

*Arbeitsgruppe Software Engineering  
Institut für Informatik*

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# Gemeinsame Wissensproduktion in der Paarprogrammierung

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Antrittsvortrag zur  
Masterarbeit

# Gliederung

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PUSH → PULL → PRODUCE

- ❖ Was ist Paarprogrammierung
- ❖ Stand der Forschung
- ❖ Ansatz und Ergebnisse der Arbeitsgruppe
- ❖ Meine bisherigen Ergebnisse
- ❖ Was habe ich noch vor
- ❖ Hindernisse
- ❖ Diskussion



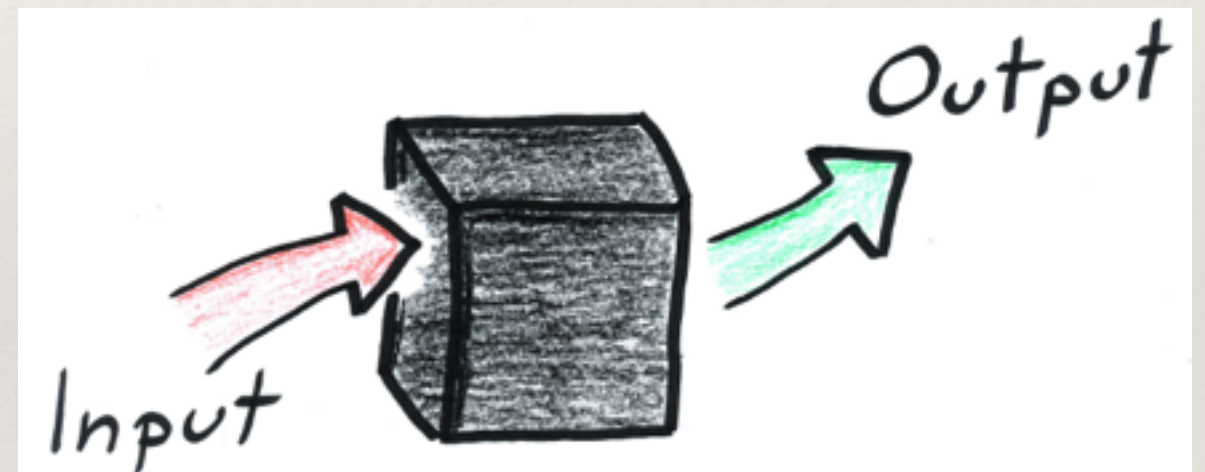
# Paarprogrammierung

- ❖ „Write all production programs with two people sitting at one machine [...]  
Pair Programming is a dialogue between two people simultaneously programming (and analyzing and designing and testing) and trying to program better“  
(Kent Beck, 2004)
- ❖ „Pair Programming is a subtle skill“ (Kent Beck, 1999)



