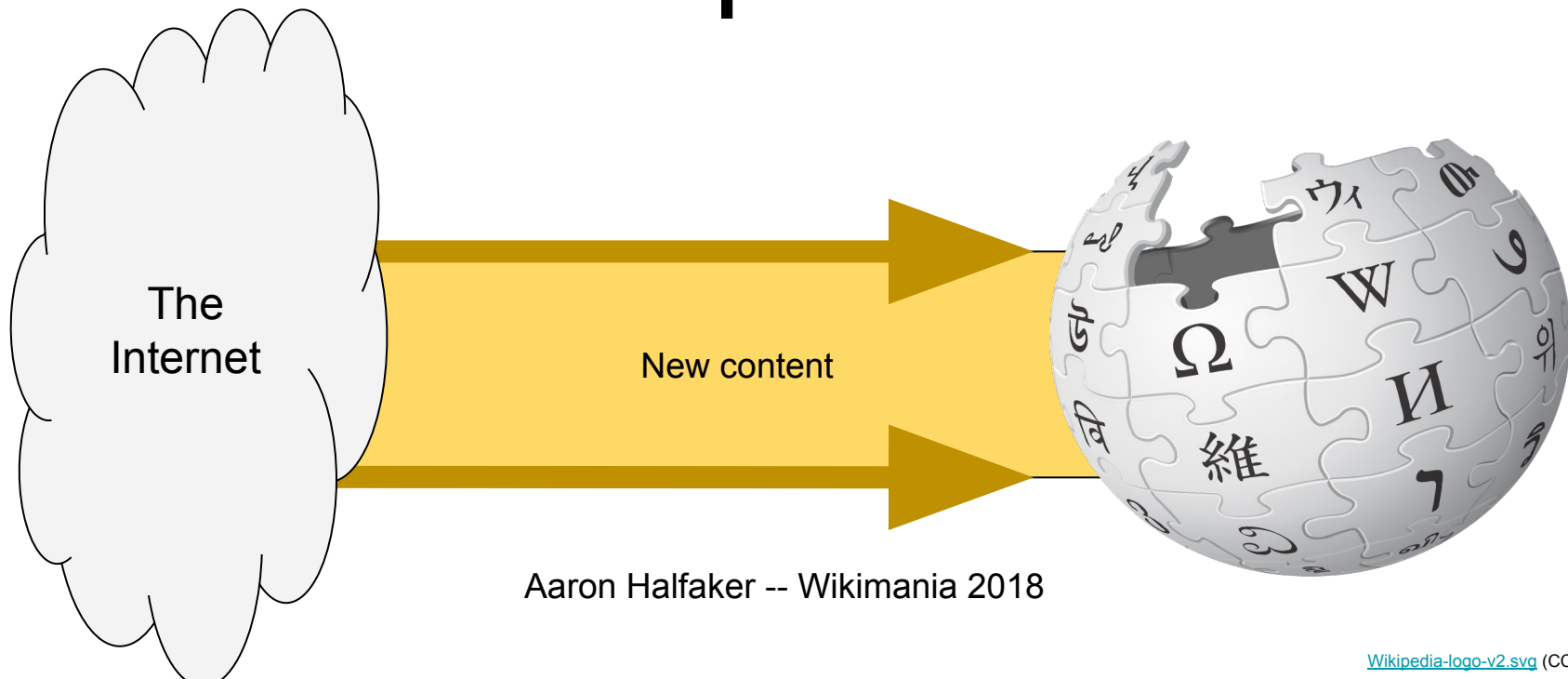


Using AI to keep Wikipedia open



Aaron Halfaker -- Wikimania 2018

Aaron Halfaker

Principal Research Scientist, Wikimedia Foundation

Think big. Measure what you can. Build better technologies.



[Halfaker, Aaron Sept 2013.jpg](#) (CC-BY-SA 3.0)

About me

Hi. I'm Aaron Halfaker. I'm a scientist. See [projects](#) and [publications](#) below. I've been a Wikipedian since 2008. I mostly build tools and run studies, but I make edits where I can. In 2011, I started working with the Wikimedia Foundation as a [research scientist](#). This is my staff account. See my volunteer account, [User:EpochFail](#), for my non-staff work.

My work

My job is to build understanding about and support for the socio-technical fabric of the Wikimedia movement. I tend to focus on our computer mediated spaces (Wikipedia, Commons, Wikidata, Wikisource, etc.) and quality dynamics (patrolling, curation, newcomer training, etc.)

See [The Rise and Decline](#) for an example of my research and [Revision scoring as a service](#) for an example of an experimental technology I'm actively working on.

Contact me

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iD

This user has the **ORCID identifier**:
0000-0001-8907-6367

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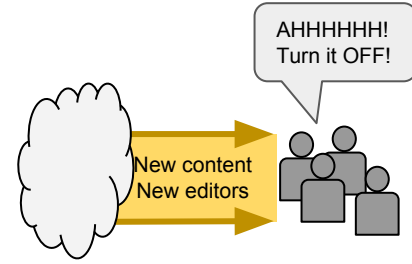
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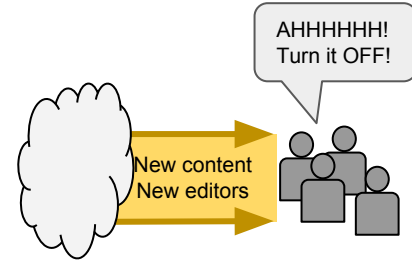
Think big. Measure what you can. Build better technologies.



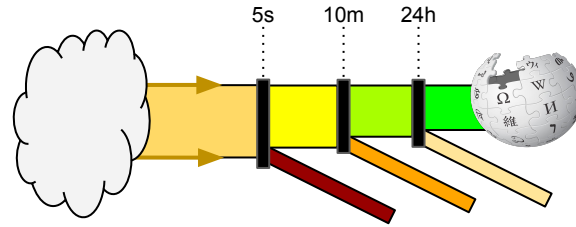
1. Openness vs. quality control



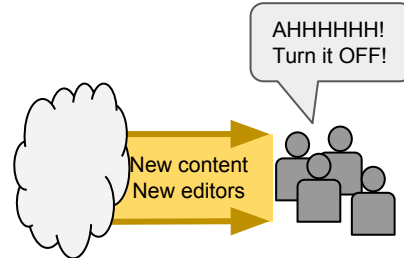
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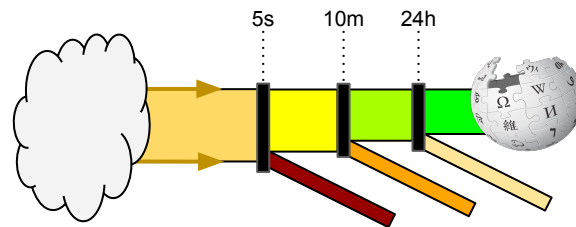
2. Scaling review process



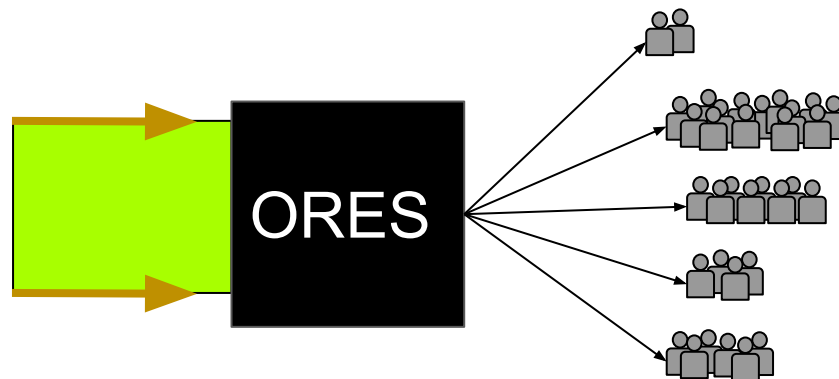
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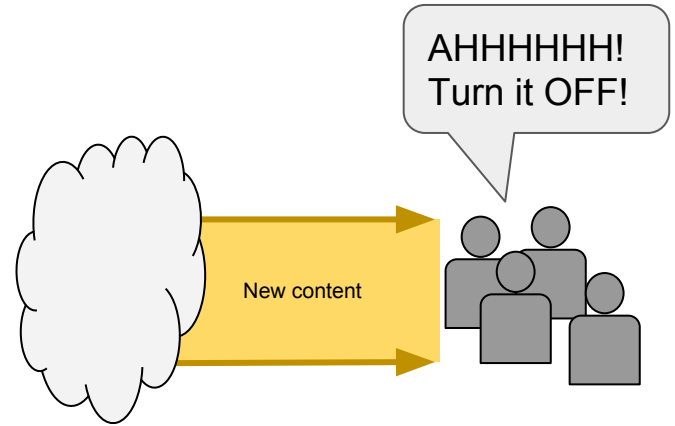


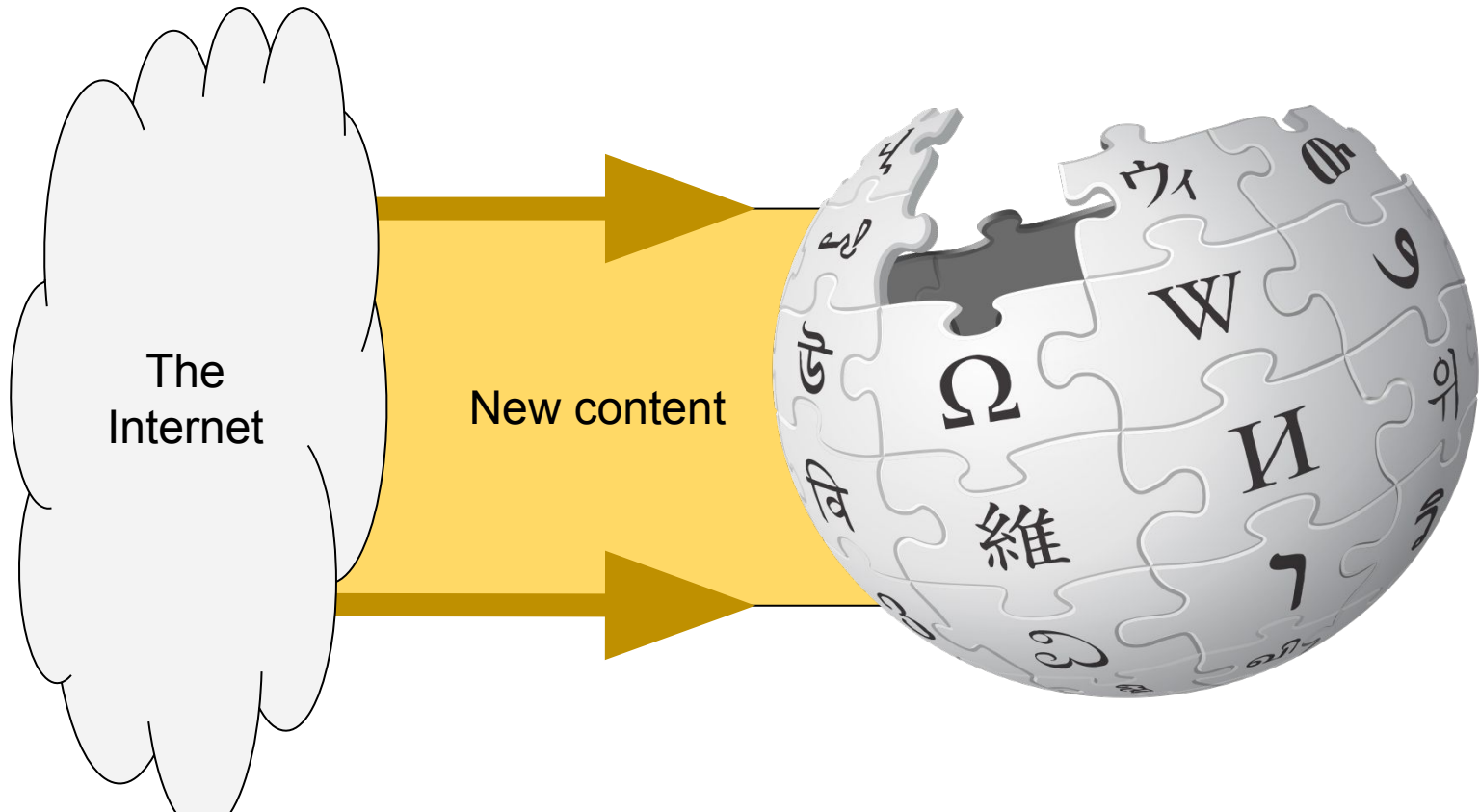
3. Using AI to re-shape new article review



Part 1

Openness vs. quality control





OMG NEW CONTENT (enwiki)

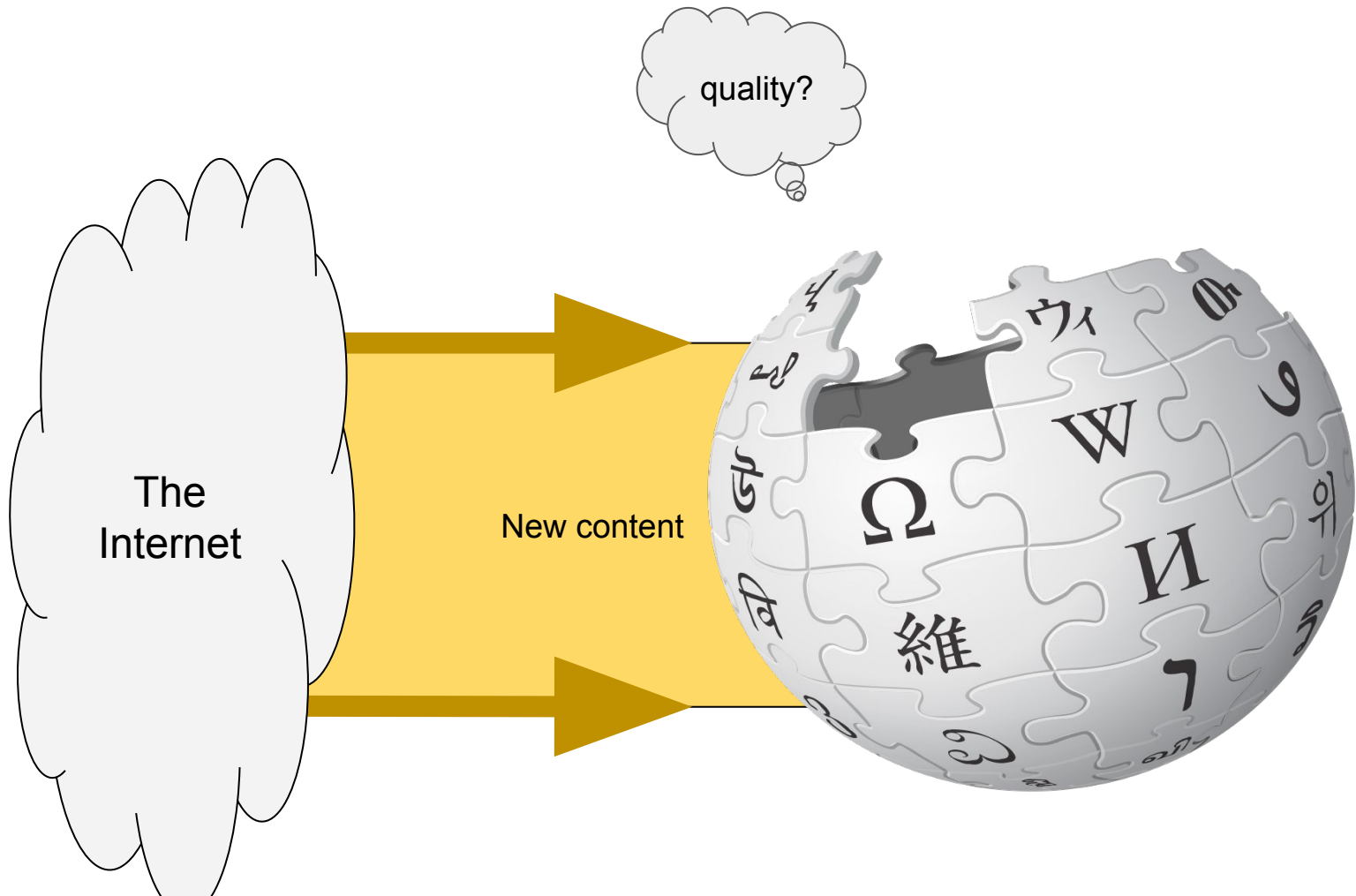
- 160k edits to review / day^[1]
- 1-2k new Article creations / day
 - ~40k drafts need review & 200 new / day^[2]
- 330k articles need cleanup^[3]
- 1600 new editors / day^[4]

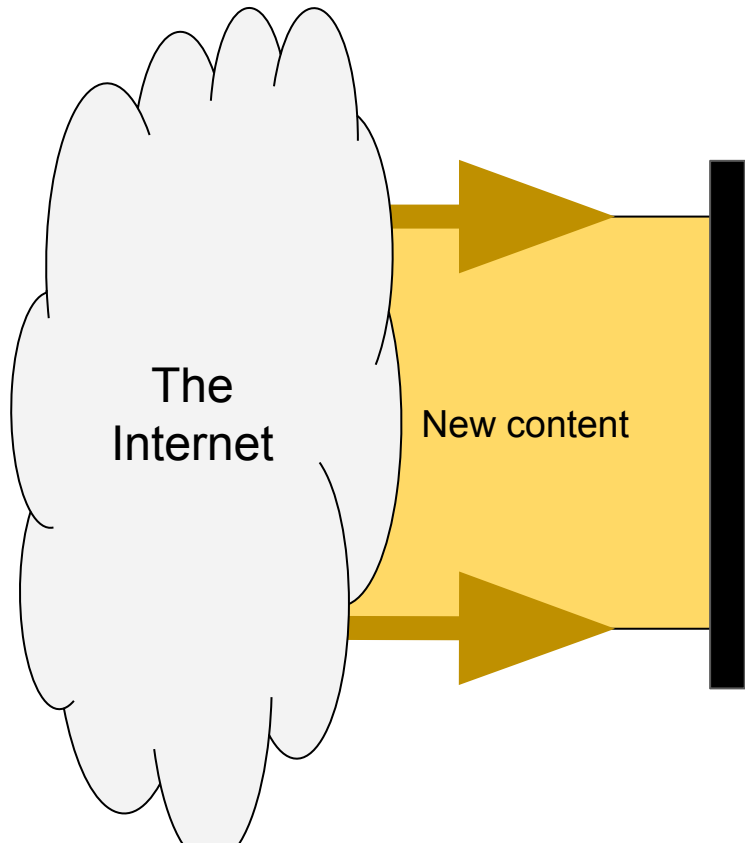
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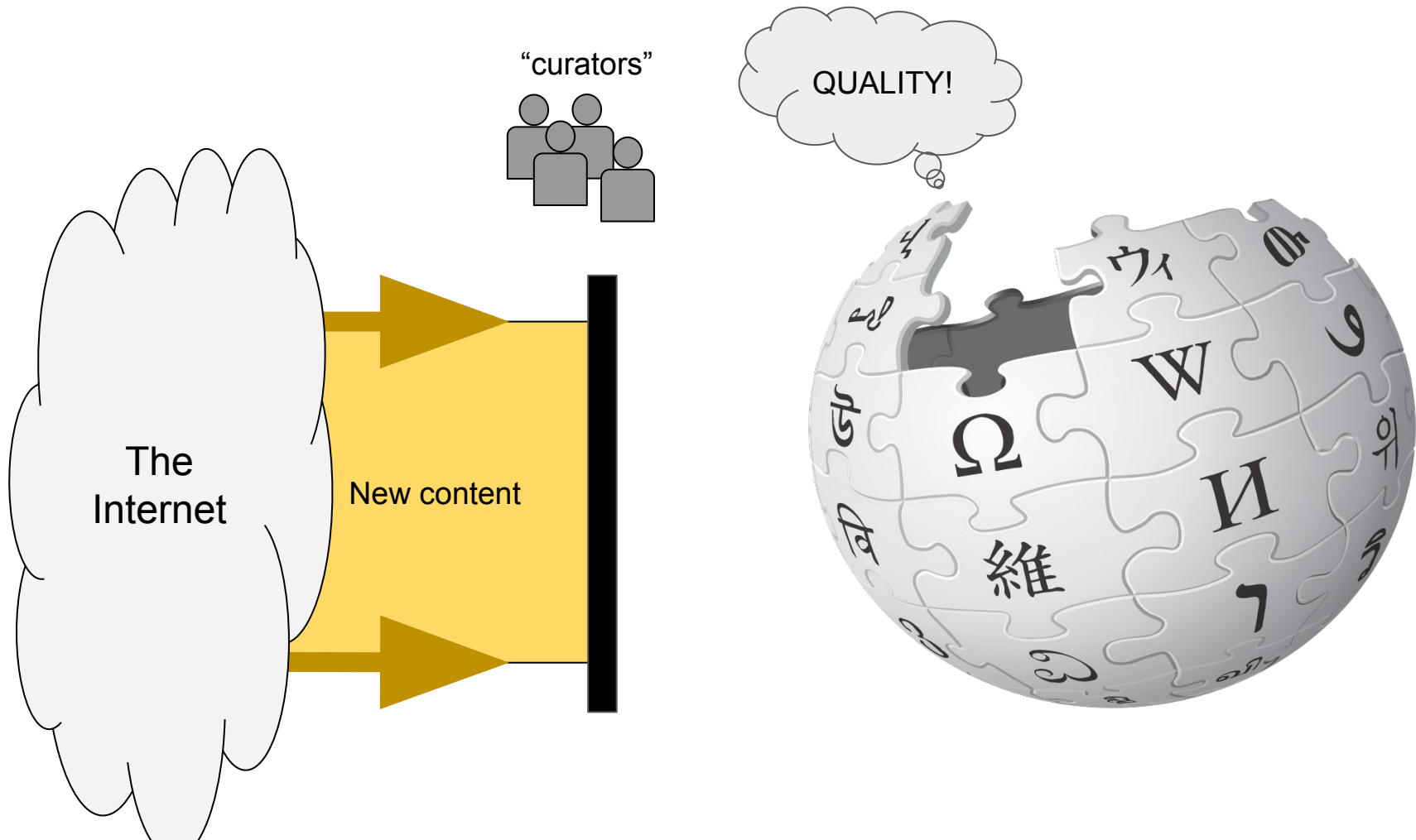
2. <http://quarry.wmflabs.org/query/4386>

