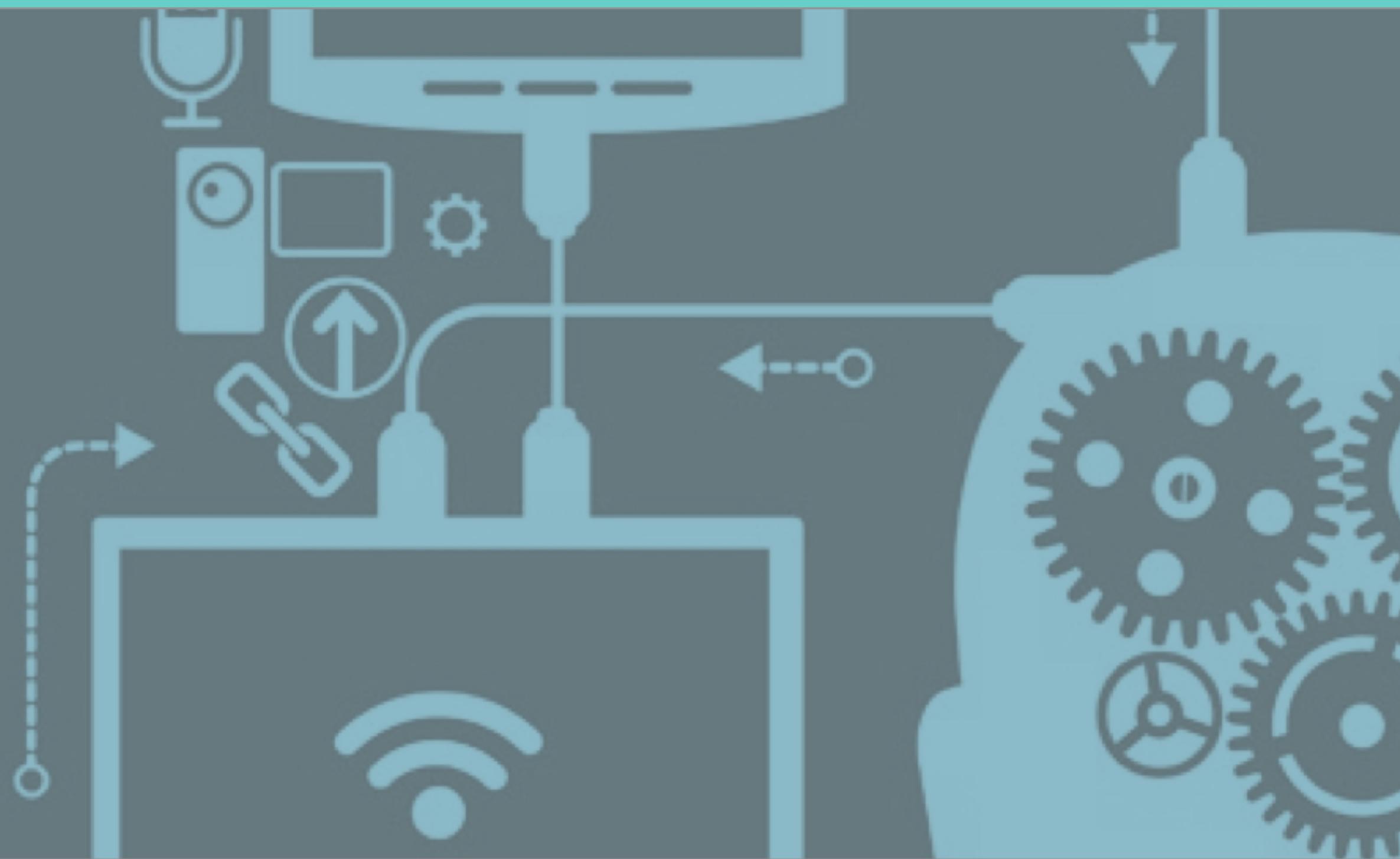


# CN6000

# Final Year Project 2025/6

## Topic 4

## Research Methods



# Agenda

- **Project Approach**
  - SDLC Methodology
    - *Methods*
  - Research Methodology
    - *Quantitative*
    - *Qualitative*
  - Different methods explained
- We will start with a Case Study:
  - [Authenticate.info](#)



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# Stop Right There!

---



Do you need ethical approval?

Week six we will talk about Legal and Ethical Considerations.

# Your Project Approach:

---

Your approach must have two parts:

- Practical
- Theoretical: Field Research

# Your Project Approach:

---

There are two sections in your Methodology:

- **SDLC\* Methodology**: has to be based on known defined IT or Computing methodology and method:
  - Methodology: Waterfall, SSADM, Agile, RAD, DSDM, Prototyping Approach...etc.
  - Method: Scrum, Kanban, Wireframe, Javascripts...etc.

# Your Project Approach:

---

There are two sections in your Methodology:

- **SDLC\* Methodology**: has to be based on known defined IT or Computing methodology and method:
  - Methodology: Waterfall, SSADM, Agile, RAD, DSDM, Prototyping Approach...etc.
  - Method: Scrum, Kanban, Wireframe, Javascripts...etc.
- **Field Research Methodology**: To complement your application
  - Methodology: **Qualitative** using themes and text analysis.
    - Method: Interviews, Focus groups, document analysis, Case Studies....

# Your Project Approach:

---

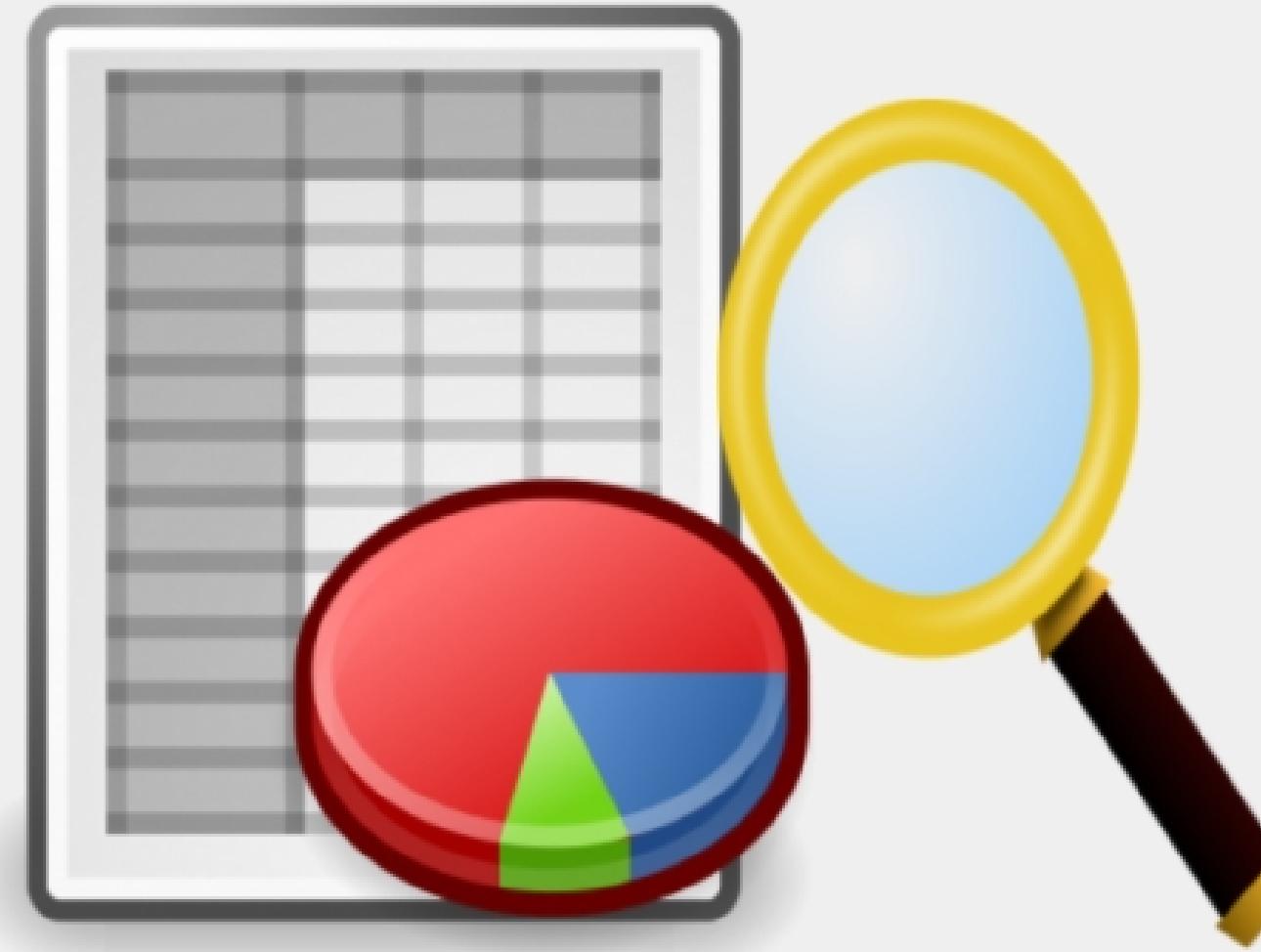
There are two sections in your Methodology:

- **SDLC\* Methodology**: has to be based on known defined IT or Computing methodology and method:
  - **Methodology**: Waterfall, SSADM, Agile, RAD, DSDM, Prototyping Approach...etc.
  - **Method**: Scrum, Kanban, Wireframe...etc.
- **Field Research Methodology**: To complement your application
  - **Methodology**: **Qualitative** using themes and text analysis.
    - **Method**: Interviews, Focus groups, document analysis, Case Studies....
  - **Methodology**: **Quantitative** using statistics analysis
    - **Method**: Surveys, Questionnaires, Datasets, may also include Case Studies...





