

INTEGRATING OML (ONLINE MACHINE LEARNING) AND CEP (COMPLEX EVENT PROCESSING) FOR BETTER CPSS (CYBER-PHYSICAL-SOCIAL SYSTEMS)

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**INTEGRATING
OML (ONLINE MACHINE LEARNING)
AND
CEP (COMPLEX EVENT PROCESSING)
FOR BETTER CPSS
(CYBER-PHYSICAL-SOCIAL SYSTEMS)**

Nov. 29, 2013

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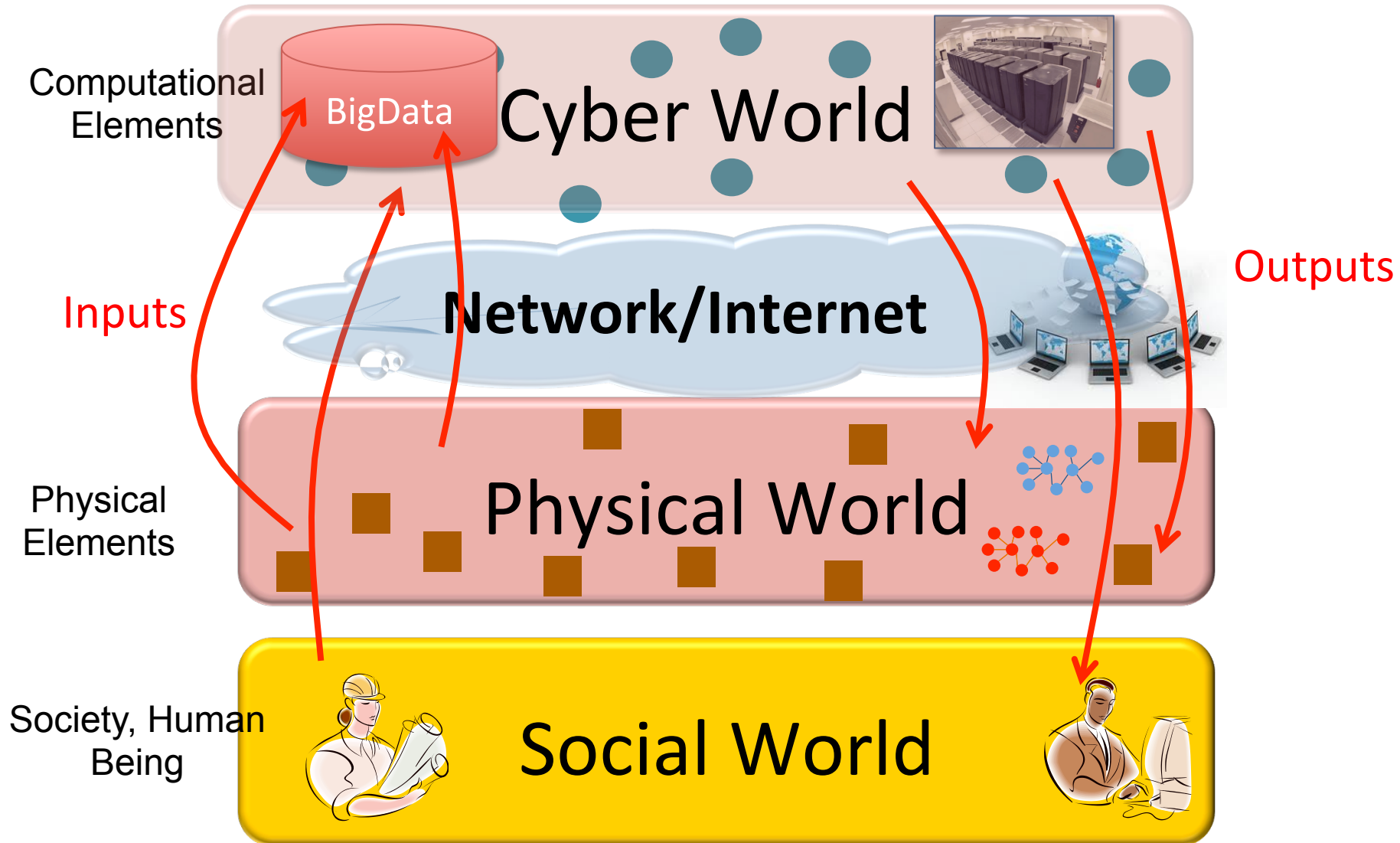
OUTLINE

- What are CPSS (Cyber-Physical-Social System), OML (Online Machine Learning), and CEP (Complex Event Processing)?
- Why do we integrate OML and CEP for better CPSS?
- How do we integrate OML and CEP for better CPSS?
- Where shall we experiment?

Part I

WHAT ARE CPSS, OML, AND CEP?

CPSS (CYBER-PHYSICAL-SOCIAL SYSTEM)

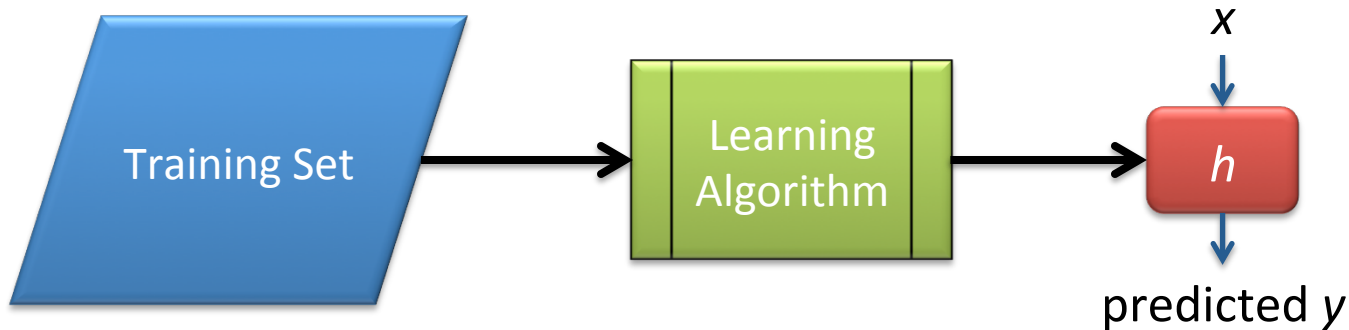


CPSS (CYBER-PHYSICAL-SOCIAL SYSTEM)