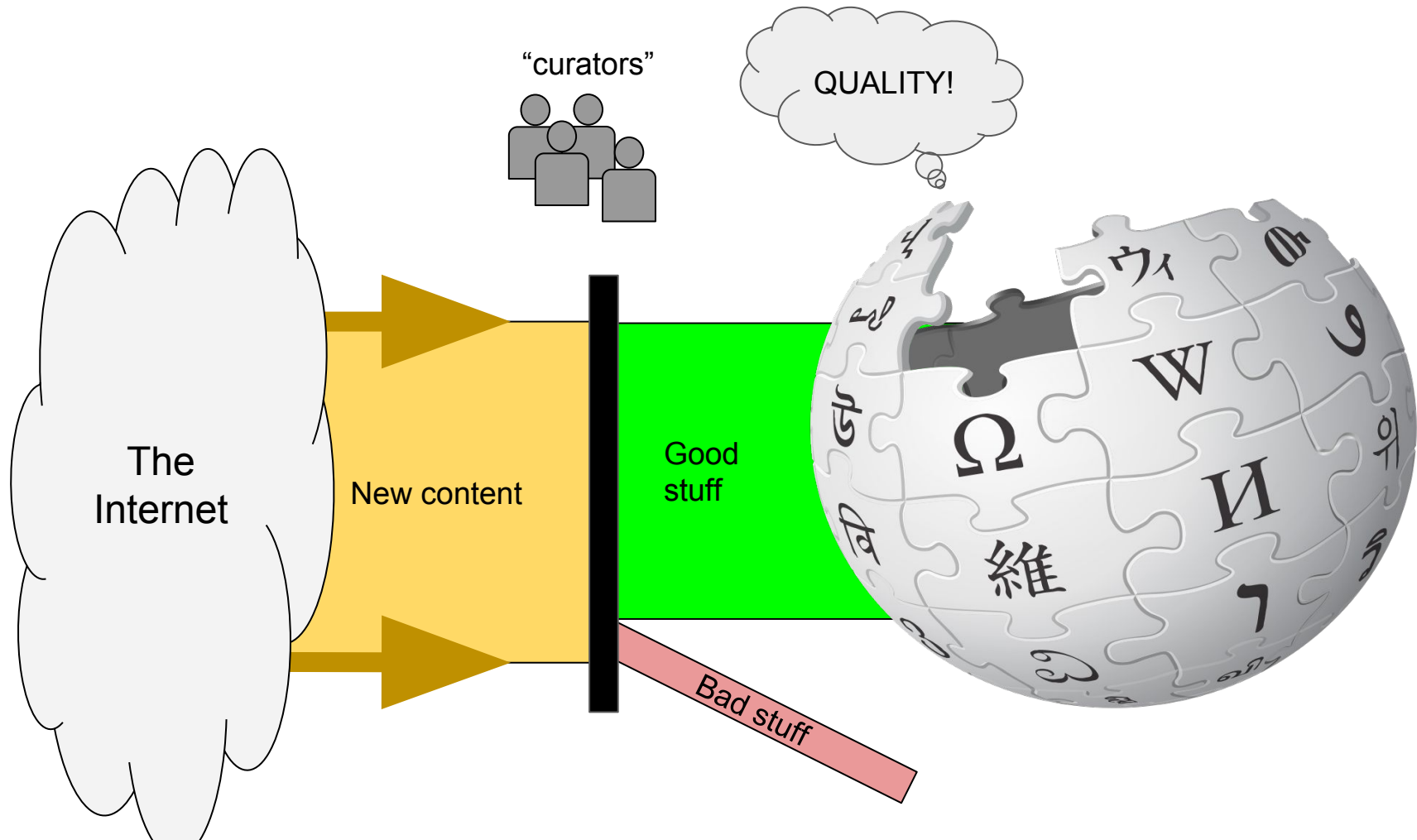
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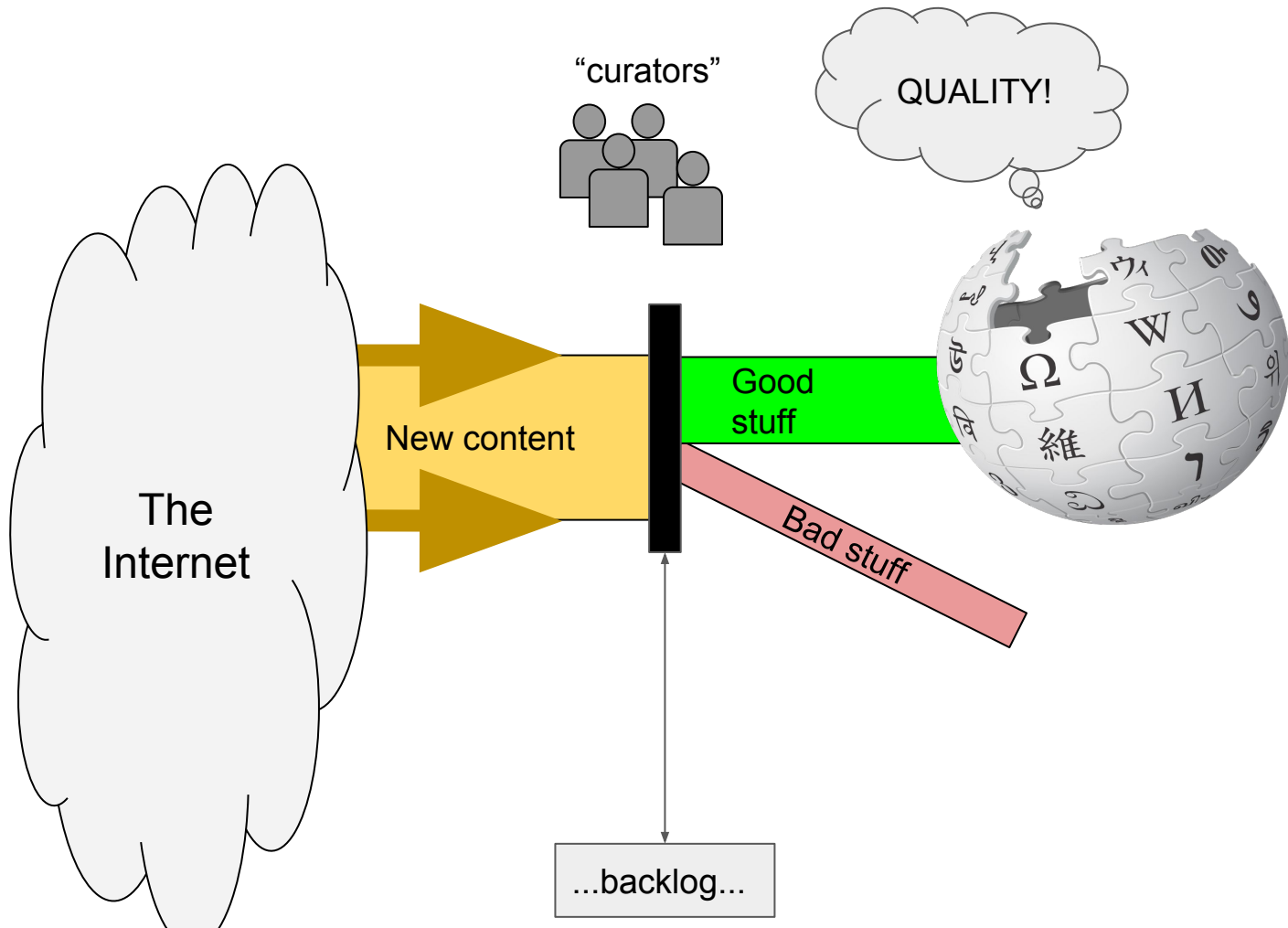
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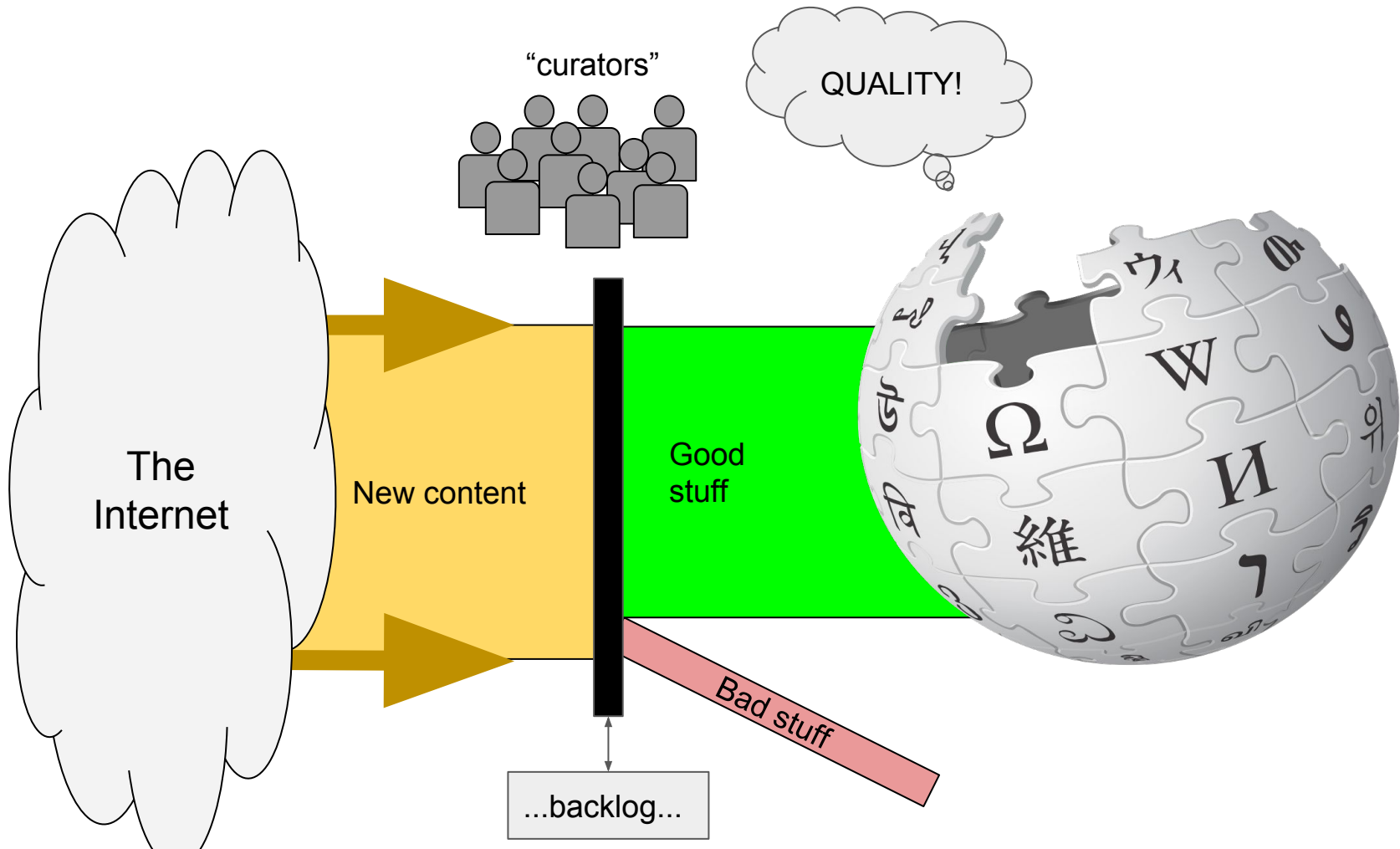


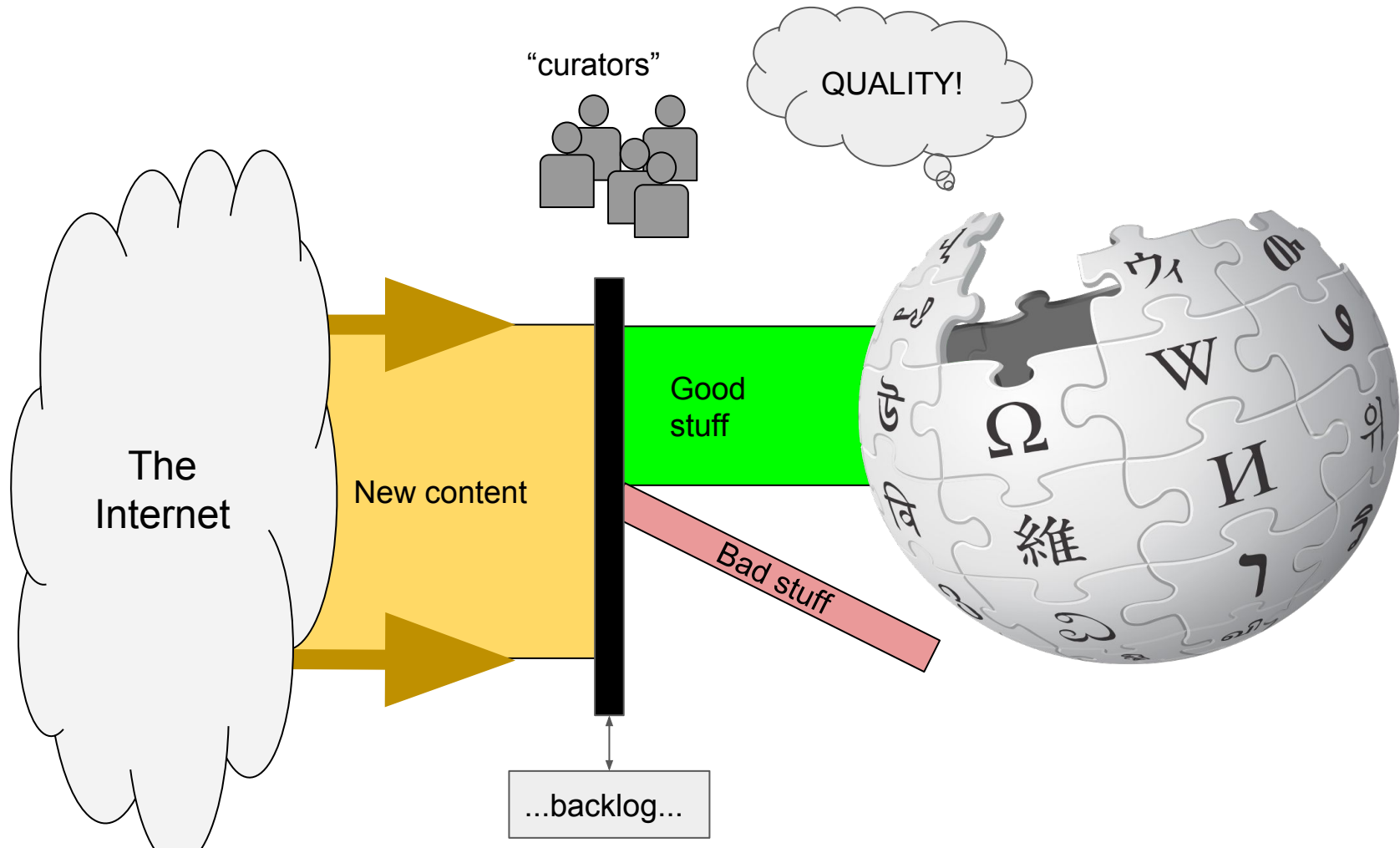


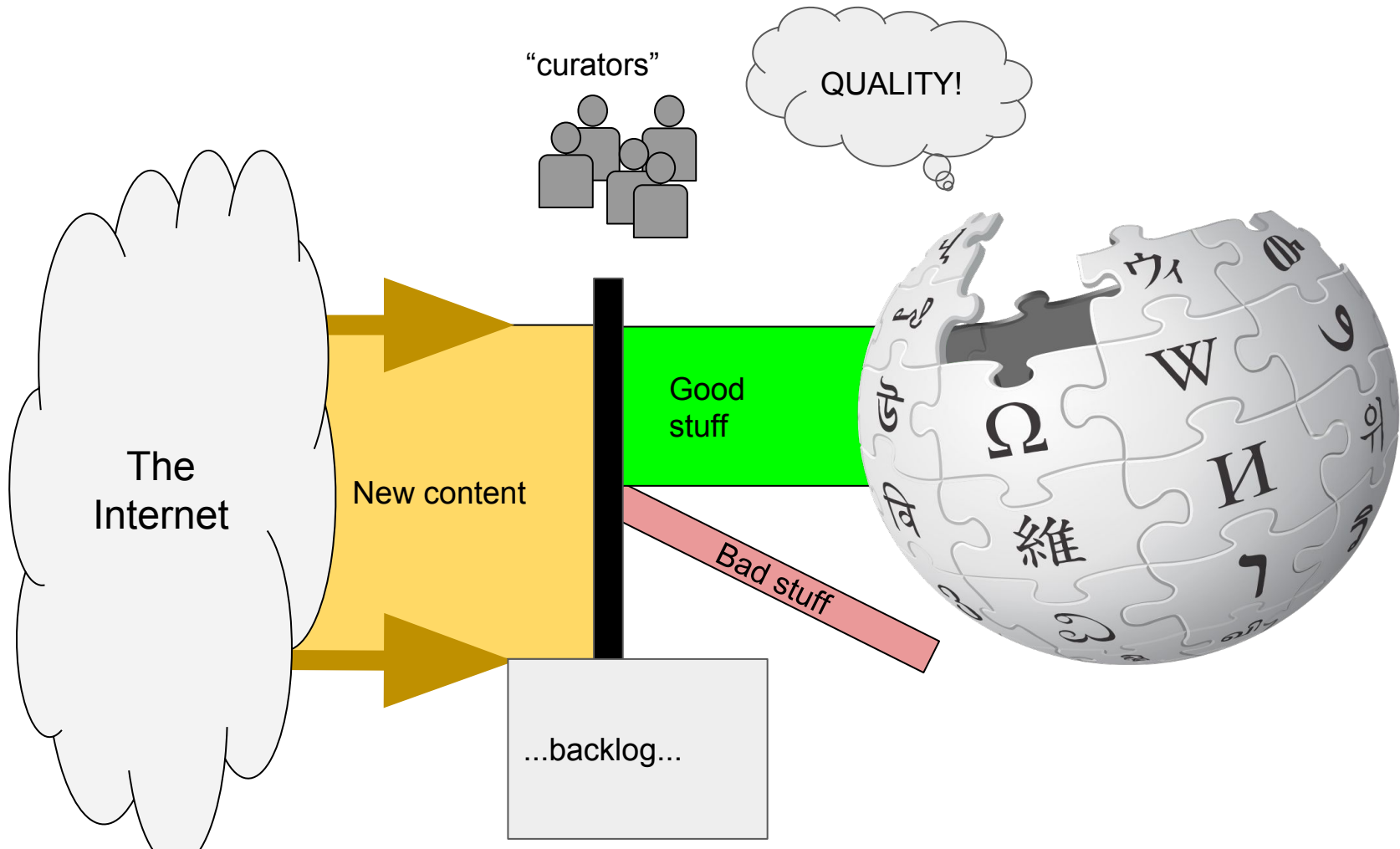


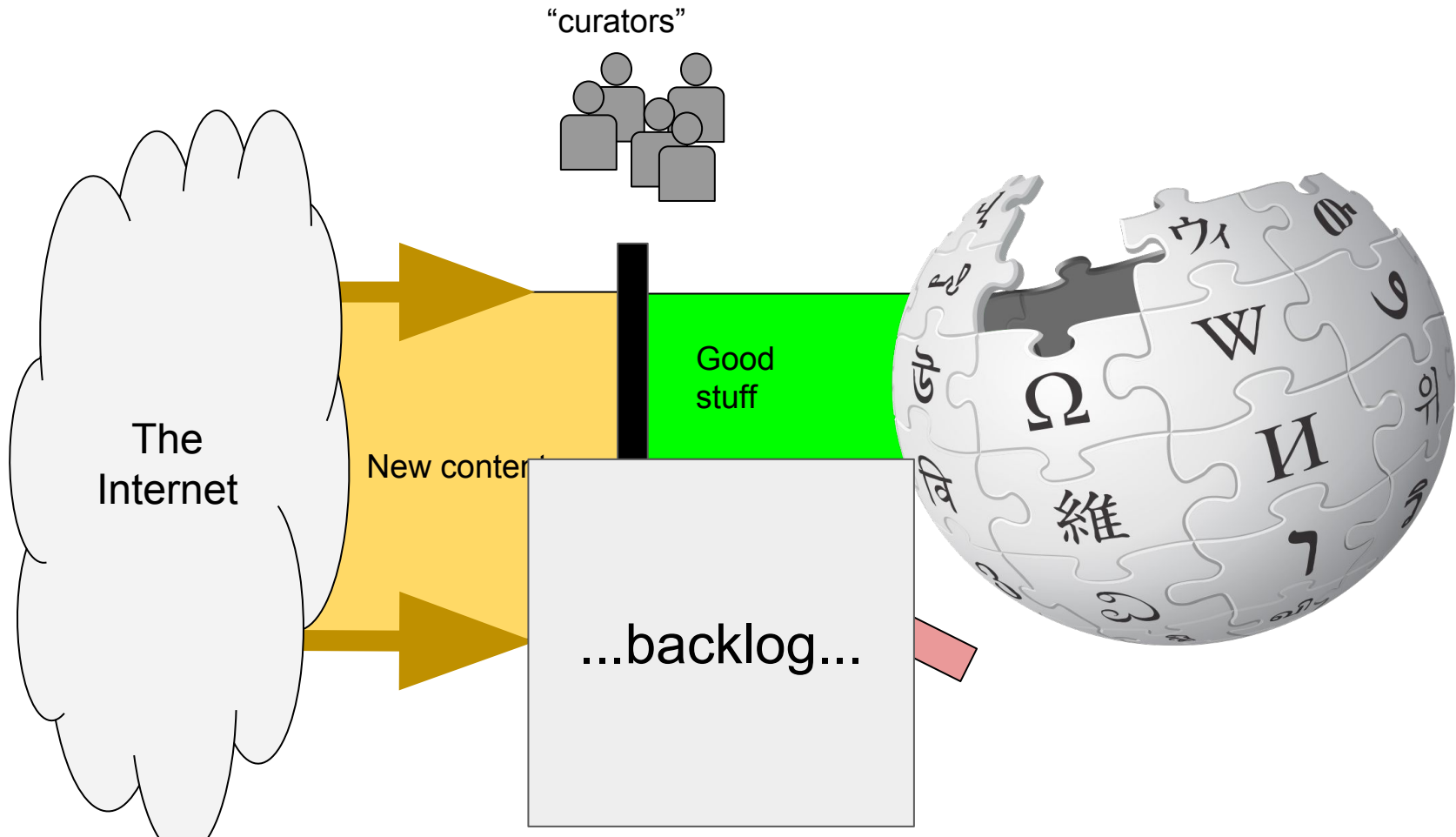


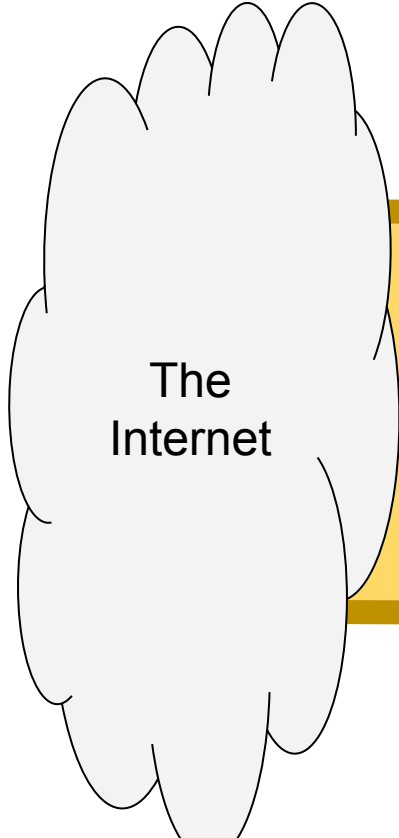








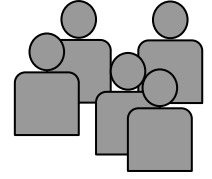




The Internet

New co

"curators"



AHHHHHH!
Turn it OFF!



BACKLOG!



In summary...

- Few curators + Small amount of new content →
Small backlog

In summary...

- Few curators + Small amount of new content → Small backlog
- More curators + Large amount of new content → Small backlog

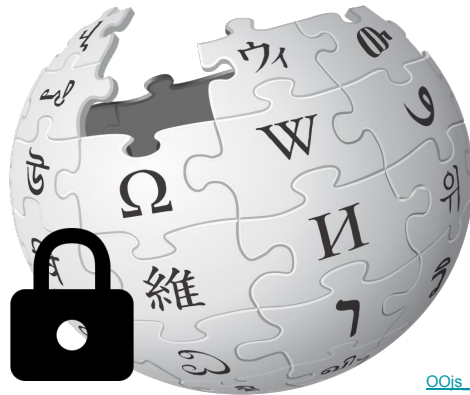
In summary...

- Few curators + Small amount of new content → Small backlog
- More curators + Large amount of new content → Small backlog
- More content than curators can handle →

Pressure to close the wiki



If we don't get this right, it's very tempting to close Wikipedia off.





Wikipedia:Autoconfirmed article creation trial



From Wikipedia, the free encyclopedia



This page in a nutshell: Until 14 March 2018, [autoconfirmed status](#) is required in order to create new articles, as part of a six-month trial. This page is a centralized location to help plan the trial. For an original proposal, please see [this archive](#).

