PILOT
Practices and infrastructure for long term collaboration
PEPR eNSEMBLE

Kick-off
November 17, 2023

Coordinators

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Agenda

- Round table (15 min)
- Presentation of the project (30 min)
- Presentations from participants + Discussion (1 hour)
- Discussion on PILOT priority topics and AMI topics (30 min)

PILOT Objectives

- Socio-technical models for long-term collaboration

- Multi-organizational, sovereign, secure, interoperable collaboration platforms promoting trust and digital well-being

Project Axes

- **Axis 1**: Understanding current and future forms of long-term collaboration

- **Axis 2**: Open technical frameworks and protocols for long-term collaboration

- **Axis 3**: Conceptual Frameworks for long-term collaboration

- **Axis 4**: Actionable guidelines and demonstrators for long term collaboration

PILOT's architecture

1- Identify new forms of collaboration / new social needs

Collect, build and organize a repository of up-to-date analyses, use cases and reports about future forms of long-term collaboration, their challenges and their limits.

2- Investigate new technological capacities

Foundations for the future infrastructure for long-term collaboration by providing new technology components that can be at the heart of safe, sustainable and secure collaborative services.

3-Define conceptual and analysis tools to ensure socio-technological approaches

New conceptual constructs for analysis, modelling, and design for articulating social needs and technology capabilities in a socio-technical perspective,

4-Provide actionable visions, guidelines and patterns

Prototypes and demonstrators, guidelines, visions, patterns

Resources

- Budget: 5 M€

- Period: 7 years (Sept. 2023 – Aug. 2030)

- Non permanent resources

  - 18 PhD theses

  - 4 postdocs of 2 years

  - 2 engineers of 4 years

  - 12 internships of 6 months

- 14 partner institutions: Inria, CNRS, Univ. Paris-Saclay, Univ. Grenoble Alpes, Sorbonne Univ., IMT, UTT, INSA Lyon, UCB, Nantes Université, ENSAM, Univ. de Lille, Univ. de Toulouse

Axis 1
Understanding current and future forms of long-term collaboration
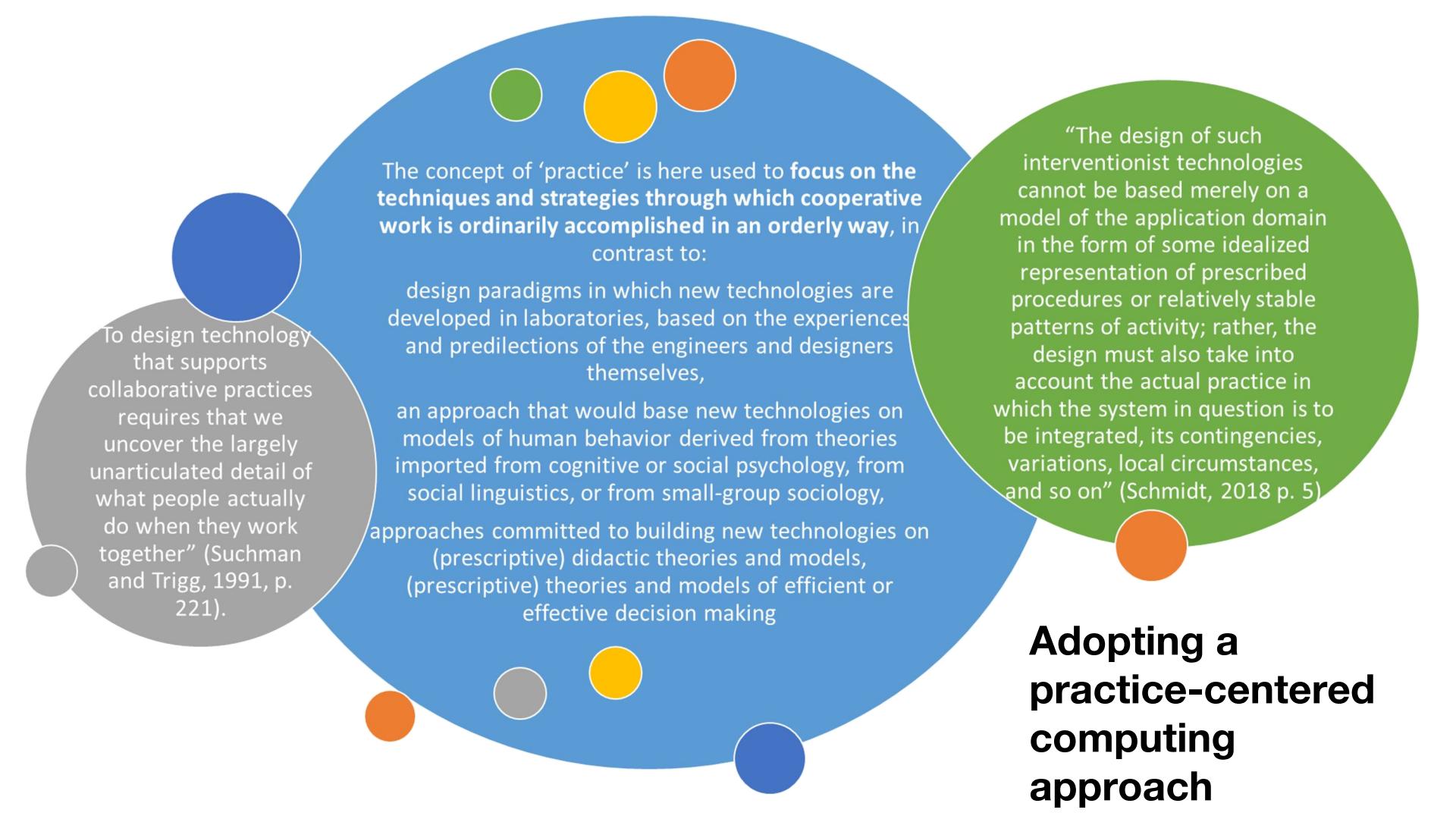
To design technology that supports collaborative practices requires that we uncover the largely unarticulated detail of what people actually do when they work together" (Suchman and Trigg, 1991, p. 221).

