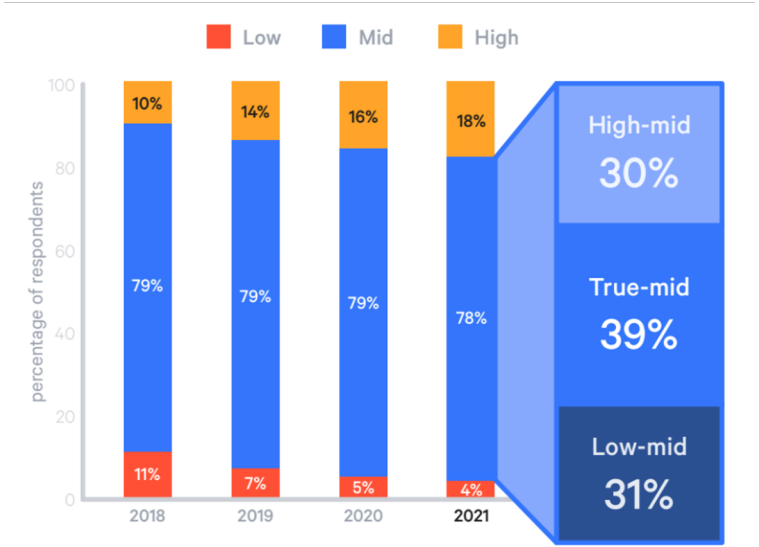
Value Stream Reference Architecture

Breaking Free from “The Way We’ve Always Done IT” Mindset!

Why is a Value Stream Reference Architecture needed?

Problem 1 - “Mid-tier Stickiness”

- Puppet State of DevOps Report 2021
  - “Devops is whatever you do to bridge the friction created by silos, and all the rest is engineering” - Patrick Debois
- As defined by CALMS, we are implementing the Automation (The engineering), but what about the rest?
- Over the last four surveys, the number of “highly evolved” firms has grown; however, the amount of organizations in the middle level has remained stagnant, now identified in three distinct levels, “high-mid,” “middle,” and “low-mid.”



*2021 Puppet State of DevOps Report

Problem 2 - Conway's Law

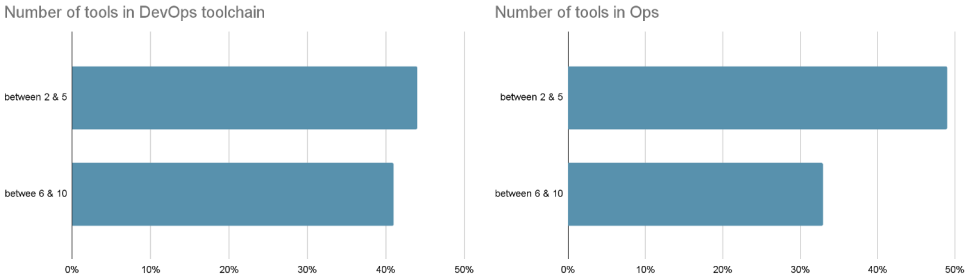
- Architecture driving Communications vs Communications driving Architecture
- Team topologies in Value Stream Management produce fast/continuous flow:
  - Stream-aligned Teams
  - Enabling Teams
  - Platform Teams
  - Complicated Sub-system Teams
- "Good DevOps": Strong identities, clear responsibilities, high degree of autonomy, and, most importantly, well defined interaction paradigms and communication channels with other teams.

Conway's Law

"Organizations which design systems are constrained to produce systems which are copies of the communication structures of these organizations."

Problem 3 - Toolchain Sprawl

- For Dev, 69% of survey takers told us they'd like to consolidate their toolchains. A full 37% said spending time on toolchain maintenance takes away from time that could be spent on compliance *
- For Ops, 63% use a DevOps Platform (a 23% increase) and 39% of respondents said the data they need exists but accessing and managing it is difficult, while 27% went further and acknowledged being "overwhelmed" by the amount and scope of data available *
- The largest aggregation of data about value stream flow comes from DIY dashboards and manual collection into spreadsheets (53.3%)
- The largest growth (5.2%) is from a single bought tool

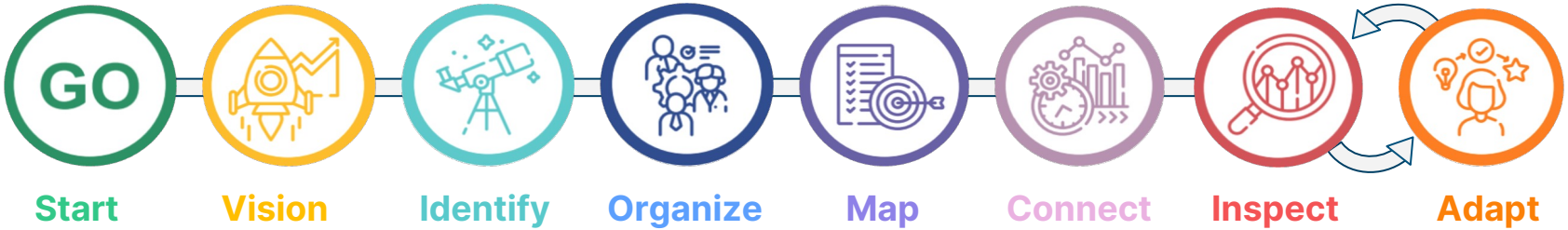


Where do you obtain data about value stream flow?	2021	2022	+/-
From a single tool we have bought	5.6%	10.8%	+5.2%
From a single tool we have acquired (open source)	2.3%	2.7%	+0.4%
From a single tool we have built	5.6%	9.5%	+3.9%
From a number of tools we have integrated	18.5%	18.2%	-0.3%
Aggregated from several sources / tools (e.g., dashboard)	36.6%	29.7%	-6.9%
Manual collection from several sources / tools (e.g., spreadsheets)	25.9%	23.6%	-2.3%
We don't	3.7%	2.0%	-1.7%

*2022 GitLab Global DevSecOps Survey **2022 VSMC State of Value Stream Management Report

How does a Value Stream Reference Architecture help?