[Shortcut](#)

WP:ACTRIAL

In April 2011, a [proposal](#) was put forth to require [autoconfirmed status](#) in order to create articles. (Previously only registration had been required.) In May 2011, the proposal was closed with a consensus that a trial should be implemented to test out this new idea. A [second RfC](#) was then opened to determine duration of the interventional phase of the trial, and it was decided that the interventional phase should run for 6 months, and then the changes should be reversed for a period of one month while their effects are discussed. The Wikimedia Foundation prevented the idea from going forward in 2011, but in June 2017 [agreed](#)^[] to conduct and help implement ACTRIAL as a research experiment. In July 2017, after a post on his talk page, Jimmy Wales issued a nonbinding [statement](#)^[] regarding ACTRIAL supporting the use of limited trials to gather data to make Wikipedia policy decisions.

The discussion on the duration and terms of the assessment of the interventional phase was announced at the Village Pump and at Centralized Discussion, and was officially closed by [independent admin summary 18 August 2011](#)^[], in favour of the proposal with "... a clear consensus for a six-month trial, followed by a one-month period of discussion to determine the trial's effects.



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[Shortcut](#)
WP:ACTRIAL

#1 reason listed:

“This would reduce the workload on New Page Patrollers”

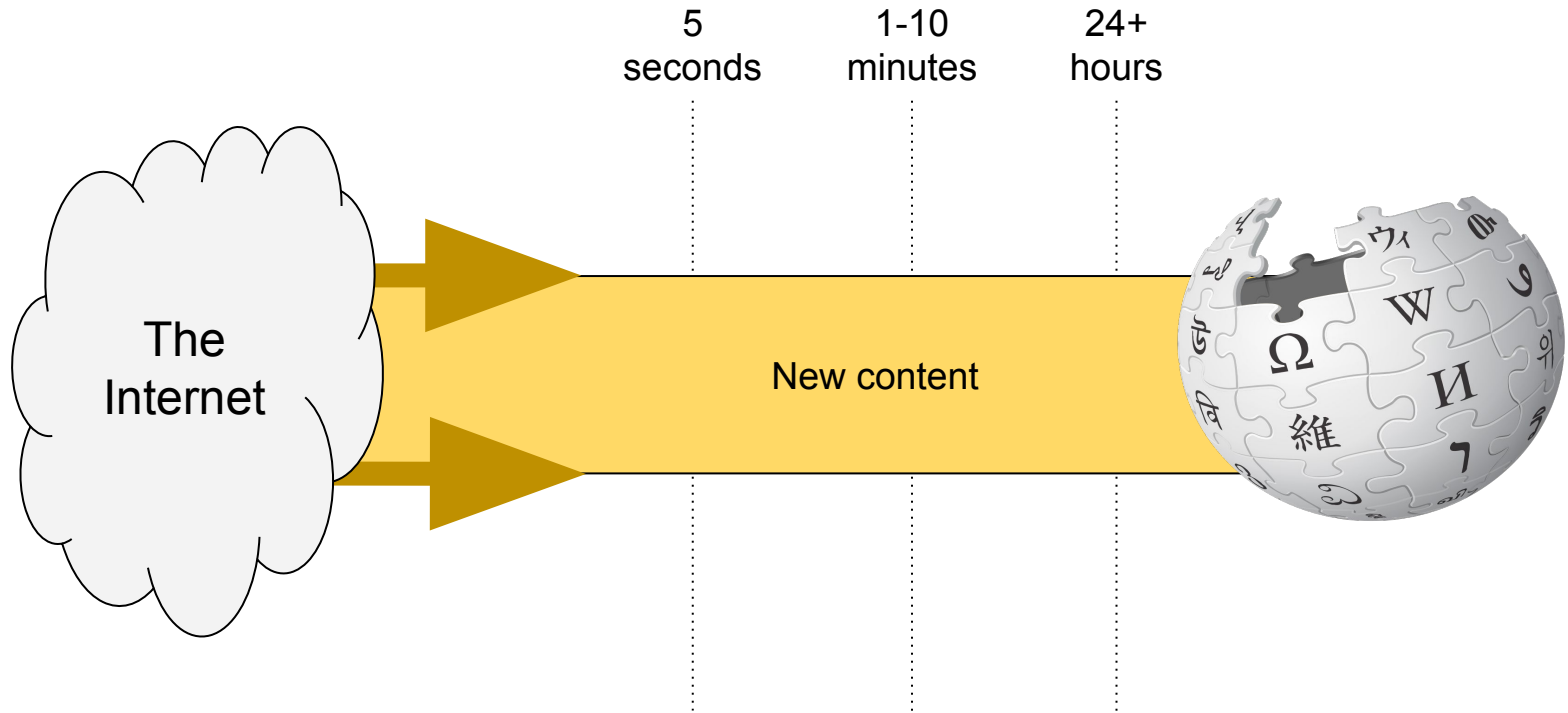
In April 2011, a proposal had been re-discussed. A new idea. A proposal to intervene. A proposal to conduct effects a nonbinding statements regarding ACTRIAL supporting the use of limited trials to gather data to make Wikipedia policy decisions.

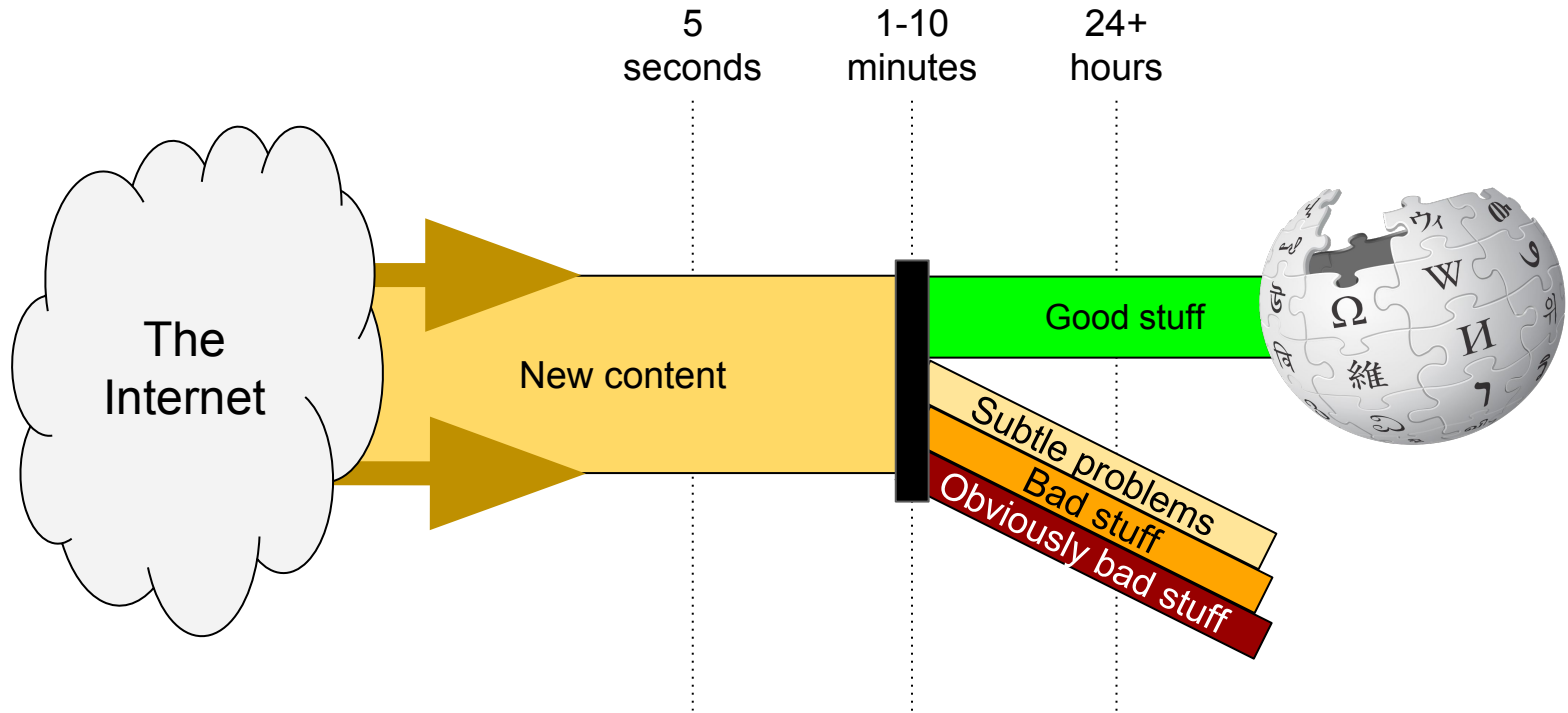
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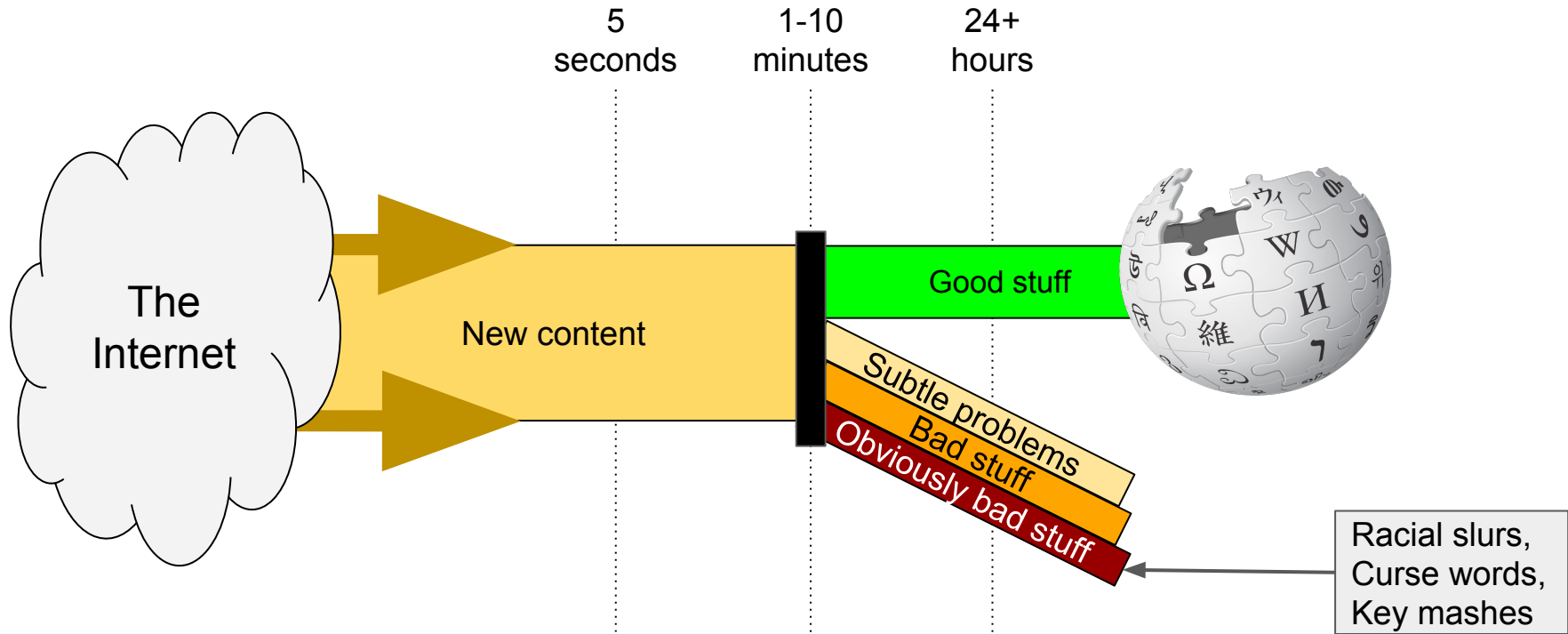
Part 2

Scaling review process

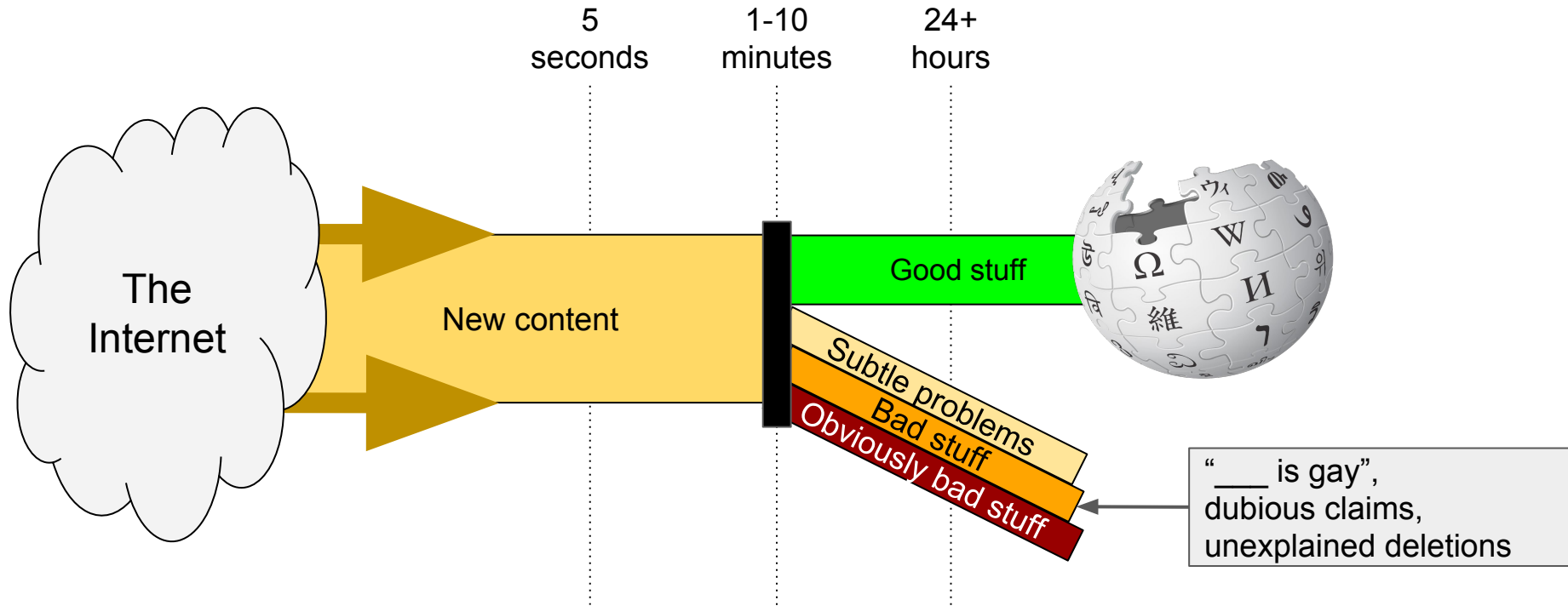




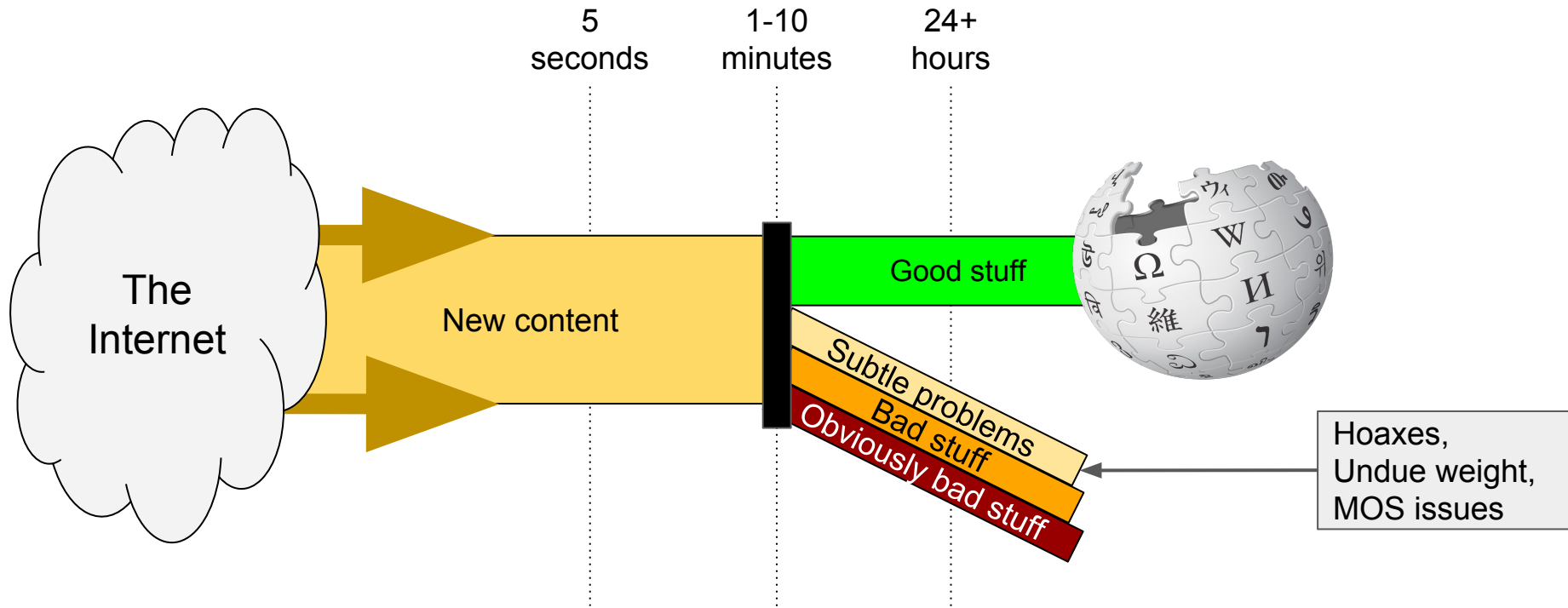
Strategy: Filter out everything in
Special:RecentChanges



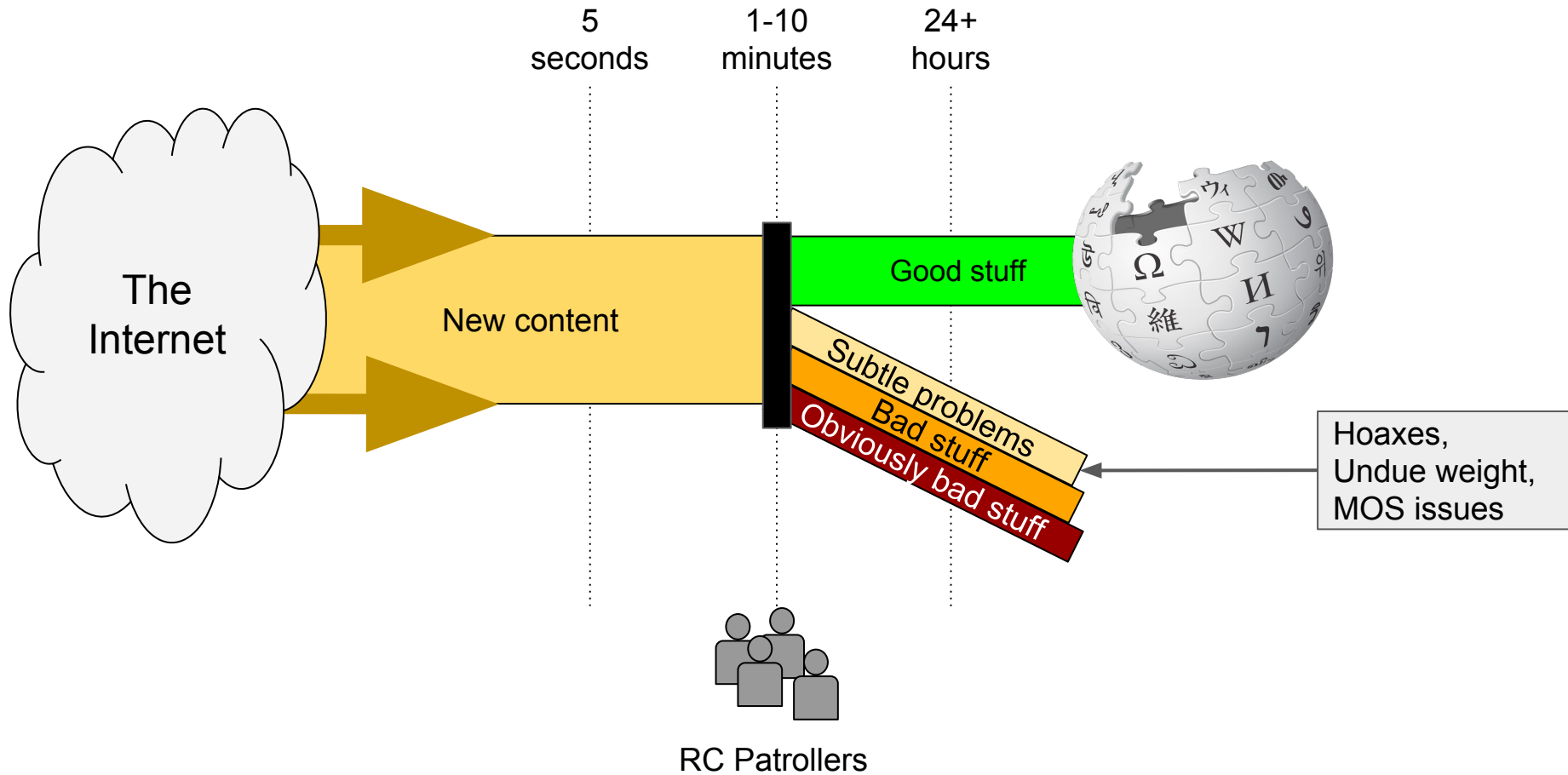
Strategy: Filter out everything in
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Strategy: Filter out everything in
Special:RecentChanges



Strategy: Filter out everything in
Special:RecentChanges



Hoax or Not

Is this edit good or bad?
Can you tell?

Ronnie Hazlehurst: Difference between revisions

A *start-class* article from Wikipedia, the free encyclopedia

Browse history



Revision as of 12:31, 18 September 2007 (edit)

82.16.172.71 (talk)

(→ *TV Themes by Ronnie Hazlehurst*)

← Previous edit

Revision as of 23:32, 20 September 2007 (edit) (undo)

90.202.68.194 (talk)

Next edit →

Line 30:

* "[[No Place Like Home]]"

* "[[Three of a Kind]]"

Line 30:

* "[[No Place Like Home]]"

* "[[Three of a Kind]]"

+

+

==Pop songs==

+

* "[[Reach (S Club 7 song)|Reach]] [[S Club|S Club 7]]"

==External links==

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HONORARY

Monarch butterfly: Difference between revisions

A *B-class* article from Wikipedia, the free encyclopedia

Browse history



Revision as of 19:05, 24 November 2004 (edit)

HenkvD (talk | contribs)

(*recat*)

← Previous edit

Revision as of 17:25, 9 December 2004 (edit) (undo)

(**thank**)

Clarknova (talk | contribs)

(*threat to population, external links added*)

Next edit →

Line 28:

The third stage is the [[pupa]], or [[chrysalis]]. The caterpillar attaches itself to a lump of material secreted on a twig or leaf. It hangs upside down in the shape of a 'J', and then molts, leaving itself encased in an articulated green exoskeleton. At this point, hormonal changes occur, leading to the development of a butterfly. Fourth, the mature butterfly emerges after about two weeks.

– The monarch butterfly is the state insect of [[Texas]] and the state butterfly of [[Minnesota]].

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Monarch butterfly: Difference between revisions

A *B-class* article from Wikipedia, the free encyclopedia

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Wikipedia: Difference between revisions



A *B-class* article from Wikipedia, the free encyclopedia. A *former* featured article.

