Grounded Theory

A/Prof Rashina Hoda

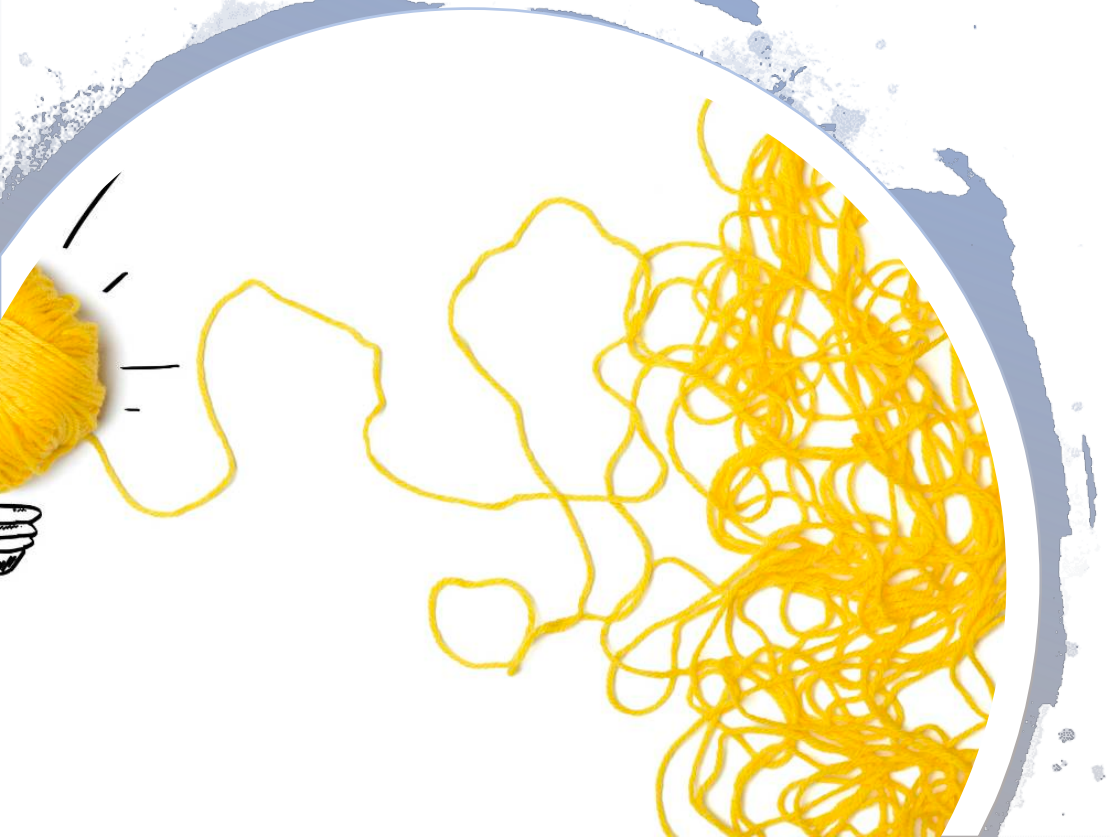
@agileRashina
www.rashina.com

Why Research Methods?

- Systematic approach to conducting research
- Map, tools, guidelines, tips, tricks
- Journey your own - unique

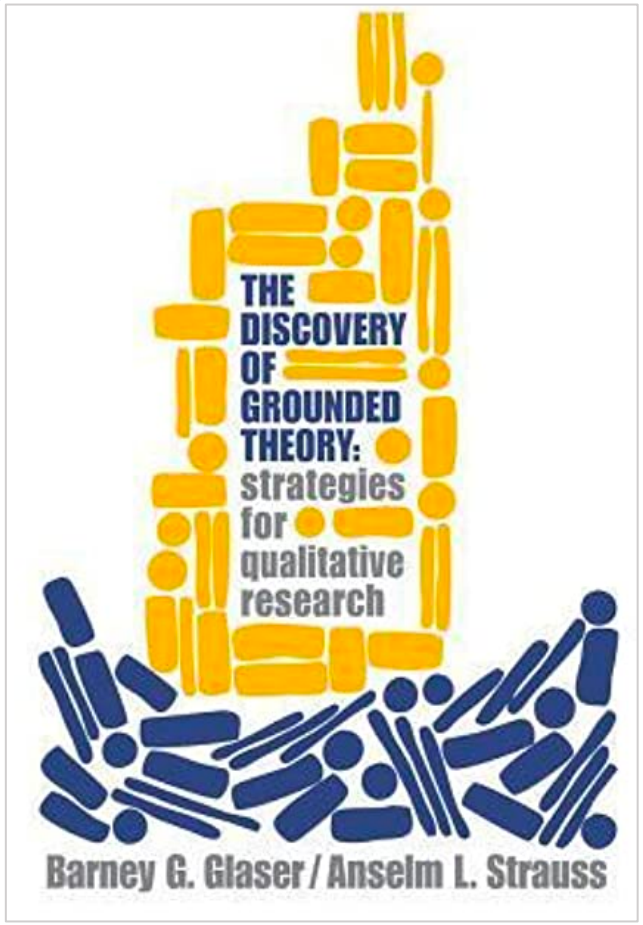
Tools for the Job…

- Action Research
- Case Study
- Ethnography
- Experiments
- Survey Research
- Grounded Theory
- …



Why Grounded Theory?

