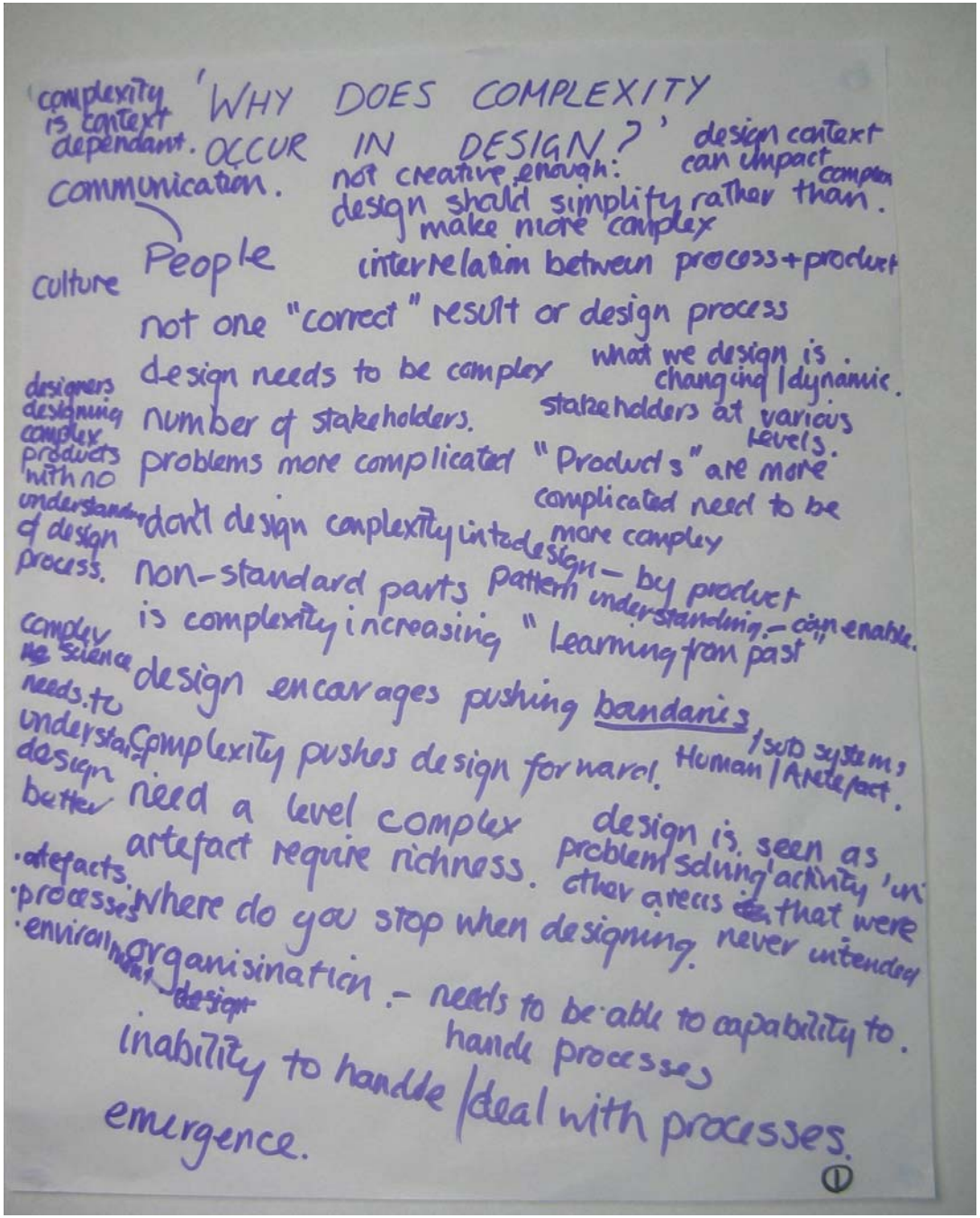

'WHY DOES COMPLEXITY OCCUR IN DESIGN?'
complexity is context dependant.
communication.
People
culture
not one "correct" result or design process
design needs to be complex
number of stakeholders.
problems more complicated
don't design complexity into design
non-standard parts
is complexity increasing
design encourages pushing boundaries
Complexity pushes design forward.
need a level complex artefact require richness.
where do you stop when designing.
organisation - needs to be able to handle processes
inability to handle/deal with processes.
emergence.
design context can impact
design should simplify rather than make more complex
interrelation between process + product
what we design is changing/dynamic.
stakeholders at various levels.
"Products" are more complicated need to be more complex
pattern understanding - can enable.
learning from past
Human/Artefact.
design is seen as problem solving activity
other areas that were never intended
designers designing complex products with no understanding of design process.
complex the science needs to understand design better
artefacts
processes
environment design

