

ANALYSE ET MODÉLISATION POUR LES ÉCOLOGIES D'ARTEFACTS RÉGULÉES (MADRAE) - UN CAS D'ÉTUDE EN TÉLÉMÉDECINE

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From fieldwork to design and implementation

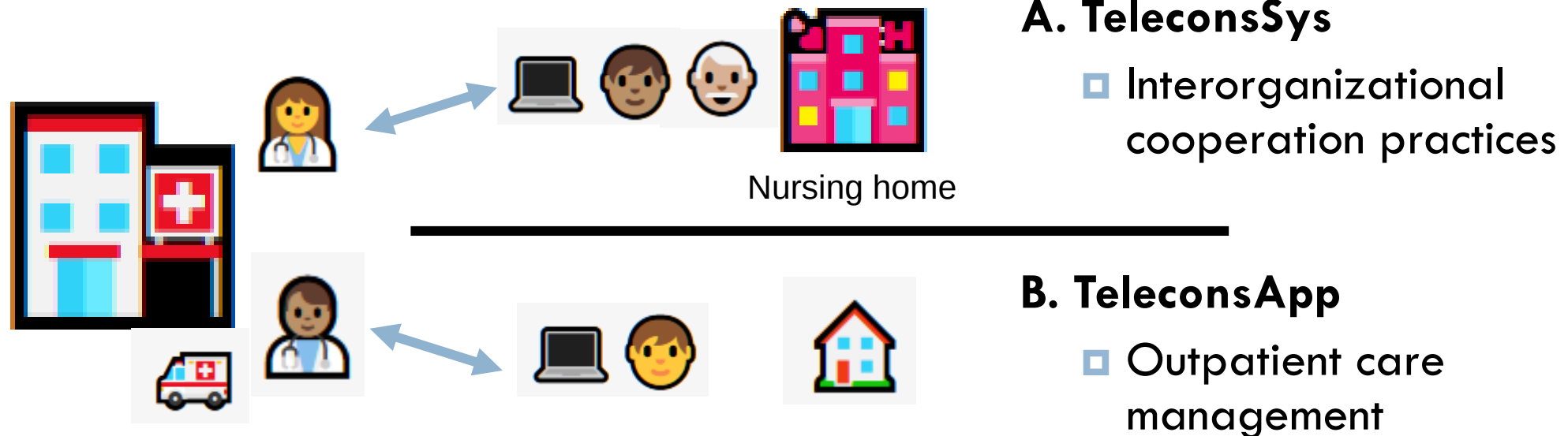
2

- Transfer of CSCW results to Information System (IS) and Technology management and design is still challenging (Lewkowicz & Liron, 2019; Ludwig et al., 2018)
 - ▣ Complexity of cooperative practices
 - ▣ 'Large scale': introducing new tools in an already technology populated environment (Korsgaard et al., 2022; Monteiro et al., 2013; Pollock & Williams, 2010)
- Research aims: Supporting the choice and design of relevant technology for supporting cooperation
 - ➔ Proposal:
Better incorporating findings into the daily toolboxes of software engineers and IS managers

A case on Teleconsultation practices at hospital (CHT)

3

- A 30 months field study on cooperative and regulated practices in health organizations
 - ▣ How health professionals are making teleconsultation in practice?



Health professionals have made efforts for integrating teleconsultation to their practices (Rossitto et al., 2014)

Ecologies of Artifacts and Data Work

4

From our observations at CHT:

- Both teleconsultation practices involve more than one tool/software
 - ▣ **Ecology of Artifacts (EoA):** (Jung et al., 2008, Bødker & Klokmoose, 2012)
the set of hardware and software pieces a person has access to
 - ▣ At personal or collective scale → Aligned EoA (Larsen-Ledet et al., 2020)

