

# Technology Department

Q1 FY20  
Ops Review  
Tuning Session

# Platform Evolution



In order to have the ability to better leverage the work and scope of the MPT Platform Evolution — artificial intelligence is becoming ever more critical to secure and enhance content, while ensuring safety for all our readers, and continue the fight against bad actors. We need to have a modernized, instrumented, and efficient platform to enable next generation engagement across the globe.

We have a few highlights in this effort to date: creating a more modern event platform as the foundation for the data driven understanding of our ecosystem; forming the new Engineering Productivity team that is focusing on developer instrumentation; and building even more artificial intelligence infrastructure tooling that includes ORES and natural language processing, focusing on search and content integrity.

However, we have challenges — we need to more clearly define what we actually need to measure and reduce the single points of failure in our front line defenses.

# Platform Evolution



MTP Outcomes	Key deliverables:	MTP Metrics	Y1-Goal	Q1-Status
We will build tooling for internal and external development and reuse of code and content	Content Integrity Machine Learning (ML) Infrastructure Technology and Product Partnerships	<p>Artificial Intelligence (AI) tools and workflows are utilized against 25% of all content</p> <p><b>Baseline:</b> All English Wikipedia content uses Artificial Intelligence tooling</p>	10%	0%
		<p>25% of content (consumed or created) uses structured data</p> <p><b>Baseline:</b> Wikidata: 234 million pageviews with 59 million pages in the month of July</p>	<b>Page Views are not the right measurement here.</b>	<b>207 million pageviews, 62 million pages</b>
		<p>25% increase in rich media content created and consumed across projects</p> <p><b>Baseline:</b> Commons: 516 million pageviews; 72 million pages in the month of July</p>	<b>Page Views are not the right measurement here.</b>	<b>560 million pageviews; 74 million pages</b>
		Partnerships (see Advancement deck)		



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# Platform Evolution



## MTP Outcomes

A secure and sustainable platform that empowers a thriving developer community with the ease of software-as-a-service tooling

## Key deliverables:

Reduce complexity of the platform

## MTP Metrics

25% increase in code quality  
**Baseline:** to be determined

Increase in developer satisfaction measured and 20% decrease in outstanding code reviews  
**Baseline:** Developer satisfaction: 3.8 / 5  
**Baseline:** Code Review: 59.22 days

5% increase in growth and retention of technical communities  
**Baseline:** <N/A>

## Y1-Goal

5%

## Q1-Status

**Setting baseline**

4%

**Next survey update in January**

What constitutes membership?

**N/A**



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# Drill Down: Platform Evolution



## The situation

The notion of “reducing complexity” of a massive, worldwide distributed system is challenging at best.

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Increasing consumptions of Structured Data requires technical infrastructure work to enable those new Structured Data needs.

## The impact

One could argue that given all we want to accomplish by 2030, our platform will get even **MORE** complex (not less).

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In order to start the Structured Data infrastructure work, and we need to prioritize the product, features, and use cases for which to build this infrastructure to serve.

## Recommendation

We can make progress: improve efficiencies, separation of concerns, better contracts between systems, modernizing the architecture.

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Fund a team to build out a Structured Data Roadmap.

# Content Integrity



## Objective:

**Secure and protect the platform and our communities, in the free knowledge movement against the spread of disinformation and bad-actor risk**

A portion of the high priority work delivered includes:

- A thorough [study](#) of patrolling on Wikipedia ([report and recommendations](#))
- A comprehensive literature review of disinformation and Wikipedia ([meta.wikimedia.org/wiki/Research:Disinformation\\_Literature\\_Review](https://meta.wikimedia.org/wiki/Research:Disinformation_Literature_Review))
- A comprehensive study of readers' engagement with citations
- Development and integration of OAuth 2.0 as a primary means of limiting activities of bad actors

As a result, we've seen...

