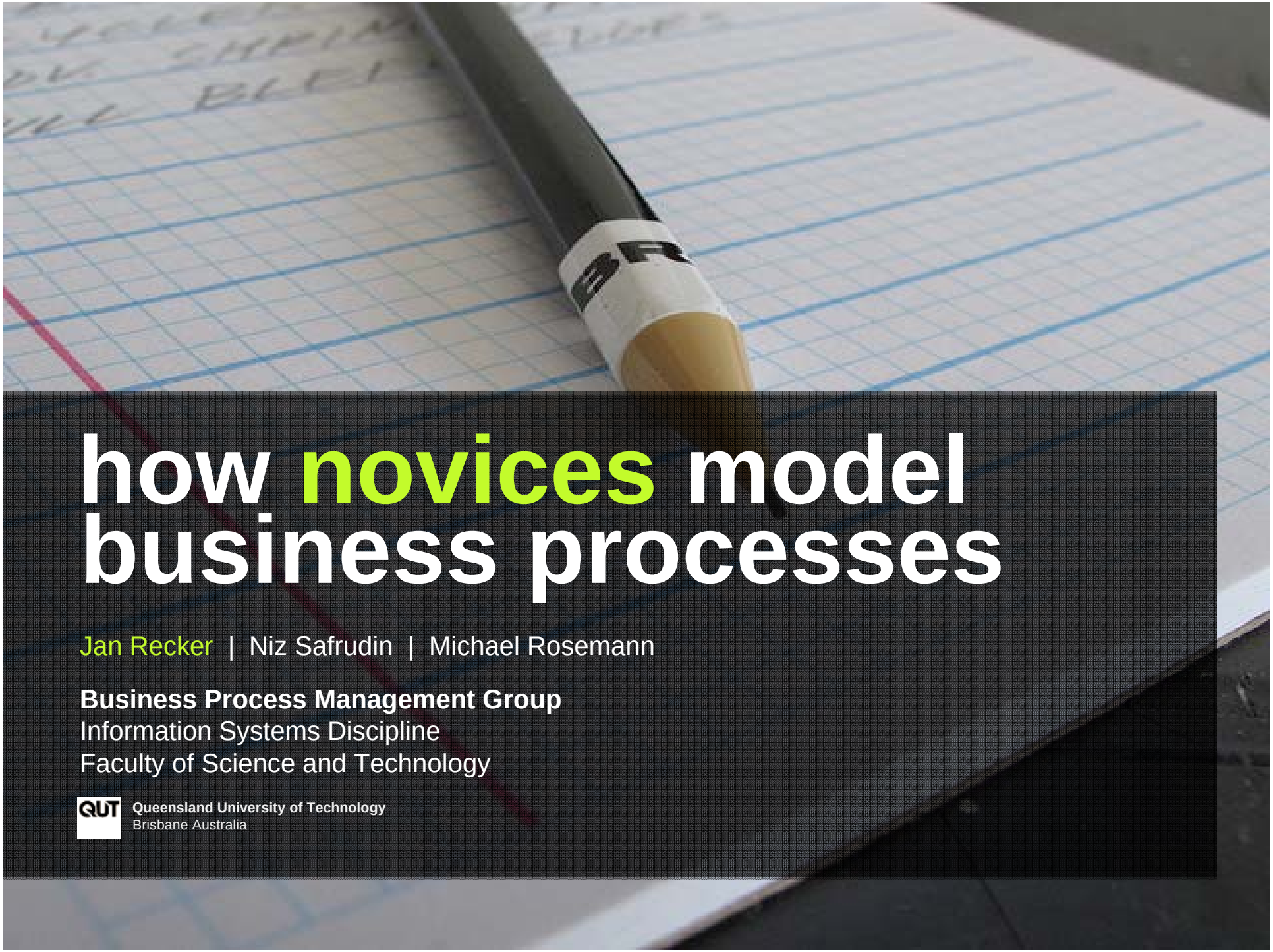


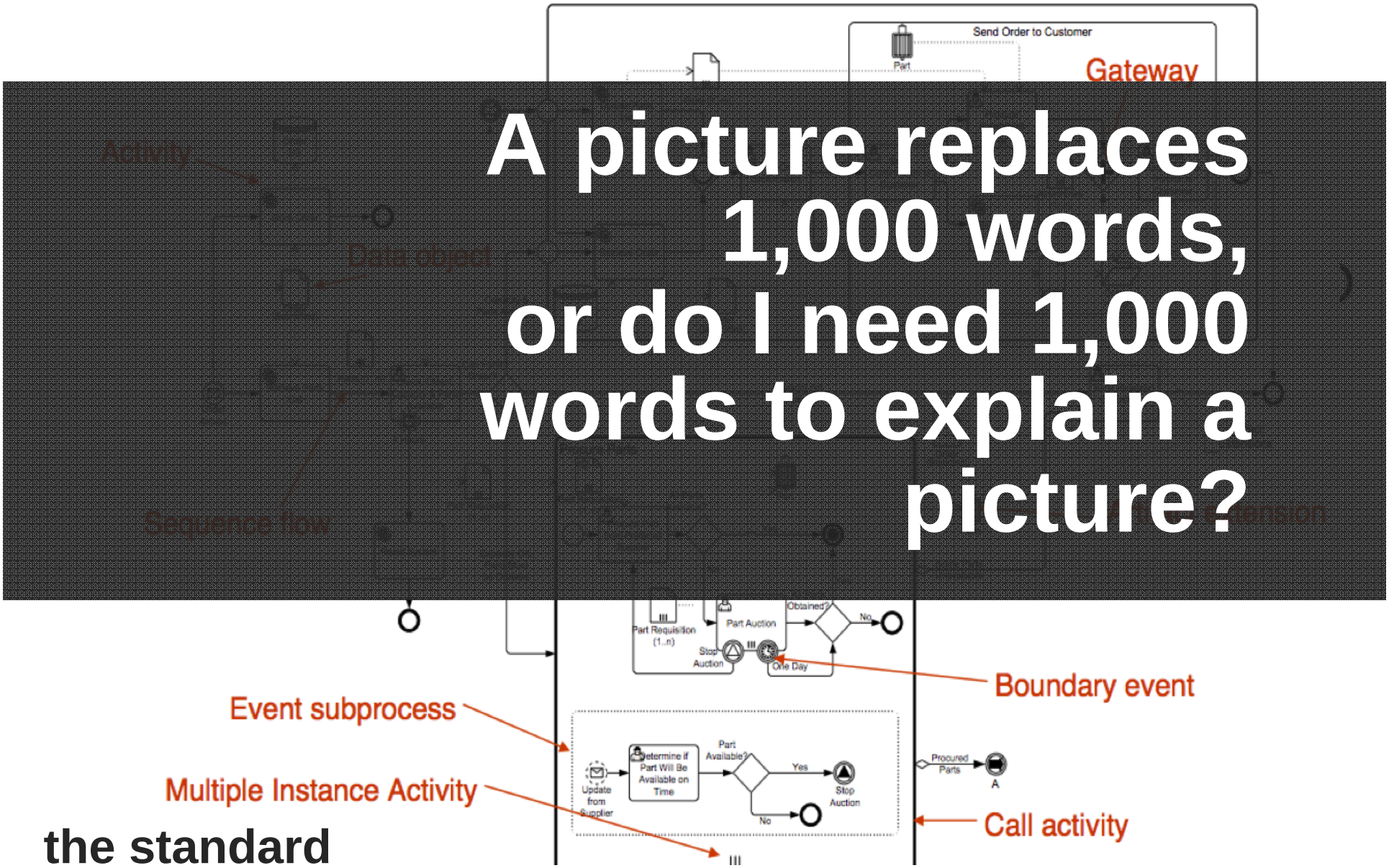
how novices model business processes

Jan Recker | Niz Safrudin | Michael Rosemann

Business Process Management Group
Information Systems Discipline
Faculty of Science and Technology