The concept of 'practice' is here used to **focus on the techniques and strategies through which cooperative work is ordinarily accomplished in an orderly way**, in contrast to:

design paradigms in which new technologies are developed in laboratories, based on the experiences and predilections of the engineers and designers themselves,

an approach that would base new technologies on models of human behavior derived from theories imported from cognitive or social psychology, from social linguistics, or from small-group sociology,

approaches committed to building new technologies on (prescriptive) didactic theories and models, (prescriptive) theories and models of efficient or effective decision making

"The design of such interventionist technologies cannot be based merely on a model of the application domain in the form of some idealized representation of prescribed procedures or relatively stable patterns of activity; rather, the design must also take into account the actual practice in which the system in question is to be integrated, its contingencies, variations, local circumstances, and so on" (Schmidt, 2018 p. 5)

Adopting a practice-centered computing approach

Studying emerging forms of collaboration
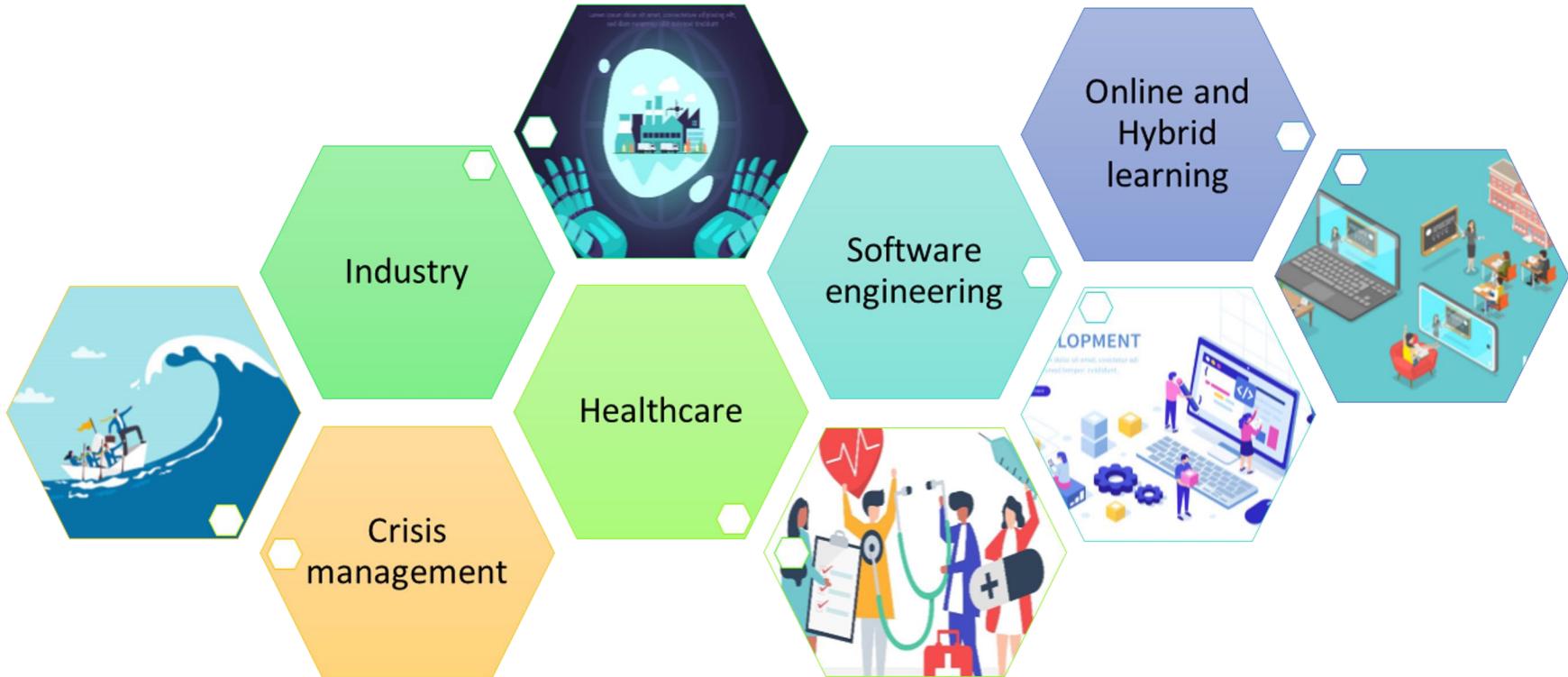
Analyzing these emerging forms of collaboration