- Increased activity and conversations about how to improve the integrity of content on Wikimedia projects

## Full-time equivalent budget

Budget: 10.6 FTE

Actual: 8.4 FTE



## Key Results

Create 2 security *governance* services: risk management and security awareness

Create 2 security *engineering* services: application security and privacy engineering

**Baseline:** 0

Develop a means to limit and disable the API access of bad actors without interrupting the access of other contributors, integrate it into our platform, and measure the effect

**Baseline:** 0%

**Y1-Goal**

4

**25%**

100%

**20%**

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# Content Integrity



## Objective:

**Expand quality control Artificial Intelligence (AI) tooling to underserved communities, to make fundamental services available for consumption by those tools that support the growth of high quality content and the maintenance of quality standards**

A portion of the high priority work delivered includes:

4 new quality control models were added on Wikipedia:

- Japanese, Galician, Swedish, and Chinese

Made 4 model improvements for edit and article quality:

- English, Hungarian, Finnish, and Serbian

## Full-time equivalent budget

Budget: 10.6 FTE

Actual: 8.4 FTE

## Key Results

Deploy 8 new quality control AI tools to Wikimedia Projects, increasing availability of AIs for tooling

**Baseline:** 0

Recruit 4 new campaign coordinators to advertise the availability of the new AI tools, increasing rate of consumption of those tools

**Baseline:** 0

Improve 3 AI tools in a statistically significant way based on community feedback, ensuring utility of AIs for quality control work

**Baseline:** ongoing

**Y1-Goal**

8

**4**

4

**0**

3

**4**



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# Machine Learning Infrastructure



## Objective:

**Consolidate and simplify workflows — building, training, and deploying models to enable machine learning aided product augmentation and research.**

Saying “no” to proprietary code in production is hard work. We have worked with AMD GPUs to provide an environment in which machine learning models can be trained, in order to be in line with our open source values. This was a four team effort that was accomplished in Q1.

*Acronym note: Advanced Micro Devices (AMD) and Graphics Processing Units (GPU)*

## Full-time equivalent budget

Budget: 3.3 FTE

Actual: 2.1 FTE



## Key Results

	Y1-Goal	Q1-Status
Deploy a fully open sourced solution for GPU-enhanced computation infrastructure, improving training times of algorithmic image analysis models by 50% <b>Baseline:</b> 0	100%	100%
Speed up model training by providing models with easier access to feature data through a feature store. <b>Baseline:</b> 0	100%	<b>Q3 work</b>

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# Machine Learning Infrastructure



## Objective:

**Enable our communities to more easily detect the hidden algorithmic biases in current Machine Learning (ML) solutions**

A portion of the high priority work delivered includes:

- Jade API is fully implemented and we are now moving into doing user interface (UI) work.
- Secondary integrations are pending.

## Key Results

Build, deploy, and establish baseline metrics for infrastructure that enables Wikipedians to correct the algorithmic predictions around quality of content to 4 wikis.

**Baseline:** 0%

Increase the rate of community-based false-positive reporting in damage detection models by 100 times

**Baseline:** 1 report per day

Y1-Goal	Q1-Status
100%	33%
100%	0%

## Full-time equivalent budget

Budget: 3.3 FTE

Actual: 2.1 FTE



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# Reduce Complexity of the Platform



## Objective:

**Build a reliable, scalable, and comprehensive platform for building services, tools and user facing features that produce and consume event data.**

A portion of the high priority work delivered includes:

- Migrated 100% percent of production and analytic events to the new EventGate platform; with **peaks of 2,000 events per second**.

As a result, we have been able to deprecate older services, simplify our code base, and have a much more flexible system.

## Full-time equivalent budget

Budget: 24.4 FTE

Actual: 26.2 FTE



## Key Results

5% of analytics and production events migrated to the new event platform.  
*The percentage of production and analytics events will increase every quarter until older systems can be fully deprecated.*

**Baseline:** 1%

**Y1-Goal**

5%

**Q1-Status**

**100% of production events and 5% of analytics events migrated**

Client Error Logging is deployed to 1 wiki and error stats are displayed on our operation dashboards.

**Baseline:** 0

1

**0 (Q2)**

By June 2020, all production and consumption of **new event data** originated in our websites is flowing through this new event platform.

**Baseline:** 0%

100%

**0%**

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# Increasing Developer Productivity



We are working to increase Developer Productivity on two fronts:

1. Improving our tooling and processes
2. Improving our architecture

The first enables us to ship code more quickly and with greater confidence.  
The second enables us to implement features faster and with fewer bugs.

We are also developing metrics in these areas, while instrumenting our tools and code in order to measure our progress.



# Reduce Complexity of the Platform →

## Objective:

**We will improve developer efficiency for all developers: new and experienced, internal and external.**

Improving our developers' day-to-day effort is a force-multiplier for all the work they do in supporting the Foundation and the Movement's goals.