VS



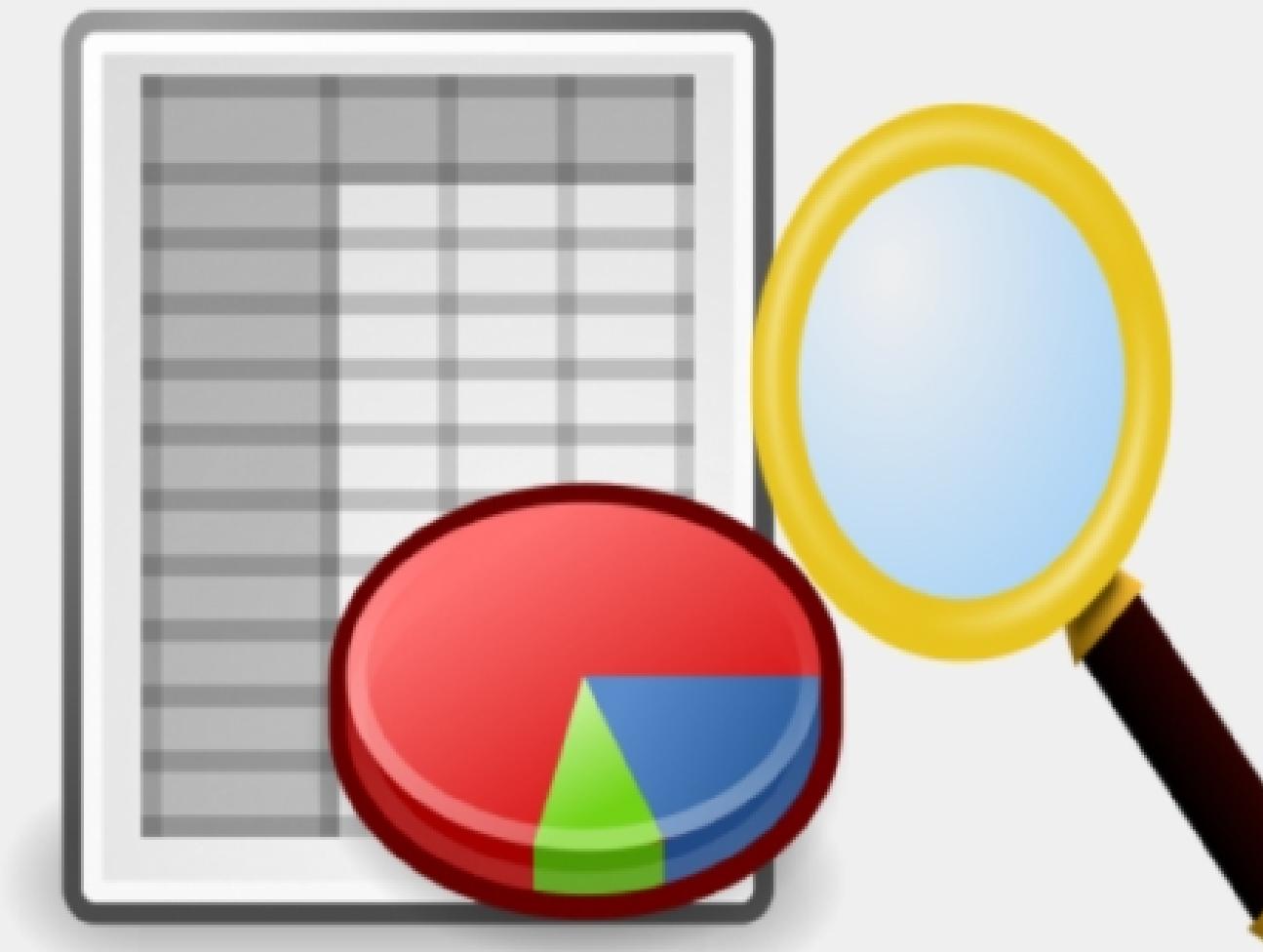
Qualitative  
research

Quantitative  
research

# Focus on Quality vs Focus on Quantity



VS



Qualitative  
research

Quantitative  
research



# QUANTITATIVE RESEARCH



# QUALITATIVE RESEARCH

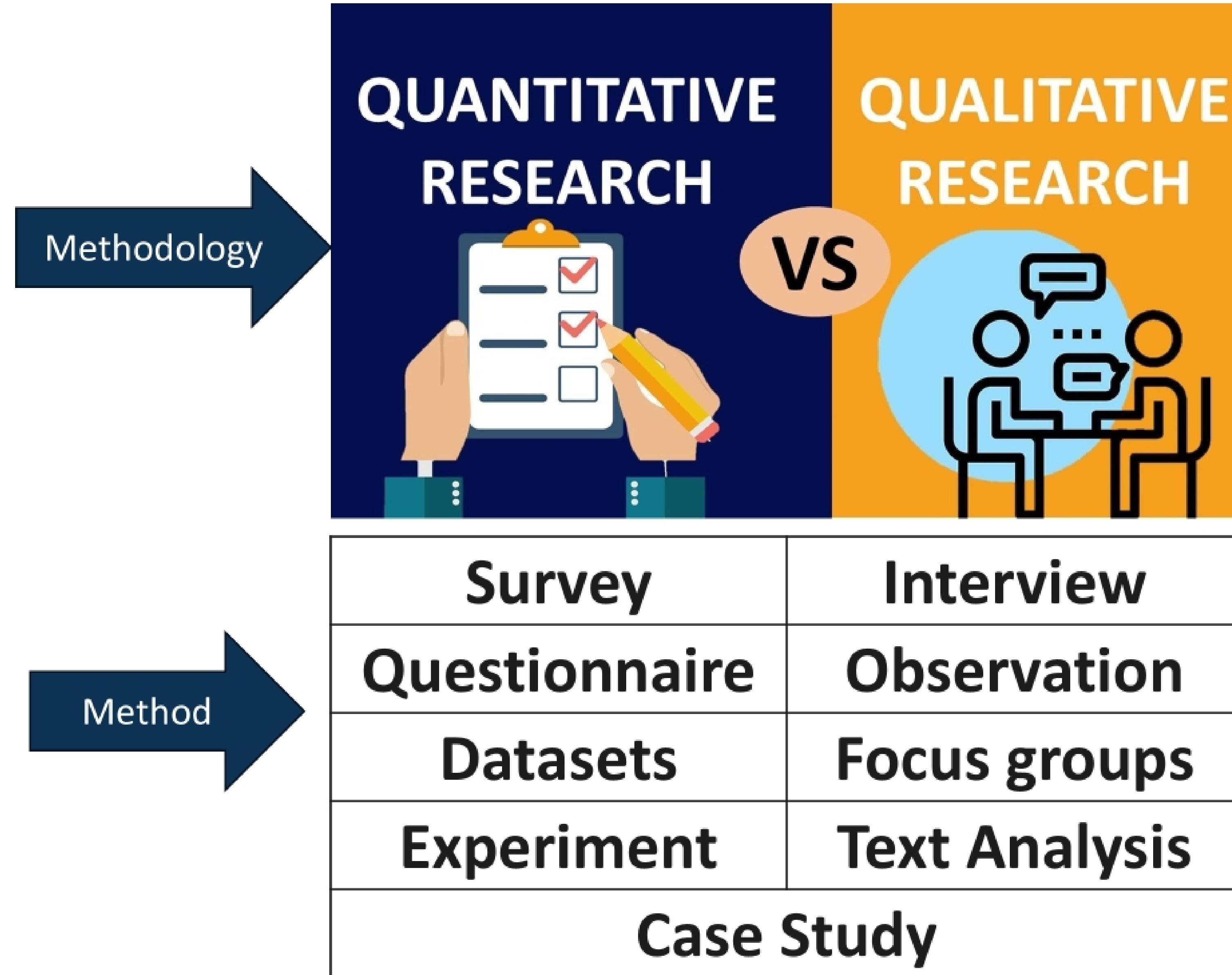
VS





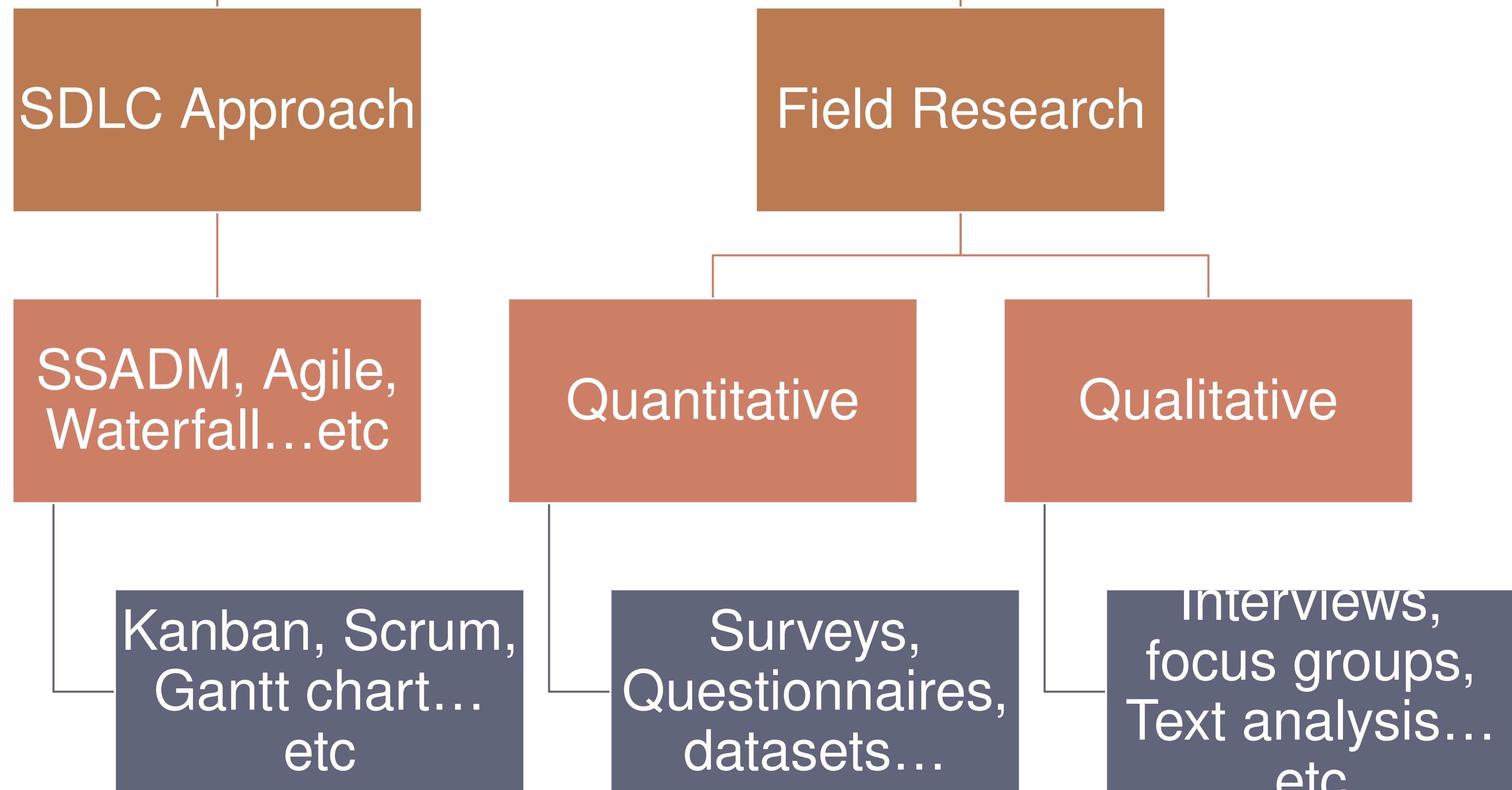
<b>Survey</b>	<b>Interview</b>
<b>Questionnaire</b>	<b>Observation</b>
<b>Datasets</b>	<b>Focus groups</b>
<b>Experiment</b>	<b>Text mining</b>
<b>Case Study</b>	<b>Analysing</b>

Which tool you **Experiment** with determines what **research** you are doing!



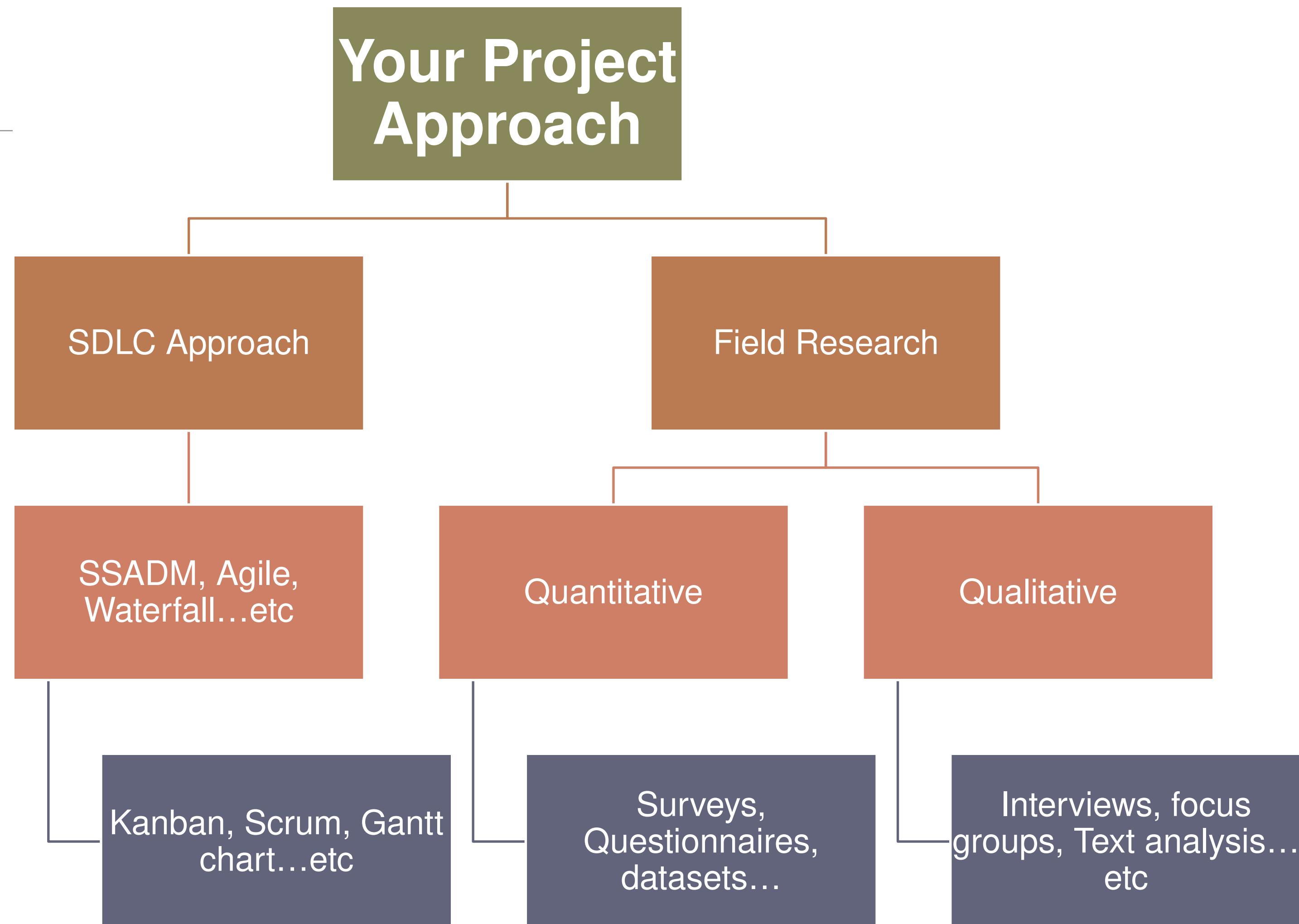
**Which tool you will use will determine what research you are doing!**

# Your Project Approach

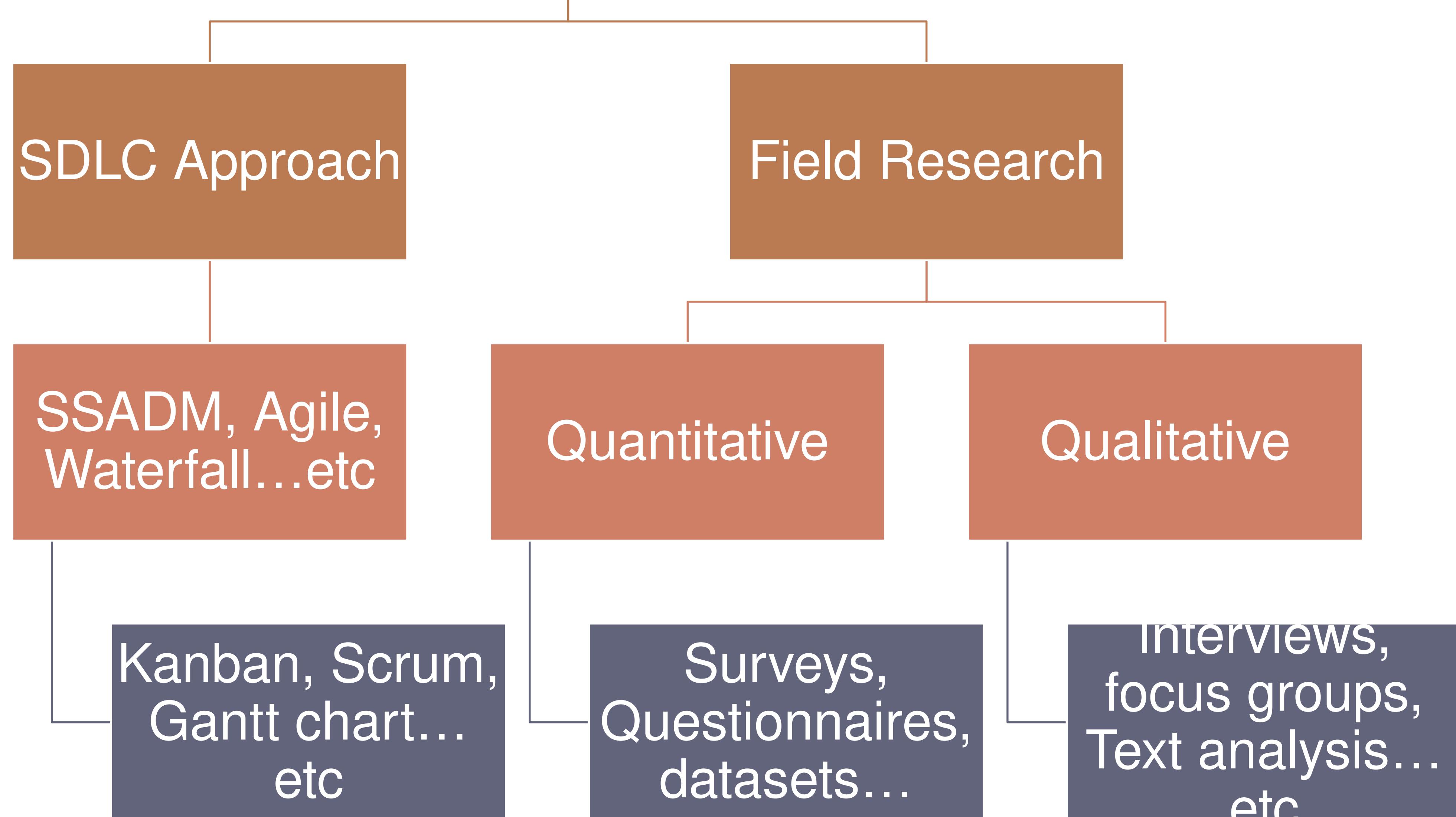


## Reflect 1:

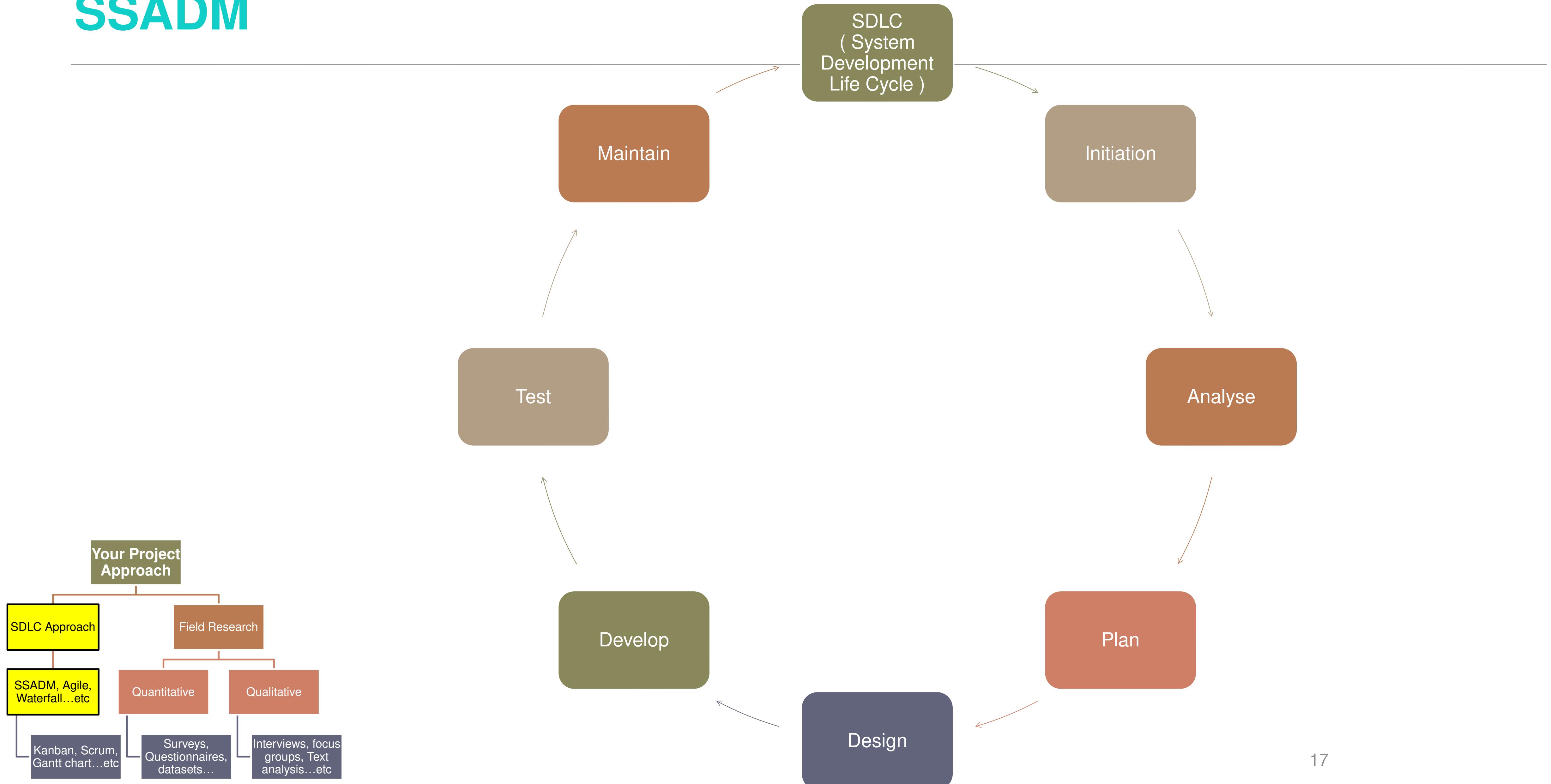
- In the next section:
  - SDLC approaches
  - Research approaches.
- Take 5 mins to write down which approach.
- See if you will change your mind as we explain them.



