

Procesos de innovación abierta:

caso DeepSeek

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Director Escuela de Sistemas Inteligentes

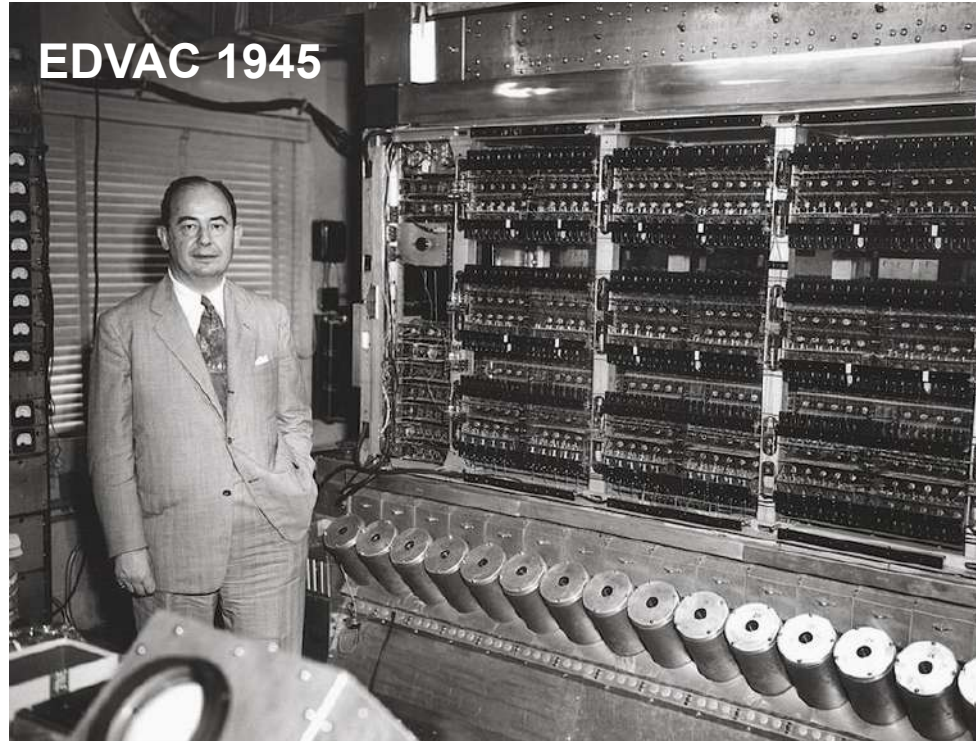
Open Source



Open Source: es un modelo donde la información, diseño o conocimiento es **público**, accesible, colaborativo y libremente **modificable**.







Von Neumann, J. (**1945**). *First draft of a report on the EDVAC* (Contract No. W-670-ORD-4926). Moore School of Electrical Engineering, University of Pennsylvania.



Thompson, K., & Ritchie, D. M. (1974). The UNIX time-sharing system. Communications of the ACM, 17(7), 365–375.

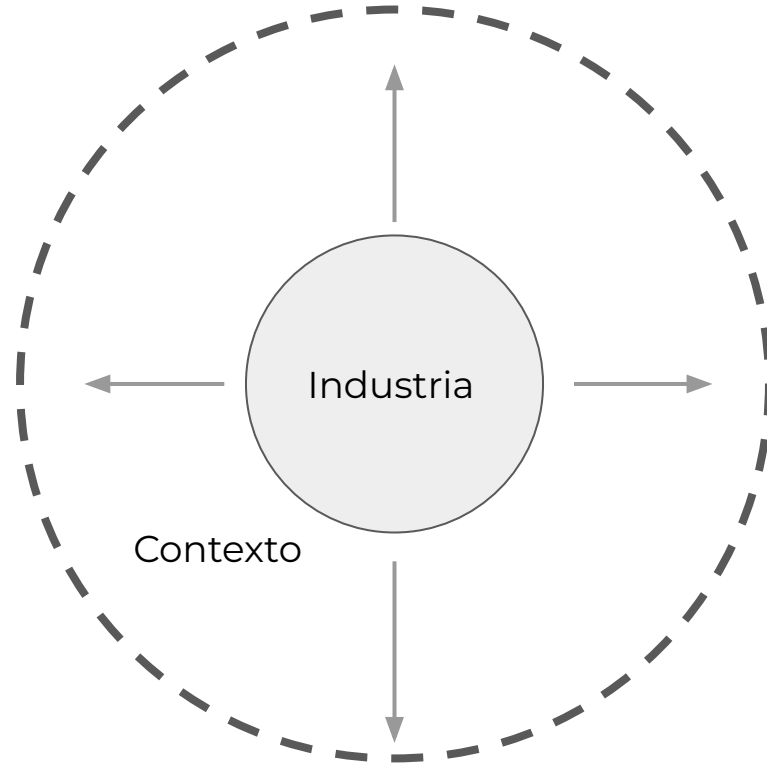


Colaboración pre-competitiva



Colaboración Pre-Competitiva

Colaboración Pre-Competitiva:
cooperación entre organizaciones para desarrollar conocimientos o tecnologías básicas **antes de competir** en el mercado.



Colaboración Pre-Competitiva

WARNING!

The following Manufacturers and Importers are licensed under the pioneer patent on

Gasolene Automobiles

Number 548,186, granted to George H. Selden, dated November 17, 1900.

MANUFACTURERS:

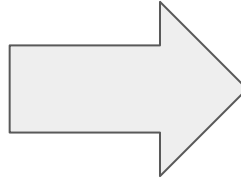
Electric Vehicle Co.	Pope Motor Car Co.
Winton Motor Carriage Co.	Smith & Mahley, Inc.
Parkard Motor Car Co.	The Commercial Motor Co.
Olds Motor Works	Berg Automobile Co.
Knox Automobile Co.	Cadillac Automobile Co.
The Hayes-Apperson Co.	Northern Mfg. Co.
The Autocar Co.	Pope-Whitcomb Co.
The George N. Pierce Co.	The Kirk Mfg. Co.
Apperson Bros. Automobile Co.	Elmore Mfg. Co.
Loocomobile Co. of America	E. H. Thomas Motor Co.
The Peerless Motor Car Co.	Buffalo Gasolene Motor Co.
Standard Motor Construction Co.	The F. B. Stearns Co.
Walsham Manufacturing Co.	Pope Manufacturing Co.
J. Stevens Arms & Tool Co.	Sandusky Automobile Co.
H. H. Franklin Mfg. Co.	Crest Manufacturing Co.

IMPORTERS:

Smith & Mahley, Inc.	Standard Automobile Co.
Central Automobile Co.	S. B. Gallaher
Alexander Fischer	Auto Import Co.
Hollander & Taugeman	F. A. LaRoche Co.
Sidney B. Bowman Automobile Co.	

Both the basic Selden patent and all other patents owned by members of this Association will be enforced against infringers. Manufacturers, Importers, Dealers and Agents, also Users of unlicensed machines are liable.

ASSOCIATION OF LICENSED AUTOMOBILE MANUFACTURERS
No. 7 EAST 42d STREET, NEW YORK



ALAM: Association of Licensed
Automobile Manufacturers

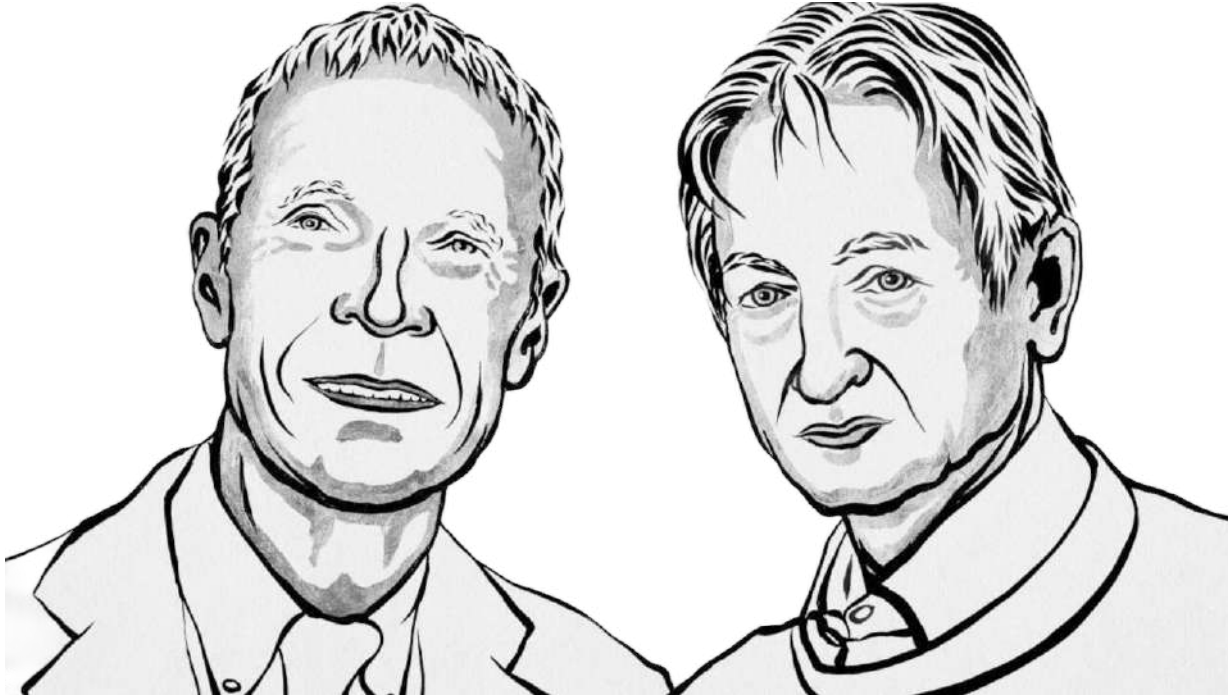


LLM

(Large Language Models)



