

## ***2 Research Problem and Thesis Statement***

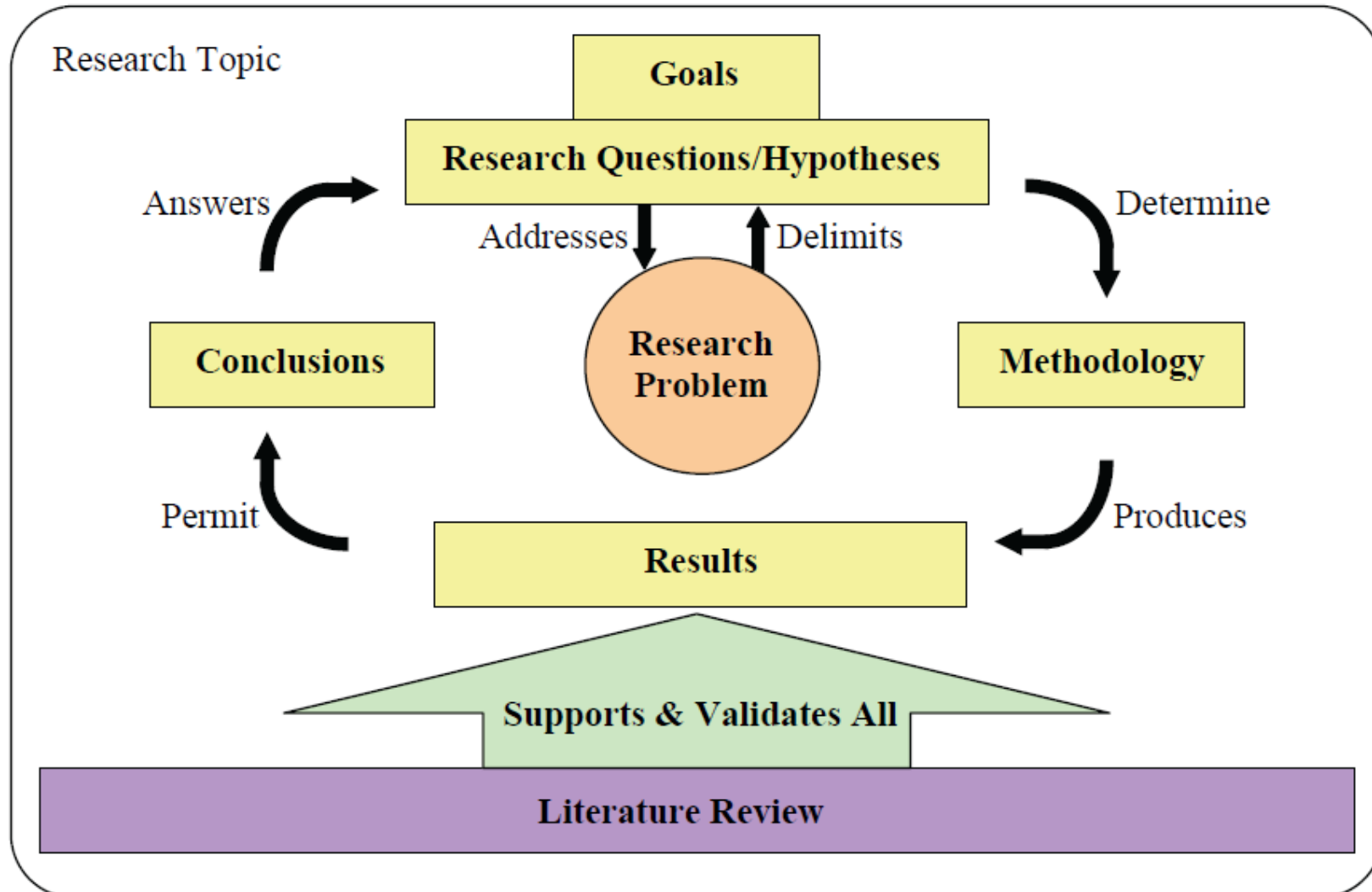
# Research Problem

- Research is based on a well-articulated research problem
- The problem statement offers the context necessary for addressing the *why* question.
- One cannot place value on research without a clear understanding of, first, *why* that research had been conducted.
  - ◆ What makes research of interest is how it will impact future research and other researchers, not the author.

(Ellis & Levy 2008)



# The Problem-Based Research Cycle



(Ellis & Levy 2008)