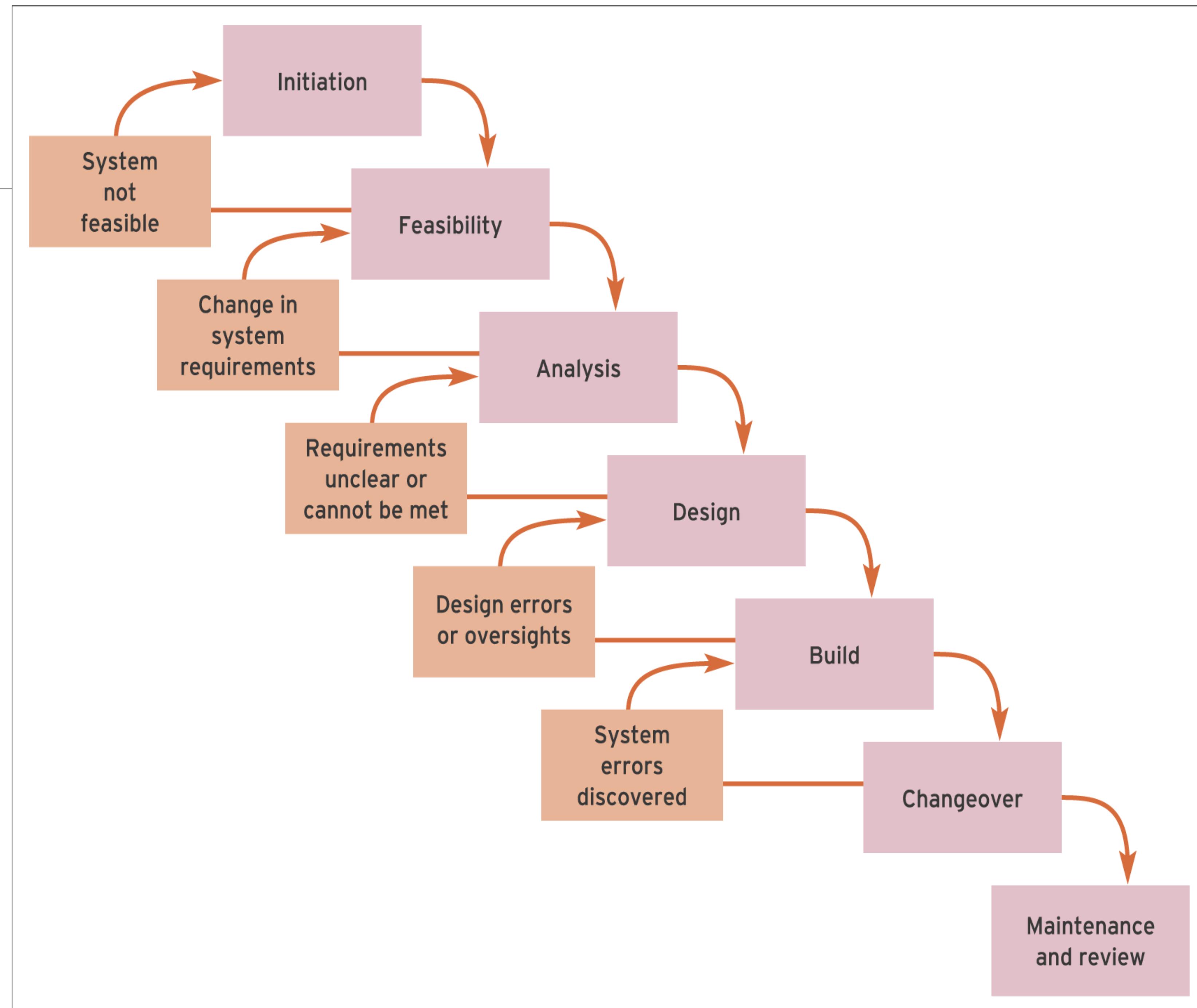
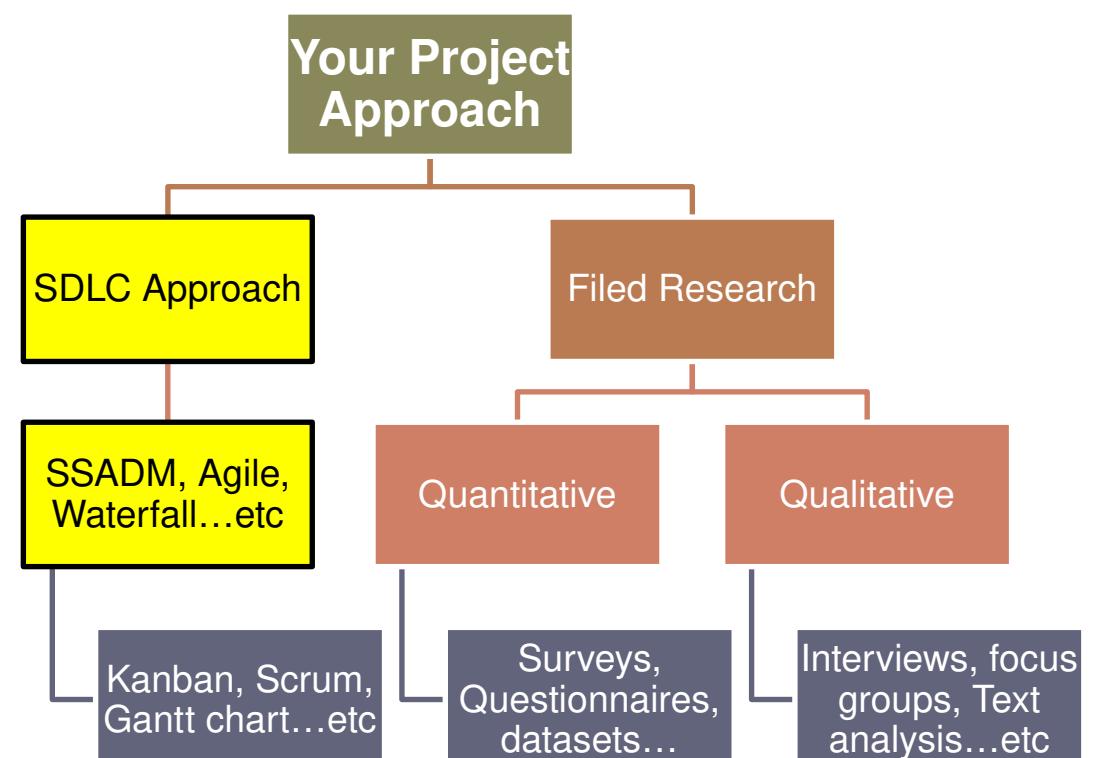
# Your Project Approach