Modelos de Lenguaje y Generativos



Hopfield 1982

Hinton 1985



Modelos de Lenguaje y Generativos



Turing 1940s

McCulloch & Pitts
1943



Modelos de Lenguaje y Generativos

Desarrollos Académicos Tradicionales



Modelos de Lenguaje y Generativos

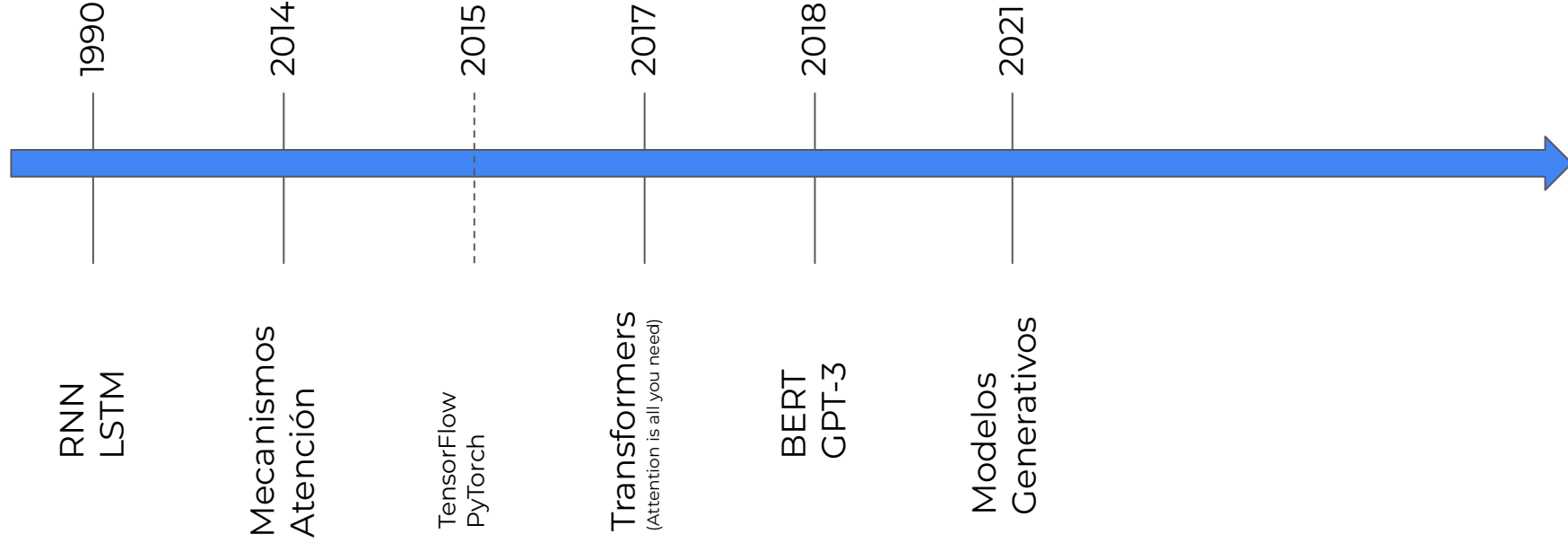
Desarrollos Académicos Tradicionales



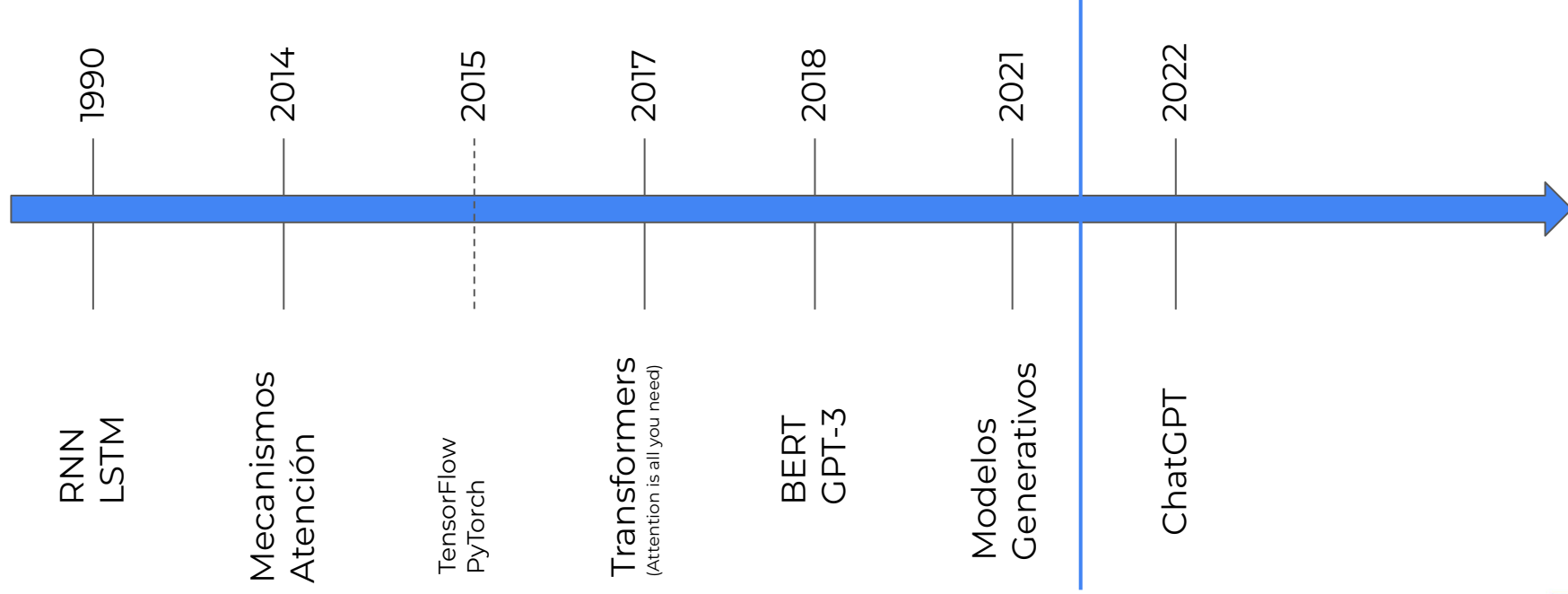
R & D



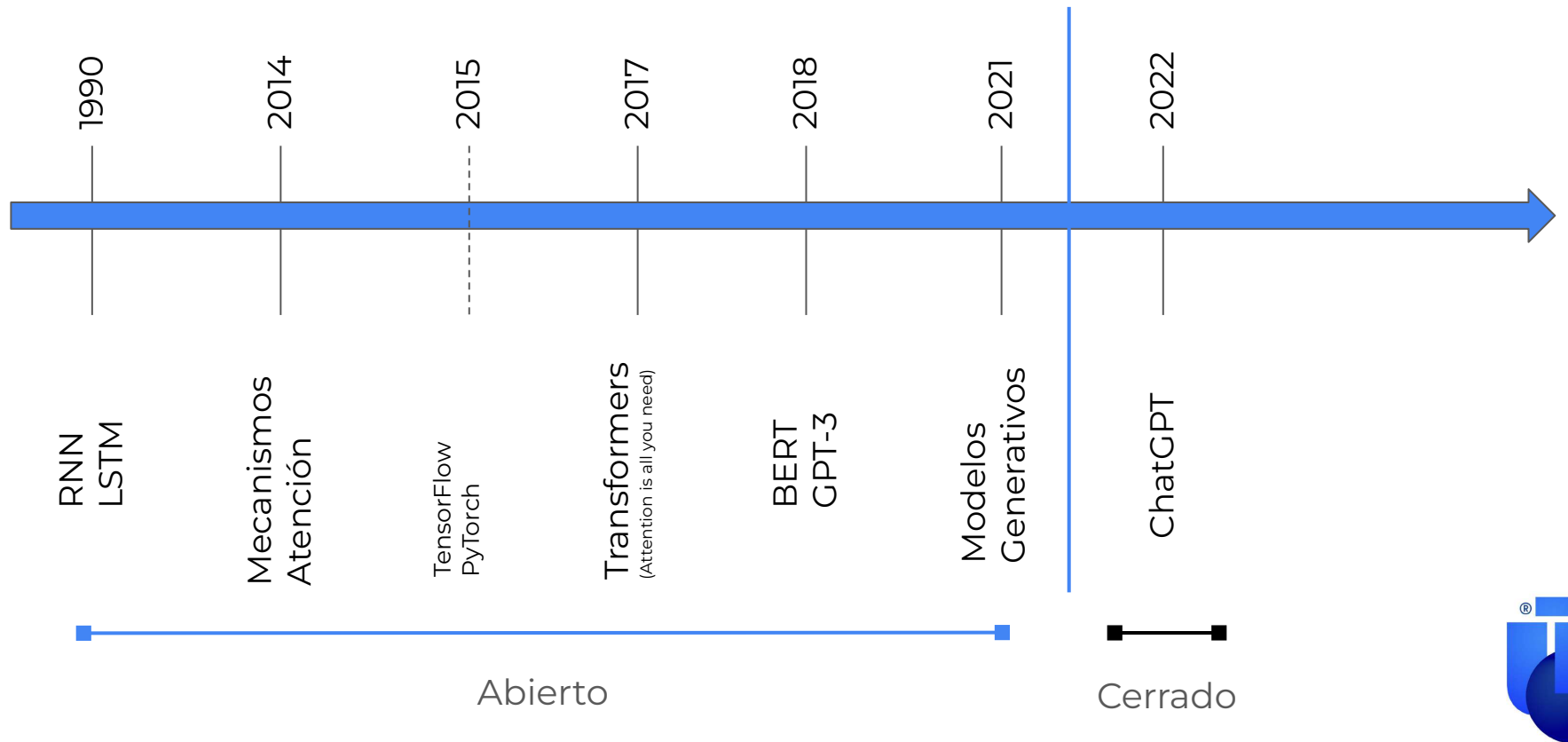