'HOW CAN WE MANAGE COMPLEXITY IN DESIGN MORE EFFECTIVELY?'

patterns recognitions

decrease constraints.

remove regulation. but. may became more complex.

optimise constraints.

eliminate complex.

alter system boundary

learning

IT infrastructure

4% software used

Capability Maturity Model.

CMM

requirement/spec

Self Organisation

Adaptive Systems

Autonomy.

generate more information. teams getting bigger

emergence - prediction

design rational.

holism

more efficient communication

design strategies.

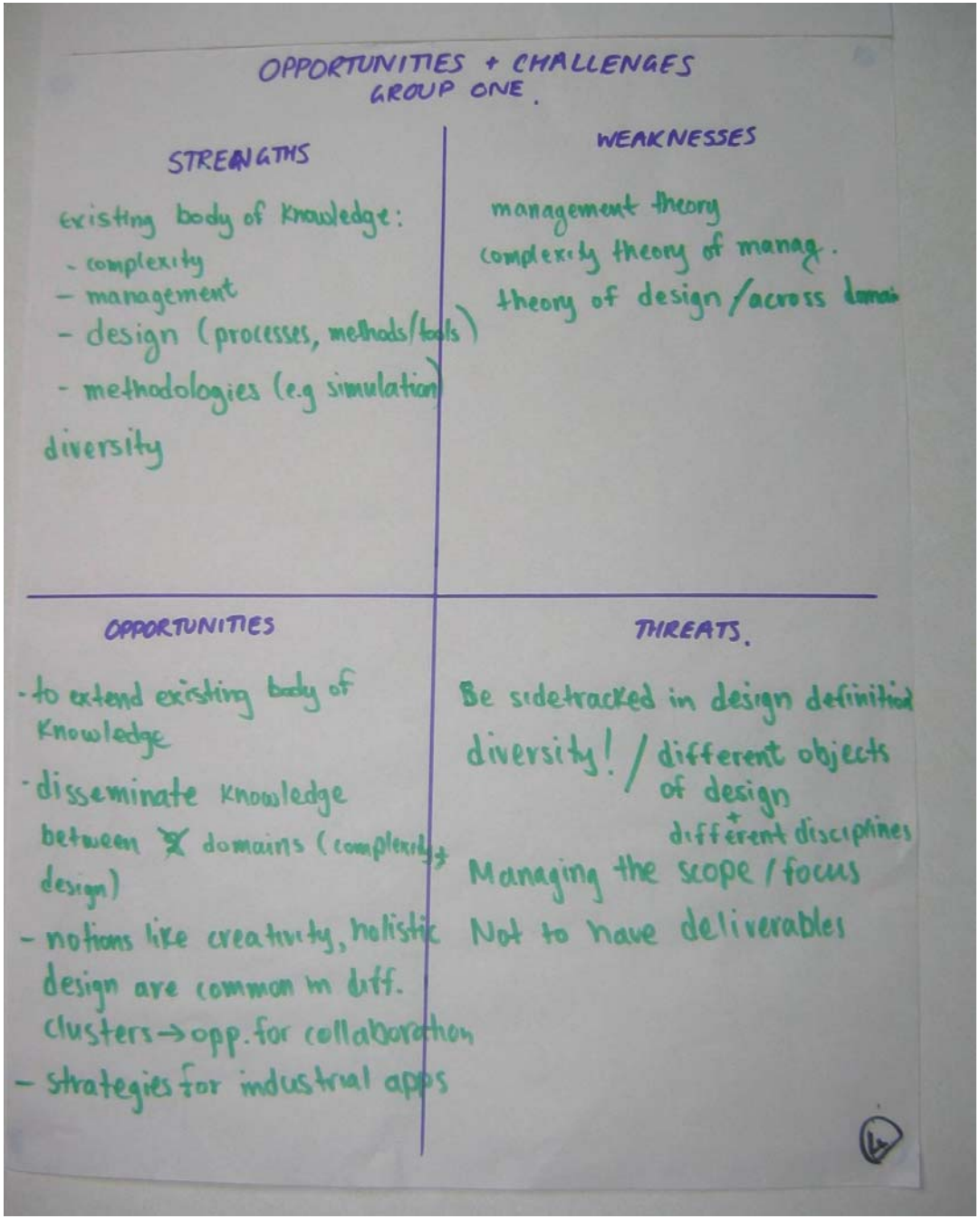
Coordination. understand relationships

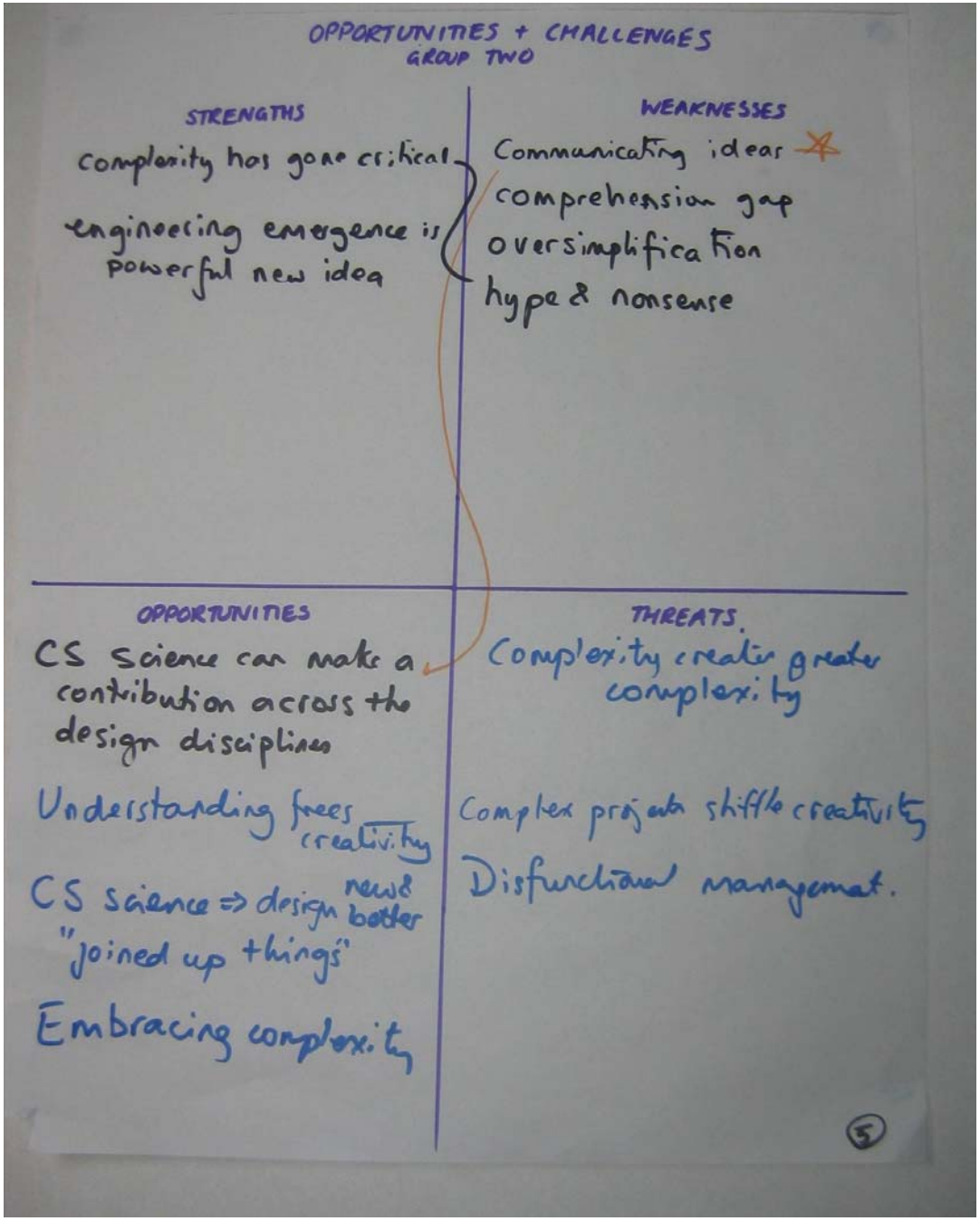
Theory(s) of management?