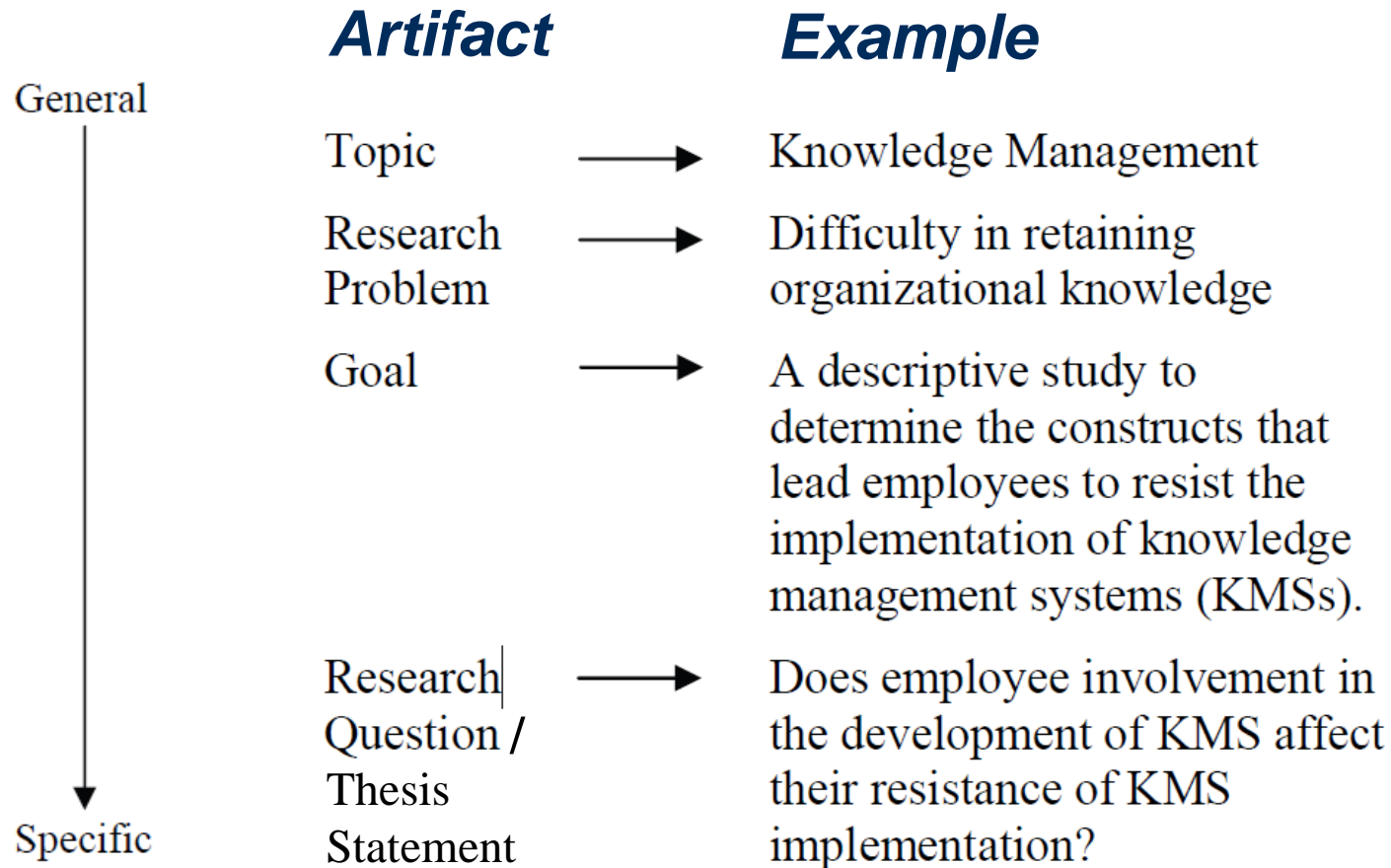
# Research Problem, Goals and Questions

- Problems are drawn from the general domain described by the topic
- The **topic** is the general domain in which the research is focused. Examples: business process management, e-government, database management, information security, human computer interaction, decision support, etc.
- Research **goals** detail what the research study intends to do in order to address the problem: “*What* will this study do?”
- The research goals are operationalized by one or more research **questions** or **hypotheses**.

(Ellis & Levy 2008)



# Relationship Among the Topic, Research Problem, Goals, and Research Questions



(Ellis & Levy 2010),, dapted from (Creswell, 2005, p. 62)



# *Methodology, Results and Literature Review*

- Methodology, results, and conclusions of a study are directly impacted by the problem driving the research.
- The type of methodology being used must be appropriate for the nature of the problem
  - ◆ The methodology is structured by the research questions
  - ◆ The methodology is, essentially, the steps that will be taken in order to derive reliable and valid answers to those questions
- The literature review serves as the foundation for the research
  - ◆ The presence of the research problem is almost always established through the literature review.
  - ◆ The appropriateness of the research goals and the research methodology are established through the literature review

(Ellis & Levy 2008)



# *What makes a Problem Research-Worthy?*

- A problem is research-worthy if it requires research to solve it
  - ◆ Deriving new knowledge (originality)
  - ◆ Results are relevant (significance)
- Preconditions
  - ◆ An exhaustive understanding of the body of knowledge related to the field or topic of study (literature review)
  - ◆ A solid conceptual foundation: there is a real, identifiable conceptual connection between the research problem and the research being conducted to address that problem
  - ◆ Filling a known gap in the body of knowledge or expanding previous research

(Ellis & Levy 2008)



# Research-Worthy Problems Should Not ...

... be based solely on personal observations and/or experiences:

- ◆ identifiable literature that documents the problem or literature that documents conflicting results should be the basis for a research-worthy problem

... be based just on a comparison of two sets of data.

- ◆ It can rather be a methodology, e.g. to validate a hypothesis
- ◆ Example, comparing employee productivity before and after ERP training does not represent a viable research-worthy problem. A research-worthy problem could be to understand the effect of ERP training on productivity level.

... be based on a correlation of two sets of data.

- ◆ correlation coefficient is nothing more than a statistic... It tells us nothing about *why* that relationship exists..A research-worthy problem should provide meaning of a correlation
- ◆ Meaningless correlation: the growth in egovernment use in North America was found to be highly correlated to the growth in birth rate of elephants in Africa.

... based on an investigation that yields a “yes” or “no” answer.

