



Más Allá de la Prosa:

Infraestructura para la comunicación de ciencia abierta, integrada, coordinada, y conectada

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Pacific Northwest National Laboratory

Con: Amy Goldman, James Stegen, Samantha Grieger,
Xingyuan Chen y Tim Schiebe (PNNL)





CIENCIA

Más Allá de la Prosa



Un Modelo **Deficitario** de Comunicación

CIENCIA

Comunicación → Público



Un Modelo de **Deficitario** de Comunicación



¿Qué pasaría si?



¿Modelos alternativos de **comunicación**?

Herramientas
de la
Ciencia
Abierta



¿Modelos alternativos de **comunicación**?

Herramientas de la Ciencia Abierta



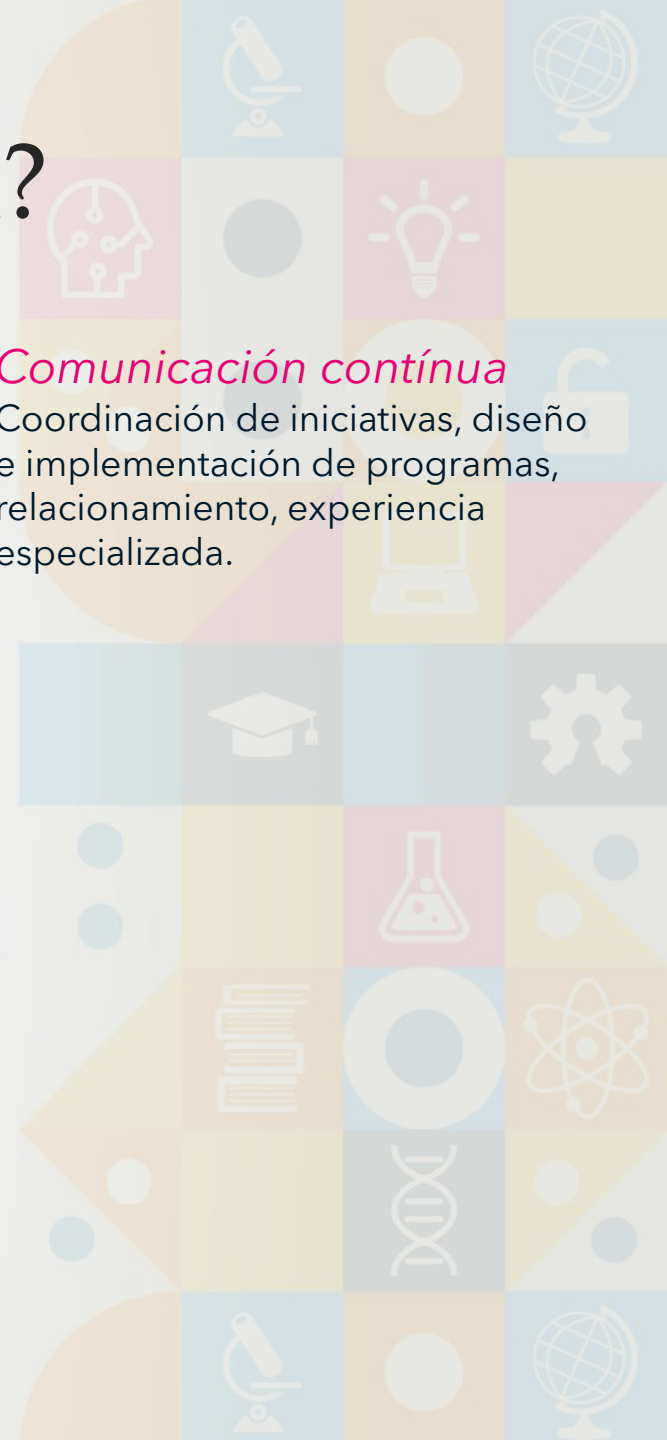
Público



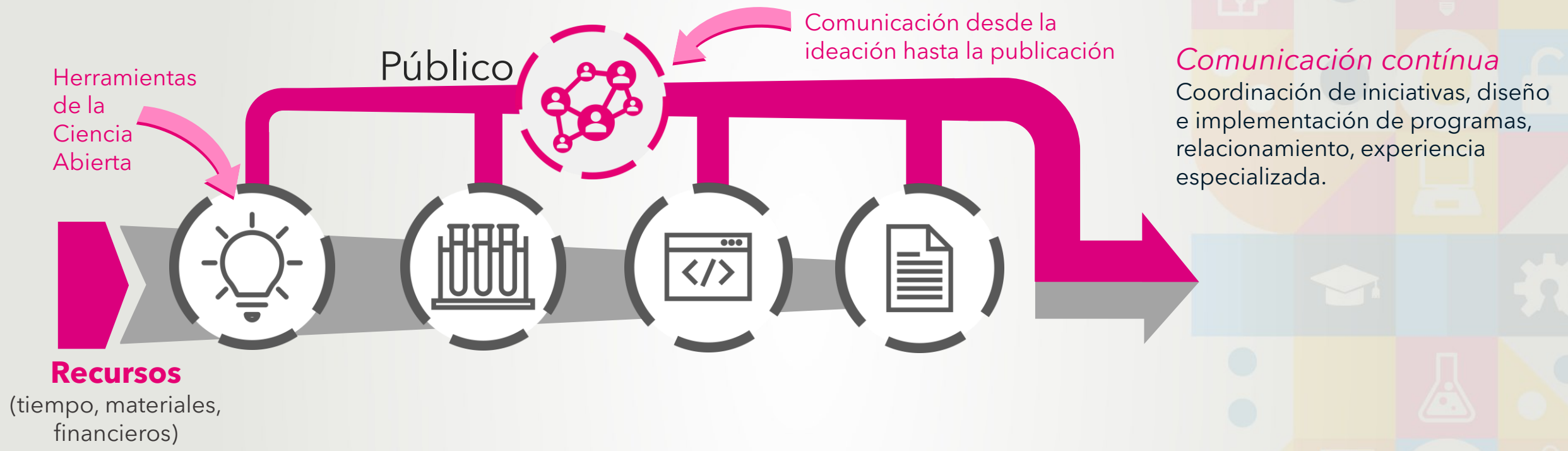
Comunicación desde la ideación hasta la publicación

Comunicación continua

Coordinación de iniciativas, diseño e implementación de programas, relacionamiento, experiencia especializada.



¿Modelos alternativos de **comunicación**?