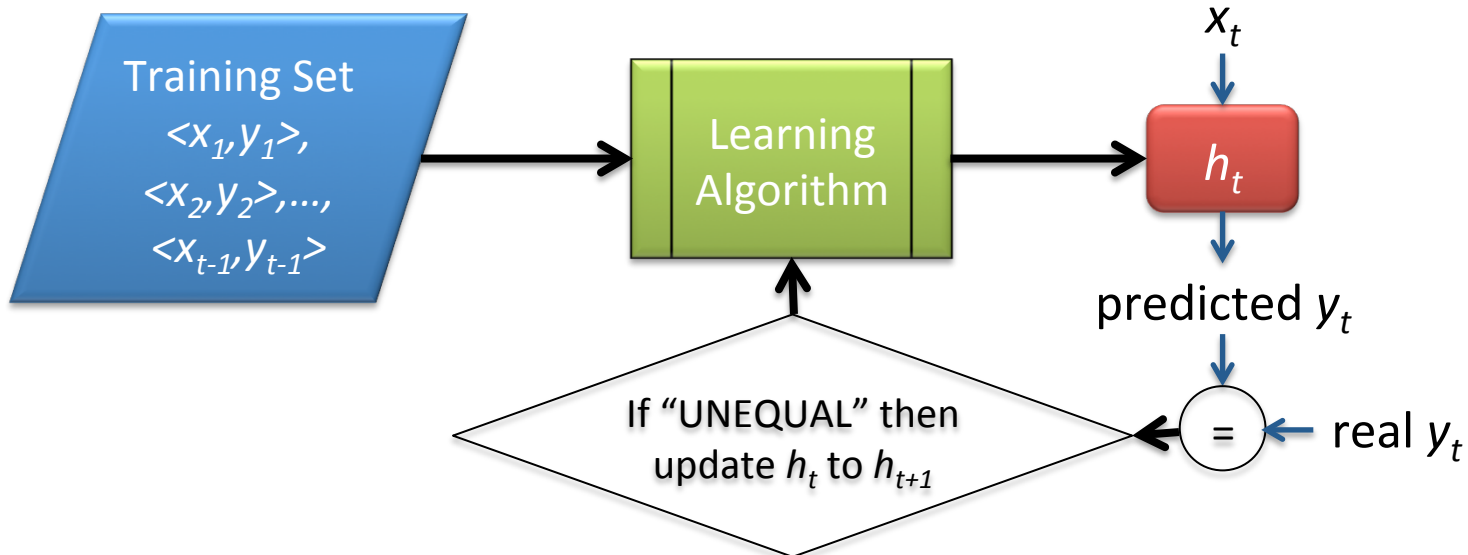


OML (ONLINE MACHINE LEARNING)

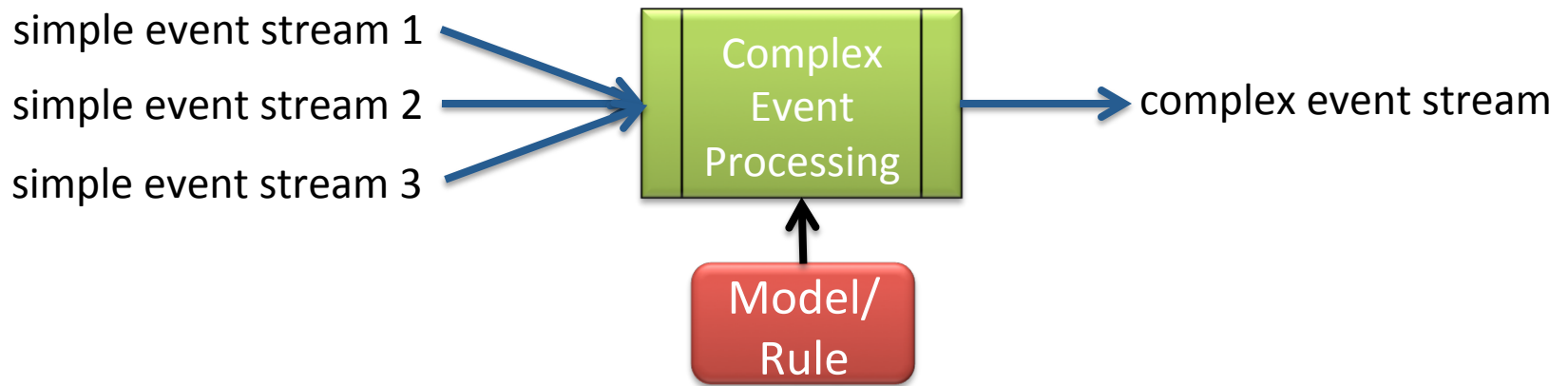
■ BML (Batch Machine Learning)



■ OML (Online Machine Learning)



CEP (COMPLEX EVENT PROCESSING)



An example:

Event1: church bells ringing
Event2: the appearance of a man in a tuxedo
with a woman in a flowing white gown
Event3: rice flying through the air



Complex event: a wedding

Part II

WHY DO WE INTEGRATE OML AND CEP FOR BETTER CPSS?