# Quantitative Studien

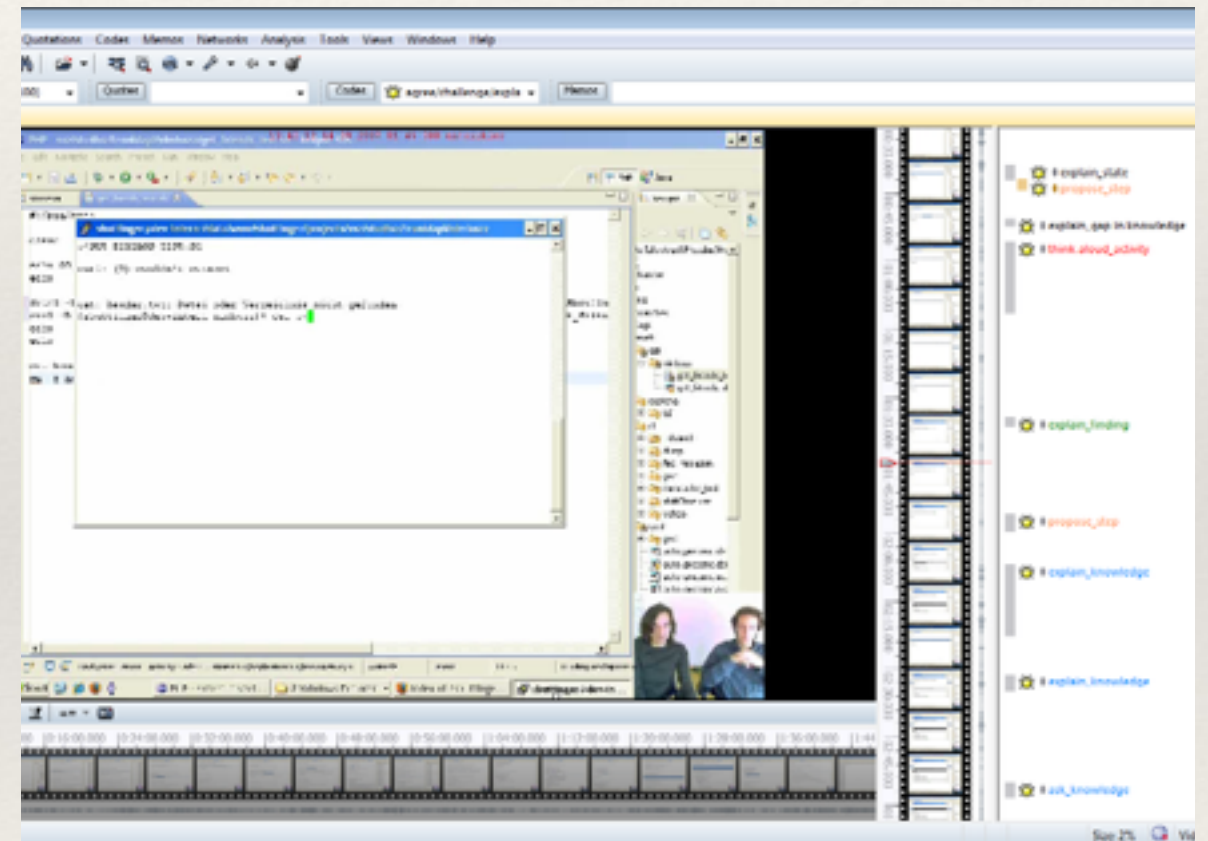
- ❖ Entwicklungsgeschwindigkeit, Codequalität, Entwicklerzufriedenheit
- ⇒ kleinen - mittleren aber signifikanten positiven Effekt
- ❖ Problem:  
heterogene Ergebnisse
- ❖ Vernachlässigung des Pair Programming Skills





# Qualitative Studien – Methodik

- ❖ Grounded Theory Method (Strauss, Corbin, 1990)
- ❖ Offenes Kodieren
- ❖ Axiales Kodieren
- ❖ Selektives Kodieren



# Qualitative Studien – Ergebnisse 1/2

- ❖ The Base Layer (Salinger, Prechelt, 2013)
- ❖ Product-oriented concepts
- ❖ Process-oriented concepts
- ❖ Universal concepts
- ❖ Miscellaneous