The Value Stream Management Implementation roadmap



Value Stream Reference Architecture

Team Topologies, value stream identification, organizational change management, value statements

Value Stream Assessments

Joint assessment of current state, constraints and impact on the business, identify and align on desired future state

The DevSecOps Platform

Deliver better products faster, increase operational efficiency, reduce security and compliance risk, unlock digital transformation results & analytics

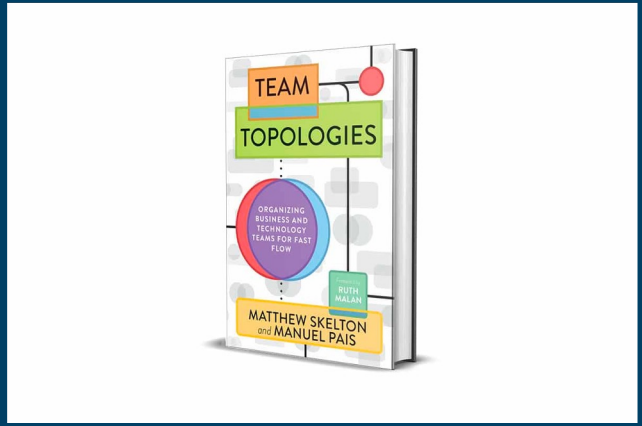
Source: 2022 VSMC State of Value Stream Management Report, VSMConsortium.org

Suggested reading

Team Topologies

Matthew Skelton & Manuel Pais

Published by ITRevolution

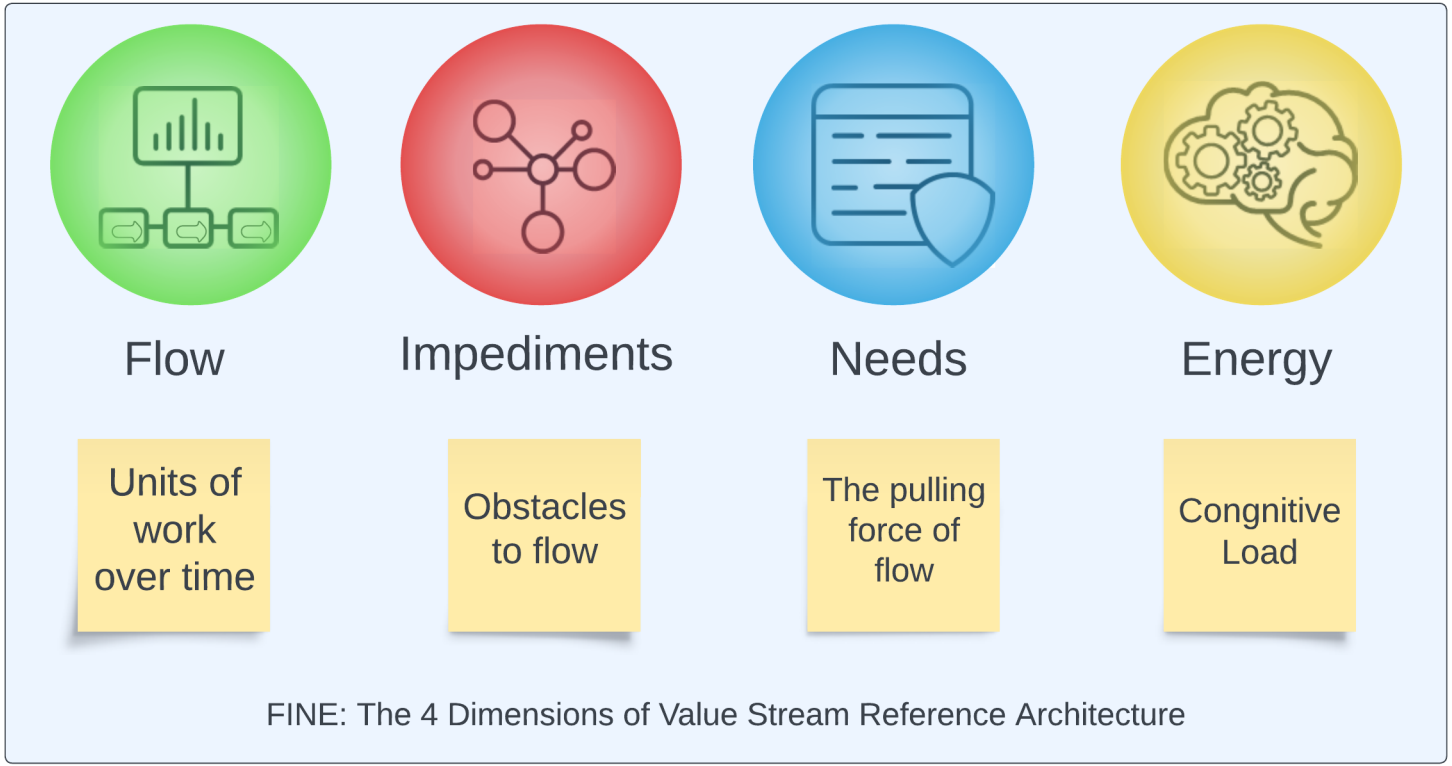


- Stream-aligned Teams
- Enabling Teams
- Platform Teams
- Complicated Sub-system Teams