- Generate new theory!
- Study real-world problems
- Address *grand challenge* of SE research – combining practical relevance & theoretical robustness

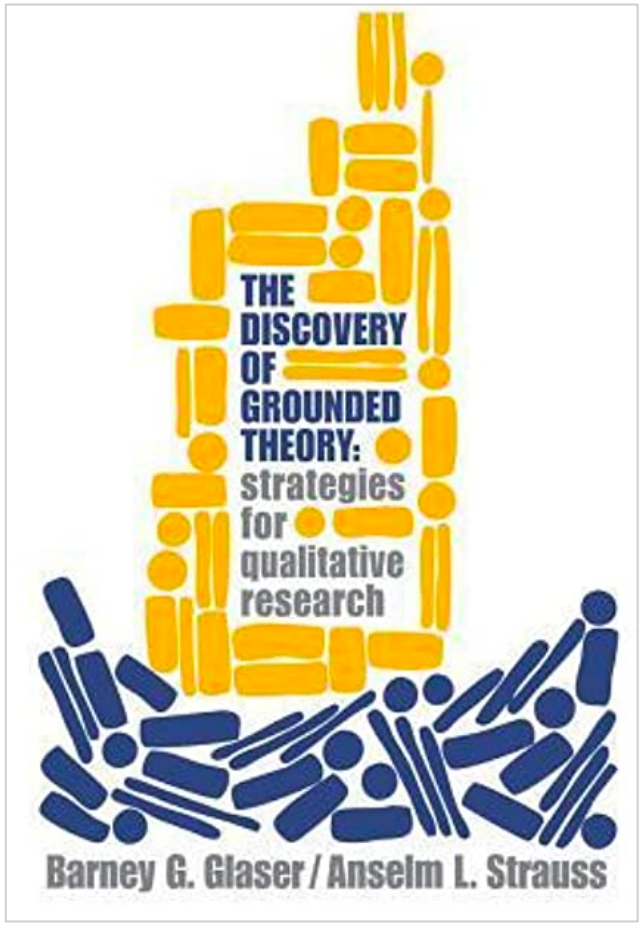


GT - Origins

- "Discovery of Grounded Theory" 1967
- Barney Glaser & Anslem Strauss
- Sociological research method to study social phenomenon

Grounded, in practical evidence

Theory, resulting outcome, relationships between key patterns, typically explains *how* and *why* of phenomenon studied



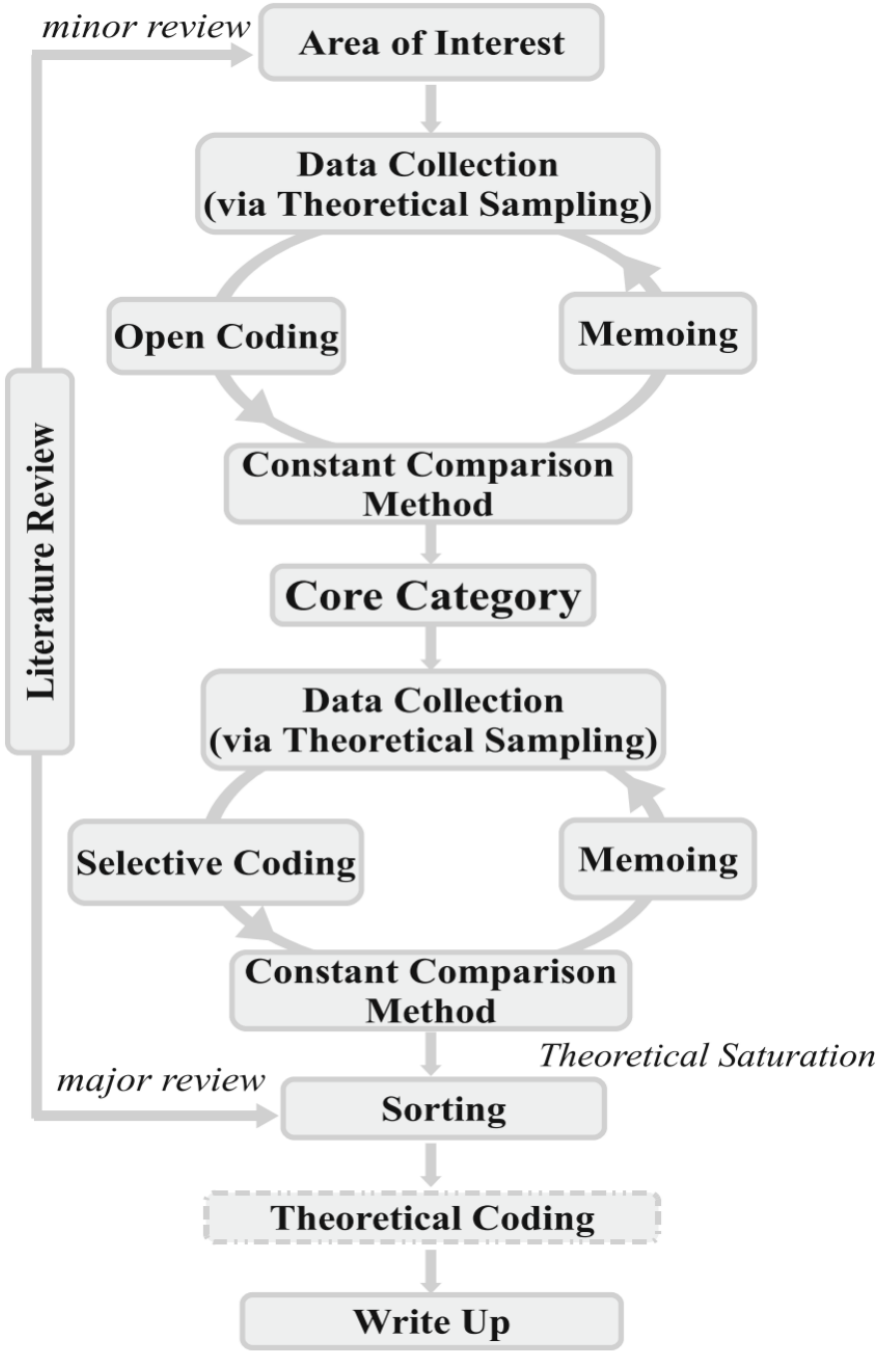
GT – Origins

- Challenged the status quo – positivist quantitative research, hypothetico-deductive approach
- Highlighted importance of theory development over verification
- Restored importance of qualitative research – systematic & rigorous procedures