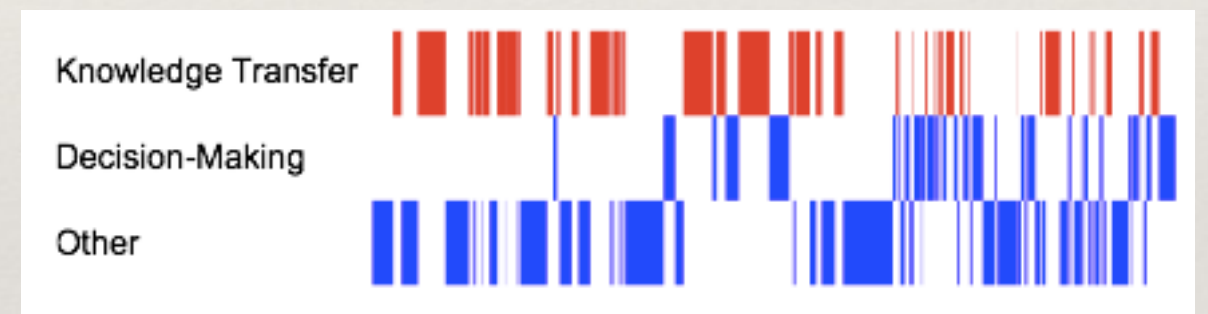
universal concepts			
<b>explain_gap_in_knowledge</b> Verbalize that certain knowledge is not possessed by either member of the pair.	<b>agree_gap_in_knowledge</b> Signal agreement with a given gap in knowledge.	<b>explain_standard_of_knowledge</b> Explain or recapitulate one's own level of knowledge with respect to a certain topic.	<b>ask_standard_of_knowledge</b> Ask the partner for his/her level of knowledge with respect to a certain topic.
		<b>ask_knowledge</b> Ask the partner for information of type 'declarative knowledge'.	<b>stop_activity</b> Suggest to stop or abort the current HCI or HEI activity.
<b>explain_finding</b> Verbalize a new insight; this includes interpreting an observed event.	<b>propose_hypothesis</b> Formulate a hypothesis or conjecture, e.g. regarding a property of the program, or the environment.	<b>explain_knowledge</b> Transfer information to the partner that is assumed to be correct declarative knowledge.	<b>think_aloud_activity</b> Verbalize aspects of one's own current HCI or HEI activity.
<b>agree_finding</b> Signal agreement with a verbalized insight or interpretation.	<b>agree_hypothesis</b> Signal agreement with a given hypothesis or conjecture.	<b>agree_knowledge</b> Signal agreement (i.e. judge as correct) knowledge stated by the partner.	<b>agree_activity</b> Signal agreement with all or part of the current HCI or HEI activity.
<b>challenge_finding</b> Reject the content of a verbalized insight or interpretation and suggest an alternative one.	<b>challenge_hypothesis</b> Reject a given hypothesis or conjecture and formulate an alternative one.	<b>challenge_knowledge</b> Declare transferred knowledge as fully, partially, or potentially wrong by opposing it with one's own knowledge.	<b>challenge_activity</b> Reject all or part of the current HCI or HEI activity and suggest an alternative activity.
<b>disagree_finding</b> Declare transferred finding as fully, partially, or potentially wrong without explaining why.	<b>disagree_hypothesis</b> Reject a given hypothesis or conjecture.	<b>disagree_knowledge</b> Declare transferred knowledge as fully, partially, or potentially wrong without explaining why.	<b>disagree_activity</b> Reject all or part of the current HCI or HEI activity.
<b>amend_finding</b> Extend a verbalized insight or interpretation without rejecting it.	<b>amend_hypothesis</b> Extend a given hypothesis or conjecture without rejecting it.		<b>amend_activity</b> Propose an extension to the current HCI or HEI activity.

facade concepts



# Qualitative Studien – Ergebnisse 2/2

- ❖ 2 dominante Arbeitsmodi (Zieris, Prechelt, 2014)
- ❖ Decision-Making
- ❖ Knowledge Transfer
- ❖ Other



# Knowledge Transfer

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- ❖ Need for knowledge
- ❖ TOPIC
- ❖ TARGET CONTENT
- ❖ 3 Knowledge Transfer Modi:
  - ❖ PUSH
  - ❖ PULL
  - ❖ PRODUCE



