Understanding “Responding to change over following a plan” agile value in a system thinking perspective

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About this work | Responding to change over following a plan

- It’s one of the Agile Values outlined in the Agile Manifest (2001), which is associated with the ability to respond to change, widely recognized as the Core of the agile approach (Gren & Per Lenberg, 2020; Conforto et al., 2016; Pinho et al., 2022).

- Although It’s known that following a plan is essential, **greater emphasis is placed on being flexible**, requiring teams to adapt goals in response to environmental changes (Martin, 2020).

- The **relationship between** “**Responding to Change**” and “**Following a Plan**” emphasizes the **necessity of balancing adaptability with structured guidance** (Lindskog & Netz, 2021).

- This relation is defined as a **constant interplay between two complementary forces**: one that **sets targets** (“following a plan”) and another focused on **recalibrating these targets** as new circumstances emerge (“responding to change”) (Cohn, 2005).

About this work | Flexibility AND Planning

- **One of the most challenging aspects in agile is not to eliminate planning but to keep it fluid and adaptable**, ensuring objectives remain relevant as stakeholder needs and new requirements emerge (Gren & Lenberg, 2020).

- Although agile methods emphasize rapid adaptation and flexibility, organizations still require structured planning **across multiple levels** (Suomalainen et al., 2015).

- To **enable this agile value**, **planning must occur at multiple levels**: **Release Planning** (defining high-level roadmaps and objectives), **Iteration Planning** (sprint-level planning), and **Daily Planning** (daily stand-ups). This **multi-tiered approach** helps **balance short- and long-term perspectives** while remaining **responsive to emerging demands** (Cohn, 2006).

- However, the most recognized agile approaches—such as Scrum and Kanban—tend to **emphasize the latter two levels**, often **overlooking the importance of a high-level strategic vision in a product development process**. Conversely, agile frameworks that address this broader perspective are often perceived as overly complex (e.g., SAFe - Scaled Agile Framework).

About this work | Gap in studies

- Most research in this area has **investigated individual practices in isolation rather than as an integrated system**, **not considering the complex interdependencies among the variety of practices used in agile development** (Suomalainen et al., 2015).

- Although previous studies (e.g., Cao et al., 2010; Glaiel et al., 2013) have utilized similar approaches, **they often focus on individual agile practices in isolation.** Therefore, an **integrated dynamic model is needed** to capture the **complexity and interdependencies** between following a plan and responding to changes systematically.

- Considering these challenges, a **dynamic systems approach can significantly enhance our understanding of how the interplay between planning and adaptability occurs in agile contexts**, modeling the loops and feedback mechanisms that shape project behavior over time (Sterman, 2000).

About this work | System thinking perspective

- It is possible to **structure this agile value in two parts**.
  - "**Following a plan**": *Goal Seeking*—fundamental mode of Dynamic Behavior—a negative loop includes a process to compare the gap between desired and actual states, so that a corrective action is taken if necessary to minimize this gap (Sterman, 2000).
  - "**Responding to change**": external or internal changes can make the desired state to be modified, and a new gap configuration is installed, requiring teams to operate in a flexible and adaptative manner (Barlas & Yasarcan, 2008).
    - ***Drifting Goals Archetype****:* the goal is eroded by short-term pressure to adjust it, leading to deterioration of long-term goals (Senge, 1997)
    - ***Double Loop Learning***: instead of only making adjustments to close the gap (single-loop), teams review and redefine goals, enabling systemic adaptation and long-term transformation (Argyris & Schön, 1996).