GT – the Method

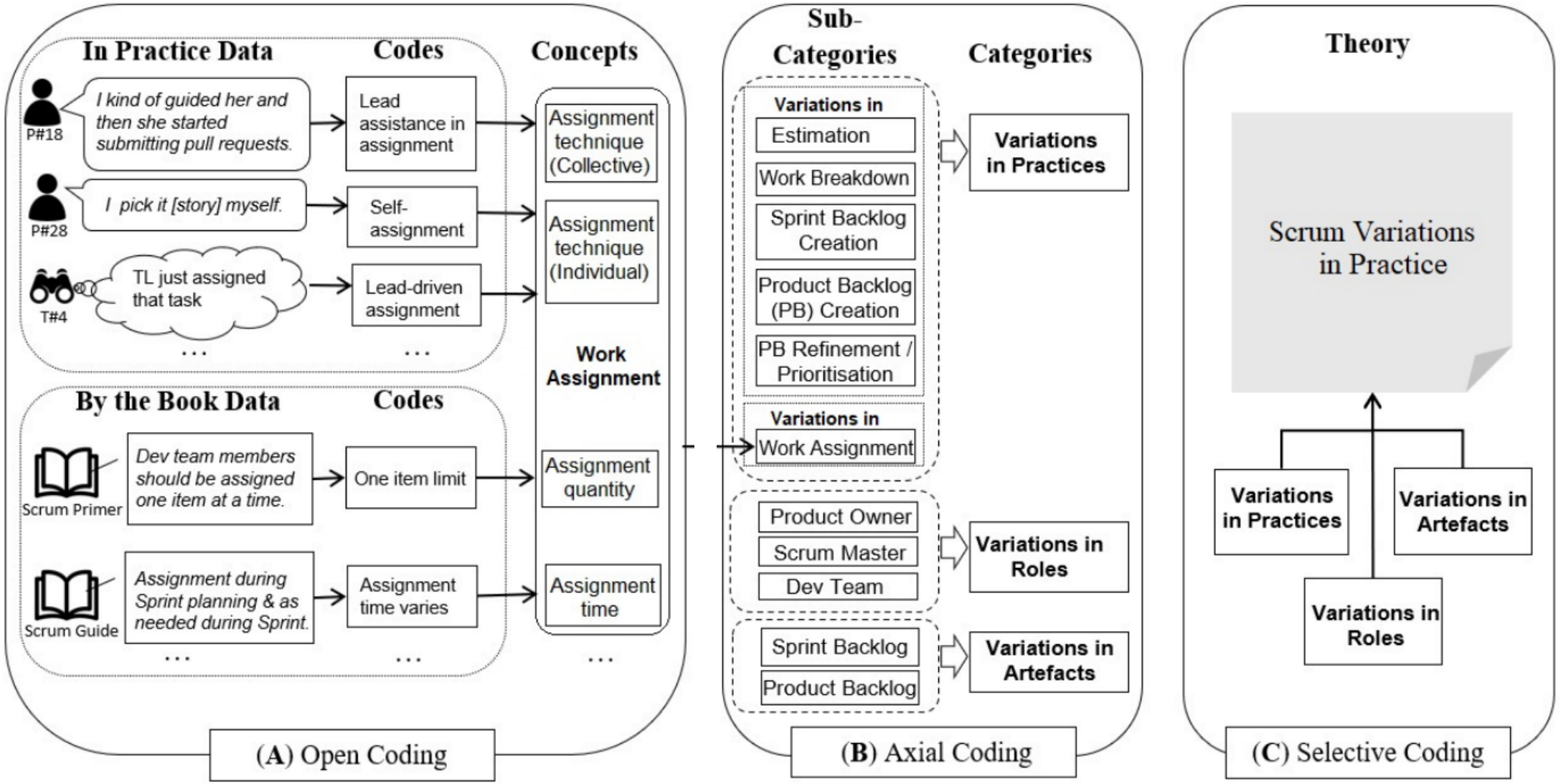
- Iterative and interleaved data collection and analysis
- Inductive, bottom-up approach (from evidence to theory)
- Increasing levels of abstraction
- Data analysis procedures
  - Open coding
  - Constant comparison
  - Selective coding
  - Theoretical coding (optional)
- Memoing
- Theoretical sampling, sensitivity, sorting, saturation

GT – the Method*



***Classic GT Method with some adaptations from:** Hoda et al., Developing a grounded theory to explain the practices of self-organizing Agile teams, Empirical Software Engineering, 2011*

Example – Coding*



***Strauss-Corbinian GT Coding from:** Masood, Z., Hoda, R. & Blincoe, K. (2020), **Real World Scrum A Grounded Theory of Variations in Practice**, IEEE Transactions on Software Engineering.* [Preprint]