Modelos de Lenguaje y Generativos



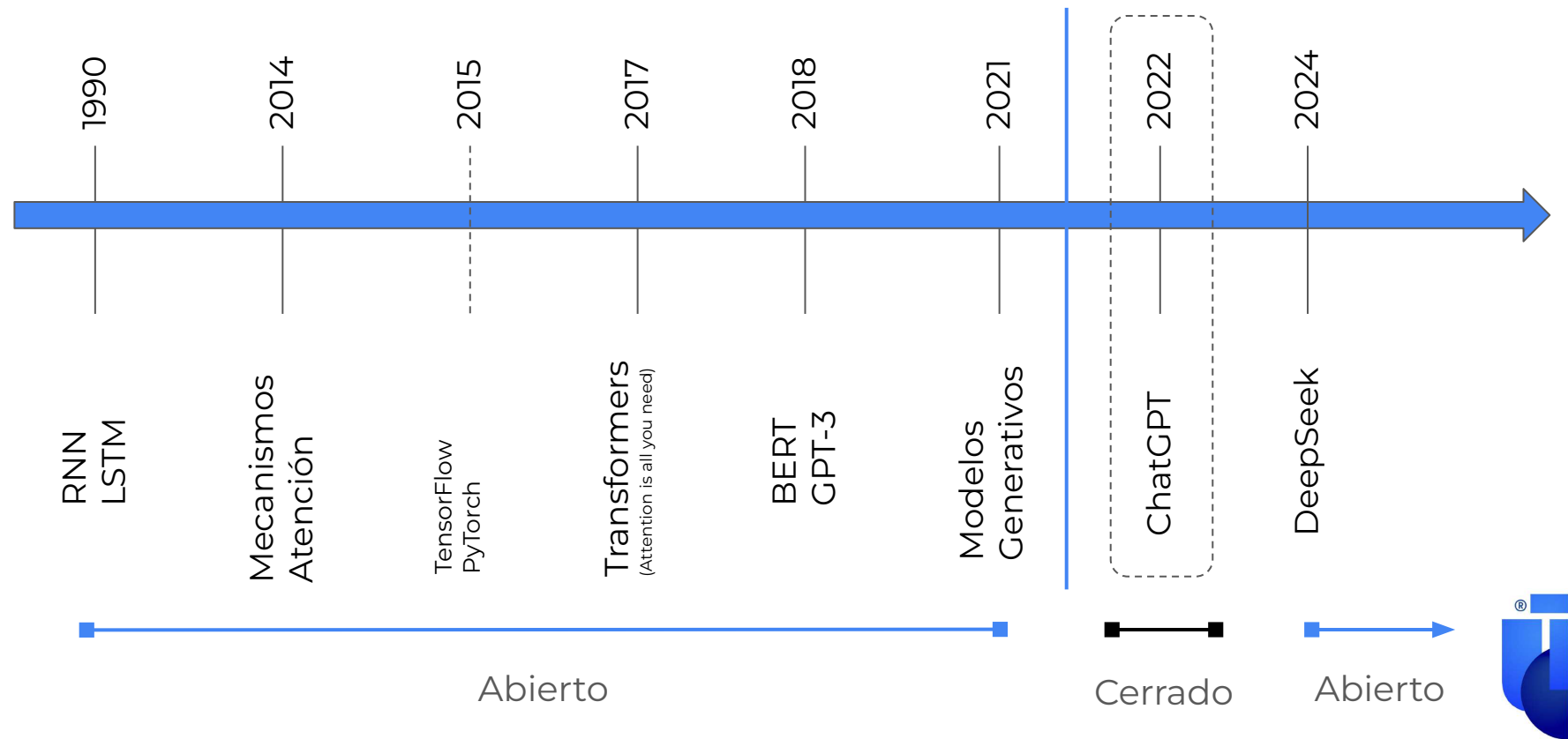
Modelos de Lenguaje y Generativos



Modelos de Lenguaje y Generativos



Modelos de Lenguaje y Generativos



ChatGPT (2022)



Inteligencia Artificial

GPT

Generative

Genera textos nuevos

Pre-Trained

Entrenado con grandes volúmenes de datos (puede seguir entrenando)

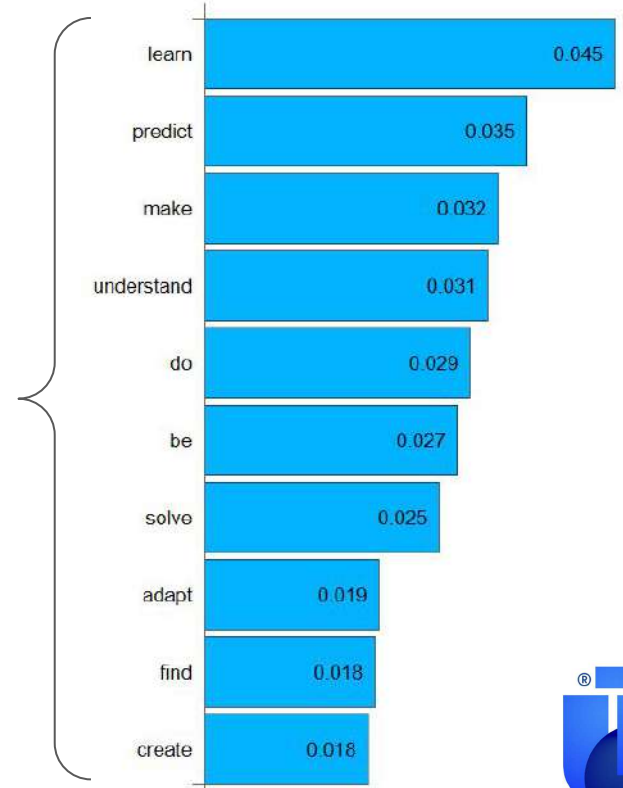
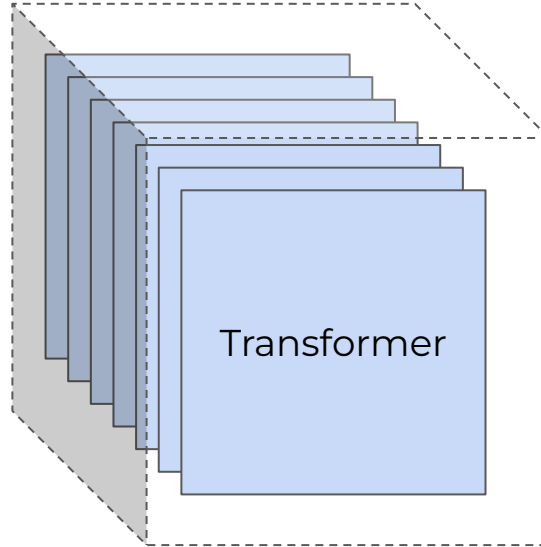
Transformer