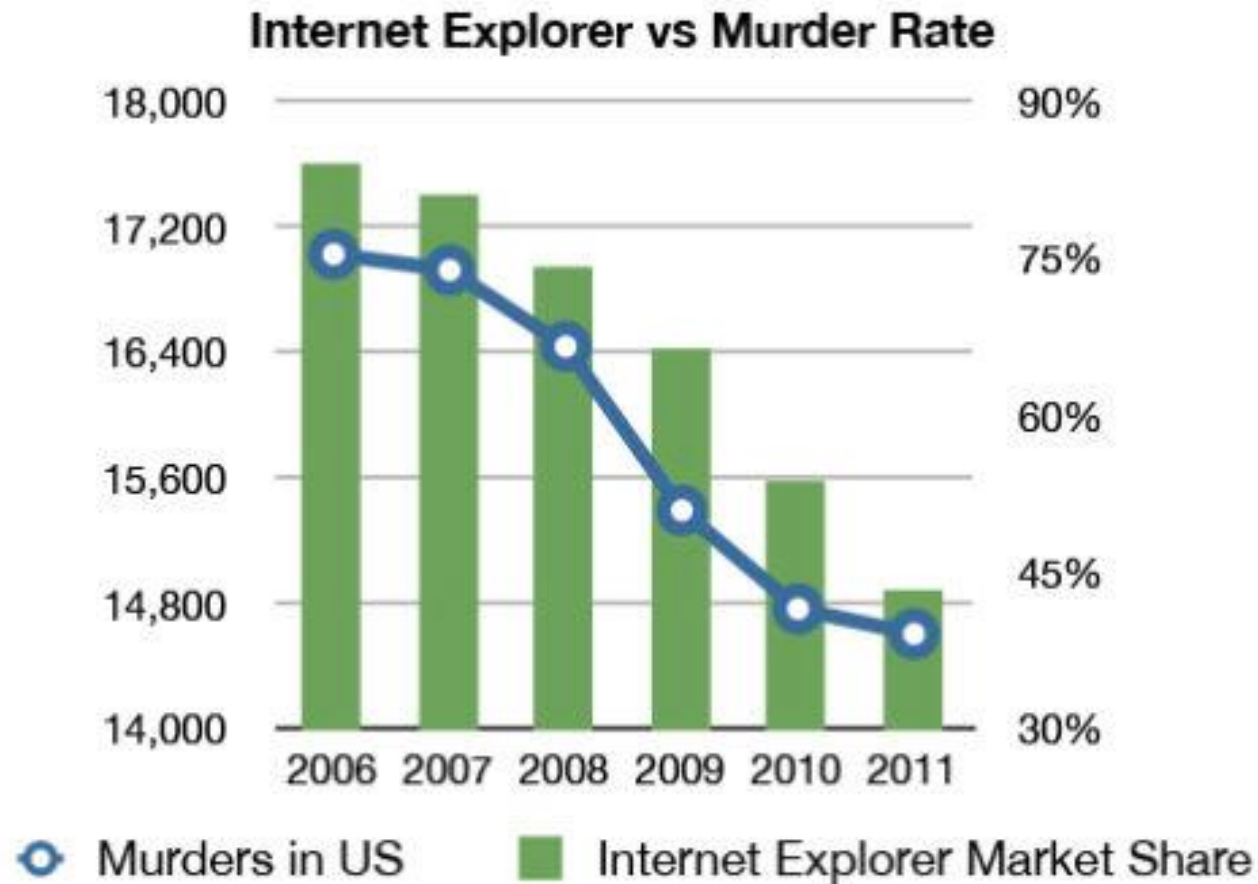
- ◆ Answers to such questions, again provide very little contribution to the body of knowledge.

(Ellis & Levy 2008)





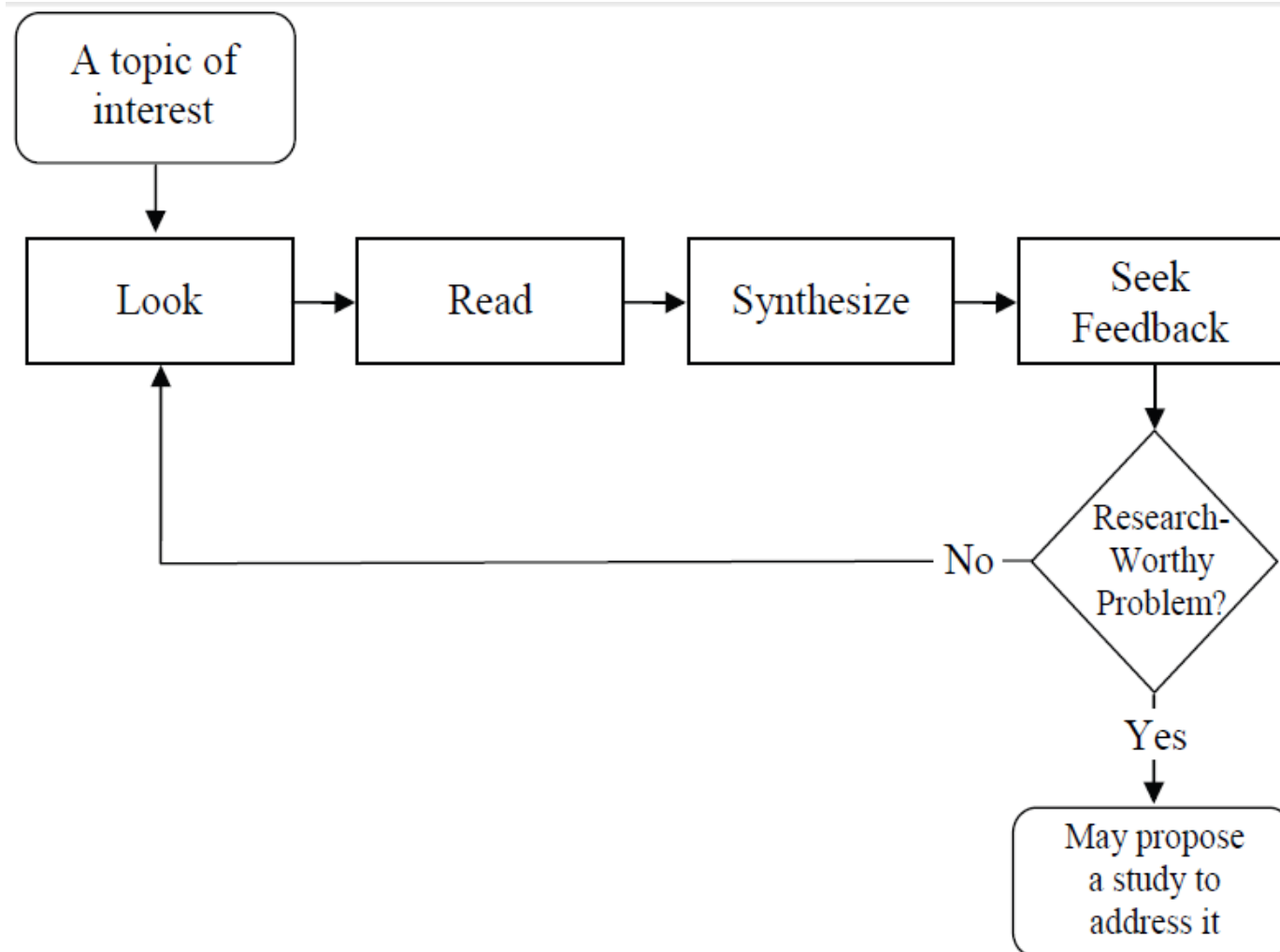
# Another example of a meaningless Correlation