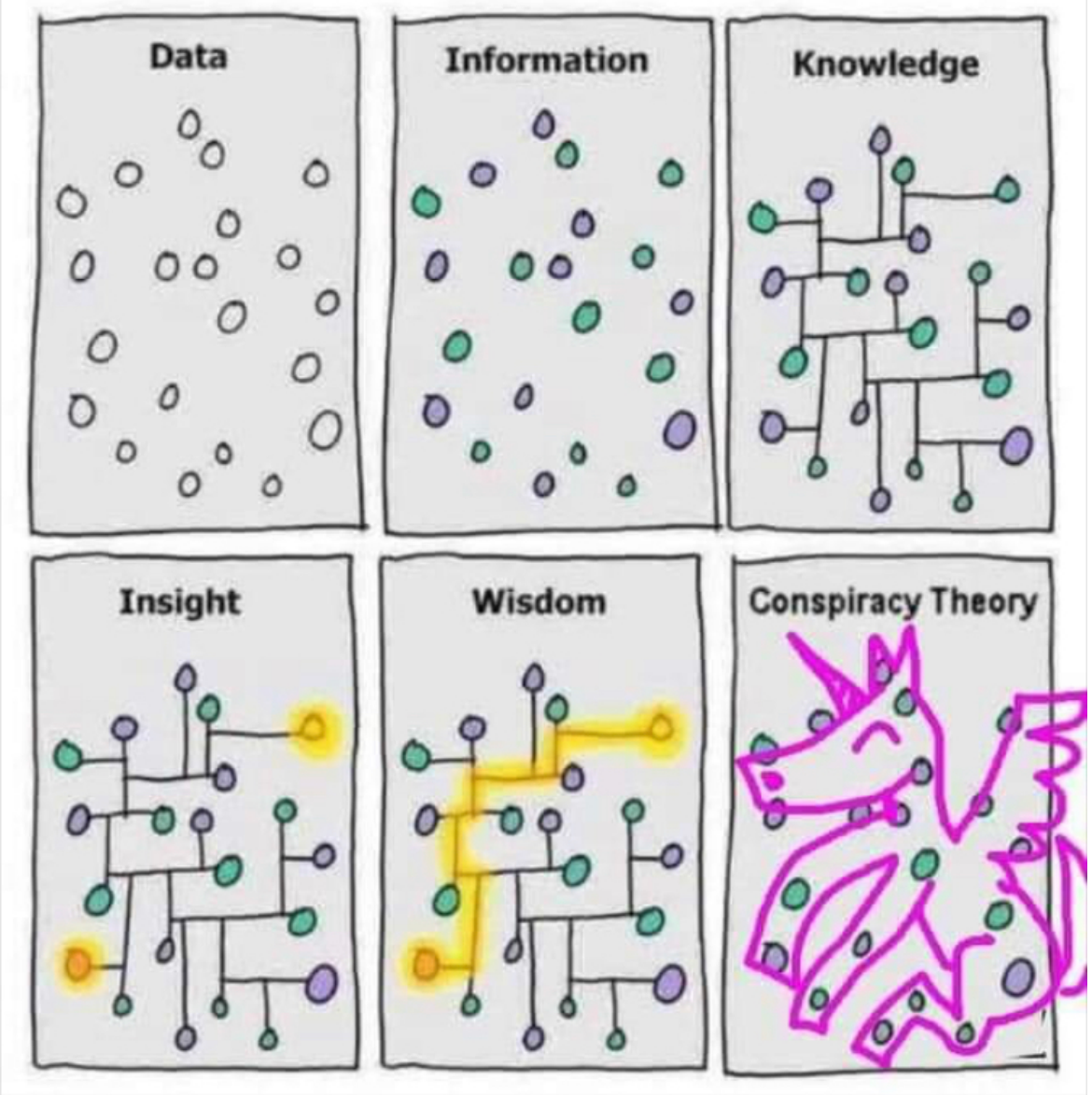
GT – the Outcome

- A theory!*
- Explanatory and likely predictive

Outcome also called a **grounded theory! Method named grounded theory method (GTM)*

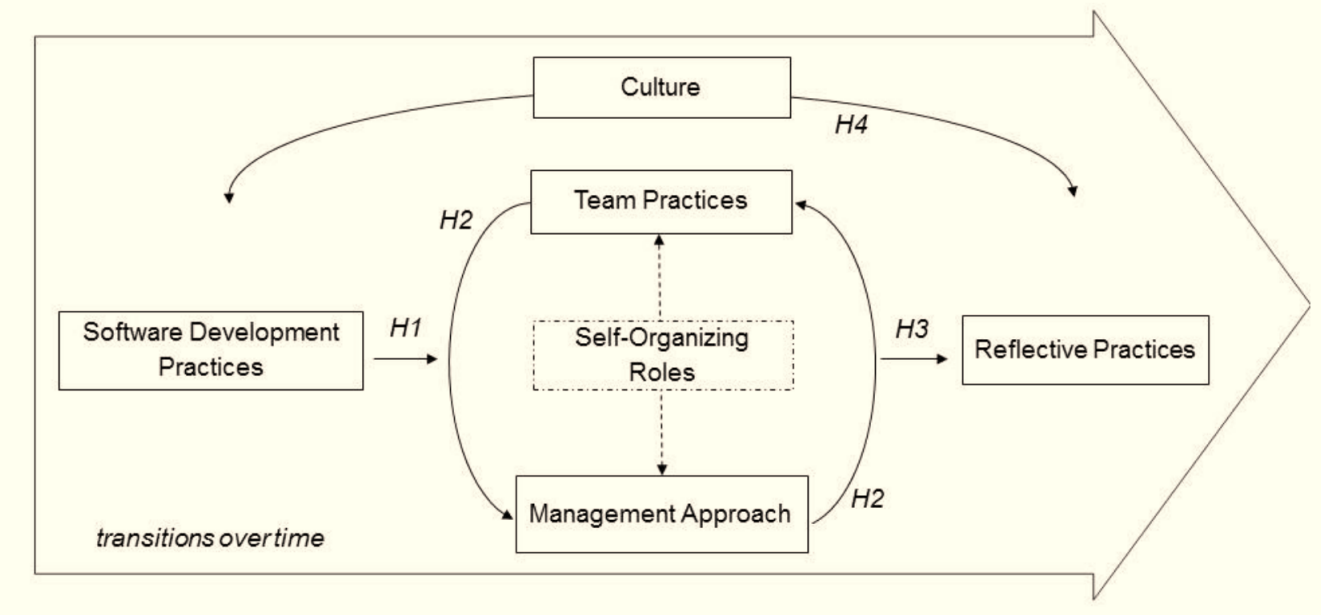
What's a Theory?

