SRE Saga: The Song of Heroes and Villains

Daria Barteneva, Microsoft Azure

Who is Daria?

Education

Applied Mathematics & Computer Science
MSc Artificial Intelligence
Music Conservatoire – Vocal Technique

Work

Principal SRE @ Azure Observability

Community

SREcon Steering Committee @ USENIX
Program Committee SREcon24 Americas & EMEA
Past: Women in Data Science, Codess, and more

Read.me

USENIX publications ;login: "Improving On-Call Fatigue",
O'Reilly "97 Things Every SRE Should Know" - Study of Human Factors and Team Culture to Improve Pager Fatigue
O'Reilly "Implementing Service Level Objectives" - SLO Advocacy
+ academic publications on multi-agent systems and behavioural modelling

Diverse Team + Common Purpose

In this talk we will use Dungeons & Dragons metaphors applied to SRE practice to help you and your team building strength and other critical abilities!

"*If you want to go fast, go alone. If you want to go far, go together.*"

Brace yourself for some…

- Dungeons and Magic Realms
- Dragons, Elves, Orcs, Gnomes, Wizards, and other (AI generated) creatures

What is Dungeons & Dragons (D&D)?

*“Dungeons & Dragons (commonly abbreviated as D&D or DnD) is a **fantasy tabletop role-playing game** originally created and designed by Gary Gygax and Dave Arneson.”*

*“In D&D, players create their own **characters** to embark on **adventures** within a **fantasy setting**.*

*One player takes on the role of **Dungeon Master** (DM), who serves as the **referee** and **storyteller**, maintaining the setting and playing the role of non-player characters (NPCs).*

*The other players control **individual characters**, **forming a party** that interacts with the setting's inhabitants and each other. Together, they **solve problems**, **engage in battles**, **explore**, and **gather treasure and knowledge**”*

from Wikipedia

Disclaimer

My D&D character is:

Minimally Viable Imposter

I never played D&D!

I did read the D&D Player's Handbook and was consulted by an experienced D&D player

Job Title: D&D Adventurer

Location: Various Realms and Dungeons

About the Role: Join a diverse and dynamic team of **adventurers** on a quest to explore **uncharted territories, battle formidable foes, and uncover hidden treasures**. As a party member, you will play a crucial role in the success of the group, utilizing your unique skills and abilities to overcome challenges and achieve common goals.

Job Title: SRE

Location: Various Cloud Environments

About the Role: Join a diverse and dynamic team of **engineers** on a quest to ensure the **reliability, performance, and scalability of our systems**. As a team member, you will play a crucial role in the success of the group, utilizing your unique skills and abilities to overcome challenges and achieve common goals.

Disclaimer: This is fictitious SRE job title generated by AI!

D&D Metaphor

- Balance of technical and soft skills, creativity and **teamwork**.
- Ability to stay calm under pressure and **adapt** to changing situations.
- Strong **problem-solving skills** and teamwork are essential.
- **Think creatively** and strategically to overcome **obstacles** and achieve objectives.
- Ensure systems are **scalable** and **observable**.
- **Remove ambiguity** and build shared **consensus** across groups.
- Play a crucial role in the **success of the group**, utilizing your **unique skills and abilities** to overcome challenges and **achieve common goals**.

Let our journey begin!

Team
Diverse Skills
Shared Purpose
Adversities

D&D Abilities

- **Strength**: Measures physical power
- **Dexterity**: Measures agility
- **Constitution**: Measures endurance
- **Intelligence**: Measures reasoning and memory
- **Wisdom**: Measures perception and insight
- **Charisma**: Measures force of personality

SRE Abilities

- System Design, Coding, Architecture
- Adaptability, Dealing with ambiguity
- Resilience, Persistence, Calm under pressure
- Strategic alignment, Seeing the bigger picture, Driving clarity
- Intuition, Technical gut
- Soft Skills, Communication

No one have all the abilities at 100%!..

...which is why we need a team!

The ~~Hero~~ Team

Team is more than sum of its parts

Lets build out team next...

G'Abe

Jedi Master

Strength
Charisma
Wisdom
Dexterity

Architecture
Strategy

Analytical
Intuition

Special Powers

Clarity
Empathy
Multi-Dimensional Realms

Achievements Unlocked

Abilities

Coding	
Architectures	
System Design	
Problem Solving	
Adaptability	
Collaboration	
Intuition	
Strategy	
Analytical	
Logical	
Detail Oriented	
Efficiency	

On Call

Feature Backlog

Tickets

Incidents

Abilities

- Coding
- Architectures
- System Design
- Problem Solving
- Adaptability
- Collaboration
- Intuition
- Strategy
- Analytical
- Logical
- Detail Oriented
- User Experience

Visionary

Strength | Charisma | Wisdom | Dexterity

Inclusivity
Detail Oriented
Problem Solving
Coding

Special Powers

- User Experience
- Team Builder
- Nicest engineer EvAr!

Achievements Unlocked

On Call

Feature Backlog

Tickets

Incidents

Jedi Master

Strength Charisma Wisdom Dexterity

Architecture Analytical
Strategy Intuition

Special Powers

Clarity
Empathy
Multi-Dimensional Realms

Abilities

Coding
Architectures
System Design
Problem Solving
Adaptability
Collaboration
Intuition
Strategy
Analytical
Logical
Detail Oriented
Efficiency

Visionary

Strength Charisma Wisdom Dexterity

Inclusivity Problem Solving
Detail Oriented Coding

Special Powers

User Experience
Team Builder
Nicest engineer EvAr!

Achievements Unlocked

On Call

Feature Backlog

Tickets

Incidents

Abilities

Coding
Architectures
System Design
Problem Solving
Adaptability
Collaboration
Intuition
Strategy
Analytical
Logical
Detail Oriented
User Experience

Abilities

Coding
Architectures
System Design
Problem Solving
Adaptability
Collaboration
Intuition
Strategy
Analytical
Logical
Detail Oriented
Security