Browse history

Revision as of 01:05, 26 December 2008 (edit)

[NuclearWarfare](#) (talk | contribs)

[m](#) (*General Fixes using AWB*)

[← Previous edit](#)

Revision as of 12:16, 26 December 2008 (edit) (undo)

[\(thank\)](#)

[TarzanASG](#) (talk | contribs)

([→ Editing model: +](#))

[Next edit](#) [→](#)

Line 50:

```
==Nature of Wikipedia==
```

```
===Editing model===
```

Unlike traditional encyclopedias such as "[[Encyclopædia Britannica]]", no article in Wikipedia undergoes formal peer-review process and changes to articles are made available immediately. No article is owned by its creator or any other editor, or is vetted by any recognized authority. Except for a few vandalism-prone pages that can be edited only by established users, or in extreme cases only by administrators, every article may be edited anonymously or with a user account, while only registered users may create a new article. Consequently, Wikipedia "makes no

Line 50:

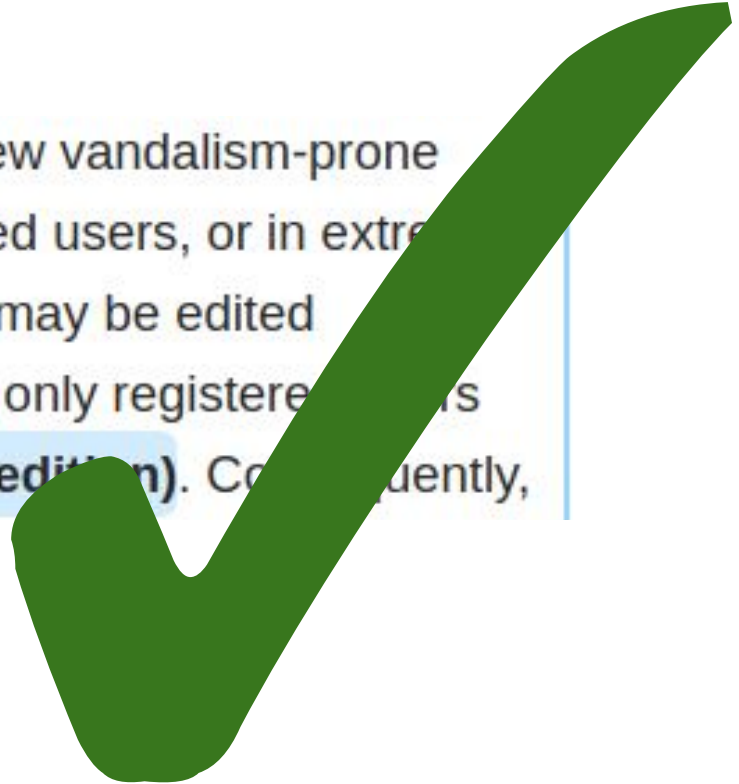
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Process modeling

A *start-class* article from Wikipedia, the free encyclopedia

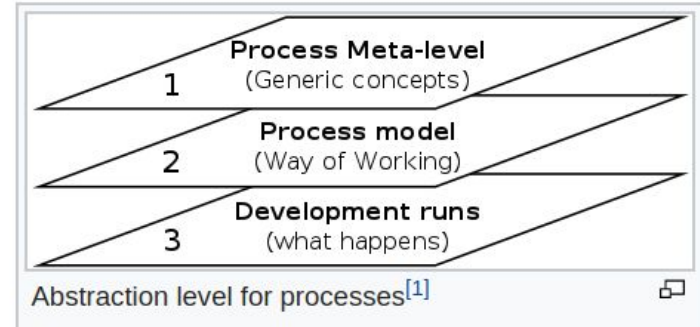
For the jargon used in the Australian republican debate, see [Process model \(Australia\)](#).

The term **process model** is used in various contexts. For example, in [business process modeling](#) the enterprise process model is often referred to as the *business process model*.

Contents [hide]

- 1 [Overview](#)
- 2 [Purpose](#)
- 3 [Classification of process models](#)
 - 3.1 [By coverage](#)
 - 3.2 [By alignment](#)
 - 3.3 [By granularity](#)
 - 3.4 [By flexibility](#)
- 4 [Quality of methods](#)
- 5 [Quality of models](#)
- 6 [See also](#)

"Process modeling" and its talk page have been added to your [watchlist](#).





Watchlist

[?](#) Help

- A **request for adminship** is open for discussion. [\[dismiss\]](#)
- The "thanks" function is currently having a **problem** and is unavailable, this is being worked on. [\[dismiss\]](#)

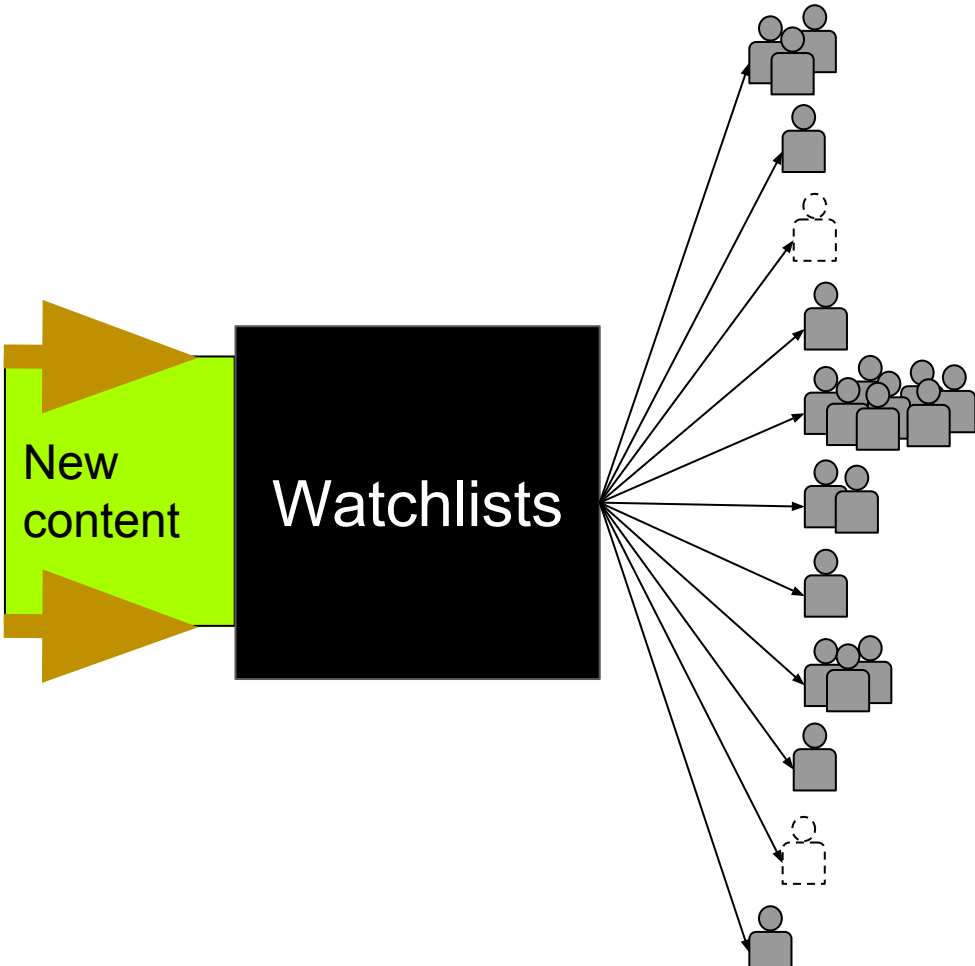
You have **108** pages on your [watchlist](#) (excluding [talk pages](#)). Email notification is enabled. Changes to pages you haven't visited since the changes occurred are shown with solid markers.

[✎ Edit your list of watched pages](#)[✔ Mark all changes as seen](#)[🔖 Saved filters](#) ▼

Active filters

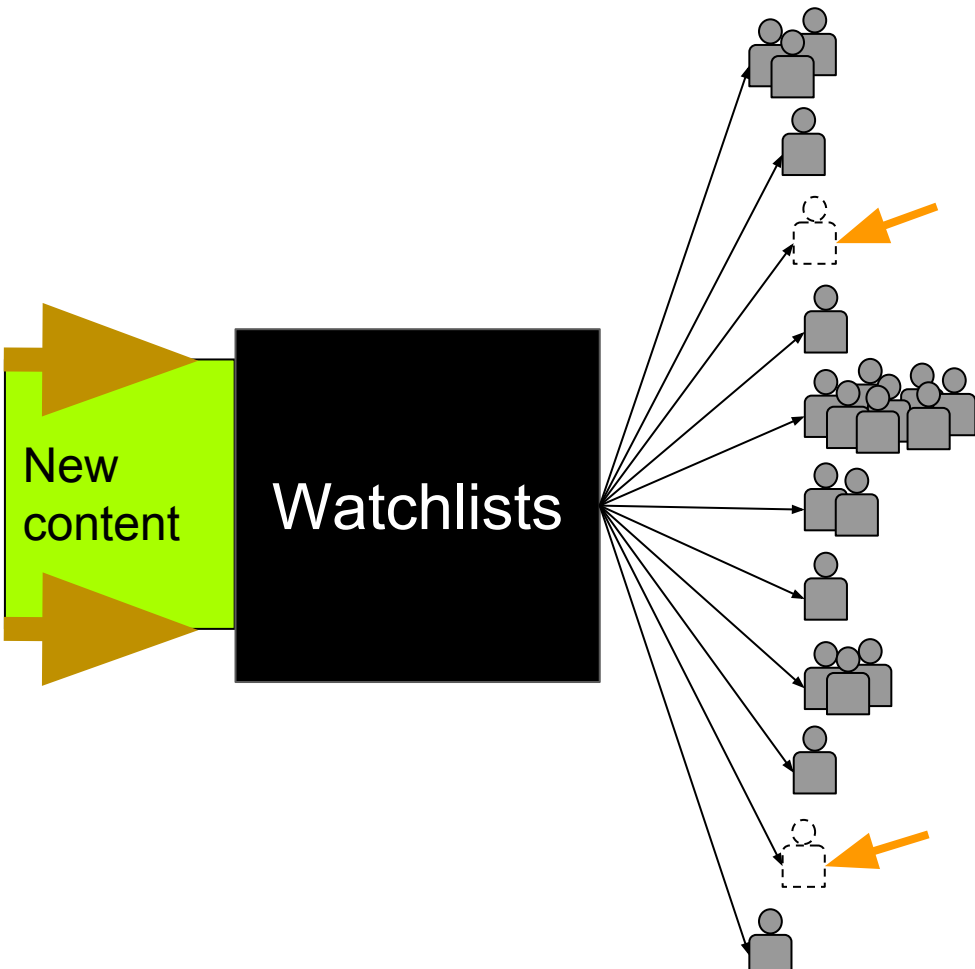
[● Likely have problems](#) ✕[● Very likely have problems](#) ✕[Latest revision](#) ✕[Page edits](#) ✕[Page creations](#) ✕[Logged actions](#) ✕[☰ Filter changes \(use menu or search for filter name\)](#)[📄 Namespaces](#) [🏷️ Tags](#)

Topic-interested individuals



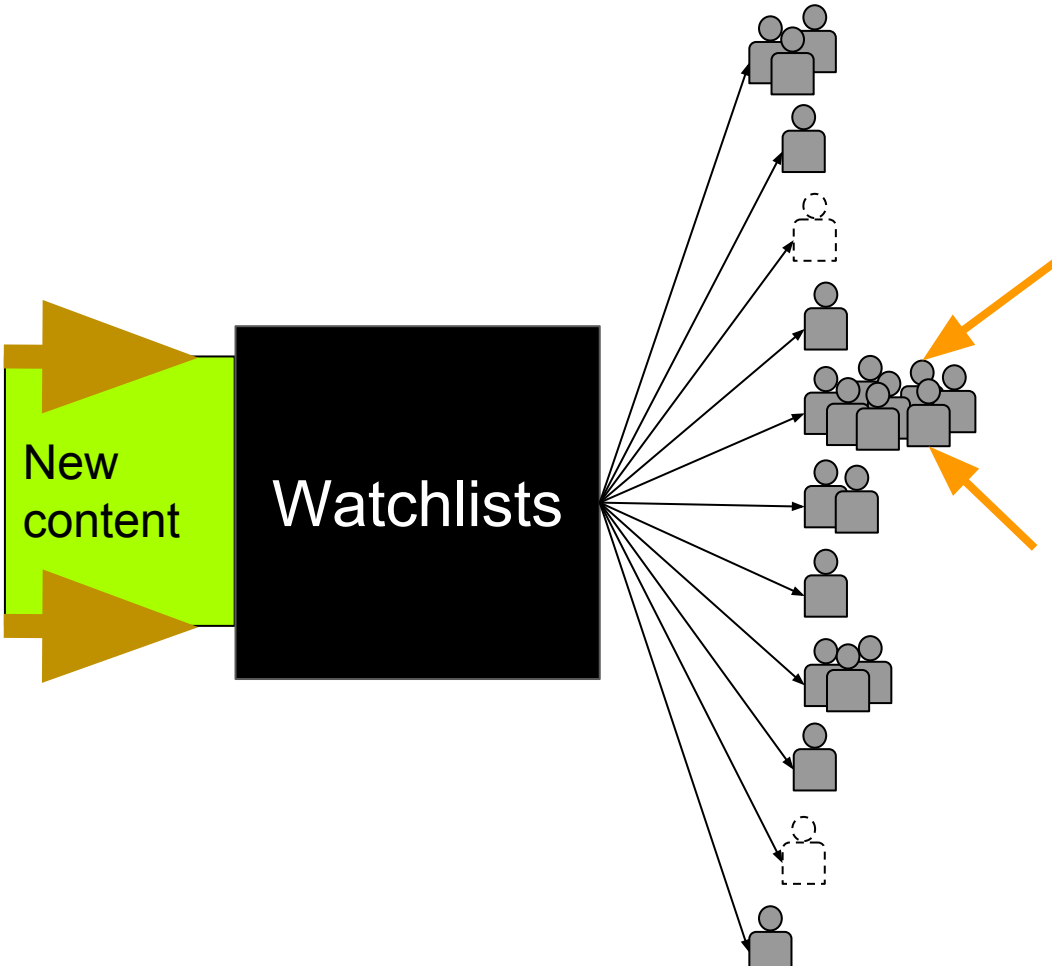
Insight:
Routing based on interest
makes subtle
judgement
calls easier.

Topic-interested individuals

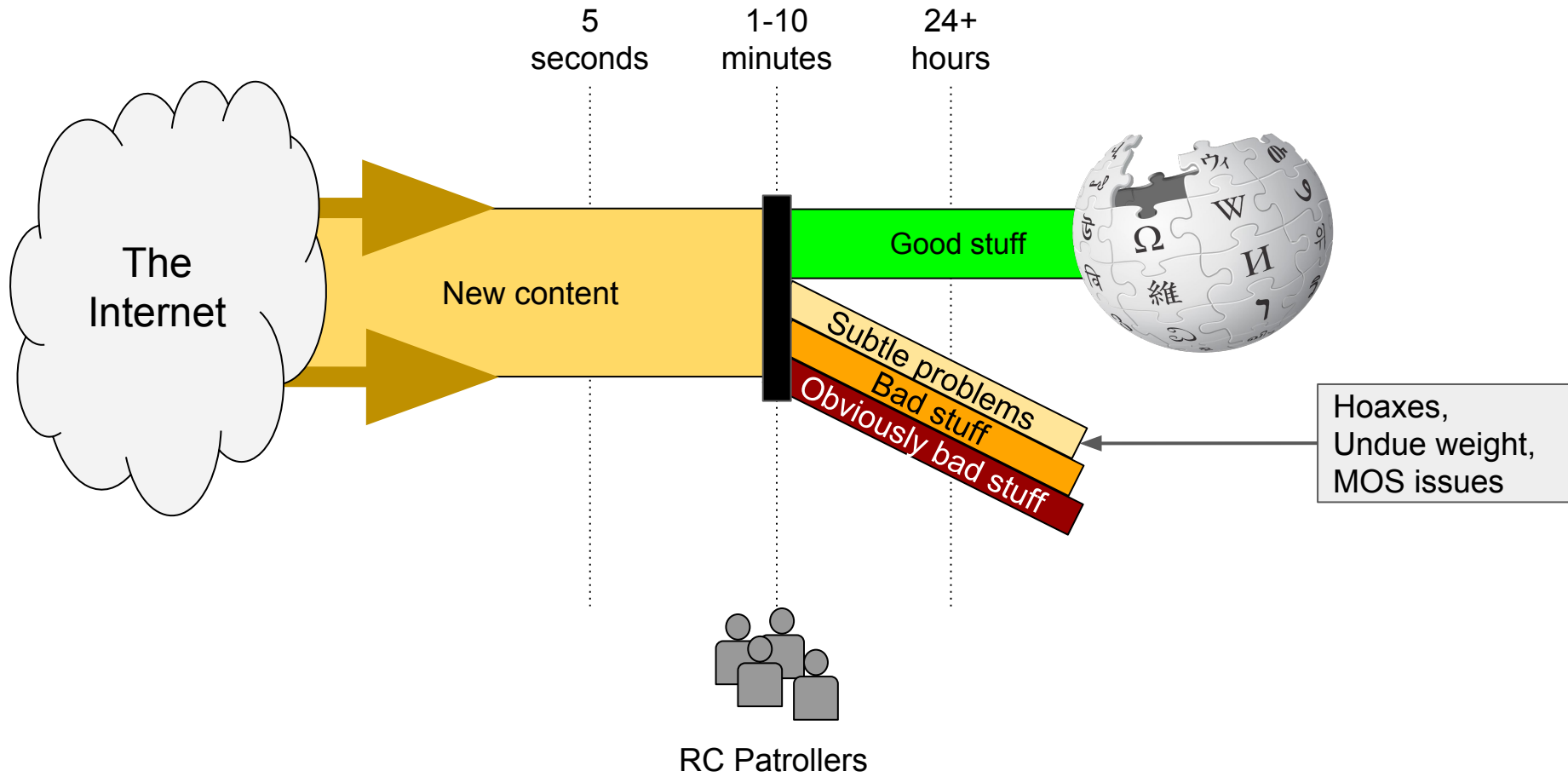


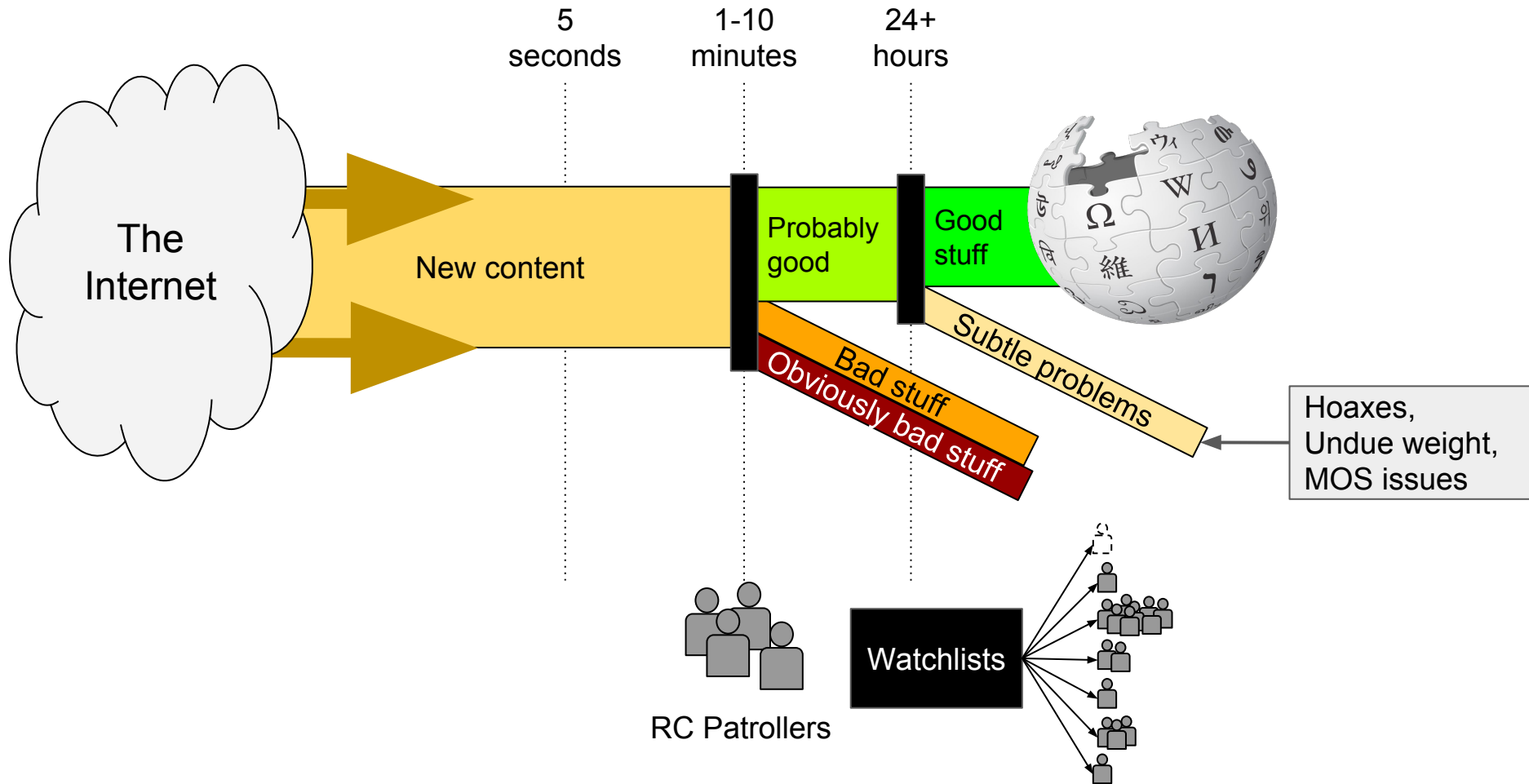
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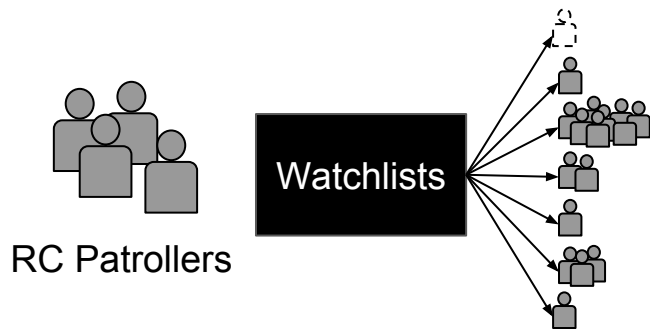
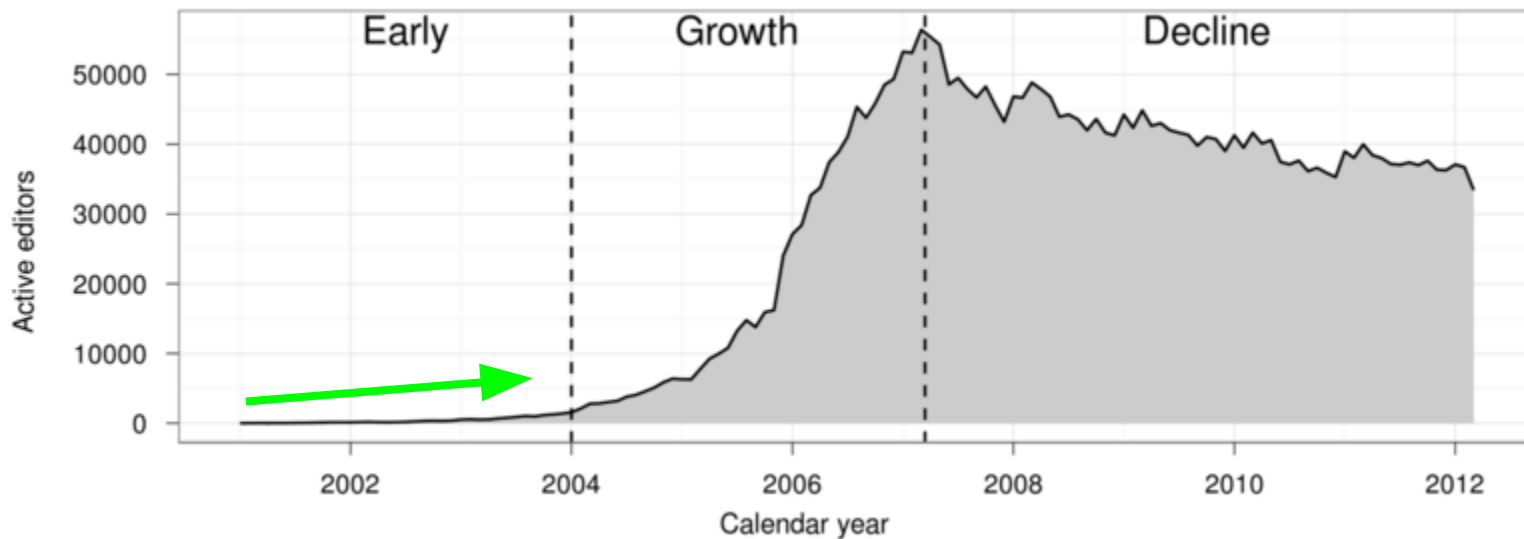
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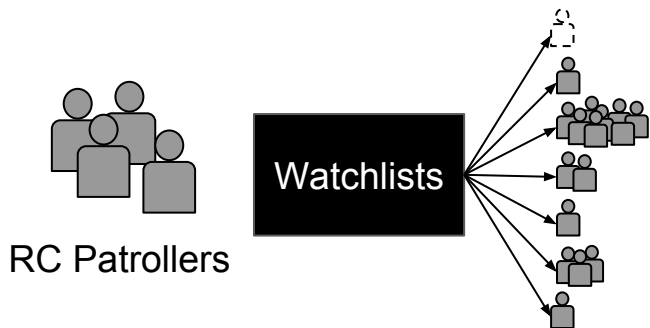
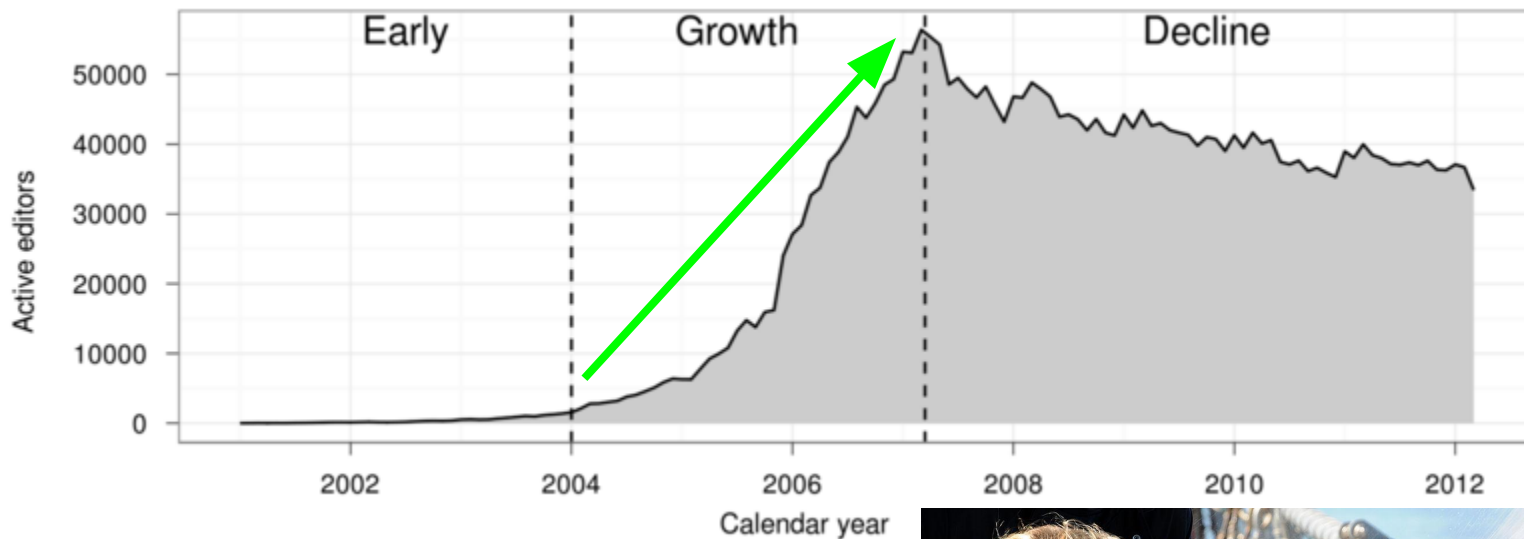