- Key patterns (categories, sub-categories, concepts)
- Relationships between patterns (emergent hypotheses)



Sample Grounded Theories

Theory of Becoming Agile (Hoda & Noble, ICSE 2017)



H1: *The transition of a team's software development practices from traditional towards agile is necessary (though not sufficient) for the changes in the team practices and the management approach to occur.*

H2: *The transitions in the team practices and the management approach tend to reflect and adapt to each other.*

H3: *Transitions in team and management practices are necessary (though not sufficient) for changes in the team's reflective practices.*

H4: *All changes are influenced by a combination of the organizational, team and individual culture.*

Hoda, R., & Noble, J. (2017, May). ***Becoming agile: a grounded theory of agile transitions in practice****.*
In 2017 IEEE/ACM 39th International Conference on Software Engineering (ICSE) (pp. 141-151). IEEE. [Preprint]

Grounded theory of making self-assignment work in agile teams (Masood et al., EMSE, 2020)

Empirical Software Engineering
https://doi.org/10.1007/s10664-020-09876-x

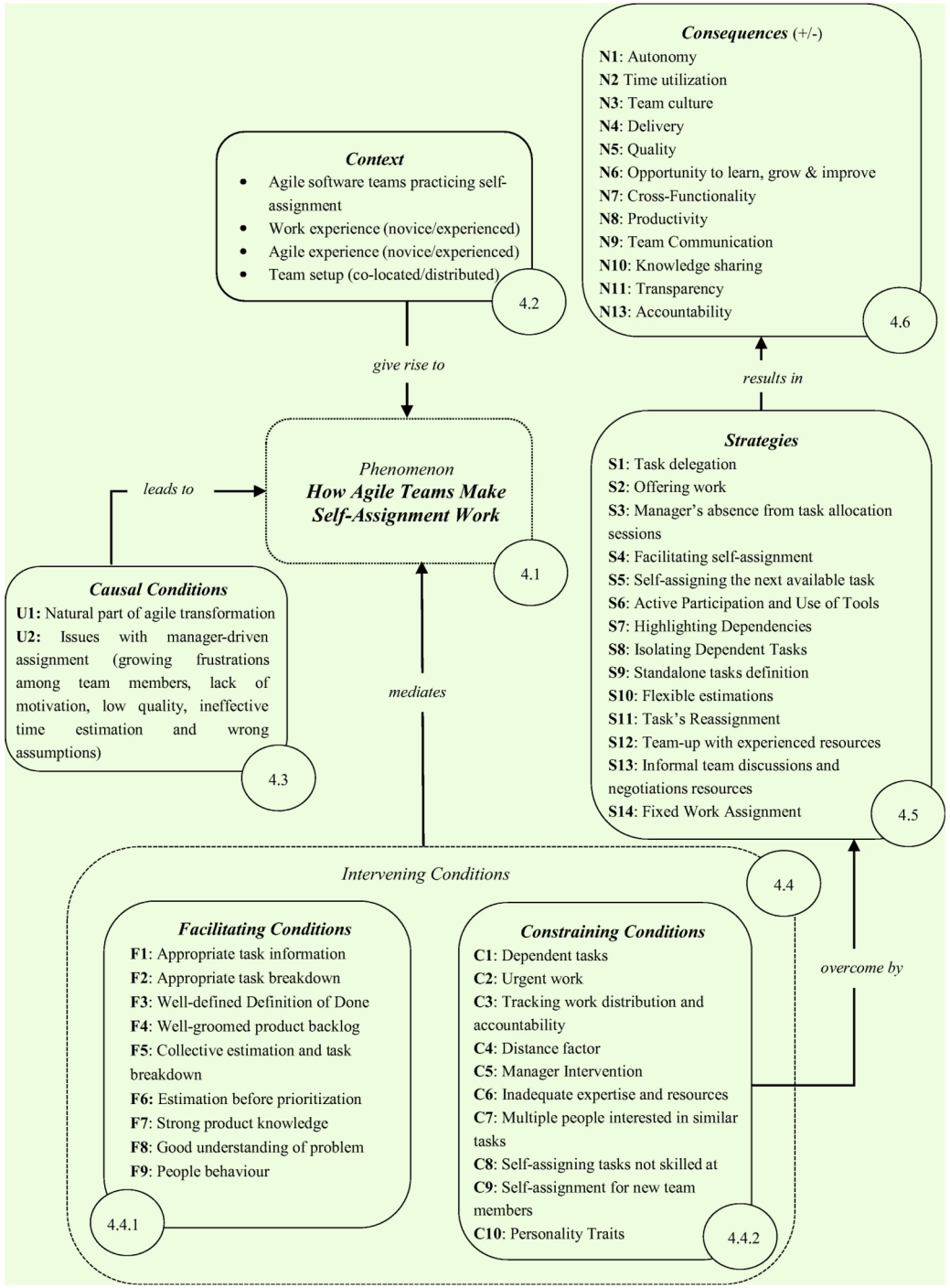
How agile teams make self-assignment work: a grounded theory study

Zainab Masood [1] · Rashina Hoda [2] · Kelly Blincoe [1]

Published online: 04 September 2020

Abstract
Self-assignment, a self-directed method of task allocation in which teams and individuals assign and choose work for themselves, is considered one of the hallmark practices of empowered, self-organizing agile teams. Despite all the benefits it promises, agile software teams do not practice it as regularly as other agile practices such as iteration planning and daily stand-ups, indicating that it is likely not an easy and straighforward practice. There has been very little empirical research on self-assignment. This Grounded Theory study explores how self-assignment works in agile projects. We collected data through interviews with 42 participants representing 28 agile teams from 23 software companies and supplemented these interviews with observations. Based on rigorous application of Grounded Theory analysis procedures such as open, axial, and selective coding, we present a comprehensive grounded theory of making self-assignment work that explains the (a) context and (b) causal conditions that give rise to the need for self-assignment, (c) a set of facilitating conditions that mediate how self-assignment may be enabled, (d) a set of constraining conditions that mediate how self-assignment may be constrained and which are overcome by a set of (e) strategies applied by agile teams, which in turn result in (f) a set of consequences, all in an attempt to make the central phenomenon, self-assignment, work. The findings of this study will help agile practitioners and companies understand different aspects of self-assignment and practice it with confidence regularly as a valuable practice. Additionally, it will help teams already practicing self-assignment to apply strategies to overcome the challenges they face on an everyday basis.