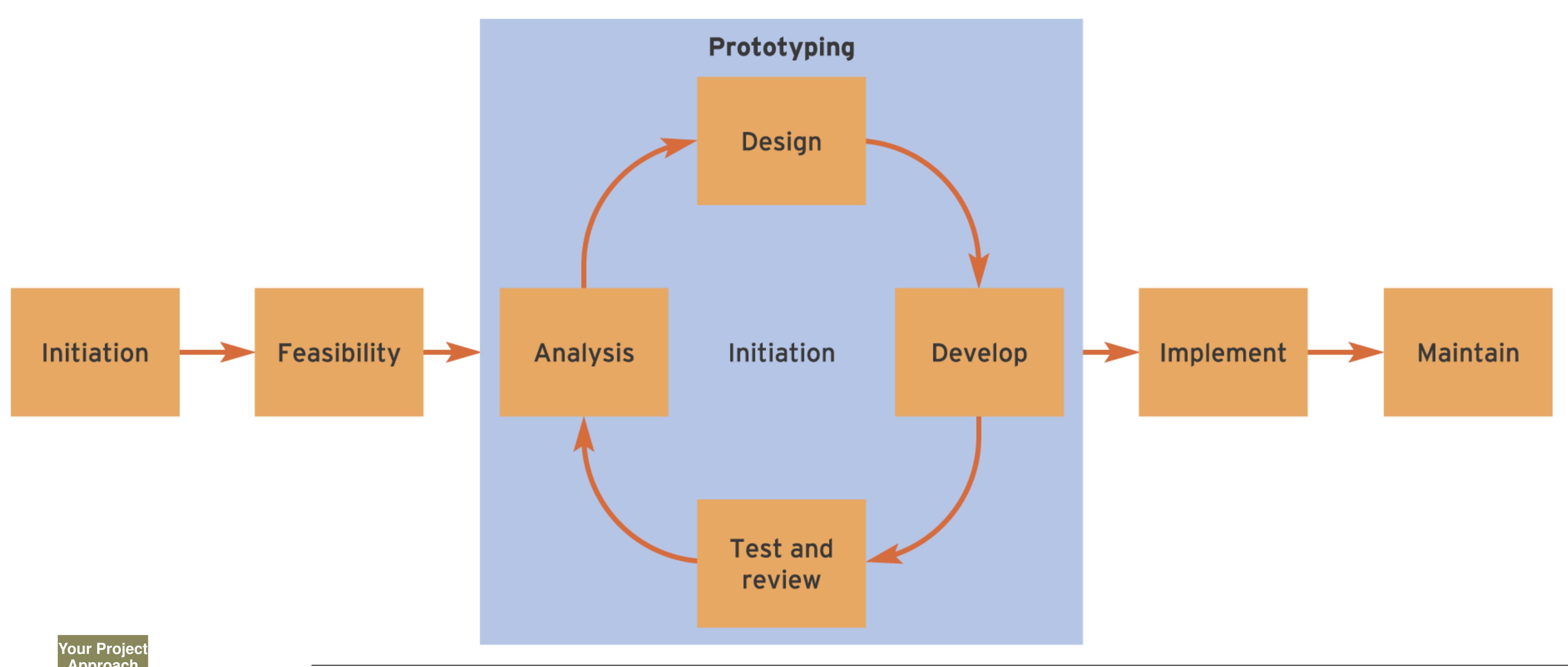


# SSADM

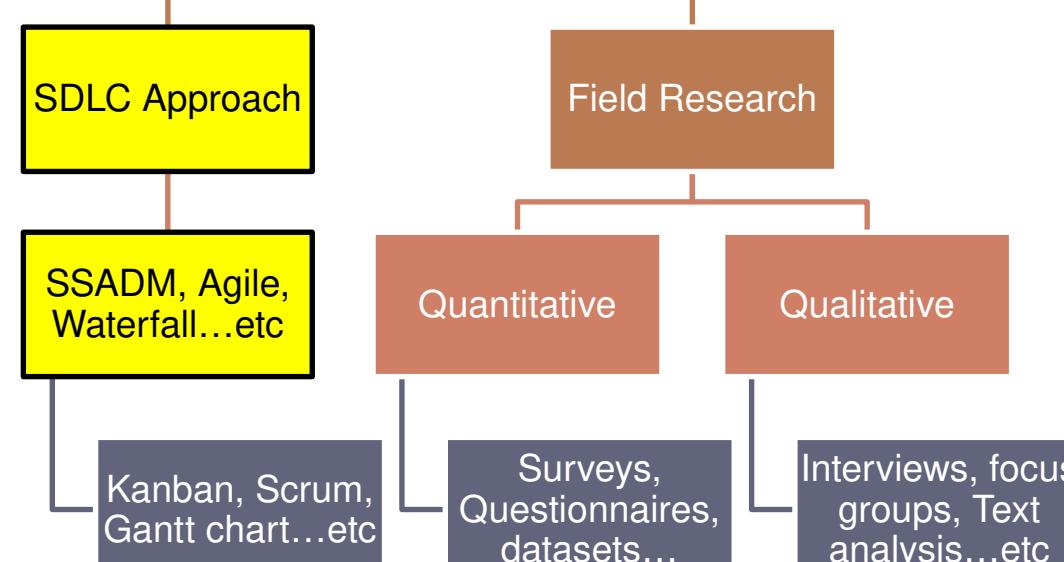


# Waterfall

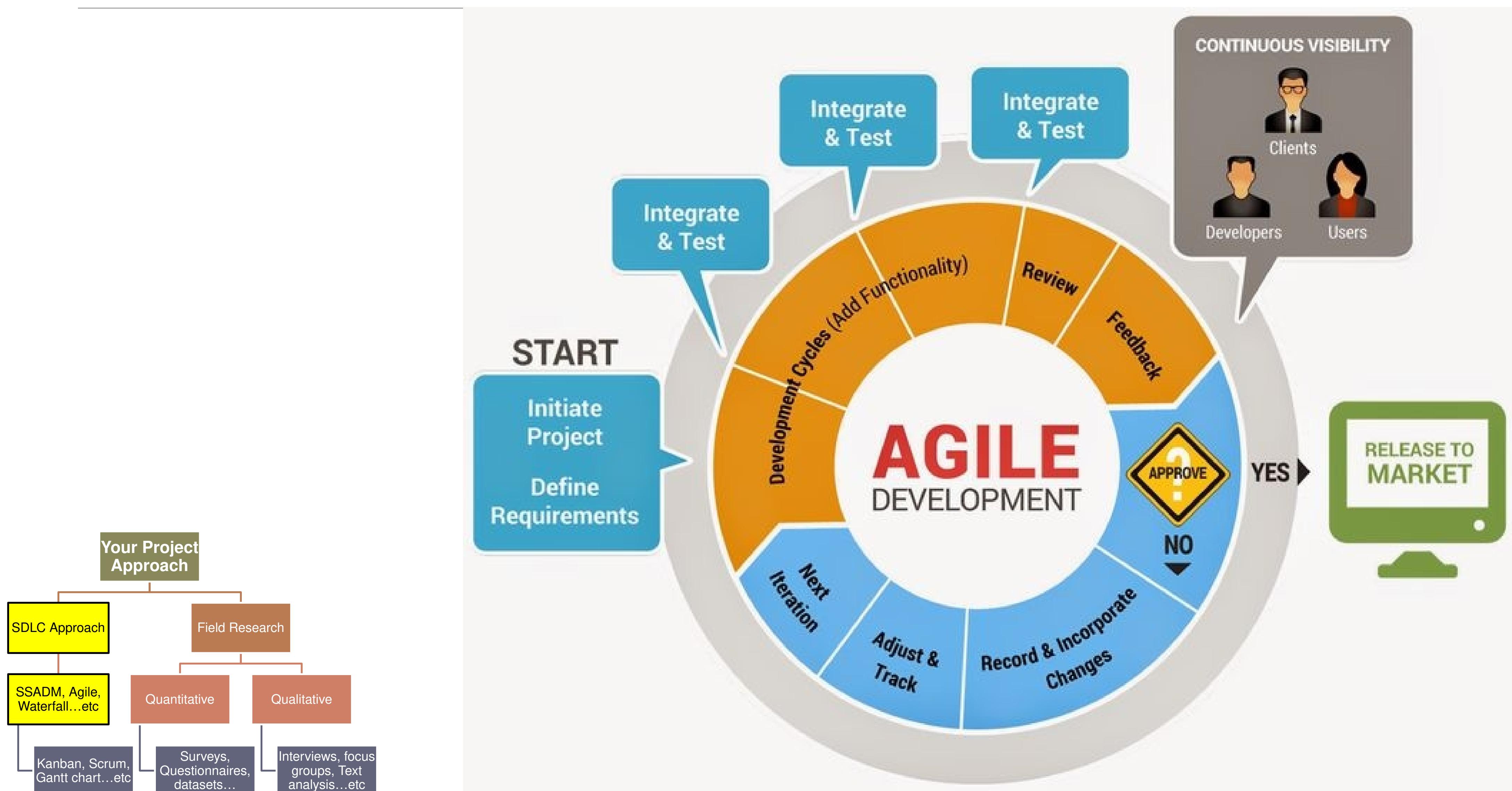




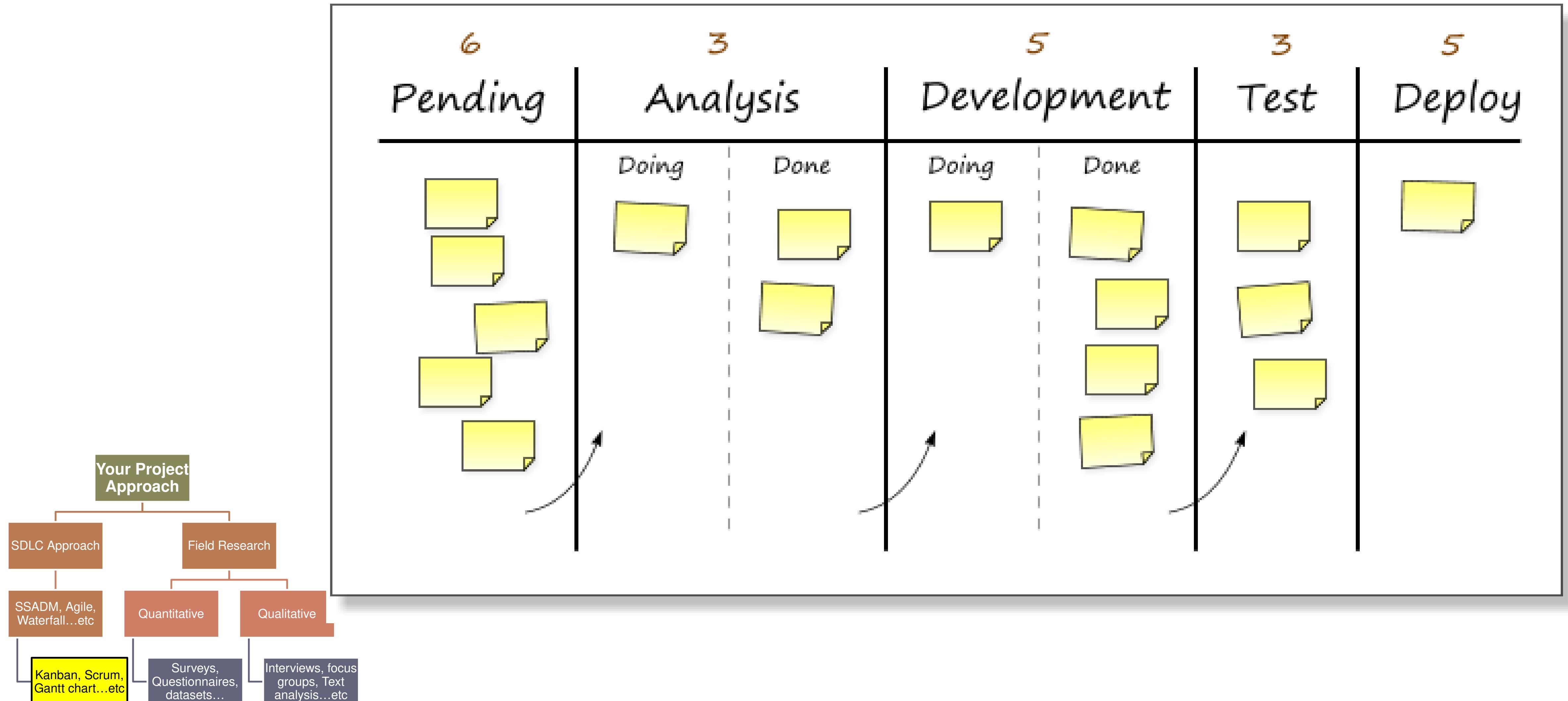
#### Your Project Approach



# Agile Software Development

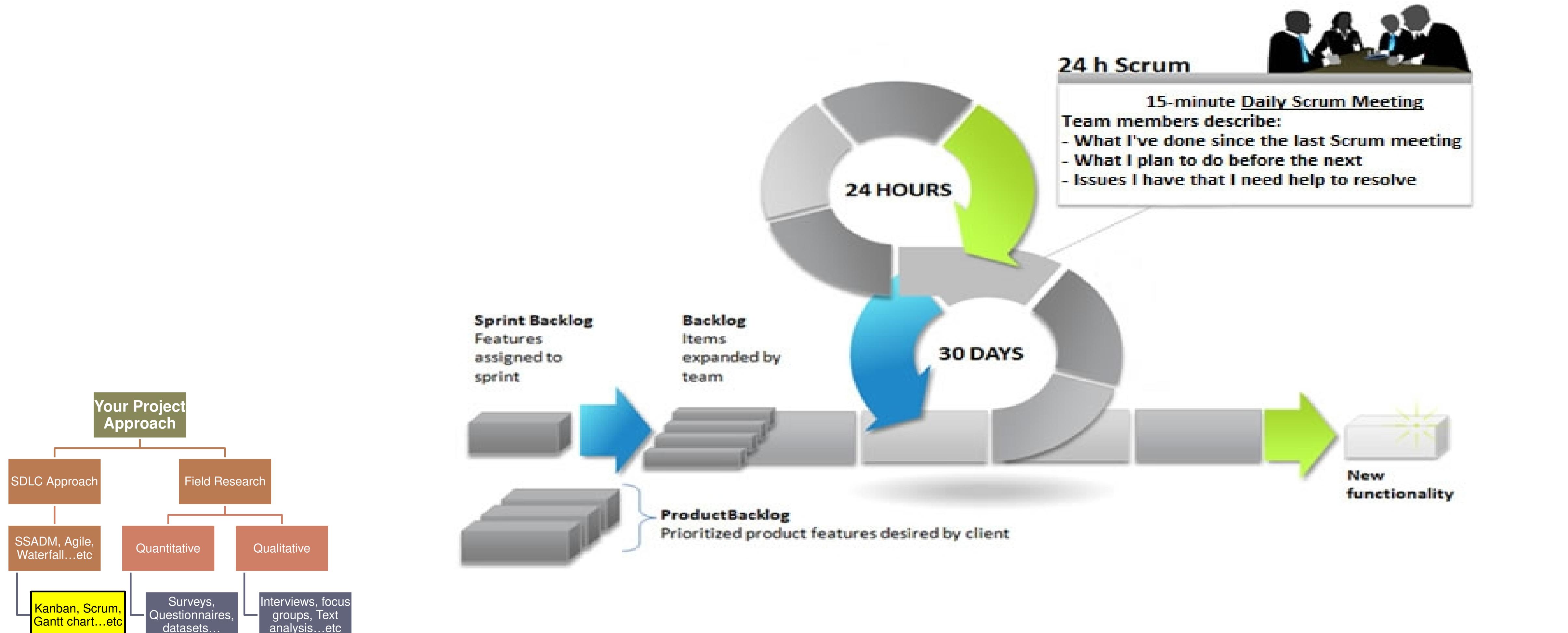


# Kanban Boards



# SCRUM Process

## SCRUM PROCESS



# The lecture explaining these processes are available

---

- These processes were explained in detail in CN4000
- You may have forgotten them or need to refresh your memory.
- A recording of these methodologies and methods will be available under the ‘Consolidate’ section.

# The lecture explaining these processes are available

---

↳ 6.6. CN4000 SDLC Lecture.



**CN/CD4000 Week 2: An introduction  
to acquiring and developing BIS**

Mr Arish Siddiqui (Module leader)

Dr Fadi Safieddine (Caretaker)

1



**Resources that support BIS**



# Field Research Methodology and Methods

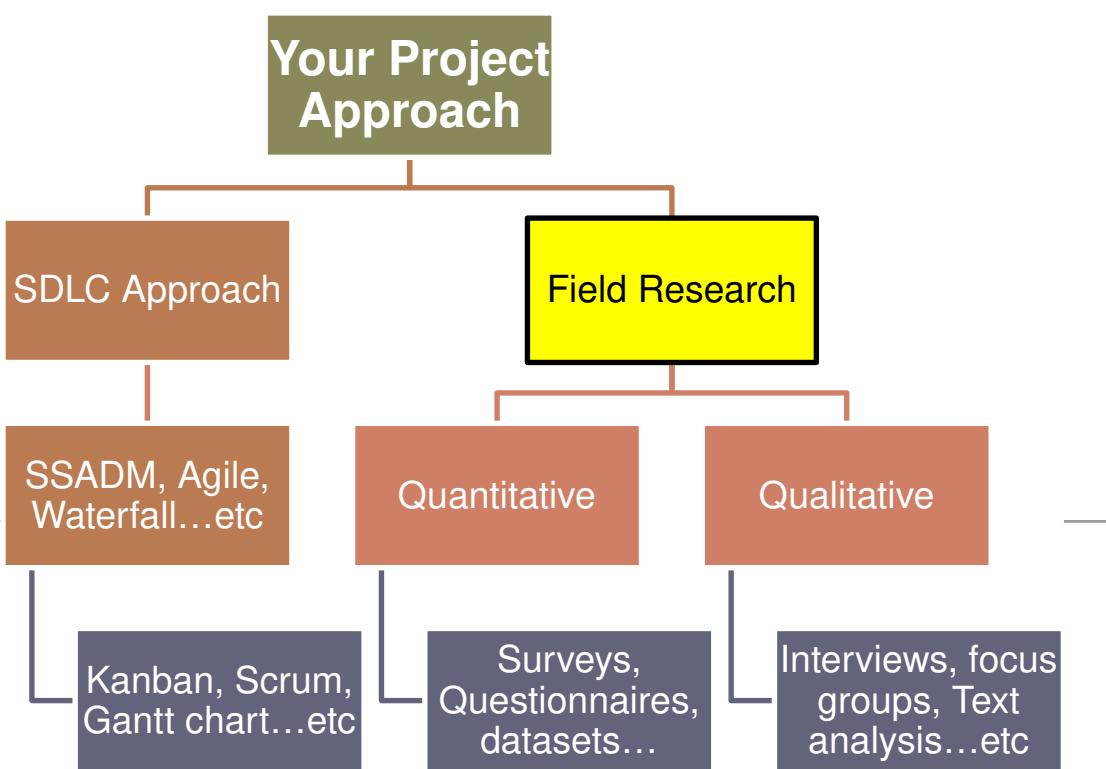
We can identify two major approaches of field research:

- **Quantitative:**

- Common in the fields of natural sciences
- Uses numeric scales
- Understand how something is constructed /built/works

- **Qualitative:**

- Common in the fields of social sciences
- Understanding factors and underlining issues.
- Common within the field of information science (interviews, observations).



# Quantitative method: Surveys

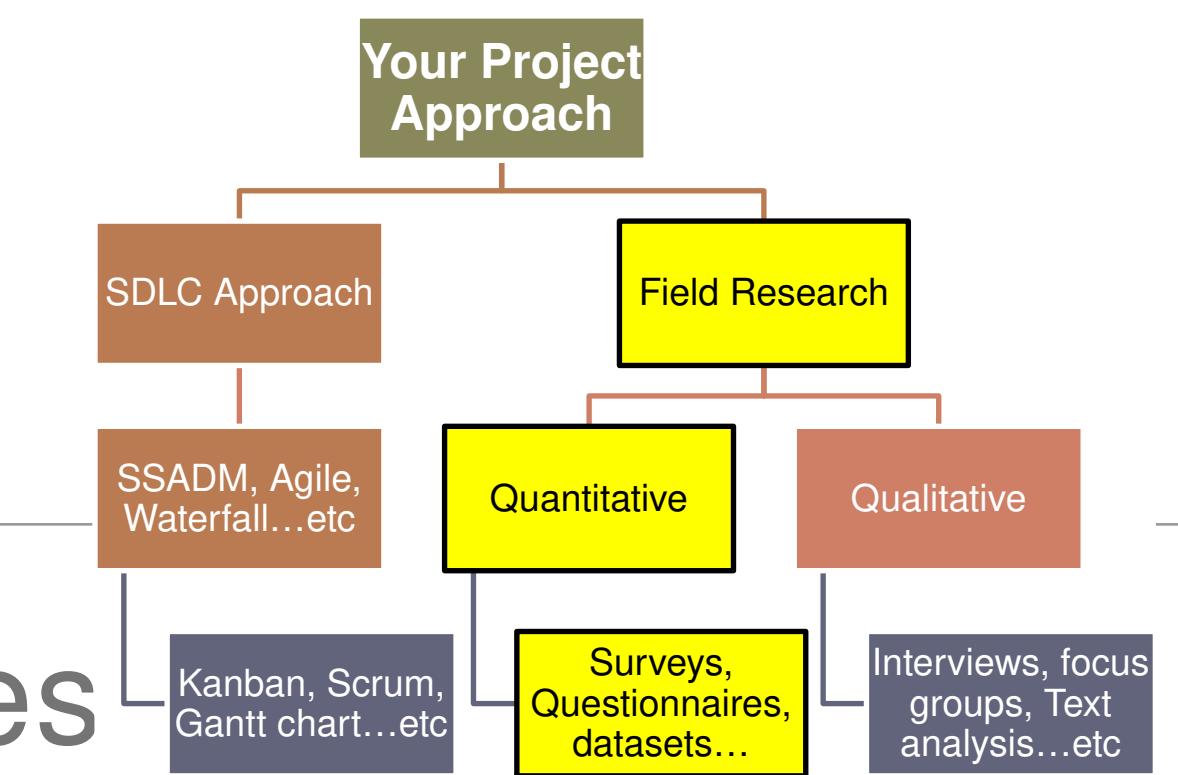
This is usually undertaken through the use of questionnaires

As part of a survey, you might have

- to identify **samples** and **sample sizes**
- to design tailored questionnaires
- to define data to be collected

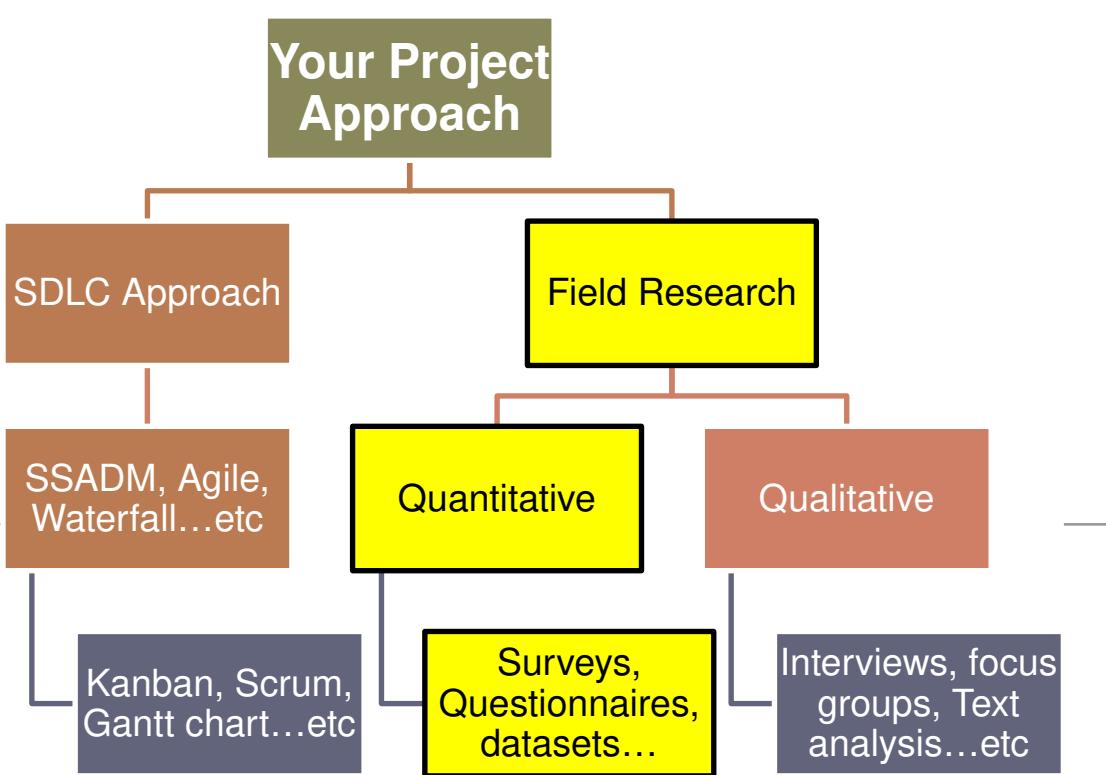
Surveys are the most commonly used research method in undergraduate projects.