Coding Ninja

Strength Charisma Wisdom Dexterity

Adaptability Analytical
Detail Oriented Collaboration

Special Powers

Coding
Integration
Happiness Officer

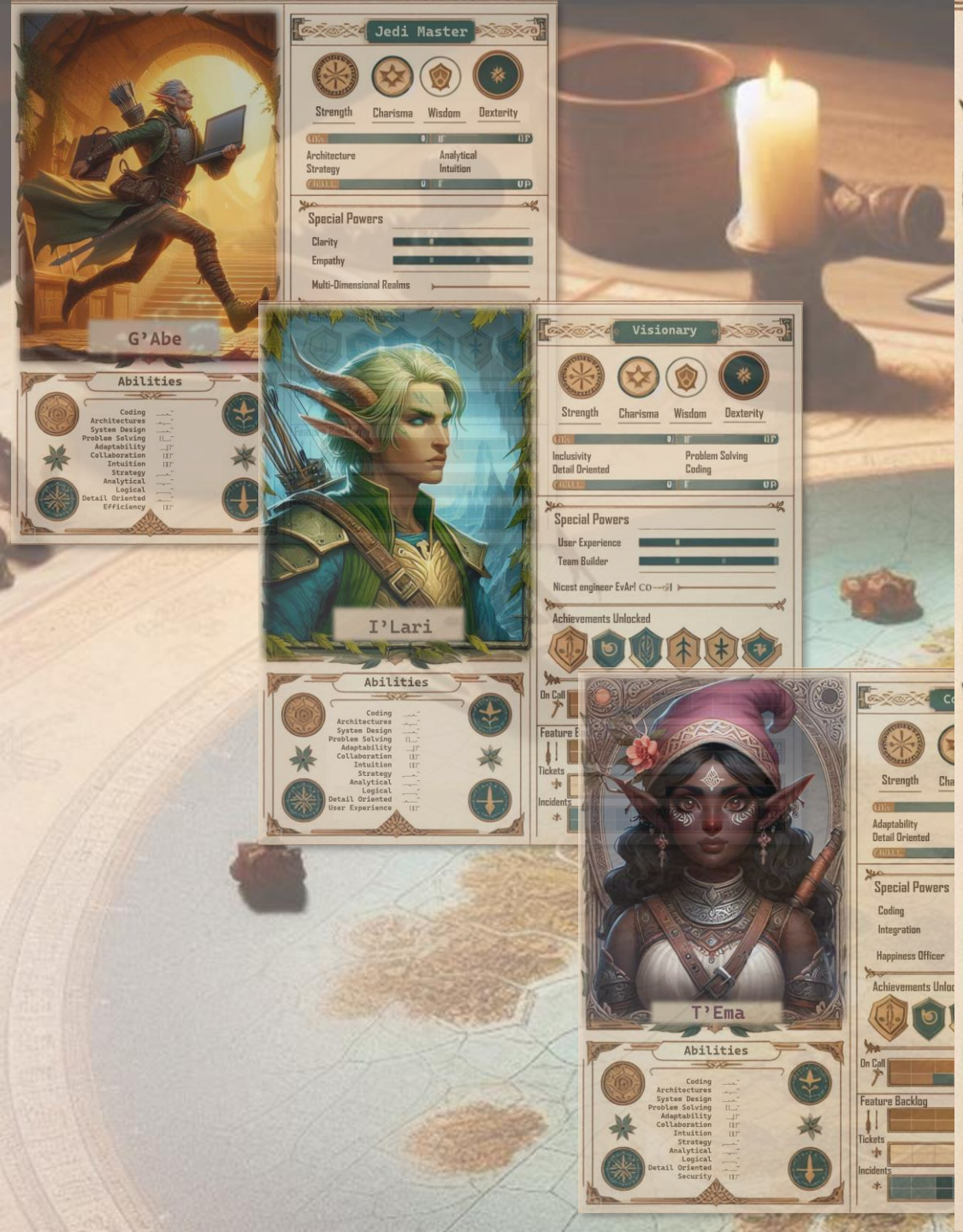
Achievements Unlocked

On Call

Feature Backlog

Tickets

Incidents



D'Ave

Abilities

Coding	
Architectures	
System Design	
Problem Solving	
Adaptability	
Collaboration	
Intuition	
Strategy	
Analytical	
Logical	
Detail Oriented	
Compliance	