- "I know correlation doesn't imply causation but..."  
... maybe we should ban Internet Explorer?!



# Process of Finding a Research-Worthy Problem



(Ellis & Levy 2008)



# *Problem Statement*

- The problem statement “should present how the research builds on previous theory or contributes to the development of new theory, and should describe the likely uses of the knowledge to be gained and the potential importance of these uses” (p. 1).
- A clear, precise, and well structured problem statement leads to a quality research
- The problem statement is described in the introductory chapter of your thesis

(Ellis & Levy 2008)



# Problem Statement Template

1. **What:** In no more than two sentences, what is the problem that the research will address? Remember, a problem is, essentially, something that is ‘going wrong’.

**Who:** List three current, peer-reviewed references that support the presence of that problem and briefly describe the nature of that support.

2. **How, Where, and When:** Again, in no more than two sentences, describe the impact of the problem. How are people or researchers’ understanding negatively impacted by the problem? When and where is the problem evident?

**Who:** List three current, peer-reviewed references that support the impact of the problem that the research proposes addressing and briefly describe the nature of that support.

3. **Why:** In no more than two sentences, identify the conceptual basis for the problem. That is, what does the literature outline as the cause of the problem?

**Who:** List three current, peer-reviewed references that support the conceptual basis of the problem and briefly describe the nature of that support.

(Ellis & Levy 2008)



# A Faulty Problem Statement

~~“One main obstacle of knowledge management is the lack of developed culture in an organization to ensure the acceptance of a knowledge management system (Becerra-Fernandez & Sabherwal, 2001; Bossen & Palsgaard, 2005; Kaweevisultrali & Chan, 2007; Pumareja & Sikkal, 2005). Non-acceptance of knowledge management system occurs with limited or no support when the proper culture for utilizing knowledge management is not practiced in the organization (Gottschalk, 2000; Kruizinga, van Heijst, & van der Spek, 1996; Swan, Newell, & Robertson, 2000). The basis for the problem is the lack of aligning knowledge management systems with the business strategy in order to develop knowledge management culture in the organization (Braganza & Mollenkramer, 2002; Chua & Lam, 2005; Storey & Barnett, 2000).”~~

(Ellis & Ley 2006, p. 29)



# A Viable Problem Statement

“Knowledge management systems (KMS) have proven to be quite difficult to implement (Becerra-Fernandez & Sabherwal, 2001; Bossen & Palsgaard, 2005; Kaweevisultrali & Chan, 2007; Pumareja & Sikkell, 2005). According to Pumareja and Sikkell, such difficulty was observed even when careful attention is paid to involving upper management and key stakeholders in the design and implementation process. Additionally, some difficulties in KMS implementation have been observed due to technological barriers (Bossen & Palsgaard) and users’ perceived knowledge satisfaction (Becerra-Fernandez & Sabherwal). According to Kaweevisultrali and Chan, cultural values place greater emphasis on cooperation and team effort than individual goal attainment during KMS implementation. The benefits of successful KMS implementations have been documented. Wong, Crowder, Wills, and Shadbolt (2006) found that KMS implementation reduces product development time, while Beis, Loucopoulos, Pyrgiotis, and Zografos (2006) found that such implementation creates complex models to facilitate organizational change. However, KMS implementation coupled with the costs associated with failed attempts like lost revenues and reduced employee confidence make effective implementation of KM efforts vital (Braganza & Mollenkramer, 2002). Although a number of factors have been suggested as important elements in impacting the success of a KMS, the impact of organizational culture appears as a common thread (Bossen & Palsgaard; Kaweevisultrali & Chan; Pumareja & Sikkell). Unfortunately, very little attention has been given in literature to exactly what constitutes the optimal organizational culture for an effective KMS and how to foster that culture.”

(Ellis & Ley 2006, p. 31)



# ***Devising Research Questions/ Thesis Statement***

# Research Question/Hypotheses

- From the problem statement you define in a concise way **what you will investigate** in your research
- This can be done as a
  - ◆ Research Question
  - ◆ Hypothesis (we call the main hypothesis a Thesis Statement)
- Hypothesis and research differ only in the kind of phrasing
  - ◆ A hypothesis is an assertion that you put forward as being (supposedly) true and which you will investigate
  - ◆ Instead of phrasing a statement you can also ask a research question that you will answer





# Research Question / Thesis Statement

- “The research question [thesis statement] is a logical statement that **progresses from what is known** or believed to be true (as determined by the literature review) **to that is unknown and requires validation.**” (Marion 2004)
- “A research question is a **narrow, challenging question** addressing an issue, problem, or controversy that is answered with a **conclusion based on the analysis and interpretation of evidence.**” (Lipowski 2008)
- A thesis statement is a narrow, challenging *hypothesis* ...

