

Adopting Design Thinking Practices to Satisfy Customer Expectations in Agile Practices: A Case from Sri Lankan Software Development Industry

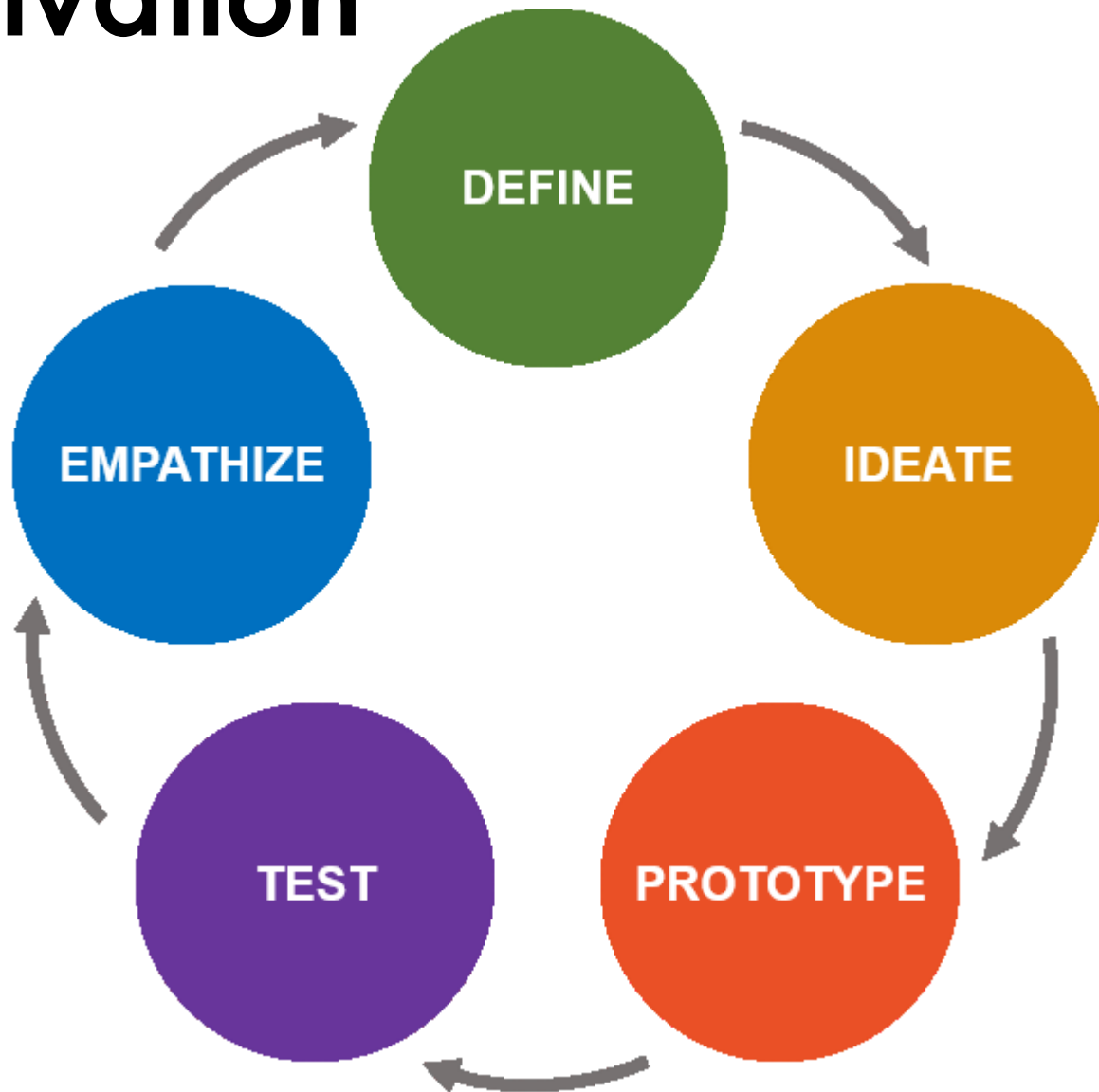
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Motivation



Motivation

- DT is a approach to provide solutions to complex, ill-defined, or unknown problems (Clark & Smith, 2008).
- DT also an iterative process of generating ideas while understanding users and to meet customer needs (F. L. Eickhoff et al., 2018).
- DT understand customer by giving a 360-degree view of the problem by trying many possibilities before coming up with a preferred solution (Holloway, 2009).
- Understanding what the customer wants is the most critical part of software development (Saiedian & Dale, 2000).

