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# Professional Practice in IT

## Info5990

### Research Methods

### Lecture 5





## Quiz 1 feedback





# Objectives of this lecture

- Understand research methods
- Explore how to conduct professional research in business
- Understand where to obtain research material
- Write good research and communicate others
- Critique others research
- Give you an example / case study of a research project





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# An Australian Computer Society Requirement



Discounted Student Membership





## Research - why

- **Why is it important for IT professionals ?**
- **Where would you use research techniques ?**



- Help make informed decisions
- Need to produce research in career
- Evaluating research in the media
- Assist in classes

# Type of Research 1

Type	Purpose	Time frame	Degree of control	Examples
Experimental / Quantitative	Test for cause/ effect relationships	current	High	 <p>Comparing two types of treatments for anxiety.</p>
Quasi-experimental	Test for cause/ effect relationships without full control	Current or past	Moderate to high	

# Type of Research 2

Type	Purpose	Time frame	Degree of control	Examples
Survey	Assess opinions or characteristics that exist at a given time.	Current	None or low	Voting preferences before an election.
Qualitative	Discover potential relationships; descriptive.	Past or current	None or Low	People's experiences of quitting smoking.





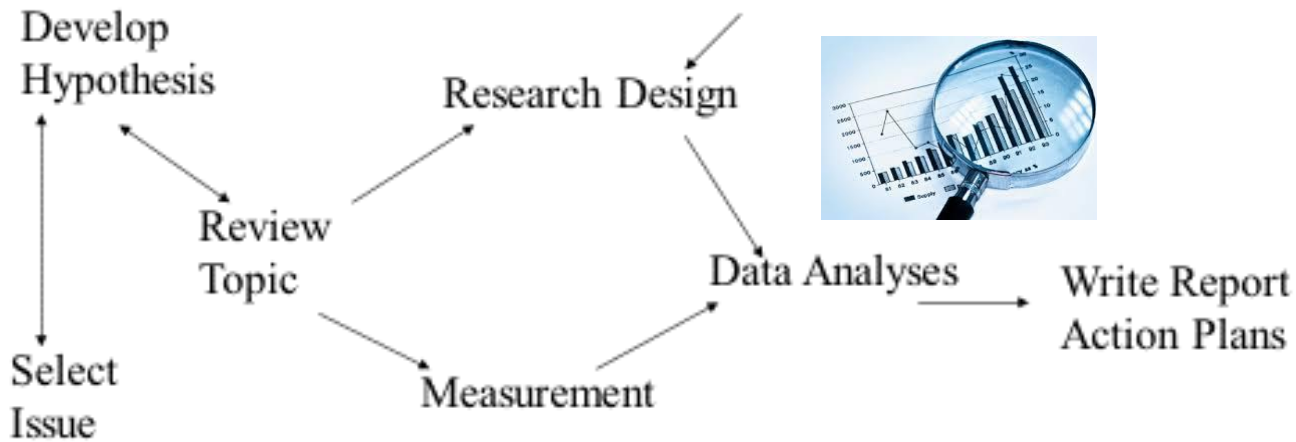
# The Research Process



## Research Process



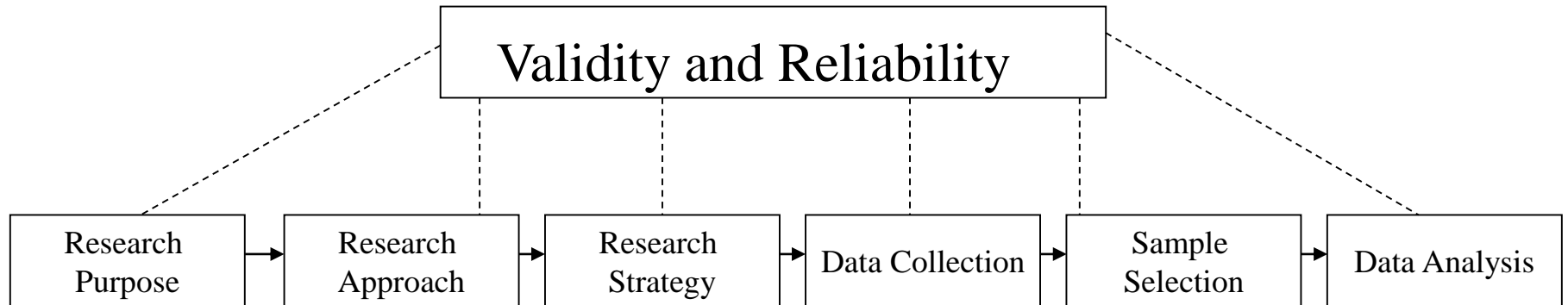
Ethics





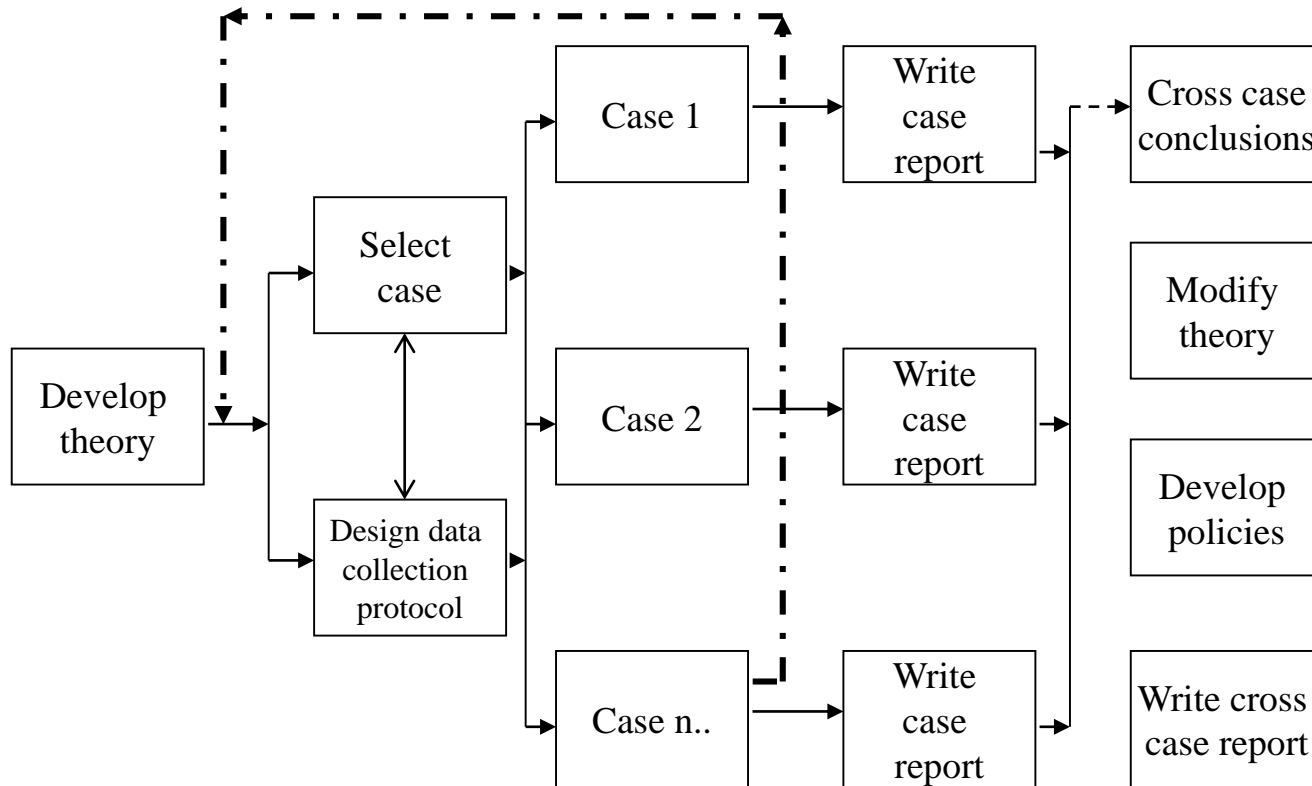


# The Research Approach





## The Research Process – another way of looking at it



Define and Design Prepare, collect,

Analyze and conclude



## Example of a Research study

The same principles apply to a PhD, a business report, and essay, etc





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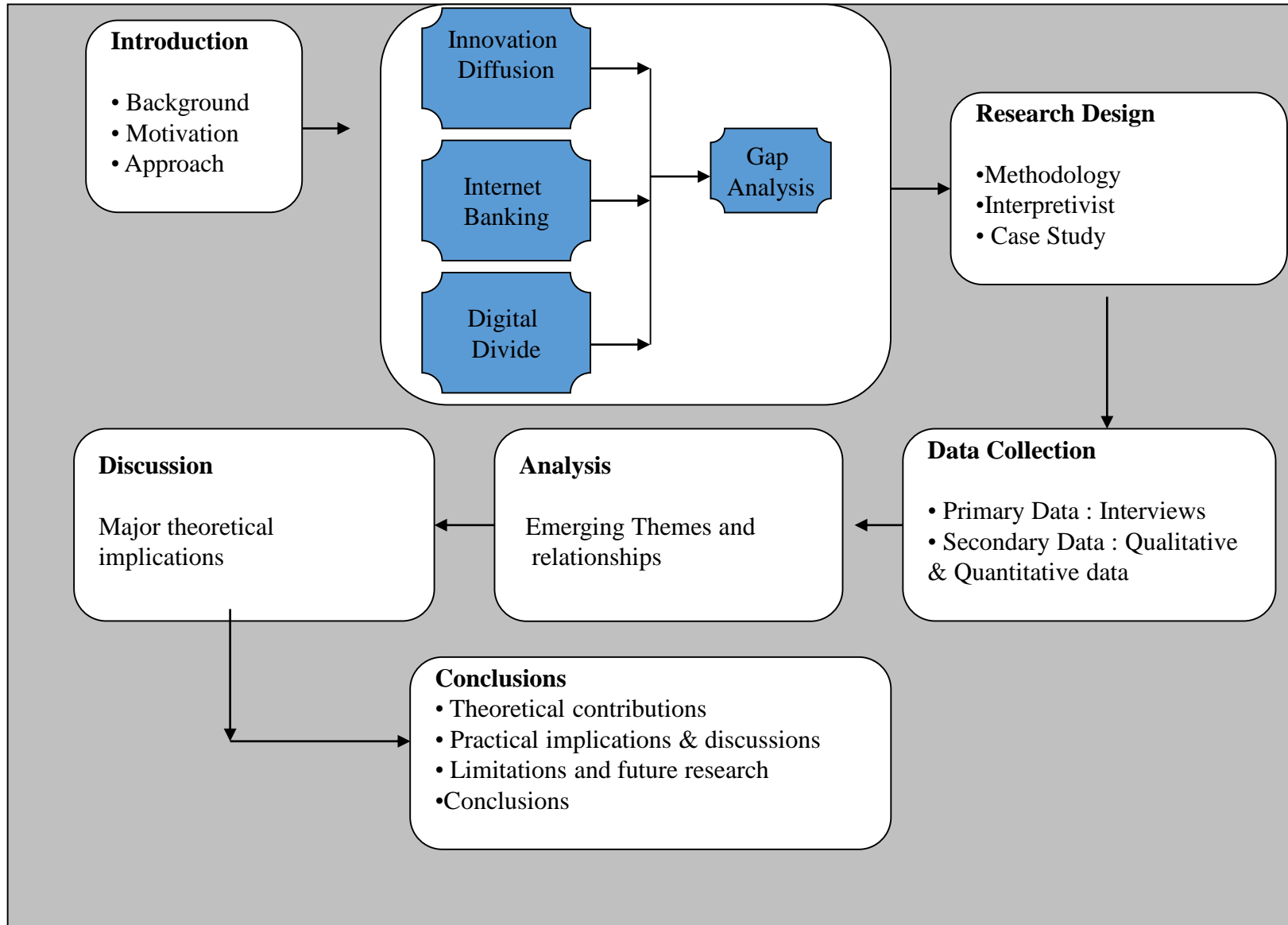
# Case Study to demonstrate research methods