(E. E. Lipowski 2008: Developing great research questions. *In American Journal of Health-System Pharmacy, Vol. 65, Issue 17*)

R. Marion (2004). *The whole art of deduction. Research skills for new scientists.* Webbook available at [http://www.sahs.utmb.edu/pellinore/intro\\_to\\_research/wad/wad\\_home.htm](http://www.sahs.utmb.edu/pellinore/intro_to_research/wad/wad_home.htm).



# Thesis Statement

A **thesis** is a guess, an unproven assertion that you will investigate in your dissertation. A thesis can be argued with evidence, or it can be empirically tested, it generally referred to as a '**research hypothesis**'. In either case you are forced to take a clear position regarding the problem that you have identified, and to either argue for that position, considering the evidence for and against, or to develop a way of testing.

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# Thesis Statement – Phrasing a Hypothesis

- A **thesis statement** is the top-level hypothesis of your research. It allows the researchers to precisely define what they will investigate.
  - ◆ It gives clear *boundaries* and a clear reason to do what you do.
  - ◆ Whenever you do anything in your research, the reason should always be 'because it is necessary in order to assess my thesis statement'
- A hypothesis is a clear position regarding the problem that you have identified, and you either
  - ◆ *argue* for that position, considering the evidence for and against, or
  - ◆ develop a way of (empirically) testing it.



# Thesis Statement

- Having a good thesis statement is central to the way that you construct your dissertation.
- The thesis is the central argument of your work. A thesis statement names that argument.
- Once you have identified a problem, you develop a thesis about it.
- You take a stand about the problem or hypothesize a solution to the problem.
- A thesis is an assertion that you put forward as being (supposedly) true.

The purpose of academic work is to come up with new knowledge. A good thesis statement should lead you up to that. This does not mean that it needs to be an original thesis in order to lead to new knowledge

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# Criteria for Thesis Statements / Research Questions

- A thesis statement doesn't merely name a topic or a problem that you've identified. It must take a stand about something.
- It must give you something to argue, to test, to prove, to probe, to measure.
  - ◆ when you can measure it, it is easier to convince people

You are not judged whether you proved your thesis statement right or wrong. You are judged on whether you investigated a worthwhile issue in a reliable manner and came to a well-substantiated conclusion about it.



# Class Discussion

- Is the following a thesis statement?
  - ◆ *A model describing the consumer behavior of adolescent boys in Italy for marketing purposes.*
- Prove? Disapprove? Argue? Disagree? Agree?
- And this one?
  - ◆ *The consumer behavior of adolescent boys in Italy can be effectively described in a five-phase model for marketing purposes.*
- A person knowledgeable in the field must be able to challenge or argue your thesis.



# Directional Hypothesis

- A (directional) hypothesis is a statement that expresses the probable relationship between variables. (Marion 2004)
  - ◆ Variables need to be measurable
  - ◆ Usually there is an independent variable and a dependent variable

- ◆ Example: “Customer satisfaction increases the profit of a company”
  - IV: customer satisfaction
  - DV: profit of a company

- ◆ ***Question: Are the variables measurable? How can we measure them?***



# Open Hypothesis

- An open hypothesis (or question) asks for possible relationships between variables
    - ◆ usually formulated as “what are the variables influencing variable X?”
    - ◆ X needs to be a measurable variable!
- ◆ Example: “what are the factors that help to increase the profit of a company?”





# Exercise

- Complete the following thesis statements by adding the specific points, claims or areas of investigation that you think should feature in the essay.
  - ◆ The life expectancy of the average person is increasing because of ...
  - ◆ Technology is changing our lives in three important areas: ...
  - ◆ A teacher must have the following qualities: ...
  - ◆ Owning an automobile is a necessity both...
  - ◆ Poverty has numerous negative consequences for society, including...
- go to Titanpad <https://titanpad.com/XQV3I207yi>

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# ***Class Activity: Derive a Thesis Statement (1)***

- Research topic:
  - *An IT system should be developed that supports customer consultants in a bank in recommending financial products.*
- What is known:
  - ◆ *Customer consultants of a bank have to take into account many information sources in order to recommend financial products that fit the needs of their customers. It is difficult to observe and consider all relevant information and to assess future development of the financial market.*
- What is unknown:
  - ◆ *How can the consultants best be supported in their work?*



## ***Class Activity: Derive a Thesis Statement (2)***

- Task: write a thesis statement for the research problem from the previous slide! Then, within that statement, identify:
  - ◆ the independent variable and
  - ◆ the dependent variable
  
- Upload your statements to TitanPad:  
<https://titanpad.com/o2zfzRN9Th>



# *Thesis statement for the example*

- Independent variable is always building the IT system
- Dependent variable 1: quality of recommendations
  - ◆ It is possible to develop an IT system that will improve the quality of recommendations for financial products.
  - ◆ It is possible to develop an IT system that makes better recommendations for financial products than a human consultant.
- Dependent variable 2: time
  - ◆ It is possible to develop an IT system that will reduce the time that consultants need to prepare their meetings with customers.



# Devising a Thesis Statement

- “...progress from what is known to what is unknown...”
  - ◆ what is known:
    - primarily literature research
    - supported by practice: interviews, focus groups, surveys, observations
    - guided by the description of your topic
  - ◆ What is unknown: the **gap** in the literature
    - your research question does not need to address the whole gap!
  - ◆ The thesis statement needs to be iteratively developed and refined especially during the literature review
    - Literature review and formulation of thesis statement is done in parallel



# Devising a Thesis Statement

- Where to look for ideas to turn into a thesis statement:
  - ◆ Yourself: think about problems that you have encountered in your work environment or that you have encountered in your previous academic work. Chat with supervisors about your ideas.
  - ◆ Go to the library: Use keywords to do searches on. Read through articles available on the topic. Read dissertation outlines on the subject.
  - ◆ Look at the further research section in dissertations / articles.
  - ◆ Investigate ALL possible concerns before you commit, because everything that you do later in your dissertation is influenced by your choice of these statements.