Keywords Self-assignment · Task allocation agile practice · Agile software development · Grounded theory



Masood, Z., Hoda, R. & Blincoe, K. (2020),
How agile teams make self-assignment work: a grounded theory study.
Empirical Software Engineering. https://doi.org/10.1007/s10664-020-09876-x [Open Access]

Grounded theory of Scrum variations in Practice (Masood, Hoda, Blincoe, IEEE TSE, 2020)

RQ: *How, when and why does Scrum practice vary from Scrum by the book?*

We found variations between Scrum by the book and in practice across three categories:

- *Variatons in Scrum Roles* (section 4.1)
- *Variations in Scrum Practices* (section 4.2)
- *Variations in Scrum Artefacts* (discussed with roles and practices)

The *variations in Scrum project management practices* span across: estimation, breakdown, assignment, sprint backlog creation, product backlog creation, and product backlog refinement/prioritization.

Section 4 details the *how, when,* and *why* variations occur, and Table 2 presents a summarized overview of the variations, including rationales (*why*).

A Nuanced Scrum Variations Classification Approach

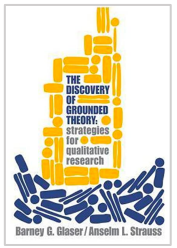
Variations to ***Scrum by the book*** are inevitable. Not all variations are process misuse or abuse. Our nuanced Scrum variations classification approach explains variations in practice as:

- ***standard variations,*** variations allowed by the book
- ***necessary variations,*** variations created in practice to address vagueness or ambiguity in Scrum by the book
- ***contextual variations,*** temporary and/or infrequent *justified* variations contradicting Scrum by the book, and
- ***clear deviations,*** ongoing or frequent *unjustified* variations contradicting Scrum by the book, excuses for poor implementation.

Our classification approach can be extended to make sense of variations in other Scrum practices and potentially in other agile methods and practice frameworks.

Masood, Z., Hoda, R. & Blincoe, K. (2020), ***Real World Scrum A Grounded Theory of Variations in Practice****, IEEE Transactions on Software Engineering.* [Preprint]

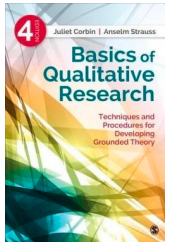
GT – the Versions



1967

Glaserian or Classic

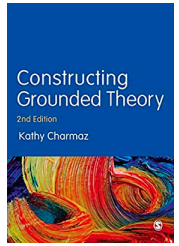
- Original, emergent, objectivist



Strauss-Corbinian[SCGT]

- Structured approach, post-positivist, symbolic interactionism

1990



2006

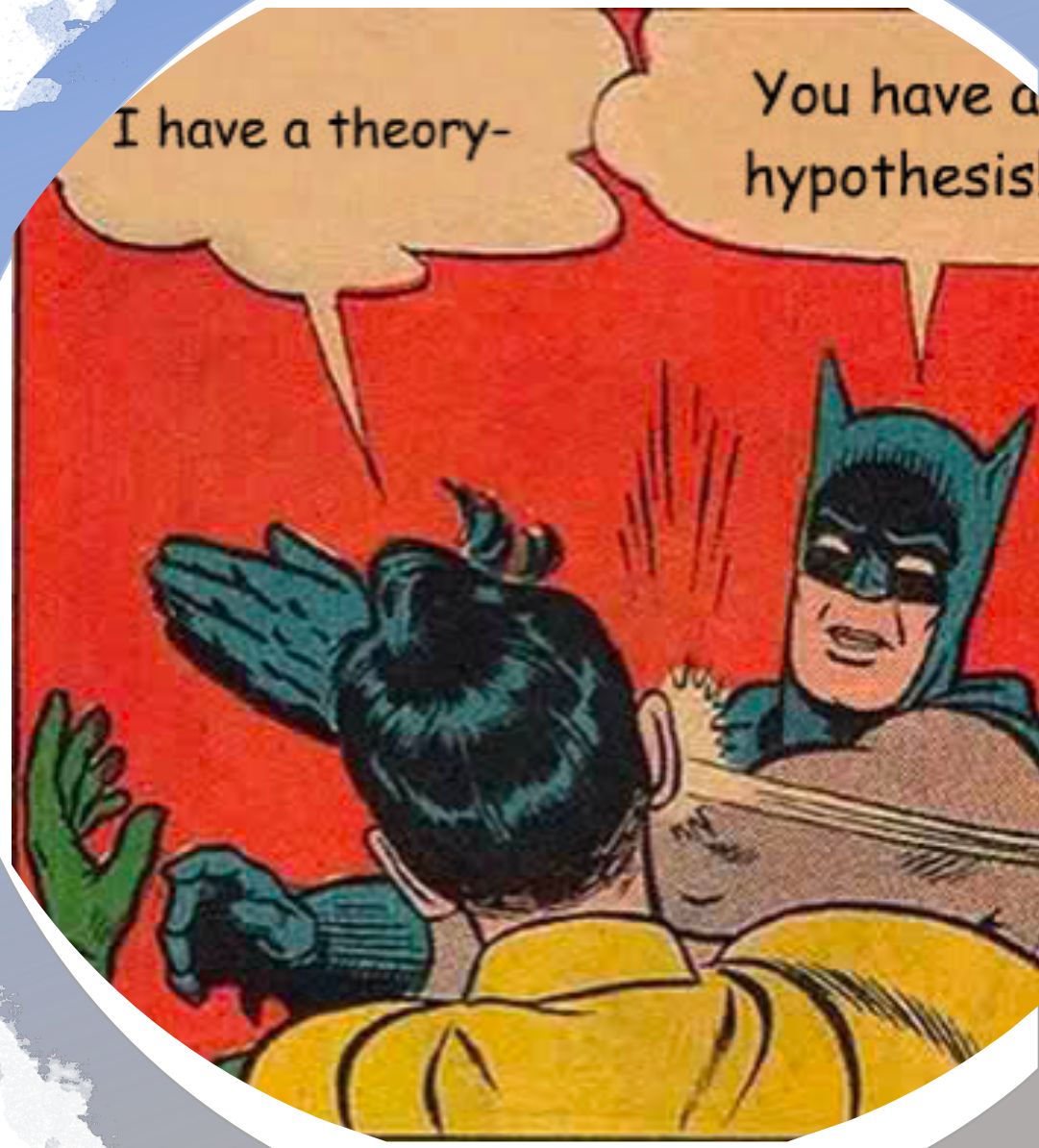
Charmazian or Constructivist[CGT]