Modelo específico de Red Neuronal el corazón de LLM



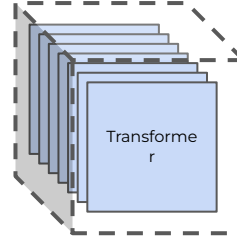
Inteligencia Artificial

The best thing
about AI is its
ability to _____



Inteligencia Artificial

The best thing about AI
is its ability to _____

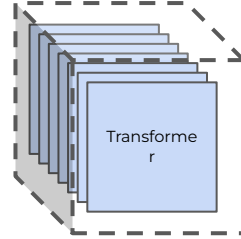


predict



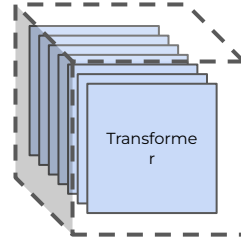
Inteligencia Artificial

The best thing about AI
is its ability to _____



predict

The best thing about AI
is its ability to predict

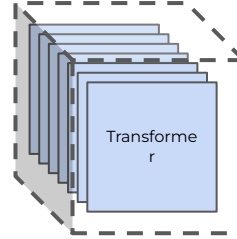


things



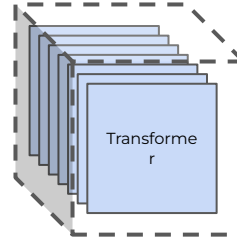
Inteligencia Artificial

The best thing about AI
is its ability to _____



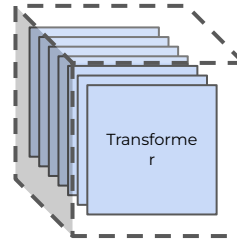
predict

The best thing about AI
is its ability to **predict**

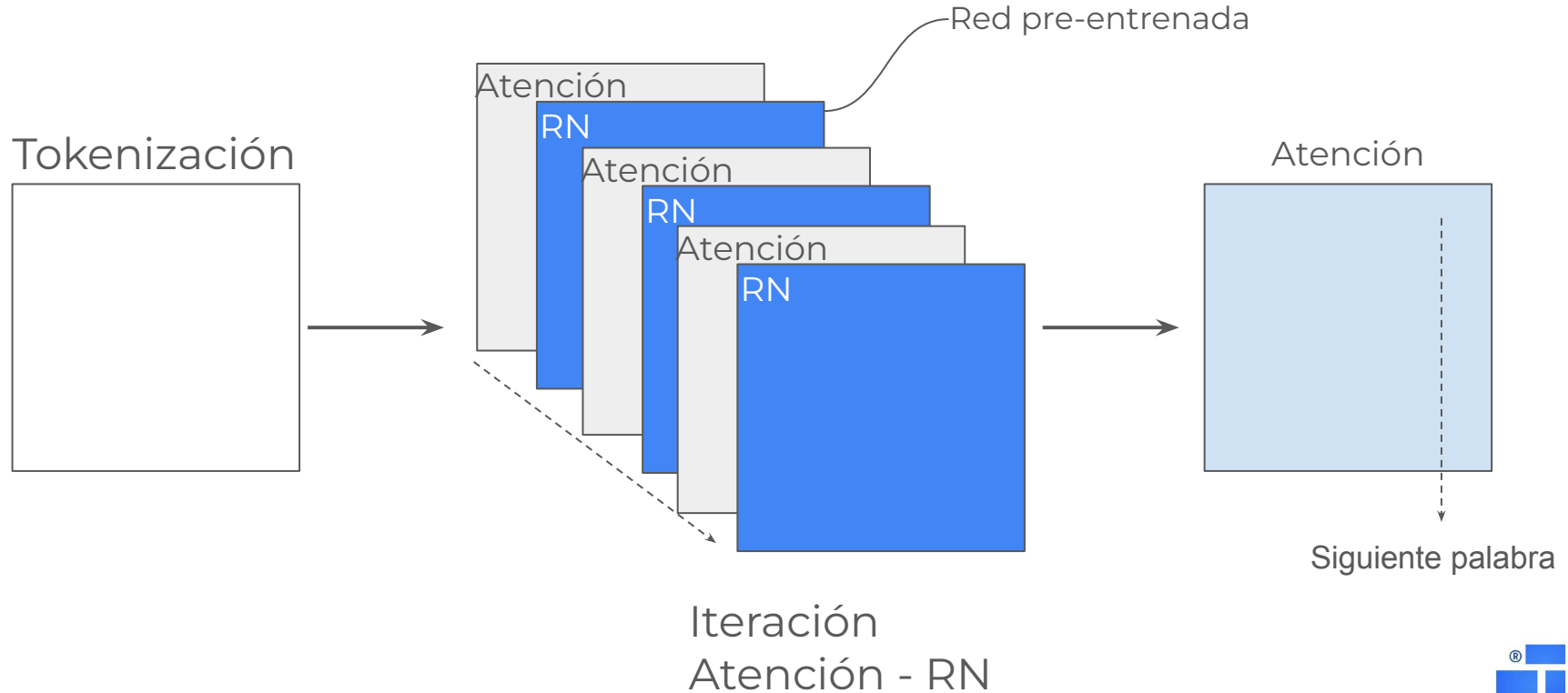


things

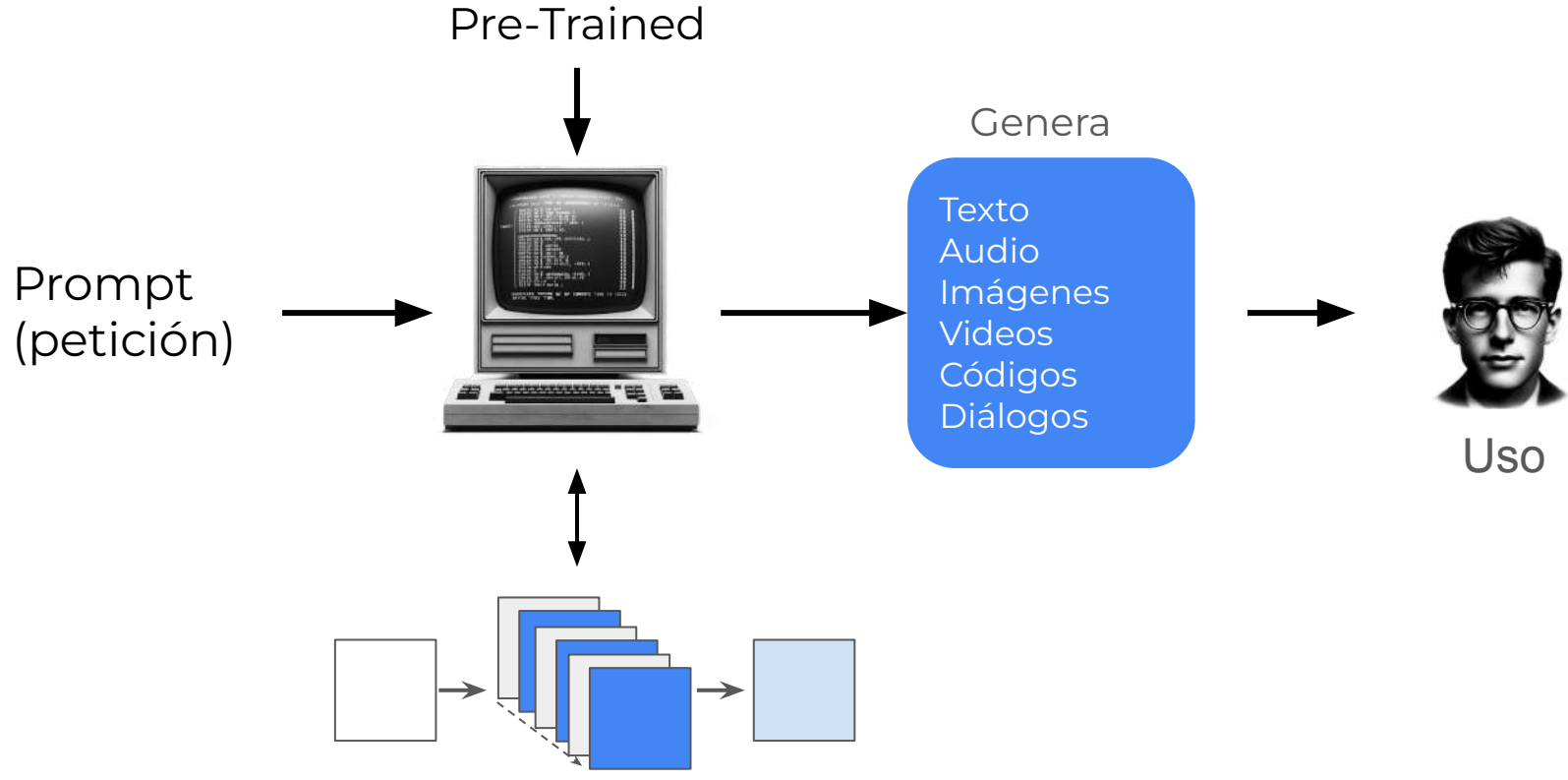
The best thing about AI
is its ability to **predict**
things _____



Inteligencia Artificial



Inteligencia Artificial



Inteligencia Artificial

ChatGPT
0.003kWh



Google
0.0003kWh



DeepSeek (2024)



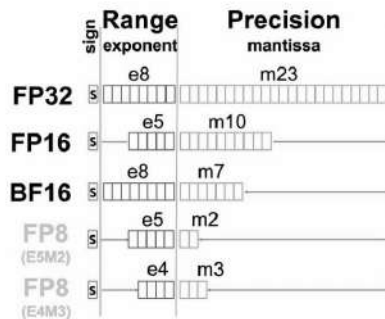
DeepSeek V3: Modelo base
Diciembre 2024

DeepSeek R1: Modelo de razonamiento
Enero 2025

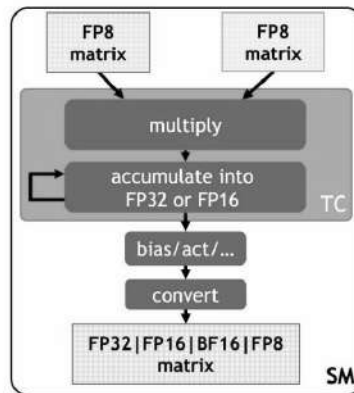


¿Que Mejoraron?