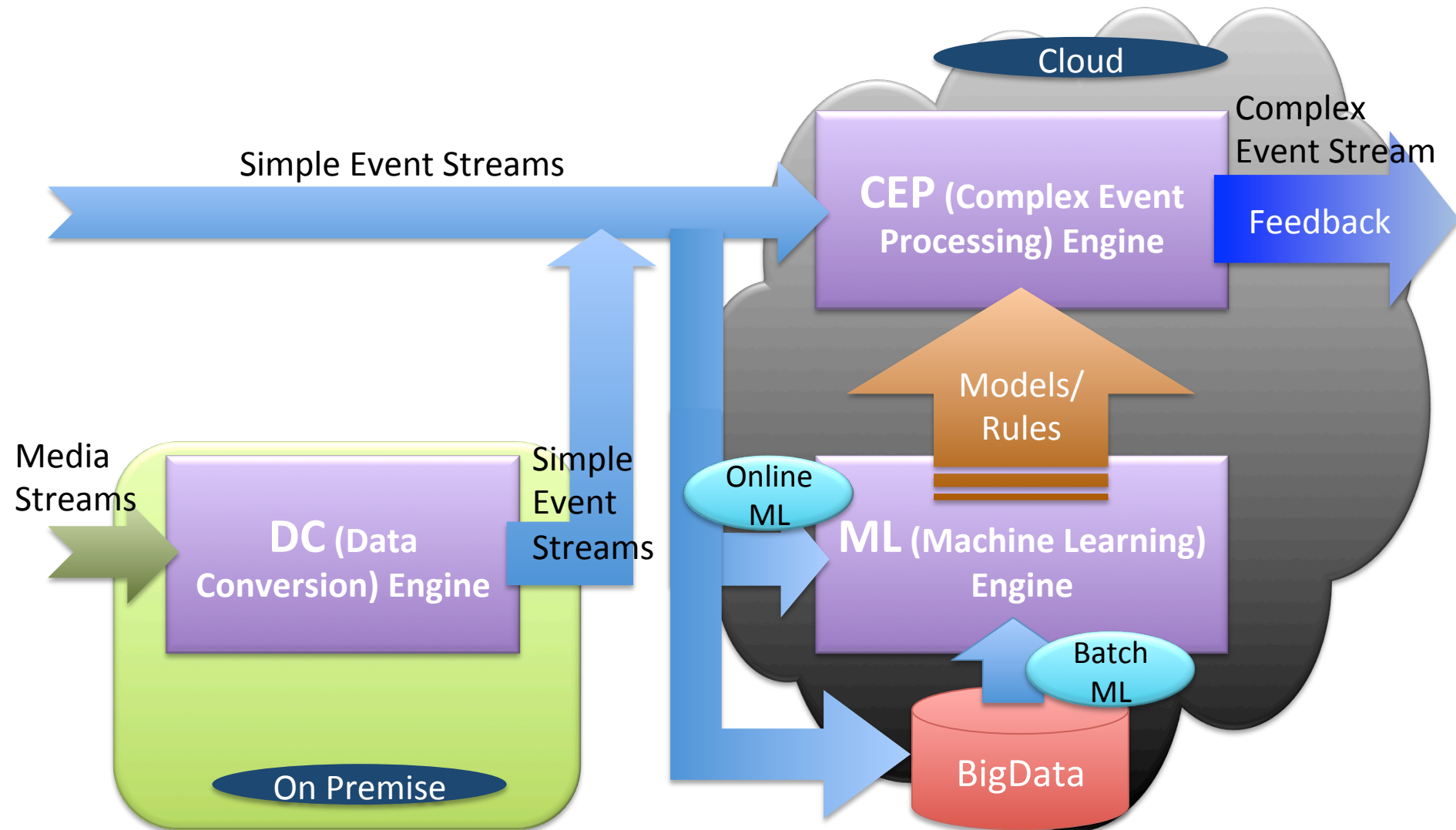
CPSS (CYBER-PHYSICAL-SOCIAL SYSTEM)