The Architect

Strength | Charisma | Wisdom | Dexterity

Intuition
Detail Oriented

Problem Solving
Logical

Special Powers

Compliance

Security

Master of Standards

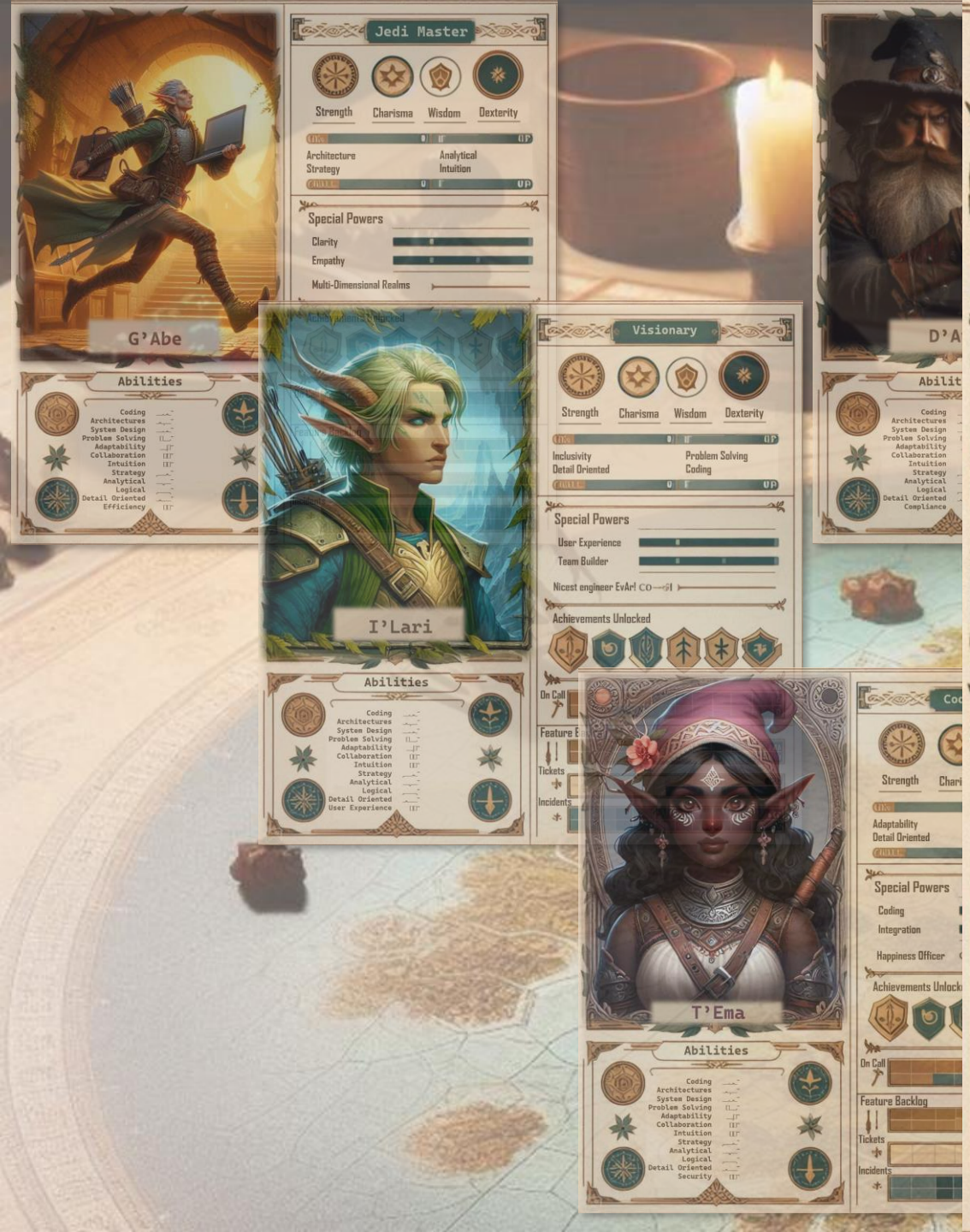
Achievements Unlocked

On Call

Feature Backlog

Tickets

Incidents



D'Aria

Abilities

Automation	
Architectures	
System Design	
Problem Solving	
Adaptability	
Collaboration	
Intuition	
Strategy	
Analytical	
Logical	
Detail Oriented	
Communication	

Observability Diva

Strength
Charisma
Wisdom
Dexterity

Intuition
Adaptability
Analytical
Collaboration

Special Powers

Data Addict
Community Builder
Master of Storytelling

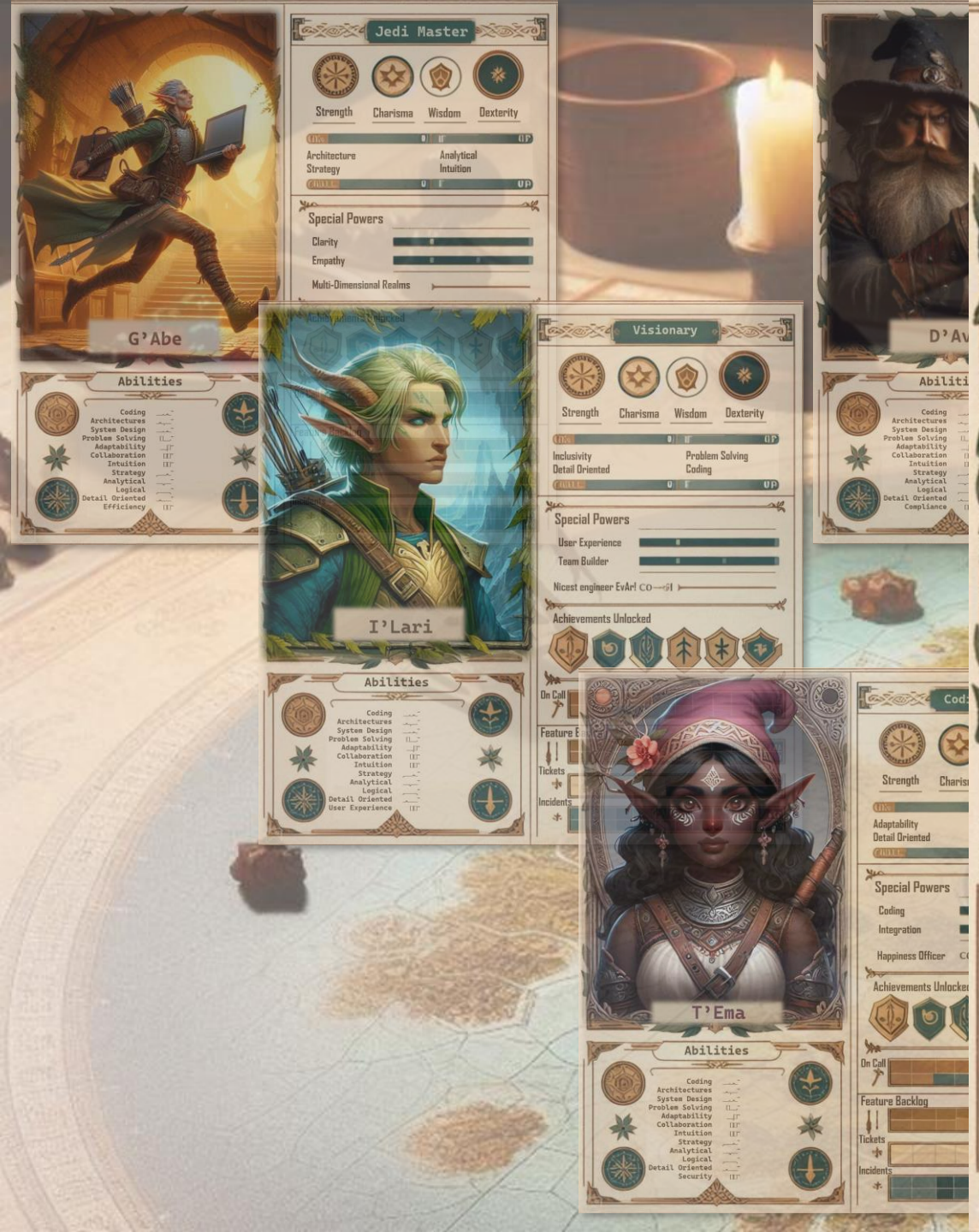
Achievements Unlocked

On Call

Feature Backlog

Tickets

Incidents



Abilities

Coding	
Architectures	
System Design	
Problem Solving	
Adaptability	
Collaboration	
Intuition	
Strategy	
Analytical	
Logical	
Detail Oriented	
Documentation	