Queensland University of Technology
Brisbane Australia

A picture replaces 1,000 words, or do I need 1,000 words to explain a picture?



the standard

BPMN 2.0

Voelzer (2009)

OUR INTERPRETATION OF THE PROBLEM

We tend to force users to think like process modelers,

when process modelers should think like users.

THE RESEARCH QUESTIONS
THE RESEARCH MODEL
METHOD & FINDINGS
DISCUSSION OF RESULTS

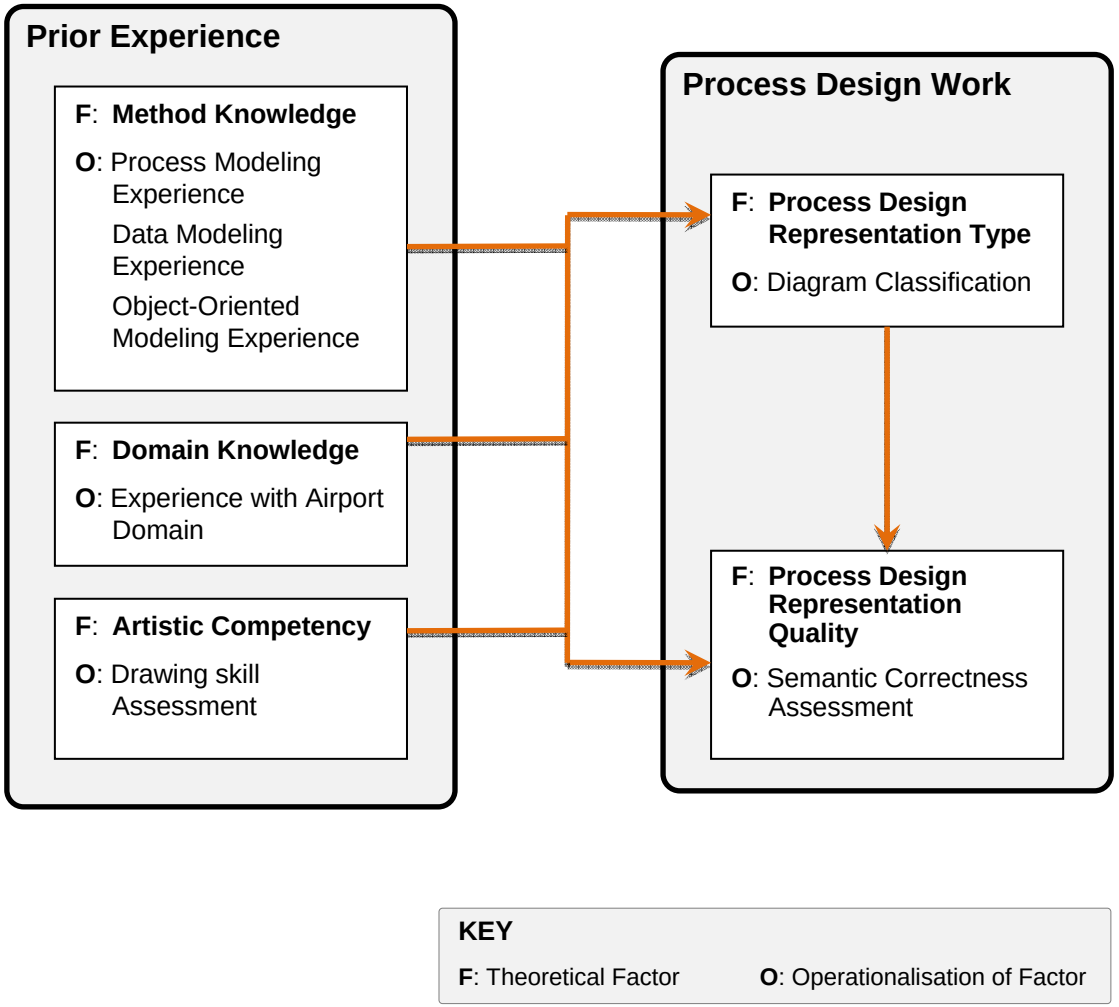
AGENDA TODAY

Research Questions

RQ1 How do novice analysts carry out business process modeling *when uninformed* of formal modeling method(s)?

RQ2 How ‘good’ are the different types of process designs in *representing important business elements* of a particular process scenario?

Our Research Model



Data Collection

QUASI-EXPERIMENT

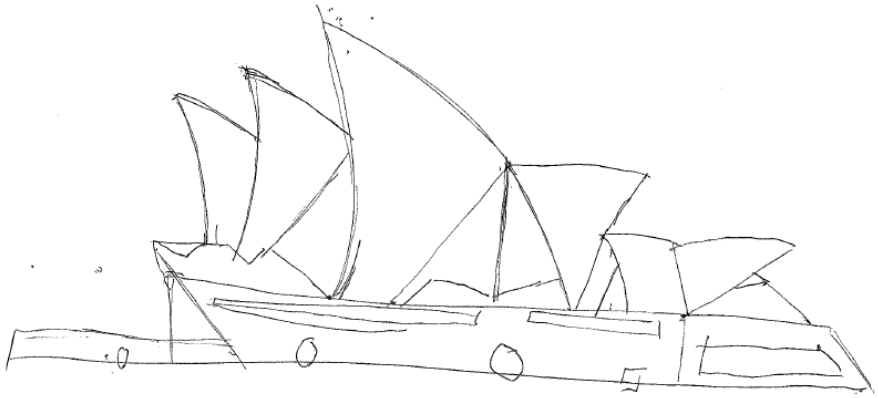
Part 1: Demographics Survey

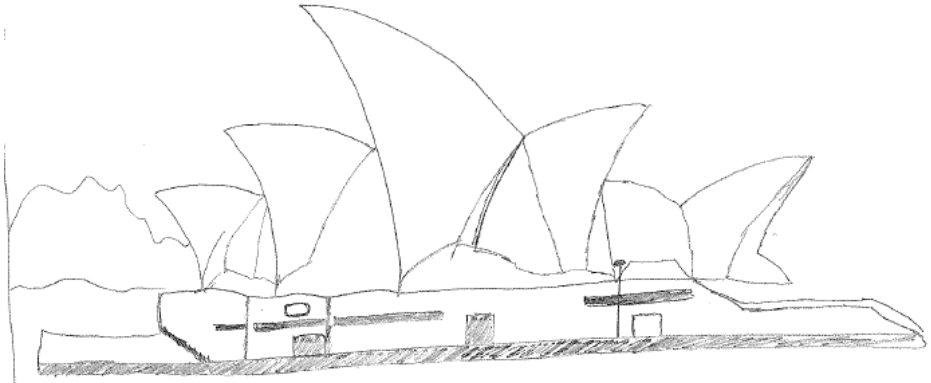
- **Method Knowledge**
  - Object Modeling
  - Data Modeling
  - Process Modeling
- **Domain Knowledge**
  - Airport Experience