Literature

Agile emphasizes the collaboration with customer, but does not guarantee that software development team work towards to solve the correct problem

(Lucena, Braz, & Tizzei, 2016)

Agile practices increase the project success rate, still a significant number of projects fail

(Padmini, Perera, & Bandara, 2016)

This is mainly due to the lack of understanding of customer's expectations

(Hussain, Mkpojiogu, & Kamal, 2016)

However, iterative and incremental delivery of Agile is insufficient when the customer is not getting what he desires.

(Gurusamy et al., 2016)

Even though agile projects have a high success rate, the question to raise would be "can agile provide customer satisfaction by implementing the right features".

(Gurusamy et al., 2016)

ET and DT share a similar process when it comes to the design stage.

(Waks, Trotskovsky, Sabag, & Hazzan, 2011)

DT is a systematic process rather than traditional thinking. It is new to the software development.

(Hassi & Laakso, 2011)

Research Question & Objectives

How to apply design thinking practices to improve customer expectations in agile practices?

Objectives

Identify design thinking elements that can be applied for agile practices.

Identify the use of design thinking practices within agile practices.

How to make use of design thinking practices for effective project management in agile teams.

Findings

- Identified 11 Elements that categorized in to 3 categories (Hassi & Laakso, 2011)

- Customer real need identification
- Customer need into pilot solutions
- Visualizing pilot solution for feedback
- Idea generation for pilot solution
- Brainstorming

- DT Practices and Factors to improve best practices to satisfy customer expectations.
- Framework, to improve the customer satisfaction through DT practices.

DT Categories & Elements

- Design Thinking Categories and Elements (Hassi & Laakso, 2011).
 - Most professionals were unaware of terminology & presence of DT practices.
 - To understand how to apply 5 DT elements with Agile practices.
 - Focus only of usage of DT practices & benefits to be gained.

Practices

- Human-centered approach
- Think by doing / Action based
- Visualizing
- Synthesis of Diverging & Converging
- Collaboration