- Constructivist, subjective and reflexive role of researcher

[SCGT] *Strauss, A., & Corbin, J. (1990). Basics of qualitative research. Sage publications.*
[CGT] *Charmaz, K. (2006). Constructing grounded theory: A practical guide through qualitative analysis. sage.*

GT – the Evaluation

- **Glaserian**
  - Fit
  - Relevance
  - Work
  - Modifiability
- **Strauss-Corbinian**
  - 7 process assessment criteria
  - 8 evidence assessment criteria
- **Charmazian or Constructivist**
  - Credibility
  - Originality
  - Resonance
  - Usefulness



GT in Software Engineering

- Rising popularity of GT in SE*

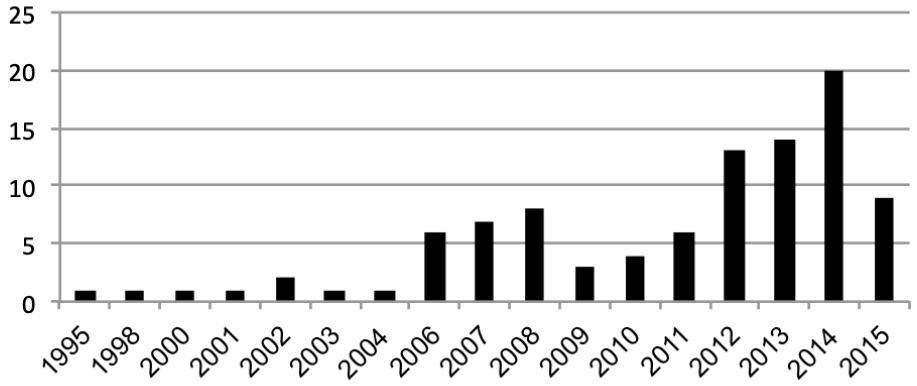


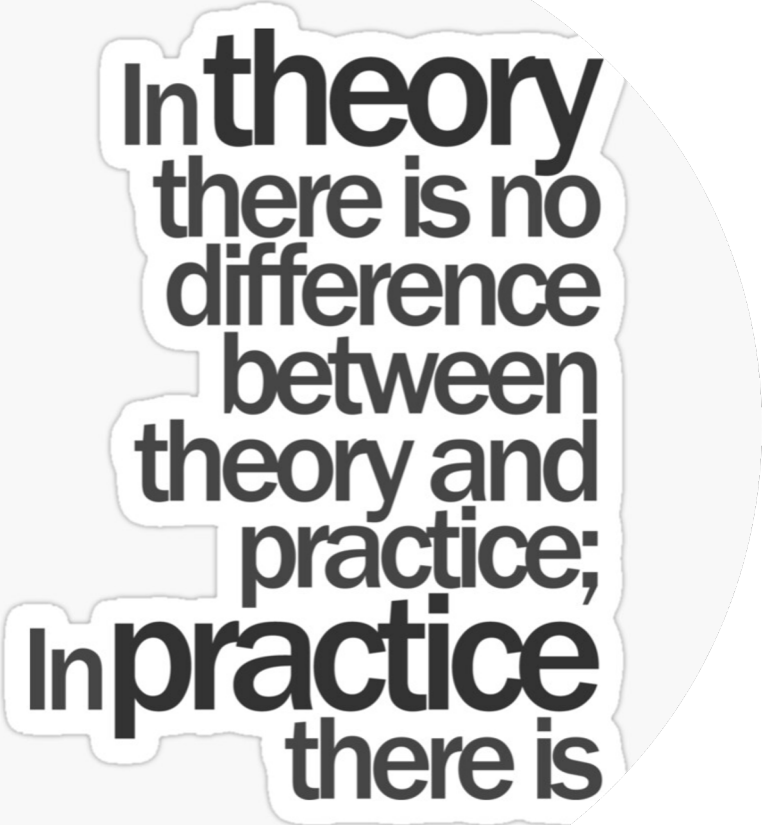
Figure 2. Distribution of publication year of selected articles

Note: Search conducted in Spring 2015, hence the drop in 2015.

Why?