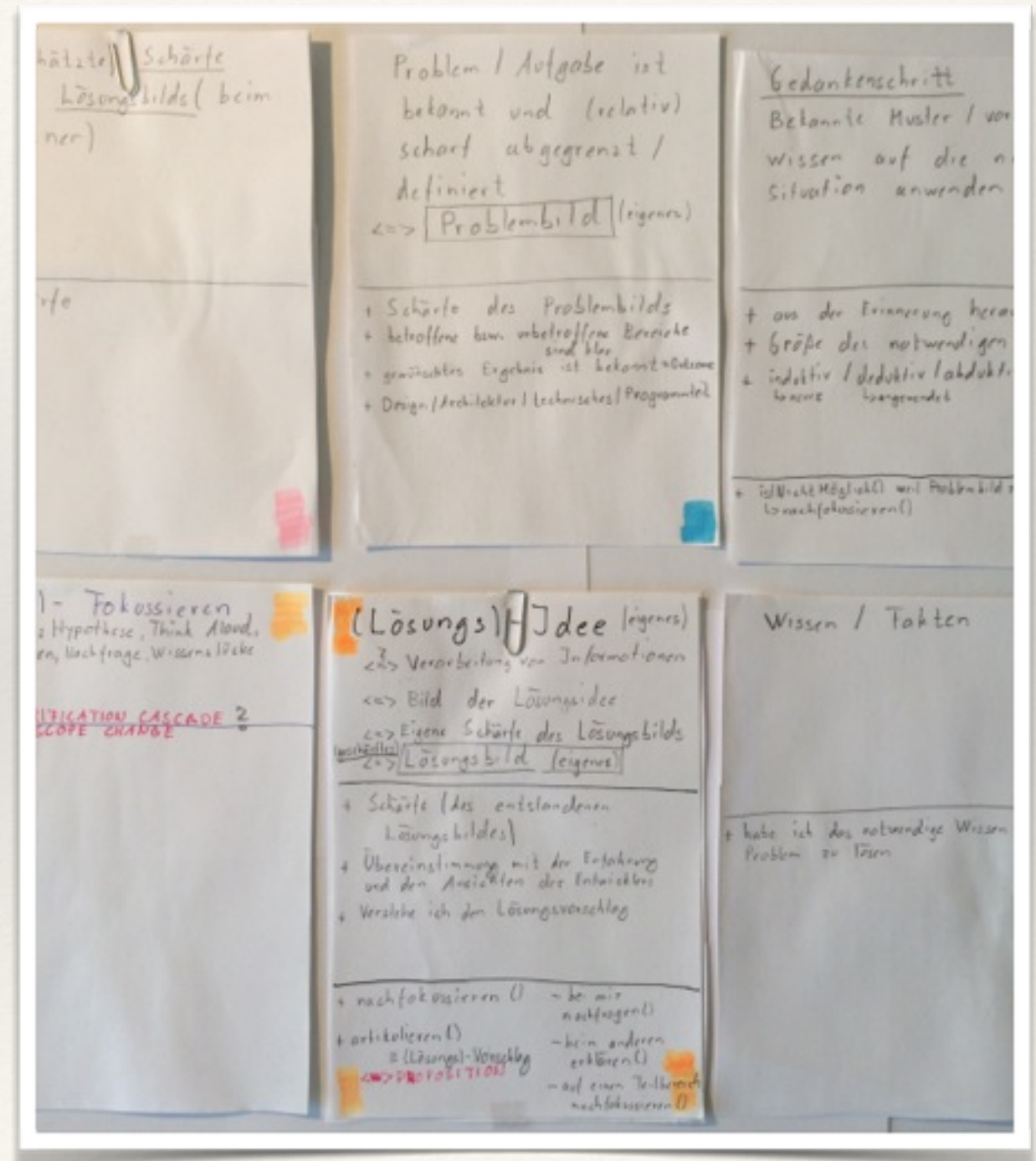
# PRODUCE

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- ❖ Keiner besitzt den TARGET CONTENT in seinem Wissen
  - ⇒ Produktion des TARGET CONTENTs
- ❖ PRODUCE Modi
  - ❖ CO-PRODUCTION
  - ❖ PIONEERING PRODUCTION