The Wise One

Strength · Charisma · Wisdom · Dexterity

Coding
Analytical
Problem Solving
Logical

Special Powers

System Design
Documentation
Hyper Focus

Achievements Unlocked

On Call

Feature Backlog

Tickets
Incidents

G'Abe
Jedi Master
Strength
Charisma
Wisdom
Dexterity
Architecture
Strategy
Analytical
Intuition
Special Powers
Clarity
Empathy
Multi-Dimensional Realms
Abilities
Coding
Architectures
System Design
Problem Solving
Adaptability
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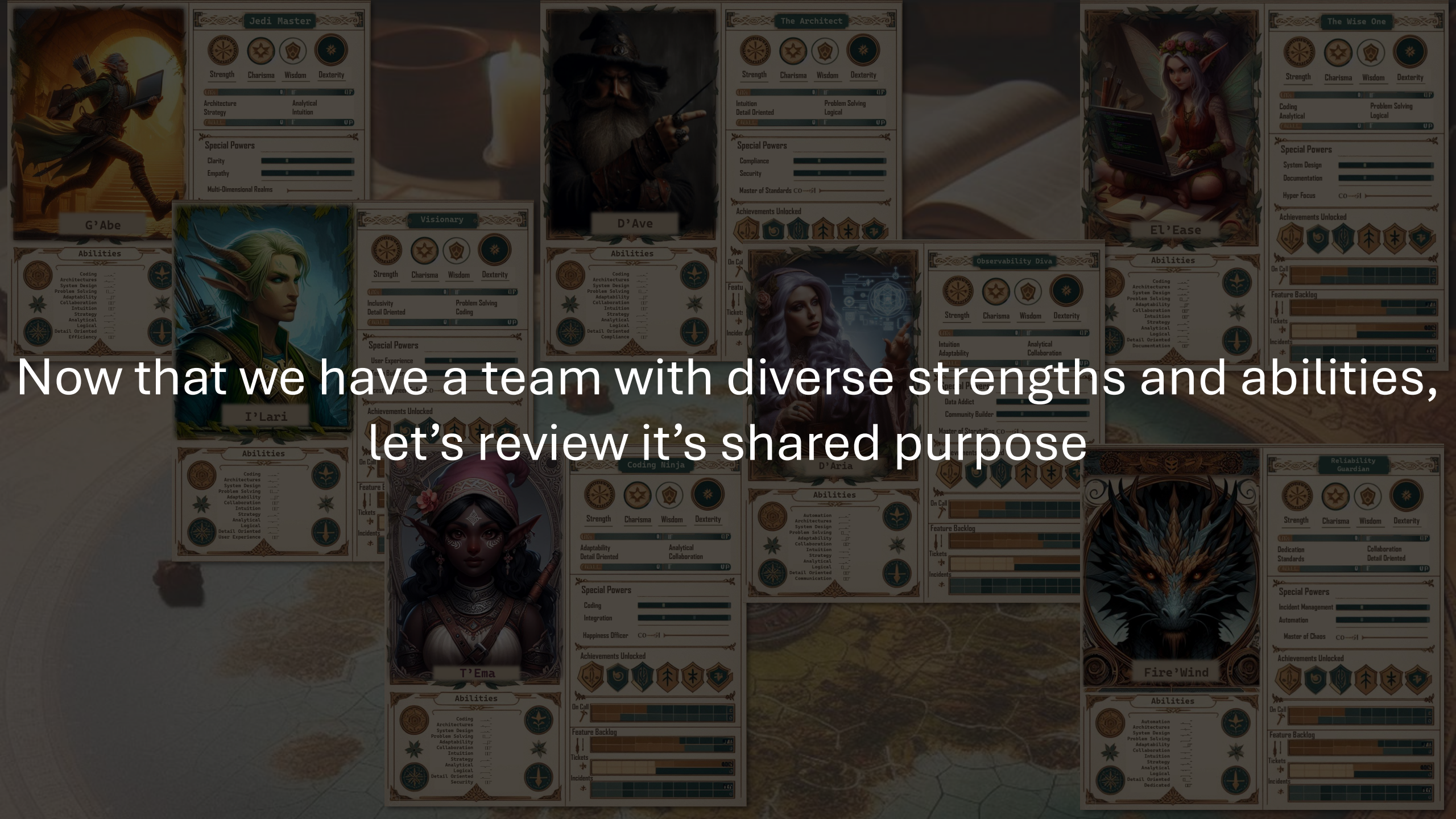
Intuition
Strategy
Analytical
Logical
Detail Oriented
Efficiency
I'Lari
Achievements Unlocked
Visionary
Inclusivity
Detail Oriented
Problem Solving
Coding
User Experience
Team Builder
Nicest engineer EvAr!
On Call
Feature Backlog
Tickets
Incidents
T'Ema
Security
Integration
Happiness Officer

Fire'Wind
Abilities
Automation
Architectures
System Design
Problem Solving
Adaptability
Collaboration
Intuition
Strategy
Analytical
Logical
Detail Oriented
Dedicated

Reliability Guardian
Strength
Charisma
Wisdom
Dexterity
Dedication
Standards
Collaboration
Detail Oriented
Special Powers
Incident Management
Automation
Master of Chaos
Achievements Unlocked
On Call
Feature Backlog
Tickets
Incidents



Now that we have a team with diverse strengths and abilities, let's review it's shared purpose

Shared Purpose

Keeping the (complex) system running reliably

- While dealing with adversities…
- …because complex systems run in a permanent failure mode
- …and changes increase system entropy introducing new forms of failure
- …but change is inevitable - we can only control our reaction to it!
- We keep the balance between innovation velocity and system reliability
- And our teams are a key part of the complex systems we run

Heroism and Villainy

“Villainy and heroism share a symbiotic relationship within the realm of storytelling and mythology. The presence of a ***compelling villain*** *often serves as a* ***catalyst for the emergence of a hero****, creating a narrative tension that propels the hero’s journey.”*

Villainy and Its Relationship to Heroism | SpringerLink

The ~~Villain~~ Adversity

The Villain (Adversity) is an antagonist of the Hero (Team).

Adversities and challenges…make the whole team stronger!

Outages, abrupt changes in scope and priorities are challenges that trigger the team (and the individual) to regroup, develop new capabilities and level up.

Biosphere 2

University of Arizona Biosphere 2 is an American Earth system science research facility located in Oracle, Arizona.

Its mission is to serve as a center for research, outreach, teaching, and lifelong learning about Earth, its living systems, and its place in the universe.

Some trees inside the Biosphere 2 suffered from etiolation and **weakness caused by lack of stress wood, normally created in response to winds in natural conditions**.