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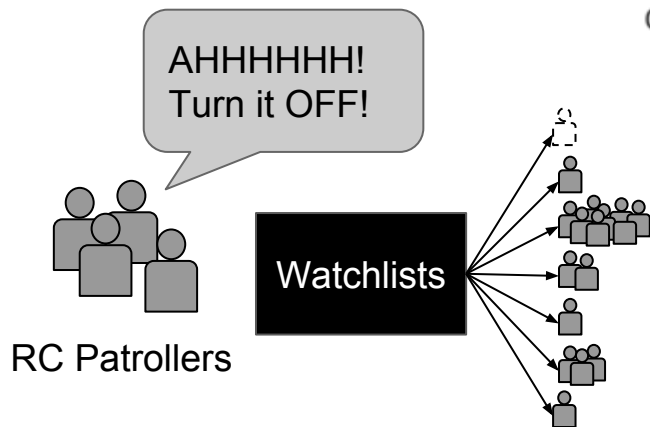
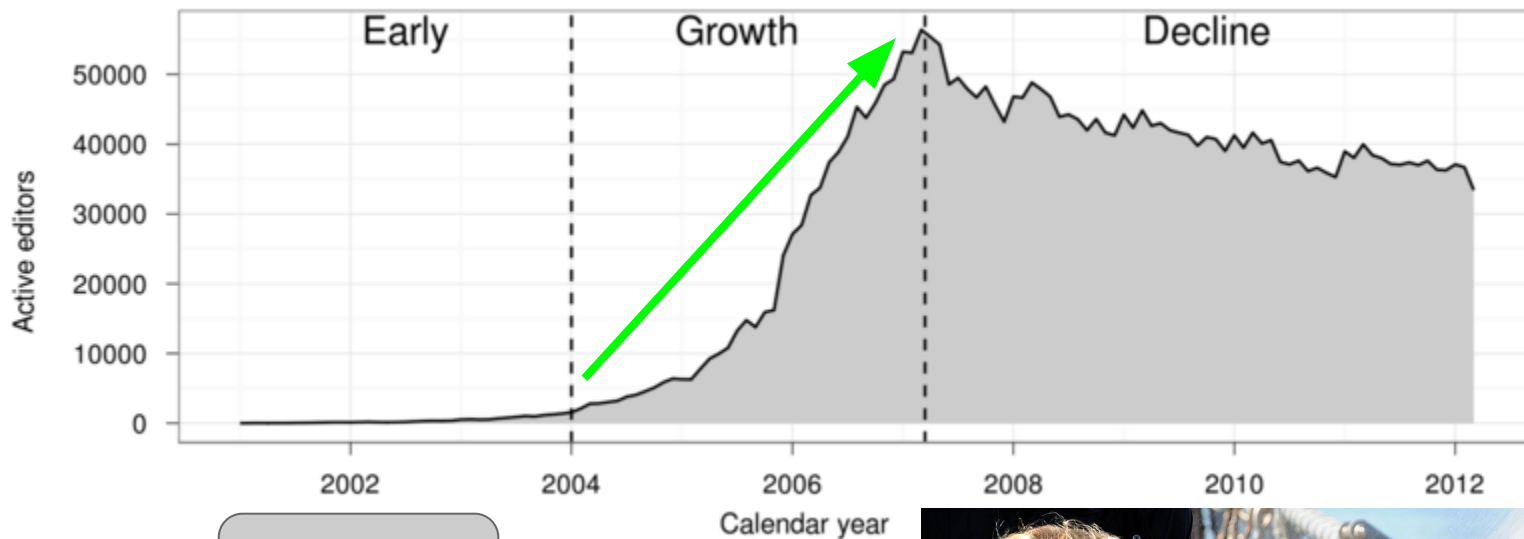








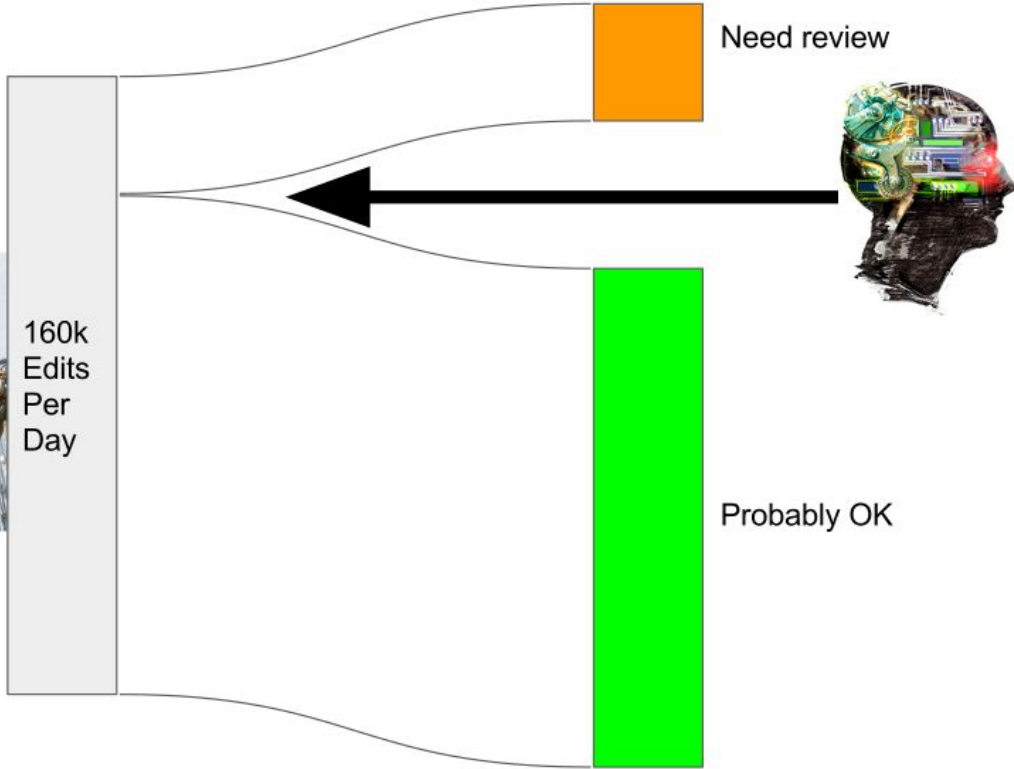
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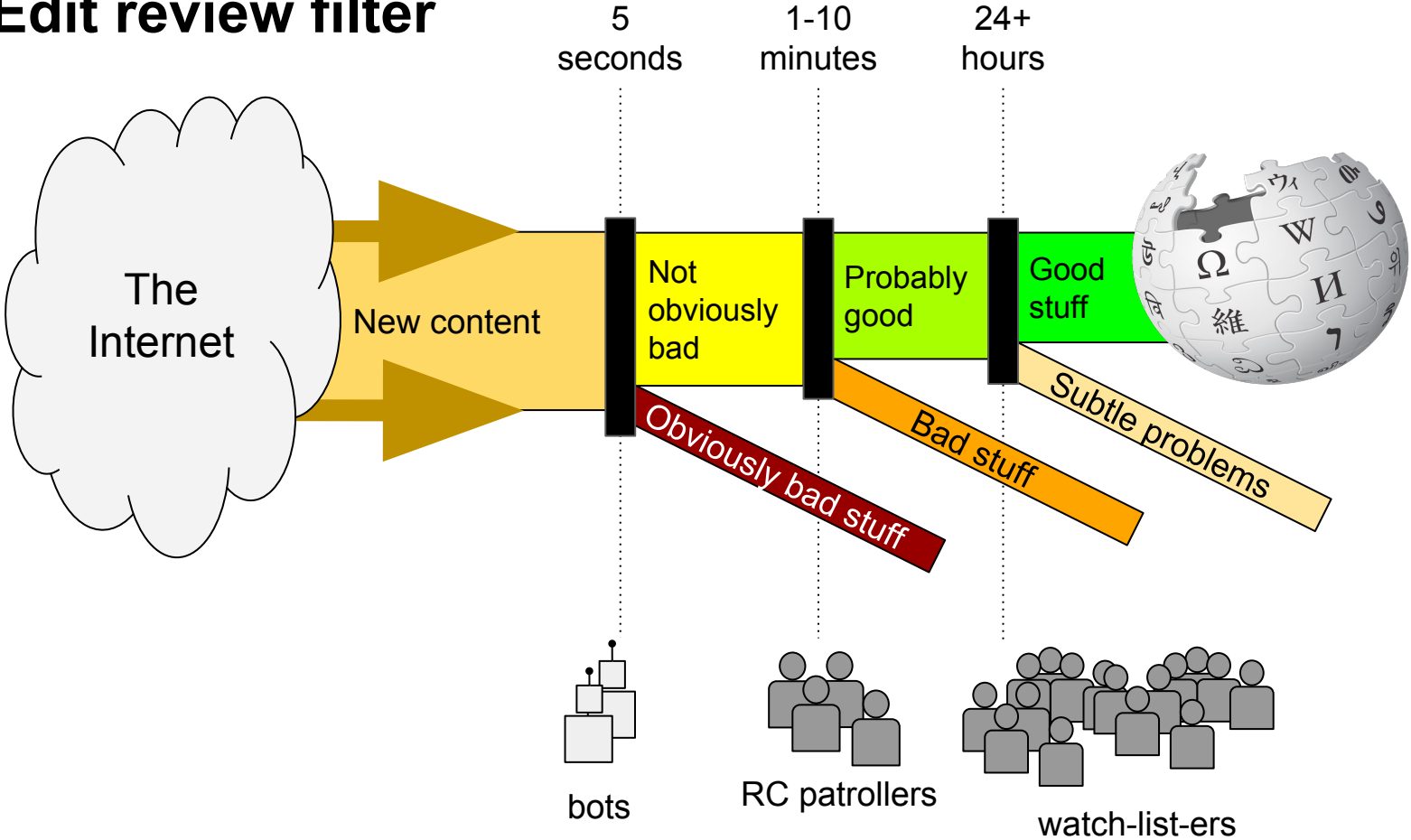
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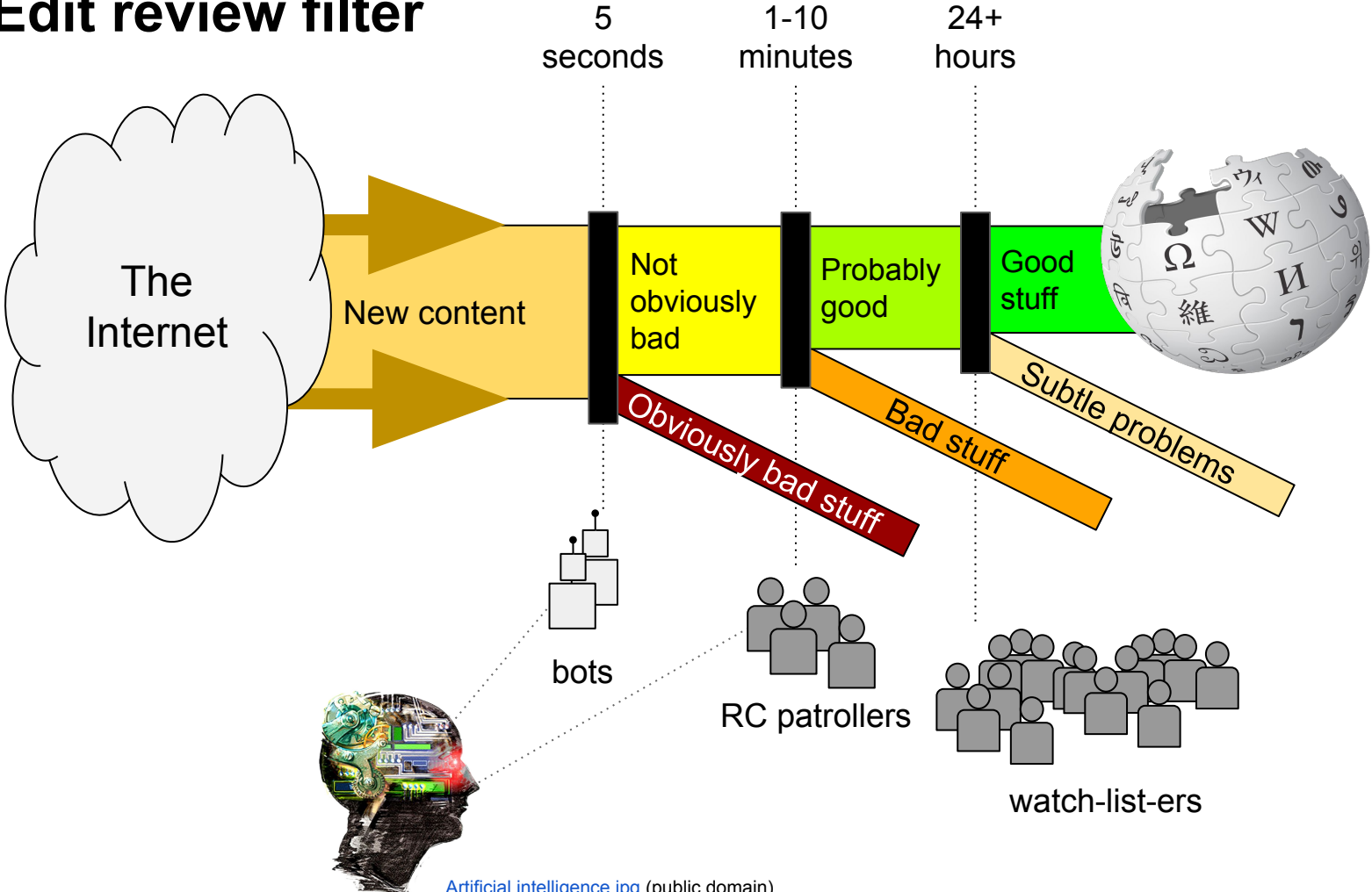
160k
Edits
Per
Day



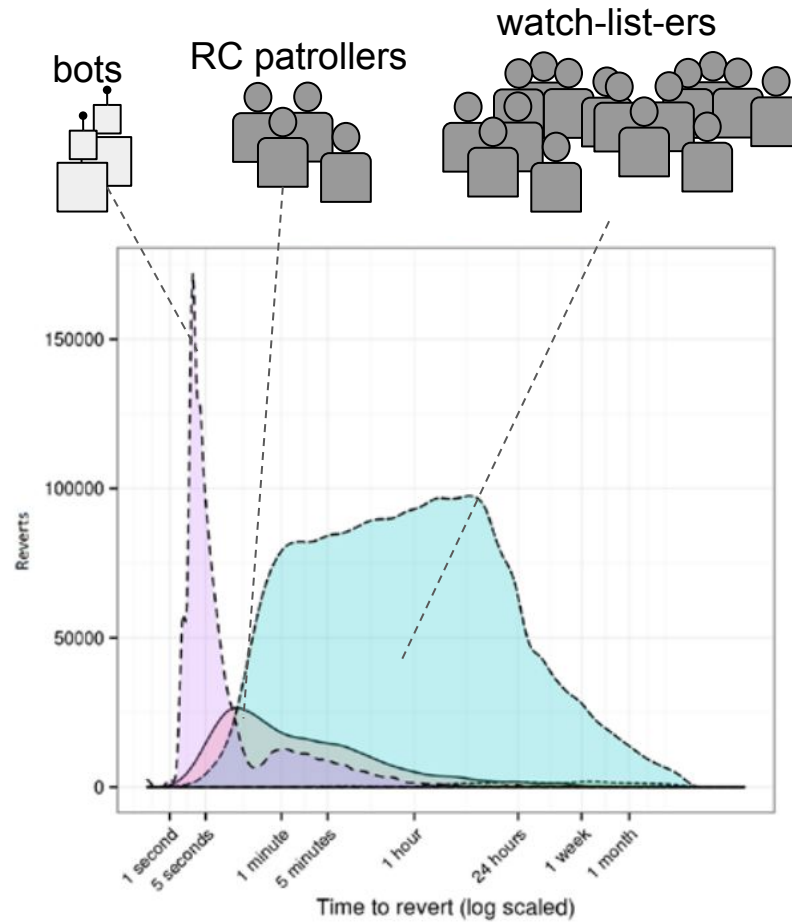
Edit review filter



Edit review filter



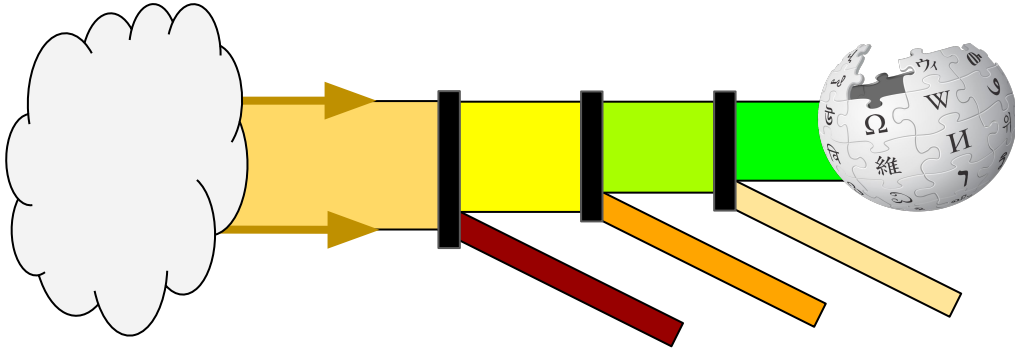
Edit review filter



Geiger, R. S., & Halfaker, A. (2013, August). When the levee breaks: without bots, what happens to Wikipedia's quality control processes?. In *Proceedings of the 9th International Symposium on Open Collaboration* (p. 6). ACM.

Figure 2: Histogram of time-to-revert during a normal month (January 2011), separated by different editing technologies.