# Meine bisherigen Ergebnisse/Konzepte

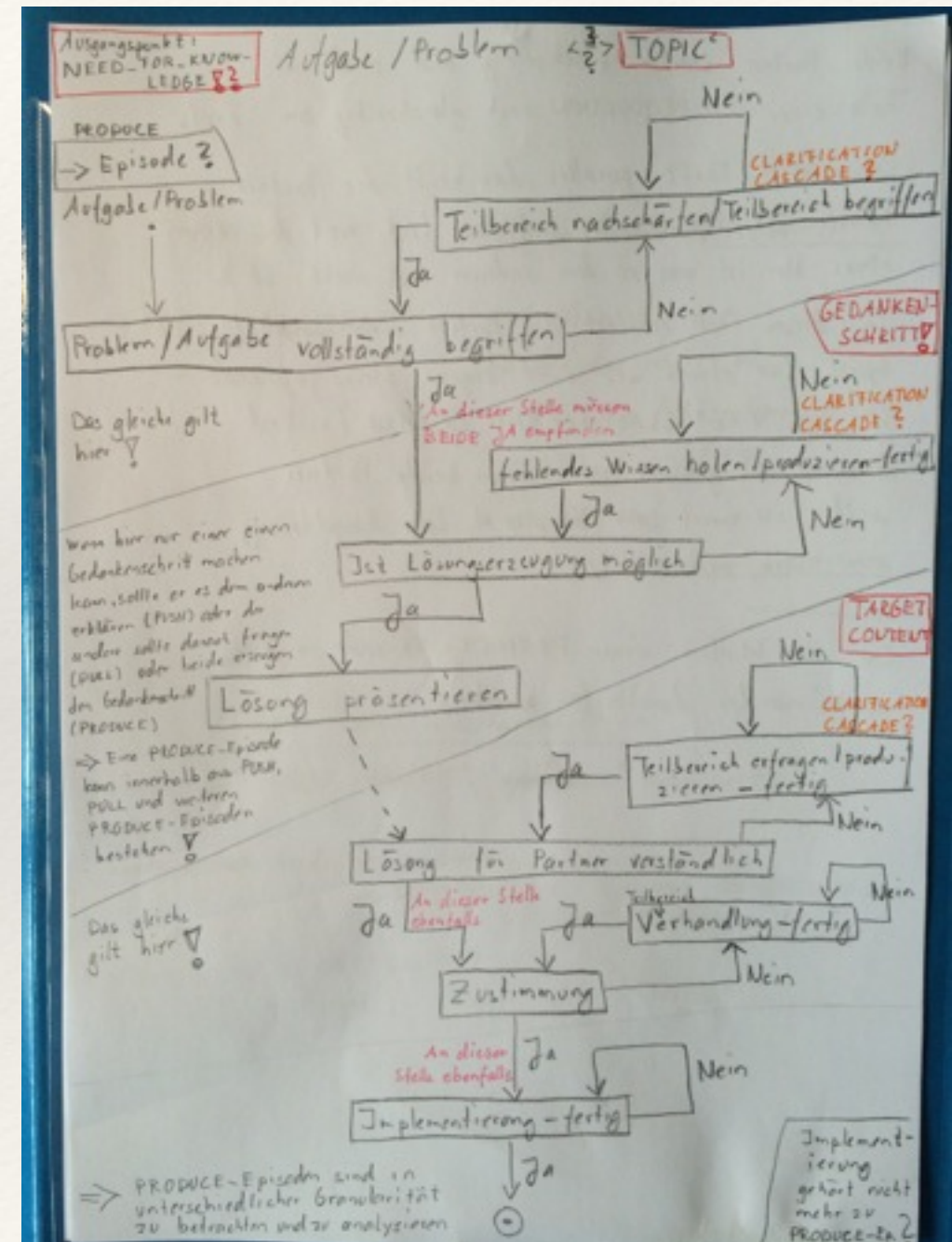
- ❖ TARGET CONTENT
- ❖ Problem Oriented
- ❖ Background Knowledge
  - ❖ Problembild
  - ❖ Gedankenschritt
  - ❖ Lösungsbild
  - ❖ Verbindung zwischen Partnern