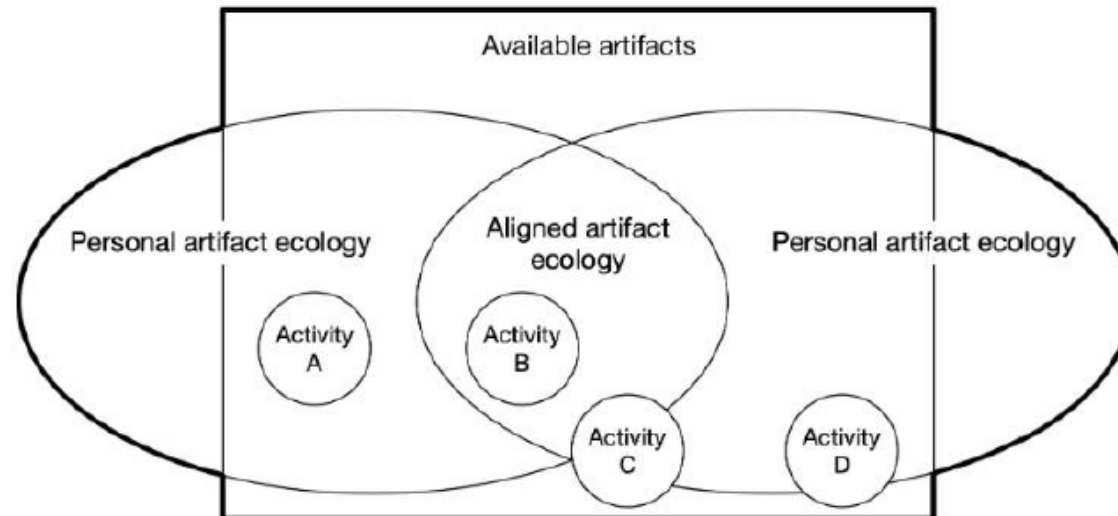
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Figure 5. Overview of artifact ecologies in collaborative writing (Larsen-Ledet et al., 2020)



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 - ▣ Automation & Interoperability versus Qualified work

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- Making EoA and data work visible for designer and prescribers of system supporting cooperation

Modeling for analysis and design

10

- Models as essential for the design of complex systems
 - ▣ Ease shared understanding and cooperation
 - ▣ Sociotechnical modeling approaches adoption is limited in IS
 - ▣ Accommodating the current tools and practices used in software engineering and IS → Unified Modeling Language (UML)

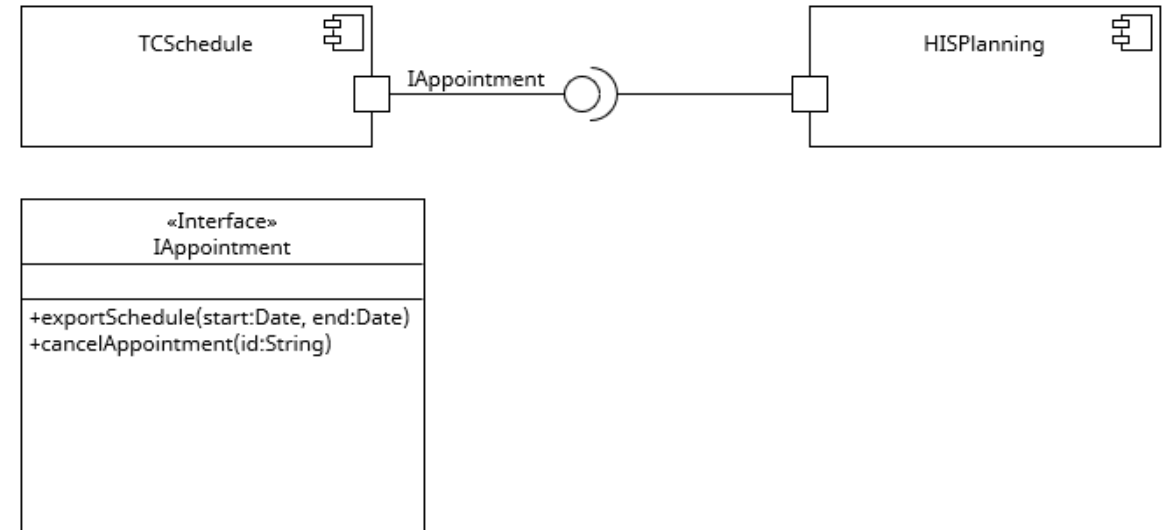
Modeling for analysis and design

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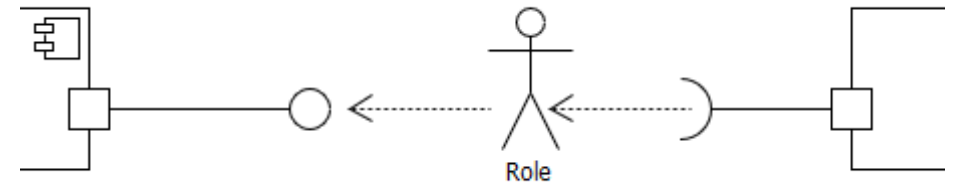
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- MADRAE: Modeling and Analysis in Regulated Artifacts Ecologies
 - ▣ Suppose fieldwork and ethnography for design (Randall et al., 2007)
 - ▣ Scale: a work practice