- Eficiencia Computacional (FP8)



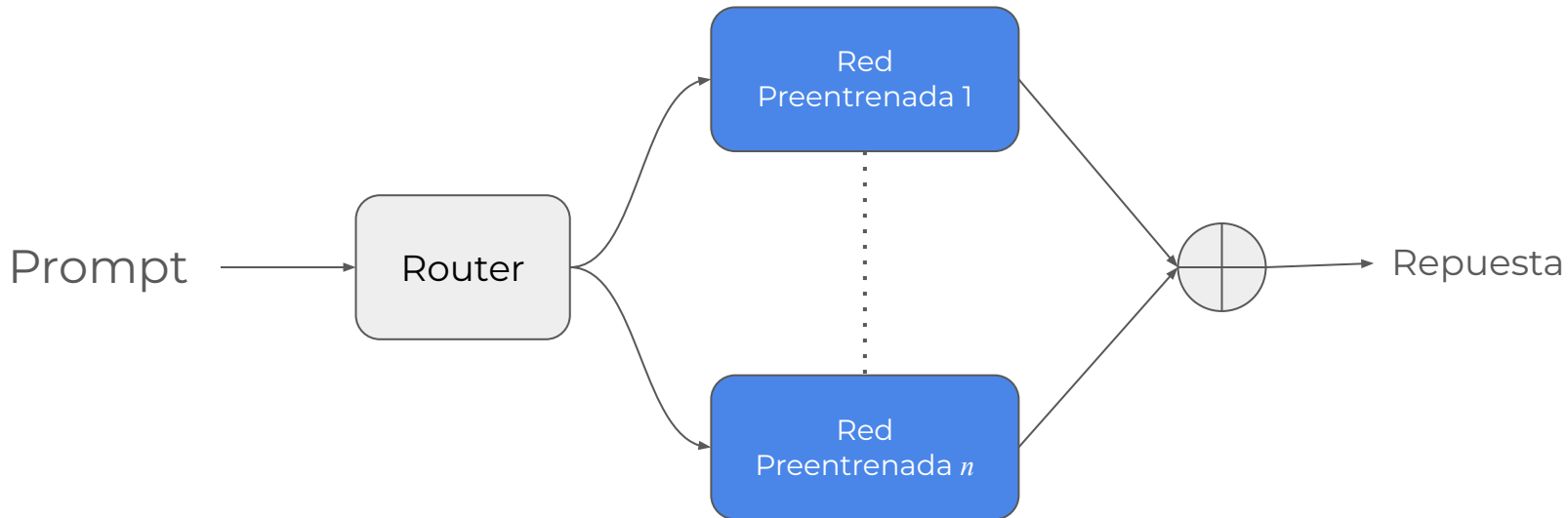
Allocate 1 bit to either range or precision



Support for multiple accumulator and output types

¿Que Mejoraron?

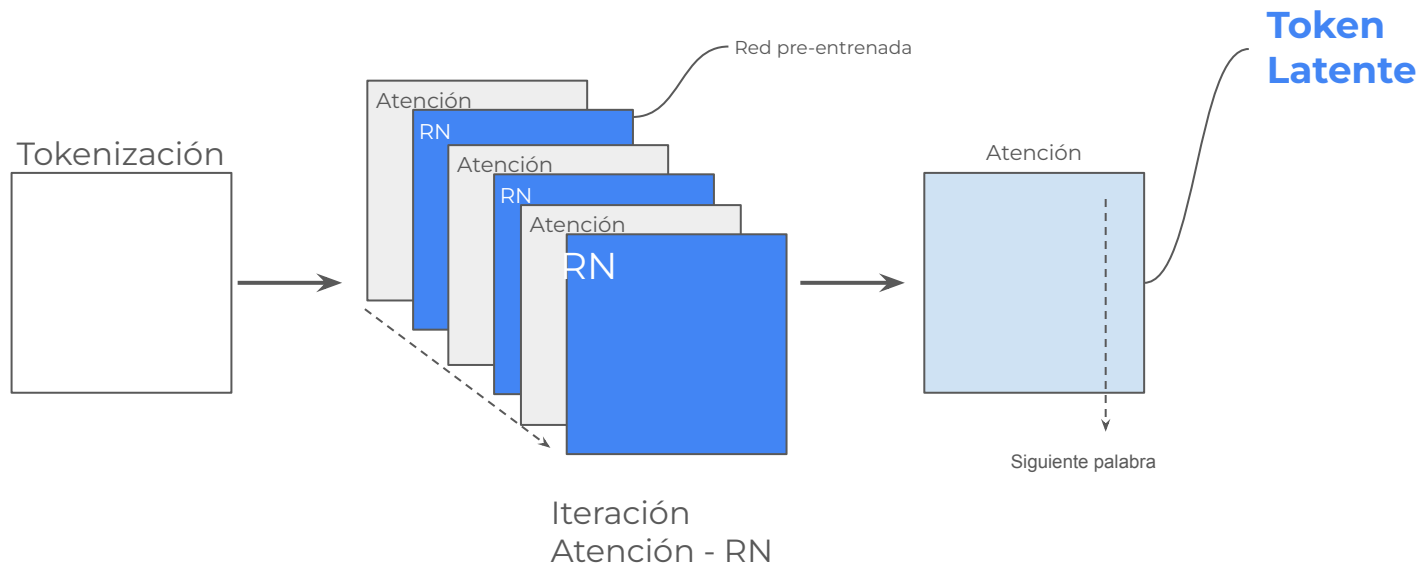
Arquitectura Mixture of Experts (MoE) 37B de 671B por token



Inteligencia Artificial

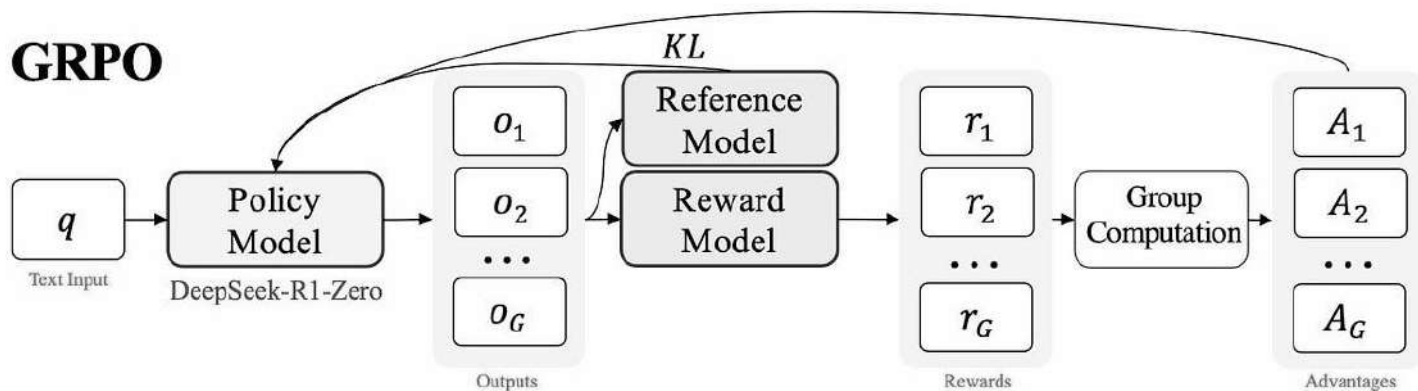
¿Que Mejoraron?

Multi-Head Latent Attention (MLA)



¿Que Mejoraron?