Building and organizing a **repository** of up-to-date **analyses**, **use cases** and **reports** about future forms of long-term collaboration

⇒ opportunities for **reflexivity**, **comparison**, and **concept building**

2 PhDs just started

Lisa Formentini

Que reste-t-il du confinement ?
Evolution des écologies d'artefacts dans des organisations de sécurité civile - LORIA/INRIA

Simon Lecuyeur

Développement d'un dispositif pour soutenir l'autorégulation des apprentissages collaboratifs - LIG/Université Grenoble Alpes

Axis 2

Open technical frameworks and
protocols for long-term collaboration

Sustainable and safe infrastructure

- Collaboration modes:
  connected, disconnected, ad hoc,
  inter-organisational

- P2P infrastructures

- Replication mechanisms

- Security for distributed collaboration
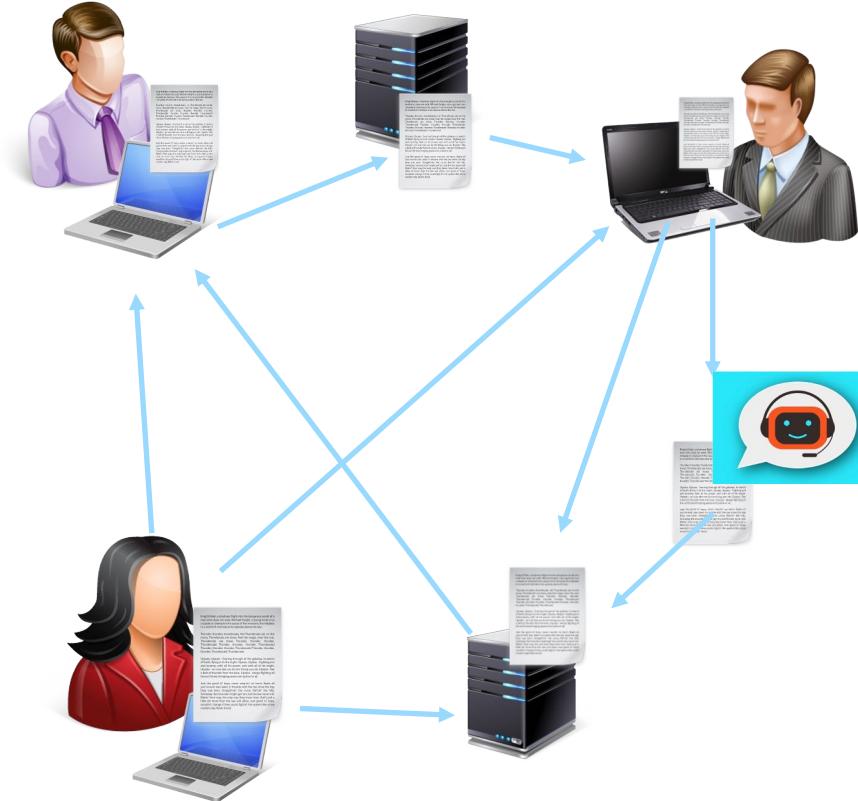
Interoperability

