A Rough Guide to the PhD[1]

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This guide is intended to stimulate discussion on the components and structure of a PhD. There are many different flavours and styles of PhD, and thus it is difficult to be prescriptive or definitive.

1. Structure of a PhD

A PhD thesis would typically comprise the following:

A. An appropriate research topic
    (Topic should be relevant to the domain of the PhD, e.g. Software Engineering, Information Systems, Management, Computer Science etc).

B. Researched in a valid way

    1. An appropriate research method should be justified and chosen.

    2. Also, the research 'gap'/research objective should be justified and based on some kind of theoretical framework.

C. To produce a contribution to knowledge
    (The contribution could arise through the process followed as well as through the results obtained).

A conceptual framework to consider this is proposed in Stol and Fitzgerald (2014) and reproduced in Fig 1.

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[1]Fitzgerald, B (2014) The Rough Guide to the PhD, Available at
http://www.brian-fitzgerald.com/wp-content/uploads/2014/06/rough_guide_to_PhD.pdf
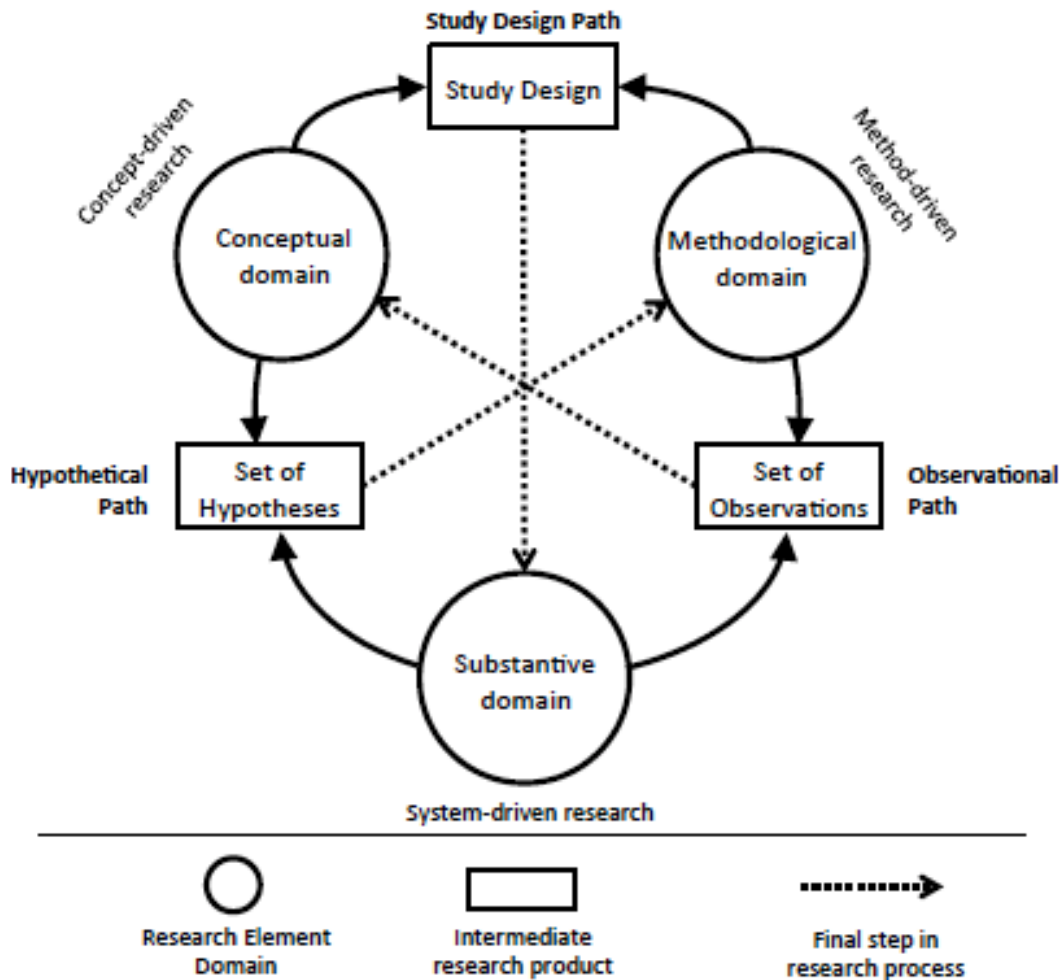
Fig.1 The Research Path Schema

The Research Path Schema is adapted from Brinberg and McGrath's (1985) Validity Network Schema. The three domains, substantive, conceptual and methodological, domains are of immediate interest here.

The *substantive* domain is the domain of phenomena and real-world systems that can be the topic of study. This corresponds to A above. The contribution to knowledge (C above) is also a contribution in the substantive domain.

Whereas the substantive domain deals with "subject matter," ("substance"), the *conceptual* domain deals with concepts, models, frameworks, and theories. These conceptualizations are used to describe the properties of, and relationships among the 'things' found in the substantive domain. This domain also contains any conceptual paradigm that may underpin the research. This corresponds to B.2 above.

The *methodological* domain of research refers to the methods and techniques to gather data about a study topic (substantive domain) or theories (conceptual domain). This corresponds to B.1 above.

1.1 Typical Thesis Components

An Introductory chapter could set the scene, and provide initial details as to the relevance and importance of the topic, the research objective, the research method, and the layout of the thesis.

A Literature Review section (often more than one chapter) will set the scene in terms of what else has been done. This section should serve to justify the research objective, and ground it in some kind of theoretical framework.

A Research Method chapter should identify the research objective, the available research methods, the rationale for its choice, and details on its operationalisation.

A Data Analysis section (often several chapters to ensure important issues not lost in turgid description) should describe the findings.

A Summary chapter should wrap up the research, could provocatively speculate on the implications (provocative judgemental language is not appropriate in the previous sections of the thesis), identify limitations of the research study, and areas worthy of future research.

Appendices could contain details such as descriptions of the companies studied, samples of data analysis worksheets, survey questionnaires, and so on.

2. PhD Proposal

The proposal should be a fairly rigorously defensible statement of the research issue, and should answer the following questions:

- What is to be done (i.e., the research topic/objective)
- Why should it be done (i.e., the 'relevance' of the research)
- What else has been done (i.e.' prior research & literature review)
- How is it to be done (i.e., the research approach)
- What is it likely to lead to (i.e., the potential contribution)
- When (i.e., plan of research with priorities, milestones etc.)

References

Brinberg, D and McGrath, J. (1985) *Validity and the Research Process*, SAGE Publications, NY.

Stol, K and Fitzgerald, B. (2014) Theory-oriented software engineering, *Science of Computer Programming*, Forthcoming.