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# *Approval of your Thesis Statement*

- When you are happy with what you have – talk to your supervisor!
- Negotiate the thesis statement – don't work on it if it is not approved by your supervisor.

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# *Devising a Thesis Statement*

Try conceptualizing your thesis statement as a marriage. Once you've committed you must be true to it; changing it is, like a divorce, unpleasant, messy, difficult and often expensive.

If you have a good thesis statement, it will be your North Star: If you follow it faithfully, it will guide you home safely.

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# Criteria for Thesis Statement / Research Question

- The thesis statement should be ...
  - ...a single thesis statement that a reasonable person in your field could agree or disagree with
  - ...an unambiguous assertion
  - ...worthwhile (= relevant)
  - ...limited in scope
  - ...feasible in terms of primary sources (i.e. can you get the data that supports your thesis statement?)
  - ...based on existing theory
  - ...doable in a reasonable amount of time
  - ...testable by you
  - ...within your area of interest/in synergy with career goals
- ***Do not focus on more than one topic within one thesis!!***



# Criteria for good thesis statements

- A good thesis statement is one that will allow you to complete a passing dissertation as quickly and painlessly as possible.
- The following are things to consider when you write your thesis statement

## Is the thesis statement you are considering:

A single thesis statement that a reasonable person in your field could agree or disagree with?

*Comment:* Be careful that you do not focus on more than one topic within one thesis. If so, complete two degrees 😊

-A trap that students fall into because they are 'scared' they have not done enough.

- Remember that you will need two methods, two body sections, two conclusions etc.

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# Criteria for good thesis statements

Is the thesis statement you are considering:

An unambiguous assertion -

*Comment:* Thesis statement sets up your readers' expectations about your work. Readers must understand *exactly* what you mean to investigate or argue – nothing more, nothing less, and nothing different. Good thesis statements are very, very clear.

You will not be able to put all the implications into one sentence. You will have paragraphs describing these under your statement. Most of your first chapter is explaining what your thesis statement means. For example, problem statements, research objectives, definitions of terms, research questions etc. are all used to support the thesis statement.

*Exercise:* To find out how unambiguous your thesis statement is, write it down on 10 cards and give it to friends and family and ask them what does it mean. If they don't all agree, you have a problem.

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## Is the thesis statement you are considering:

Worthwhile?

Classic test: read it and then imagine someone saying “So what?”

Your answer is the significance of the work that your thesis statement leads to. Note that significant is not a synonym for difficult.

You only need to make a contribution to the existing knowledge. It does not need to be hugely significant in order for you to get your degree. Academic work is *incremental*.

## Is the thesis statement you are considering:

Limited in Scope?

Reduce the scope while retaining the significance.

Thesis statements that deal with focused problems lead to dissertations with reliable conclusions that actually get completed.

Compare:

South African businesses need a new management paradigm in order to remain competitive in the global economy.

South African paint manufacturers who have nurtured a strong black middle management component have raised the productivity of their factory employees above that of their competitors.

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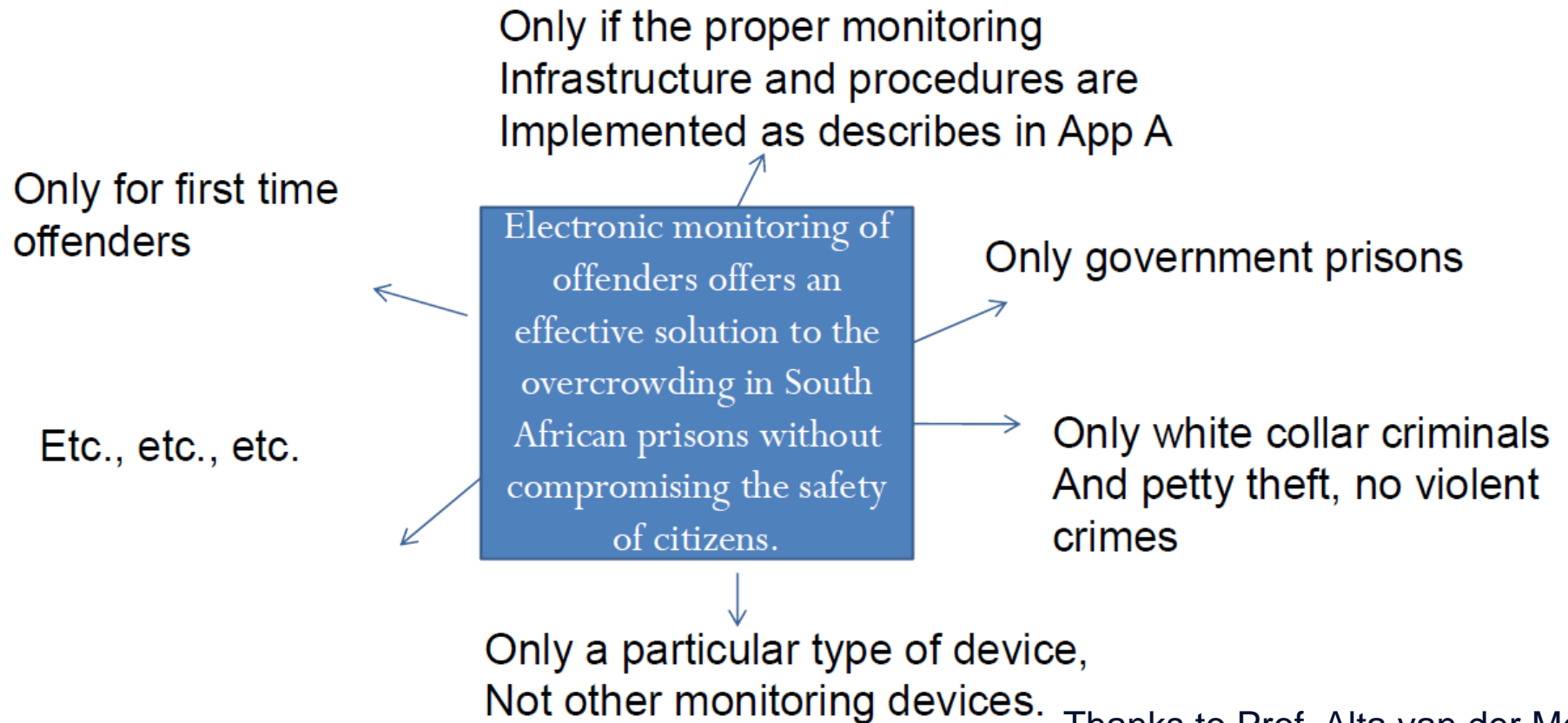