- Open and extensible formats, ontological approaches

- Software models and infrastructures capable of fostering collaboration among heterogeneous actors and artifacts.
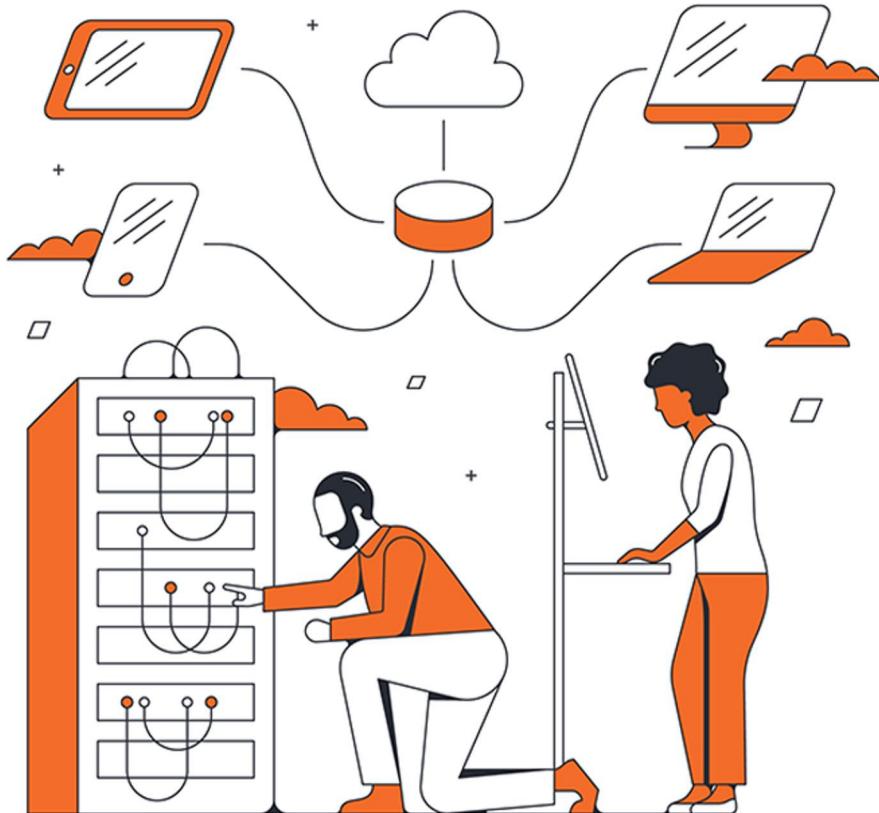
1 PhD just started

Yann Trividic: "Facilitating collaboration and appropriation in single-source publishing factories through creative coding". ex)situ team, UPSaclay, Inria, CNRS

Axis 3
Conceptual Frameworks for long-term collaboration

Forget the unified collaborative platform
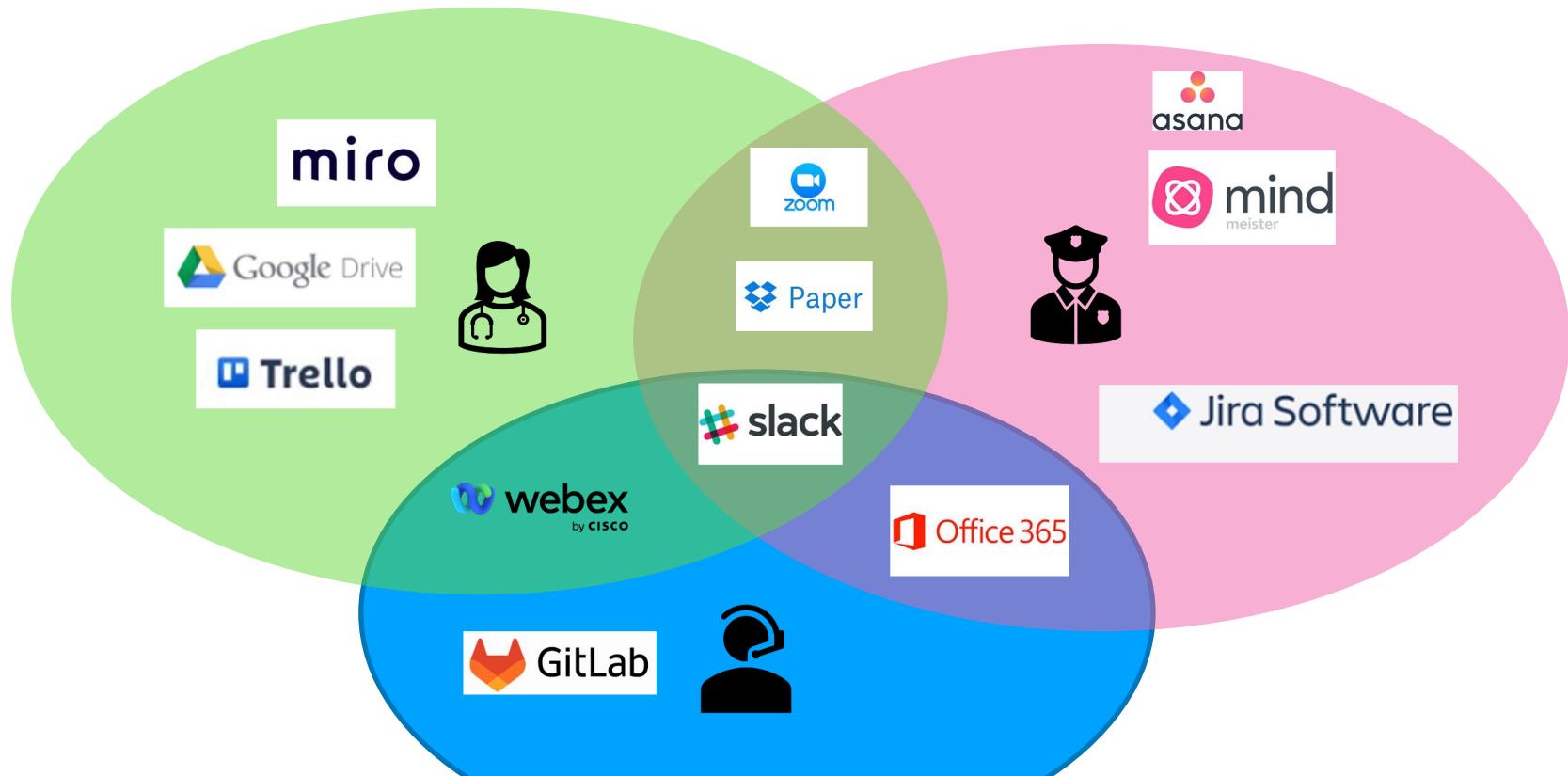
Embrace diversity