Herramientas de la Ciencia Abierta

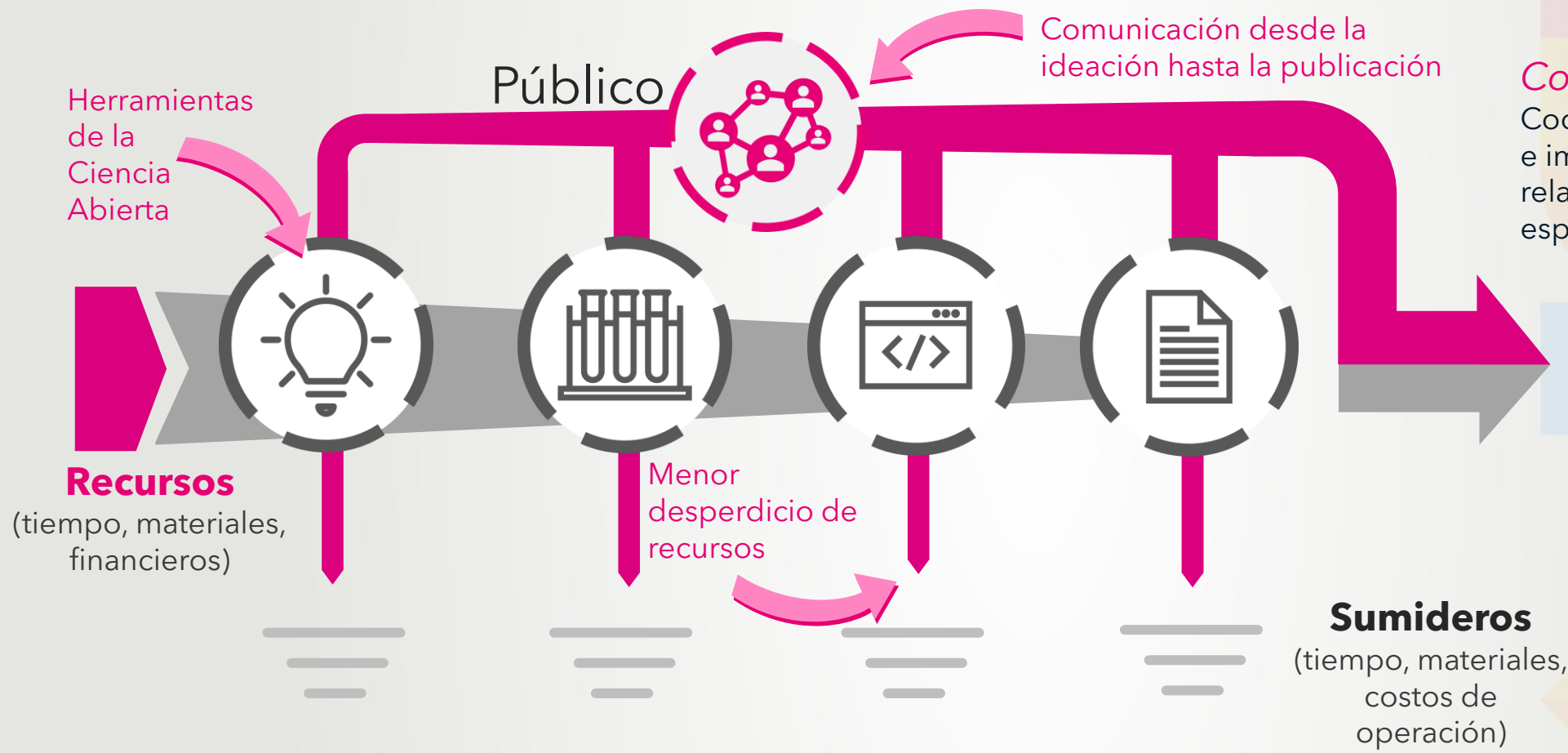
Recursos
(tiempo, materiales, financieros)

Público

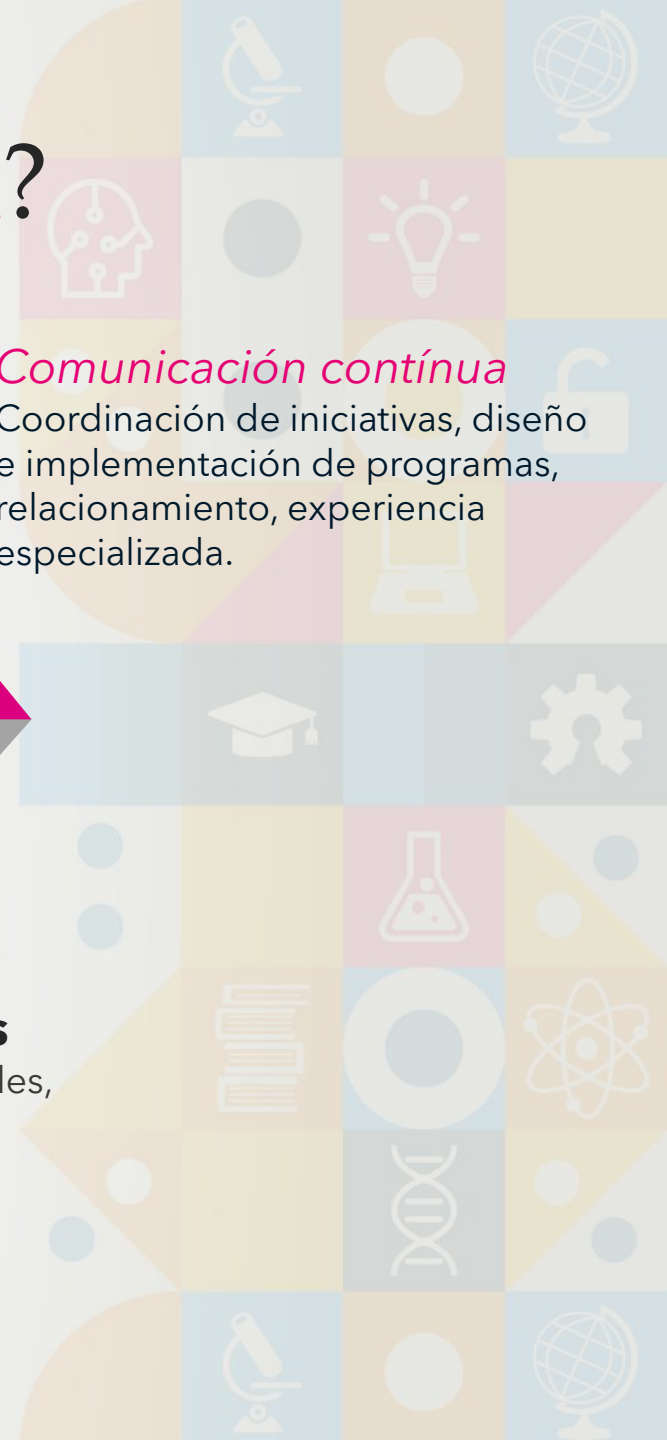
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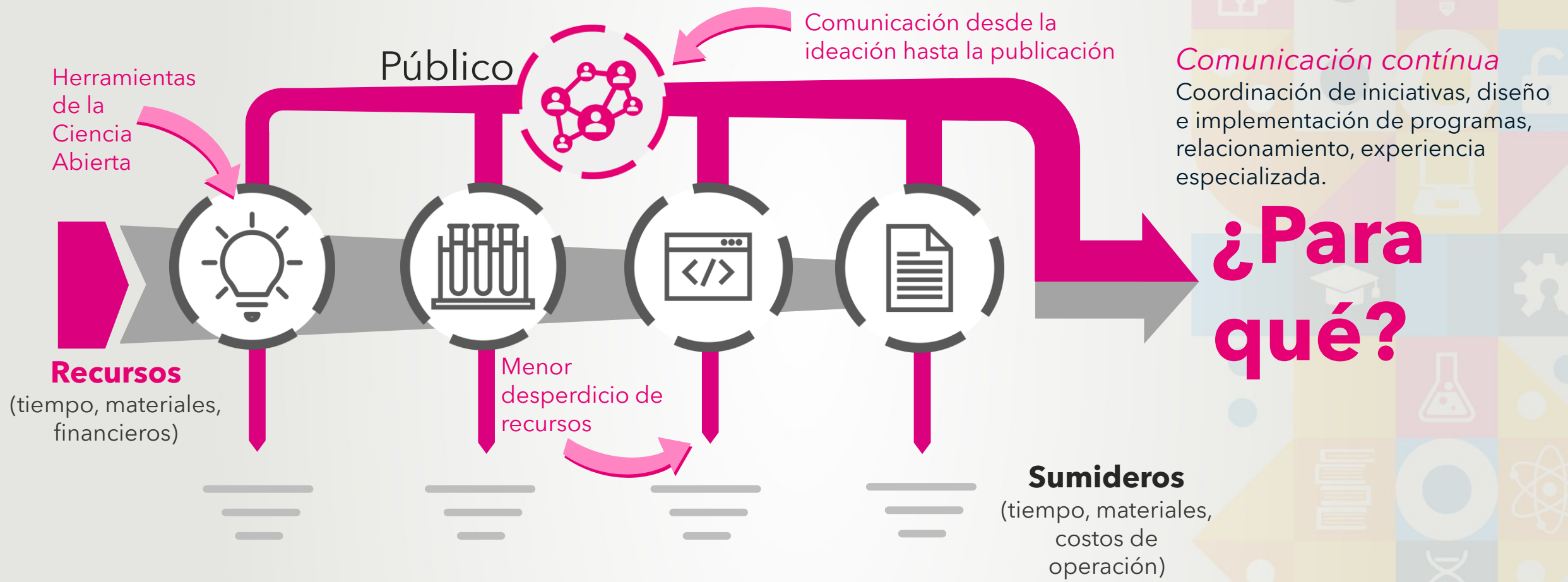
¿Modelos alternativos de **comunicación**?