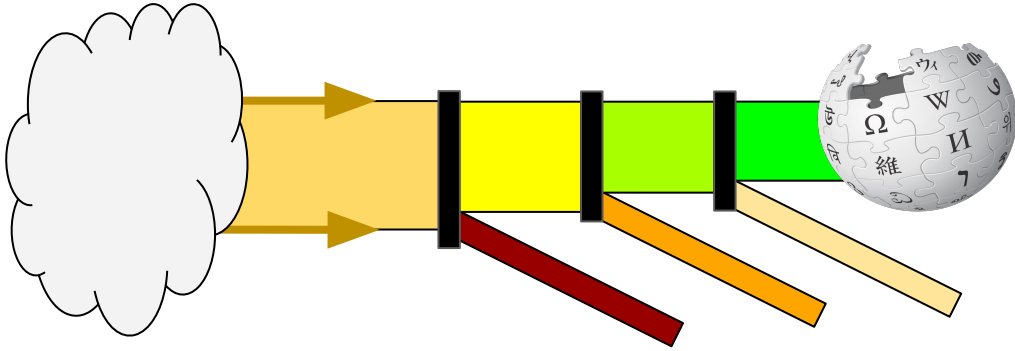
Edit review process



[Strainer_MET_98065.jpg](#) (CC0)

- Fast
- High capacity

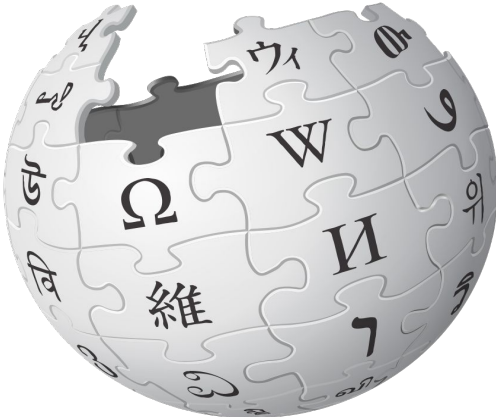
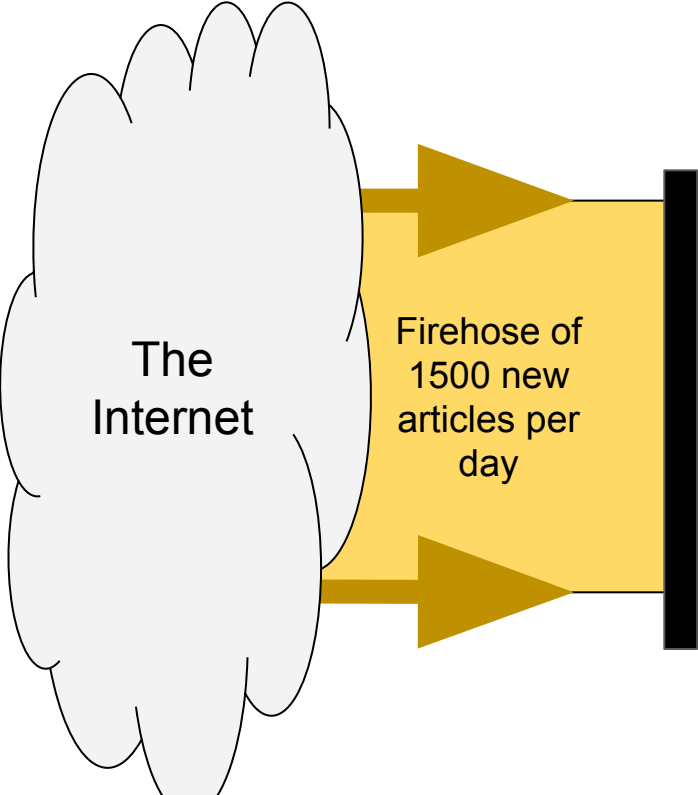
Edit review process