- Collect cases studies and technologies

- Develop analysis frameworks for collaboration across organisations considering

  - Coordination mechanisms

  - Heterogeneity of the artifacts and asymmetries in the collaboration

  - Evolution of the collaboration over time

- With different domain perspectives

  - Software engineering, health care, civil security, education

Axis 4
Actionable guidelines and demonstrators for long term collaboration

In the steps of Engelbart

Build a **shared statement** on ways to **achieve common goals** through collective efforts and shared resources from **different organizations** with **different backgrounds and cultures** and a **long duration scope** (months, years).

Actionable visions

- Building actionable visions for long-term collaboration among organisation through

  - A living repository of guidelines, patterns, practices and artifacts

  - their declination for different domains

- Collect and formalize patterns for problems relative to long term collaborative activities (e.g. tool migration, partner onboarding or removal, share repository management, access rights)

Presentations from participants

Equipe ACES,Télécom Paris

Collaborative long-term maintenance of open source software

- Open source:
  - a successful emerging **model of collaboration**
  - with **massive impact** on how software is developed today
- The long-term maintenance of open source software in question:
  - lack of clear model so that widely used pieces of open source keep being maintained
  - need for collaborative models of organization to enable long-term maintenance
  - emerging solutions such as *Community Package Maintenance Organizations*
  - We can **develop conceptual frameworks and tools** to facilitate **collaborative maintenance**
- Contributions to:
  - Axis 1 (understanding current and future forms of long-term collab.), especially WP 1.5
  - Axis 3 (conceptual frameworks for long-term collab.), especially WP 3.4
  - Axis 4 (actionable guidelines and demonstrators for long-term collab.), especially WP 4.2 / 4.3

Delys Team (LIP6 – SU/CNRS)

- **Distributed algorithms** to support large-scale asynchronous collaborations

- Focus on **causal broadcast** (building block for consistency of publish/subscribe distributed systems, collaboratives applications…)
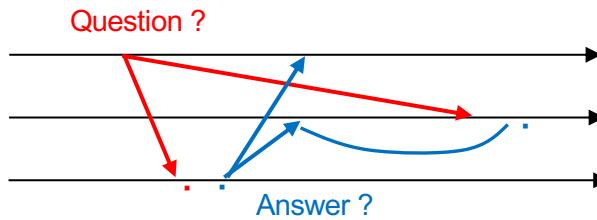
- Existing protocols do not scale (prohibitive extra cost on messages size, centralization, fix number of participants,…) and don't support mobility and/or disconnection

Causality and consistency for long-term collaborations

Challenge: How to adapt causal broadcast to large and open communities ?