Part III

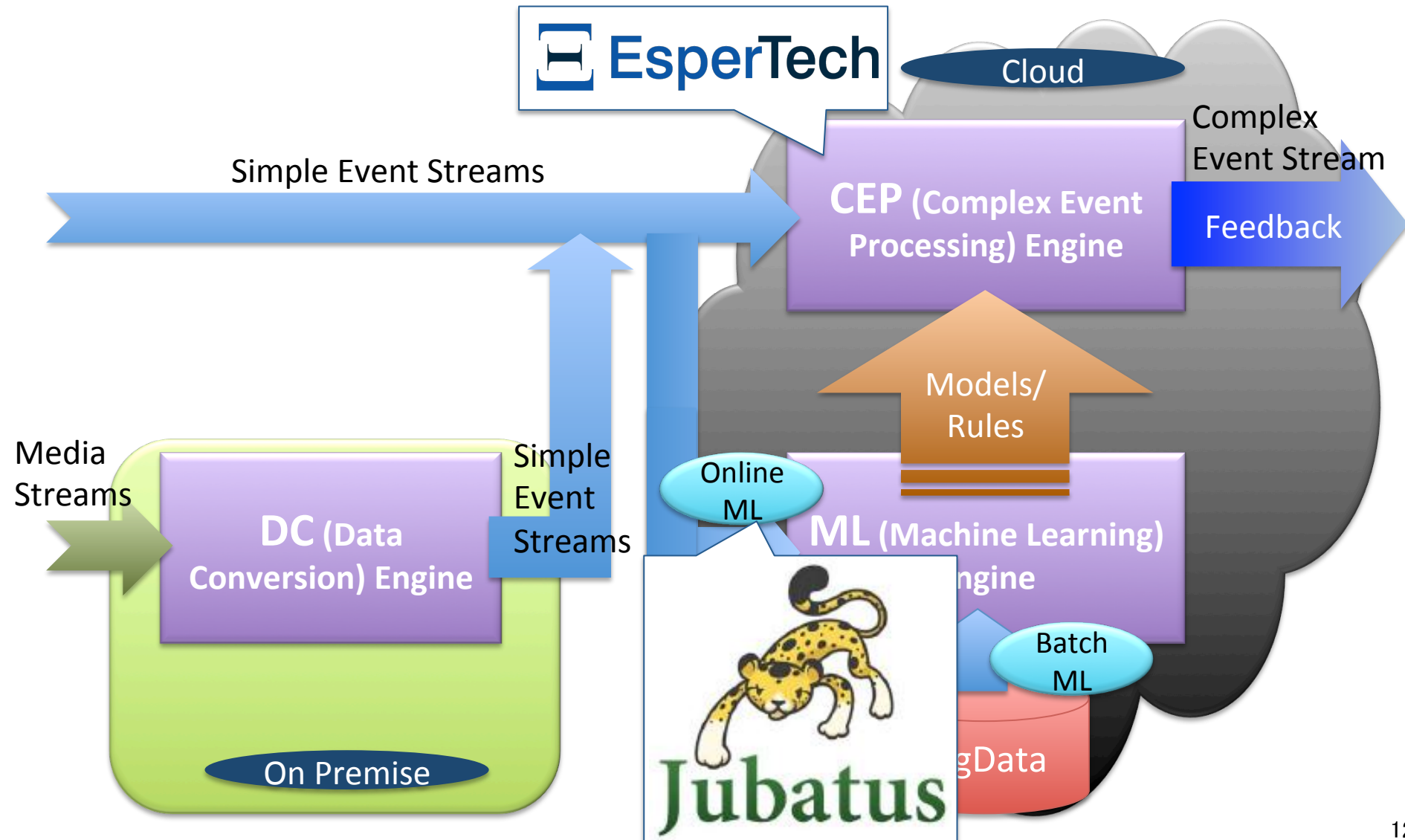
HOW DO WE INTEGRATE OML AND CEP FOR BETTER CPSS?