- Collaboration
- X-as-a-Service
- Facilitation

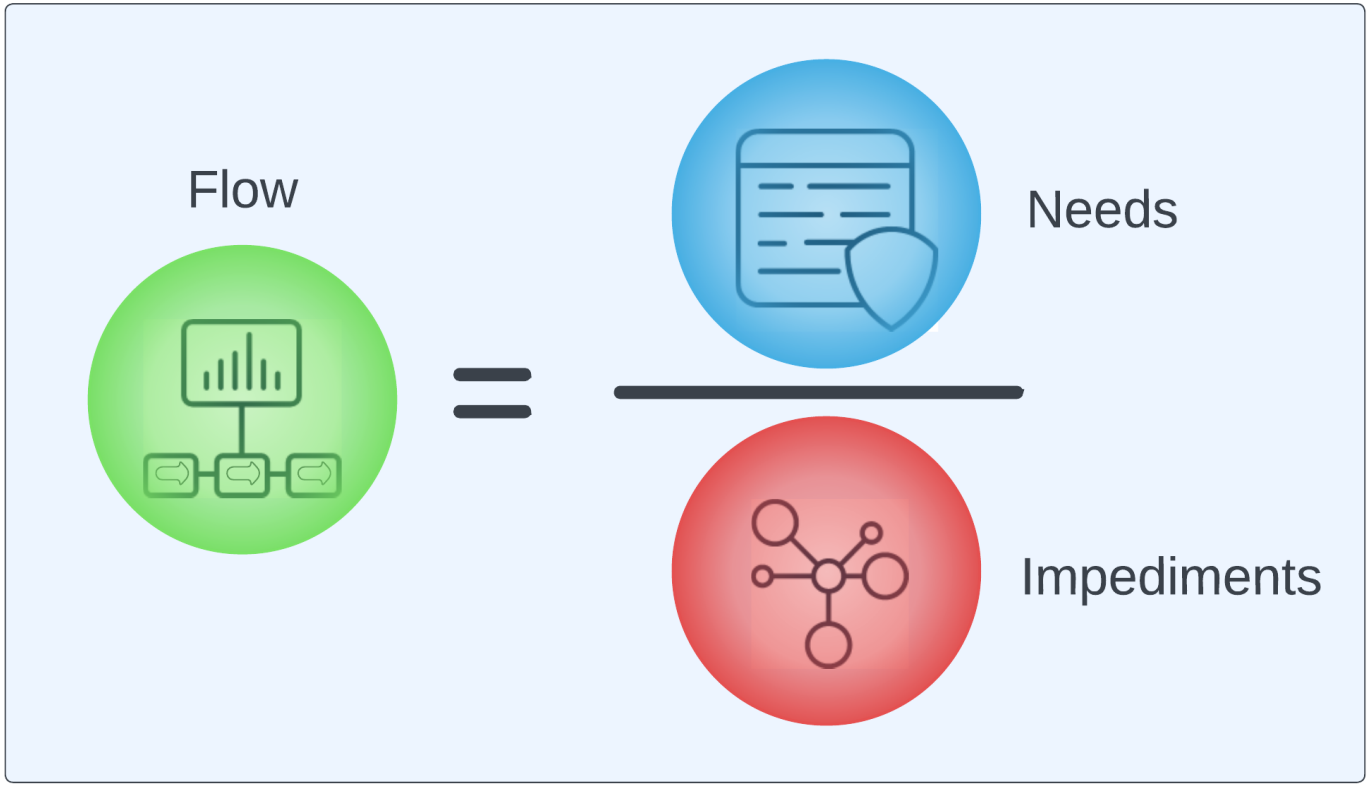
With VSRA everything is FINE

The four FINE dimensions of VSRA

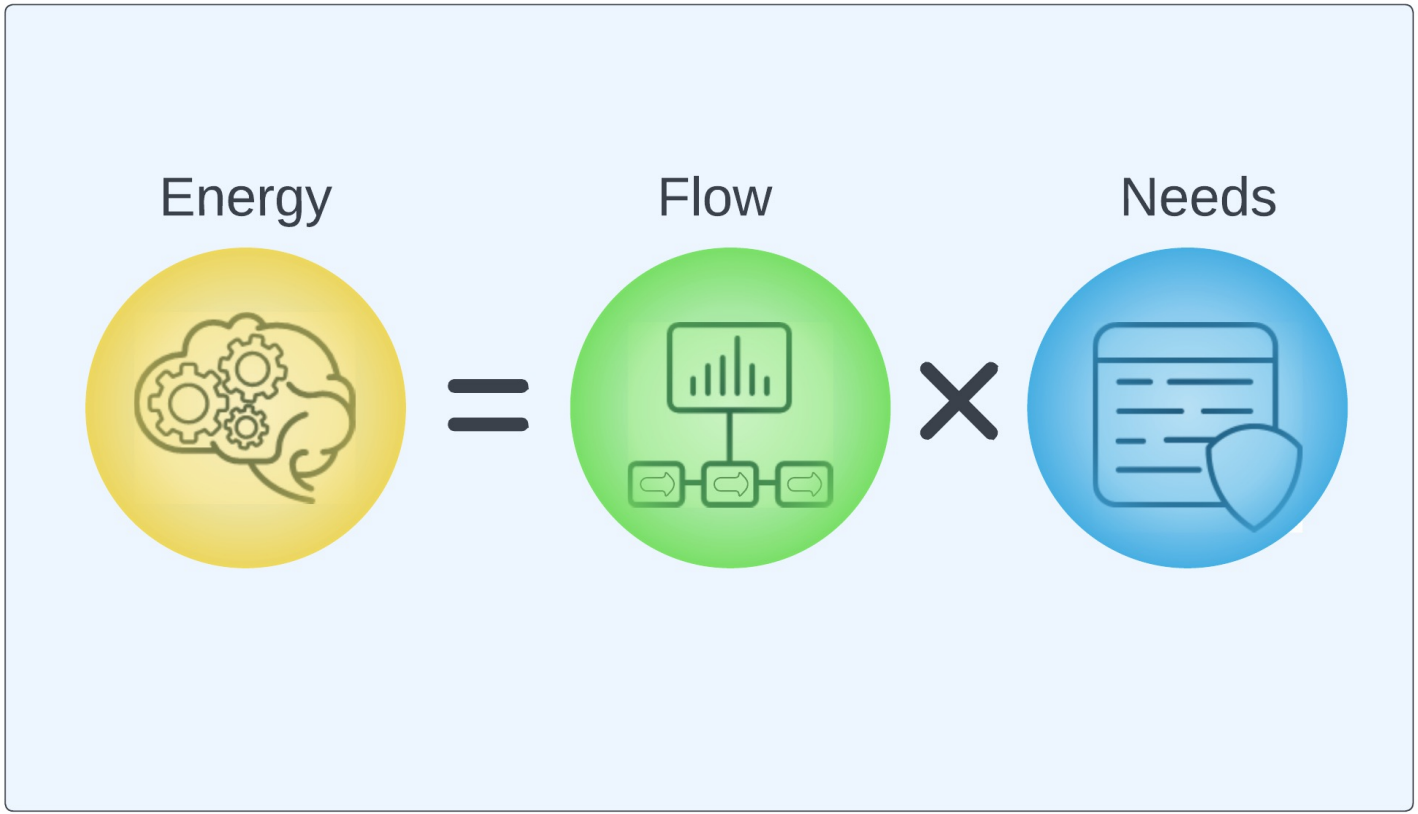


FINE: The 4 Dimensions of Value Stream Reference Architecture

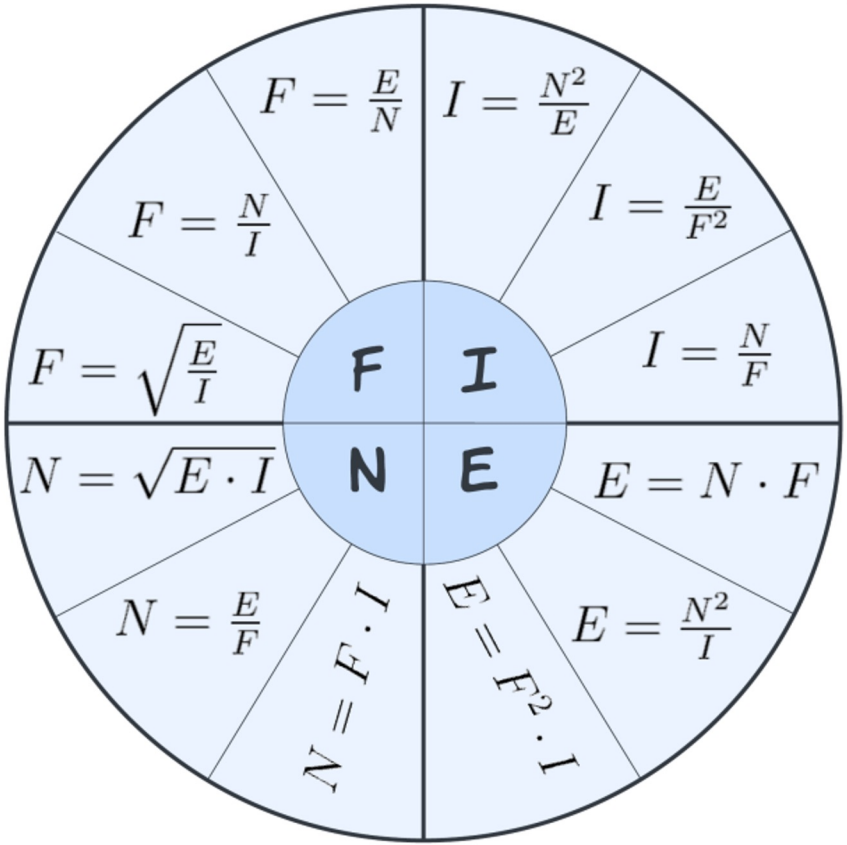
Flow is the ratio of Needs over Impediments



Energy is the product of Flow and Needs



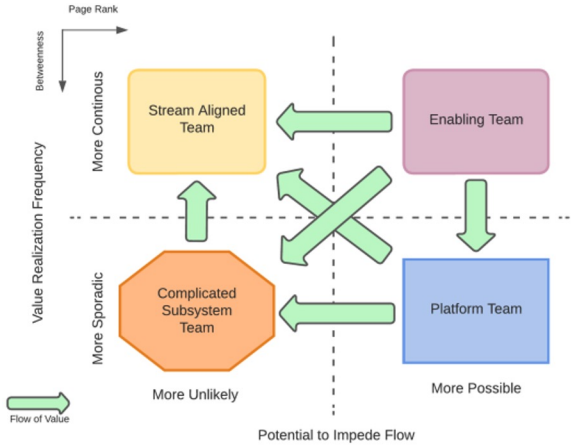
The FINE Flow Circle



But VSRA is more than FINE...

Identifying Value Streams

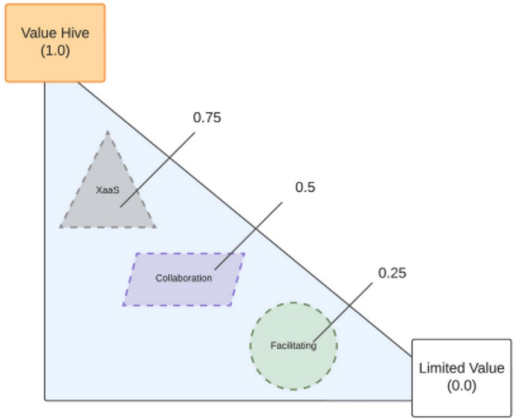
- By using Team Topologies and applying Graph Theory, we see a profile on team types
- Mapping our own organization into a graph allows us to see our existing team types and team interactions
- From this we can create a Value Stream Reference Architecture that can match to
  - Our Organizational Structure
  - Our Business Systems Architecture
- According to Conway's Law, these must be the same. Not doing so leads to;