Contributions : New models (dynamic graphs), distributed algorithms, implementations

Coast team - Distributed secure collaboration

Distributed file system

- P2P architectures (IPFS, Matrix, …) for supporting different collaboration modes (connected, disconnected, ad-hoc)
- Conflict-free Replicated Data Types (CRDTs) for consistency maintenance

Security for distributed mutable data without central authority

- Easy to use distributed access control
- Encryption for mutable data by means of CRDTs

Operational transformation

Transform(msg_1, msg_2)

Transform(msg_2 , msg_1)
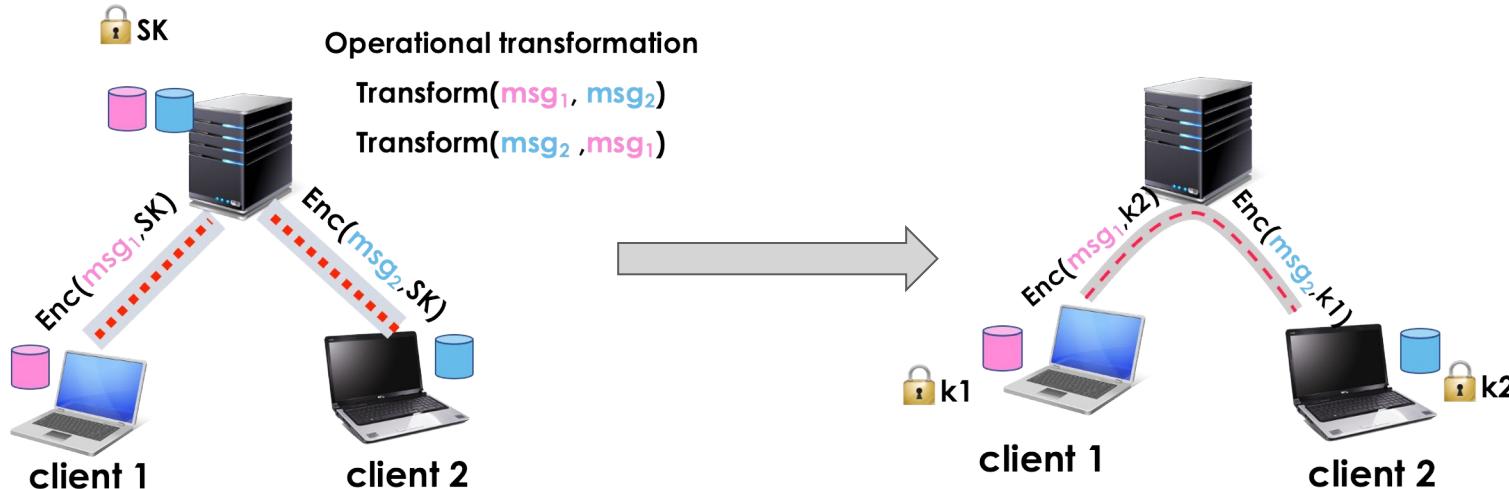
Towards better collaborative tools for skill sharing

Axis 2 - Open technical frameworks and protocols for long-term collaboration

WP2.2 Interoperability for long-term collaboration

- Explore skill sharing descriptions that are platform and version free (see WP3.3-3.4 below)

WP 2.4 Collaborative interaction histories

- Investigating how collaborative histories on a shared document could be analized and distributed to facilitate skill sharing among collaborators/within community of practices (focus on graphical editing and spreadsheet formula?)

Axis 3 - Conceptual frameworks for long-term collaboration

WP3.3 Asymmetries and heterogeneity in asynchronous collaboration

- Understanding friction created by these asymmetries. design of adaptive or assistive interfaces

WP 3.4 New models for software engineering and design

- Implementing "compilable" tutorials based on skill sharing descriptions

Ongoing work

PhD Raphael Perraud (ANR JCJC Discovery)

Characterizing frictions encountered in asynchronous skill acquisition (tutorials)

- Paving the way for platform-version free skill sharing descriptions

Ongoing reflections

- Reflective tools for skill sharing (alongside A. Tabard, Univ. Lyon)
- Collaborative interaction histories (alongside M. Nancel)

MeTAH, LIG, UGA
Concepts and tools for collaboration in education

Axis 1 - Understanding current and future forms of long-term collaboration

WP1.3 Long-term collaborative practices for the future of digital and hybrid learning
- analysis of existing practices, concepts and tools
- modeling co-regulation in team-based learning situations

Axis 4 - Actionable visions for future forms of long-term collaboration

WP 4.2 Derive and design actionable guidelines and visions for different domains
- design principles for indicators to regulate collaborative learning
- guidelines for teachers to stimulate co-regulation

...and also :
- use cases in education
- a platform that can serve as field of experimentation

LabNbook

- work in progress in the special domain
  Computer Supported **Collaborative Writing**

Methods :
- design based research
- user centered approach

LIRIS SICAL-Situated Interaction, Collaboration, Adaptation and Learning

Écosystème de collaboration, système de référence fonctionnel commun capable de s'adapter à différentes situations