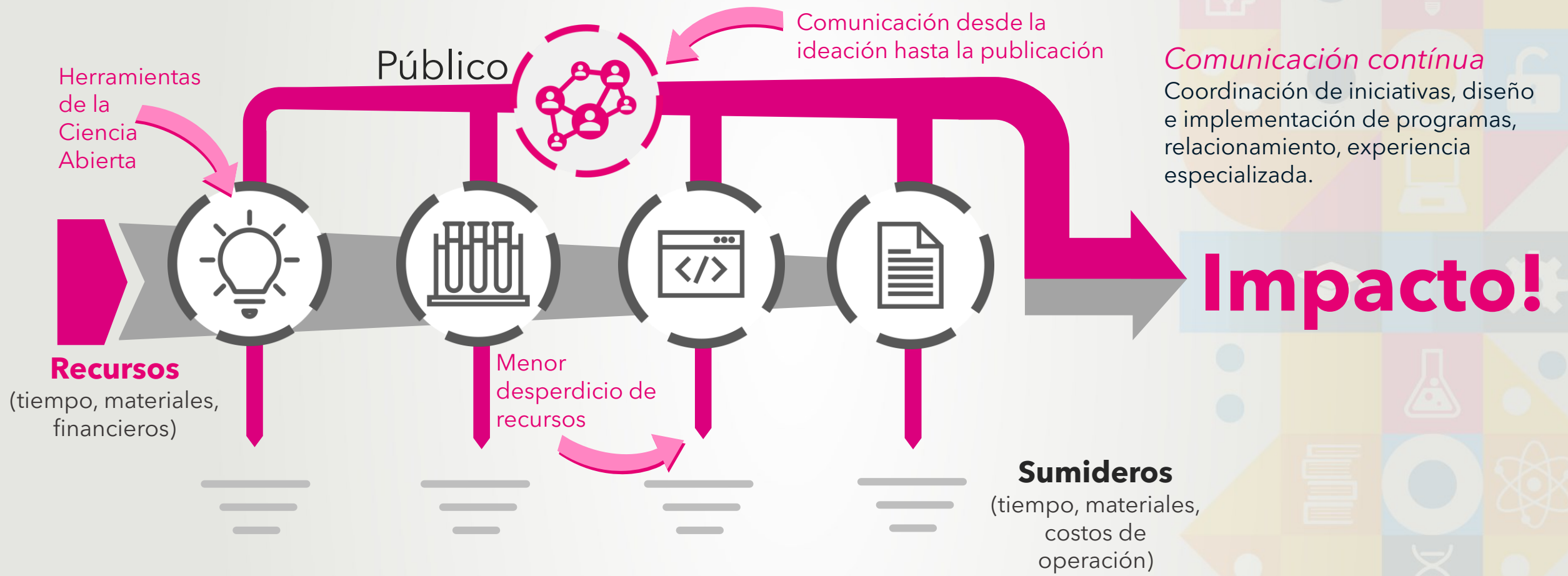
Comunicación continua
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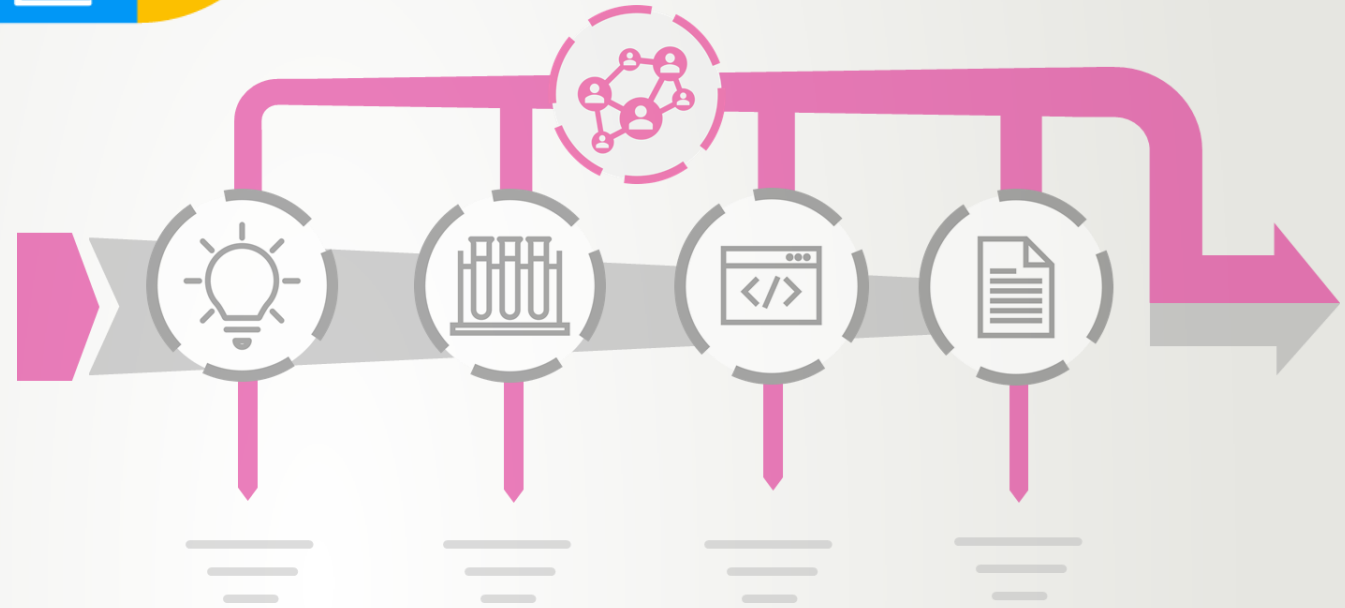


¿Modelos alternativos de comunicación?



¿Modelos alternativos de **comunicación**?