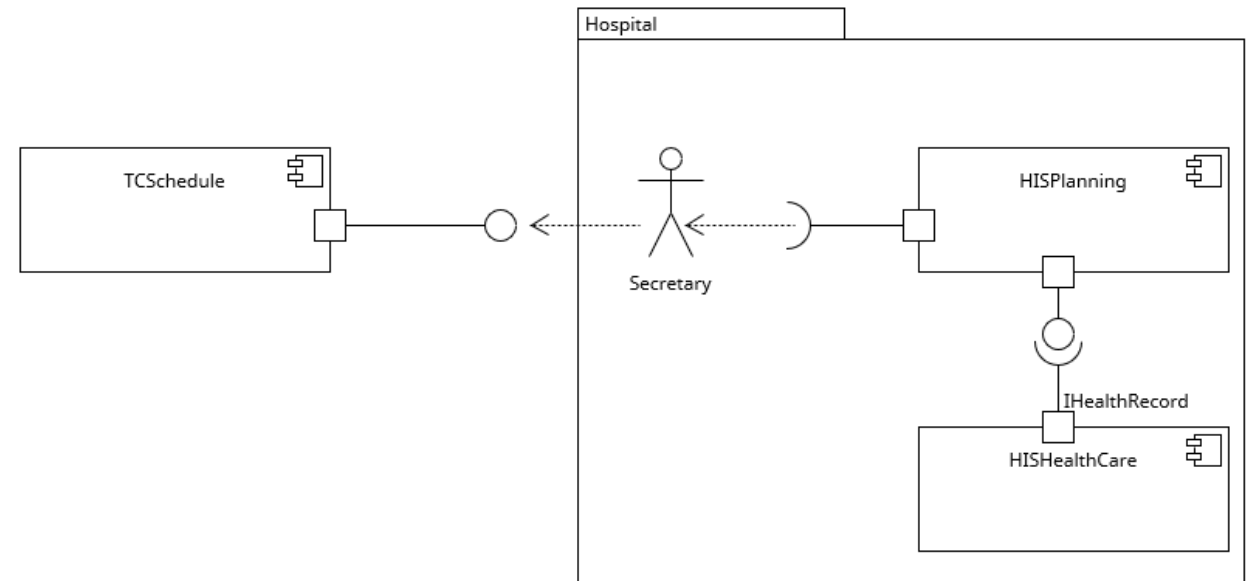
- UML Component diagram
 - ▣ Static model for EoA
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- Extensions with MADRAE
 - ▣ Representing data work as *dependencies* with human actors
ie, HISPlanning depends on a Secretary to get updated information about teleconsultation appointments from TCSchedule

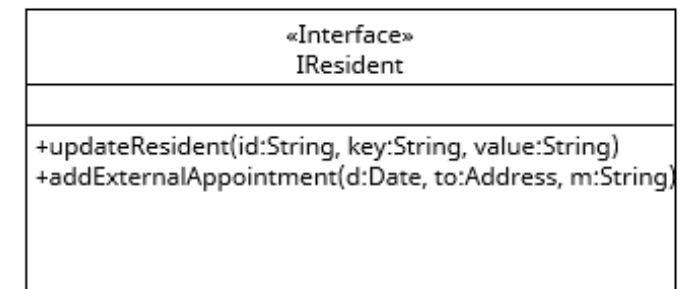
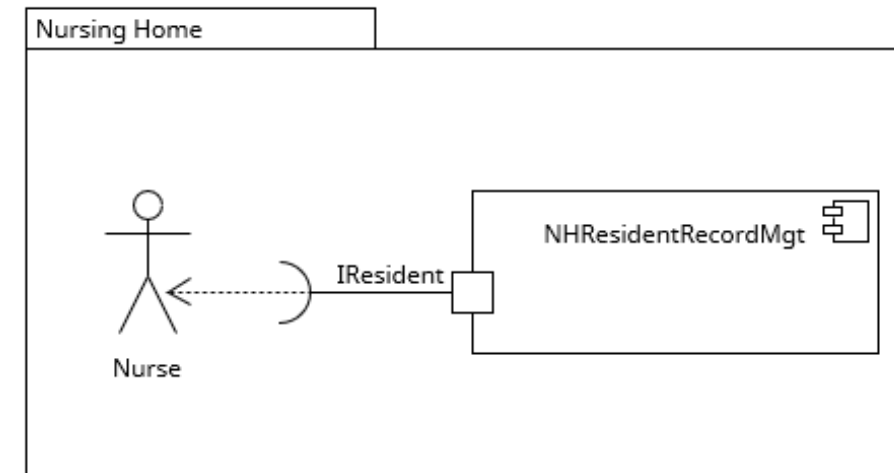