  - Frequent re-organisations
  - Frequent re-architecture of Business Systems
  - In between, friction created by silos



Betweenness	PageRank	Likely Team Topology
Low	Low	Stream-Aligned Team
Low	High	Enabling Team
High	Low	Complex Sub-System Team
High	High	Platform Team

Organising Value Streams

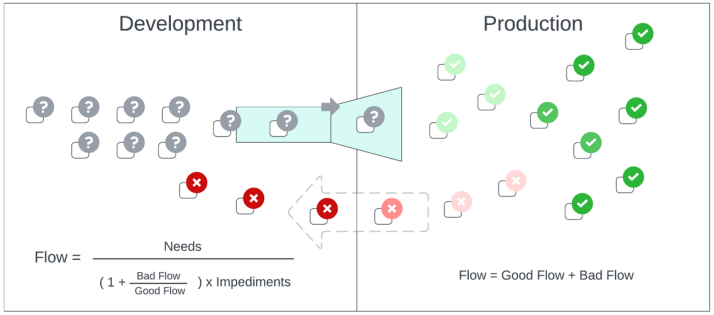
- Applying the Inverse Conway Maneuver
  - Define the Business Systems Architecture we require as a Value Stream Reference Architecture
  - Compare to the Existing, identified Value Stream Reference Architecture
  - Define the differences in;
    - Team Topology types
    - Team interactions
  - Apply Agile Organizational Change Management
    - Apply a strong identity
    - Clear responsibilities
    - Apply high degree of autonomy within confines of identity and responsibilities
    - Define interaction paradigms and communication channels
- Consider Cognitive Load and how interactions affect teams - The Cognitive Slope

