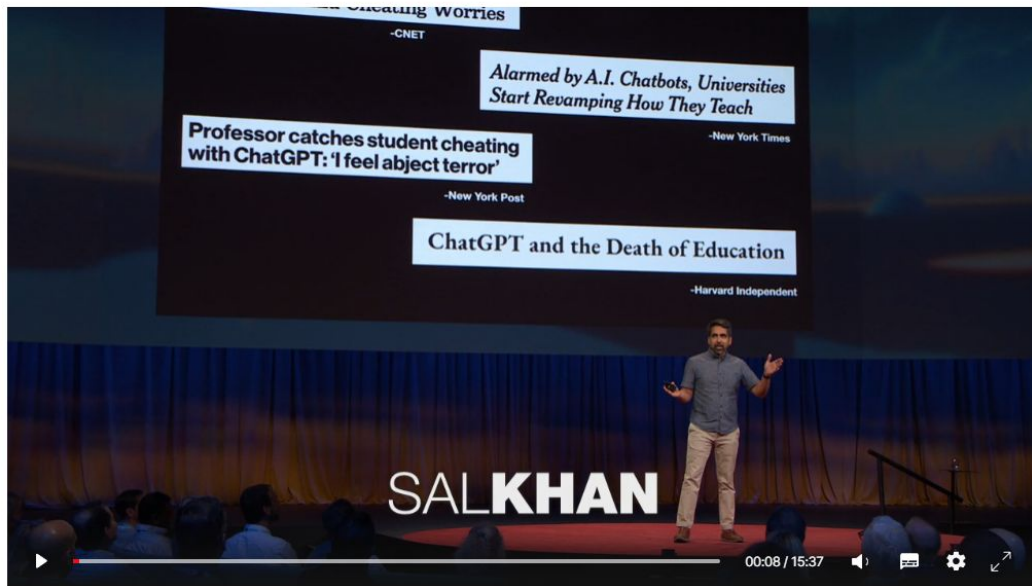
Sal Khan's TED Talk ([link](#))

How AI could save (not destroy) education | TED Talk

TED

Ideas worth spreading

WATCH



How AI could save (not destroy) education

1,269,317 views | Sal Khan • TED2023

Insights

- ① Tools are *not* required to focus on humans
- ② We don't need to read as much documentation (but still need good docs)
- ③ Troubleshooting and logging needs to deliver to AI not humans



Photo by [Ramesh Chaudhary](#)

Challenges

① Knowing what is import

② Prompting skills

③ Building a base level of expertise



Photo by Jocelyn

“Better Stronger Faster”

**THE
SIX MILLION
DOLLAR MAN**



“Better Stronger Faster”

THE

**AI is a significant force multiplier, but
how do we make better operators?**

What can AI help fix?

SURPLUS OF

💖 Documentation

💖 Tooling silos

💪 Equipment types

💪 Equipment vendors

👁 Architecture

LACK OF

💖 Reusability

💖 Validation & Linting

💪 Backwards compatibility

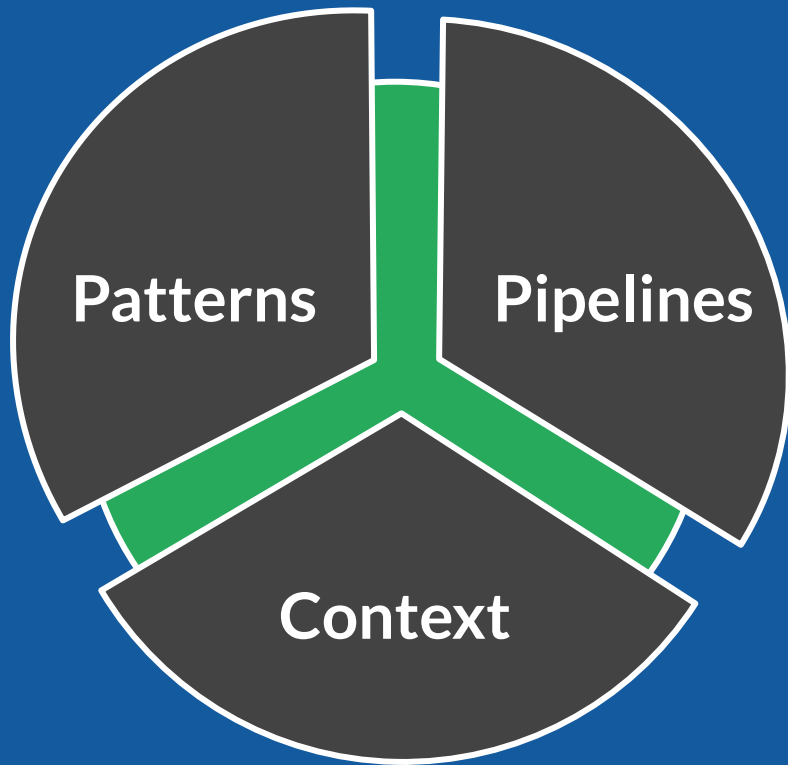
💪 Resilience

👁 Shared state

10x Operators are not just AIs

Systems Require:

1. Architectural Patterns
2. Shared State Pipelines
3. Expertise in Context



**AI bridges major
obstacles,
*and we need to
reinvest that
into our systems.***



Questions?



Want to become a 10x Operator?
Visit us at RackN.com

Rob Hirschfeld, CEO of RackN

 @RobHirschfeld

 @Zehicle