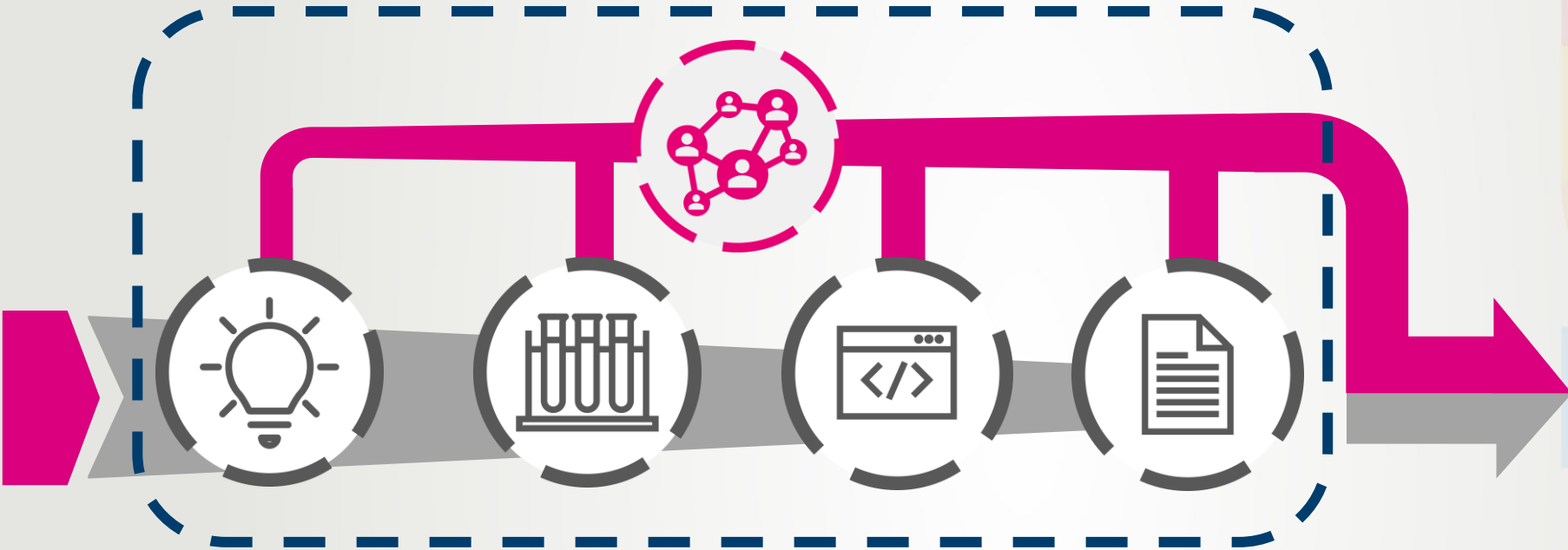




Pensando en infraestructuras



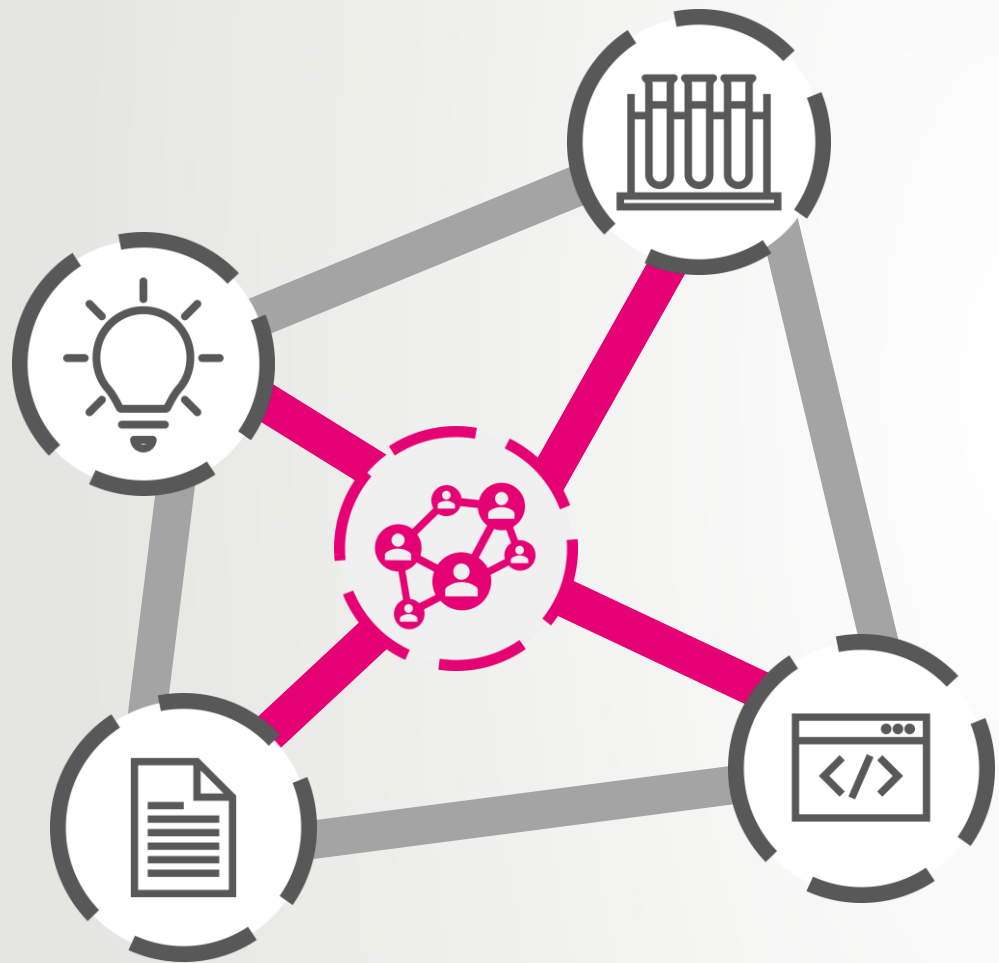
¿Modelos alternativos de comunicación?



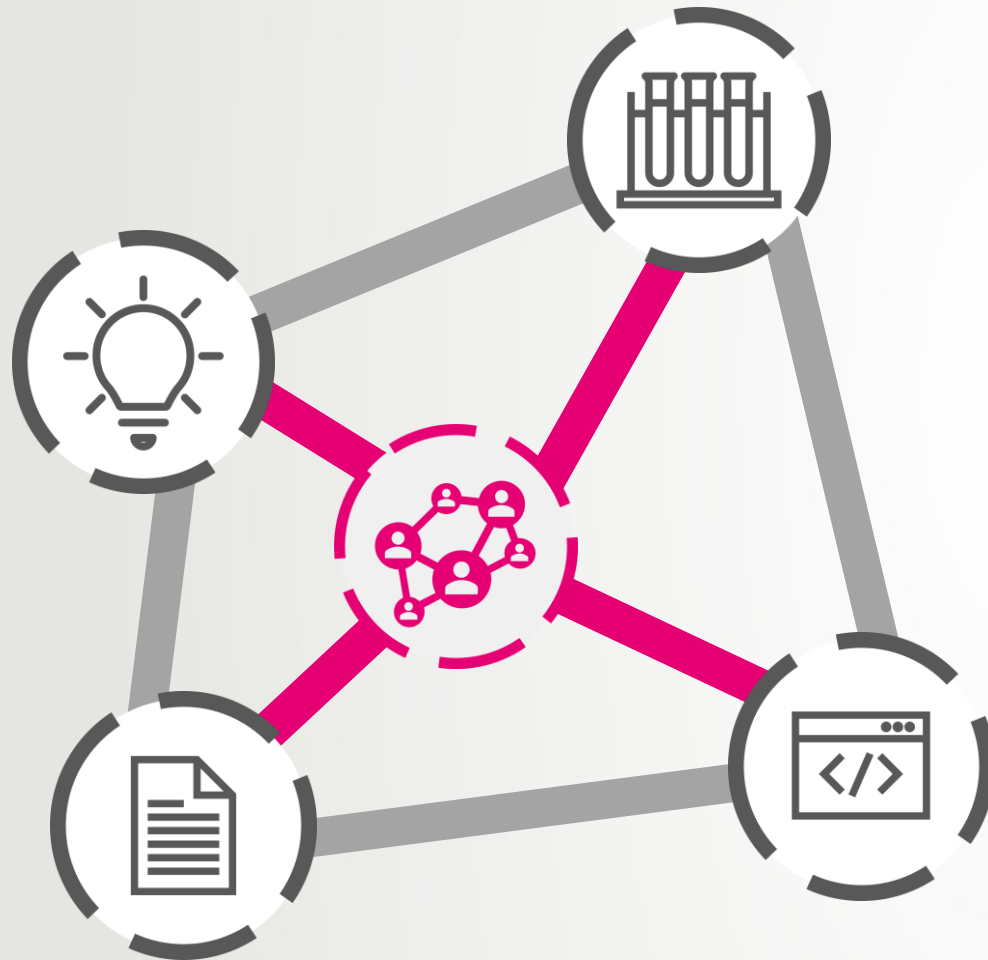
Impacto!



Infraestructura para la **comunicación**



Infraestructura para la **comunicación**



Ciber-infraestructura y comunicación científica

Las ciber-infraestructuras disponibles están orientadas a los objetos de investigación, procurando la accesibilidad y la interoperabilidad.





Un problema de diseño



Program

Integrated Coordinated Open Networked (ICON) Science Cooperative

Science for and by the community



Principios **ICON**



Integra a través de **atributos** físicos, químicos, biológicos, **sociales** y de escalas espaciales y temporales;



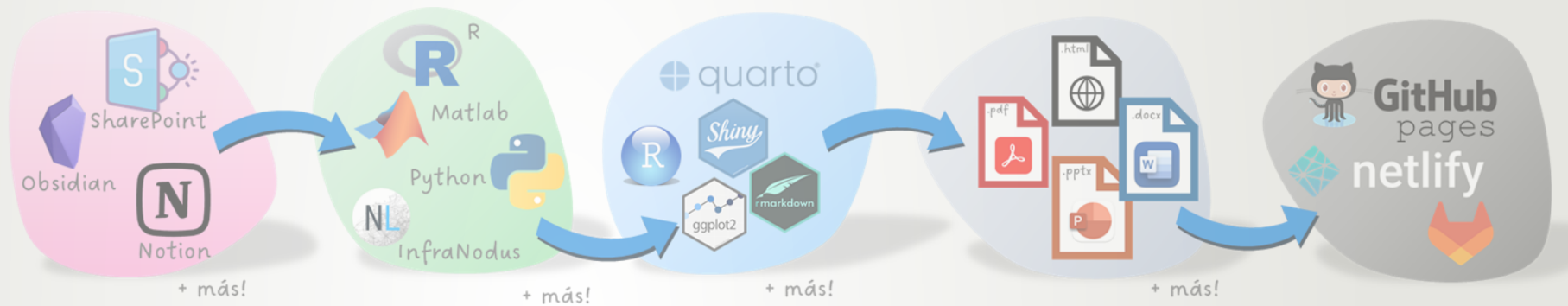
Coordina el uso de protocolos y metodos a través de (eco) sistemas y **grupos de investigación**, lo cual facilita la transferabilidad y los beneficios mutuos.