## My PhD Example – Innovation Adoption in countries

### Literature Review





# Purpose of Research

- *Improve understanding of diffusion of disruptive Internet & Mobile Internet banking across Australian and Indian banks.*



compare



contrast



Understand



# Expected Contributions

- **Theoretical contributions to research**

- Improve the understanding diffusion of Internet banking across different countries
- Providing support for Institutional Theory and Disruptive theory



- **Contribution to Practice**

- Improve the understanding of disruption for business executives.

- **Contribution to Methodology**

- To conduct a comparative industry cases in different countries and





# Research Motivations – Ask Why ?

- Global diffusion differences between countries has highlighted vast differences in technology adoption between nations (Digital divide).



- **Diffusion of innovation across an industry is a relatively new phenomena,**
- Work by Christensen and Raynor (2003) on sustaining and disruption claims internet banking is sustaining





# The Process Phases

Explore

Phase 1

Literature review

Primary Data

New Literature

Gap in Literature

Develop

Phase 2

Research Qn.

Target Identification

Primary data design

Data collection

Analyze

Phase 3

Data synthesis

Data Theming

Analyze

Organize

Write Up

Phase 4

Establish Theoretical view

Answer Research Qn

Write up

Submit



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# Literature Review

- **Internet banking - 1995 onwards (IS and Banking disciplines)**
  - Demonstrates why developed nations introduced Internet banking – cost saving, branch rationalisation, channel migration
- **Innovation literature (1903 onwards)**
  - Diffusion – explains adoption of new technologies / products
    - S-Curve
  - Institutional – explains diffusion of innovation across an industry
    - Adoption of Internet banking, online airline check in
- **Disruptive – explains diffusion of new products/technologies**
  - Sustaining – incremental innovation
  - Disruptive – new market Digital Divide - recent phenomena (1980-90) – explores differences & growing gap of technology adoption between developed & developing nations (REF)

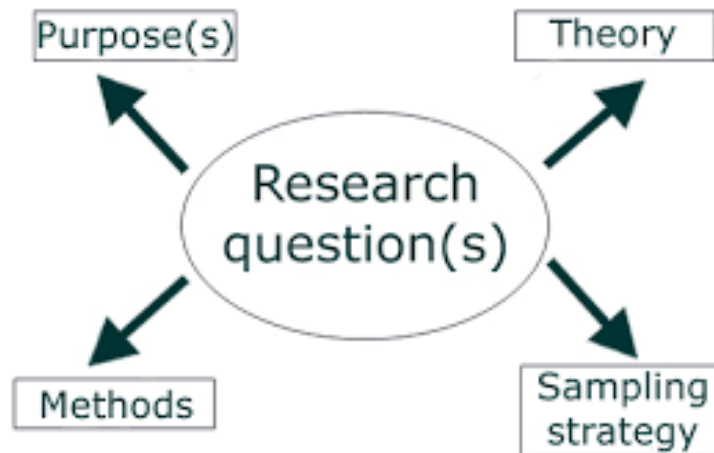


Literature covers only basic and raw information



# Research Question

1. *What are the drivers of Internet and mobile banking diffusion in developed and developing countries?*
2. *How do these drivers impact on diffusion of Internet and mobile banking?*



Robson (2000)