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 - ▣ Package for locating roles and components



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- Extensions with MADRAE
 - ▣ Representing data work as *dependencies* with human actors ie, *HISPlanning depends on a Secretary to g updated information about teleconsultation appointments from TCSchedule*
 - ▣ Package for locating roles and components
 - ▣ Combination with other design documents

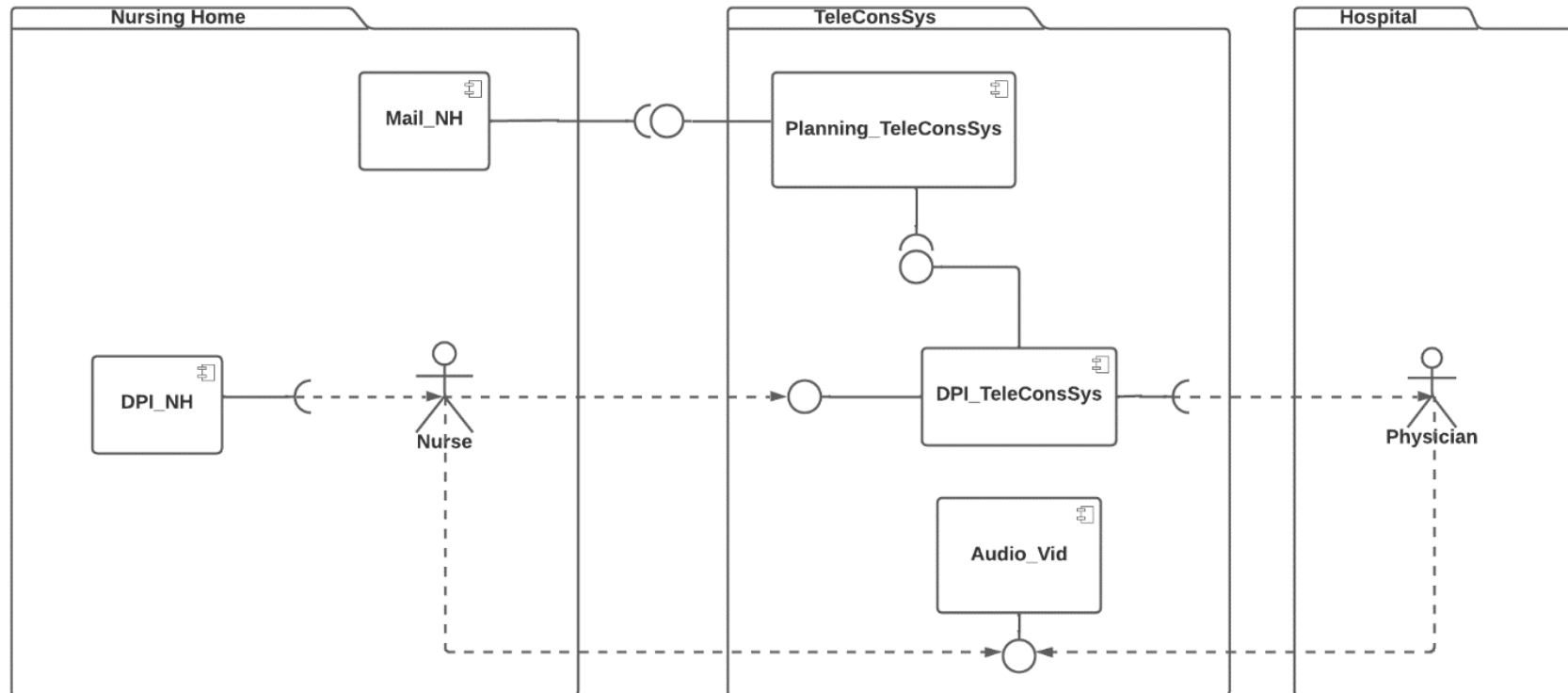
Memo #12 (IResident):
After having requested a teleconsultation with the hospital and received a confirmation by email, the nurse in shift records the information in the nursing home information system. The orderlies and nurse in charge the day of the appointment will then be able to anticipate and prepare the resident on time.