(Open) Abierta al intercambio de ideas, datos, software, y modelos a lo largo del ciclo de vida de la investigación. También busca que todos los objetos de investigación abiertos y FAIR lo que le **permite a los investigadores contribuir y maximizar el uso de los recursos**, y

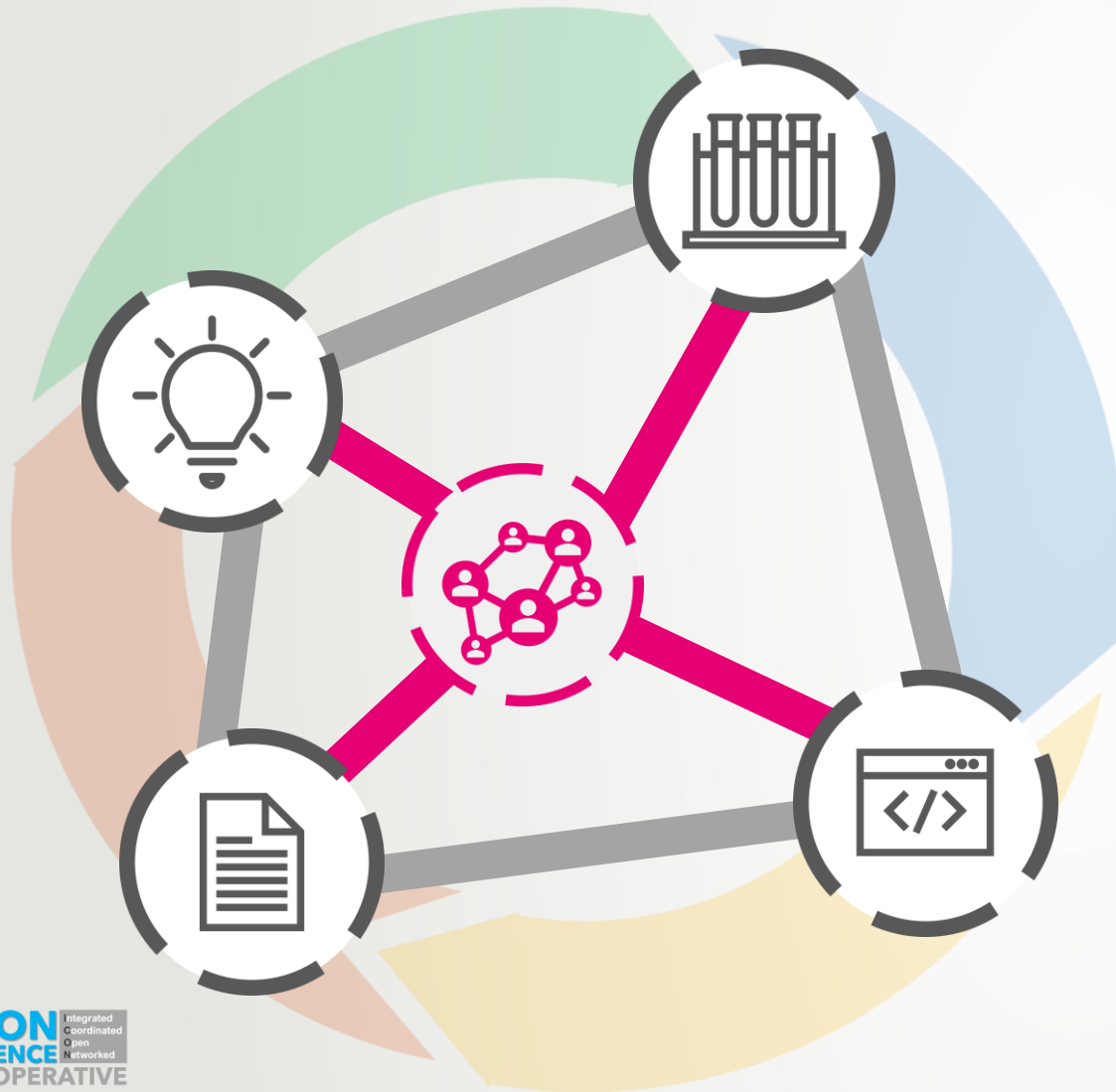


(Networked) Conecta esfuerzos. La investigación es diseñada e implementada a lo largo de su ciclo de vida con un **amplio rango de participantes con el fin de lograr beneficios mutuos**.



Hacia la implementación de una Infraestructura para la comunicación de ciencia abierta, integrada, coordinada, y conectada