A PLATFORM ARCHITECTURE FOR CPSS



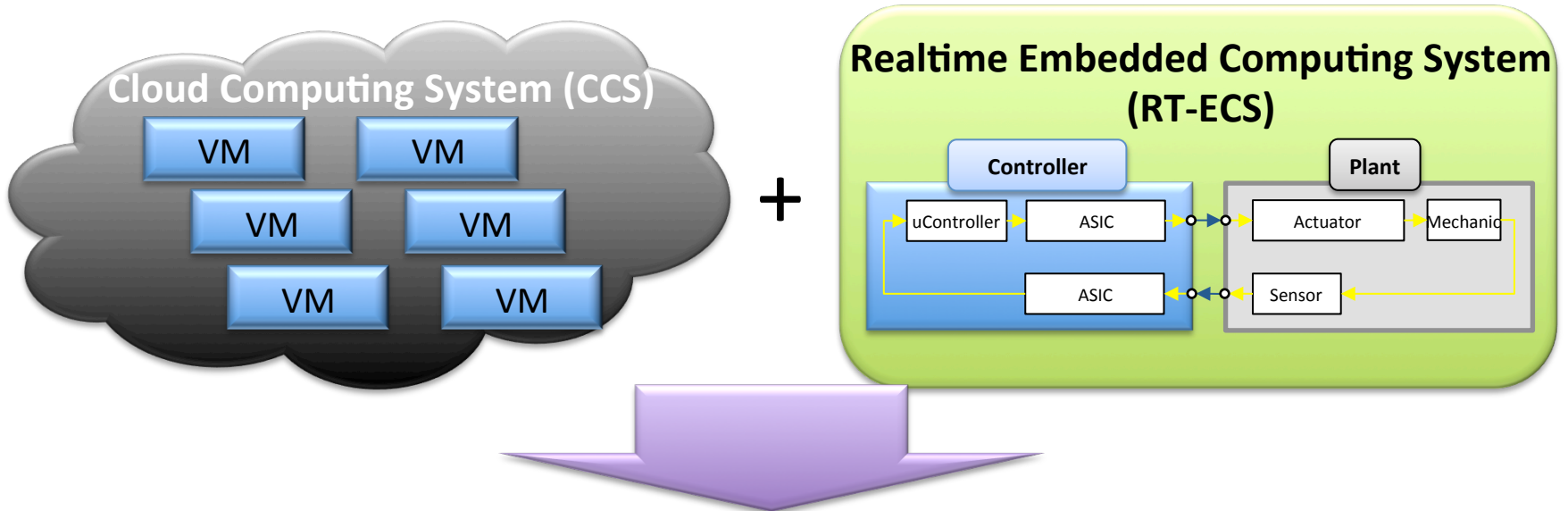
A PLATFORM ARCHITECTURE FOR CPSS

- A SOFTWARE PERSPECTIVE -

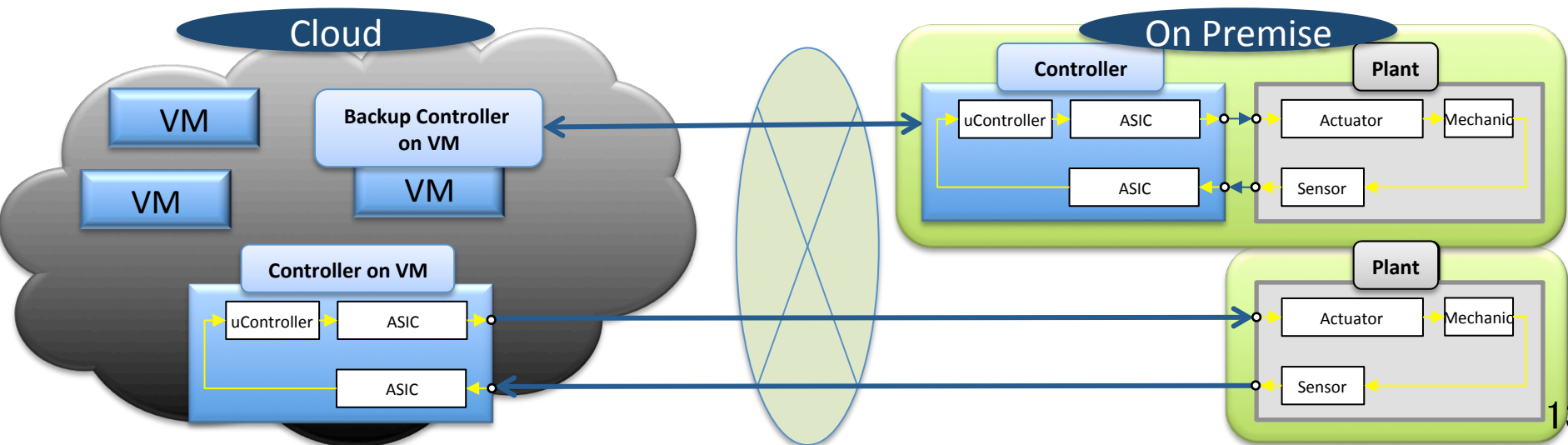


A PLATFORM ARCHITECTURE FOR CPSS

- A HARDWARE PERSPECTIVE -



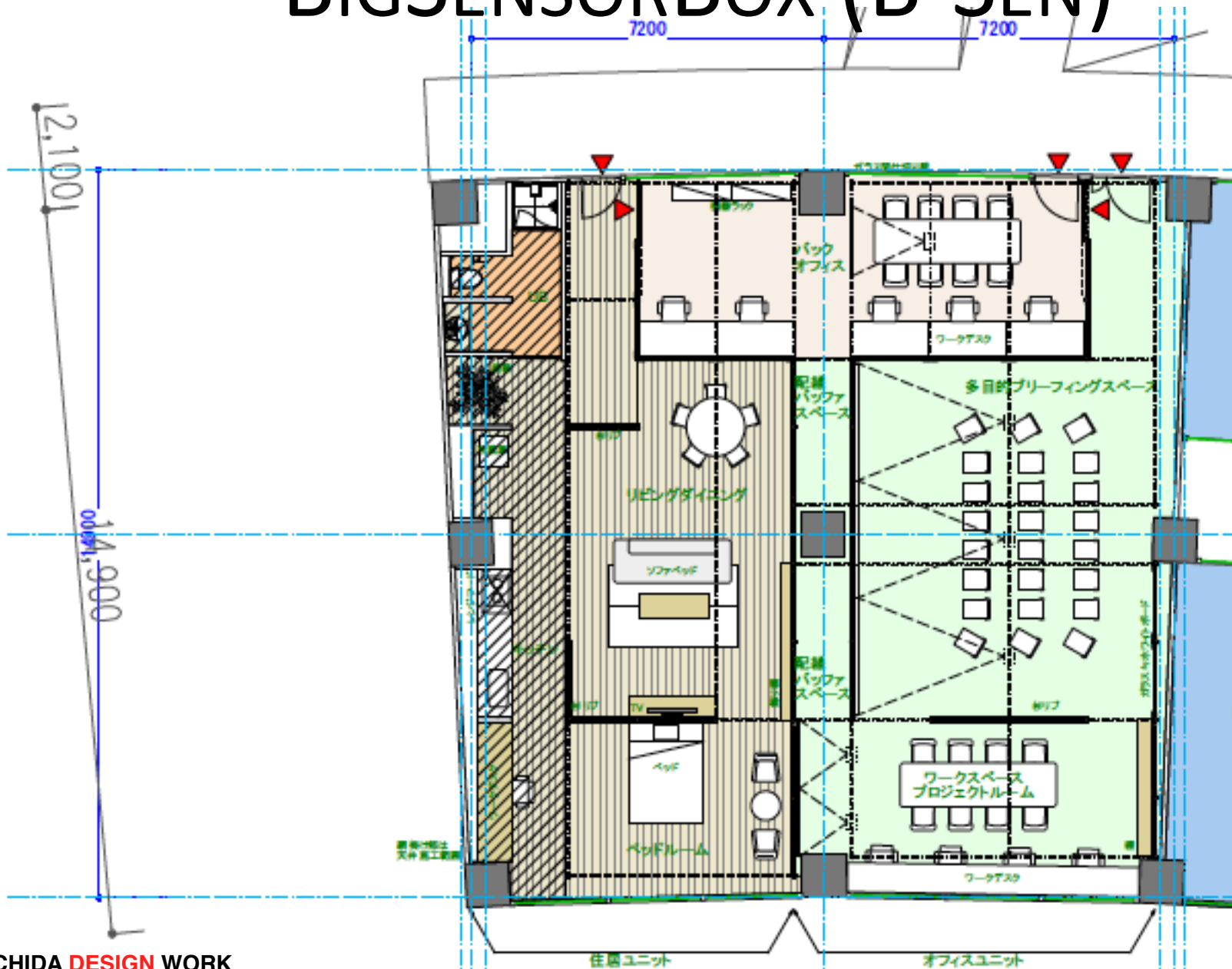
RT-ECCS (Realtime Embedded Cloud Computing System)