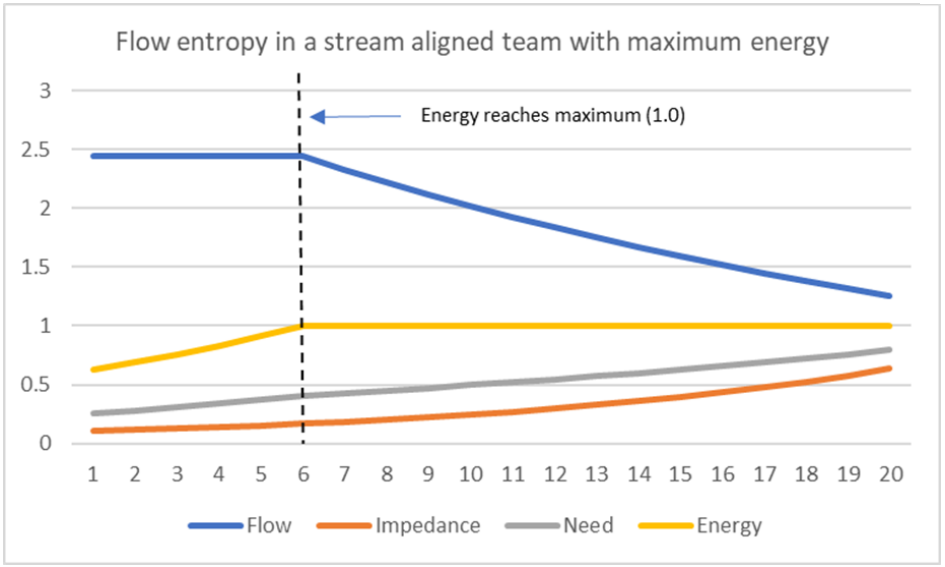


Team Topology	Average Cognitive Load	Summoned Cognitive Load
Stream-Aligned Team	0.625	2.5
Enabling Team	0.4375	1.75
Complicated Sub-System	0.625	2.5
Platform	0.8125	3.25

Measure Flow Entropy

- The FINE flow analysis also allows inspection of Flow Entropy.
- Energy (cognitive load) is finite.
- Flow ratio (bad flow vs good flow – similar to change-fail-rate).
- Bad flow creates new impediments.
- Energy increases to maintain flow until it reaches a max.





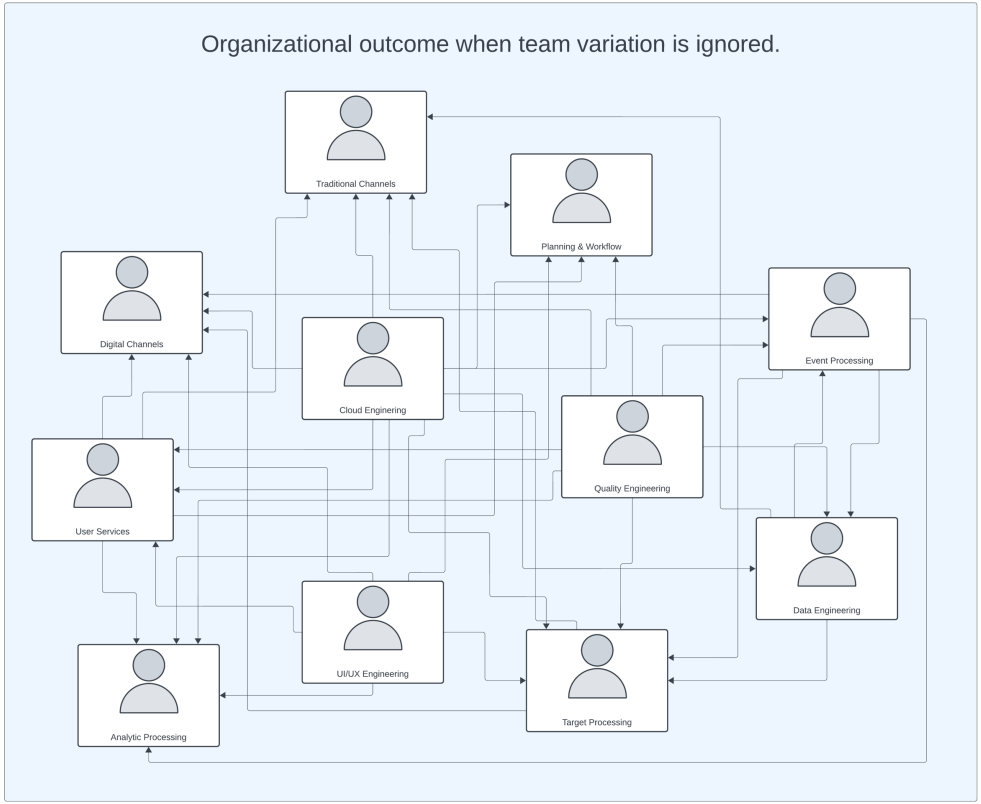
- At maximum energy (cognitive load) flow starts to drop.
- Flow entropy starts at this point.
- Team resilience can be measured by the number of cycles they can go before flow entropy becomes a problem.
- Changing the team topology and the interaction styles between teams can be used to control flow entropy.