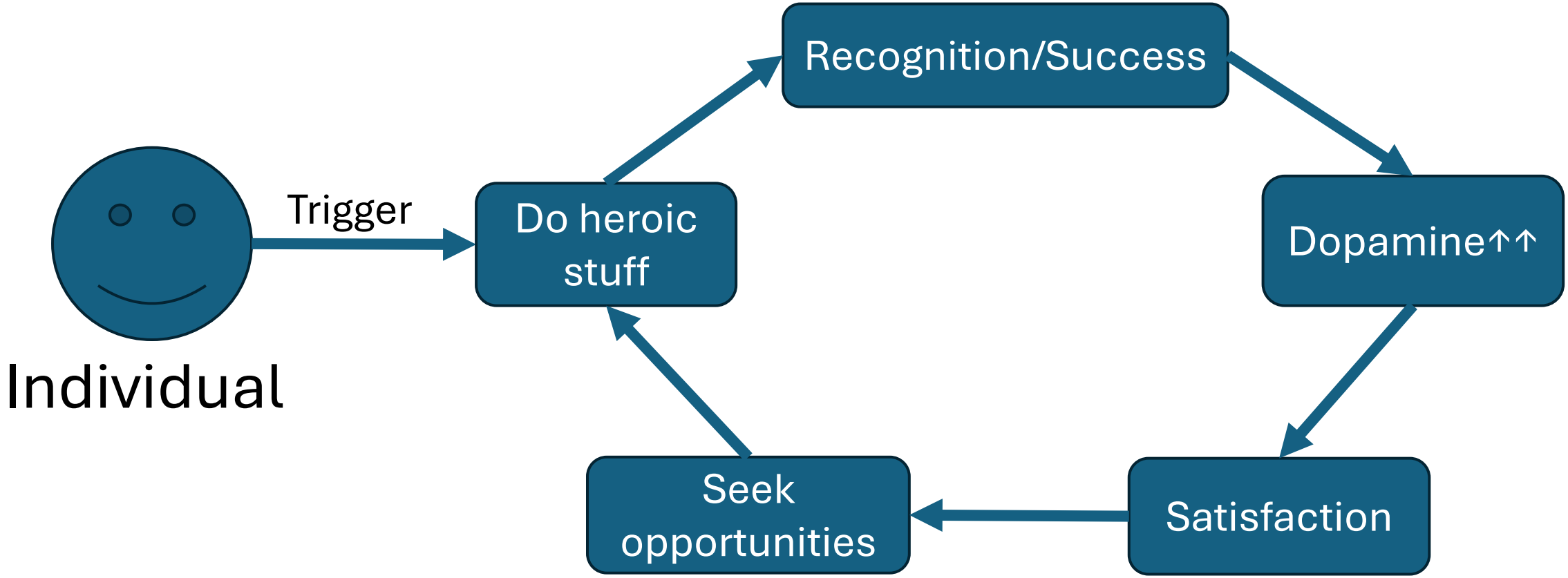
Source: Biosphere 2 - Wikipedia

Adaptability

- Individual adaptability
- Team adaptability
- System resiliency

The rise of a superhero

How (super) heroes are born?



Dopamine *is a neurotransmitter that plays a key role in the brain's reward system.*

Impact of the hero on the team (and the system)

When problem arise one of your team members jumps onto it and solves it…

… and keep doing it repeatedly.

Short term – saves the day and have positive impact!

Long term – negative impact, especially when team start relying on it!

- Siloed (undocumented) knowledge
- Hero is a Single Point of Failure (SPOF) in your system
- Unsustainable: hero burnout (or departure)
- Unrealistic expectations (from the team and the system)
- Bad role model
- Ineffective new team members onboarding

Note: If your on call relies on heroism – your systems and processes need to improve!

Reducing heroism

- Recognize there is a problem
- Rotate feature ownership
- Restructure your on call (try 2-tiered system)
- Reduce tacit knowledge – documentation, training, shadowing

Let things break!

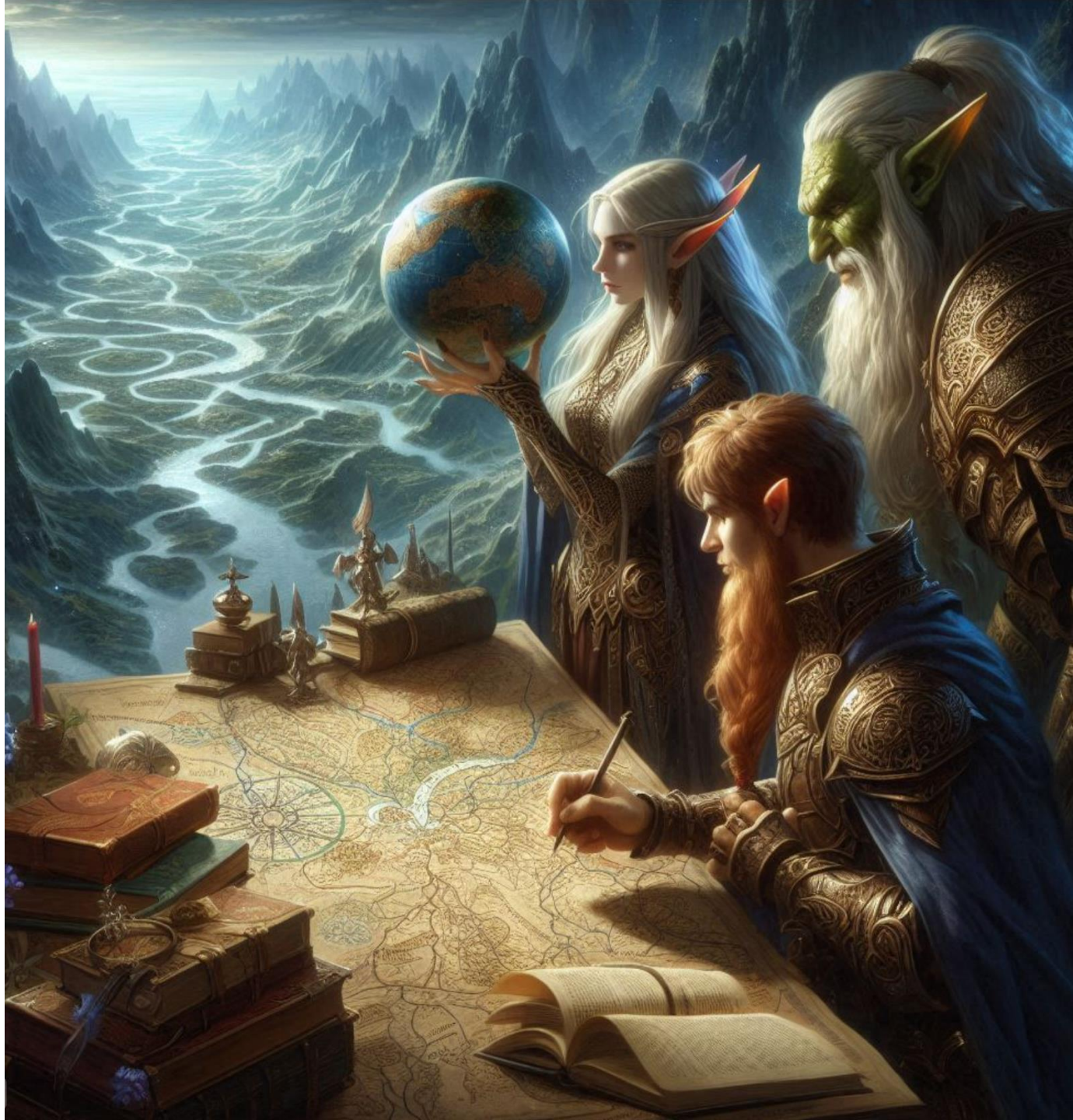
If no one knows there is a problem, and it won't get funded and fixed!