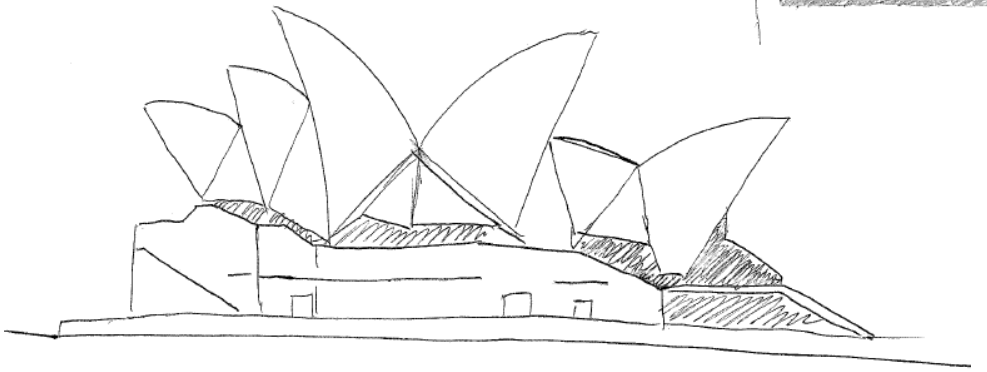
Data Collection

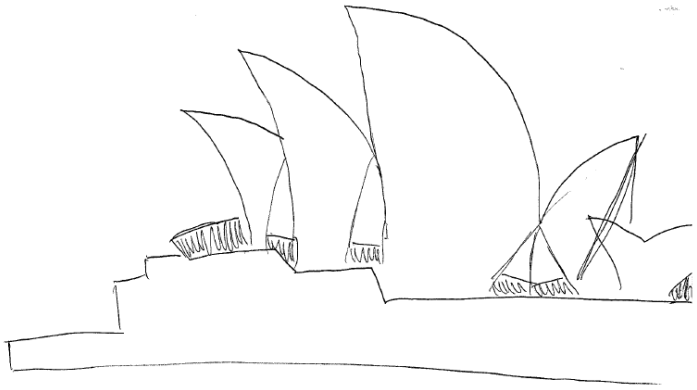
QUASI-EXPERIMENT

Part 2: Drawing Skills







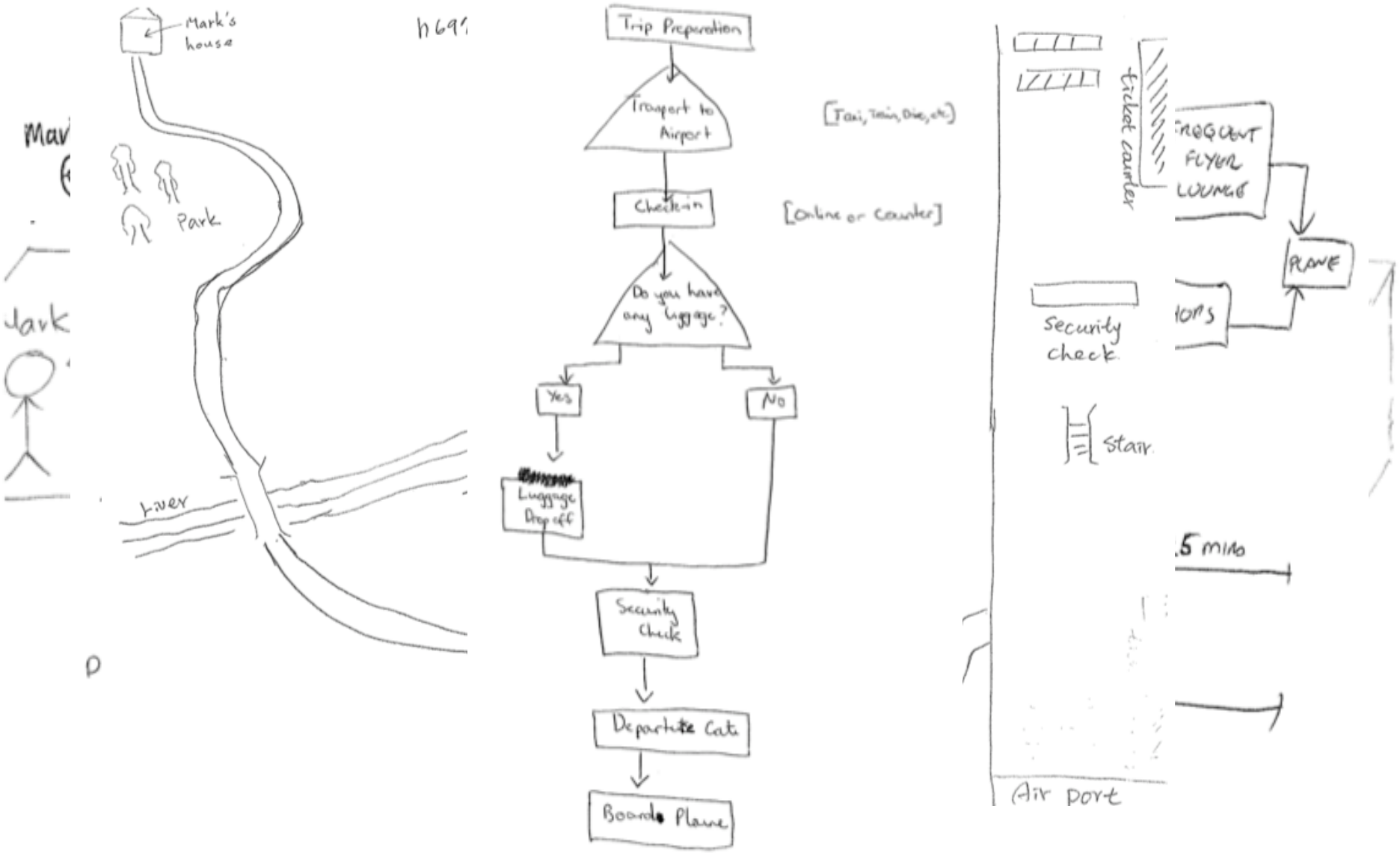


Data Collection

QUASI-EXPERIMENT

Part 3: Solving a modeling problem

Mark is going on a trip to Sydney. He decides to **call a taxi** from home to the airport. The **taxi arrives** after 10 minutes, and takes half an hour for the 20 kilometers to the airport. At the airport, Mark uses the **online check-in counter** and **receives his boarding pass**. Of course, he could have also used the ticket counter. He does not have to check-in any luggage, and so he proceeds straight to the **security check**, which is 100 meters down the hall on the right. The queue here is short and after 5 minutes he walks up to the level with the **departure gates**. Mark decides not to go to the Frequent Flyer lounge and instead **walks up and down the shops** for 15 minutes and **buys a newspaper** before he **returns to the gate**. After ten minutes waiting, he **boards the plane**.