How SAS Institute is accelerating its DevOps transformation using VSRA

SAS Institute (a brief history)

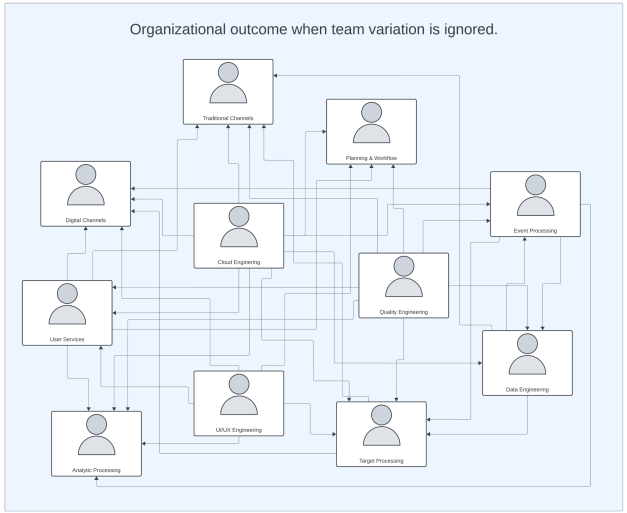
- 1976: SAS Institute founded. 300 people attend first users conference. SAS has 100 customers. The SAS programming language is established.
- 1980: $10 million in revenues. SAS opens its new HQ in Cary, NC.
- 1985: SAS Rewritten in popular C language, abandoning the IBM-only PL/1 language.
- 2000: $1.1 billion in revenues.
- 2004: SAS Marketing Automation V4 released.
- 2007: $2.15 billion in revenues.
- 2012: SAS is largest market-share holder in the advanced analytics segment.
- 2013: $3.02 billion in revenues. The shift to SaaS begins.
- 2016: SAS Viya introduced optimized for public clouds (Azure, GCP, AWS).
- 2020: SAS Strengthens cloud offerings with Microsoft as partner.
- 2023: SAS Customer Intelligence 360 launched in AWS Marketplace.

Flow is messy because orgs are messy



Mapping dependencies

	TD	DC	PW	EP	AS	TP	DE	US	UE	QE	CE
Traditional Channels (TD)					●	●	●	●	●	●	●
Digital Channels (DC)				●	●	●	●	●	●	●	●
Planning & Workflow (PW)							●	●	●	●	●
Event Processing (EP)										●	●
Analytic Services (AS)							●			●	●
Target Processing (TP)					●		●			●	●
Data Engineering (DE)										●	●
User Services (US)									●	●	●
UI/UX Engineering (UE)										●	●
Quality Engineering (QE)											
Cloud Engineering (CE)											



Performing the FINE Flow Analysis

Team	Type	Flow	Imp	Needs	Energy
Traditional Direct (TD)	SA	4.2317	0.0349	0.1477	0.625
Digital Channels (DC)	SA	4.1844	0.0349	0.146	0.6111
Planning & Workflow (PW)	SA	4.3155	0.0349	0.1506	0.65
Event Processing (EP)	CS	2.0726	0.1455	0.3016	0.625
Analytic Services (AS)	CS	2.1077	0.1337	0.2817	0.5938
Target Processing (TP)	CS	2.7429	0.0807	0.2214	0.6071
Data Engineering (DE)	PF	1.5131	0.3397	0.514	0.7778
User Services (US)	CS	2.5593	0.1036	0.2651	0.6786
UI/UX Engineering (UE)	EN	1.5269	0.1716	0.262	0.4
Quality Engineering (QE)	EN	0.7383	0.6306	0.4656	0.3438
Cloud Engineering (CE)	EN	0.7271	0.6306	0.4585	0.3333

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Type = Classification (From Graph Centralities)

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$$\text{Flow} = \sqrt{\text{Energy} / \text{Imp}}$$

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Imp = Page Rank

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$\sqrt{\text{Energy x Imp}} = \text{Needs}$