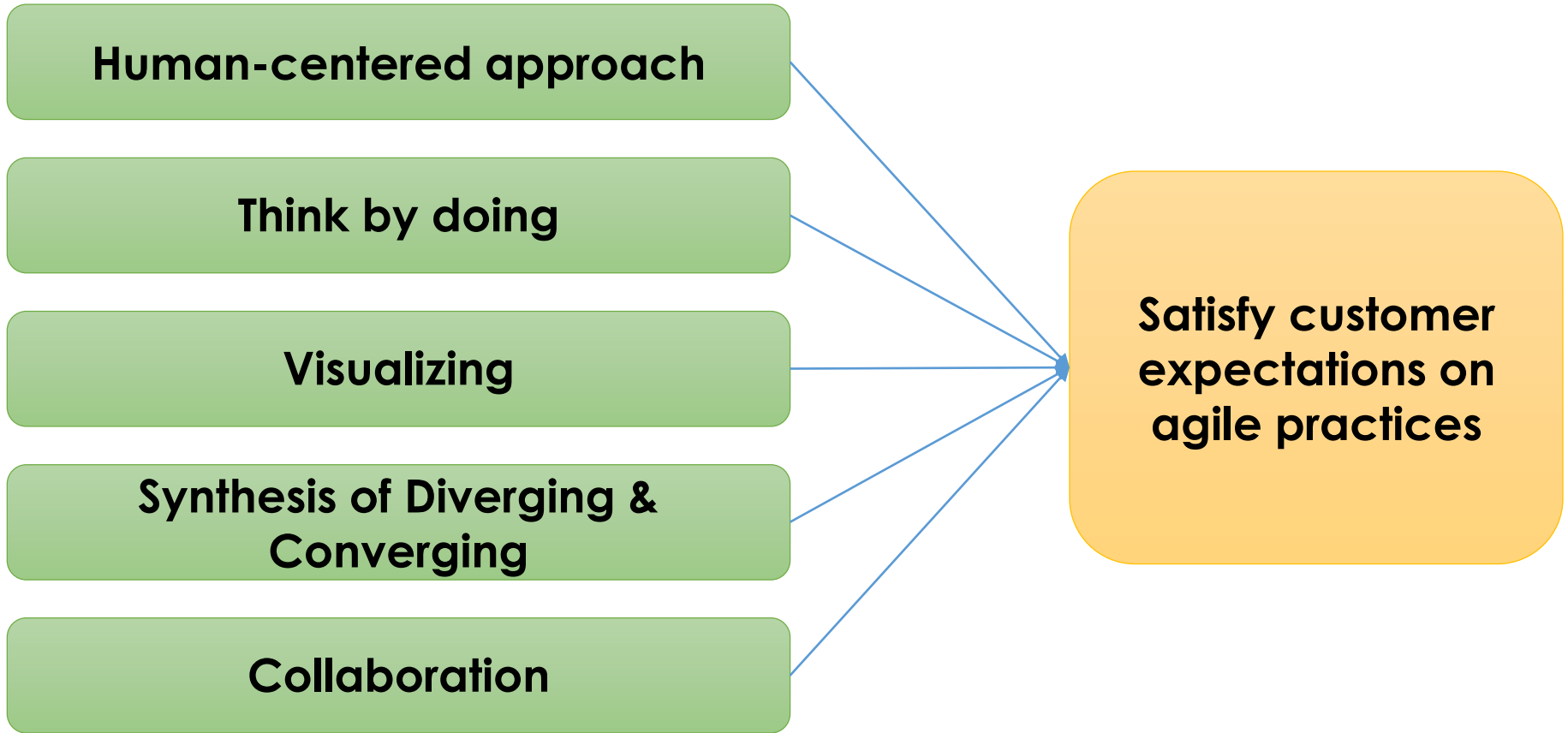
Cognitive Approach

- Holistic viewpoint
- Integrative thinking
- Abductive thinking

Mindset

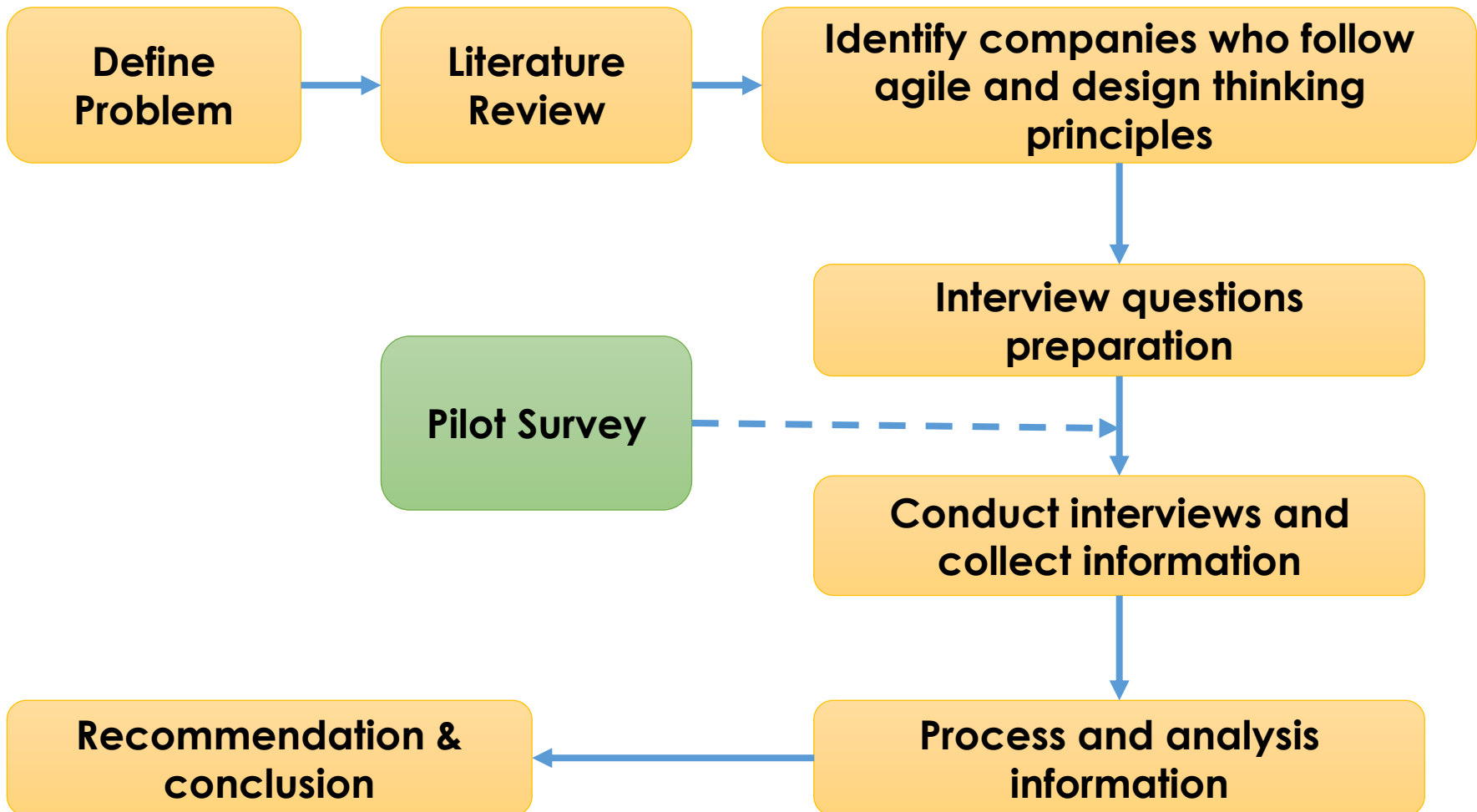
- Future oriented
- Explorative
- Experimental