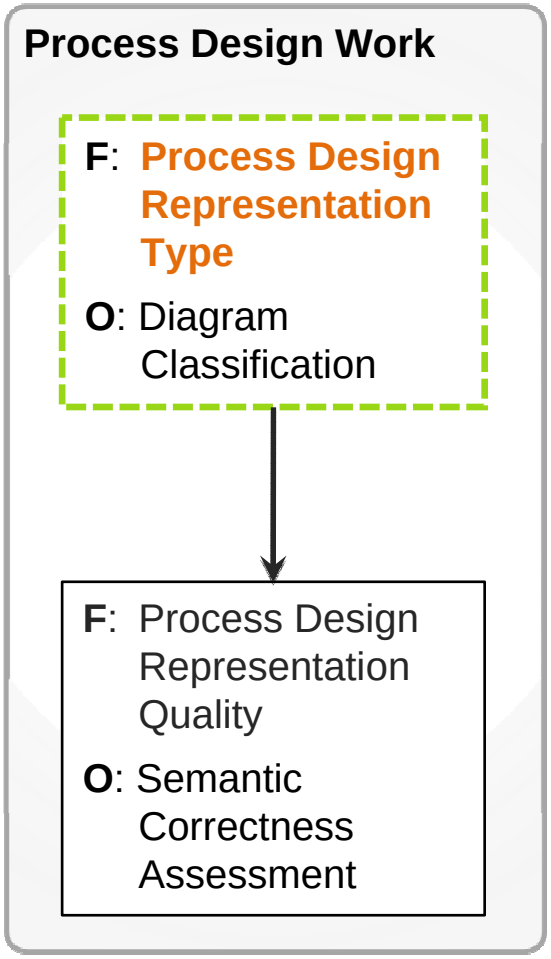
HOW NOVICES MODEL BUSINESS PROCESSES

... for instance

Coding and Analysis

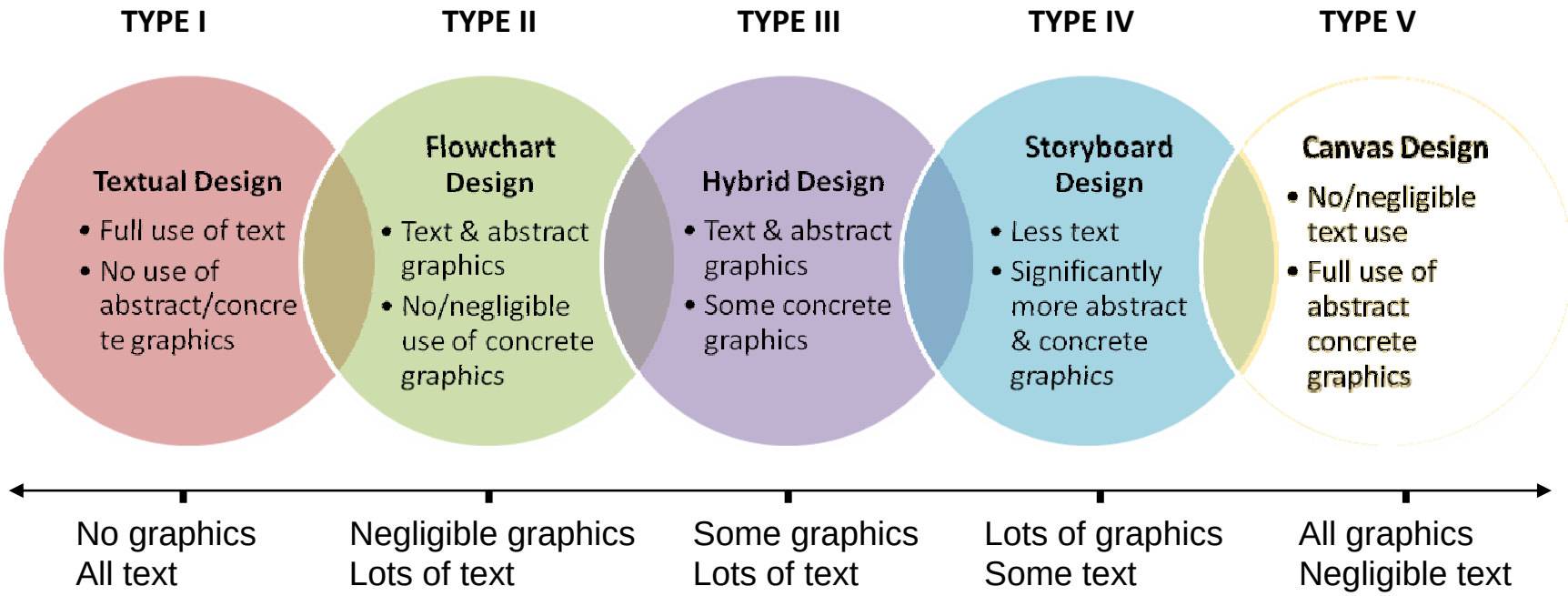
Process Design Type [DT]