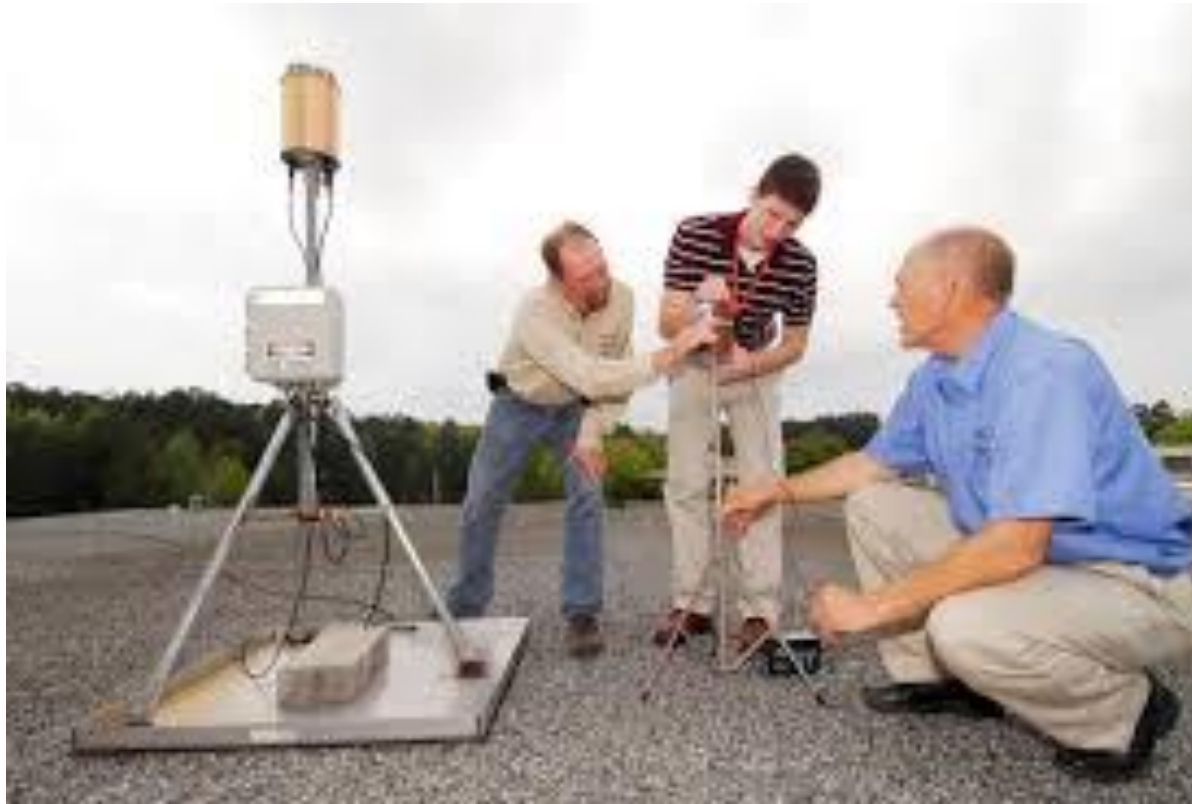


# Research Design

Design	Activity
<b>Method</b>	Industry case study (banking industry in Australia and India), and consisting of individual banks in Australia and India
<b>Selection of countries and banks.</b>	Native banks head quartered in Australia and India, who had introduced Internet banking. Excludes foreign banks. Australia – 9 banks (September 2006 – Jan 2007) India – 8 banks (September 2006) Availability and access to data. Interviews with bank CIO's, General Managers, Product Managers, Senior VP's
<b>Data Collection</b>	Interviews with bank executives Company documents, annual reports, analyst white papers Industry reports
<b>Data Analysis</b>	Open coding from primary data Thematic coding using Nvivo



# Field research





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# KEY FINDINGS





# Preliminary Findings

Australia	India
<ul style="list-style-type: none"><li>Cost reduction</li><li>Branch rationalization</li><li>Alternative channels</li><li>Meeting customers demands</li><li>Self service for customers</li><li>Competitive edge</li><li>Customer retention</li></ul> <p>Overseas experience of executives</p>	<ul style="list-style-type: none"><li>Cost reduction</li><li>Branch rationalization</li><li>Alternative channels</li><li>Meeting customers demands</li><li>Self service for customers</li><li>Competitive edge</li><li>Customer retention</li></ul> <ul style="list-style-type: none"><li>Lack of core banking</li><li>Infrastructure limitations – land lines</li><li>Security limitations</li><li>New emerging consumer class</li><li>Mobile phone uptake</li><li>Inability to build branch networks</li><li>New customers (unbanked)</li><li>Leapfrogging</li><li>Mass new customer base</li></ul>