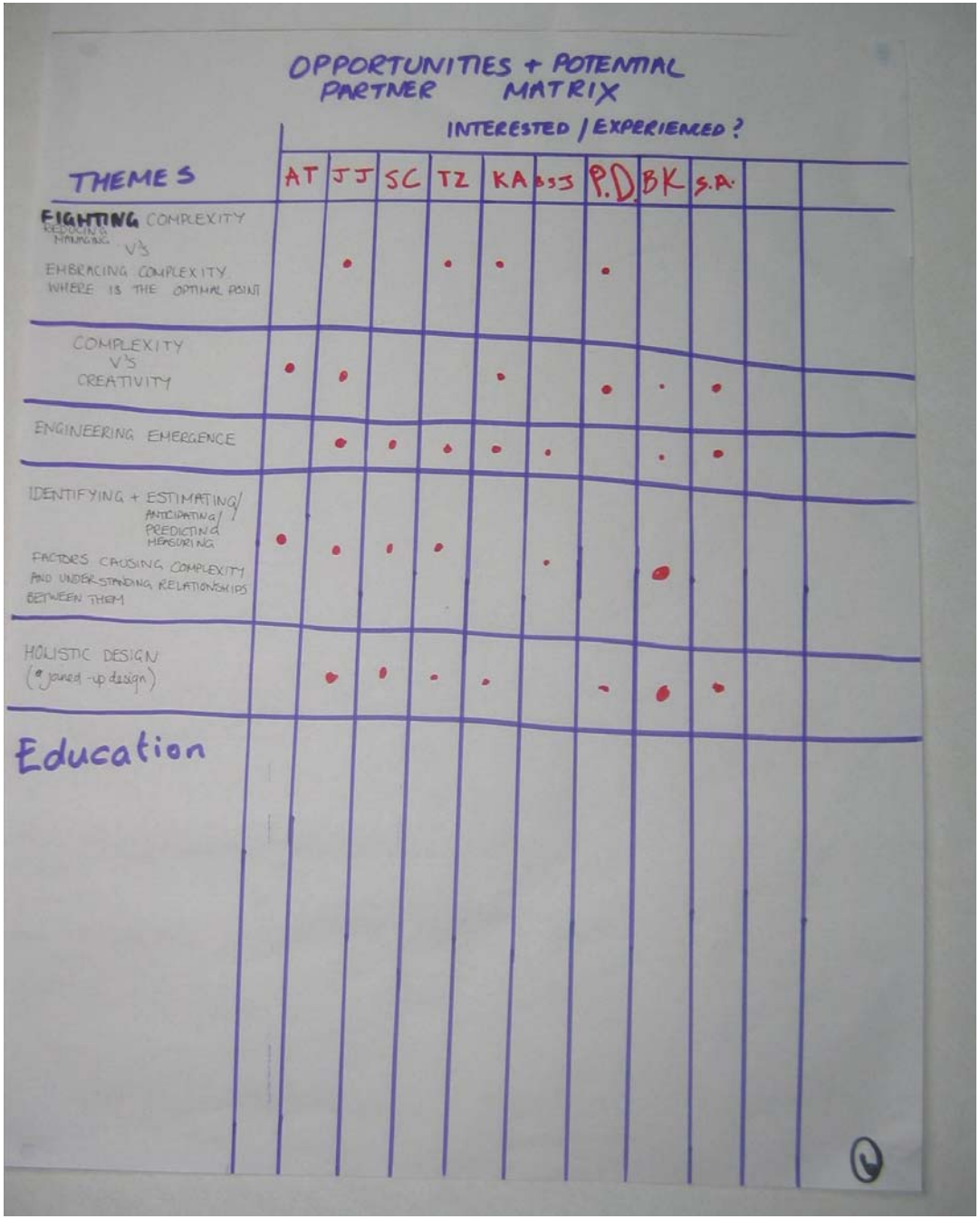
System Eng Life Cycle

KEY ISSUES + THEMES

- Fighting (reducing / managing) complexity v's embracing complexity. Where is optimal point?
- complexity v's creativity.
- ~~en~~ engineering emergence.
- identifying and estimating / (anticipating / predicting / measuring).
  ~~Comple~~ factors causing complexity.
  (relationships amongst)
  (comprehend relationships between individual elements.)
  - Holistic design. ← rather than designing elements.


OPPORTUNITIES + CHALLENGES
GROUP ONE.
STRENGTHS
existing body of knowledge:
- complexity
- management
- design (processes, methods/tools)
- methodologies (e.g simulation)
diversity
WEAKNESSES
management theory
complexity theory of manag.
theory of design / across doma
OPPORTUNITIES
- to extend existing body of knowledge
- disseminate knowledge between X domains (complexity + design)
- notions like creativity, holistic design are common in diff. clusters → opp. for collaboration
- strategies for industrial apps
THREATS.
Be sidetracked in design definition
diversity! / different objects of design
+
different disciplines