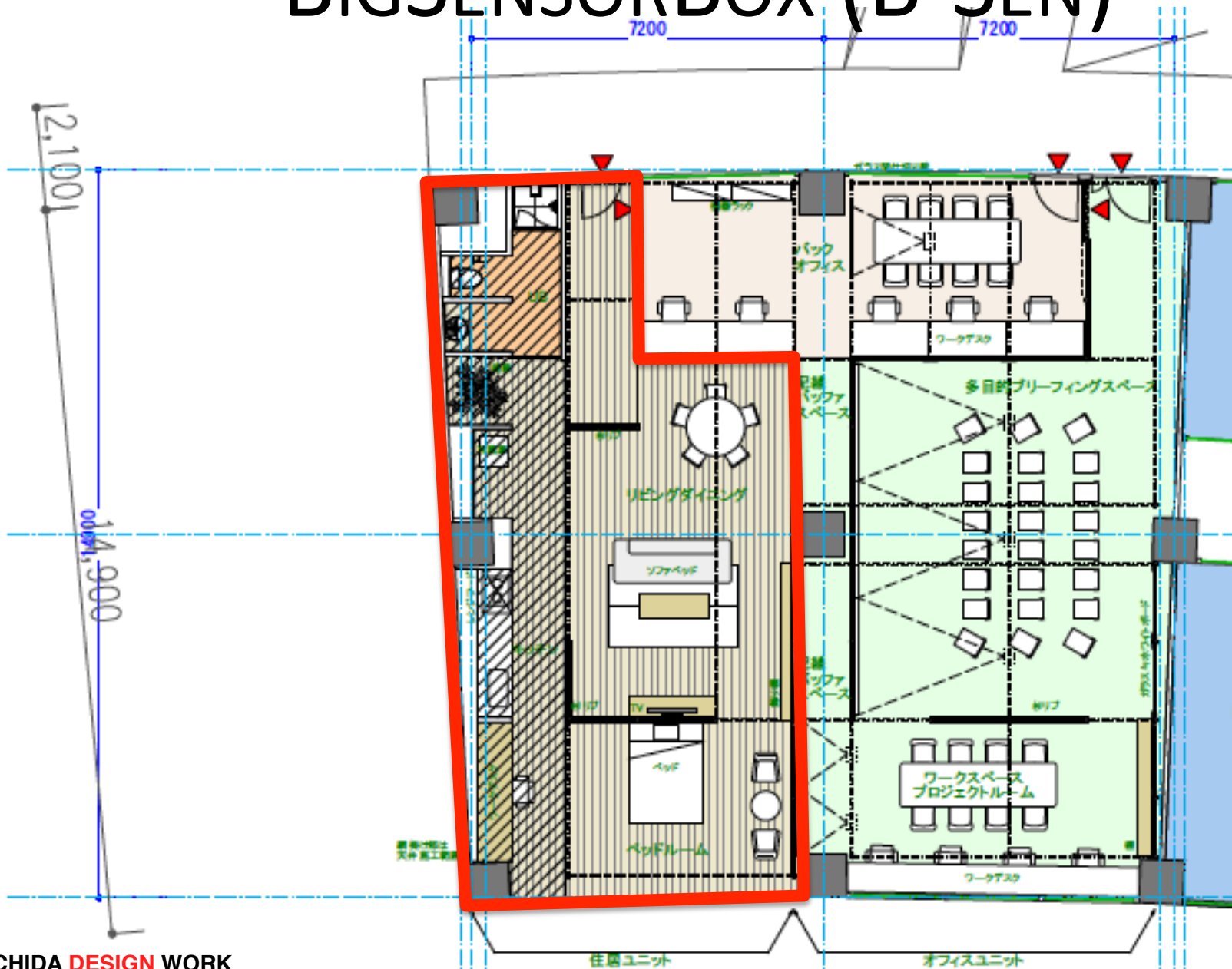
Part IV

WHERE SHALL WE EXPERIMENT?

BIGSENSORBOX (B-SEN)