Conceptual Framework



Research Methodology

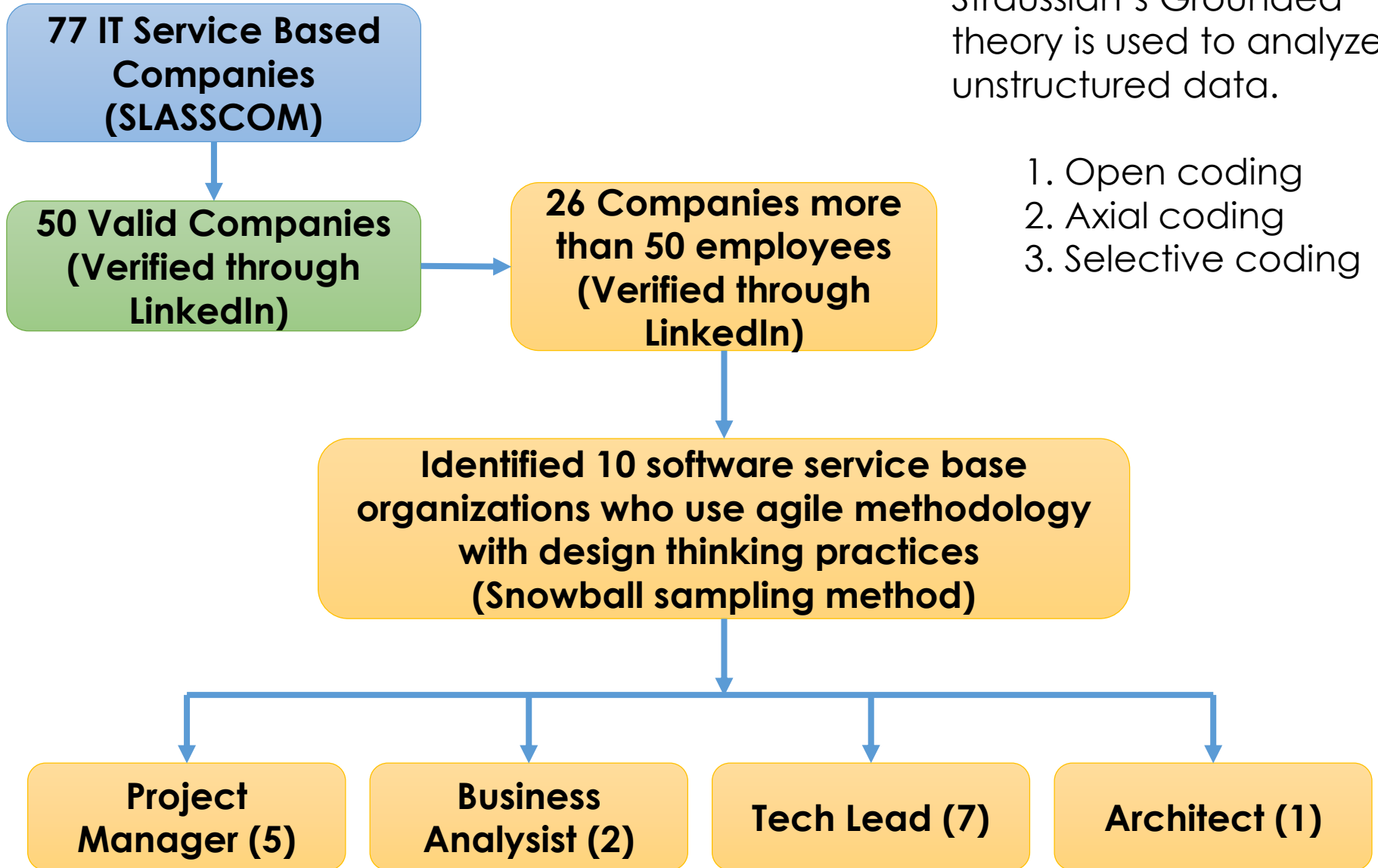
- Qualitative research & inductive reasoning