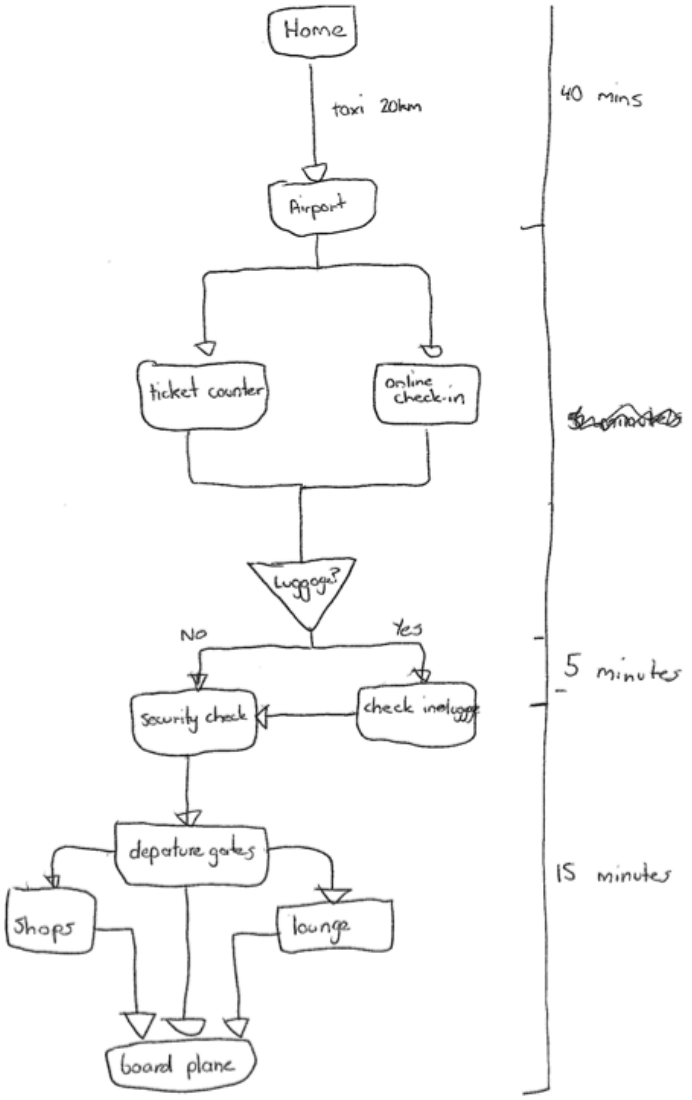
- Iterative multi-coder approach
- Classifying diagrams per:
  - Graphical constructs
  - Textual information
  - Control flow



Research Findings

The 5 Types of Design

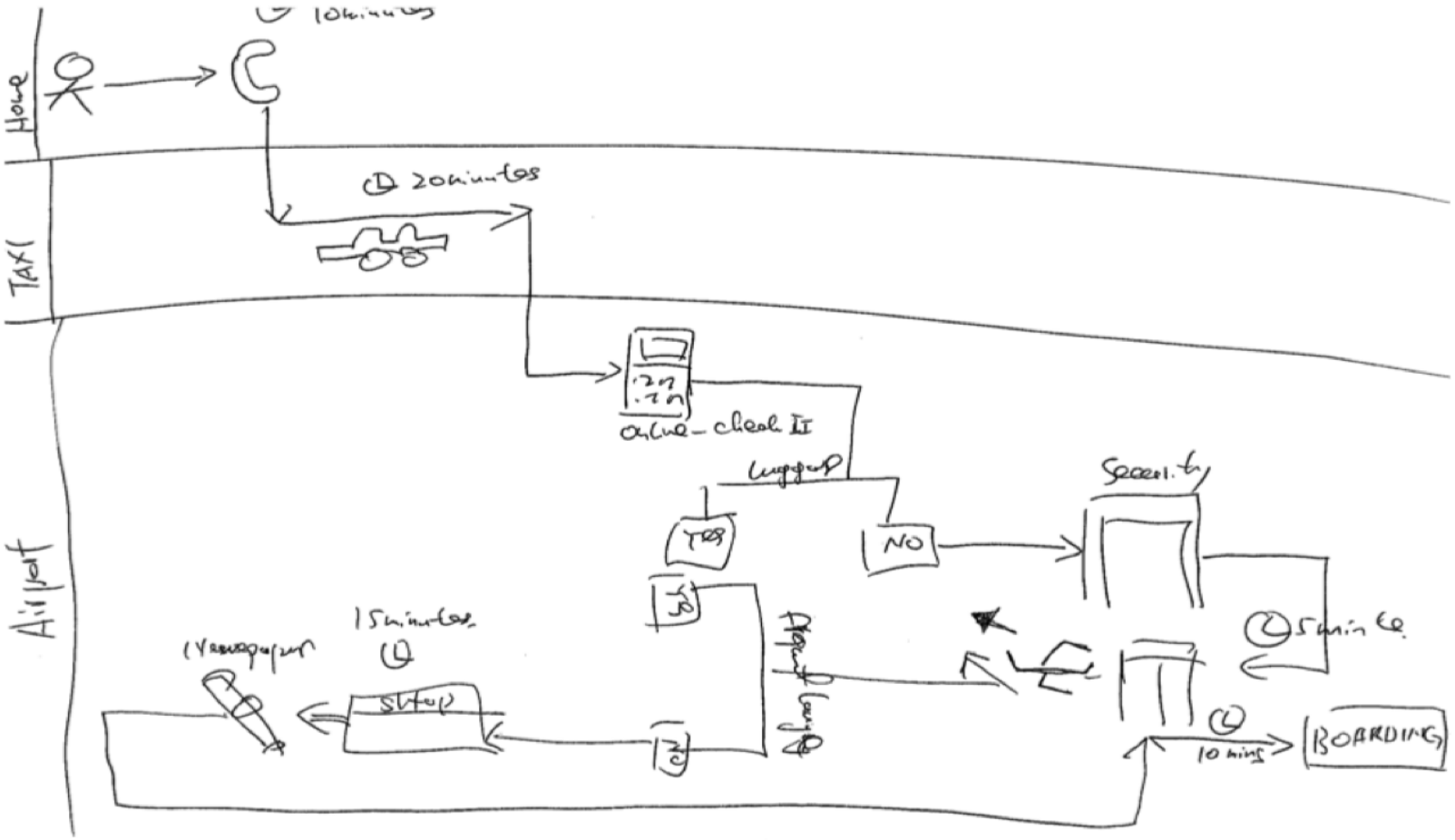




No. of Diagram **54 / 75**

Percentage of Students **72%**

DT2 Flowchart Design



No. of Diagram 6 / 75
Percentage of Students 8%

DT3 Hybrid Design

No. of Diagram **11 / 75**
Percentage of Students **14%**

DT4 Storyboard Design

Research Findings

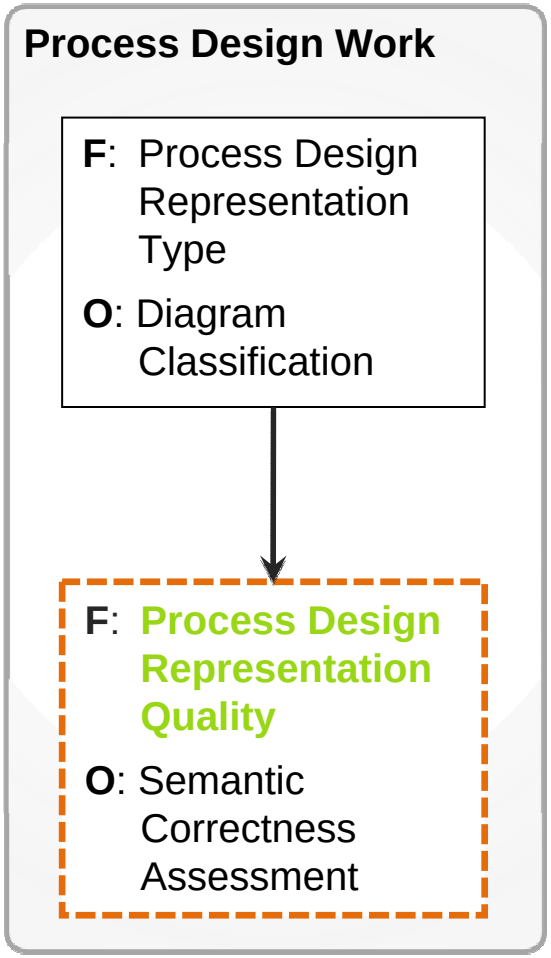
Predicting the chosen Process Design Type [DT]