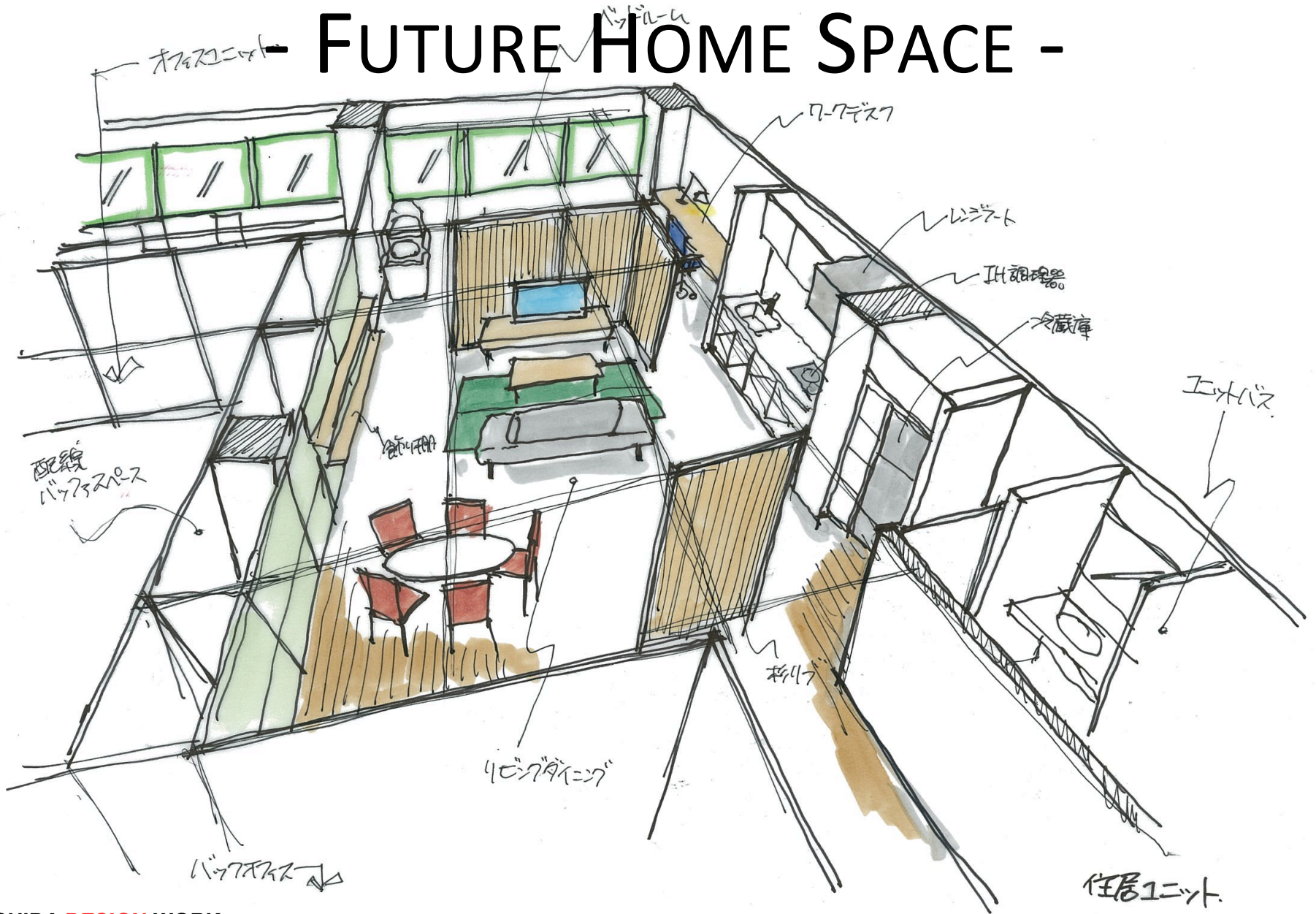


BIGSENSORBOX (B-SEN)



BIGSENSORBOX (B-SEN)

- FUTURE HOME SPACE -



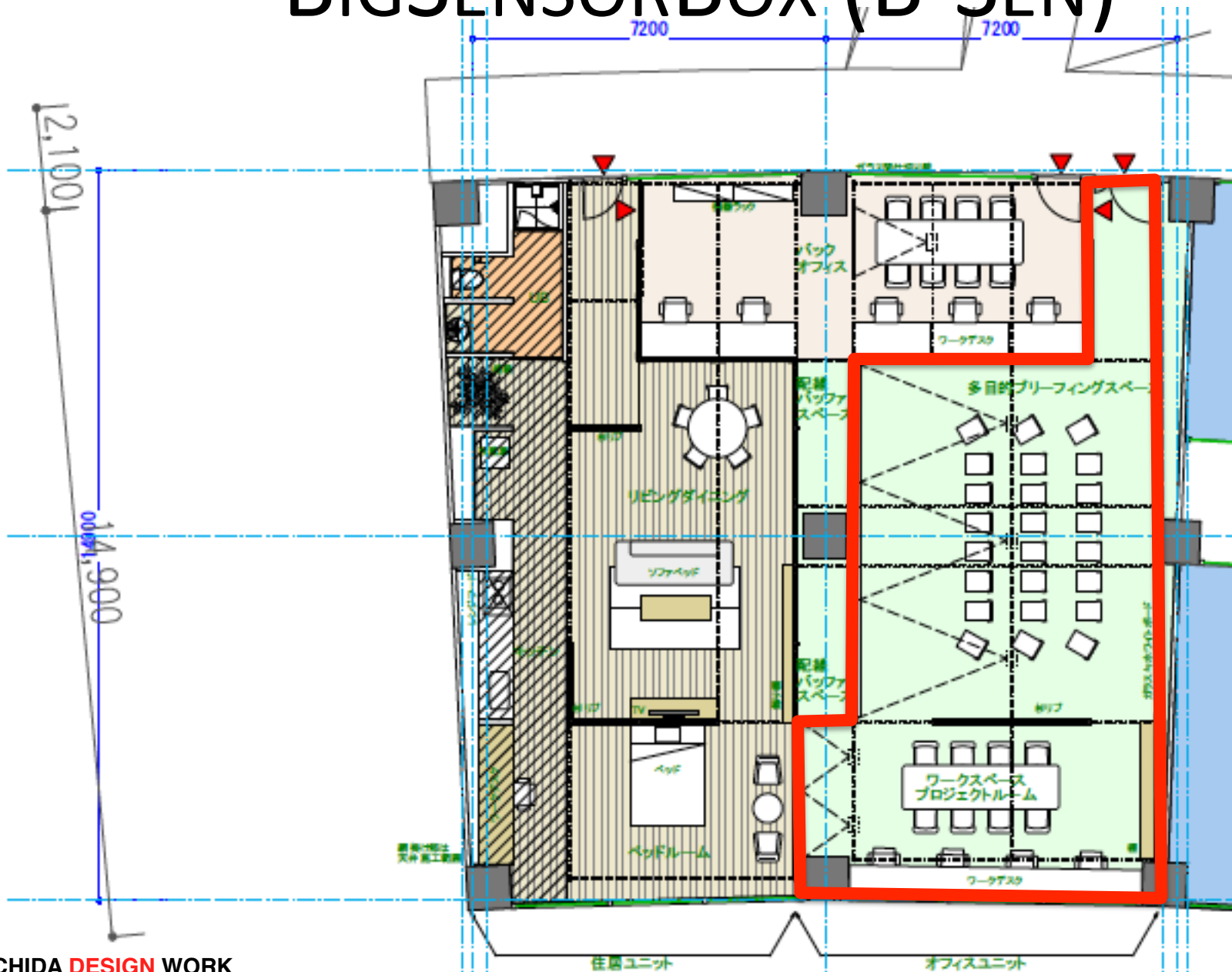
FUTURE HOME IMAGE



FUTURE HOME IMAGE



BIGSENSORBOX (B-SEN)