Population & Sampling

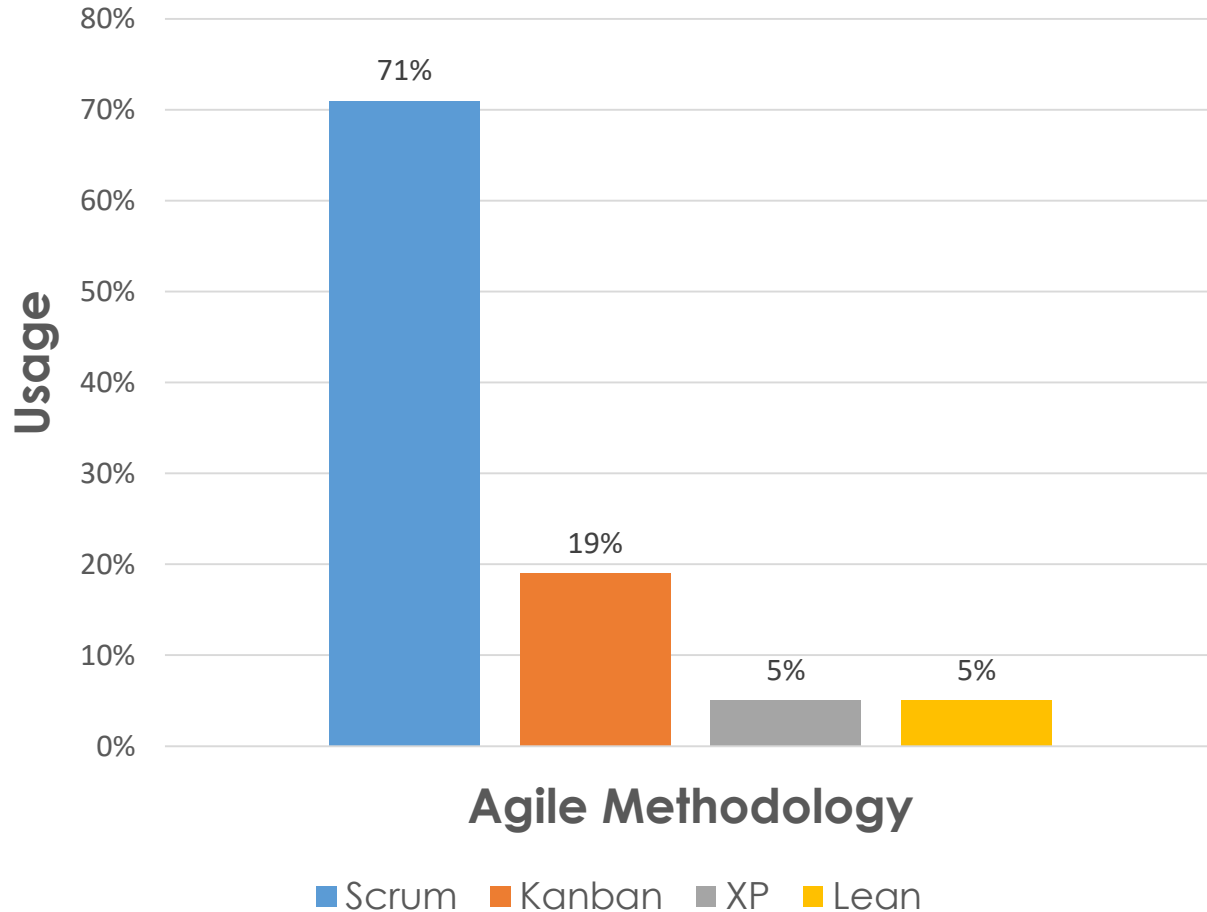
Straussian's Grounded theory is used to analyze unstructured data.