A portion of the high priority work delivered includes:

- Formed the Code Review workgroup to help assess the current state of code reviews, and they have identified three key areas to improve.
- Completed the porting of Parsoid to PHP — one step closer to having only one parser (to reduce overall maintenance and bugs)

## Full-time equivalent budget

Budget: 24.4 FTE

Actual: 26.2 FTE

## Key Results

Determine a baseline set of metrics to assess internal developer efficiency, including time to first merge (new devs), time to first review (new devs), average time to merge (fully ramped devs), and average time to review (fully ramped devs), by end of Q2.

**Baseline:** Determining baseline

Improve all baseline developer efficiency metrics by 10% by the end of the year.

**Baseline:** 3.8/5 or 76%

Improve Cycle Time by 10% year over year.

**Baseline:** 11.6 days

**Y1-Goal**    **Q1-Status**

4	0
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# Reduce Complexity of the Platform



## Objective:

**Enable engineering-wide quality and testing strategy, tooling, education, and personnel.**

A portion of the high priority work delivered includes:

- Quality & Test Engineering team formation and formalization of testing practices across the Foundation.
- Implemented API integration testing which will allow us to reduce the number of breaking changes while making large architectural changes.

## Full-time equivalent budget

Budget: 24.4 FTE

Actual: 26.2 FTE

## Key Results

An explicit set of unit, integration, and system testing tools are available for all supported engineering languages by the end of the fiscal year.

**Baseline:** 0%

## Y1-Goal

Three recommendations

**17%**

Evaluate alternative system level testing tooling options and provide a single recommendation by the end of Q2.

**Baseline:** 0%

Recommendation is available

**50%**



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# Reduce Complexity of the Platform →

## Objective:

**Maintain and evolve developer tooling, testing infrastructure, validation environments, deployment infrastructure, and supporting processes.**

Some of the high priority work delivered includes:

- Creation of the new Continuous Integration (CI) "Code Health" pipeline. This pipeline is responsible for running a proof of concept deployment of overall Code Health metrics.
- Started using the same deployment charts for local development and deployment
- Assisted with the migration of two services into the Deployment Pipeline and documentation

## Full-time equivalent budget

Budget: 24.4 FTE  
Actual: 26.2 FTE

## Key Results

Release Engineering and SRE teams create a plan to implement a Deployment Pipeline compliant CI system.  
**Baseline:** 0%

Maintain and improve the Continuous Integration and Testing services  
**Baseline:** Avg build time: 7 minutes

Developers have a consistent and dependable deployment service.  
**Baseline:** 1 issue per quarter

Reduce infrastructure gaps in the areas of backups, disaster preparedness, observability, infrastructure automation and team structure & support.  
**Baseline:** TBD

**Y1-Goal**    **Q1-Status**

100%	10%
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Reduce spikes in build time	<b>On track</b>
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Address new reports within 1 month	<b>On track</b>
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TBD	<b>TBD</b>
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# Supporting work

P-O15-D2

# Supporting wins: Q1

Data Center/Hardware Improvements: easier hardware procurement, more people on site to make changes

Traffic Caching progress: Sending and testing live requests

Established baseline research on gender usage amongst editors for some Wikipedia languages

PHP7 migration: Migrated all servers and completed a year long project

DDoS mitigation efforts

Parsoid: Migrated our modern parser into the platform, a key step in standardizing on a single parser

Kicked off Frontend Working Group collaboration with Product Dept

Wikimania Stockholm: Coolest Tool Award and helped support small communities with Small Wiki toolkits

Mentoring: 14 projects successfully completed in both Google Summer of Code (GSoC) 2019 and Outreachy Round 18.

7 projects being promoted in Outreachy Round 19

# Challenges: Q1

Hiring across a number of key roles

Single Points of Failure in critical front-line defenses (risk mitigation)

Onboarding a new Chief Technology Officer (CTO)

Technology Department vision and alignment



# Supporting themes: Q2

Improving incident response through better alerts, paging, and error logging

Self Service Infrastructure: Migrate new services, while integrating into Toolforge and upgrading

Establish an official Technology Blog to advocate for staff and community stories

Research Code Review practices to establish a common set of tools and practices

Finalize the minimum viable product (MVP) for the REST API with a Documentation Portal prototype

CTO team strategy and hiring

Product & Technology Department alignment



# Reflections to date

# Questions