 Similarities

 Differences



## What have I found ?

- Assessed **diffusion technology** and suitability to empirical evidence and in particular differences from Indian data.
- Found that emergent Indian data, e.g. – new customers were coming online, taking on services which did not exist before – reflecting Disruptive Innovation Technology.
- Theory explain why Australian data was different – e.g. “Un-banked” – status, and “new economy”
- Started writing.....







# Results -1

***That the first movers are often lonely, with the industry in skepticism:-***

*“Being first everybody had their eyes on you”, **Aus1***

*“We served as frontiers banks for the industry” **Ind1***





## Results -2

***Mobile banking was taking off as outlined below:***

*“It is a low ticket transaction, low volume. we are ready”, Ind5*

*In Australia there was no demand- yet in India it was taking off:*

*“Yes nobody wanted it. You know so my recollection is we killed the whole project at some point and not all that far end to it.”, Aus4*





# Results -3

*I have hence used Christensen's Diffusion Theory to explain if the above results can be explained :*

***Theory of sustaining and disruption:***

*Sustaining – extending existing business*

*Disruption – new business*

***I found that :***

*Both Australia and India demonstrated evidence of sustaining innovation. However, only Indian data demonstrated instances of disruptive behavior.*

***Sustaining activity was evident from comments such as:***

*“alternative channel development”, Aus2*

*“new channel to service customer”, Ind3*

***Disruptive innovations was evident by the data such as:***

*“a nest of customers were created”, Ind1*

*“new services were offered”, Ind3*





## Conclusions of study

1. Institutional Theory helps to understand industry diffusion of innovations, but has limitation,
2. These limitations were based on socio-economic factors.
3. Christensen's DIT helps to understand, but does not take into consideration the digital divide.
4. Contribution has been: Institutional theory has been used for the 1<sup>st</sup> time in a cross border manner to explain diffusion
5. DIT has for the first time been used in a comparative cross border study.
6. This study adds to the original thinking from Christensen that "Internet banking is sustaining", by providing that in India it was probably more disruptive.
7. Finally – there were many similarities, but also major differences between banks in India and Australia





The fun part – writing !



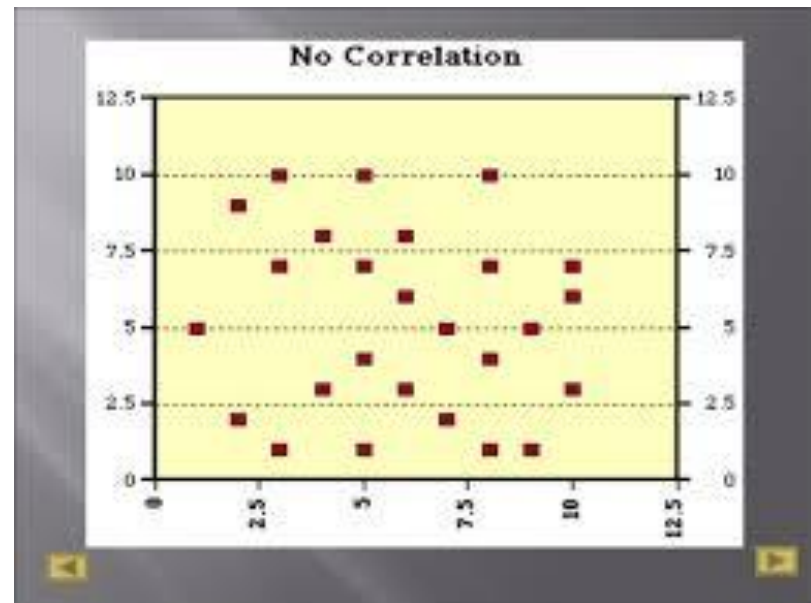
It's like walking on glass !