We will discuss that more in at later lessons



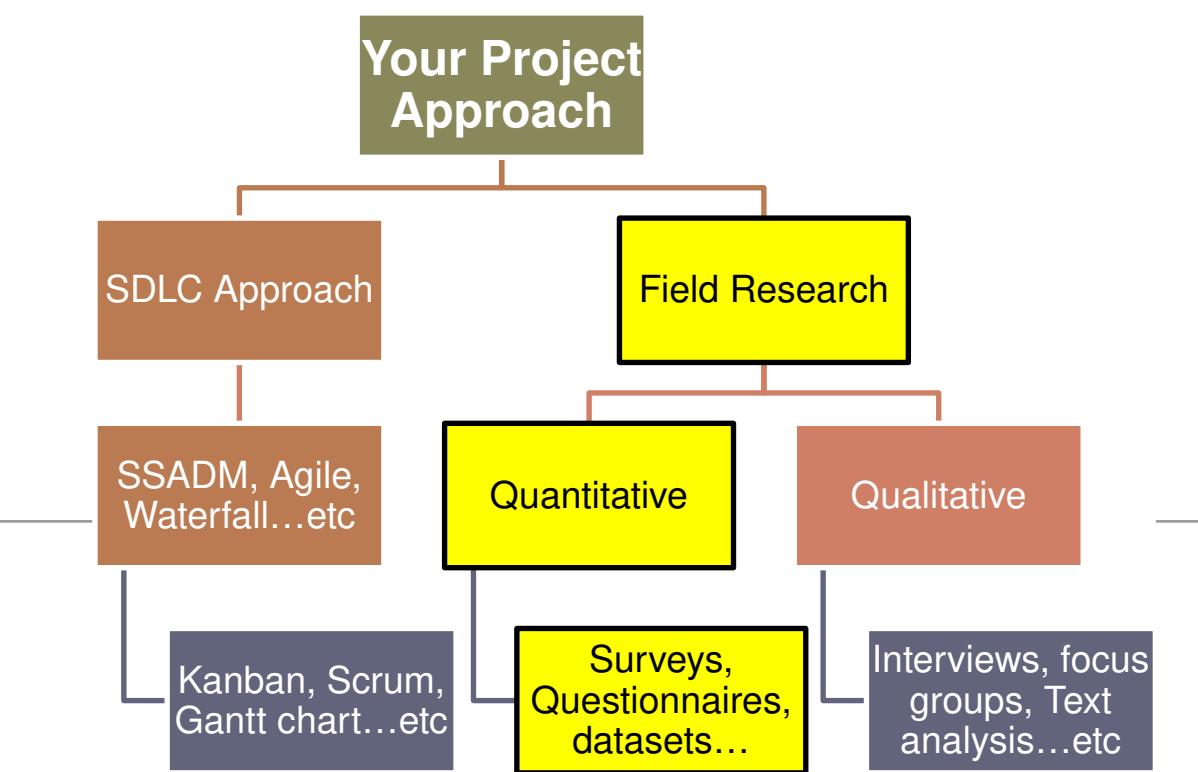
# Example of survey questions

- Binary
- Multiple Choice
- Likert
- Open ended
- Text
- Numeric



# Example of survey questions

- Binary



**Do you believe that the death penalty is ever justified?**

Yes

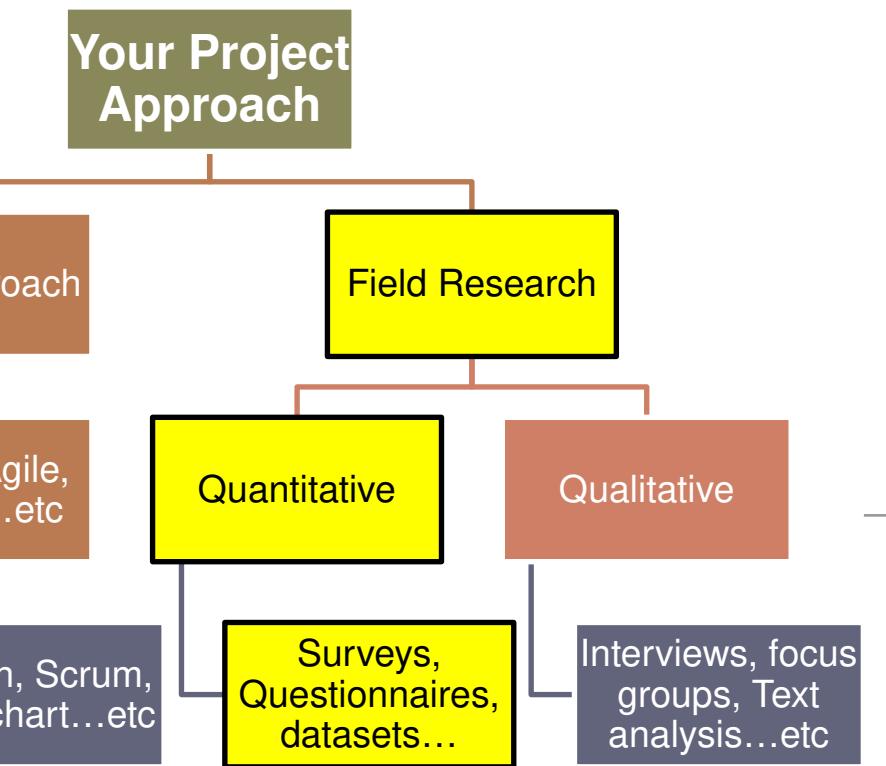
No

**Please enter your gender:**

Male     Female

# Example of survey questions

- Binary



**Do you believe that the death penalty is ever justified?**

\_\_\_ Yes

\_\_\_ No

Please enter your gender:

Male     Female

Binary questions are NOT good

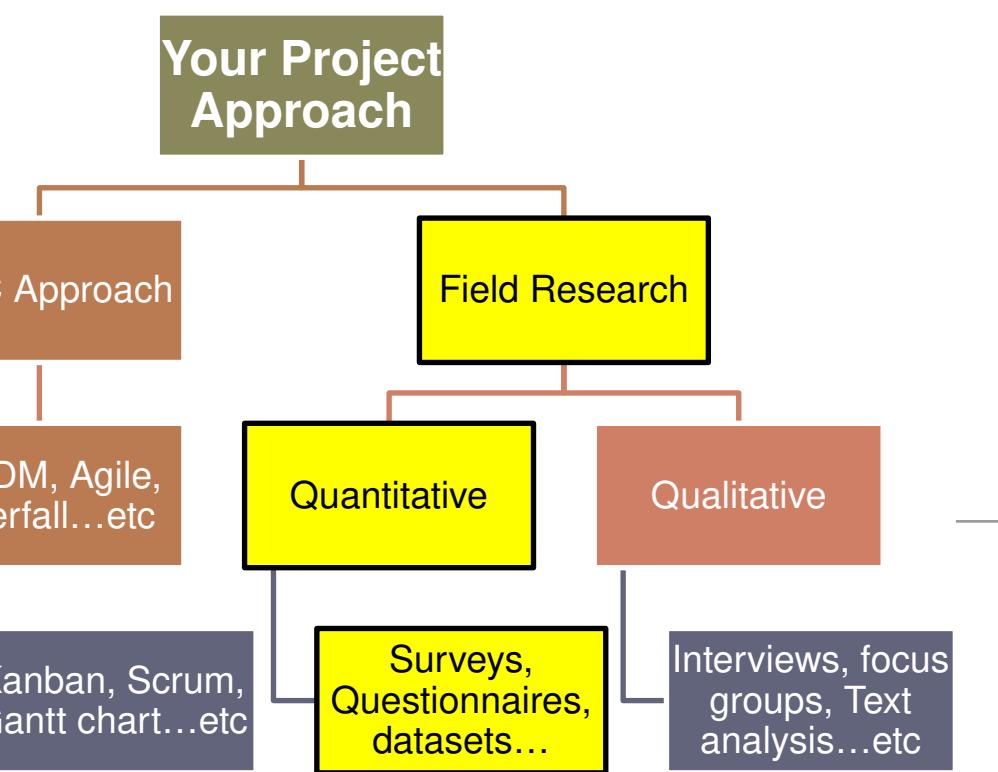


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Pioneering Futures Since 1898

# Example of survey questions

- Multiple Choice questions



## 2. How do you like your coffee?

- With milk/cream
- With non-dairy cream (soy milk, almond milk, etc.)
- With sweetener
- Other - Write In

# Example of survey questions

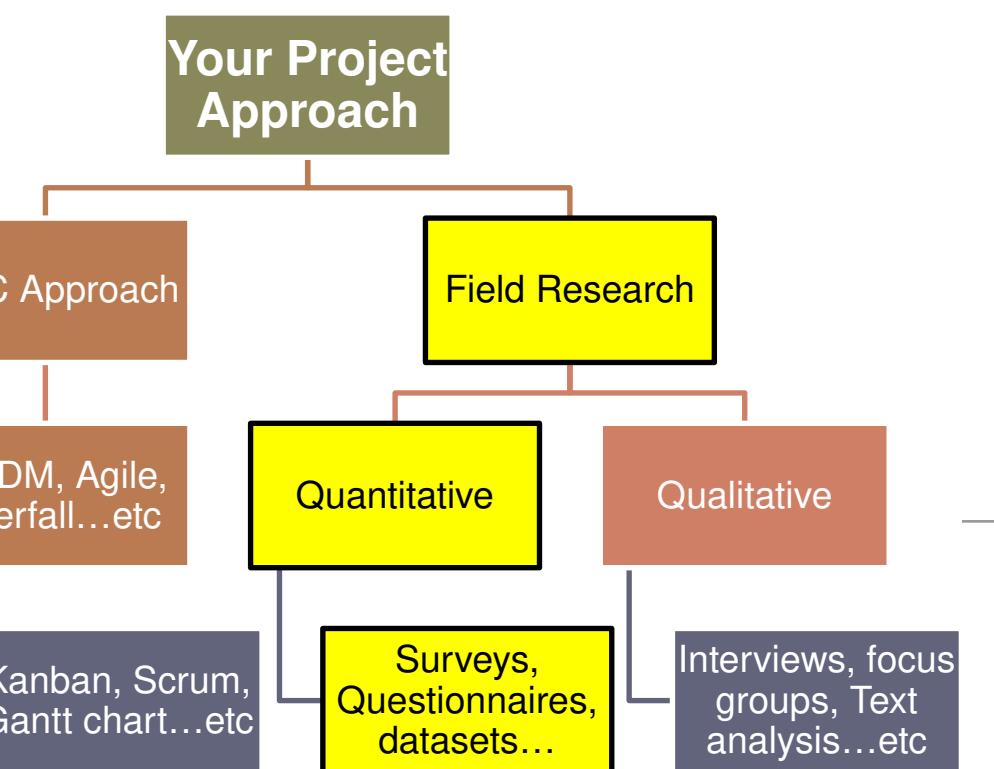
- Multiple Choice questions

2. How do you like your coffee?

- With milk/cream
- With non-dairy cream (soy milk, almond milk, etc.)
- With sweetener
- Other - Write In

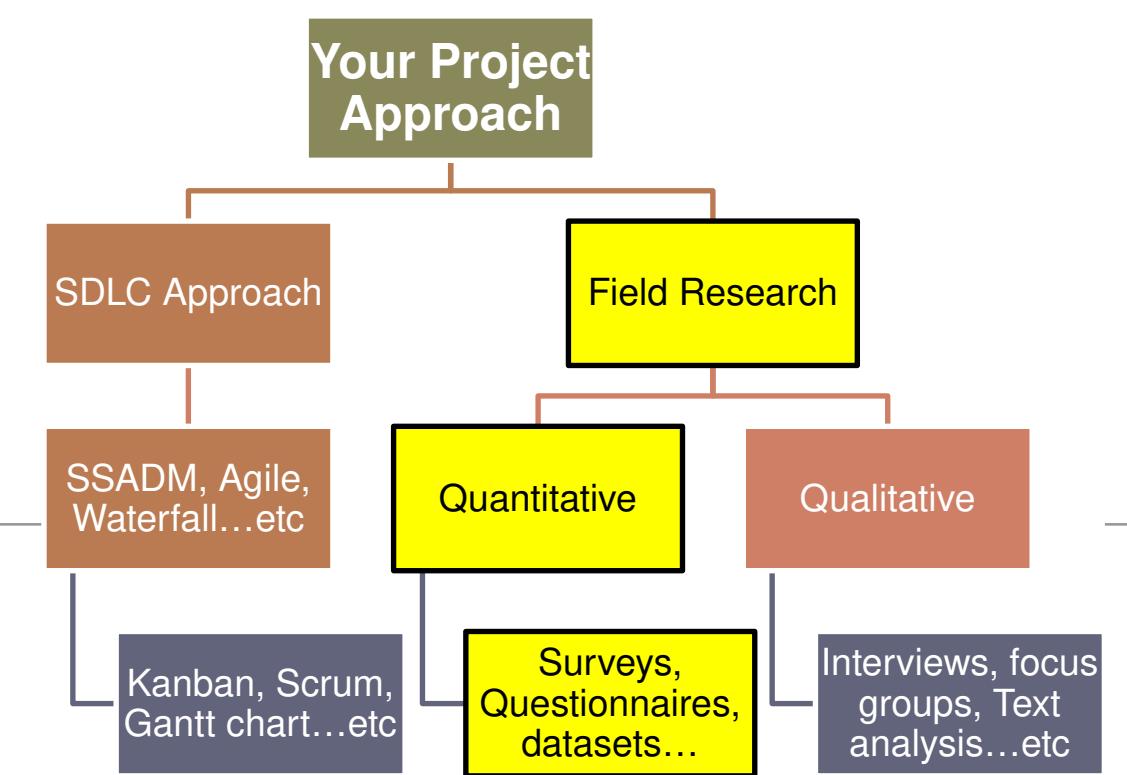
14. When visiting your favorite local café or coffee shop, how do you usually get there?