Managing the scope / focus
Not to have deliverables


OPPORTUNITIES + CHALLENGES
GROUP TWO
STRENGTHS
complexity has gone critical
engineering emergence is powerful new idea
WEAKNESSES
Communicating ideas
comprehension gap
oversimplification
hype & nonsense
OPPORTUNITIES
CS science can make a contribution across the design disciplines
Understanding frees creativity
CS science ⇒ design newS better
"joined up things"
Embracing complexity
THREATS
Complexity creates greater complexity
Complex projects stifle creativity
Disfunctional management.
5


OPPORTUNITIES + POTENTIAL PARTNER MATRIX
INTERESTED / EXPERIENCED?
THEMES
AT
JJ
SC
TZ
KA
BJJ
P.D
BK
S.A
FIGHTING COMPLEXITY
REDUCING & MANAGING
V'S
EMBRACING COMPLEXITY.
WHERE IS THE OPTIMAL POINT
COMPLEXITY V'S CREATIVITY
ENGINEERING EMERGENCE
IDENTIFYING + ESTIMATING/ ANTICIPATING/ PREDICTING & MEASURING
FACTORS CAUSING COMPLEXITY AND UNDERSTANDING RELATIONSHIPS BETWEEN THEM
HOLISTIC DESIGN (a joined-up design)
Education

KEY PRIORITIES + STRATEGY
GROUP 1

ENGINEERING EMERGENCE - HOLISTIC DESIGN.

emergence must be in multilevel systems.

bottom-up generation (eg shape grammars)