Approche proposée :
- Adapter le comportement de référence aux situations souhaitées : 1/ Les <u>interactions</u> (dispositifs, métaphores d'interaction, objets d'interaction et objets réels) 2/ <u>L'espace ou les espaces</u> d'action et de déroulement (virtuels, réels, leur répartition géographique et/ou logique). 3/ <u>L'organisation dans le temps</u> (synchrone, asynchrone), le respect des processus (workflow).
- Etude de l'évolution du fonctionnement de l'interface utilisateur qui peut être exécutée par tout le monde ou par des acteurs identifiés.
- Architecture matérielle et logicielle visant en assurer le fonctionnement et assurer la relation entre l'écosystème et ses situations de travail.
- Etude des modèles, formalismes, méthodes, architectures et IHM CSCW déjà existants en vue de les revisiter.
- Validation expérimentale (plateformes matérielles et logicielles).

Domaines : applications industrielles, la ville intelligente et l'apprentissage en ligne

LIRIS

Hyperglosae : la glose de la glose
## « Une plateforme de blogs sous stéroïdes » pour repenser le rapport aux sources
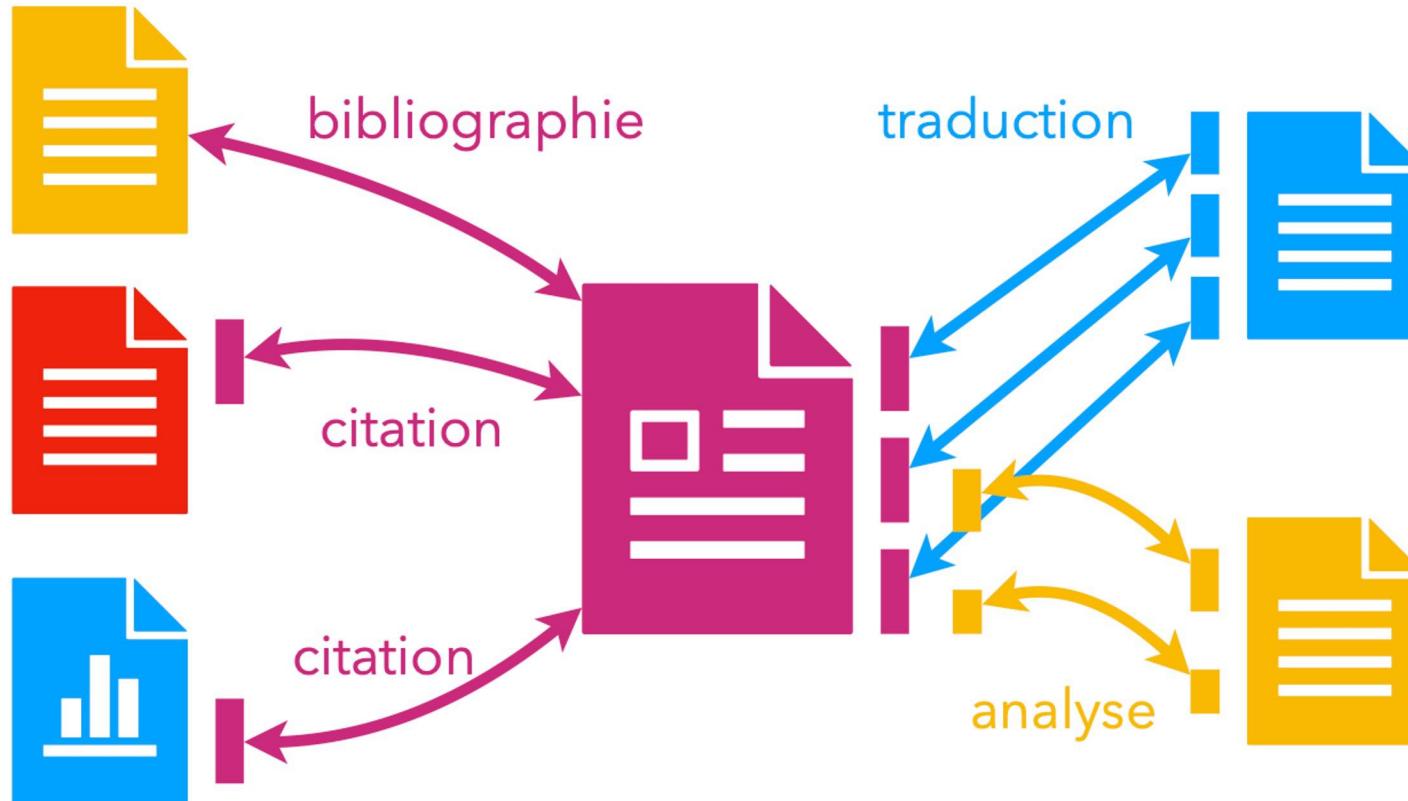
Hyperglosae : le « docuverse »
Partager et remixer des biens communs dans le respect des auteurs