SRE team Contexts &
Structure

Disclaimer

Proposed 5 SRE team types are not specific to one organization and rather an abstraction of different types of SRE teams I observed across industry

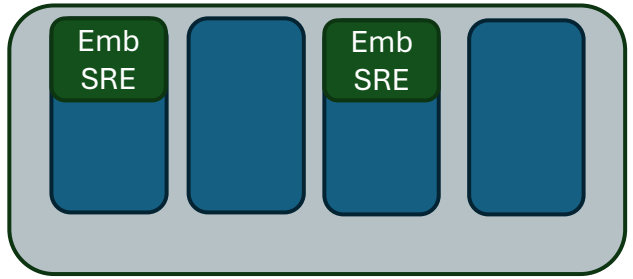
Each one of the types rarely exists in its pure form or on its own



Embedded SRE

Part of the development team with the ownership **scoped to specific area**

- **For example**: deployments, incident response, etc...
- **Reporting structure**: either through DEV or through dedicated SRE organization;
- **Pros**: high domain knowledge, direct accountability;
- **Cons**: line blurry line between SRE and DEV and may lose focus on SRE aspects of the job due to 'feature' pressure;

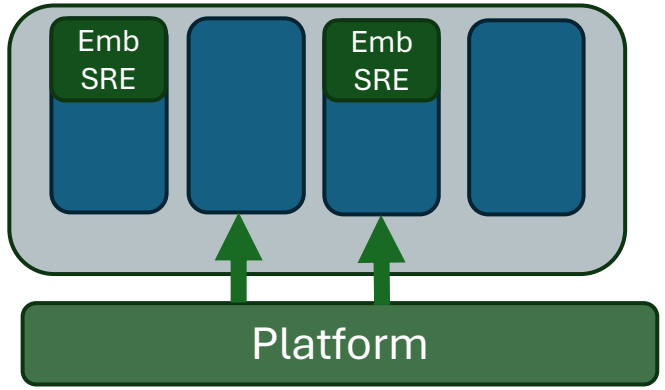


SRE Service

Platform SRE

Owns a product/part of the platform that plays key role in cross-service reliability. Runs that part of the platform and helps with integrations.

- **For example:** automation framework, common infra components, etc…
- **Reporting structure:** either shared between multiple DEV teams at a higher level or dedicated SRE organization;
- **Pros**: 'glue' role/router in complex systems to shorten time to mitigate;
- **Cons**: lesser domain knowledge in a specific area so often requires pairing with service subject matter experts (SME) in incident (as example);

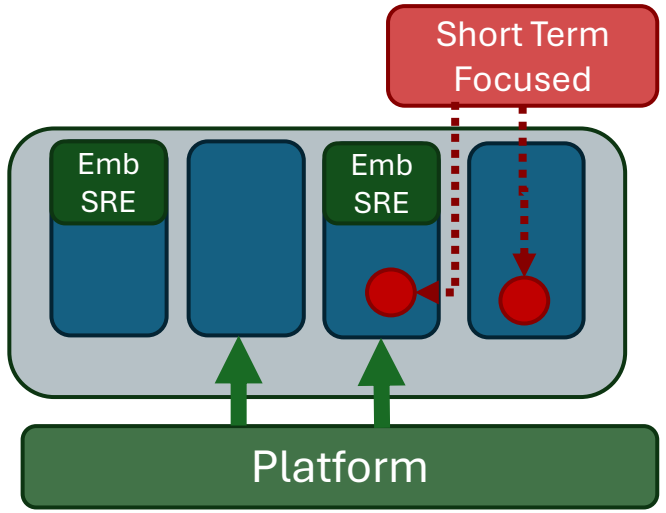


SRE Service

Short Term Focused SRE

Technical short term consultancy model with temporary allocation of experienced SRE to support product changes to improve its reliability.

- **For example:** Hands on, short term (for ex. semester), SRE will work together with DEV team, update code, focus on solving specific problem;
- **Reporting structure:** usually through dedicated SRE organization;
- **Pros**: good for spikes in specific focus, develop strong problem domain knowledge to help many;
- **Cons**: low accountability, low service domain knowledge, potentially costly to ramp up in heterogenous infrastructures;

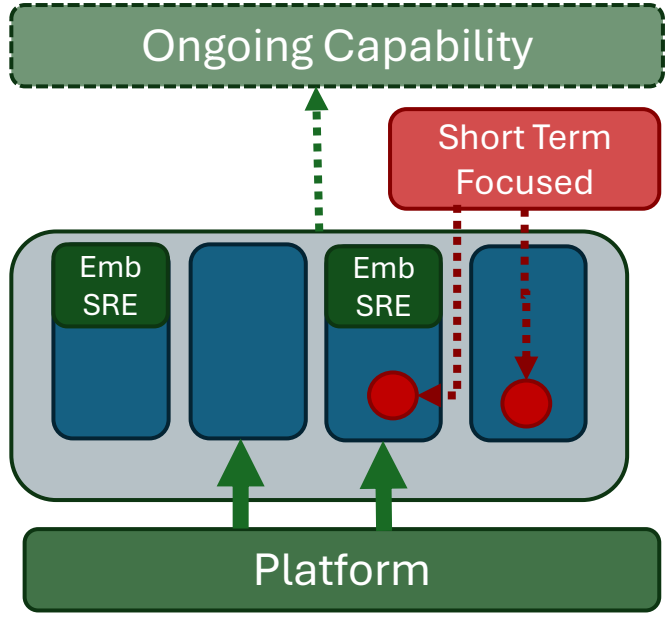


SRE SRE Service

Ongoing Capability SRE

Provides service to multiple teams in a specific reliability area. Practice focused. Doesn't own specific product but may build internal tools that support the practice. A mix of practitioners and program managers.

- **For example:** incident response, reliability/operational maturity dashboards, etc…;
- **Reporting structure:** usually through dedicated SRE organization;
- **Pros**: consistent focus on the SRE tenants and normalization across multiple services;
- **Cons**: less accountable, typically less service domain knowledge;

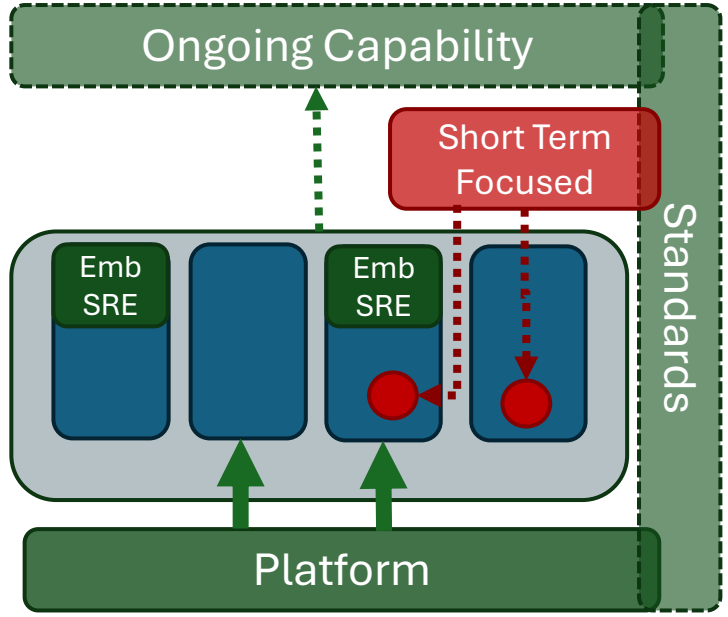


SRE | SRE | Service

Standards SRE

Central team overseeing reliability state and maturity across multiple teams and identifying gaps in reliability practices. Defines reliability standards and tracks adoption of those standards. Program/project management heavy