Analysing aligned EoA with MADRAE: TeleconsSys

16

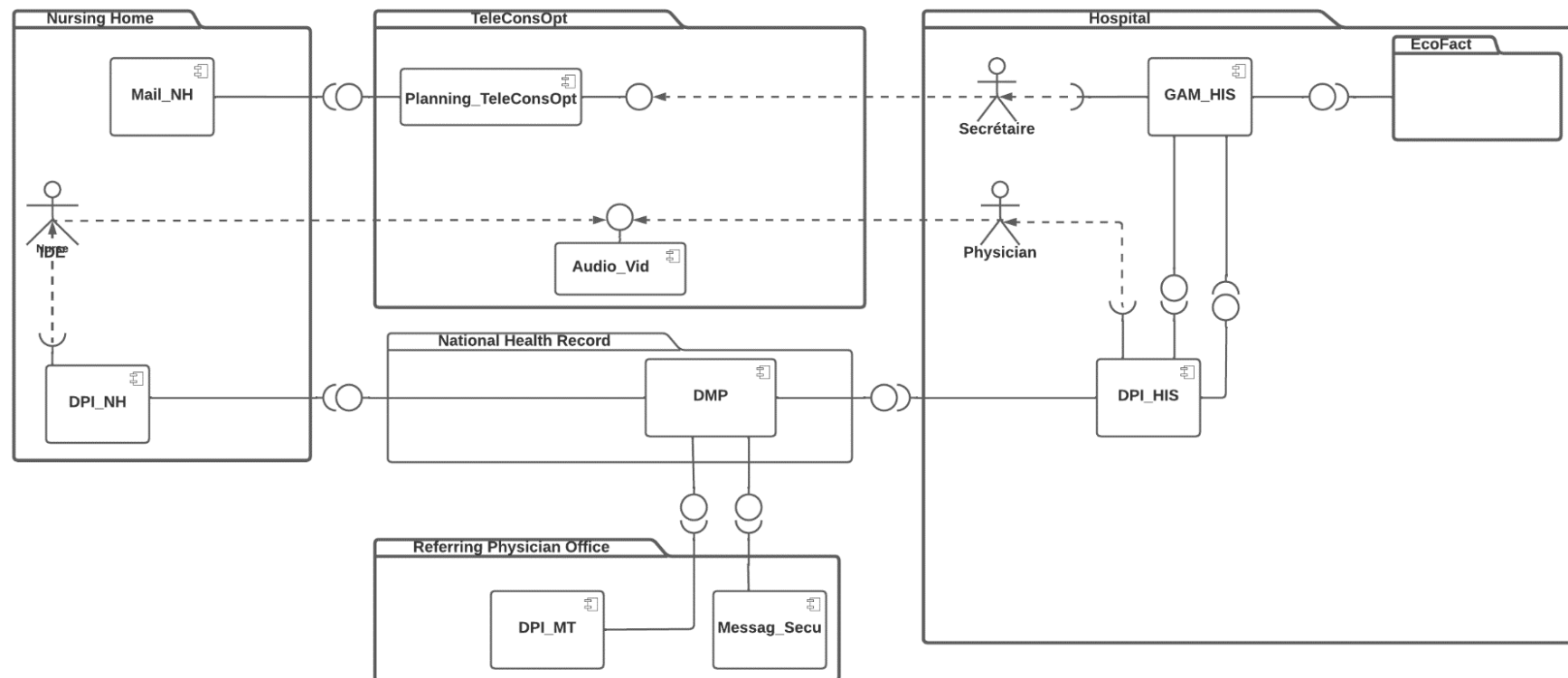
- Spotting issues and capabilities in an aligned EoA
 - ▣ Making human work involved visible
 - ▣ Pointing issues and holes (here absence of relation to the hospital IS)