USER FRONTEND

API requests

USER OR USER ORGANISATION BACKEND

filtered replications

OTHERS' BACKEND

OTHERS' BACKEND

OTHERS' BACKEND

CONTRIBUTION AU WP2.3 ?

https://github.com/Hypertopic/Hyperglosae
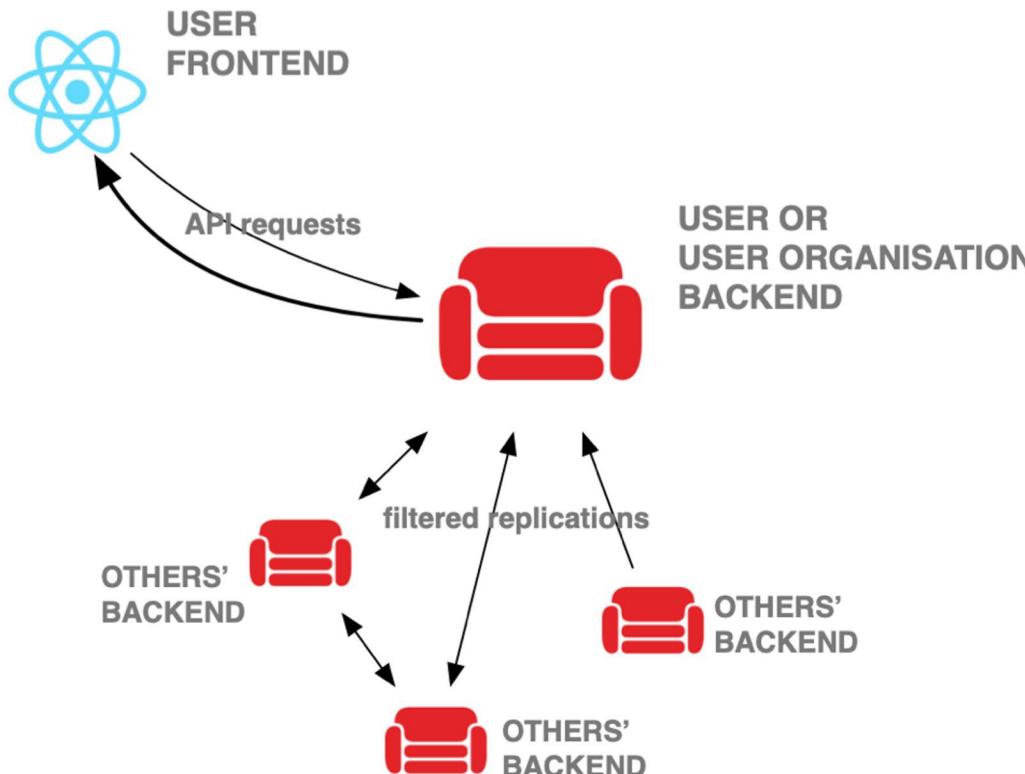
Ways of participating in PILOT

Doctoral program: https://pepr-ensemble.fr/prog_doctoral.html

Phase	Qui	Action	Date limite
1	Directeurs de programme	Affichage des thématiques	27 mars
2	Membres de l'eNSEMBLE	Envoi des propositions de sujets de thèse	11 avril
	Responsable des projets ciblés	Sélection de propositions	11 avril
	Directeurs de programme	Notification aux porteurs et affichage des sujets de thèse	14 avril
3	Porteurs d'un sujet de thèse	Sélection de deux candidatures au plus par sujet de thèse	12 mai
4	Responsables de projets ciblés	Pré-sélection des candidatures-Sujets pour l'audition	17 mai
	Candidat(e)s à une thèse	Audition	1-2 juin
	Directeurs de programme	Notification aux porteurs et aux candidat(e)s	3 juin
5	Candidatures retenues	Démarrage des thèses	Sept.-Dec. 2023

PILOT Report on 2023

- Priority topics:
    - Emerging and future forms of long-term collaborative practices
    - Distributed infrastructure for long-term collaboration
    - Interoperability for long-term collaboration

- 9 PhD subjects were proposed

- 6 interviews were conducted

- 3 PhD were selected

- 2 funded PhD theses (1 finally financed by UPSaclay) + 2 environmental costs

AMI, AAP

Call for Expressions of Interest (AMI) – **deadline January 15**

2 Calls for projects (AAP): in 2024 and 2025 (Total of 5 M€)

Rules per project:

- Duration: max of 4 years

- Budget: 800 K€ - 1 M€

- Partners: 2-5 research teams (at least from 2 different institutions)

Discussions

https://miro.com/app/board/uXjVNNnnWRY=/?share_link_id=786076193725