1. Open coding
2. Axial coding
3. Selective coding



Analysis and Result

Usage of Agile Methodology



- 71% of Companies use Scrum.
- 19% of Companies use Kanban.
- 5% of Companies use XP and Lean.

Pain Points in Satisfying Customer Expectations

Unable to prioritize what customer really wants

Dealing with fix bid projects (time, cost, & scope).

Requirement changes in a limited budget.

After completing the implementation only, user realizes feature is useless.

Product developed without realizing target market or audience.

Customer always expect to work only with domain experts and subject matter experts.

Techniques to Understand Customer Expectation

Conduct workshops to understand customer & end-user wish list.

Conduct reviews & demos (e.g., POCs & prototypes).

Conduct frequent, formal & casual discussions.

Hire an end user to understand his/her pain points.

Small & frequent deliverables with updating customer about progress.

Communicate the blockers early as possible.

Conduct market validation before starting product implementations.

Derive business case & form foundation of the solution.

Identify non-functional requirements.

Challenges Faced by Agile Teams While Practicing DT

Organizations use techniques in DT practices without having theoretical knowledge.

Lack of understanding of agile principles & DT principles.

Common practices such as collaboration are available for both agile & DT practice

Techniques used to capture requirements: Customer journey mapping, prototype, POCs, wireframes, (UX) design, story-mapping, use-cases, scenario identification, customer profiling, and persona.

Vendor not engaging with end user & communicated only through product owner, which is not acceptable.

Best practices to satisfy customer expectations in agile

Customer real need identification

- Accepting requirement only from BA is not recommended.
- Before starting actual implementation, it is recommended to spend good amount of time to capture customer need.
- Practice HCA with workshops & discussions.

Customer need into pilot solutions

- POCs, Prototype, Persona Identification & Wireframes are used determine the idea.
- Indicate failures early rather than leading to an unexpected failure.
- Ensure team is solving the right problem.

Visualizing pilot solution for feedback

- Understand stakeholder perception on idea.
- Get feedback by asking questions on outcome of planned solution.
- Testifying the idea with end-user.
- Encourage customer to think more on their own requirements & planned solution.

Idea generation for pilot solution

- 1st idea is not always the best idea.
- Identify most suitable solution for customer given business context.
- Have confidence on development team.