- Car
- Bus
- Bicycle
- Walking
- Other - Write In



# Example of survey questions

- Likert Questions (5 scale)

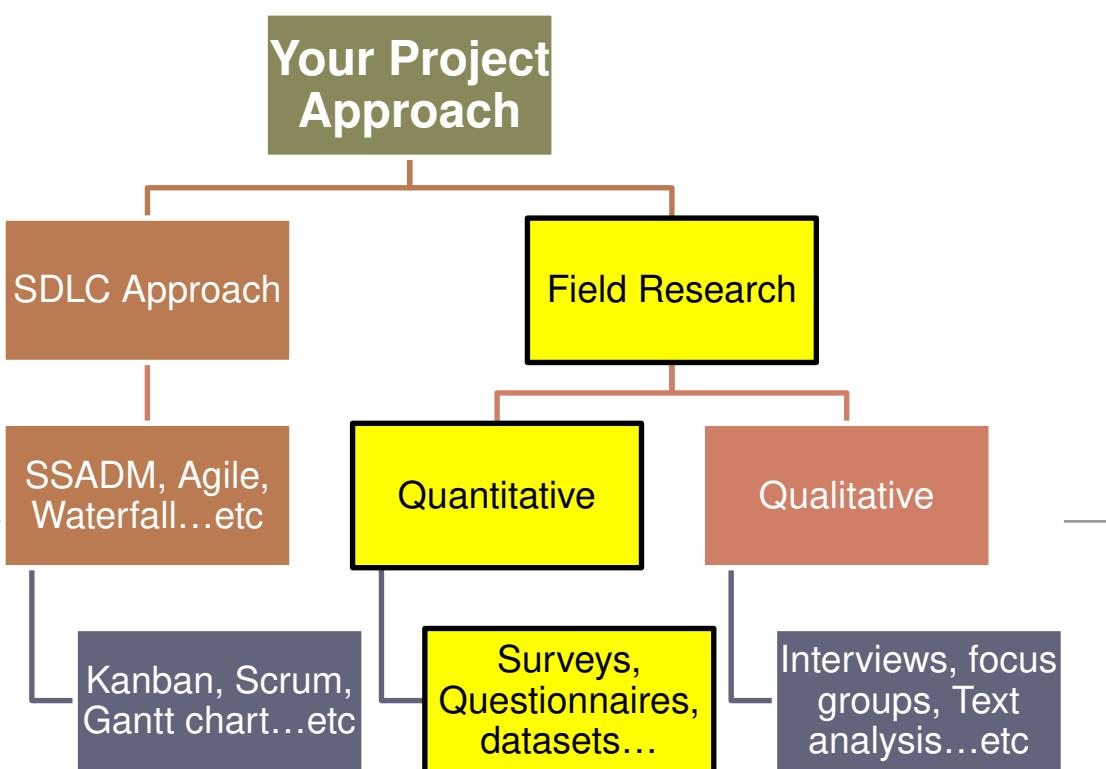


	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I'm fully focused at my job.	<input type="radio"/>				
I'm motivated at work.	<input type="radio"/>				
I feel encouraged to do my best at work.	<input type="radio"/>				
I'm motivated to go extra miles at work when needed.	<input type="radio"/>				
My job gives me the opportunity to develop my skills.	<input type="radio"/>				
My job gives me the opportunity to learn new skills.	<input type="radio"/>				
I feel I'm appreciated at work.	<input type="radio"/>				
I feel my work is appreciated.	<input type="radio"/>				
My work and dedication to company are fairly rewarded.	<input type="radio"/>				
I look forward to go to work every day.	<input type="radio"/>				
Superiors shows me sincere interest for my career goals at work.	<input type="radio"/>				
I am inspired by my organization's vision.	<input type="radio"/>				



# Example of survey questions

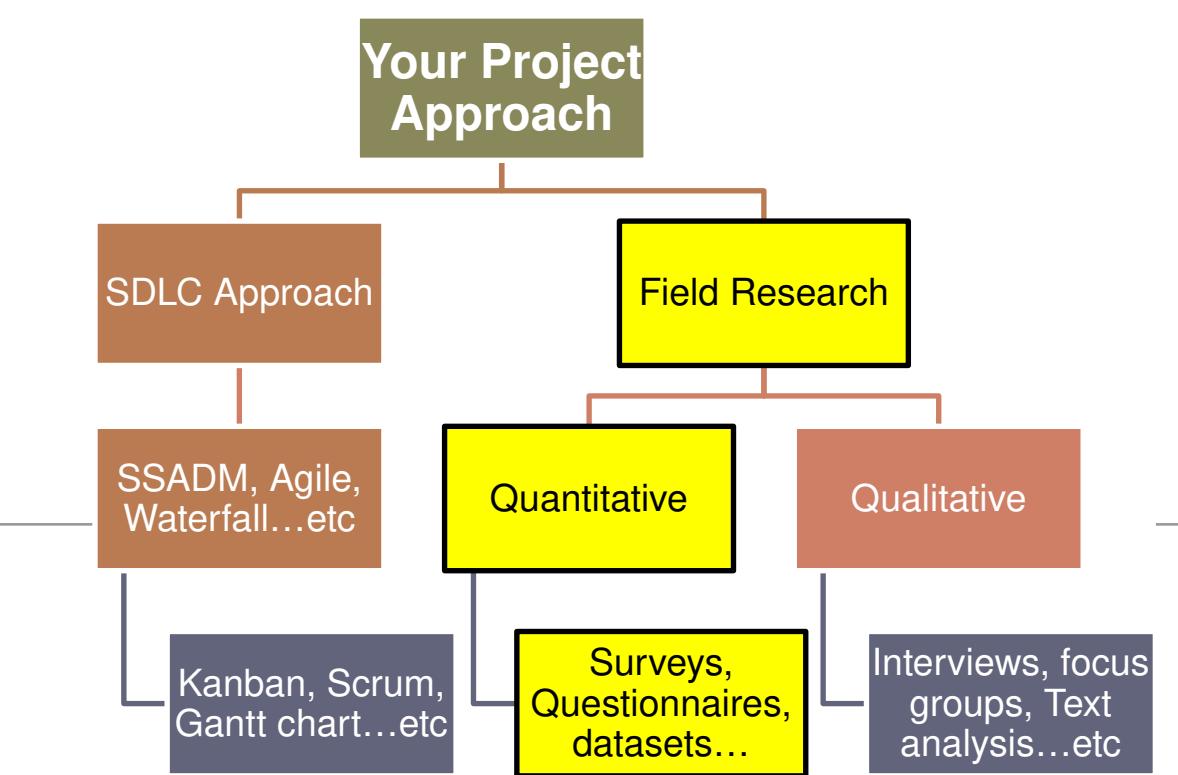
- Likert Questions (5 scale)



#	Question	Survey Scale: 1=Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree
1	I have easy access to the supplies and equipment I need to do my work on this unit.	1 2 3 4 5
2	The support services to this unit respond in a timely way.	1 2 3 4 5
3	I can discuss challenging issues with care team members on this unit.	1 2 3 4 5
4	My ideas really seem to count on this unit.	1 2 3 4 5
5	I speak up if I have a patient safety concern.	1 2 3 4 5
6	Care team members on this unit feel free to question the decisions or actions of those with more authority.	1 2 3 4 5
7	Important patient care information is exchanged during shift changes.	1 2 3 4 5
8	If I have an idea about how to make things better on this unit, the manager and other staff are willing to try it.	1 2 3 4 5
9	Care professionals communicate complete patient information during hand-offs.	1 2 3 4 5
10	Essential patient care equipment is in good working condition on this unit.	1 2 3 4 5

# Example of survey questions

- Some open ended questions



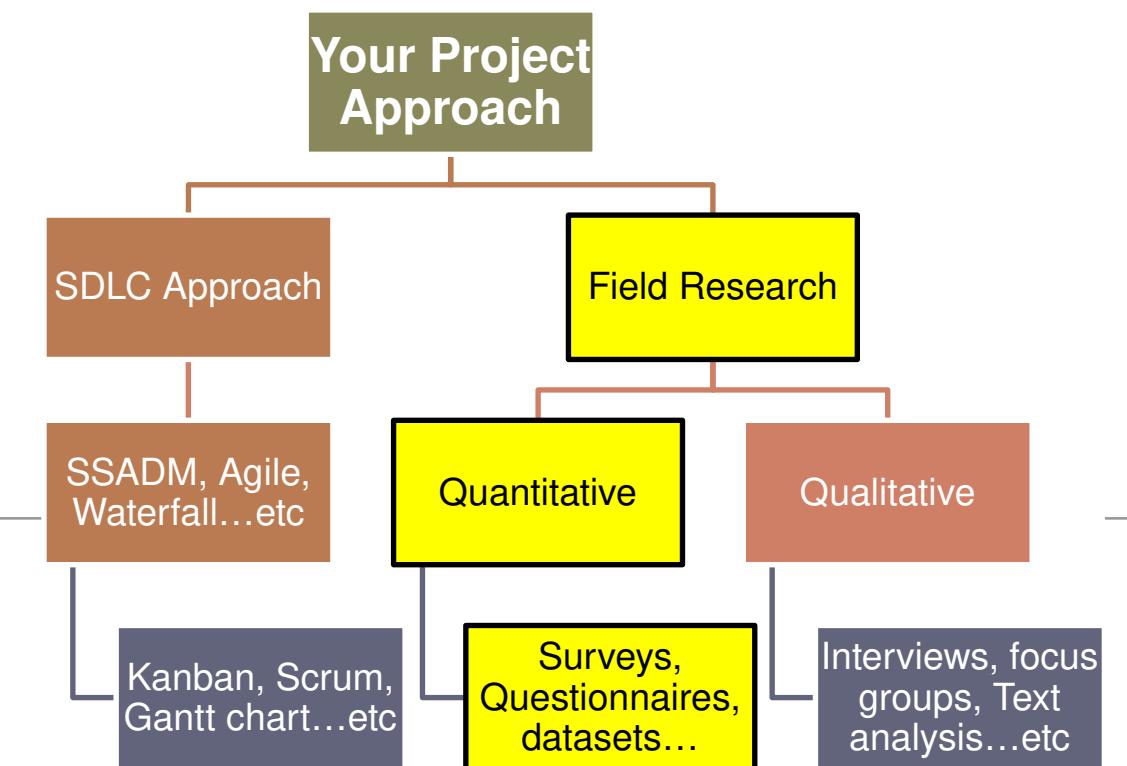
13. Tell us about the first time you drank coffee.

# Example of survey questions

- Some open ended questions

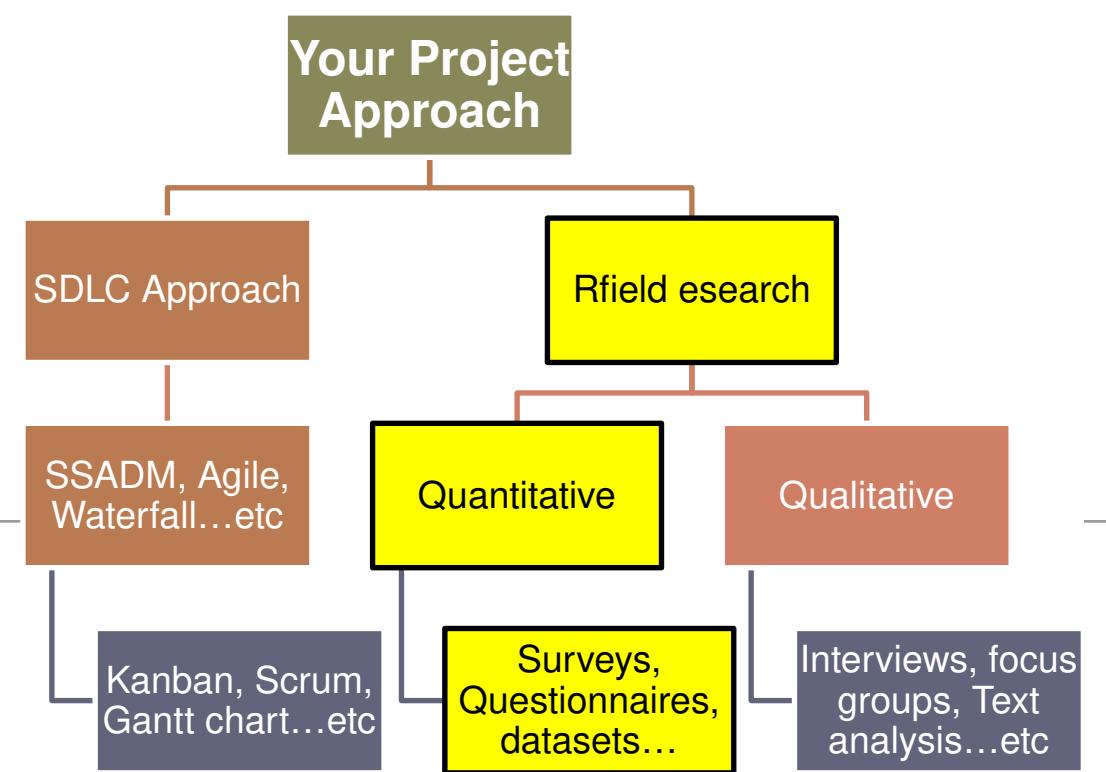
13. Tell us about the first time you drank coffee.

Cannot be used for Qualitative Research!!



# Example of survey questions

- Some open ended questions



1)\* How satisfied are you with our selection of products?

Very satisfied    Satisfied    Neutral    Dissatisfied    Very dissatisfied

Any comments?

2)\* How satisfied are you with the ease of the order process?

Very satisfied    Satisfied    Neutral    Dissatisfied    Very dissatisfied

Any comments?

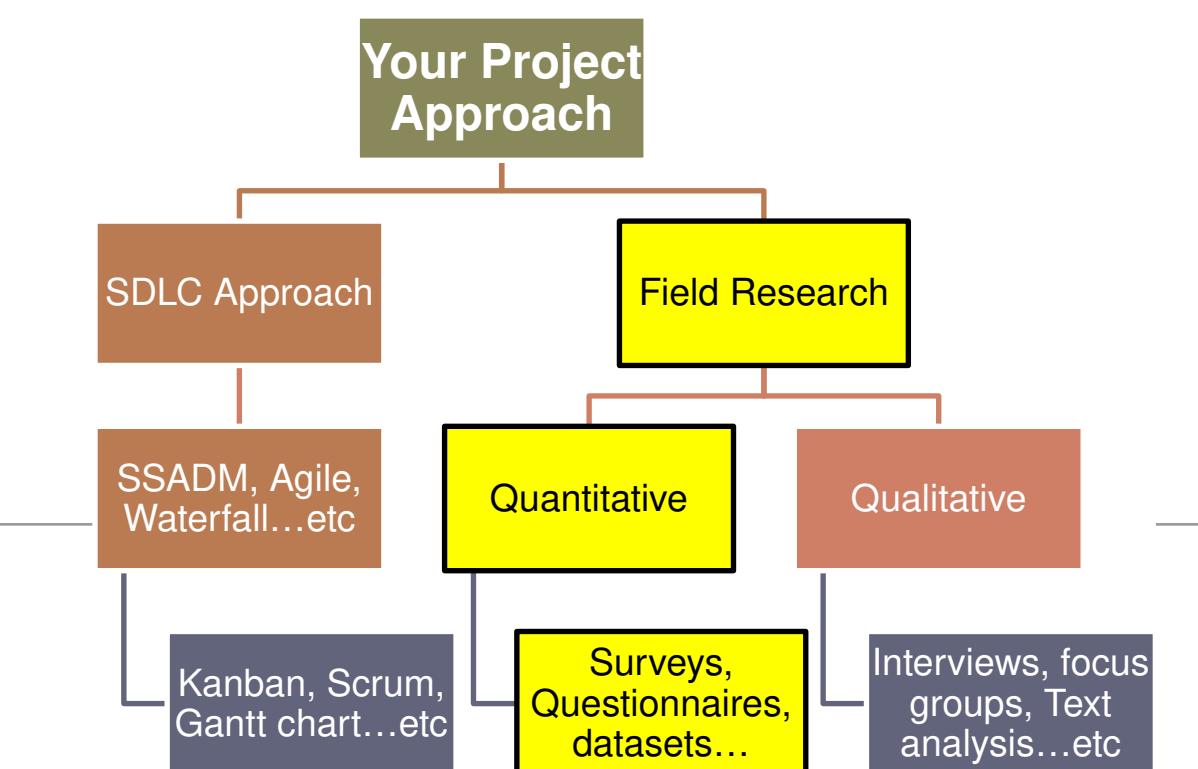
3)\* How satisfied are you with the speed of delivery of your order?