- **For example:** Identify platform gaps that prevent standardization around reliability practices and helps to address the gap;
- **Reporting structure:** usually through dedicated SRE organization;
- **Pros**: dedicated focus to drive a concrete initiative;
- **Cons**: difficult to build trust with the team being so disconnected, no grounding as no active service attachment;

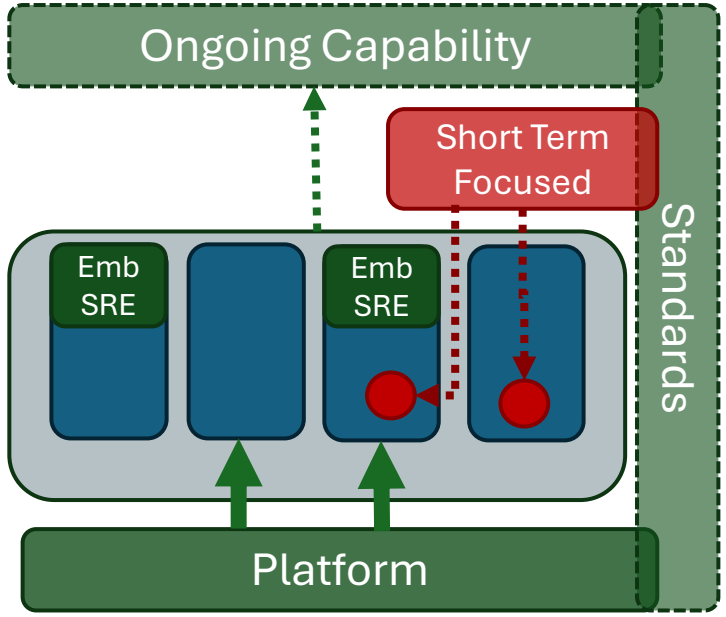


SRE | SRE | Service

SRE team: Contexts & Structure

Examples of SRE teams

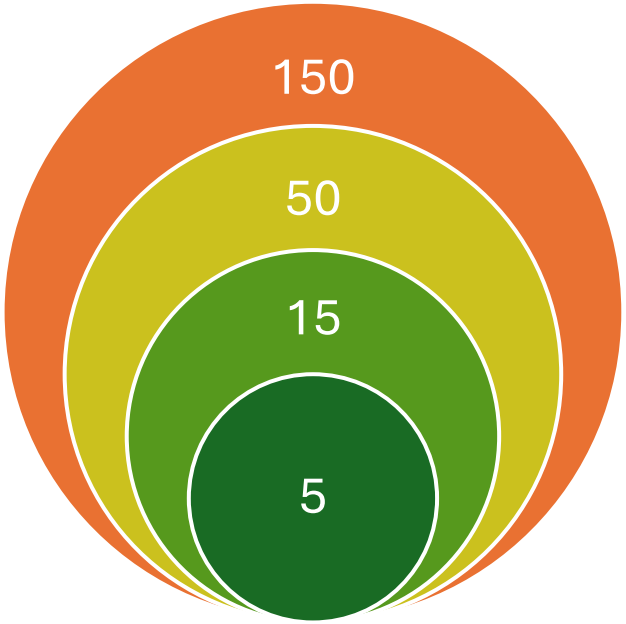
- Embedded
- Platform
- Short Term Focused
- Ongoing Capability
- Standards



Multiple team setups would exist at the same time, collaborating and influencing each others backlog and priorities.

SRE Team Size

- Have at least…
- …5 people in a team (think of oncall cadence)
- …2 senior engineers
- …1 glue team member
- … 1 force multiplier with an interest in elevating the team
- …1 common workstream
- …1 opportunity to celebrate achievements (weekly!)
- …5 buckets of measures of success
  - Customer satisfaction
  - Business growth
  - Platform reliability
  - Operational maturity
  - Team satisfaction



*“**Dunbar's number** is a suggested cognitive limit to the number of people with whom one can maintain stable social relationships—relationships in which an individual knows who each person is and how each person relates to every other person.”*

Neocortex size as a constraint on group size in primates - ScienceDirect

Transformation Journey

Building your Abilities and Skills

Building Technical Gut and Intuition

“How is technical gut and intuition and smell developed? Certainly by doing, by osmosis, by time, by sleeping, and waking, and doing it again.

I think it's exposure. ***It's exposure to a diverse set of technical problems that all build on a solid base of fundamentals.”***

Scott Hanselman

Being Intentional

“The key is not to prioritize what's on your schedule, but to schedule your priorities.”

Stephen Richards Covey

Transformation Journey

Step by Step

Things you are good at

Unexciting stuff

Things you love doing

Unavoidable Space

Comfort Zone

!Comfort Zone

Learning Space

Things I am good at, but don't necessarily love doing

+ Easy and rewarding (dopamine spike)