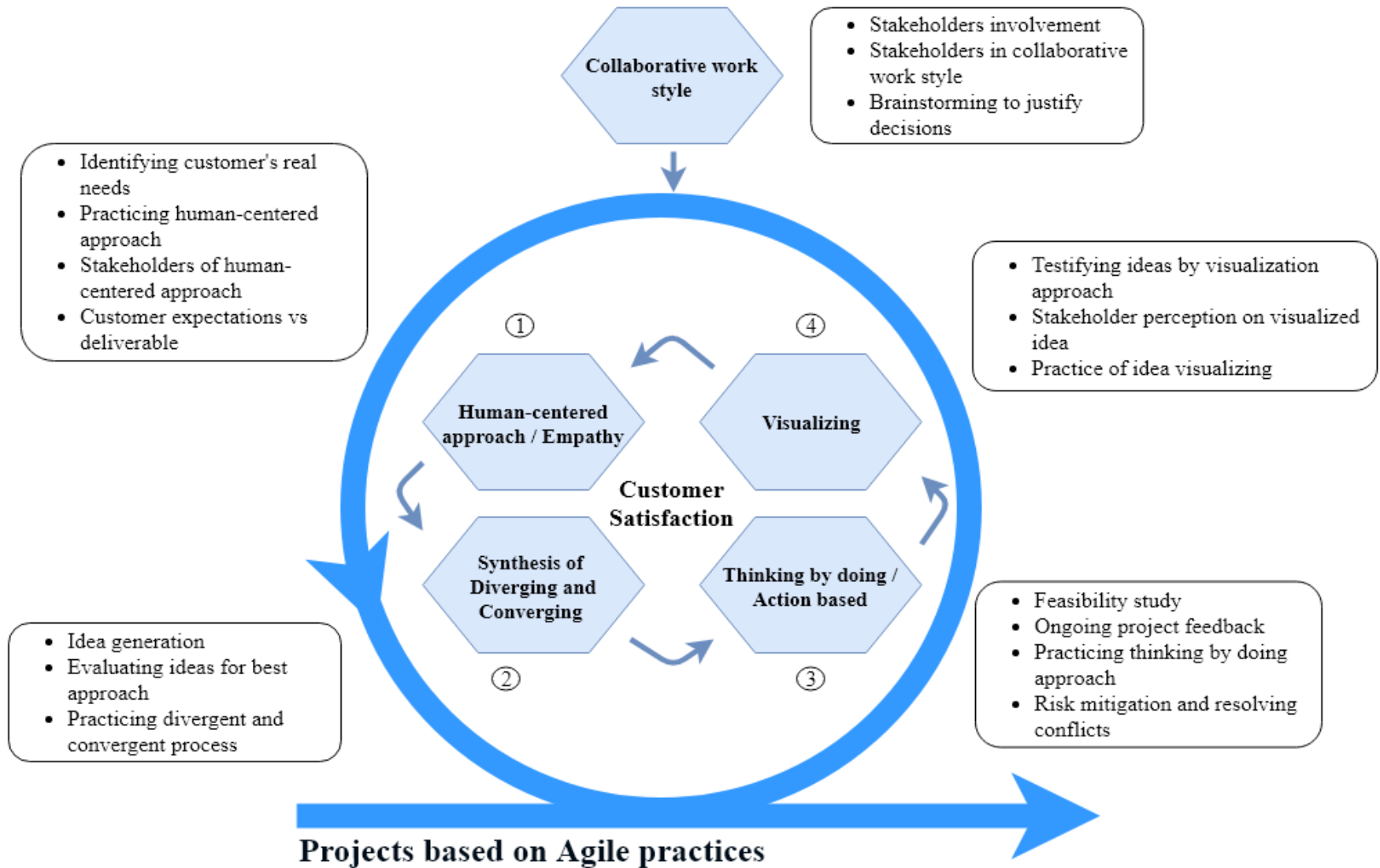
Brainstorming

- Justify decisions get ideas, evaluate ideas, pros & cons to make decisions, and clarification with expertize ideas.
- Spread responsibility about the final decision.
- Stakeholder involvement is essential.
- Avoid conflicts due to different understandings.

DT Practices & Factors

DT Practices	Factors
Human-Centered Approach (HCA)	Identifying customer's real needs
	Practicing human-centered approach
	Stakeholders of the human-centered approach
	Customer expectations vs deliverable
Thinking by doing / Action based thinking	Feasibility study
	Ongoing project feedback
	Practicing thinking by doing approach
	Risk mitigation and resolving conflicts
Visualizing	Testifying ideas by visualization approaches
	Stakeholder perception on the visualized idea
	Practice idea visualizing
Synthesis of Divergent & Convergent methods	Idea generation
	Evaluating ideas for the best approach
	Practicing divergent & convergent techniques
Collaborative work style	Brainstorming to justify decisions
	Stakeholders in collaborative work style
	Stakeholders involvement

Proposed Framework



Improve customer satisfaction

1. Apply HCA in requirement gathering phase to identify customer real needs.
 2. Generating ideas by using Divergent & Convergent approach.
 3. Convert complex problems into pilot solutions based on generated ideas.
 4. Visualize pilot solutions for end-user testing & for their feedback.
- Conduct DT workshops & establish DT coaches.
 - Combine Agile with DT by adding DT tasks to backlog.
 - Promote DT culture for more customer centric & collaboration.
 - Use DT as a tool for better decision-making around development.

Research Limitations

- Focus only the service based software companies.
- Companies who practice DT in Agile projects.
- Desired knowledge of DT even they practice DT.
- Focusses on the top level such as; project managers, business analyst, tech leads, and architect.

Future work

- Proposed framework can be improved further by applying it on real world scenario.
- As a second step, proposed framework can be improved with other two categories, cognitive approach and the Mindset identified by the (Hassi & Laakso, 2011).

Summary

- We explore how effectively use DT practices with agile process.
- We further explored challenges faced by agile teams and propose a set of solutions.
- Developed a framework to identify end-user expectations more precisely & provide the best possible solution with having early feedbacks to eliminate surprises at latter part of project.



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