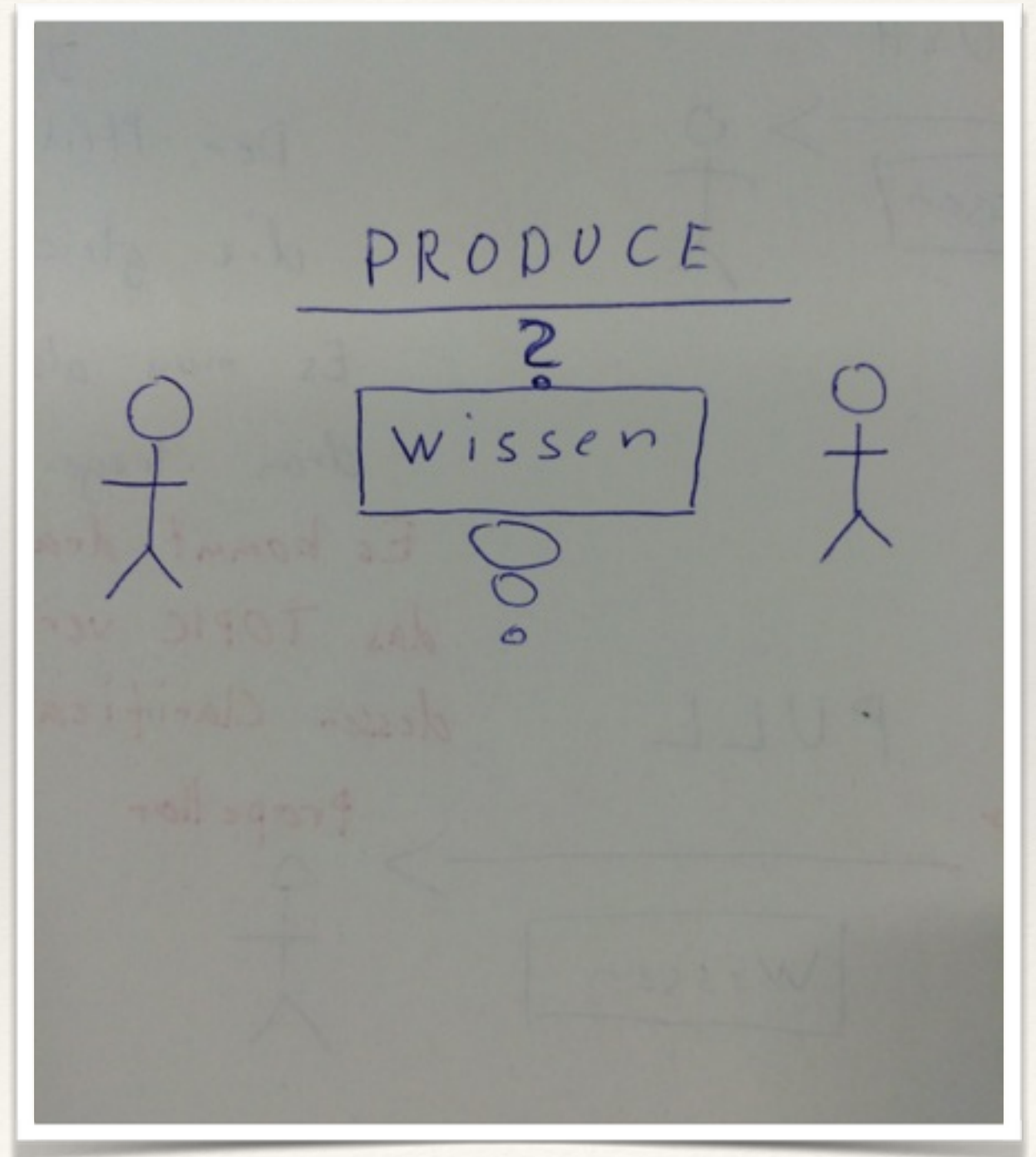
# Problem Oriented TARGET CONTENT

- ❖ 3 Etappen
- ❖ Problembild schärfen
- ❖ Gedankenschritt machen
- ❖ Einigung mit Partner