Aprendizaje por Refuerzo (GRPO, Sin Humanos)



Modelo de Desarrollo País



Desarrollo País

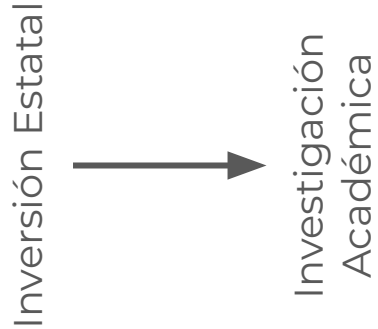
Hecho en China 2015

Inversión Estatal



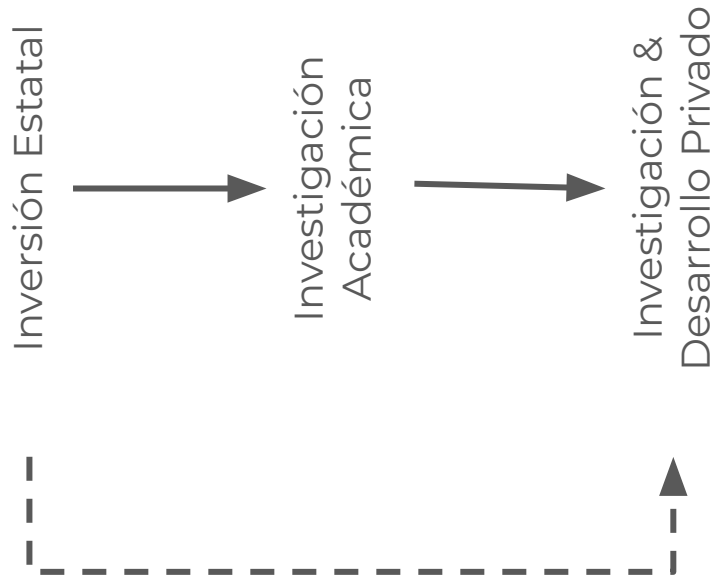
Desarrollo País

Hecho en China 2015



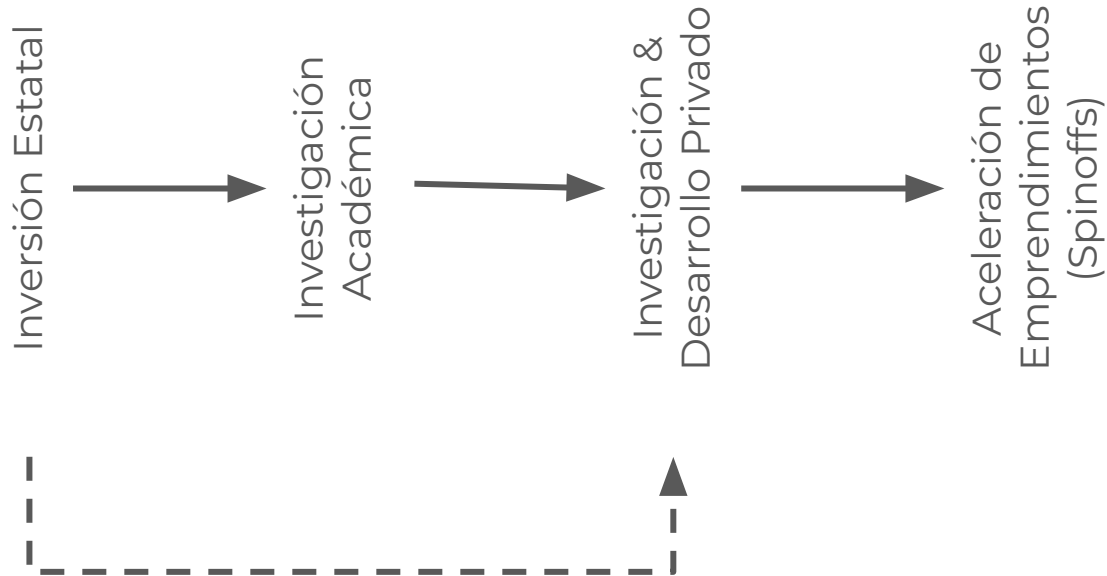
Desarrollo País

Hecho en China 2015

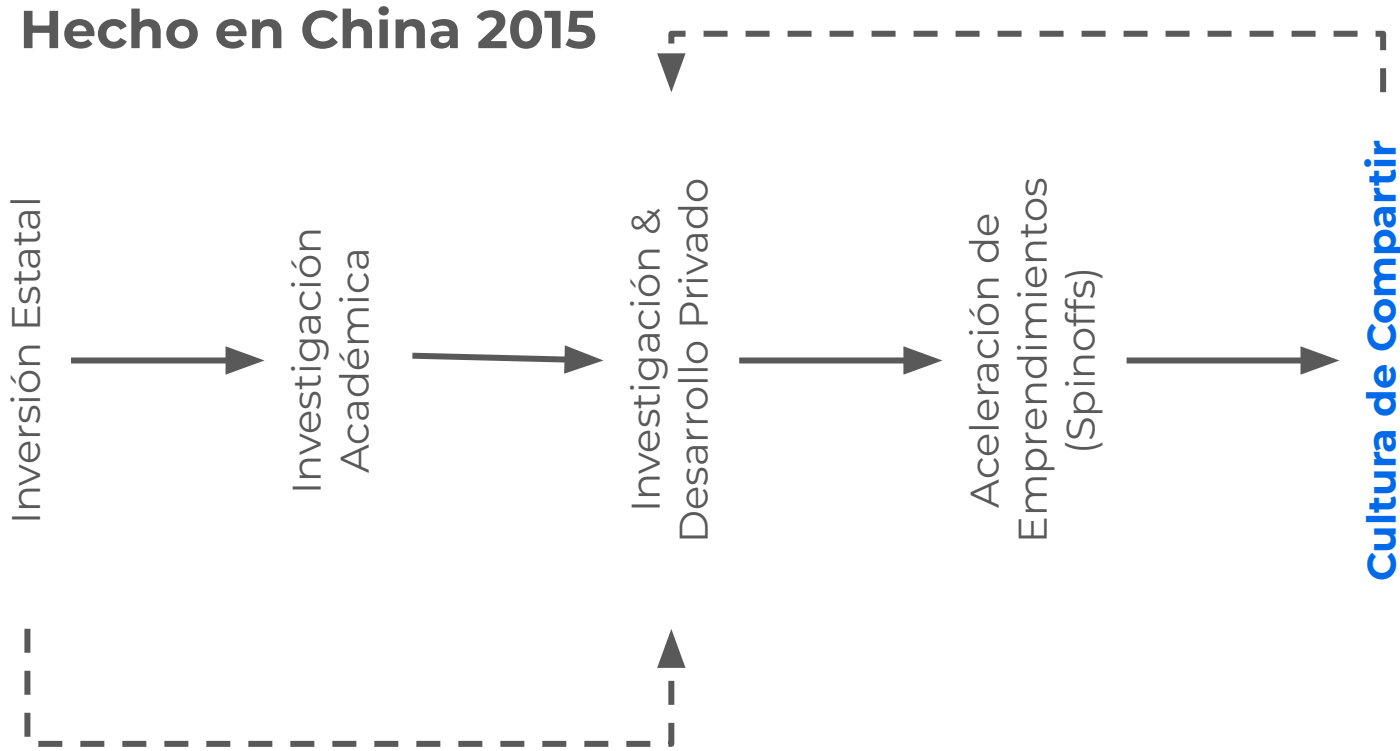