Very satisfied    Satisfied    Neutral    Dissatisfied    Very dissatisfied

Any comments?

# Example of survey questions

- Numeric



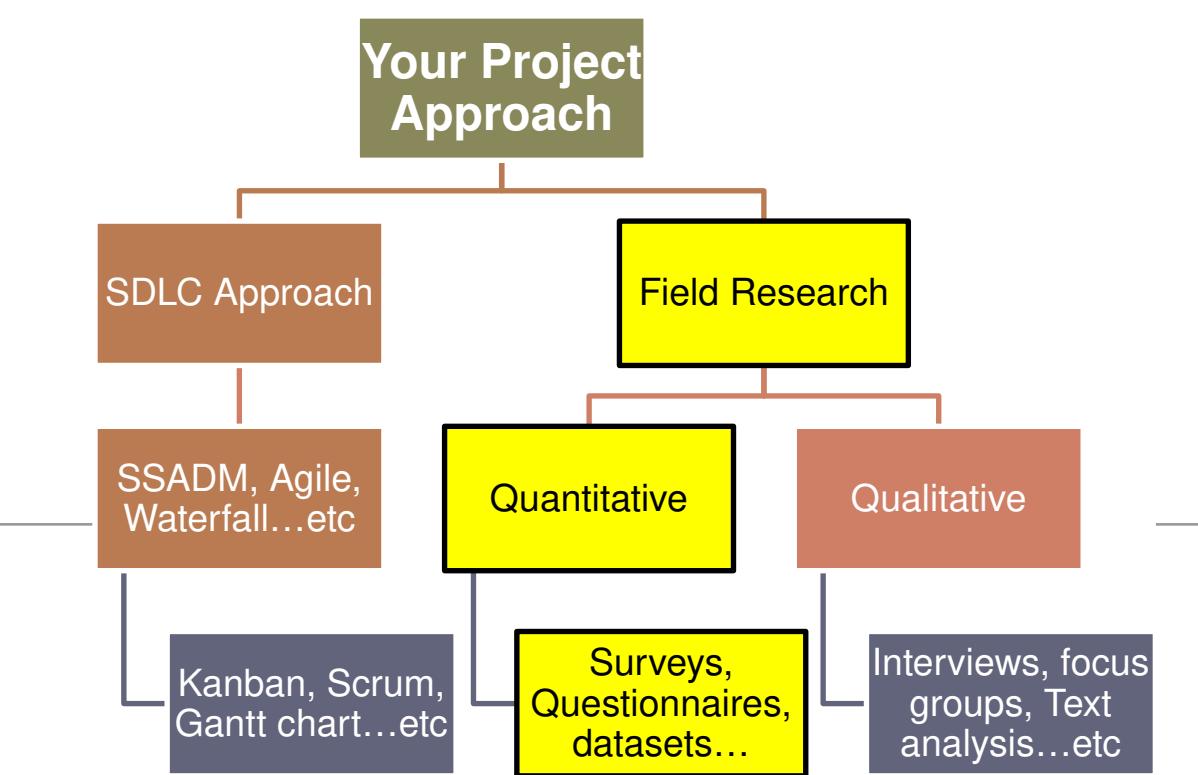
5. How many people live in this house? Live-in servants or other employees are included in the count.

Next Question

2. How much did you spend on groceries this week? \_\_\_\_\_

# Example of survey questions

- Textual



What city do you live in? \*

Short-answer text

# Online Surveys

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# Internet survey systems

Web survey systems provide advanced support with features such as predefined questions, custom collectors, crosstabulation reporting etc.



Strongly recommended for UEL



# Surveys: Getting Responses

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Surveys through questionnaires usually produce very low response rates.

- You could contact your subjects beforehand to get their agreement to respond.
- Another way of improving your response rate is to offer to send any respondents a summary of the results.
- Including a cover letter is also a good way of introducing yourself the purpose of the study.
- Surveys do not have to be online! Face to Face surveys.

## Reflect 2:

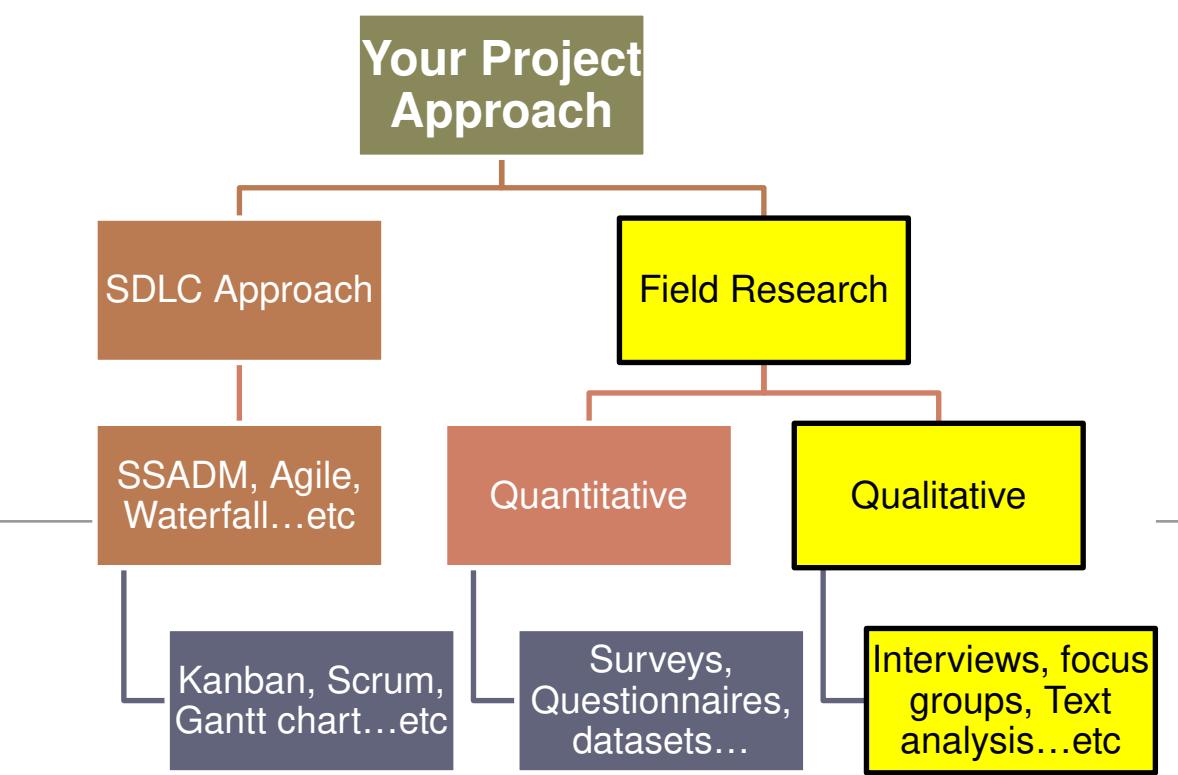
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- Could you use a survey to validate your design? How many people like your design?
- Could you create a survey to see what students ‘really’ want?
- Any questions about surveys?

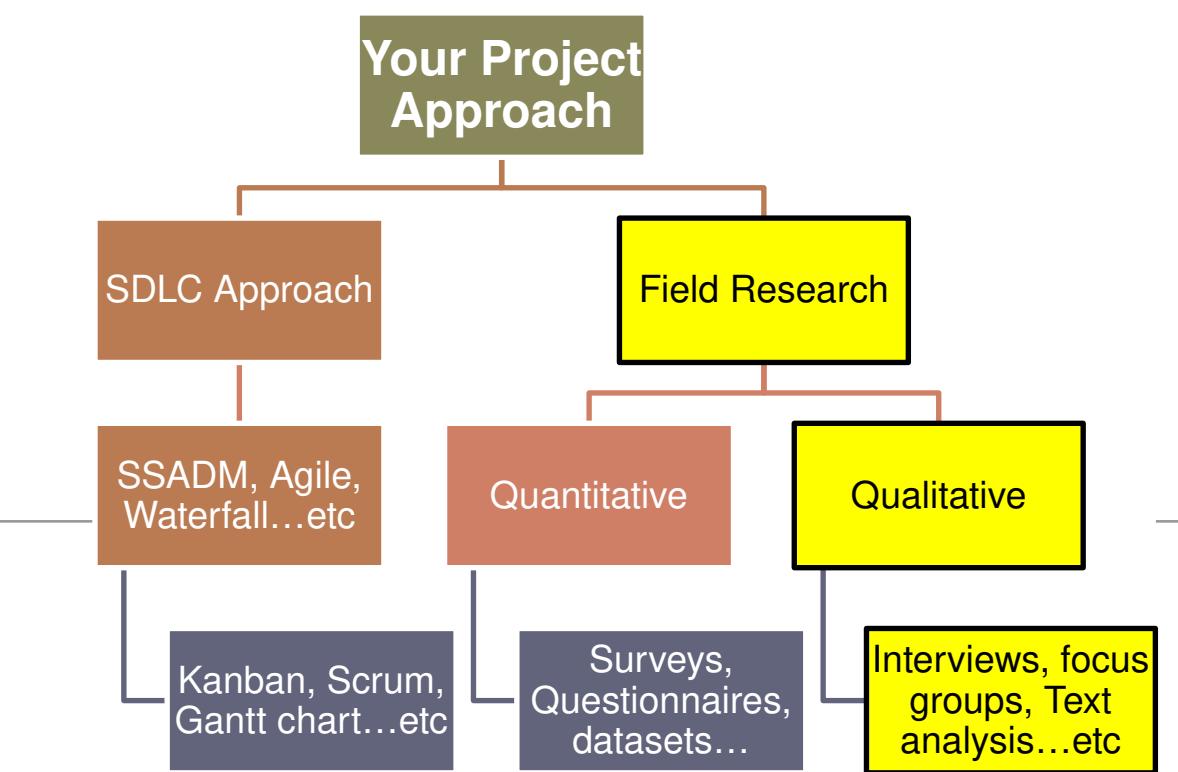
# Qualitative Method: Interviews

Interviews can be:

- *Semi-structured*
  - a series of preset questions that you go through with the interviewee,
- *unstructured*
  - less formal with open-ended questions offering more flexibility in terms of answers.
- Unstructured interviews may provide interesting data, but the data is typically more complex to analyze, and hence, it is more challenging to extract useful information.
- It is recommended to have ‘semi-structured’ interviews.



# Qualitative Method: Interviews

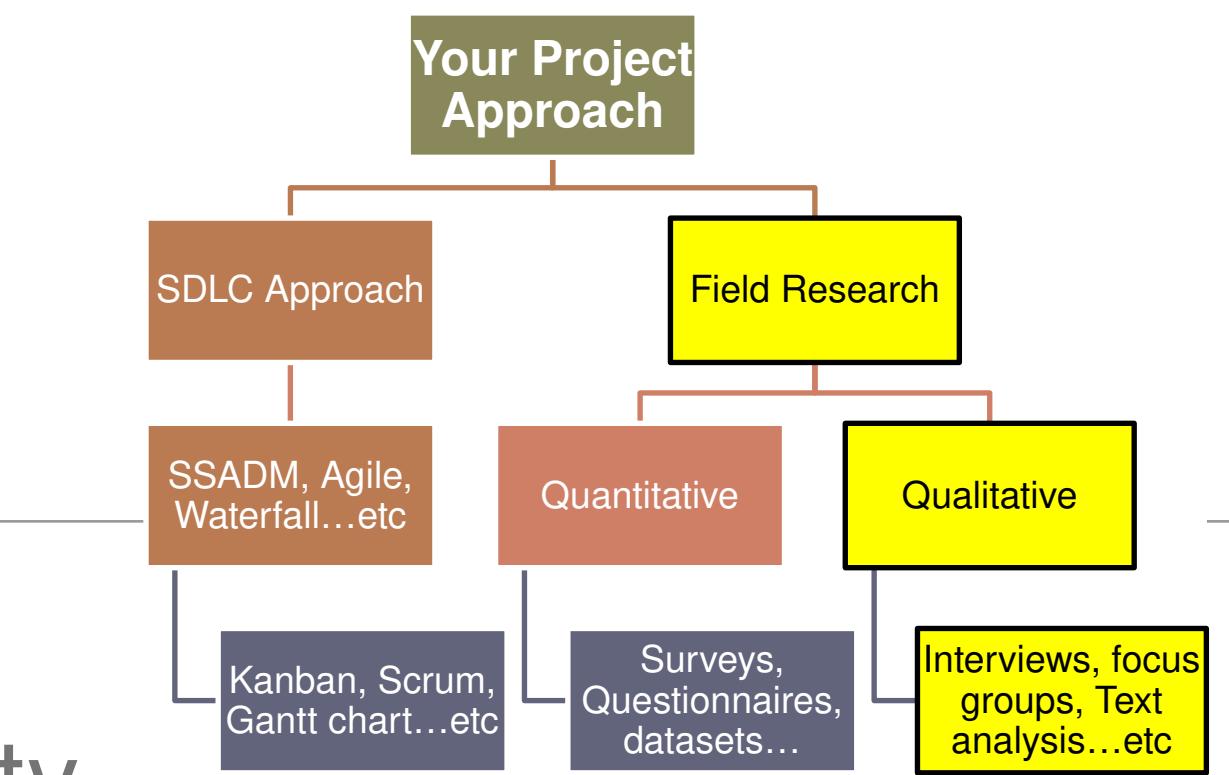


You need to put a lot of thought and preparation into your interviews. Here are a few points to take into account when designing your interview.

- **Selecting interviewees.** If you are performing a case study within a company, you might not be able to interview the people you really need to.
- **Preparation.** Have some opening questions ready to ask in an unstructured interview, or carefully prepare a set of questions for a structured interview.
- **Questions.** You could prepare a set of questions and use this as a basis for your interviews. This would ensure consistency when interviewing a number of people.