# Correlational Studies

- Type of descriptive research design
  - Advantage is that it can examine variables that cannot be experimentally manipulated (e.g., IQ and occupational status).
  - Disadvantage is that it cannot determine causality.
  - Third variable may account for the association.
  - Directionality unclear



Other Examples where this method could be used in IT ??

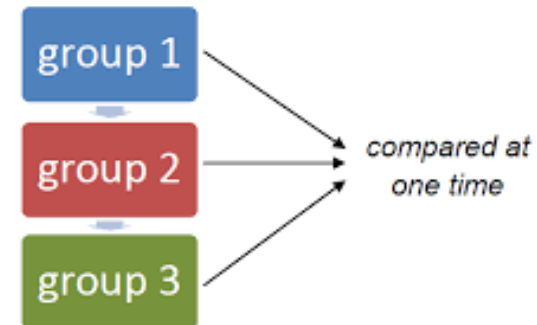
# Cross-Sectional Study Designs

- Compares groups at one point in time
  - E.g., age groups, ethnic groups, disease groups.
- Advantage is that it is an efficient way to identify possible group differences because you can study them at one point in time.
- Disadvantage is that you cannot rule out cohort effects.



## Cross-Sectional Research Study:

*different groups*



Other Examples where this method could be used in IT ??



# Longitudinal Design

- Gathers data on a factor (e.g. confidence) over time.
- Advantage is that you can see the time course of the development or change in the variables
  - Confidence increasing with age.
  - Confidence increasing at a faster rate in the 30's than the 40's.
  - Confidence decreasing in the 50's and 60's.



Other Examples where this method could be used in IT ??

# Survey Methods

- Interviews

- **Advantage** - Comprehensive, ensure participant understands the question, minimizes missing data, enables clarification of unclear responses
- **Disadvantage** – expensive, people more likely to refuse participation, can be risky for interviewer, interviewer may bias the responses.

- Types of methods

- Face-to-face interviews
  - Expensive and time-consuming
  - Telephone interviews
- Need to use random-digit dialing to reach both listed and unlisted numbers.
- Mail
  - Return rate is usually low (20-30%).



Other Examples where this method could be used in IT ??

# Types of Questions

- Open-ended
  - E.g., Can you tell me about your typical experience with dating?
- Close-ended
  - E.g., How do you typically meet someone to date?
    - Introduced by someone
    - Social event
    - In university class or place of work
    - At a bar
    - Through sports or other athletic events



# Sampling

- Population is everyone in your population of interest.
- Sample is some proportion of the population.
- Haphazard sampling – convenience sample
- Random sampling
  - There is always some degree of sampling error.



# Qualitative Methods

- Multimethod approach to studying people in their natural environment
  - It is interpretive – researcher has to make sense of the data
  - Multimethod – can use interviews, photographs, natural observation, archives, etc.
  - It is typically conducted in person's natural environment.
- Valuable to use when phenomenon not fully defined.



# Experimental Designs

- Examines differences between experimentally manipulated groups or variables (e.g., one group gets a certain drug and the other gets a placebo).
  - Advantage is that you can determine causality.
  - Disadvantage is cost and many variables cannot be experimentally manipulated (e.g., smoke exposure over time).



# Experimental Method

- Advantages
  - Strength with which causal relationships can be inferred.
  - Ability to manipulate one or more variables.
  - Proven to be a very useful and robust scientific method (i.e., withstood the test of time).
- Disadvantages
  - Tight controls often produce artificial conditions that could limit the generalizability of the findings (i.e., internal vs. external validity trade-off).
  - Time consuming & Expensive.
  - Human behavior is very complex and cannot be fully studied using experimental methods.

Other Examples where this method could be used in IT ??



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Ok – lets see what you learnt  
this week !







See you next week :

- Don't forget Quiz
- Do the readings
- Start preparing for the individual Oral's