Desarrollo País

Hecho en China 2015



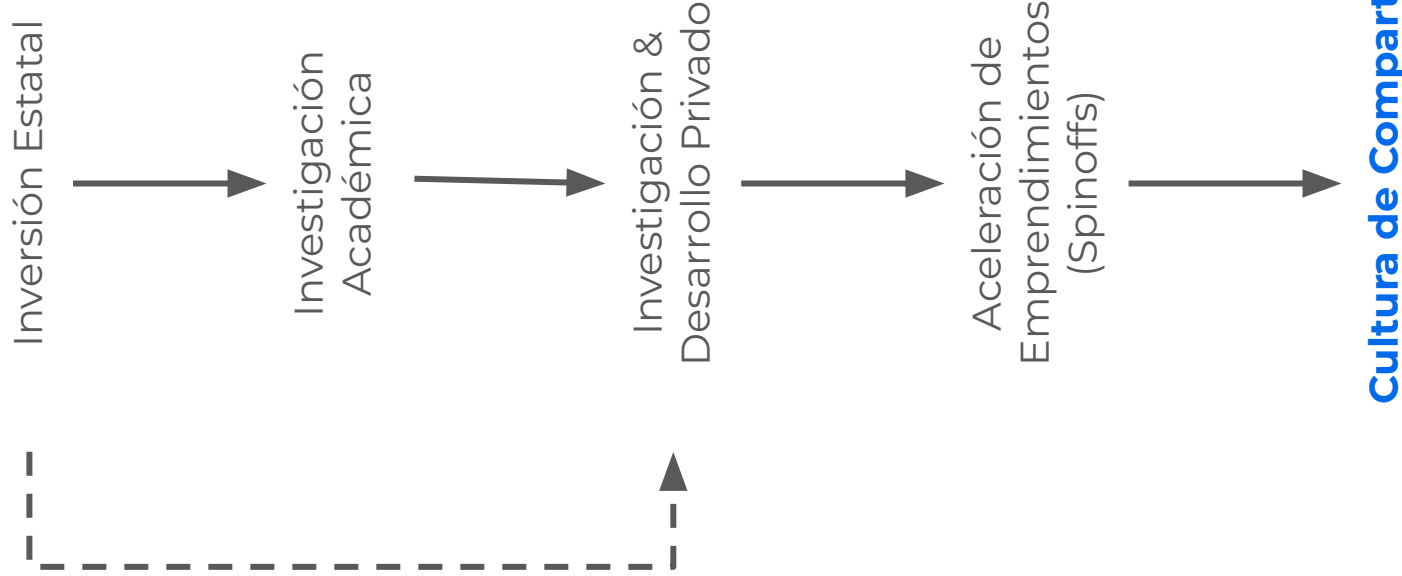
Desarrollo País



Desarrollo País

Silicon Valley

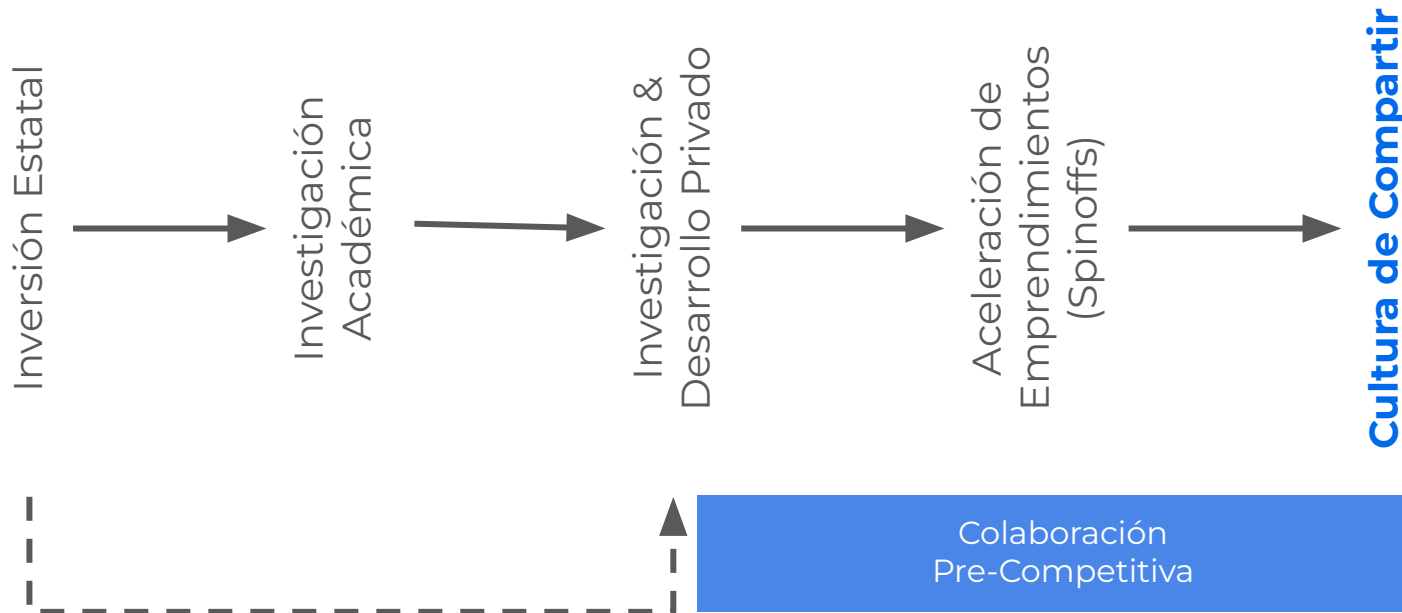
Hecho en China 2015



Desarrollo País

Silicon Valley

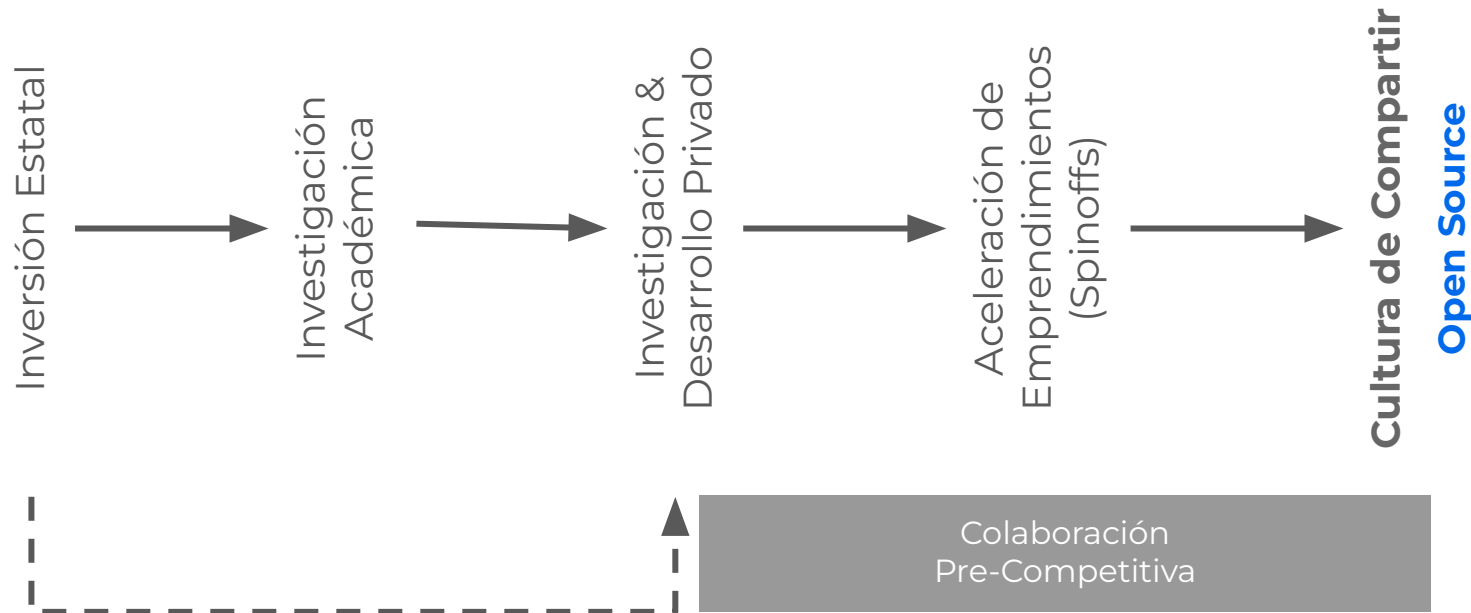
Hecho en China 2015



Desarrollo País

Silicon Valley

Hecho en China 2015