Infraestructura para la **comunicación**

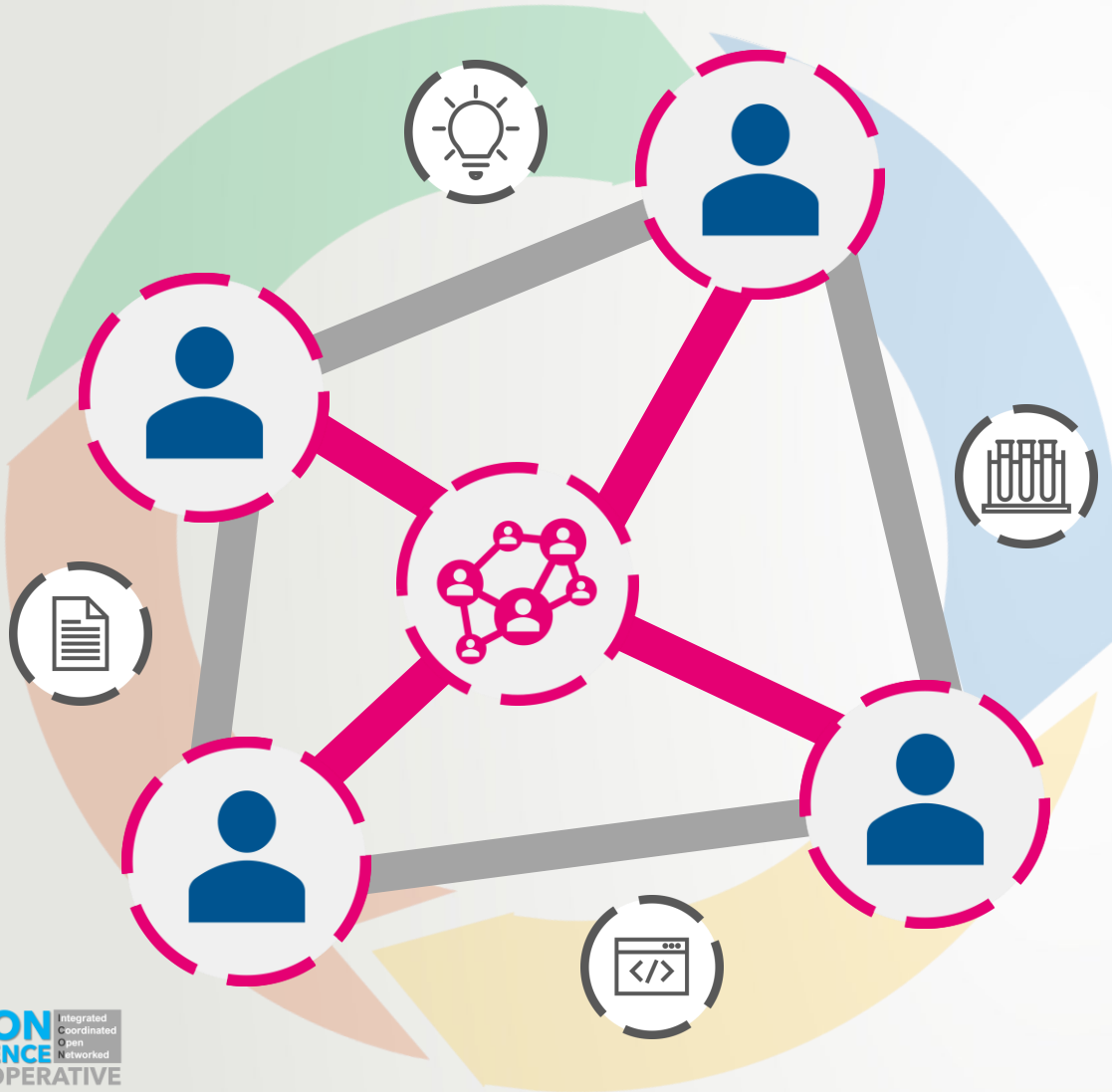


Ciber-infraestructura y comunicación científica

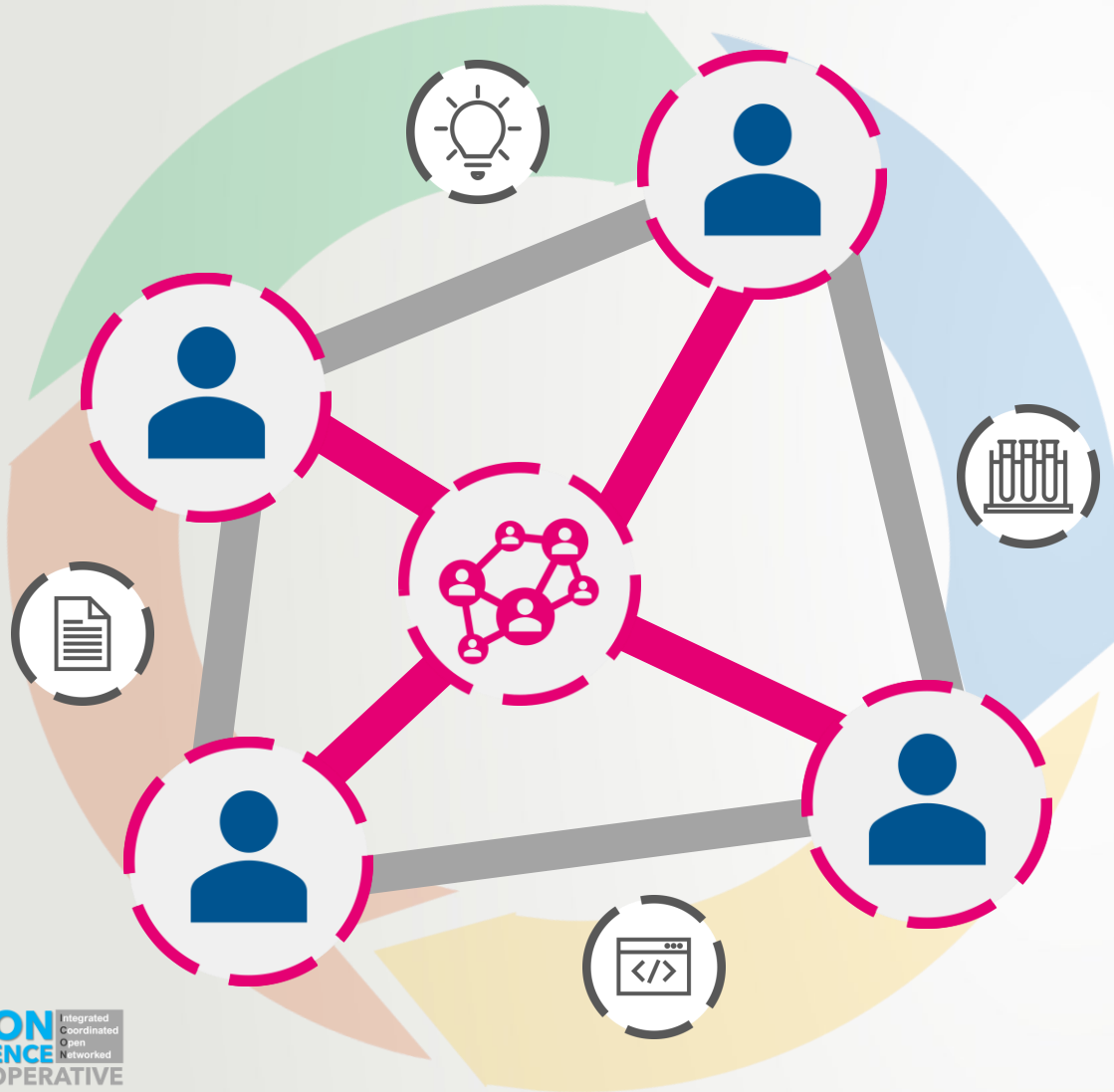
Las ciber-infraestructuras disponibles están orientadas a los objetos de investigación, procurando la accesibilidad y la interoperabilidad.



Infraestructura para la **comunicación**



Infraestructura para las **Personas**



Quienes
Somos

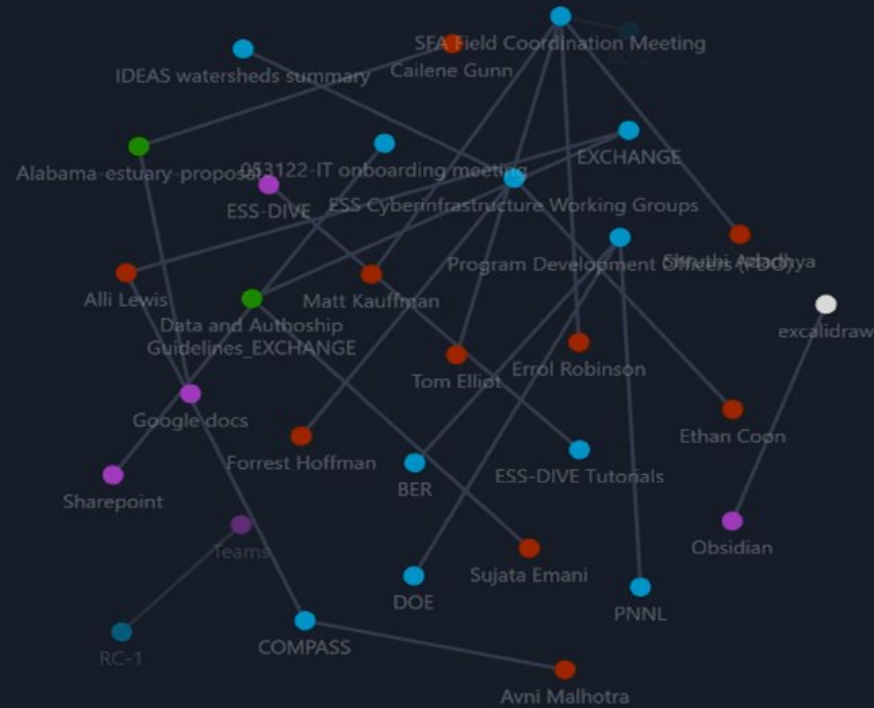
Lo que
hacemos

A quienes
conocemos



Datos

Base de Conocimiento
(personal) del
Laboratorio
Nacional
Del Pacifico
Noroccidental
(PNNL)





Analytics



Paul Leonardi
Professor of technology
management, University of
California, Santa Barbara



Noshir Contractor
Professor of behavioral
sciences, Northwestern
University

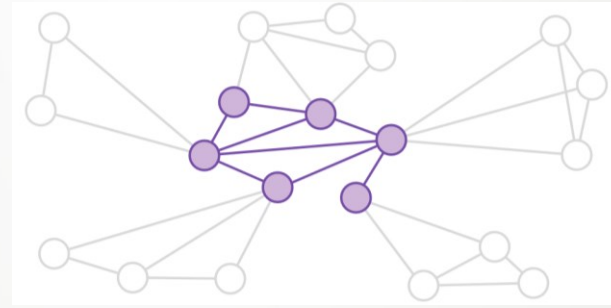
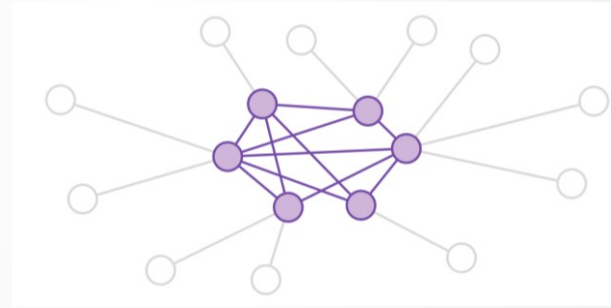
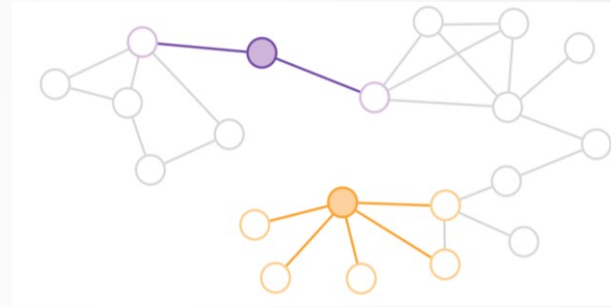
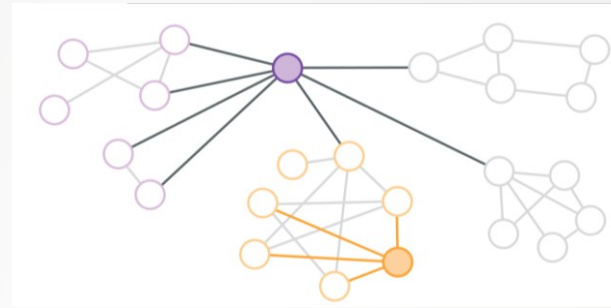
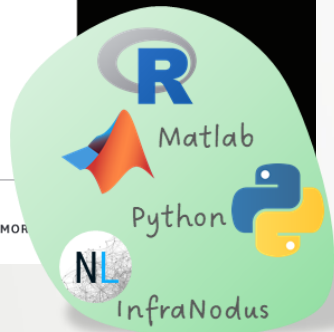
Better PEOPLE Analytics