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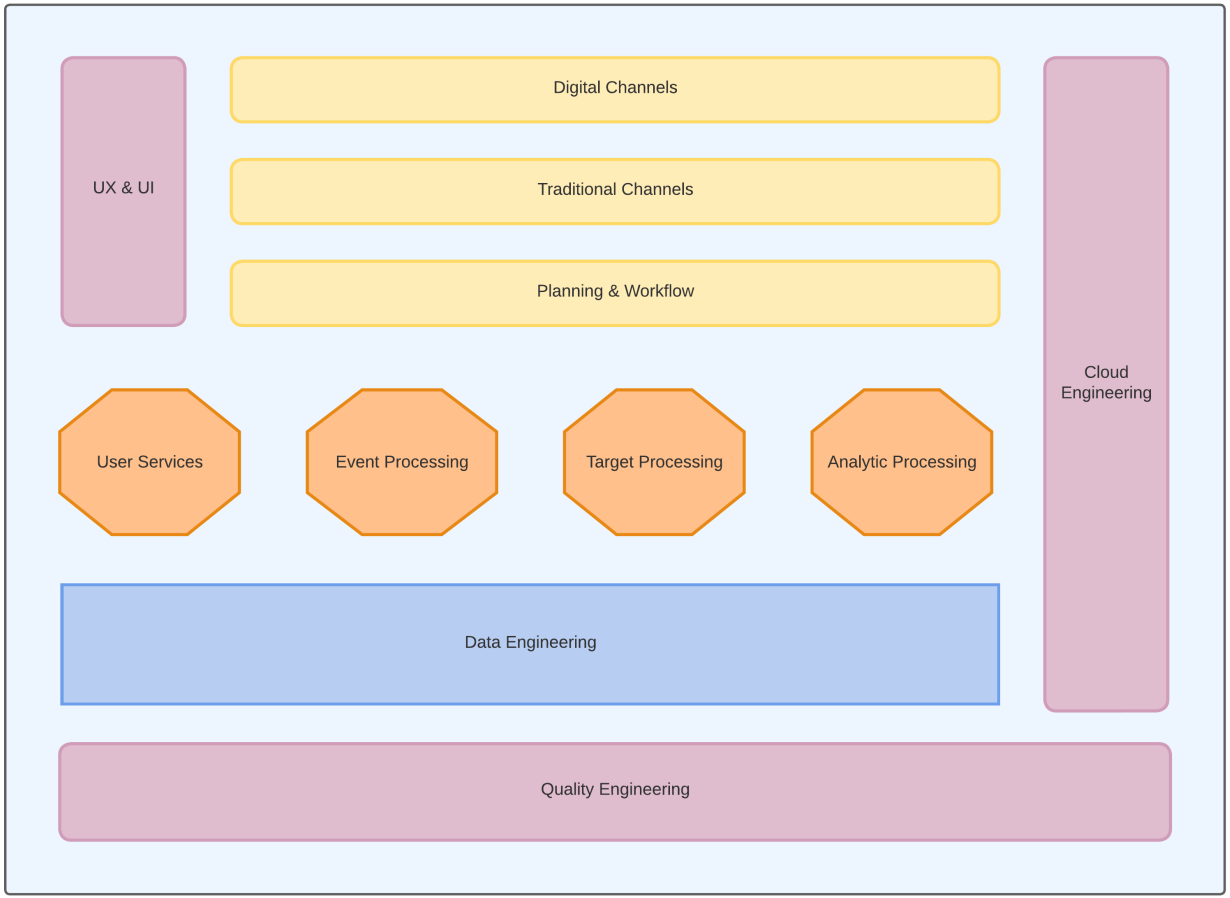
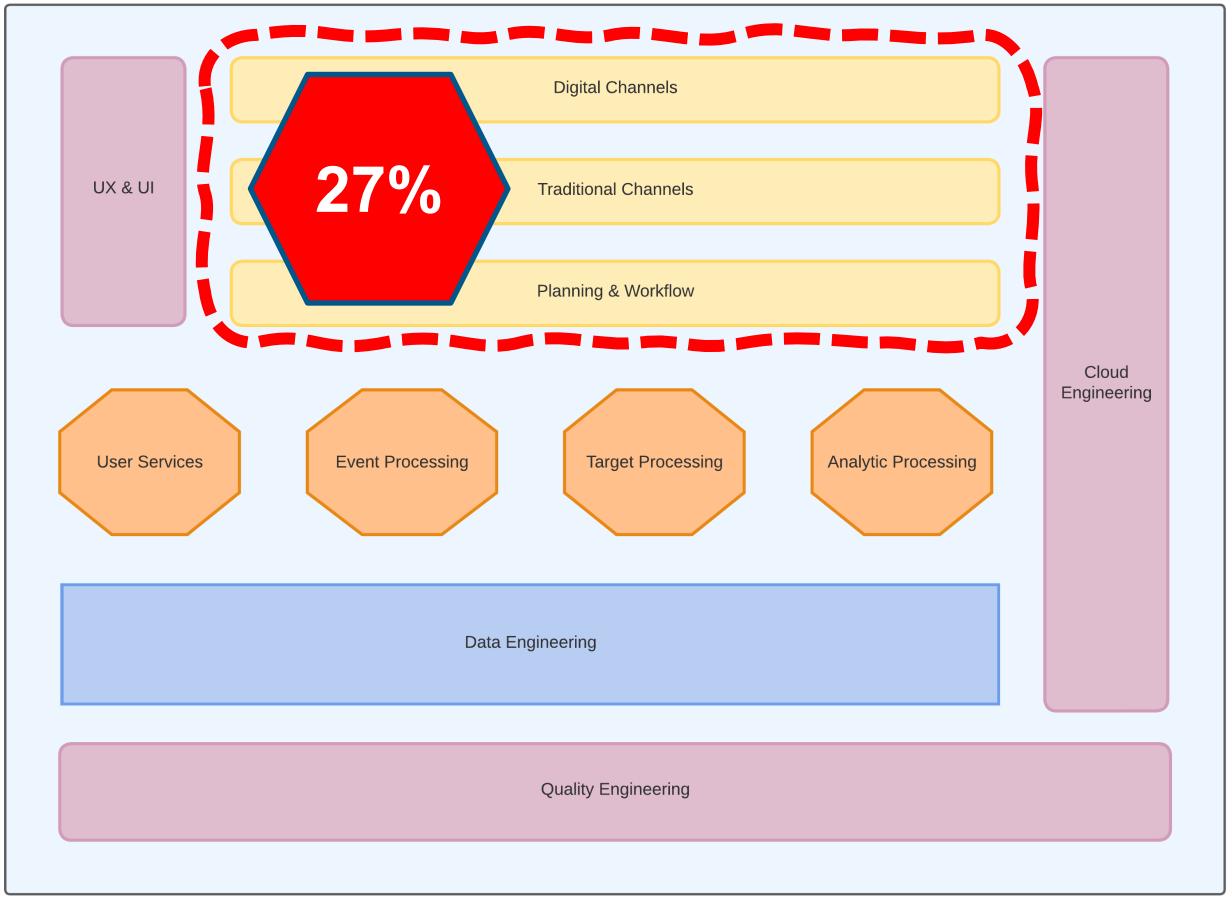
Cognitive Load (Ave. Cog. Slope) = Energy

Assert the existing Team Toplogy



Challenge the existing Team Toplogy



Maximize for Flow with VSRA

- Create stronger identities amongst the teams.
- Separate out clearer responsibilities.
- Produce higher degrees of autonomy.
- Build well defined interaction paradigms and communication channels with other teams.
- Focus on stream-aligned teams as the priority.
- Reduce the number of complex sub-systems.
- Amplify value with close attention to platform.
- Ensure enabling teams are focused on facilitation.
- Model Flow Entropy using FINE to look for resiliency weak-spots.
- Experiment by running FINE analysis of any potential changes.

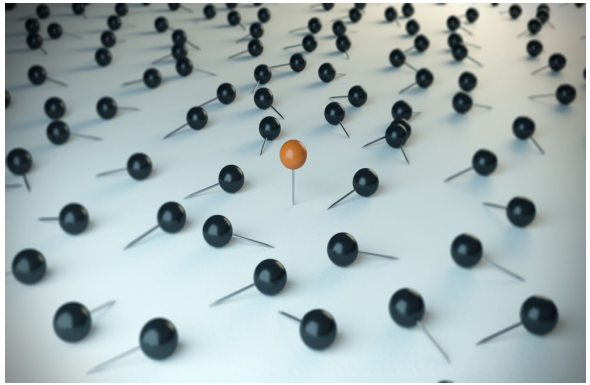
Use VSRA to focus on outcomes

"We've delivered these net new revenue generating capabilities, absolutely when we said we were going to deliver them on time. So really a lot of confidence building [within the business]."