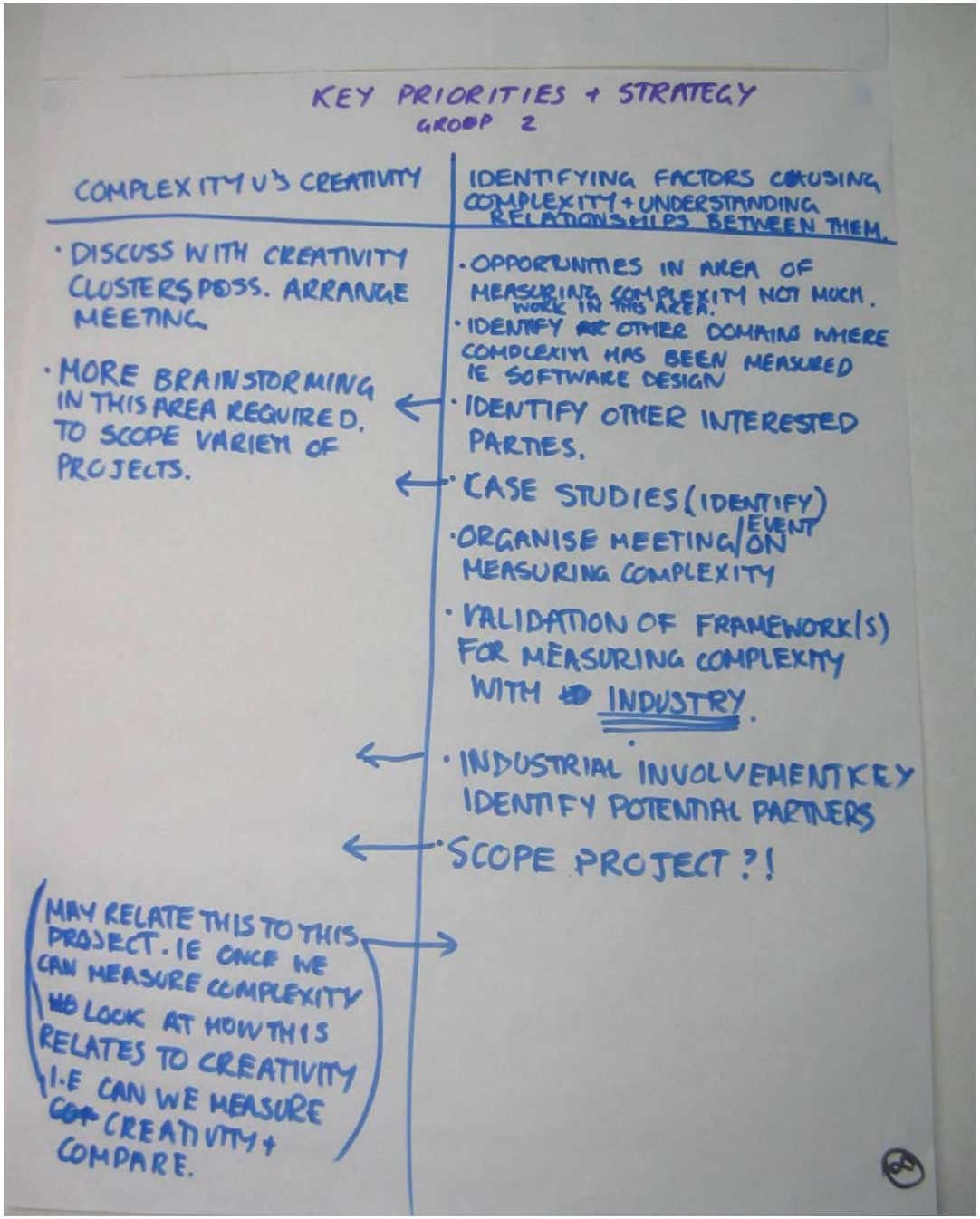
top-down, from properties to parts & assembly

automated reductionism (Pattern Recognition Cognition)

holism - system - environment boundary

Research should be in empirical context

Sufficiently complex to carry the theory


KEY PRIORITIES + STRATEGY
GROUP 2
COMPLEXITY V'S CREATIVITY
IDENTIFYING FACTORS CAUSING COMPLEXITY + UNDERSTANDING RELATIONSHIPS BETWEEN THEM.
• DISCUSS WITH CREATIVITY CLUSTERS POSS. ARRANGE MEETING.
• MORE BRAINSTORMING IN THIS AREA REQUIRED. TO SCOPE VARIETY OF PROJECTS.
• OPPORTUNITIES IN AREA OF MEASURING COMPLEXITY NOT MUCH. WORK IN THIS AREA.
• IDENTIFY ARE OTHER DOMAINS WHERE COMPLEXITY HAS BEEN MEASURED IE SOFTWARE DESIGN
• IDENTIFY OTHER INTERESTED PARTIES.
• CASE STUDIES (IDENTIFY)
• ORGANISE MEETING/EVENT ON MEASURING COMPLEXITY
• VALIDATION OF FRAMEWORK(S) FOR MEASURING COMPLEXITY WITH INDUSTRY.
• INDUSTRIAL INVOLVEMENT KEY IDENTIFY POTENTIAL PARTNERS
• SCOPE PROJECT ?!
MAY RELATE THIS TO THIS PROJECT. IE ONCE WE CAN MEASURE COMPLEXITY WE LOOK AT HOW THIS RELATES TO CREATIVITY I.E CAN WE MEASURE CREATIVITY + COMPARE.