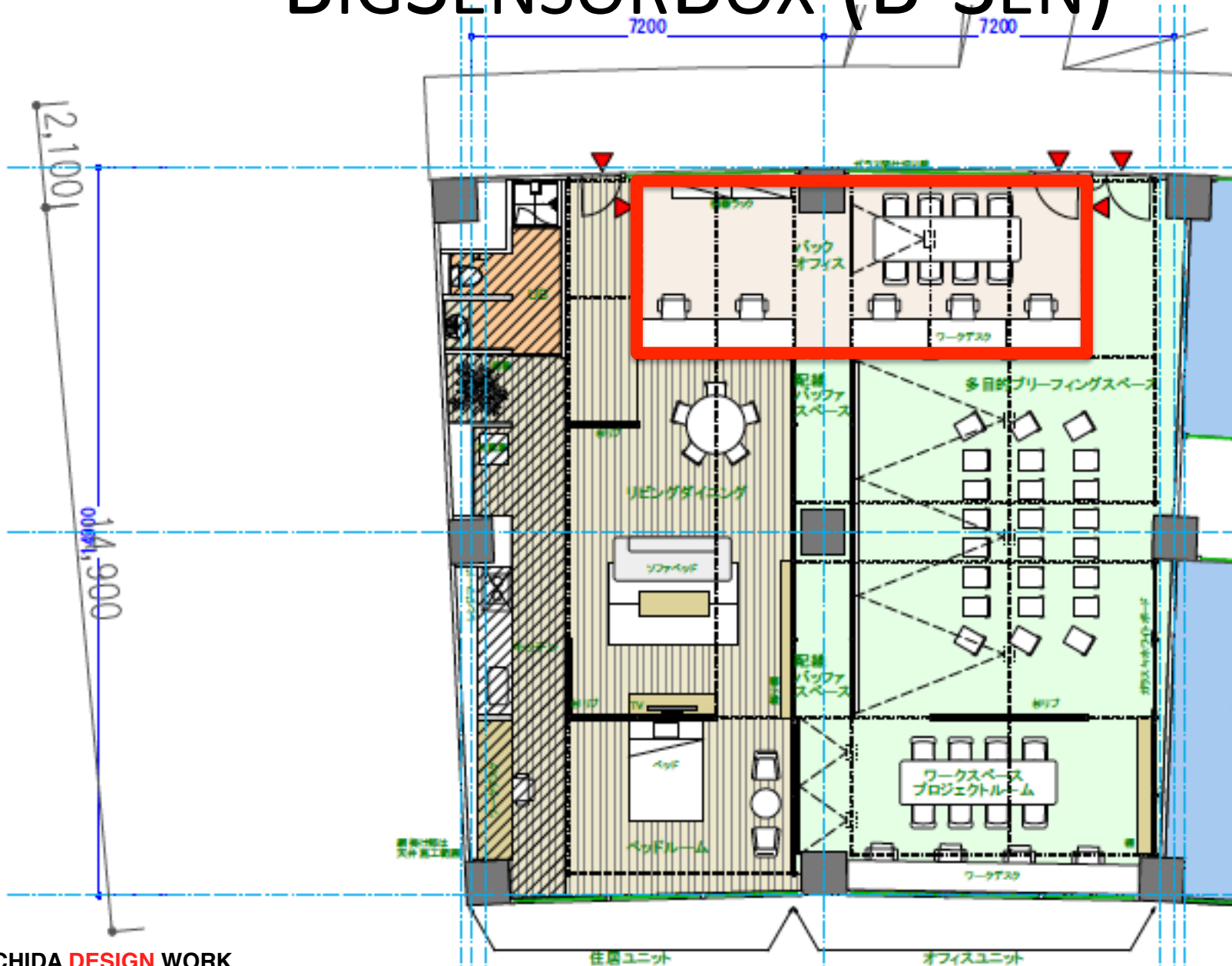
FUTURE OFFICE IMAGE



FUTURE OFFICE IMAGE



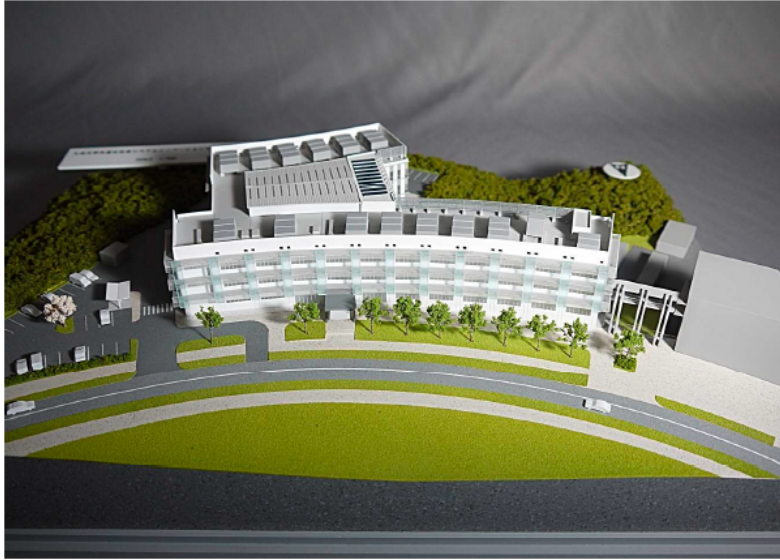
BIGSENSORBOX (B-SEN)



BACK OFFICE (DATA SCIENTIST ROOM)



ISI (INTERNATIONAL SCIENCE INNOVATION) CENTER



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SUMMARY

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