*Measure
Who
THEY
KNOW,*

*Not Just
Who
THEY
ARE.*

70 Harvard Business Review
November-December 2018

Illustrations by ANDY GILMORE



Generación de ideas: Personas conectadas con equipos diversos podría generar más ideas nuevas que aquellas con un menor rango de contactos.

Influencia: Personas con conexiones más allá de primer grado pueden ser más influyentes que aquellas con múltiples conexiones sólo de primer grado.

Eficiencia: Equipos altamente conectados tienden a trabajar más eficientemente.

Innovación: Equipos menos conectados internamente tienden a compartir ideas más diversas que pueden conllevar a innovaciones.

Motor de análisis

Infraestructura Sostenible

Coding for broader impact: leveraging coding skills for stakeholder communication

Daniel B Turner^{1,2*}, Jocelyn E Behm¹, Payton M Phillips¹, Victoria A Ramirez¹, and Matthew R Helmus¹

Sharing ecological research with stakeholders has broader impacts for conservation and sustainability outcomes. However, ecologists face major challenges to effective communication with stakeholders, including lack of reciprocal trust, unacknowledged incentives, differing goals, and scientific inaccessibility. These obstacles largely stem from professional training in ecology prioritizing effective communication among peers over the public. Here, we argue that coding skills honed for peer communication can be leveraged to overcome these challenges within a “coding for broader impact” framework that provides tasks to promote effective communication and culminates in individualized stakeholder reports. The reports explicitly incorporate stakeholder knowledge and are coded in conjunction with tasks for peer communication. We illustrate the framework through three case studies in which we shared data and information about backyard biodiversity, agricultural impacts, and tick-borne disease with homeowners, farmers, and land managers. A coding for broader impact framework allows a common analytical tool to become a public communication skill valuable to diverse stakeholder audiences.

Front Ecol Environ 2022; 20(4): 255–262. doi:10.1002/fee.2469

Public communication of ecological research promotes science-based conservation and environmental sustainability goals, appreciation for nature, and funding for basic research. However, communicating ecological research so that stakeholder audiences understand and value scientific narratives can be difficult (Pace *et al.* 2010). Effective communication often does not readily occur between ecologists and stakeholders who require (eg land managers), are affected by (eg property owners), or express interest in (eg the public) ecological research and its technical analyses (eg environmental

engineers, epidemiologists, insurance analysts, and environmental risk analysts; Enquist *et al.* 2017). Training in effective stakeholder communication is often unavailable or not prioritized by ecologists because post-graduate training typically focuses on peer-to-peer communication (Kuehne *et al.* 2014). However, broader impacts can be realized if skills honed by ecologists for peer communication are also used for stakeholder communication.

Most ecologists today are familiar with coding, at least to some degree. Although ecologists primarily write code to produce data analyses, summaries for publications, and scientific presentations, code can also be repurposed to disseminate information to stakeholders. For example, data journalists use code to communicate complex stories by wrangling data, producing statistics and graphics for general audiences (Gray *et al.* 2012; Coddington 2015). Ecologists likewise can use their coding skills for improving communication both within the scientific community and with affected stakeholders.

We present a “coding for broader impact” framework that helps overcome the major challenges ecologists encounter when attempting to communicate effectively with stakeholders. Our framework outlines steps for stakeholder communication and a programming workflow to produce accessible reports. Stakeholder reports are research summaries written in the context of stakeholder knowledge and goals. We apply the framework in three case studies that vary in terms of the ecological question, the report style, and the target audience. In these case studies, we describe the framework’s operationalization in how we interacted with stakeholders, efficiently designed and coded reports, and overcame challenges to effective communication. To facilitate use of the framework, we provide a code repository of the case studies and a report template (<https://dbturner.github.io/c4bi>).

In a nutshell:

- Effective communication between ecologists and their stakeholders may not readily occur due to lack of reciprocal trust, unacknowledged incentives, differing goals, and scientific inaccessibility
- Achieving effective communication becomes easier if ecologists use data visualization and analysis code developed for publications as the basis for individualized stakeholder reports
- This “coding for broader impact” framework is applied across the length of a research project, beginning with initial interactions with stakeholders and data collection and culminating in report generation and distribution
- We discuss three case studies involving different types of stakeholders and ecological questions to demonstrate the wide-ranging application of our framework

¹Department of Biology, Temple University, Philadelphia, PA (dturner137@gmail.com); ²Department of Entomology and Ecology, Evolution, and Behavior Program, Michigan State University, East Lansing, MI

Centro de
Producción



+ más!

Objetos de
Investigación



+ más!

Ilustración adaptada del trabajo de Allison Horst
<https://github.com/allisonhorst/stats-illustrations>

Infraestructura Sostenible

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Centro de Producción



+ más!

Objetos de Investigación



+ más!

Interfaces de usuarios



+ más!

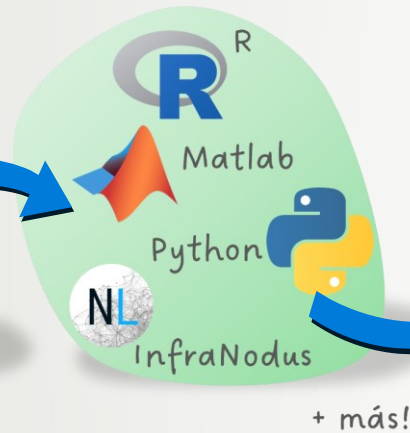
Ilustración adaptada del trabajo de Allison Horst
<https://github.com/allisonhorst/stats-illustrations>