## Is the thesis statement you are considering:

Limited in Scope?

When you are busy to fine-tune your thesis statement with delimitations, try to avoid what has already been done, and focus on the original in your research.

Explicit delineation protects you from criticism such as ‘why didn’t you do this or that’.



## Is the thesis statement you are considering:

Feasible in terms of primary sources?

Can you get the primary data that supports your thesis statement?

The easier it is for you to collect the data you need, the sooner you will be able to complete your dissertation.

The better the quality of the data you use, the more reliable your conclusions will be.

For doctoral dissertations it is highly exceptional that you will be allowed to work exclusively with secondary sources.

Sometimes data may lead to the thesis statement .. You have the data and you then ask what value can I derive from this data?

If it seems as if it is difficult to get all the data you need, first consider alternative ways of answering the thesis statement. Or bend the thesis statement. If neither works, reconsider.

## Is the thesis statement you are considering:

Based on existing theory?

There should be a theory based on the work that you are planning to do.

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## Is the thesis statement you are considering:

Testable by you?

If you can not test your thesis statement then there is no point in considering the dissertation on the topic.

If you can't construct a rational argument backed up by evidence, don't pose the thesis.

You need to give readers a good reason to believe, or at least consider carefully, whatever it is that you argue. The only way to do so is to have a good method.

## Is the thesis statement you are considering:

Doable in a reasonable amount of time?

Check all the possible things that may slow you down:

- Do you need funding?
- Do you need data from somewhere else?
- Is it feasible to monitor the group of people that you intend?
- Is your supervisor committed to your thesis statement?

Don't take risk! Consider the pros and cons of commencing work for each of your statements.

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## Is the thesis statement you are considering:

Within your area of interest/in synergy with career goals?

Always good to compliment your area of interest/work with your research goals.

If you consider to do research related to your work interest, remember that you need to consider intellectual property.

Remember dissertations are the property of the University. The moment it is published ANYONE may use what ever was written within the work.

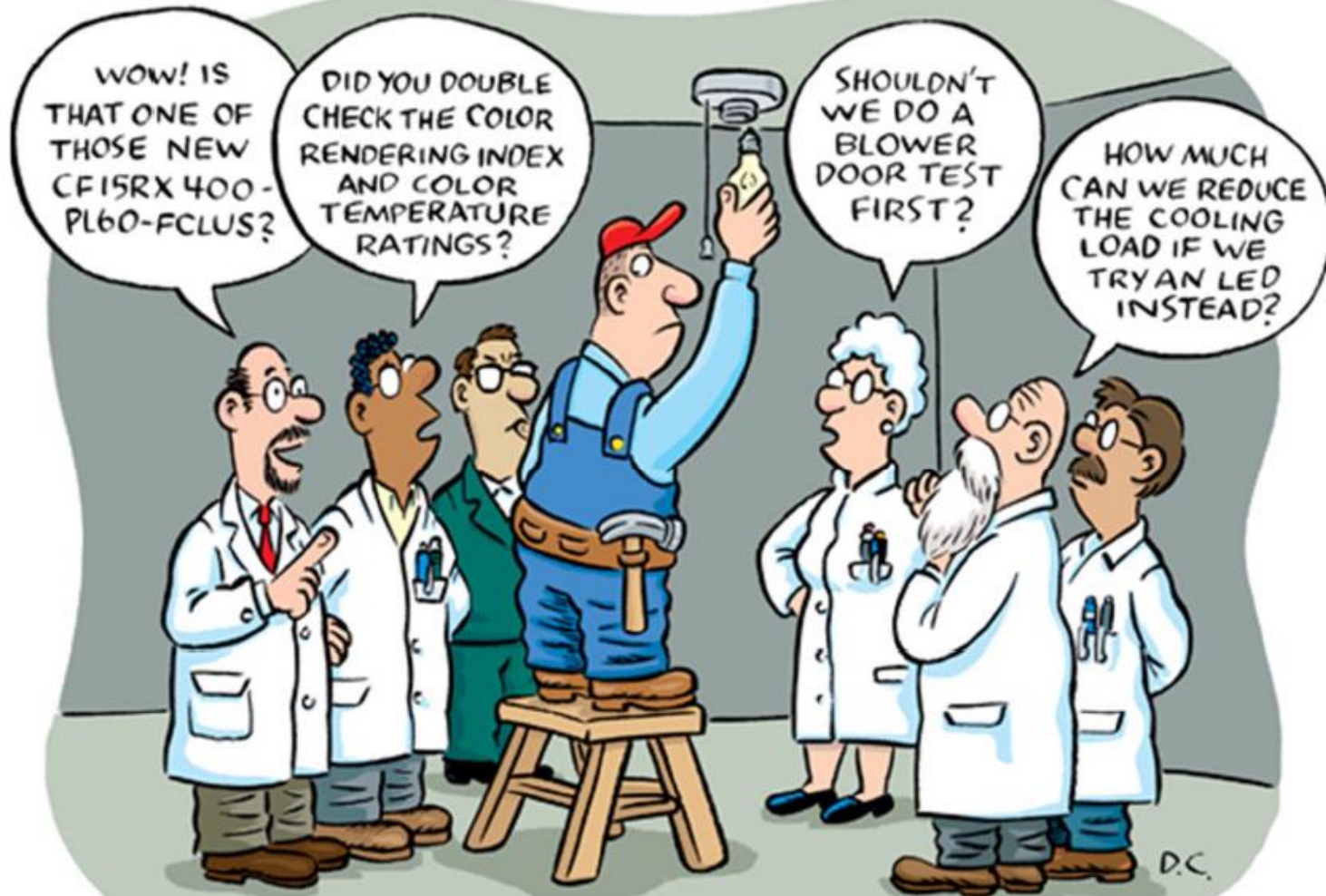
Consider a supervisor that is also interested in your topic – be careful to work in something that ONLY interest your supervisor. Be careful of ‘larger’ projects.