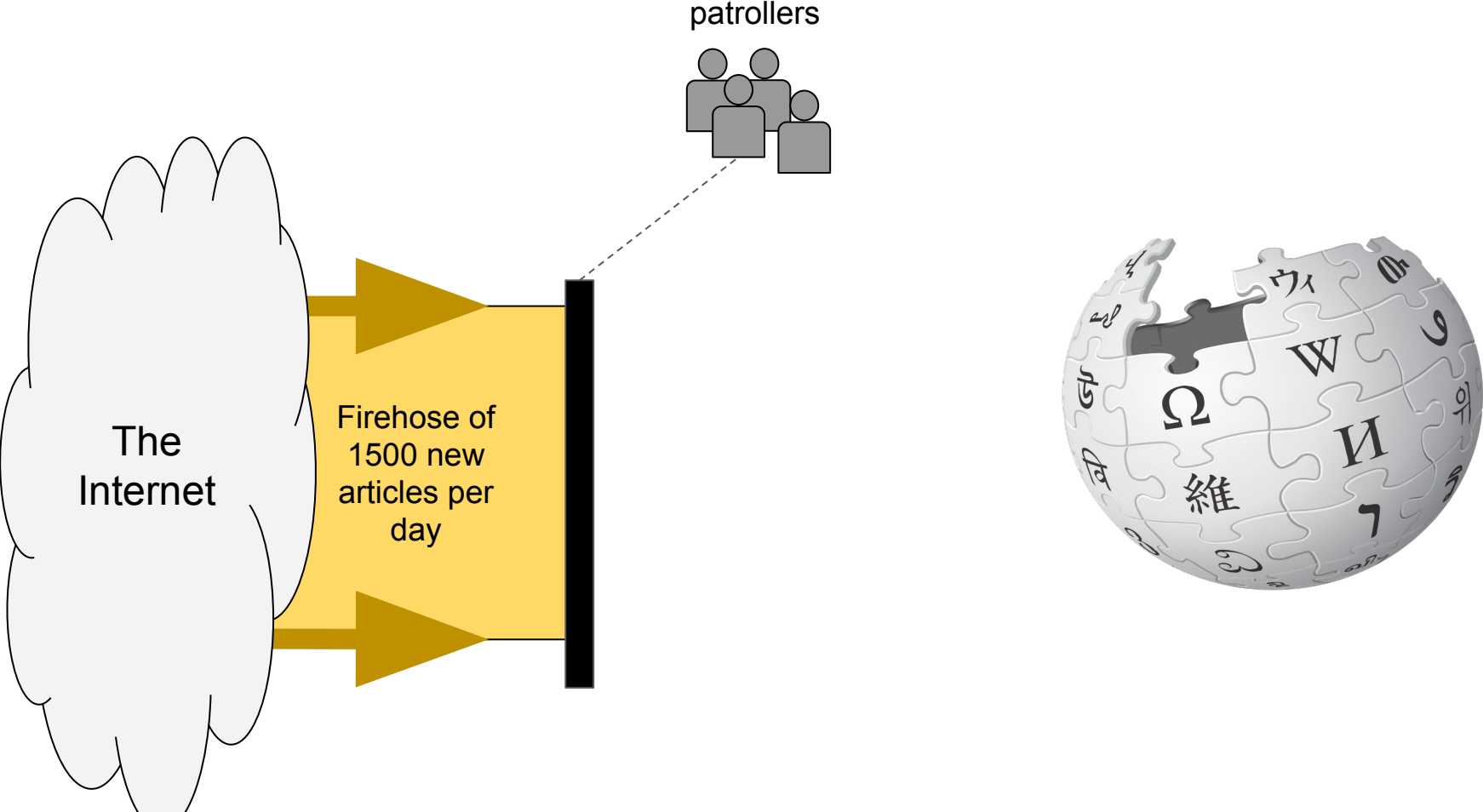
- Fast
- High capacity

Reduces the pressure to close off
contribution

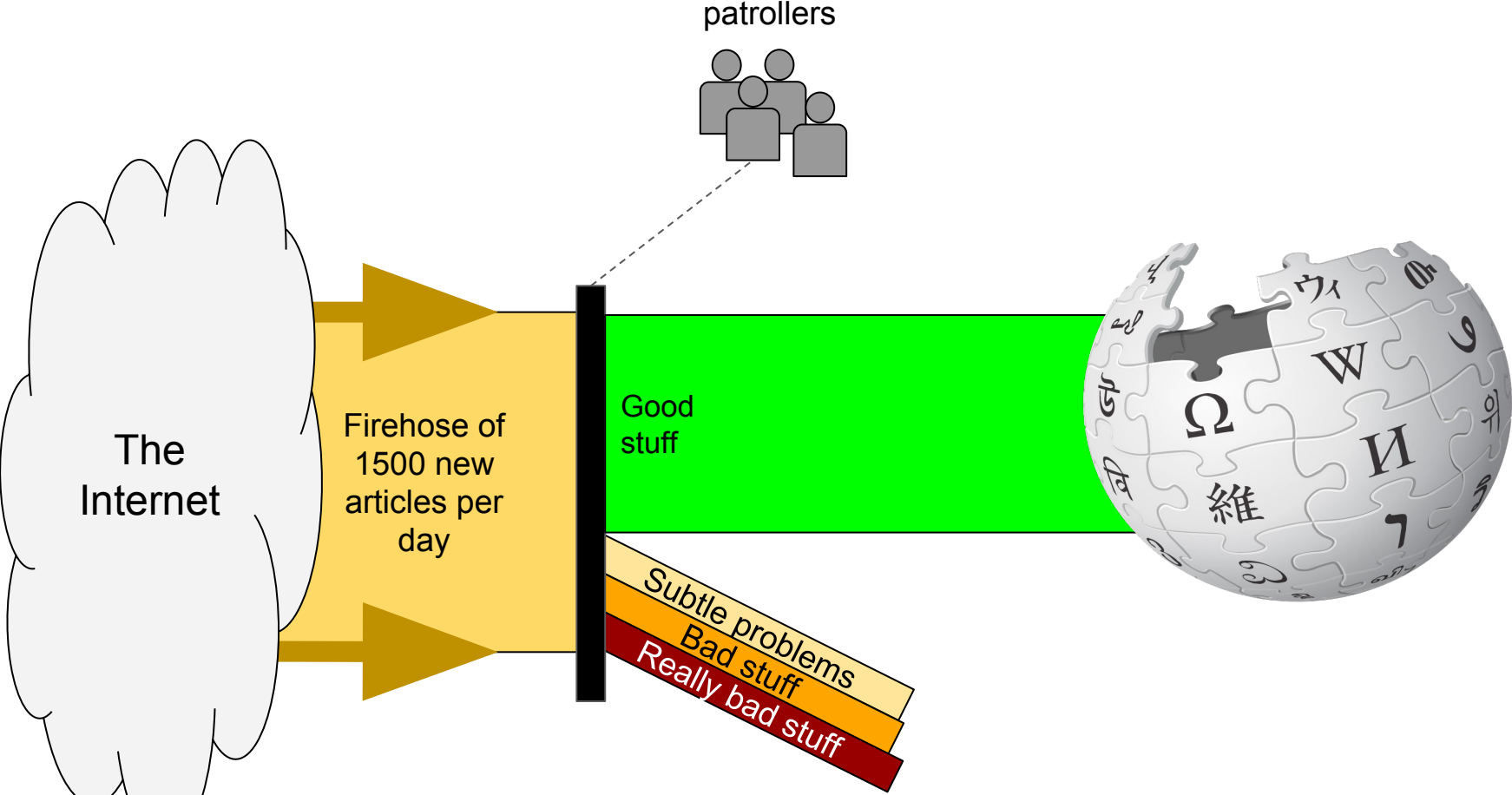
New page patrol process



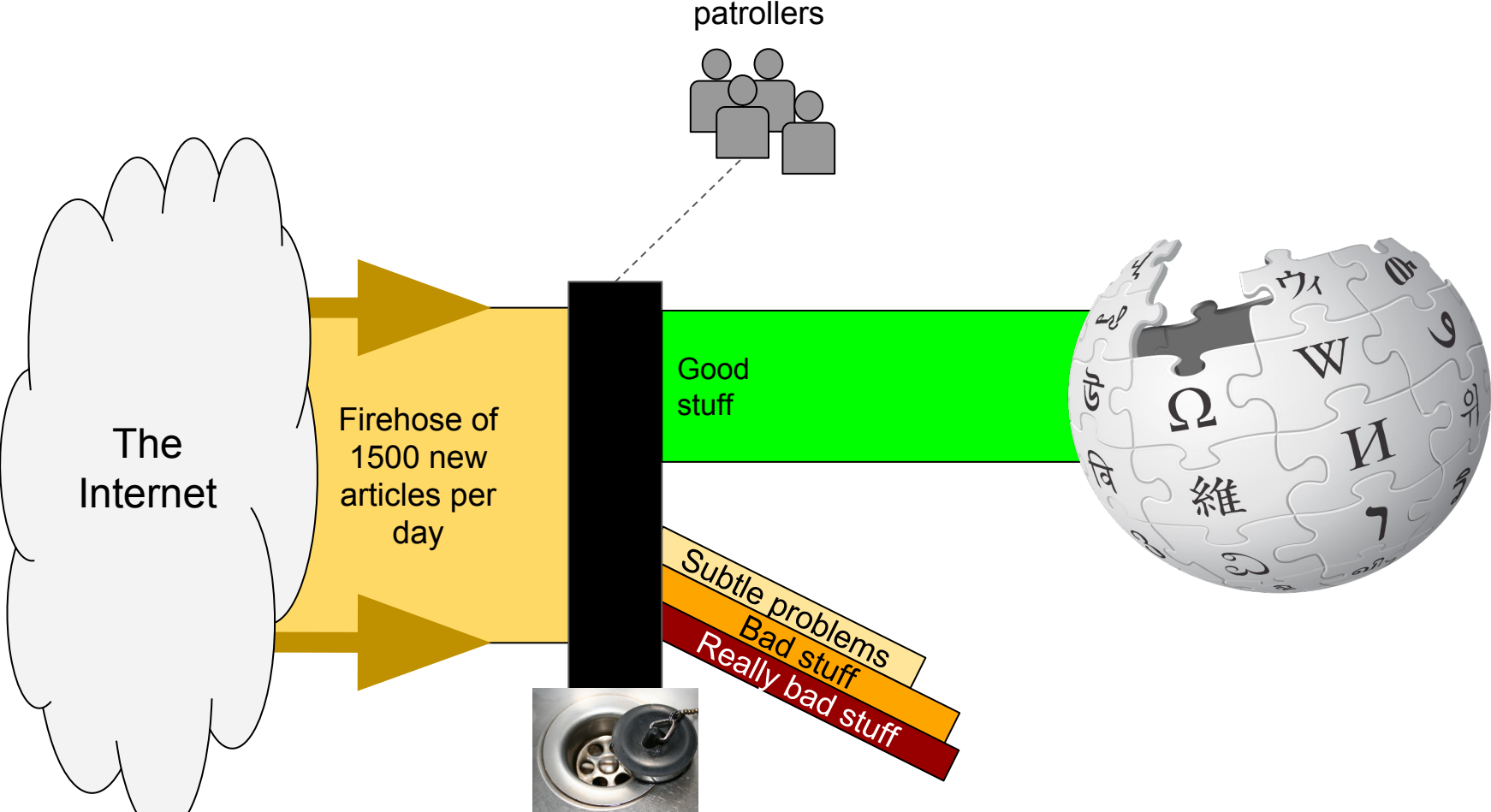
New page patrol process



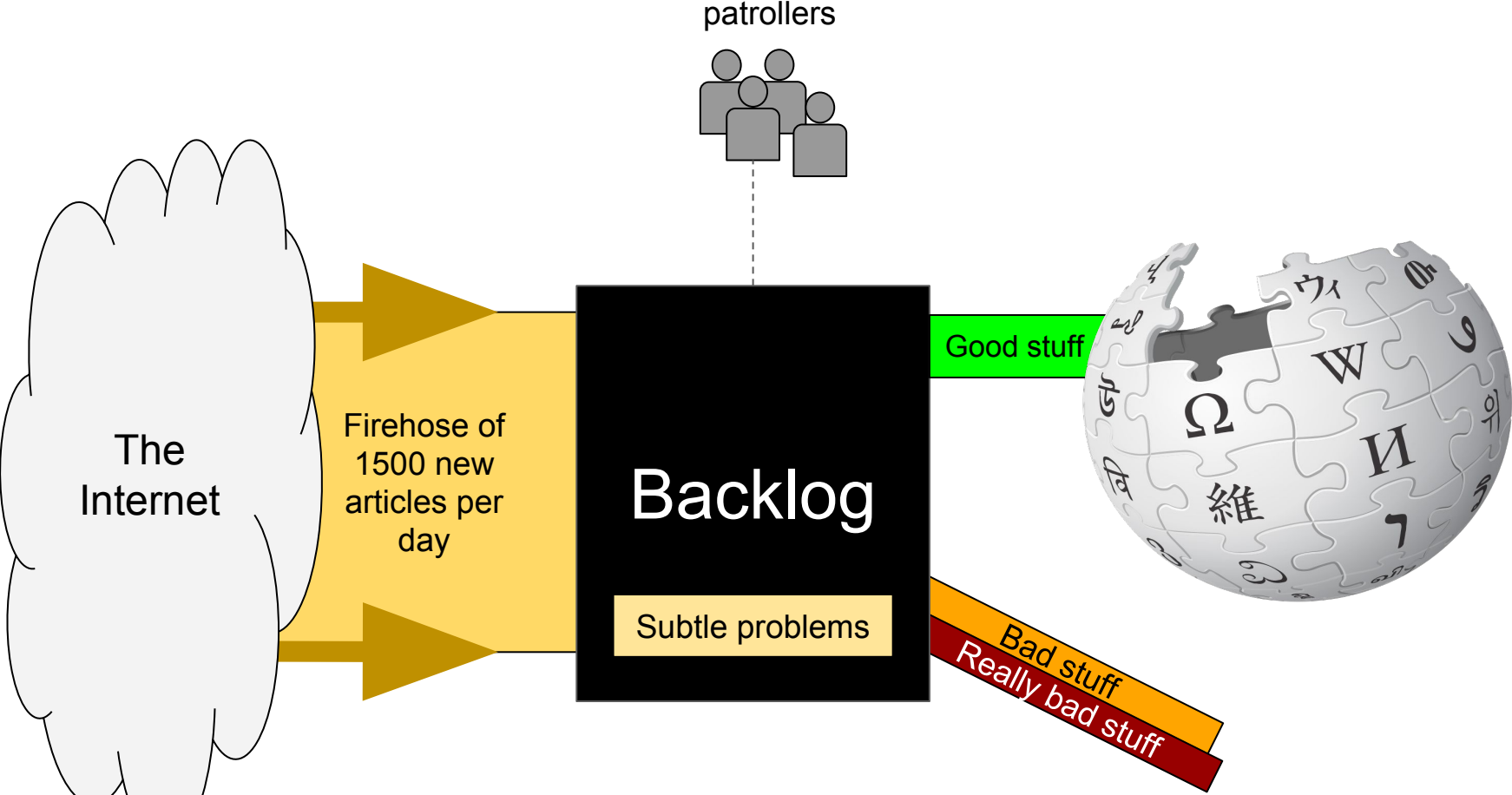
New page patrol process



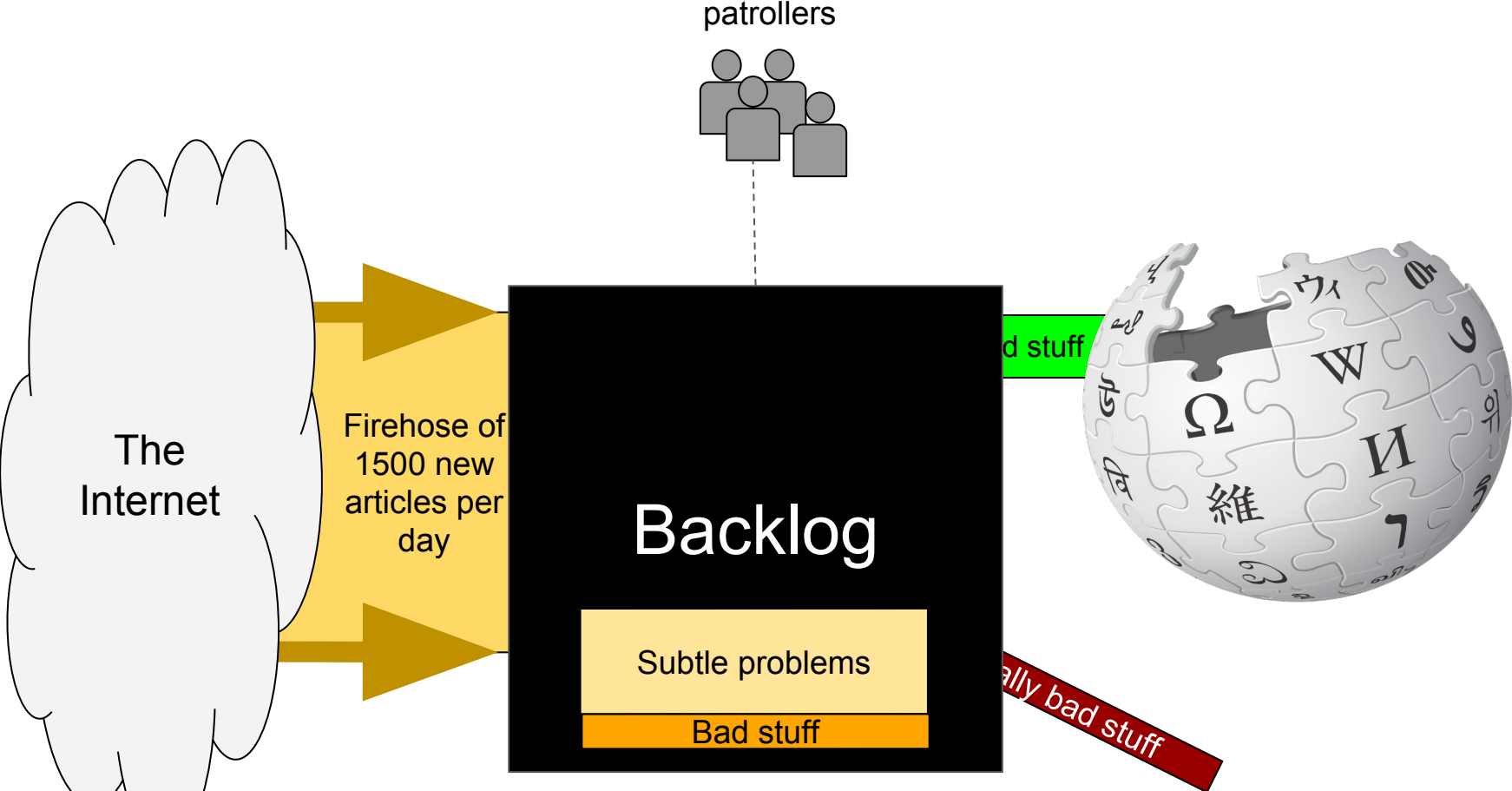
New page patrol process



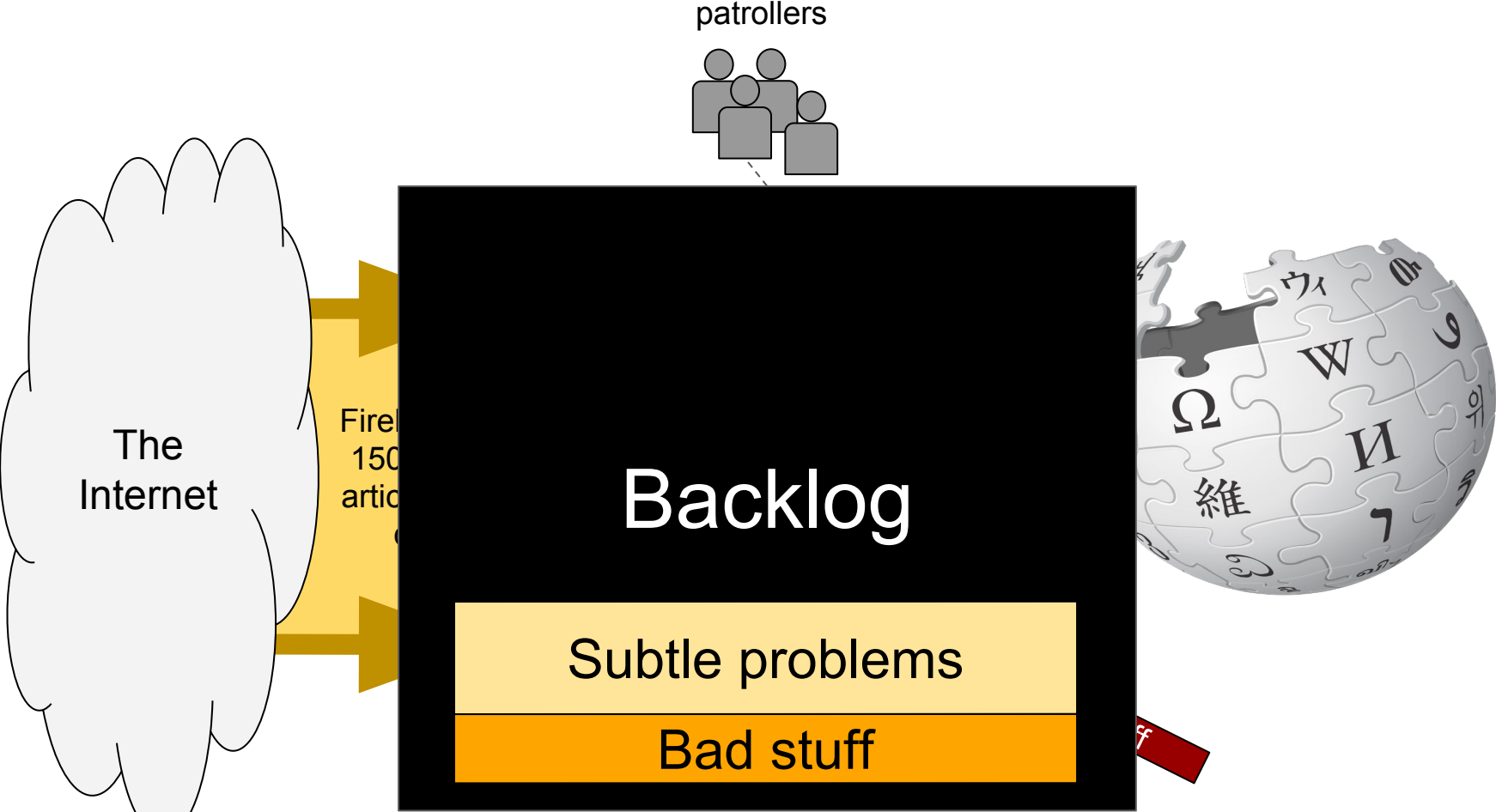
New page patrol process



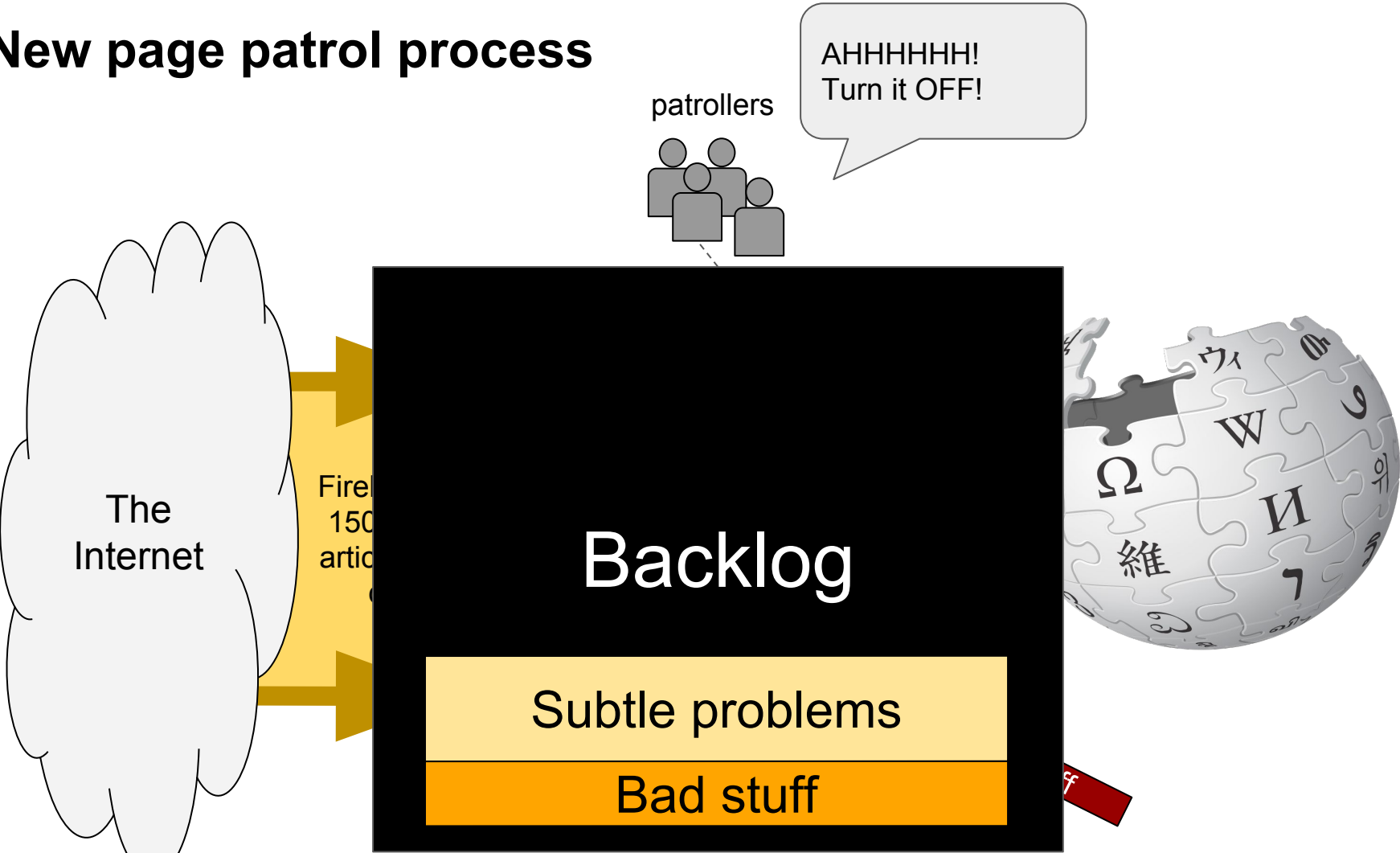
New page patrol process



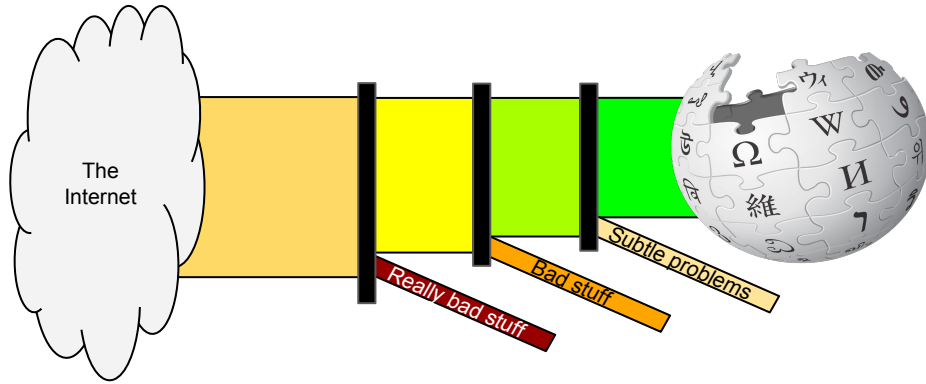
New page patrol process



New page patrol process

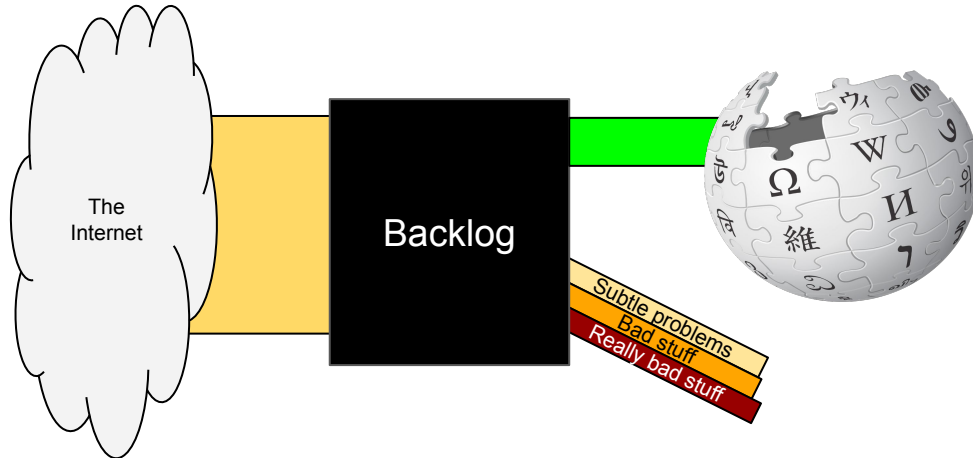


Edit review process



https://commons.wikimedia.org/wiki/File:Strainer_MET_98065.jpg (CC0)

New page patrol process



<https://commons.wikimedia.org/wiki/File:Gootsteenstop.png> (PD)



Wikipedia:Autoconfirmed article creation trial



From Wikipedia, the free encyclopedia



This page in a nutshell: Until 14 March 2018, [autoconfirmed status](#) is required in order to create new articles, as part of a six-month trial. This page is a centralized location to help plan the trial. For an original proposal, please see [this archive](#).

[Shortcut](#)

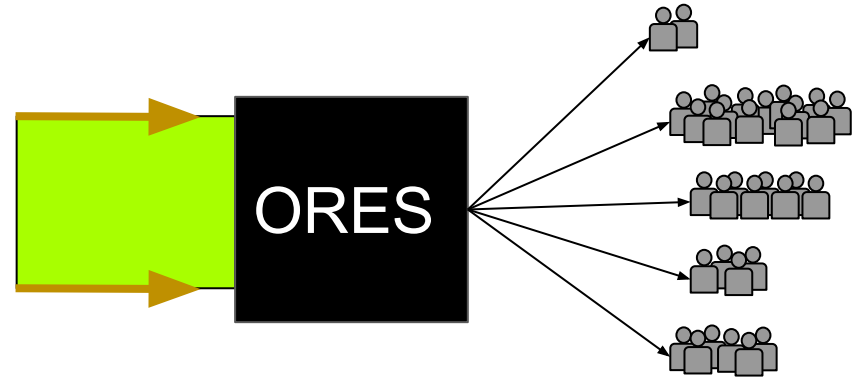
WP:ACTRIAL

In April 2011, a [proposal](#) was put forth to require [autoconfirmed status](#) in order to create articles. (Previously only registration had been required.) In May 2011, the proposal was closed with a consensus that a trial should be implemented to test out this new idea. A [second RfC](#) was then opened to determine duration of the interventional phase of the trial, and it was decided that the interventional phase should run for 6 months, and then the changes should be reversed for a period of one month while their effects are discussed. The Wikimedia Foundation prevented the idea from going forward in 2011, but in June 2017 [agreed](#)^[] to conduct and help implement ACTRIAL as a research experiment. In July 2017, after a post on his talk page, Jimmy Wales issued a nonbinding [statement](#)^[] regarding ACTRIAL supporting the use of limited trials to gather data to make Wikipedia policy decisions.

The discussion on the duration and terms of the assessment of the interventional phase was announced at the Village Pump and at Centralized Discussion, and was officially closed by [independent admin summary 18 August 2011](#)^[], in favour of the proposal with "... a clear consensus for a six-month trial, followed by a one-month period of discussion to determine the trial's effects.

Part 3

Using AI to re-shape new
article review



Obviously bad stuff

Bad stuff

Obviously bad stuff

Bad stuff

Wikipedia:Criteria for speedy deletion



From Wikipedia, the free encyclopedia

Find this page confusing? [Just use this link to ask for help on your talk page](#); a volunteer will visit you there shortly!

For requests to hide the contents of [edit summaries](#), see [Wikipedia:Revision deletion](#).

"WP:SPEEDY" redirects here. For the guideline discussing when to end deletion debates early as "keep", see [Wikipedia:Speedy keep](#). For the list of current candidates for speedy deletion, see [Category:Candidates for speedy deletion](#). For the speedy renaming of categories, see [Wikipedia:Categories for discussion/Speedy](#).

"WP:SD" redirects here. For the shortcut directory, see [Wikipedia:Shortcut directory](#). For information on short descriptions, see [Wikipedia:Short description](#).



This page documents an English Wikipedia policy.

It describes a widely accepted standard that all editors should normally follow. Changes made to it should reflect [consensus](#).

[Shortcuts](#)

[WP:CFSD](#)

[WP:CSD](#)

[WP:SPEEDY](#)



This page in a nutshell: Under certain limited conditions, a page may be deleted by an [administrator](#) without waiting for any discussion.

The **criteria for speedy deletion (CSD)** specify the only cases in which [administrators](#) have broad [consensus](#) to bypass [deletion discussion](#), at their discretion, and immediately delete Wikipedia pages or media. They cover only the cases specified in

Deletion policies

Criteria for speedy deletion

[Deletion policy](#)

Obviously bad stuff

Bad stuff

Wikipedia:Criteria for speedy deletion



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- G3: Pure vandalism and blatant hoaxes
- G11: Unambiguous advertising or promotion
- G10: Attack pages



an [administrator](#) without waiting for any discussion.

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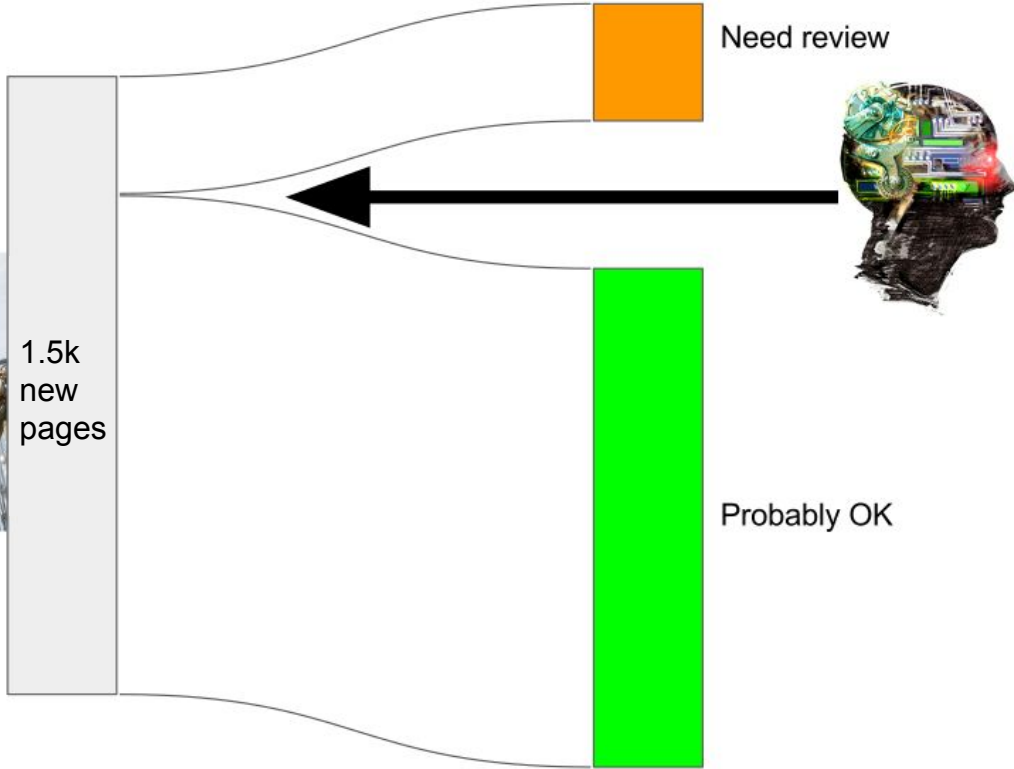
Deletion policies

Criteria for speedy deletion

[Deletion policy](#)



1.5k
new
pages



Subtle problems

Subtle problems

Notability

Subject-specific guidelines

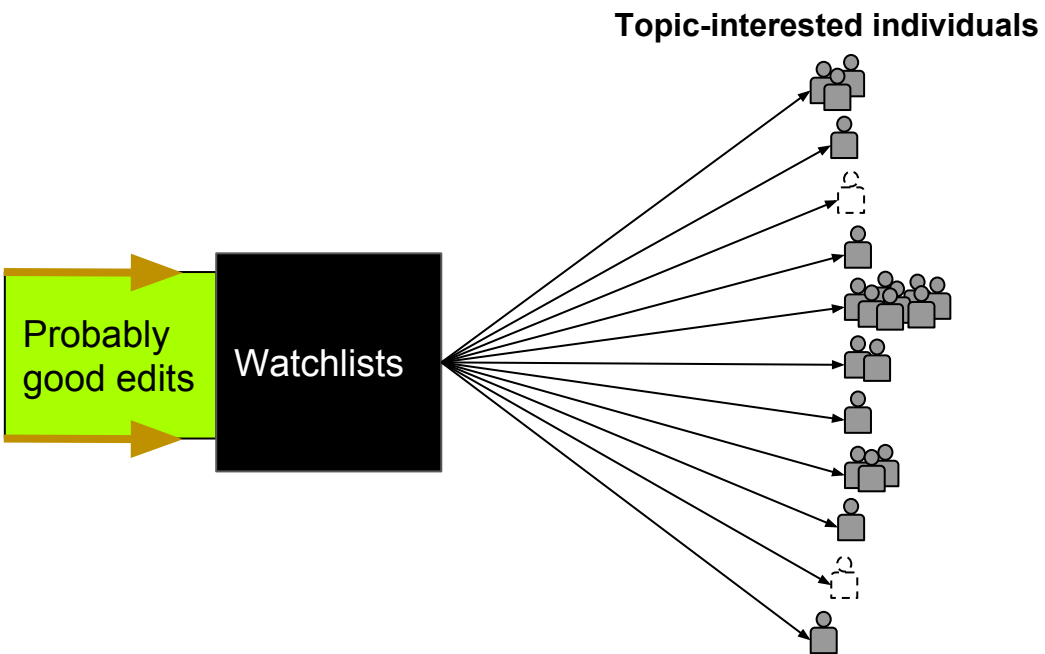
[Academics](#) ·
[Astronomical objects](#)
[Books](#) · [Events](#)
[Films](#) · [Geographic features](#)
[Military](#) · [Music](#) · [Numbers](#)
[Organizations and companies](#)
[People](#) · [Sports and athletes](#)
[Web content](#)

See also

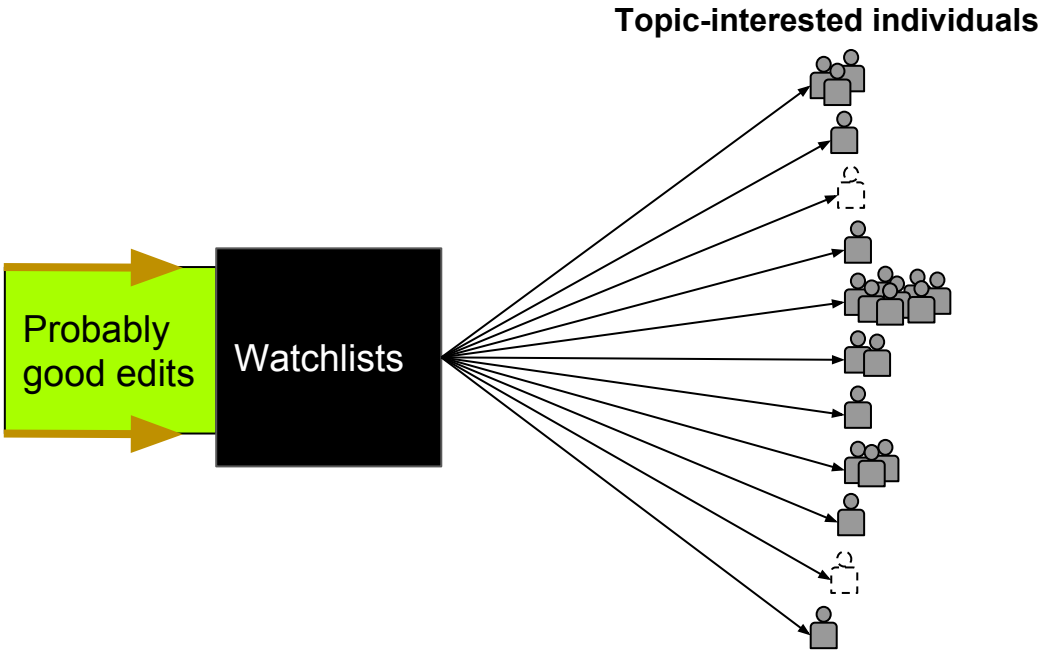
[Wikipedia essays](#)
[Guide to deletion](#)
[Common deletion outcomes](#)
[Why was my article deleted?](#)

[V](#) · [T](#) · [E](#)

Subtle problems

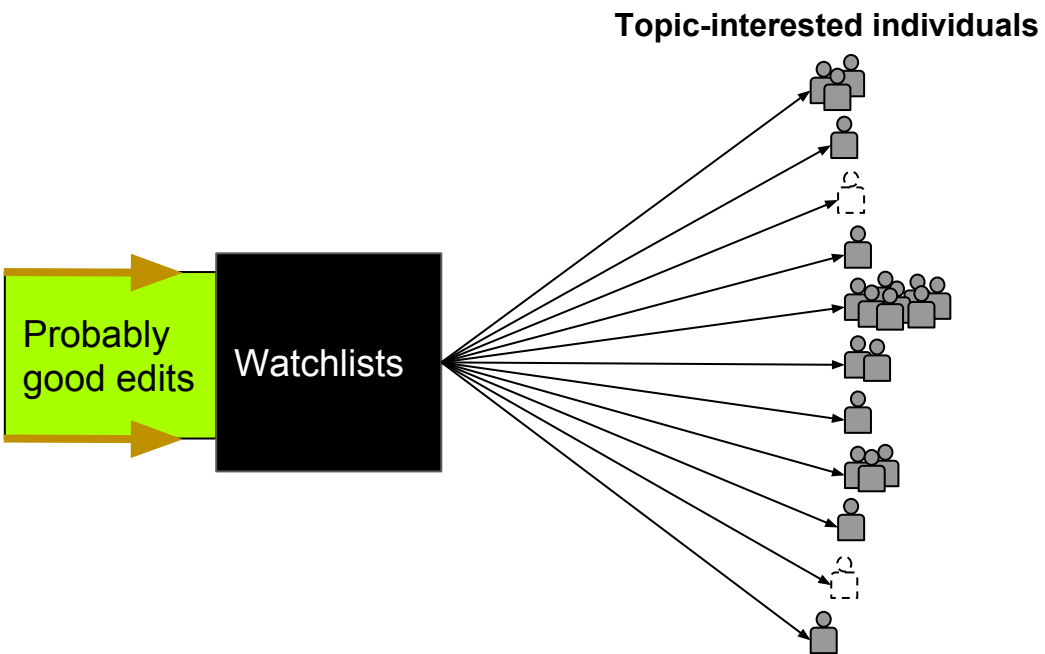


Subtle problems



Very difficult to watch pages before they are created...

Subtle problems



Topic modeling in ORES

Alan Turing

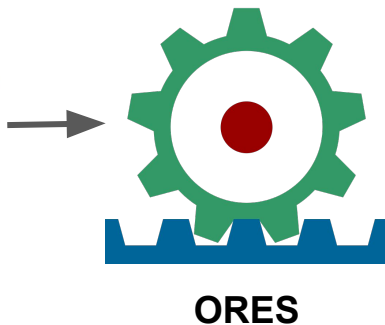
A *good article* from Wikipedia, the free encyclopedia. A former *featured article candidate*.

This is an **old revision** of this page, as edited by **Manning Bartlett (talk | contribs)** at 19:39, 12 November 2001 (*added an introductory sentence*). The present address (URL) is a **permanent link** to this revision, which may differ significantly from the **current revision**.