- Not particularly exciting to do

+ Frequently unblocks more exciting stuff

Things I am good and love doing

+ gives you energy and rewards

- doesn't challenge you

- no learning happening here

Things I don't like doing and I am bad at

+ stretches your capabilities

+ build resilience

- energy draining and slow to see results

Things I am not good at, but love doing

+ gives you energy

+ repetition will lead to mastery

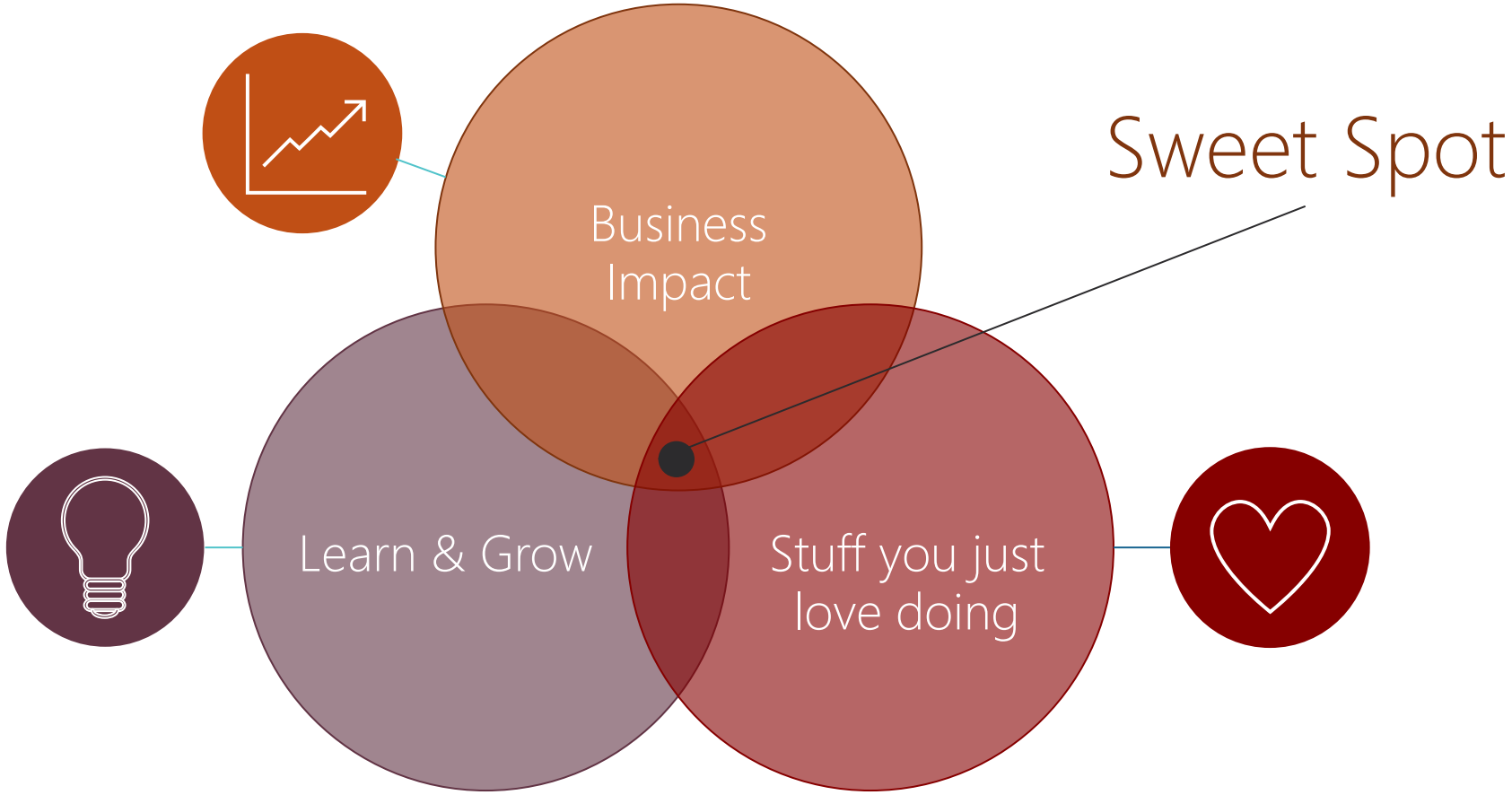
- can be demotivating

Transformation Journey
Example Matrix

Areas	**Effort and Time required**	**Competences I develop**	**Organizational impact (huge, big, small, tiny)**
Data Analysis	(write here different things you do and how much time it takes you on a regular basis. For example, “Weekly review – 1 hour/week”)	…	
Security			
Standards			
Culture and Education	…	…	…
On Call	…	…	…
Rhythm of the Business	…	…	…
Mentoring	…	…	…

👍Add thumbs up if you are good at it
❤️ Add heart if you love doing it

This talk wouldn't be real thing if I didn't add the Venn diagram☺



Transformation Journey

Step by Step

Things you are good at

Unexciting stuff

Things you love doing

Unavoidable Space

Things I am good at, but don't necessarily love doing

Thing A – Big business impact, keep doing

Thing B – Some business impact, but takes a lot of time, pause or delegate

Comfort Zone

Things I am good and love doing

Thing G – Big business impact – keep doing

Thing H – No business impact, but gives you energy – keep doing or pause?

!Comfort Zone

Things I don't like doing and I am bad at

Thing D – generate business impact, keep doing

Thing E – drains your energy, low impact, stop doing

Learning Space

Things I am not good at, but love doing

Thing J – low business impact, but you are building critical skills - keep doing

Thing K – some business impact, but takes a lot of time from other things - pause

Transformation Journey

Key Takeaways

- Start with **understanding where you are** in different skills
  - identify your **natural strengths** and create your Adventurer card
- Who are your **role models and mentors**?
- What **skills** you want to develop in the next 6 months?
- Look at **what you spend your time on**
  - Work projects
  - Community engagements
  - Personal hobbies
- Use the matrix and **be intentional** about your priorities.
- **Get help** from your manager, mentor, community

Many ways to practice...

- Work groups/Discussion groups
- Direct/Reverse Shadowing
- Onboarding buddies
- Code Reviews
- Joint Retrospective Reviews/Risk Threat Modelling discussions
- 1:1 mentoring

Into the Dungeon

Dealing with the on call

“For many adventuring parties the dungeon is where they encounter many of their adversities, and this is the opportunity for them to level up.”

by Dave Lubash, D&D expert

Into the Dungeon
Dealing with the on call

- On call satisfaction goes beyond the volume of pages!
- It’s about agency and team culture
  - Trust
  - Blameless culture: It’s ok to fail!
  - Technical literacy and hands-on experience
  - Onboarding. Training. Documentation
  - Communication and Collaboration
  - Accountability & Ownership
  - Feedback Loop
- Emotional Contagion (Trust, Empathy, Context)
- Impact on your stress levels - (NUTS) Novelty, Unpredictability, Threat to Ego, Sense of Control

Be an agent of change!

Dealing with the on call

- Keep documentation up to date
- Build feedback loops (survey, Interviews)
- Communicate! A lot!
- Take ownership of a problem
- Build horizontal workstreams – connect across teams
- Practice proactive empathy
- Build trust – be consistent
- Praise successes
- Failing is a way of learning (fast)
- Share your experiences
- Find a mentor
- Become a mentor

Key Takeaways

- Improve resilience and adaptability of individual, team and the service
- Watch out for red flags to avoid the rise of “Hero as a Service”
- See disruptors and adversity as an opportunity to grow
- Be intentional about your own transformation journey and know your strength and learning opportunities
- Going into the dungeon builds your strength and resiliency – all the interesting things happen there!
- Overcoming fears and helping others to overcome their fears builds culture of trust and mutual support and makes team stronger
- When we overcome challenges together – we create “stress wood” making team stronger
- Leave the safety of your comfort zone to upskill!

Q&A