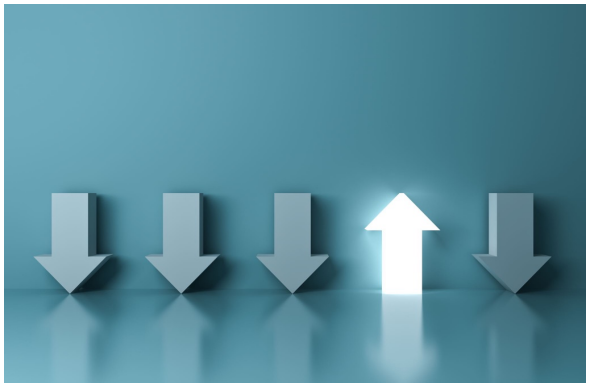
Mike Blanchard – VP of Customer Intelligence at SAS

What feedback have we had on VSRA so far?

The four key areas of interest in VSRA (so far...)



Agile Organizational Change Management



Optimized Continuous Improvement

Cognitive Load Measurement/Analysis

Team Identity Alignment

So what is next…

- Pilots – some underway, we would like more
- Feedback and results – The good, the bad AND the ugly
- Case studies – Why VSRA was used, how you used it and what it gave you
- Advance the FINE Flow Toolkit

About the Presenters

Stephen Walters - EMEA Field CTO, GitLab

Stephen Walters has been in the IT industry for over 30 years and is an extensively experienced Subject Matter Expert in Value Stream Management, DevSecOps, DevOps, ALM, SDLC and IT4IT, with management & consultancy experience across end-to-end IT disciplines. Currently also operating as an Ambassador for the DevOps Institute and an Influencer in the Value Stream Management Consortium, he has an interest in all things DevOps. Certified in Value Stream Management, DevOps, SAFe, CMMI, ITIL, TOGAF and Prince2, Stephen is currently implementing leading edge thinking into Value Stream Management at GitLab to enhance the complete DevOps experience.

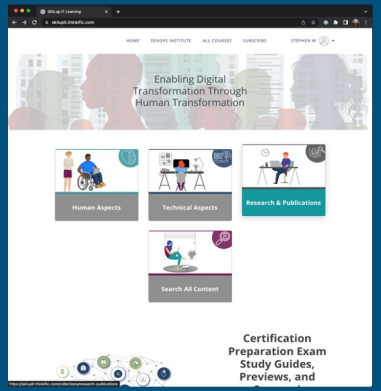
https://www.linkedin.com/in/1stephenwalters/

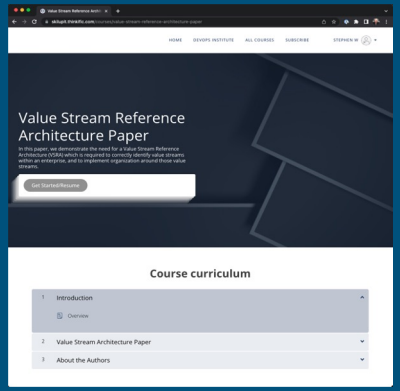
Dr. Craig Statham - Chief Software Architect, SAS Customer Intelligence Solutions

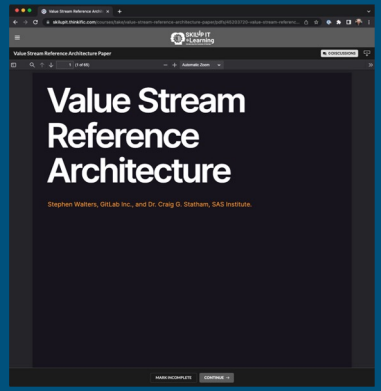
Dr. Craig Statham is the Chief Software Architect in the Customer Intelligence division at SAS Institute. He holds a Ph.D. from the UK's Liverpool John Moore's University and has been involved in software development for over 35 years. The majority of his career has been spent in senior management roles helping organizations and teams to develop cutting edge solutions to some of the most analytically demanding IT projects. He has worked across industry verticals including manufacturing and data science. A keen advocate for education, Dr. Statham has also served in an advisory capacity to National Academy Foundation accredited schools in helping educators bring forth the next generation of IT professionals.

https://www.linkedin.com/in/craig-statham/

Download The Paper - Now!

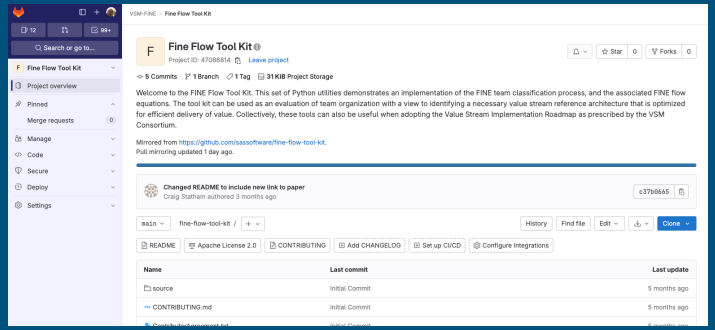




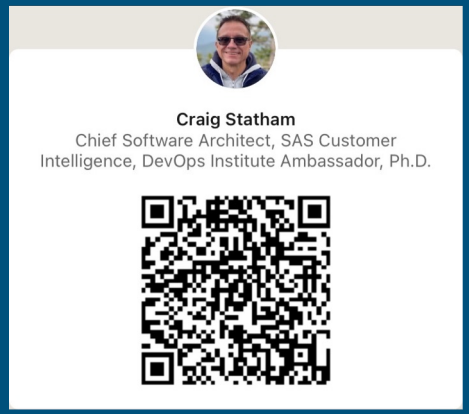


https://skilupit.thinkific.com/courses/value-stream-reference-architecture-paper

Download The FINE Flow Toolkit- Now!



https://gitlab.com/vsm-fine/fine-flow-tool-kit



Thank you