Generating design proposals with MADRAE: TeleconsOpt

17

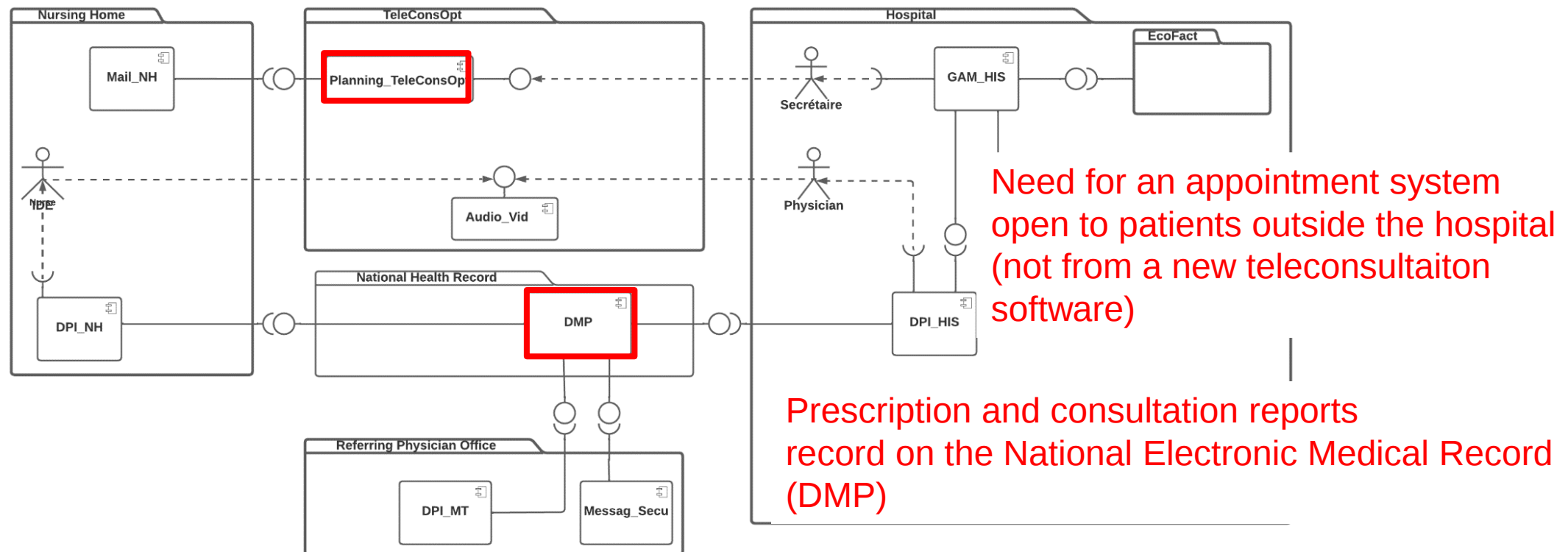
- TeleconsOpt: Envisioning new aligned EoA
 - ▣ Supporting both interorganizational cooperation and outpatient care teleconsultation practices at CHT



Generating design proposals with MADRAE: TeleconsOpt

18

- TeleconsOpt: Envisioning new aligned EoA
 - ▣ Supporting both interorganizational cooperation and outpatient care teleconsultation practices at CHT



Learnings from a formative expert evaluation

19

- Interview with the Head of Hospital Information System (HHIS) of CHT (45 min.)
 - ▣ (1) the understanding of the MADRAE approach and notation
 - “[UML] I used it a long time ago”; “UML everybody knows what it is”
 - “I would have at least represented DPI_HIS with two required connectors and nobody at the end! [laugh] Just to better show that this link is clearly missing”
 - ▣ (2) the evaluation of the model of TeleconsSys and TeleconsOpt
 - HHIS point policy compliance issue with TeleconsSys (ie, Health Data hosting policy)
 - HHIS suggests of improvements for TeleconsOpt for better integration with the National Health Record
 - ▣ (3) limits and suggestions for improvements
 - “visualizing the users’ process is mandatory aside from tools and architecture”
 - is essential to HIS team from our interviewee perspective
- ➔ HHIS understand the approach and the presented models support relevant and detailed discussion

Conclusion Future Work

20

- MADRAE as an approach for transferring EoA and data work to IS design and management practices
- Next steps
 - ▣ Taking into account policies and regulation in our models
(Fitzpatrick & Ellingsen, 2013; Jackson et al., 2014)
 - ▣ Application in more project context,
especially for the development of new aligned EoA

Thank you for your attention

21

□ Documentation of MADRAE and extended notation for the component diagram is publicly available:

□ <https://github.com/Clement-Cormi/MADRAE>

□ Feel free to use and help us to improve

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