- SE is human-centered – GT enables study of human and social aspects
- SE needs theory – GT enables theory development

**Stol, K. et al. (2016) Grounded theory in software engineering research: a critical review and guidelines. ICSE.*

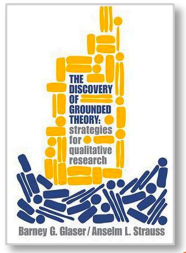


GT in SE – Challenges

- Apprehension
- Misunderstanding
- Misuse/abuse
- Random adaptations
- Overly harsh/lax Evaluations

GT – Evolution

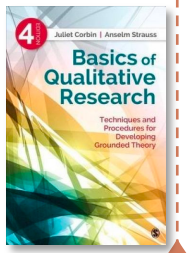
1967



Classic (Glaser)

- Original, emergent, objectivist

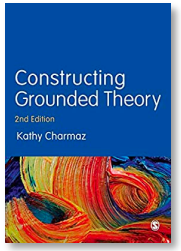
1990



Strauss-Corbinian

- Structured approach, post-positivist, symbolic interactionism

2006



Constructivist (Charmaz)

- Constructivist, subjective and reflexive role of researcher

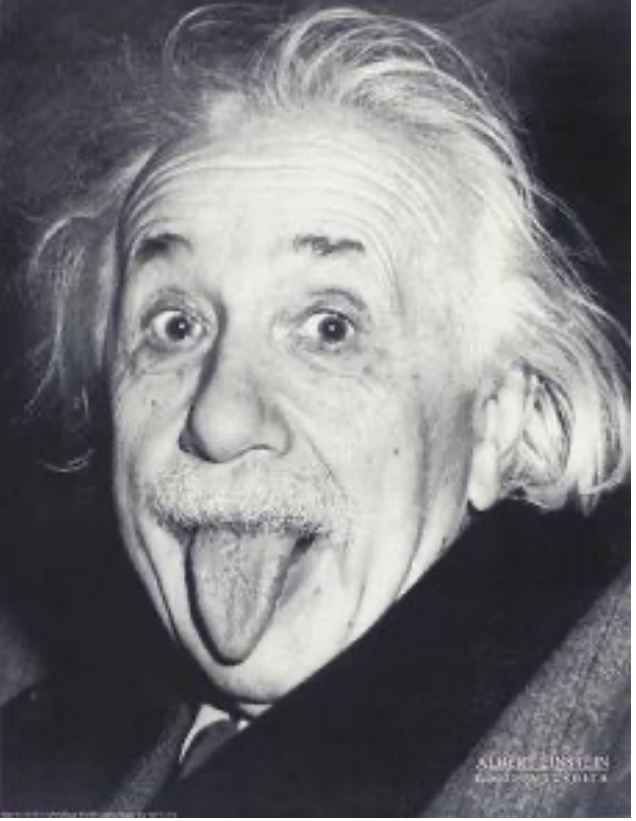
2020

Socio-Technical Grounded Theory Hoda 2020

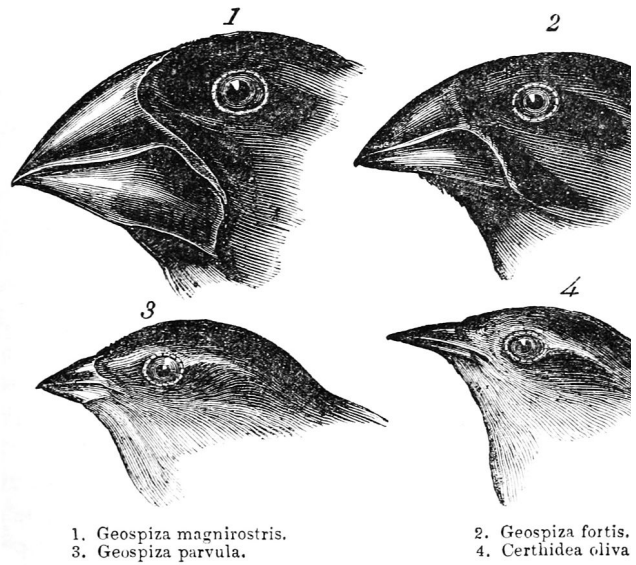
Socio-technical (Hoda)[STGT]

- Socio-technical version for ST domains such as SE, CS, IS, HCI, AI…

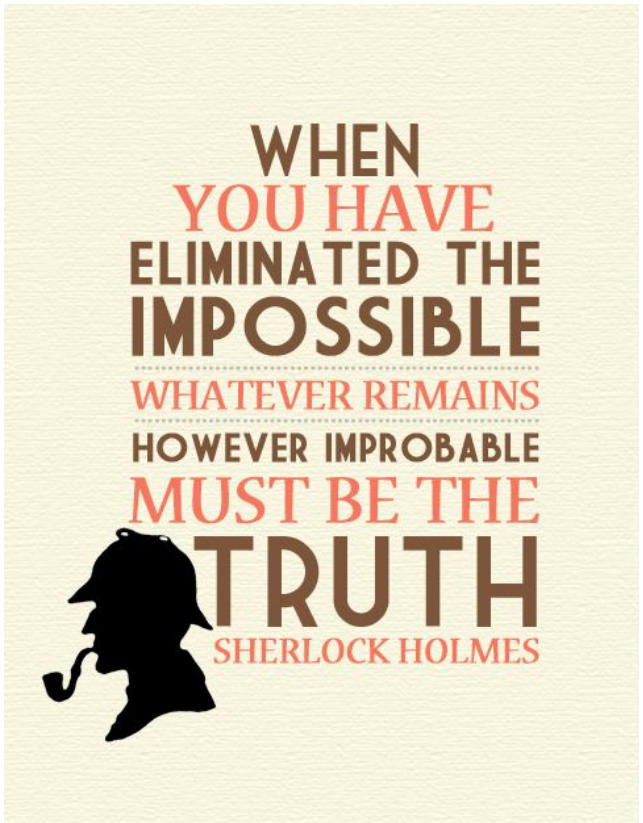
[STGT] *Grounded Theory for Software Engineering (tentative title) by Rashina Hoda, Springer 2020(21?)*



the BIG BANG THEORY



1. Geospiza magnirostris.
2. Geospiza fortis.
3. Geospiza parvula.
4. Certhidea oliva



Thank You!

Rashina Hoda

@agileRashina
www.rashina.com