Infraestructura Sostenible

Base de Conocimiento



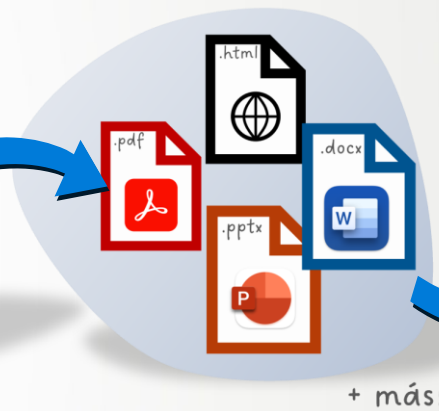
Motor de Análisis



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Objetos de Investigación



Interfaces de usuarios

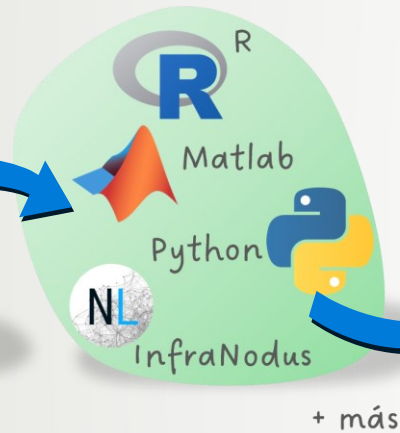


Infraestructura Sostenible

Base de Conocimiento



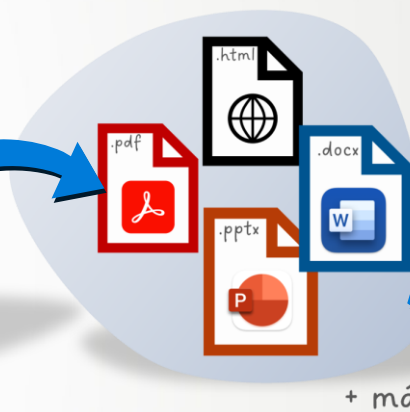
Motor de Análisis



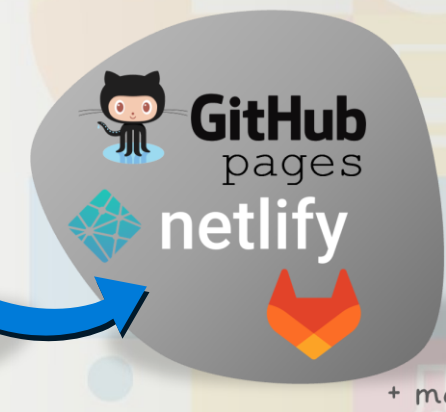
Centro de Producción



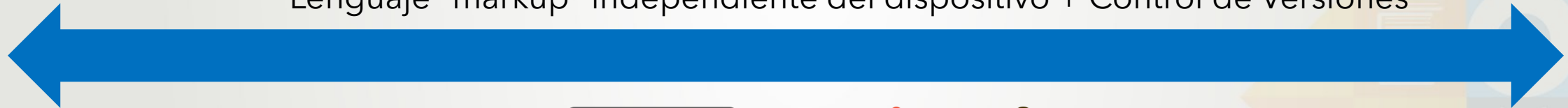
Objetos de Investigación



Interfaces de usuarios



Lenguaje "markup" independiente del dispositivo + Control de Versiones



Infraestructura Sostenible

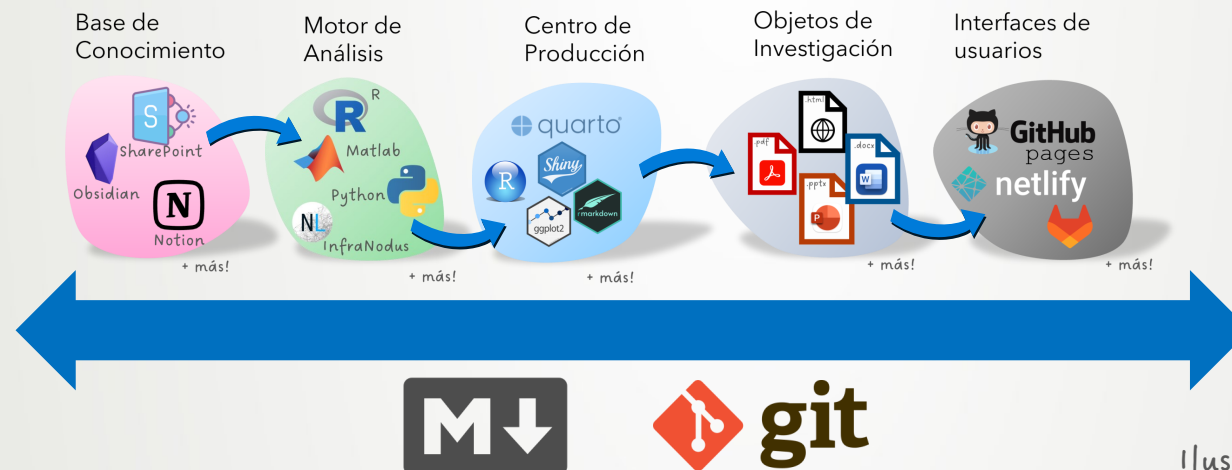


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Infraestructura Sostenible

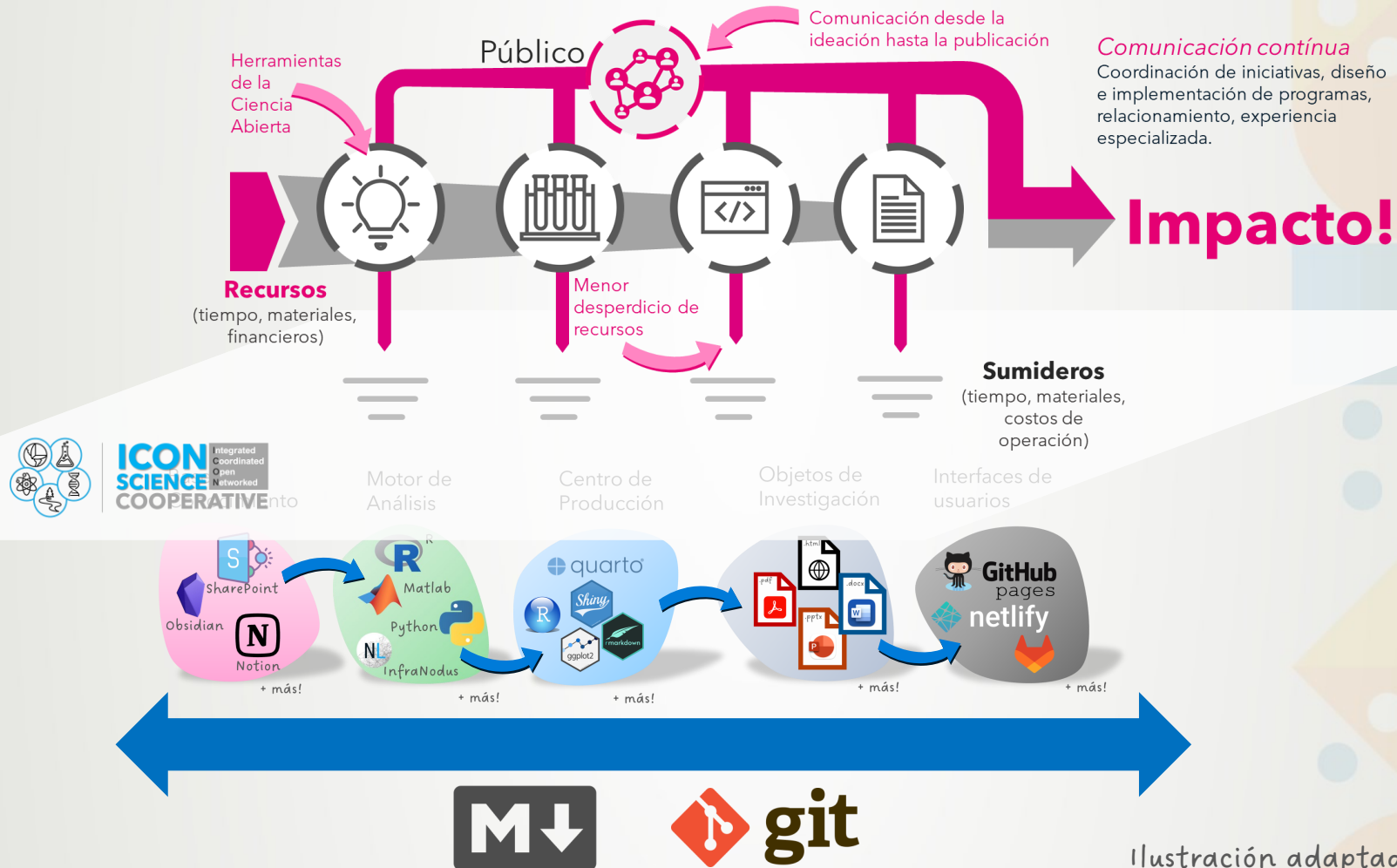


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En resumen

La ciencia abierta, entendida también como un espacio de **multiplicación** de los **impactos** positivos en la sociedad, requiere un replanteo de la **infraestructura** de su **comunicación**. En nuestra visión, proponemos expandir una infraestructura alrededor de los objetos de investigación hacia una infraestructura:

- Centrada en las **personas** (bases de conocimiento)
- Guiada por **datos** (Motores de análisis aplicados a bases de conocimiento)
- Sostenible (guiada por **escalabilidad** - "bottom up")

En el Laboratorio Nacional del Pacífico Noroccidental (**PNNL**) hemos empezado a explorar la implementación de esta visión en el marco de los principios de la **ciencia ICON** (Integrada, Coordinada, Abierta y Conectada). Estamos abiertos a **colaboración y discusión** con nuestros pares de **América Latina**.

Congreso Iberoamericano de Ciencia Abierta

Organizan:



Co organizan:



Aliados





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