- DT2 (Flowchart Design):
  - PDK a significant predictor (Beta = 1.47, p = 0.04)
- DT4 (Storyboard Design):
  - OMK a significant negative predictor (Beta = -3.62, p = 0.01)

Coding and Analysis

Process Design Quality [DQ]

- Multi-coder approach
- Semantic Correctness
  - based on (Yang et al., 2005; Mendling et al., 2009; Nickerson et al., 2008)
- Representation of:
  - Activities
  - States
  - Events
  - Business Rule
  - Temporal Information
  - Geospatial Information



Research Findings

Predicting the Process Design Quality [DQ]

- ANOVA Analysis
  - DT a significant predictor (F = 12.46, p = 0.00)
  - PDK a significant predictor (F = 9.57, p = 0.01)

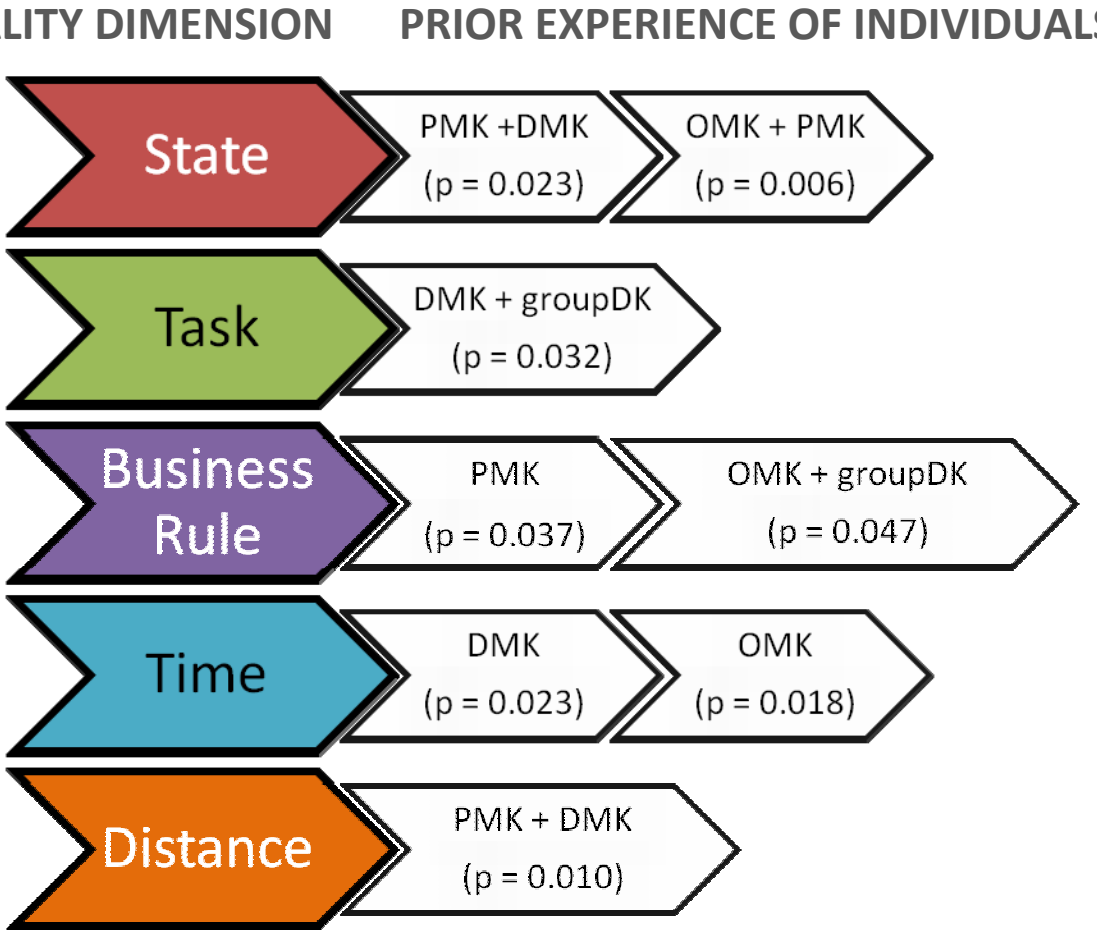
Research Findings

Predicting the Process Design Quality [DQ]

DT with highest *mean* results	State	Task	Event	Business Rules	Time	Distance
DT1	5.00	5.00	1.00	4.00	4.00	5.00
DT2	**2.98***	**3.81***	**2.81***	**4.06**	**3.15 ***	3.07
DT3	2.50	3.00	1.33	3.17	3.00	3.67
DT4	2.73	2.82	1.27	3.09	2.91	**3.73***
DT5	1.00	1.00	1.00	1.00	1.00	1.00

Multivariate ANOVA Selected Results

Research Findings



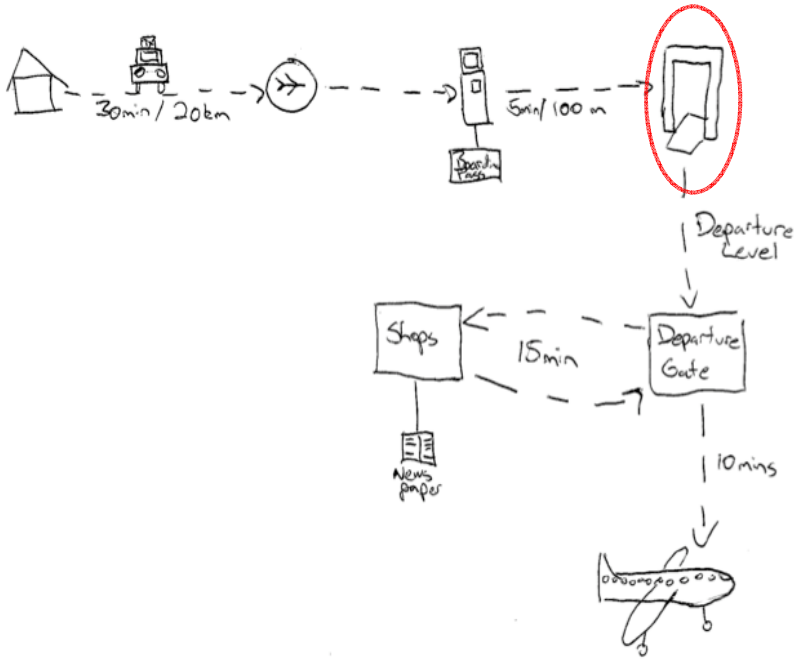
MANOVA Significant Results of Prior Experience