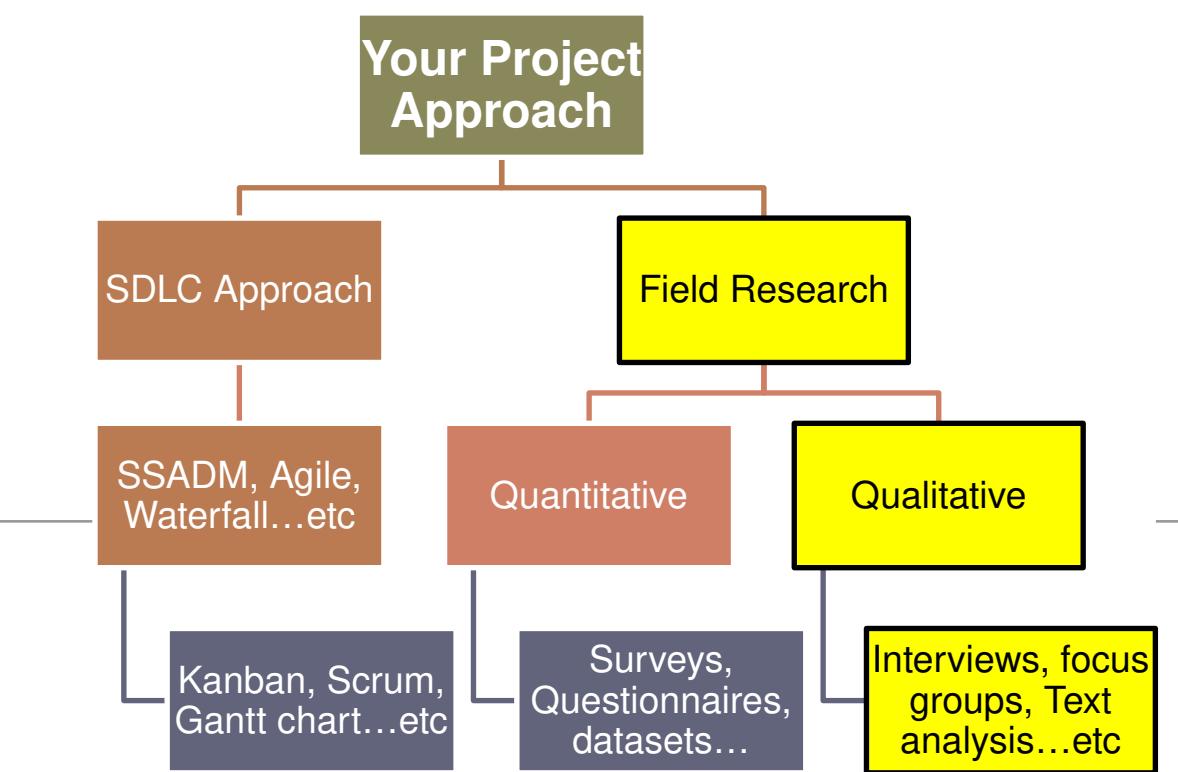


# Qualitative Method: Interviews



- **Confidentiality.** You MUST guarantee the interviewee's confidentiality, if appropriate.
  - Consider whether the information they are providing is confidential to their company.
  - May need to arrange some sort of confidentiality clause or disclosure agreement.
  - Consider what happens to the transcript of the interview and also what you will be able to reproduce in your report.
- **Logistics of the session.** You will need to arrange the interview, the time, location and duration. Be aware that this can take time to organize as people are very busy.

# Qualitative Method: Interviews



- **Characterization.** You might be interviewing several people during the course of your study, and they may have different backgrounds (technical, personal, etc.).
  - You should consider how their background might influence their responses.
  - When you perform an interview, interviewees need to be able to trust you, and you should not betray that trust!

Without trust, your interviewee may not provide you with the depth of detail you hope to achieve.

# Some Examples of Interview Questions

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- Do you find the existing system helps you get the job done?
- Can you give me examples of features of the existing system that you don't like?
- Roughly how often do you and your colleagues make mistakes entering order details?
- Which type of mobile app would best meet your needs? An HTML 5 based application or a native application?
- Who is responsible for setting network security policy within your organisation?
- Tell me what you like about the system?

**Always ask yourself: Do you need that question? How will it help you answer your research?**

## Surveys and Interviews: Drafts and pilot test

---

Whatever approach you decide to take, you **HAVE TO** check it with your supervisor and try it out with a limited number of people (classmates) to see what feedback you receive.

You might then redraft the questions in light of these responses (rephrase questions, restructure the layout, and so on).

And finally,

- Avoid leading questions.
- Avoid jargon. The users may not understand what you mean or have a different interpretation of you,
- Avoid asking questions that could be difficult to answer.

# Field Research Methods: Case Studies

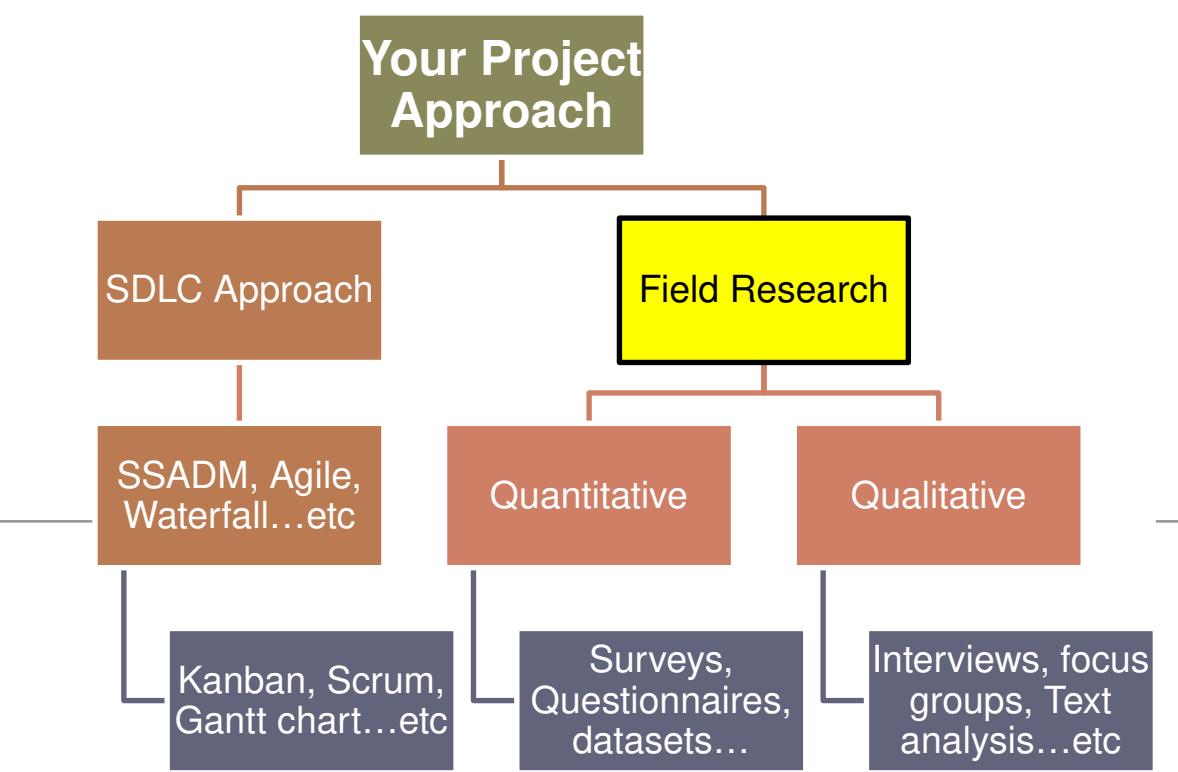
## An in-depth exploration of a situation:

It involves the investigation of a particular situation, problem, company or group of companies. This investigation can be performed:

- directly (interviews, observation),
- indirectly (study of reports or documentation).

In a case study, the purpose is not to simply report on the outcome of the case study investigation.

A proper case study also requires analysis and generalisation from the specific details of the examined situation.

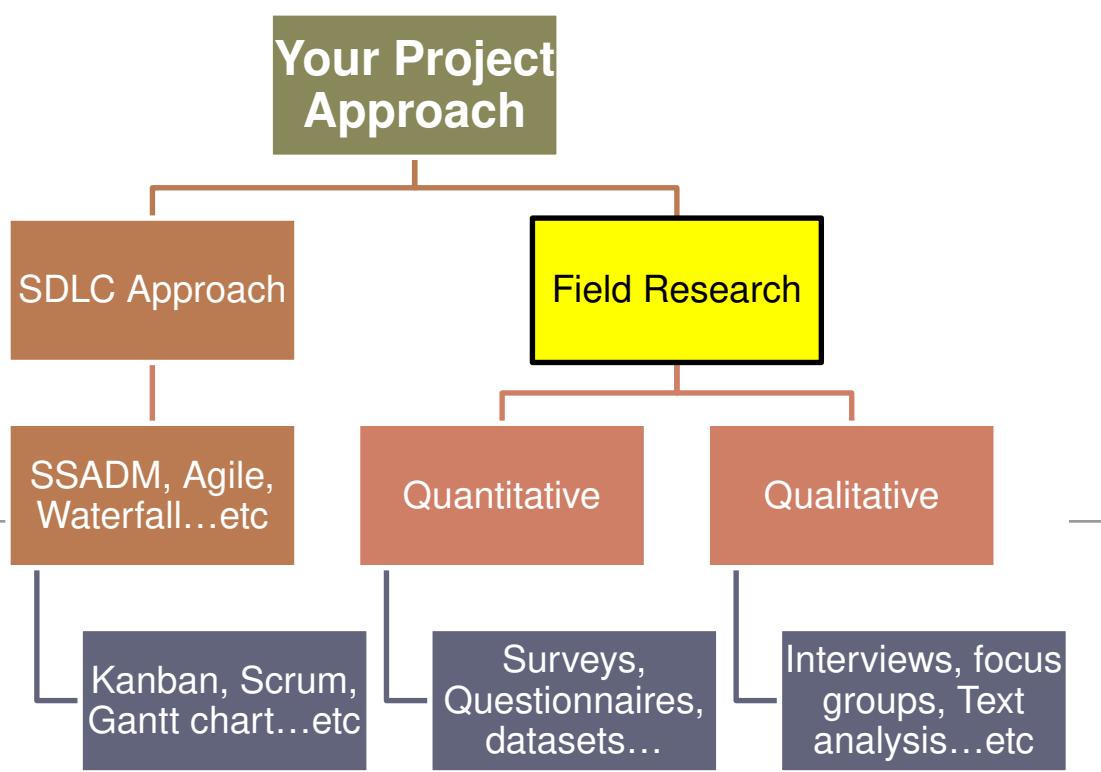


# Research Methods: Case Studies (cont.)

You should also be aware of your own influence on the case study if it is performed directly.

For example, when you interview people:

- did they tell you what they felt you wanted to hear rather than the facts of the situation?
- are there any means of obtaining data from two or three different sources to confirm the truth in what you are told?



## Reflect 3:

---

- Could you use an interview to validate your design? Show them and collect feedback.
- Could you use interviews to see what students ‘really’ want?
- Any questions about interviews?

## Examples:

---

- Newham Health App?

## Examples:

---

- Newham Health App?
  - **Agile Approach** using Gantt chart, Kanban using Zoho Creator.
  - **Qualitative Approach** using
    - **Focus group** invite five residents interested in this app as to what they would like to have features in this app.
    - Review feedback other local health apps have on the App stores.

## Examples:

---

- Newham Health App?
  - **Waterfall Approach** using Scrum and Network Planning using AppSheet.
  - **Quantitative Approach** using
    - Survey of 50 Newham resident students about their health habits.
    - Survey of facilities in Newham.

# Can we combine Qualitative and quantitative in research?

---

- Newham Health App?
  - **Waterfall Approach** using Scrum and Wireframe using HTML5 & Javascripting.
  - **Quantitative Approach** using
    - Survey of 50 Newham resident students about their health habits.
    - Survey of facilities in Newham.
  - **Qualitative Approach** using
    - Focus group invite five residents interested in this app as to what they would like to have features in this app.  
**YES**

**It is correct but you will not have enough time!**

## Examples:

---

- Newham Health App?
  - **Waterfall Approach** using Scrum and Network Planning using AppSheet.
  - **Quantitative Approach** using
    - Survey of 50 Newham resident students about their health habits.
    - Survey of facilities in Newham.
  - **OR**
  - **Qualitative Approach** using
    - Focus group invite five residents interested in this app as to what they would like to have added **Better stick to one**

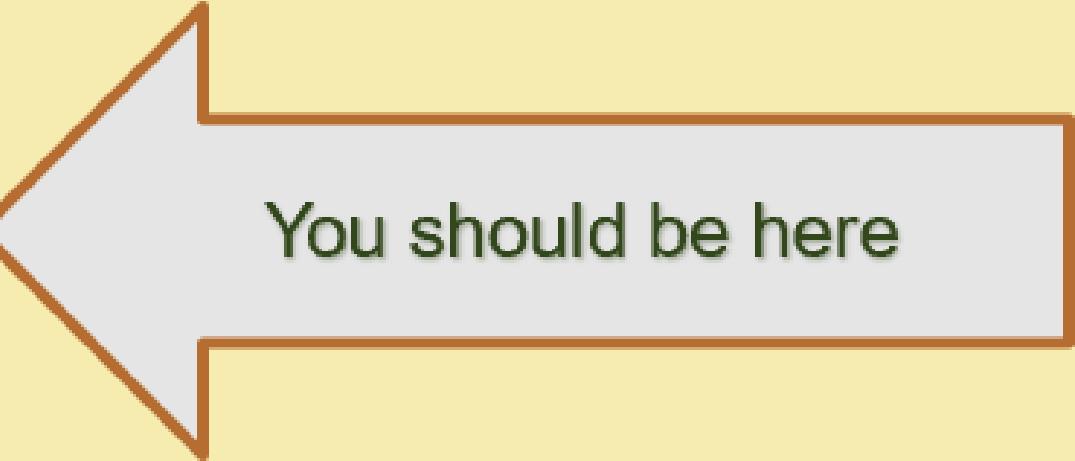
**only**

# Where do you write your Approach?

- You write it in chapter 3: Methodology!

Most projects/reports in the university follow the following structure:

- Title Page
- Contents page
- Chapter 1: Introduction
- Chapter 2: Literature review
- **Chapter 3: Methodology**
- Chapter 4: Results
- Chapter 5: Discussion
- Chapter 6: Conclusion
- References
- Appendices



You should be here

# Methodology:

## Typical Structure of a Methodology:

### ***Chapter 3: Methodology***

#### 3.1. Introduction:

...

....

#### 3.2. Approach: :<<define the implementation and research approaches>>

...

#### 3.3. Implementation:

##### 3.3.1. SDLC: Agile

....

##### 3.3.2. Method: Wireframes, E-R, PHP and Javascipts

...

#### 3.4. Research Approach:

##### 3.4.1. Literature

.....

##### 3.4.2. Quantitative Approach using Survey

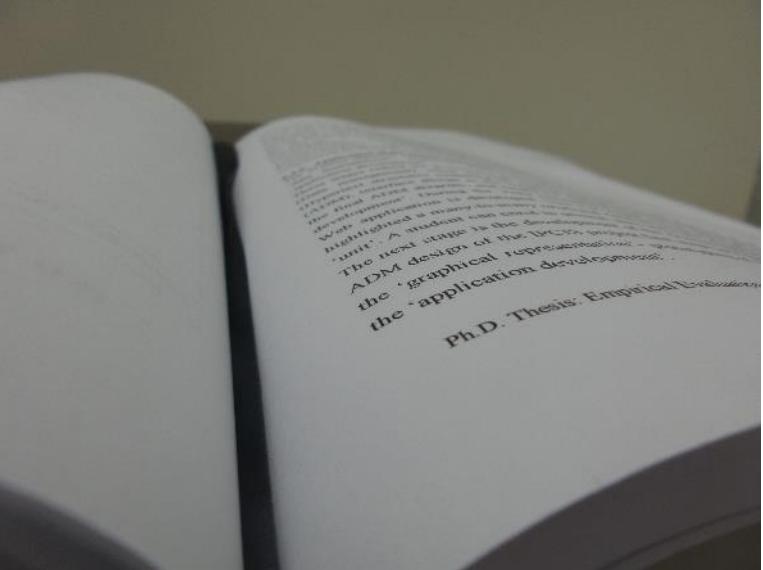
.....

#### 3.5. Challenges and limitations:

....

#### 3.9. Ethical Considerations:

.....



# Homework!

---

- Explore the other tools we could not cover in detail today:
  - Watch CN4000 recordings of SDLC
  - Research other tools: Focus Groups, Observation, Questionnaires...etc.
  - Decide your approach with the support of your supervisor!

# Learning Objectives

Upon completion of this topic, you should be able to:

- Distinguish between the various research methods of relevance to computing projects.
- Identify the circumstances in which you would apply each of the methods to a computing project.
- Select and apply research methods that are appropriate to your project.



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# Directed Reading

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- Dawson, C.W., 2015. Projects in computing and information systems: a student's guide. Pearson Education. Chapter 2
- SurveyMonkey. nd. Avoid Bad Survey Questions: Loaded Question, Leading Question. [ONLINE] Available at: <https://www.surveymonkey.com/mp/5-common-survey-mistakes-ruin-your-data/>. [Accessed 02 October 2021].