# Background Knowledge TARGET CONTENT

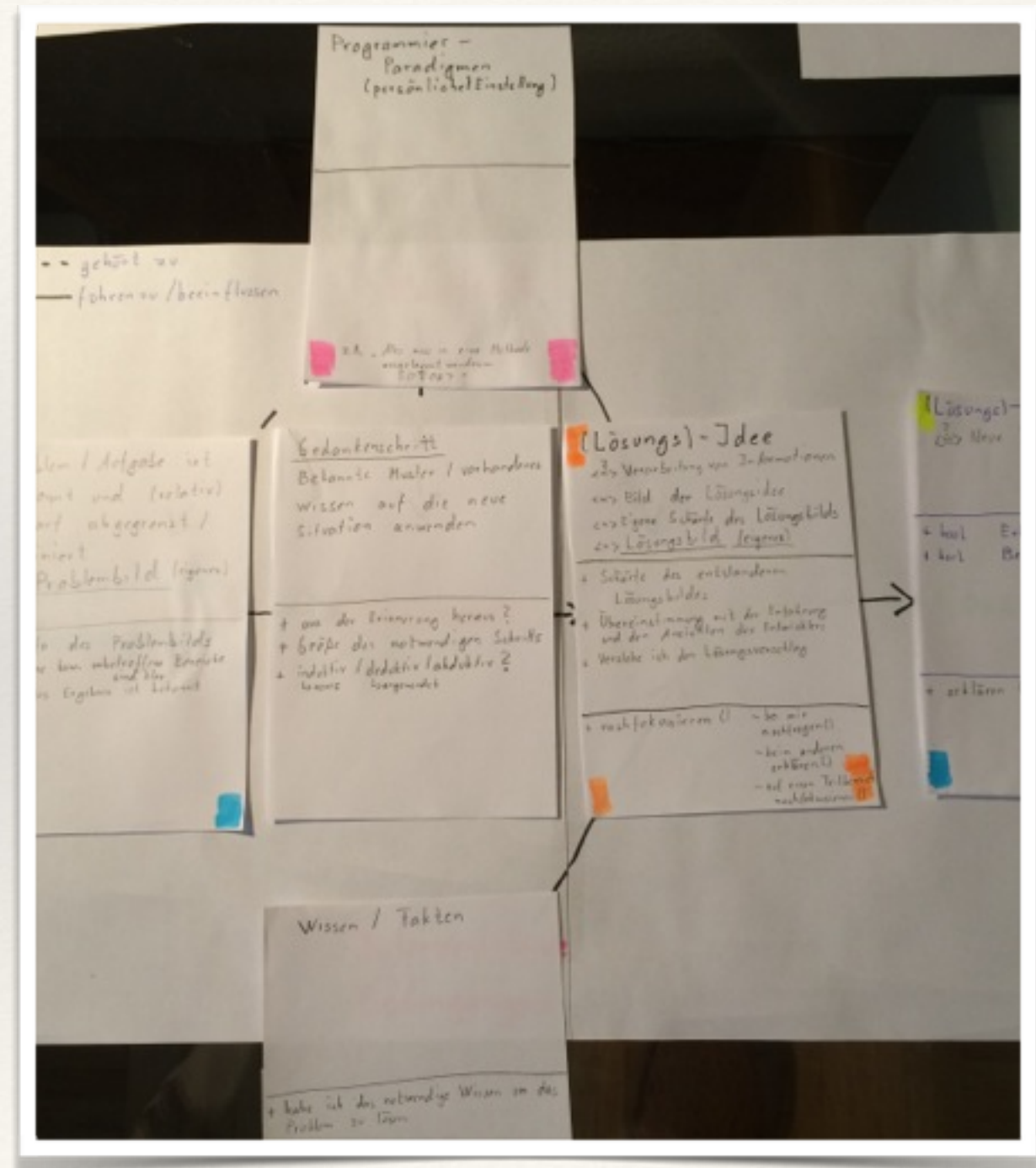
- ❖ Wissen aus der Mitte wird mittels Gedankenschritt erweitert
- ❖ Einer der beiden PULLED von einer anderen Quelle als dem Partner





# Weiteres Vorgehen

- ❖ Abgleichen mit den Daten
- ❖ Offenes Kodieren ↔  
Axiales Kodieren ↔  
Selektives Kodieren



# Hindernisse

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- ❖ Grounded Theory Method ist nicht einfach
  - ❖ Benennung und Abgrenzung von Konzepten
  - ❖ Operationalisierung von Konzepten
  - ❖ Zusammenhang von Konzepten bilden
- ❖ Endergebnis unklar → Verunsicherung



# Quellen

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- ❖ K. Beck and C. Andres. Extreme Programming Explained: Embrace Change, Second Edition. Addison-Wesley Professional, 2004.
- ❖ K. Beck. Extreme Programming Explained: Embrace Change. Addison-Wesley Professional, 1999.
- ❖ <http://de.wikipedia.org/wiki/Pairprogrammierung> (14.7.2014)
- ❖ <http://dzd.blog.uni-wh.de/files/2014/02/Behaviorismus.png> (13.7.2014)
- ❖ S. Salinger and L. Prechelt. Understanding Pair Programming: The Base Layer. BoD, Norderstedt, Germany, 2013. 978-3-7322-8193-0.
- ❖ F. Zieris and L. Prechelt. On Knowledge Transfer Skill in Pair Programming. Proceedings of the 8th ACM-IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM), Torino, Italy, September 2014.



!! Vielen Dank für die Aufmerksamkeit !!