Qualitative Analysis

“Dual Coding Theory”

Paivio (1990) Effective conveyance of information

- Interdependency – text and graphics

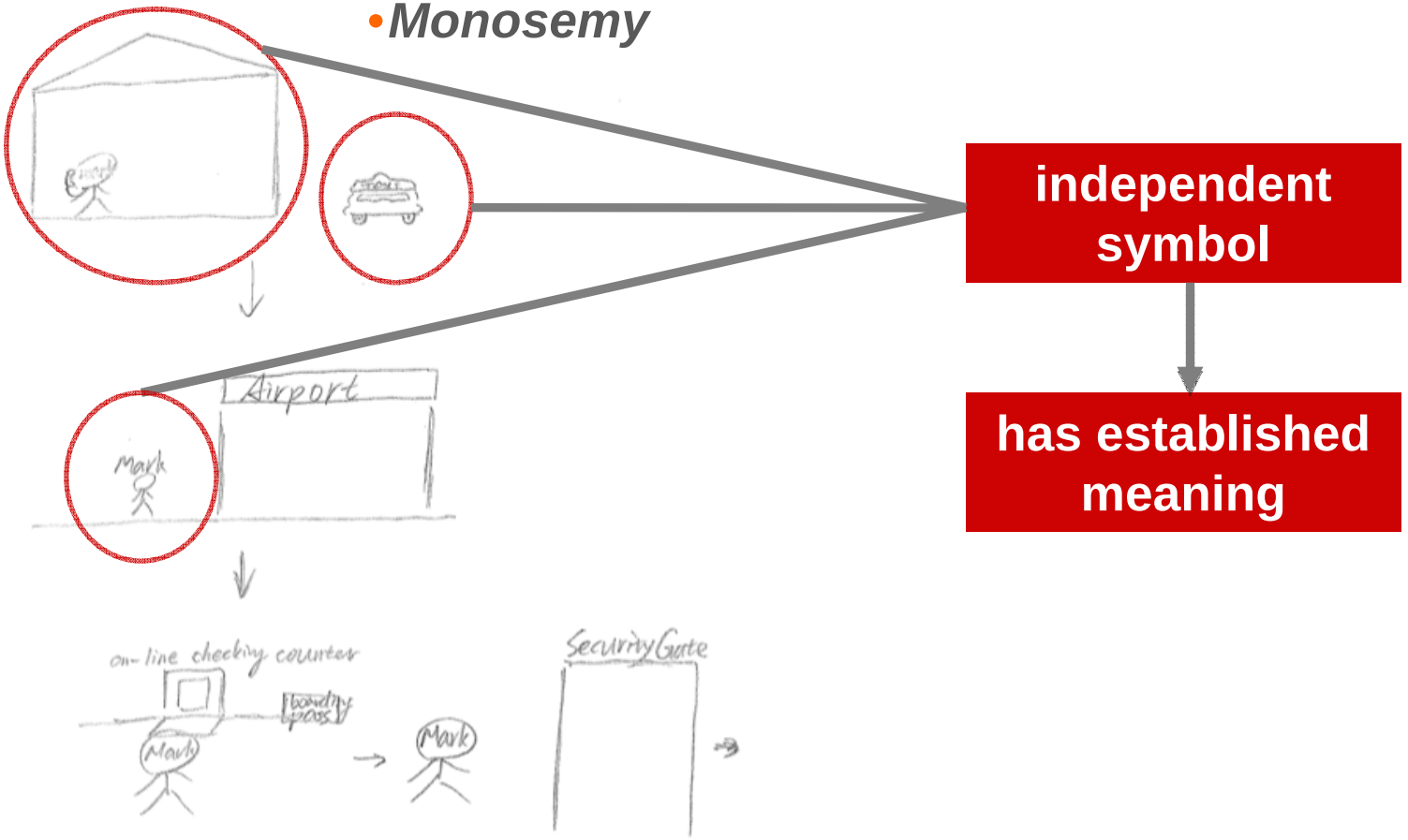


Qualitative Analysis

“Physics of Notation”

Moody (2009) Theory of effective visual notations

- ***Monosemy***



independent symbol

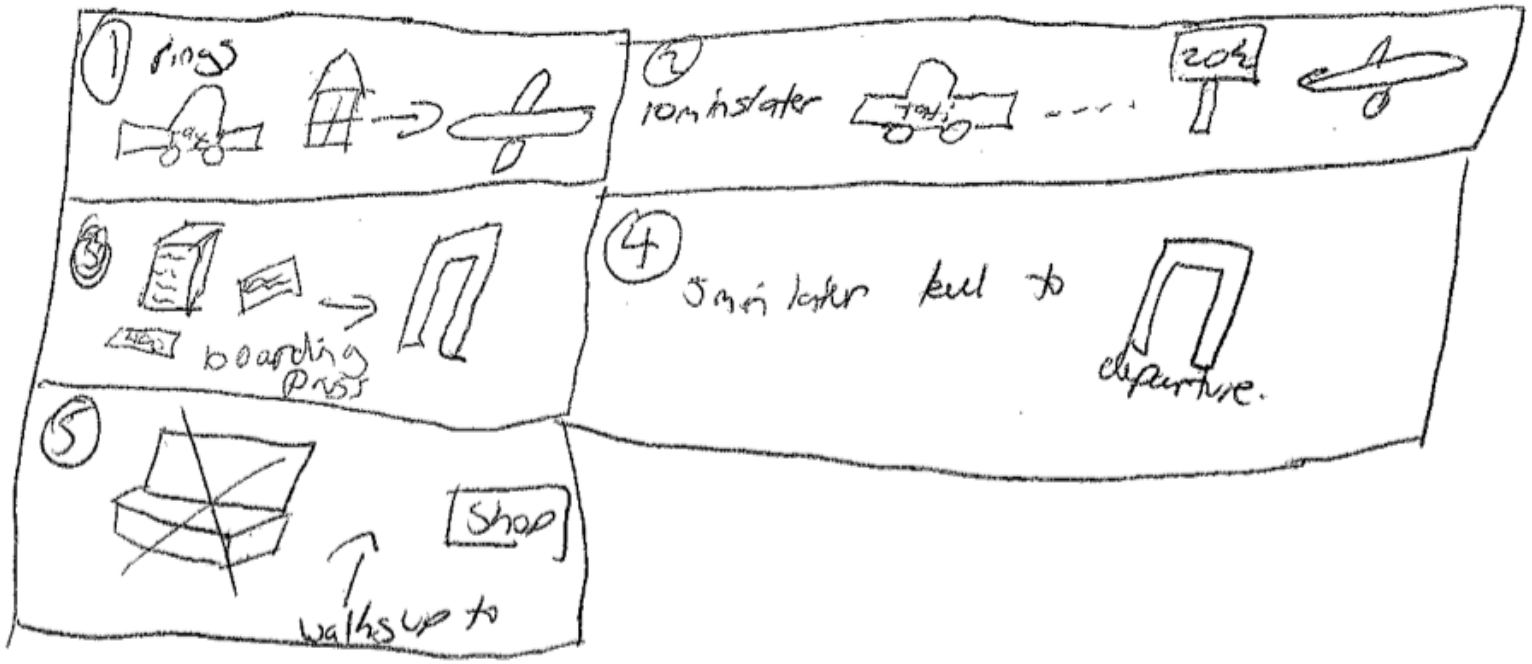
has established meaning

Qualitative Analysis

“Spatial Contiguity”