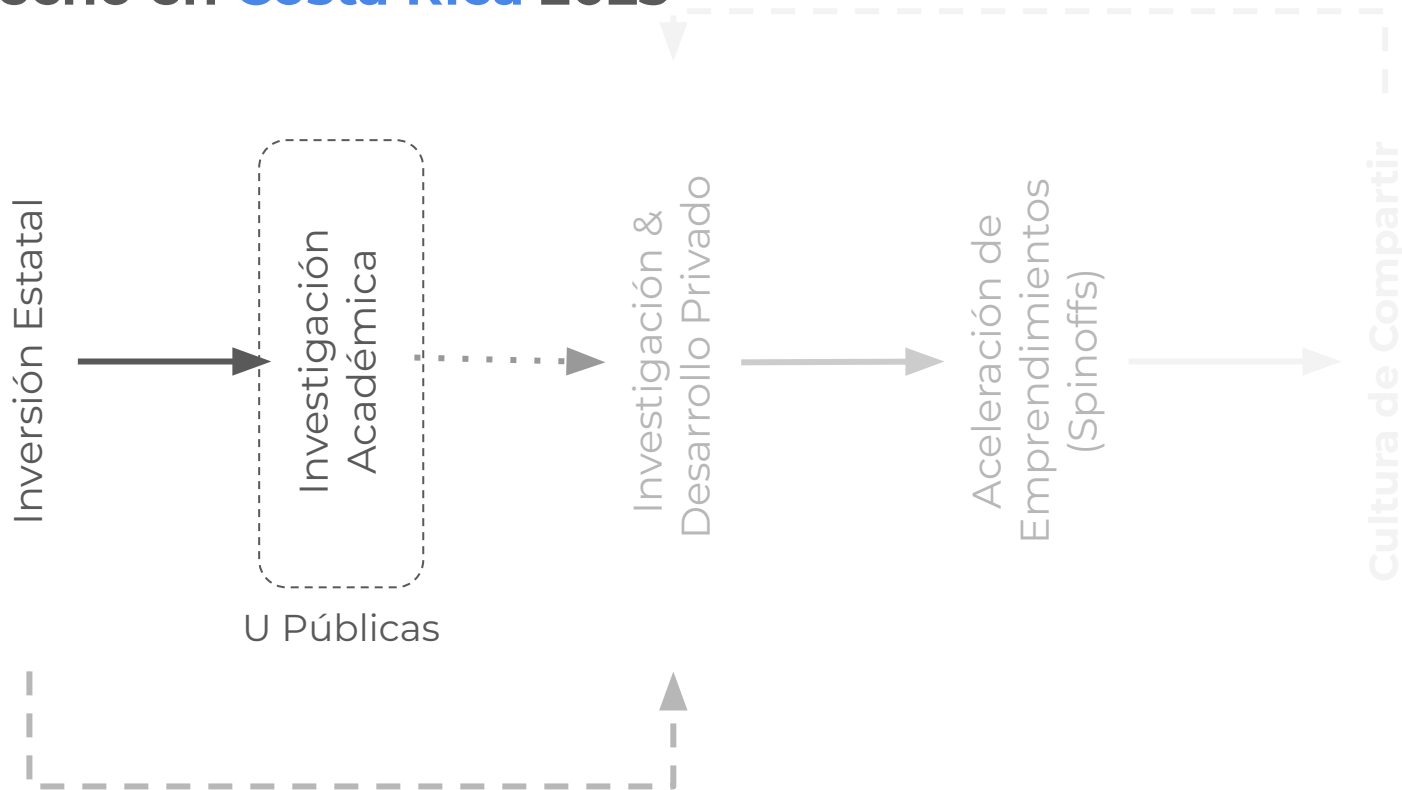
Desarrollo País

¿y Costa Rica?



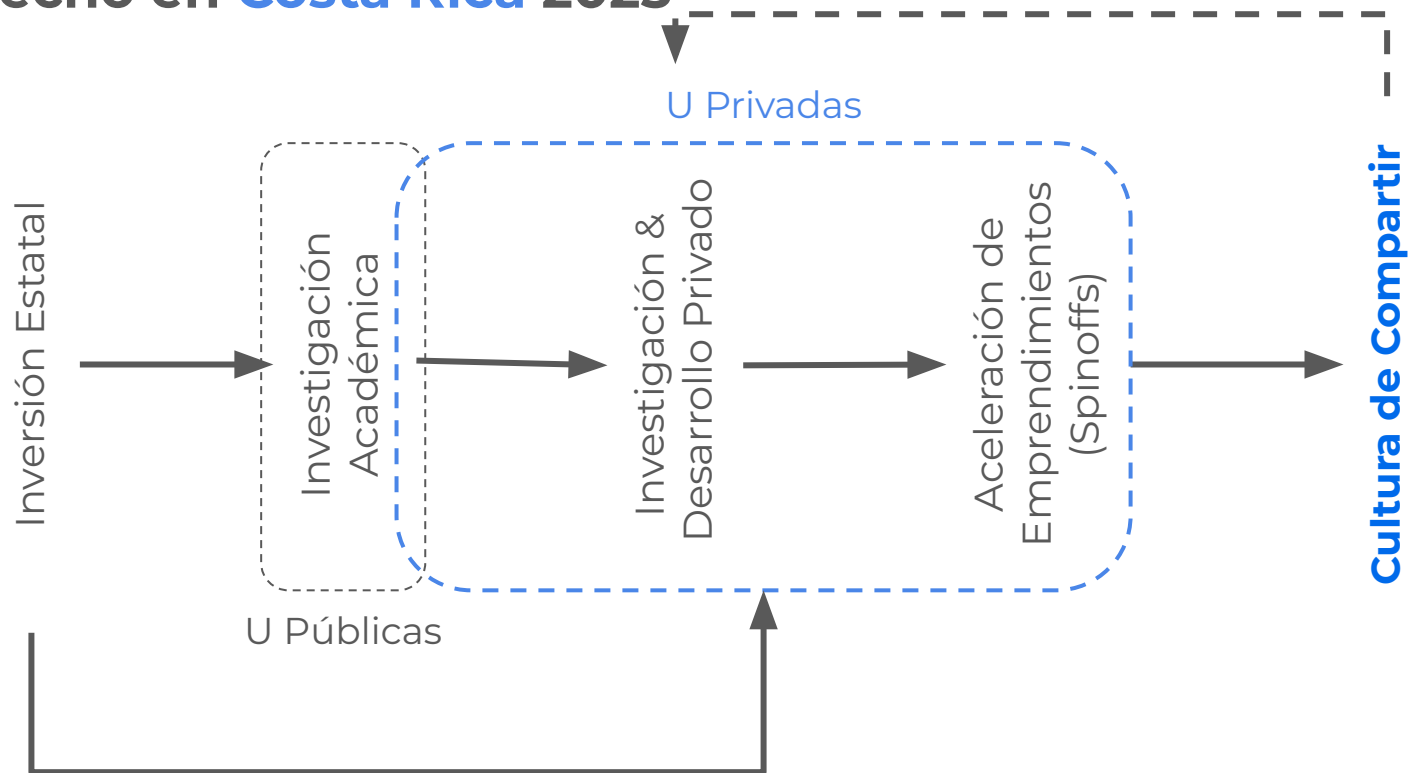
Desarrollo País

Hecho en **Costa Rica** 2025



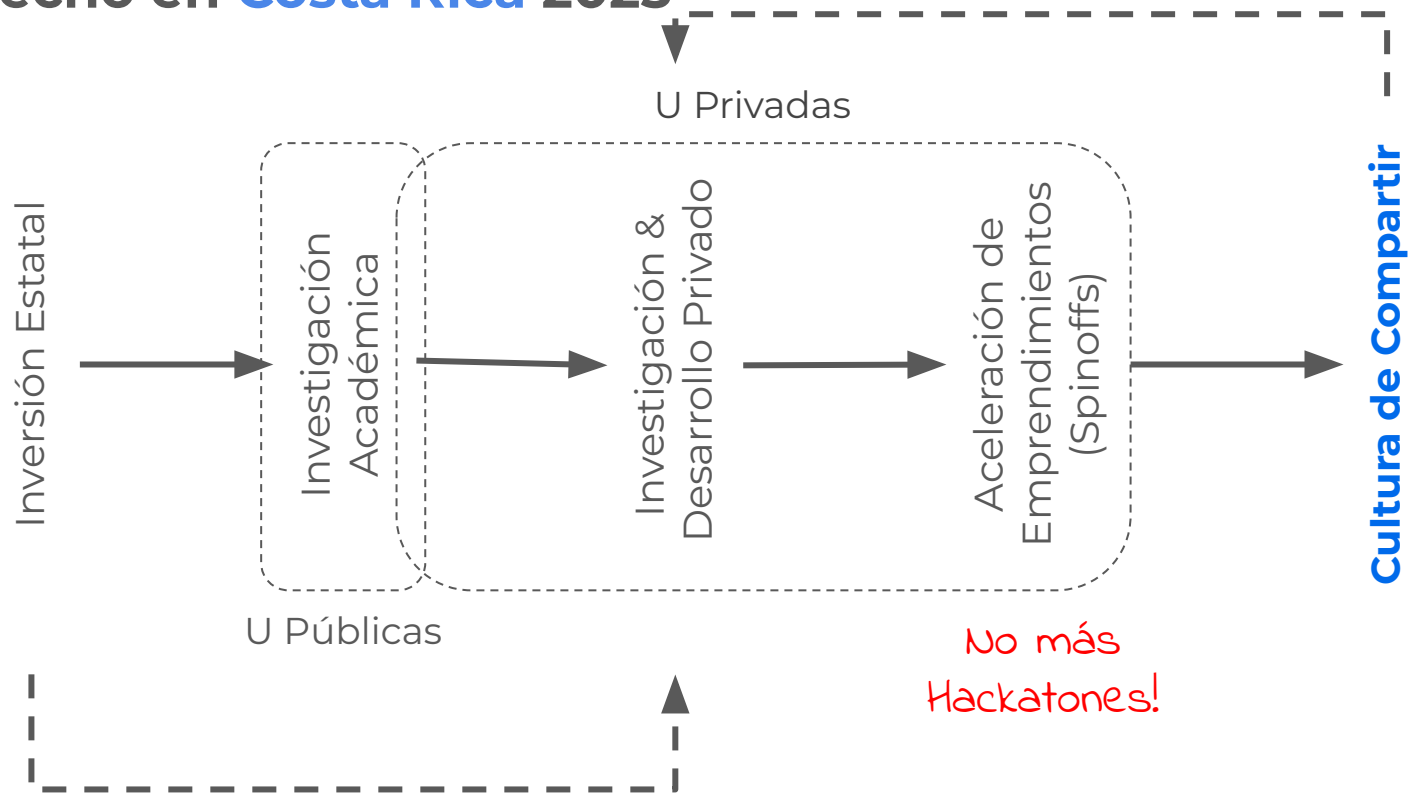
Desarrollo País

Hecho en **Costa Rica** 2025



Desarrollo País

Hecho en **Costa Rica** 2025



¿Preguntas?



tdecamino@ucenfotec.ac.cr



@tomasdecamino