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# A good Thesis Statement leads to a good Dissertation

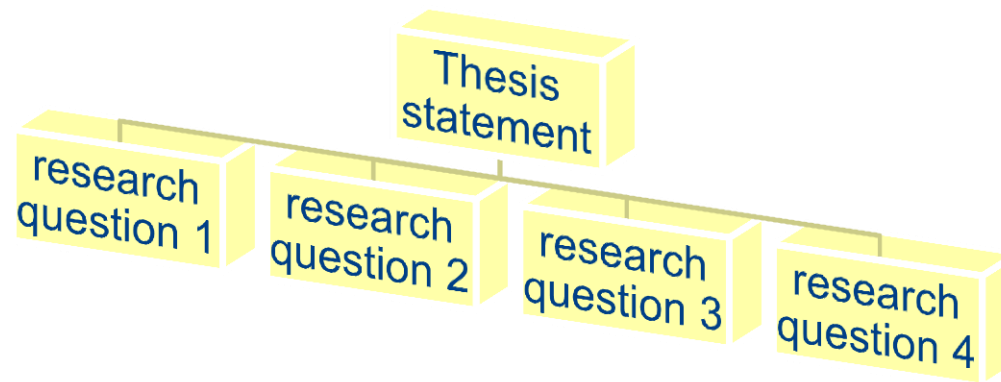


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# Detailing your research

- The thesis statement leads to more detailed research questions



# Devising your Research Questions

- The methodology is structured by the research questions
  - ◆ Each question corresponds to a step in your research
- For a design or development research you typically have questions for the typical design phases
  - ◆ Awareness of the problem
    - An instance of «What is the real problem?»
  - ◆ Suggestion
    - An instance of «What would be an appropriate approach to solve the problem?»
  - ◆ Development
    - An instance of «How can the approach be realized?»
  - ◆ Evaluation
    - An instance of «How can it be shown that the solution workd?»



# Example

## ■ Thesis Statement

*The appropriate use of Unified Communication leads to the improvement of core business processes in a hospital*

## ■ Research Questions:

1. What are the core business processes of a hospital?
2. Where do people have to communicate in these processes?
3. What are the problems in the communication?
4. What are the functionalities and advantages of UC?
5. How can the identified problems be improved by UC?
6. What are the success factors for UC in a hospital?

Problem  
Awareness

Suggestion  
Development  
Evaluation



# *Exercises*

# *Directional Hypothesis: Example*

## ■ Example:

- ◆ General problem: when searching the internal documents of an organisation, algorithms currently implemented in enterprise search engines fail to retrieve relevant documents because the searcher's background and context (e.g. department he/she belongs to) are not considered
- ◆ Hypothesis: «It is possible to design a retrieval algorithm for enterprise search that takes into account organisational background knowledge and uses it to retrieve more relevant documents while maintaining a high precision among the retrieved documents.»

- Question: what is the independent, what is the dependent variable here? How can they be measured?



# Exercise

- Complete the following thesis statements by adding the specific points, claims or areas of investigation that you think should feature in the essay.
  - ◆ The life expectancy of the average person is increasing because of *improved nutrition, greater awareness of health issues and better medical treatment.*
  - ◆ Technology is changing our lives in three important areas: *in the home, at work and in our leisure activities.*
  - ◆ A teacher must have the following qualities: *patience, interpersonal skills, a love of children and an authoritative demeanour.*
  - ◆ Owning an automobile is a necessity both *for career women and for mothers of small children.*
  - ◆ Poverty has numerous negative consequences for society, including *crime, drug abuse and prostitution.*



# Sub Questions

- *Assumed thesis statement:*

- ◆ «It is possible to design a retrieval algorithm for enterprise search that takes into account organisational background knowledge and uses it to retrieve more relevant documents while maintaining a high precision among the retrieved documents.»

- **Task:**

- ◆ what are possible sub-questions and/or sub-hypotheses of interest?





# *Thesis statement for the example*

- Independent variable is always building the IT system
- Dependent variable 1: quality of recommendations
  - ◆ It is possible to develop an IT system that will improve the quality of recommendations for financial products.
  - ◆ It is possible to develop an IT system that makes better recommendations for financial products than a human consultant.
- Dependent variable 2: time
  - ◆ It is possible to develop an IT system that will reduce the time that consultants need to prepare their meetings with customers.



# *Measurability Problem*

- *What is a good recommendation? How can the quality of a recommendation be measured?*