Mayer & Moreno (2003) Inclusion of text and graphics

- Rather than segregation

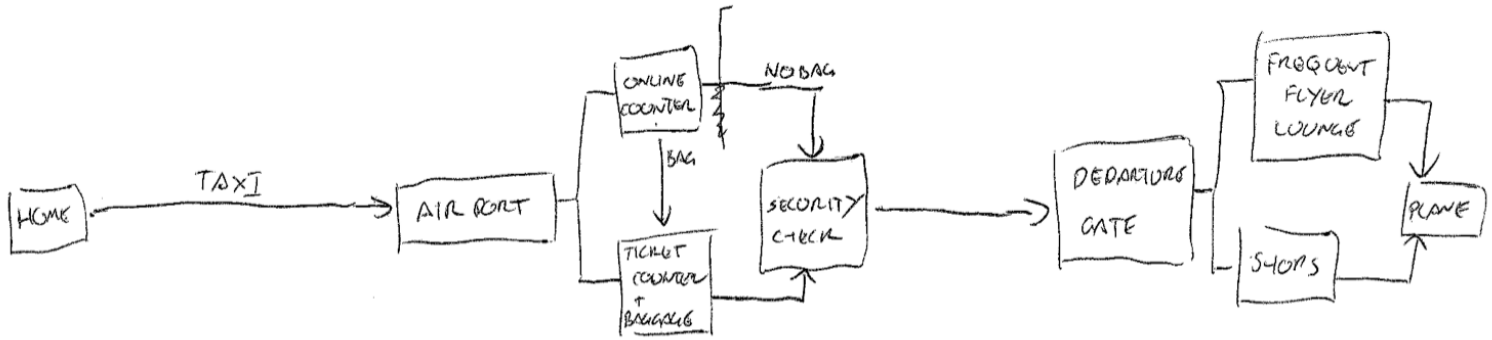


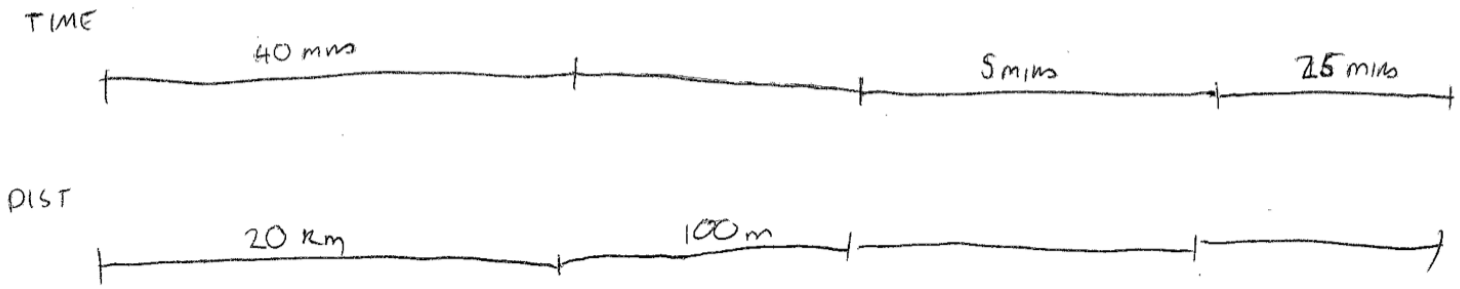
Qualitative Analysis

“Temporal Information”

Boroditsky (2000) DT2 Flowcharts

- Textual captions within abstract shapes



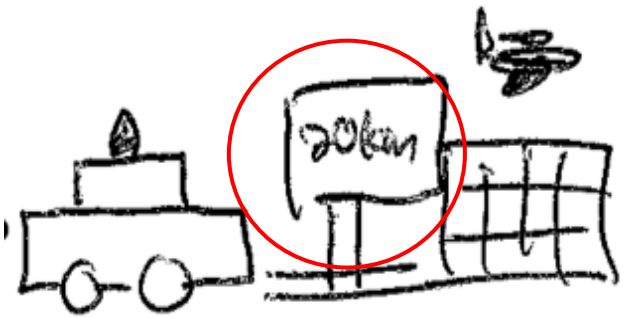


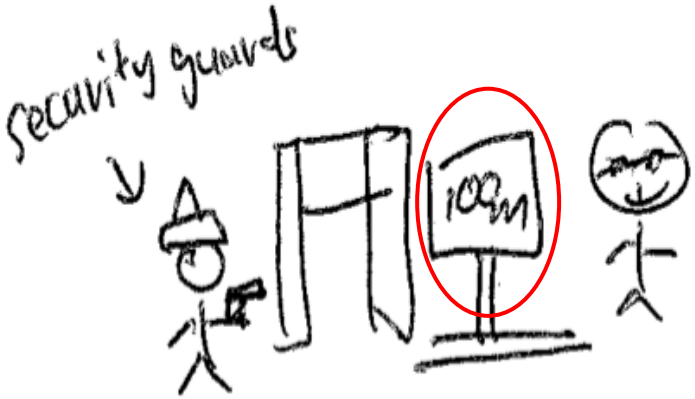
Qualitative Analysis

“Geospatial Information”

DT4 Storyboards

- Notable: Effective and intuitive representation





Discussion

RESEARCH LIMITATIONS

- **Students** as novice analysts
- **Inter-Subjectivity** in coding
- Drawing, **not designing**, skill assessment
- Explanatory **power** of statistics
- Coding by professional modeler

Conclusions

Implications

- ✓ **ACADEMIC CURRICULUM**
  - Introduce Business Process Modeling informally
  - General teaching practice
- ✓ **INDUSTRY PRACTICE**
  - Communication amongst uninformed stakeholders
  - Leverage intuitive articulations in process (re-) design initiatives
- ✓ **RESEARCH**
  - How can creative problem-solving (for process innovation) be supported through process models?


THANK
YOU

Contact Us

Jan Recker, Niz Safrudin,Michael Rosemann

Business Process Management Group
Queensland University of Technology
126 Margaret Street
Brisbane QLD 4000 Australia

e {j.recker; norizan.safrudin; m.rosemann}@qut.edu.au
t janrecker, nizzsafrudin, ismiro
w http://www.bpm.fit.qut.edu.au