(diff) ← Previous revision | Latest revision (diff) | Newer revision → (diff)

Alan Mathison Turing (June 23,1912-June 7,1954), British mathematician and computer scientist *ante litteram*, considered to be one of the fathers of modern digital computing. In his paper "On Computable Numbers, with an Application to the Entscheidungsproblem" (1936), he proved that there was no solution to the **Entscheidungsproblem** by first showing that the **halting problem** for **Turing machines** (a formal device introduced by Turing and useful in **computational theory**) is unsolvable. While his proof was published subsequent to that of **Alonso Church**, Turing's work is considerably more accessible and intuitive.

https://en.wikipedia.org/w/index.php?title=Alan_Turing&oldid=234785 (CC-BY-SA)



Topic modeling in ORES

Alan Turing

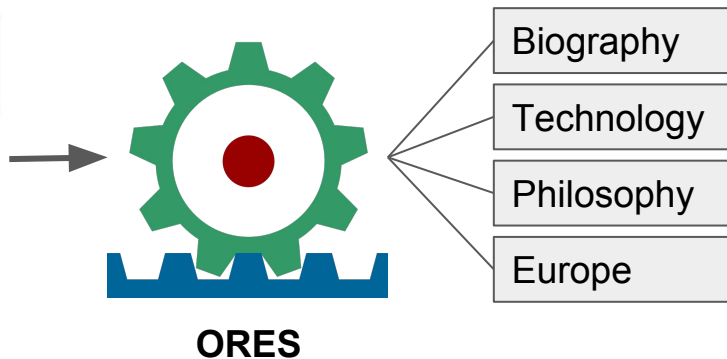
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Topic modeling in ORES

Alan Turing

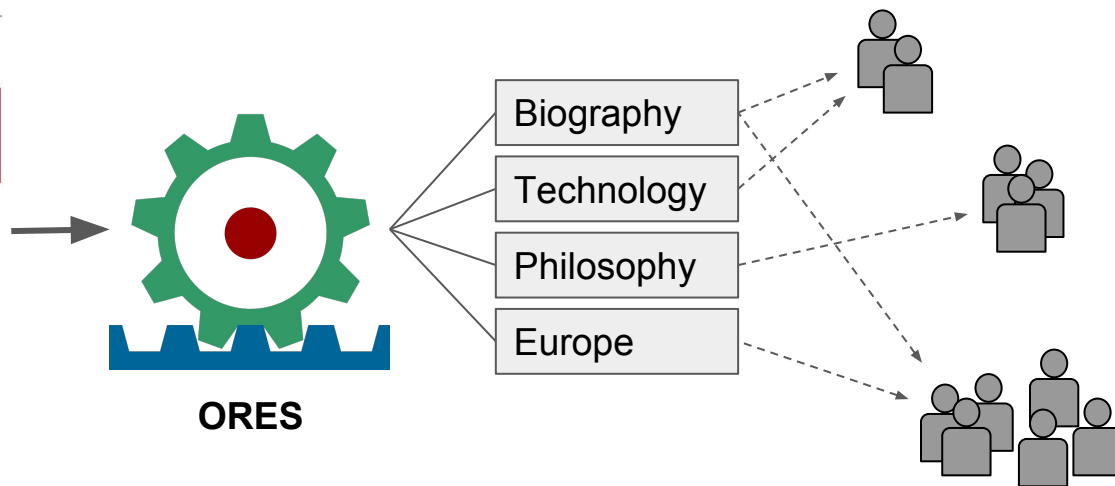
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https://en.wikipedia.org/w/index.php?title=Alan_Turing&oldid=234785 (CC-BY-SA)



Alan Turing

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WikiProject Biography / Science and Academia	(Rated GA-class)	[show]
WikiProject Computing / CompSci	(Rated GA-class, Top-importance)	[show]
WikiProject Robotics	(Rated GA-class, Top-importance)	[show]
WikiProject Mathematics	(Rated GA-class, Top-importance)	[show]
WikiProject LGBT studies / Person	(Rated GA-class)	[show]
WikiProject Philosophy	(Rated GA-class, Mid-importance)	[show]
WikiProject Cryptography / Computer science	(Rated GA-class, Top-importance)	[show]
WikiProject History of Science	(Rated GA-class, Mid-importance)	[show]
WikiProject London	(Rated GA-class, High-importance)	[show]
WikiProject Greater Manchester	(Rated GA-class, High-importance)	[show]
WikiProject Cheshire	(Rated GA-class, High-importance)	[show]
WikiProject England	(Rated GA-class, High-importance)	[show]
WikiProject Running	(Rated GA-class, Low-importance)	[show]
WikiProject Molecular and Cell Biology	(Rated GA-class, Mid-importance)	[show]
WikiProject Athletics	(Rated GA-class, Low-importance)	[show]

Wikipedia:WikiProject Council/Directory

From Wikipedia, the free encyclopedia
< Wikipedia:WikiProject Council



Community portal

Dashboard · Departments (Maintenance) · IRC · Meetups
Directories (Rules · How-to · Essays · Index · Noticeboards · **WikiProjects**)

WikiProject directory

This is the main **directory of WikiProjects** and related [administration pages](#) on English Wikipedia. Due to the high volume of WikiProjects (over 2,000), this directory has been split into several "sub-directories" based on the projects' scope.

- You can also use the [Special:Search](#) box below to locate WikiProjects and sub-pages.

New to WikiProjects? See [FAQs about WikiProjects](#) for the answers to the most common inquiries. The [WikiProject guideline page](#) outlines generally accepted protocols and conventions.

Adding to the listings or changing entries! The directories sub-pages listings are constructed using the `{{Wikipedia:WikiProject Council/Directory/WikiProject}}` template; full instructions and a definition of "inactive WikiProject" are available [here](#).

[Shortcuts](#)

[WP:PROJDIR](#)

[WP:LWP](#)

Contents [hide]

- WikiProjects by topic
 - Culture and the arts
 - Geographical
 - History and society
 - Science, technology and engineering
 - Wikipedia assistance and tasks
- Administration pages
 - WikiProject Council

Culture and arts

Arts
Music
Performing
Plastic
Visual
Broadcasting
Crafts and hobbies
Entertainment
Games and toys
Food and drink
Internet culture
Language and lit.
Linguistics
Biography
Media
Philosophy and rel.
Sports

Geography

Bodies of water
Cities
Countries
Africa
Americas
Asia
Europe
Oceania
Landforms
Maps
Parks & cons.

History and society

History and society
Business and econ.
Education
Military and warfare
Politics and gov.
Transportation

STEM

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Chemistry
Economics
Engineering
Geosciences
Medicine
Information science
Mathematics
Meteorology
Physics
Space
Technology
Time
Women's health

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Technology
Time
Women's health

Alan Turing

A [good article](#) from Wikipedia, the free encyclopedia. A former [featured article candidate](#).

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[Emily Dickinson](#)

A *featured article* from Wikipedia, the free encyclopedia

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Space
Technology
Time
Women's health

Nelson Mandela

President of South Africa, anti-apartheid activist ([Wikidata](#)),

Hand-wavey Feature Engineering for my ML Friends

- Features: 300 cell vector based on word2vec

...

- Estimator: GradientBoosting (one vs rest strategy)

Hand-wavey statistics for my ML Friends

	Accuracy	PR_AUC	ROC_AUC	F1-Measure
RandomForests	91.9	64.6	93.9	51.62
GradientBoosting	97.5	74.5	95.2	66.93

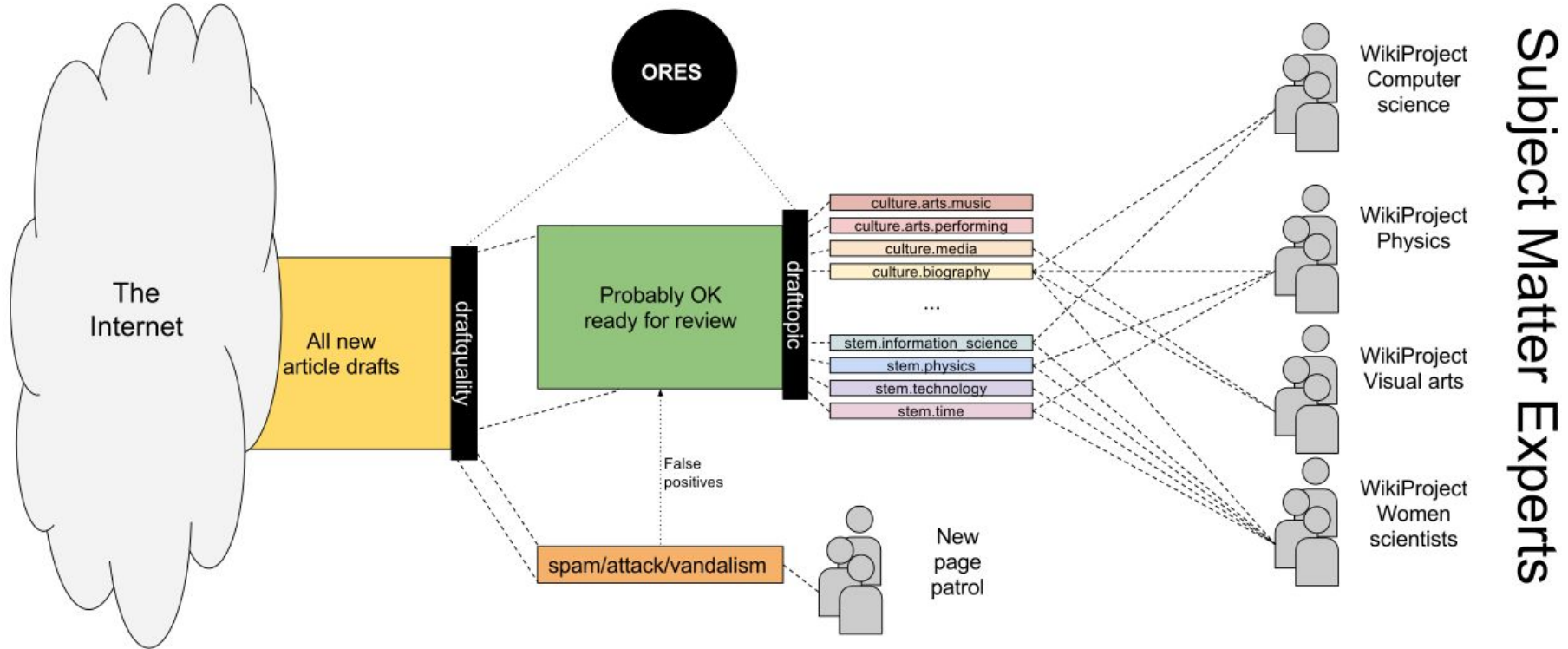
Table 1: Macro Statistics for RandomForest and Gradient Boosting models

	Accuracy	PR_AUC	ROC_AUC	F1-Measure
RandomForests	87.9	66.2	91.9	56.22
GradientBoosting	94.5	77.8	94.9	72.61

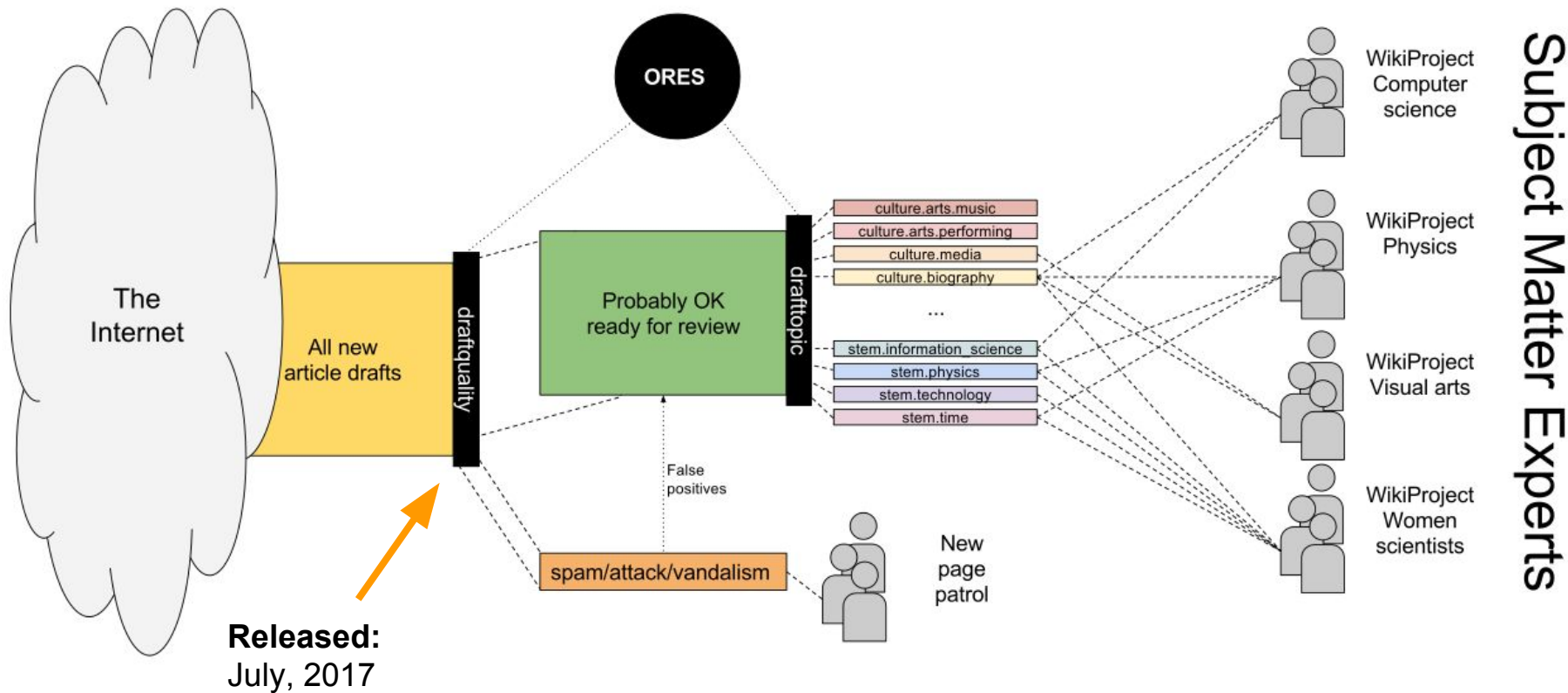
Table 2: Micro Statistics for RandomForest and Gradient Boosting models

TL;DR: It really works well -- even on the drafty first revisions of articles!

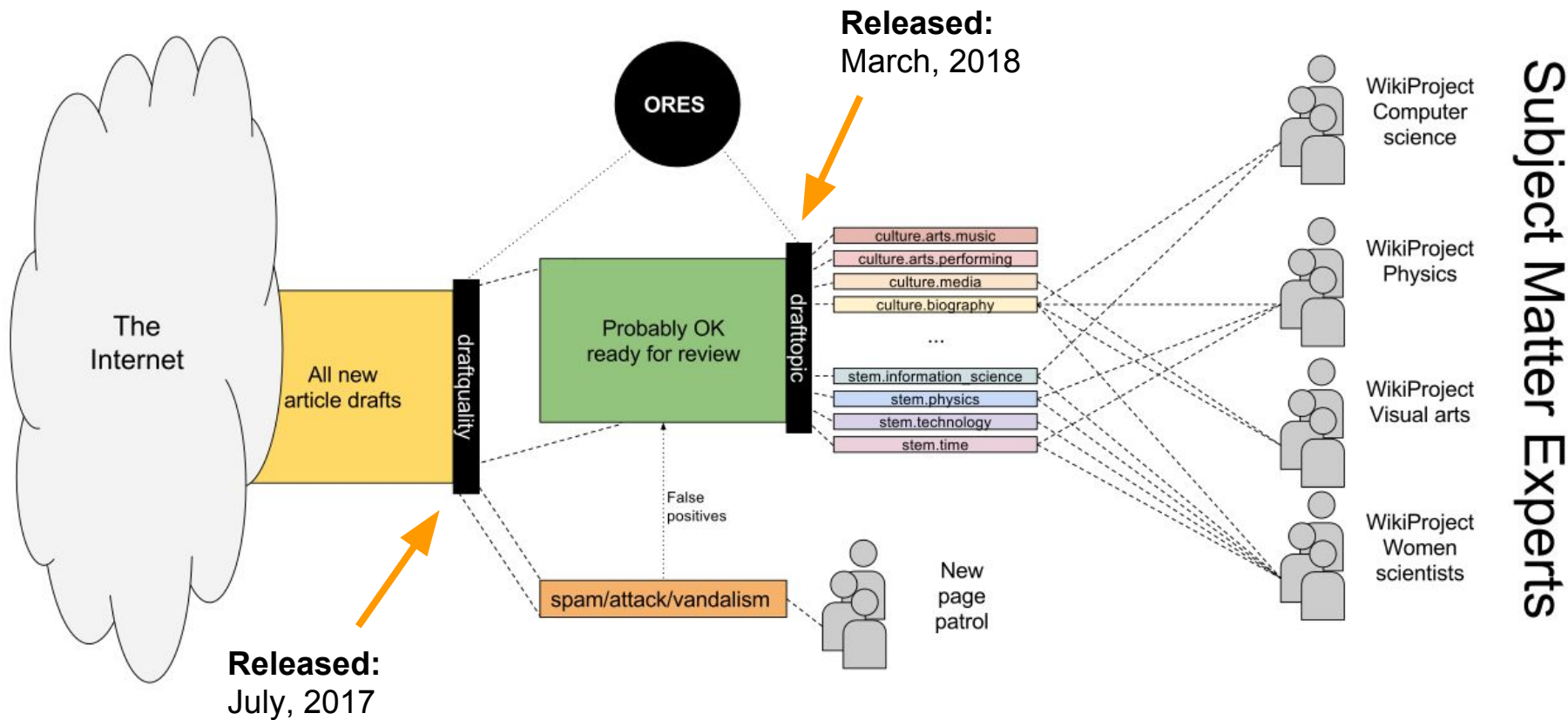
The ORES vision for article draft review



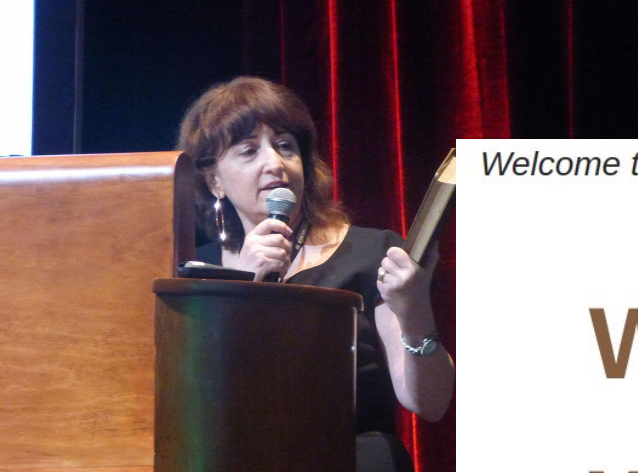
The ORES vision for article draft review



The ORES vision for article draft review







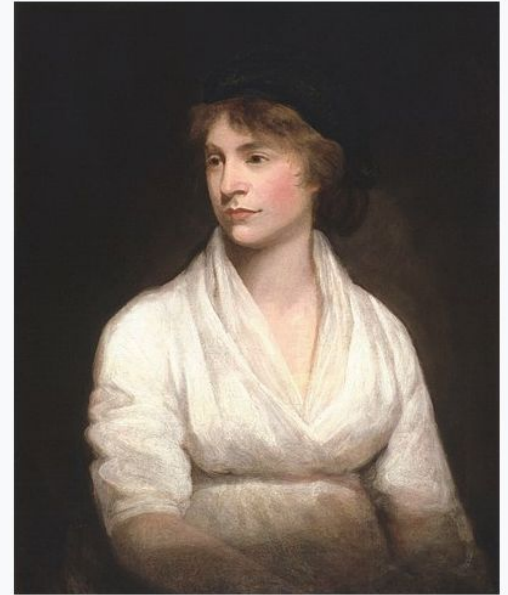
Welcome to...

WikiProject Women writers

A [WikiProject](#) dedicated to ensuring quality coverage of women writer biographies, as well as their works and their awards. The project also

[Mary Wollstonecraft by John Opie \(c. 1797\).jpg](#) (PD)

WikiProject Women writers



Mary Wollstonecraft

Shortcut

[WP:WMNWRITE](#)

Categories

[WikiProject Women writers articles](#), [Women writers](#)

Portals



[Biography portal](#)

Welcome to **WikiProject Article Rescue Squadron** (ARS). Sometimes Wikipedia articles about **notable topics** exist in poor form, badly written, unsourced— but is that sufficient in itself to remove them from the encyclopedia at **Articles for Deletion**? No! If an article is about an **encyclopedic topic** that has received significant coverage in **reliable sources** that are **independent** of the subject, the article may simply need **improvement**.



[Rescuesquad.png](#) (CC-BY-SA)

People like:



+ New Editors = More New Editors

People like:



+ New Editors = More New Editors

and

Less hard work for page patrollers

Disclaimer: Rosiestep has not reviewed or endorsed this presentation or the modeling project I have described.

I had one conversation with Rosiestep at Wikimania'17 and I happen find her and her work inspiring -- so I thought she made for a great example.

She deserves some of the credit, but none of the blame for what I'm talking to you about.

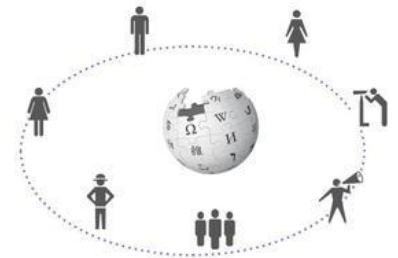
We have the models...

We have the models...

Now we need product integration.

We have the models...

Now we need product integration.



Page Curation

A new editor engagement tool

We have the models...

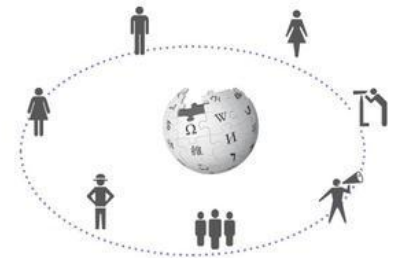
Now we need product integration.

Edit Review Improvements (ERI)

- Edit Review Improvements
- Glossary

Features

- New filters for edit review



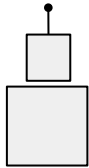
Page Curation

A new editor engagement tool

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User:SQLBot

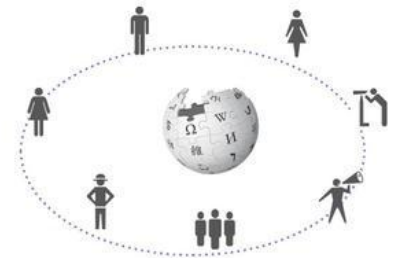


Edit Review Improvements (ERI)

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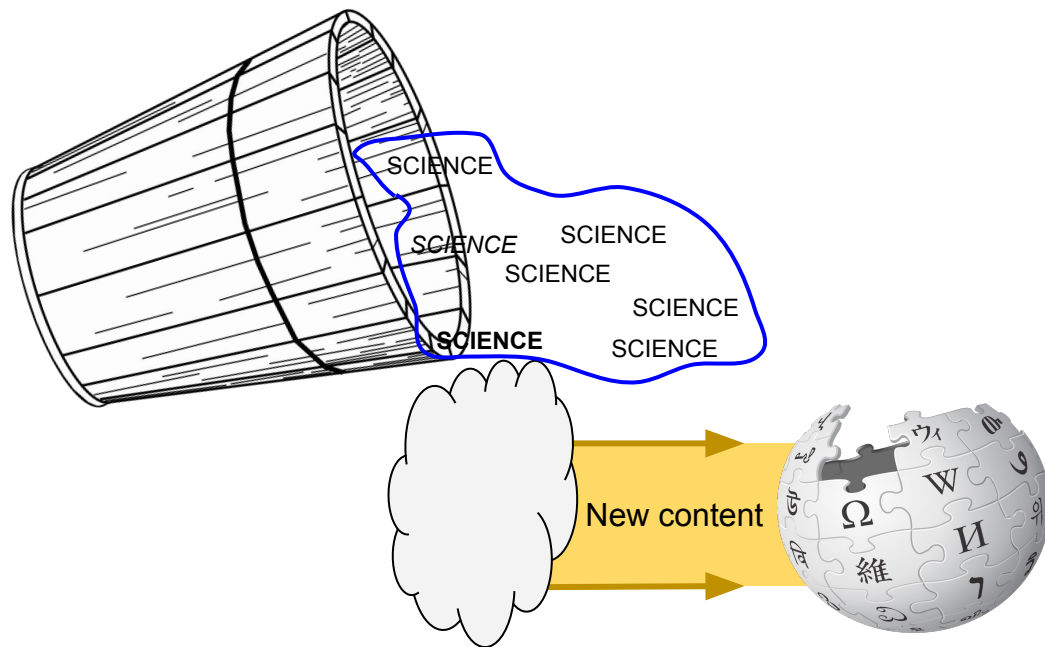
- New filters for edit review



Page Curation

A new editor engagement tool

Thanks!



Props to **Sumit Asthana**
for doing most of the hard
work.

Aaron Halfaker

ahalfaker@wikimedia.org

EpochFail/halfak

- Expanding beyond English Wikipedia
- Other workflows that are struggling
- Demo some of these AIs -- what is ORES anyway?