About this work | Goal

- This work aims to **understand the process behind the agile value “responding to change over following a plan” adopting the lenses of system thinking** through **interviews** and **documental analysis** with a **project agile manager** based on two questions:
  - “Following a Plan”
    - **How are the goals defined, monitored and achieved in the project that you manage?**
  - “Responding to change”
    - **How are the goals modified as the project progresses?**

- Those interactions resulted in a **causal diagram model** and **three scenarios** in a **Software Development Project.**

What did we discover (for now)

Three Scenarios

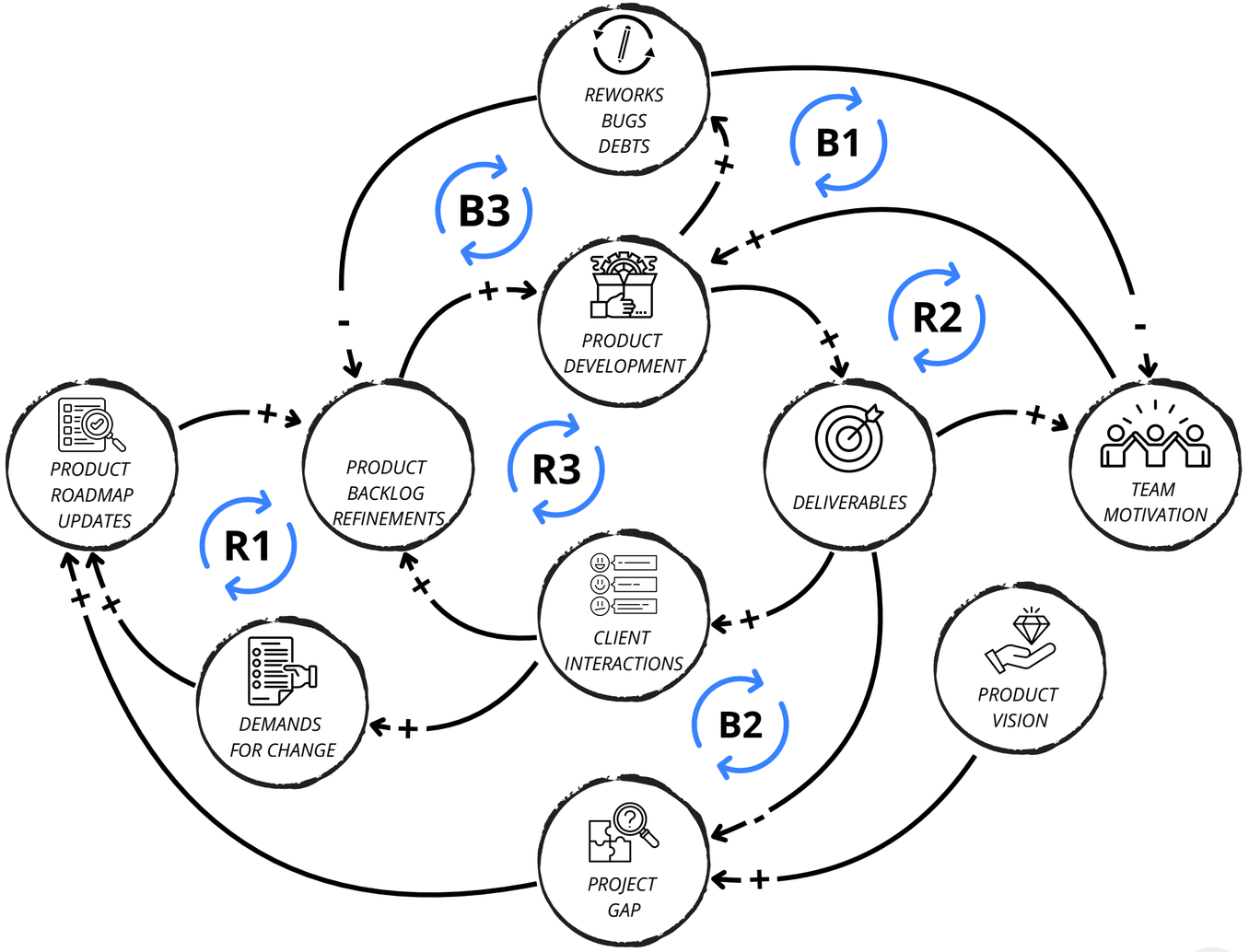
1. Following a Plan

2. Responding to Changes

3. Unexpected Changes

News

B | Balancing Feedback
R | Reinforcing Feedback



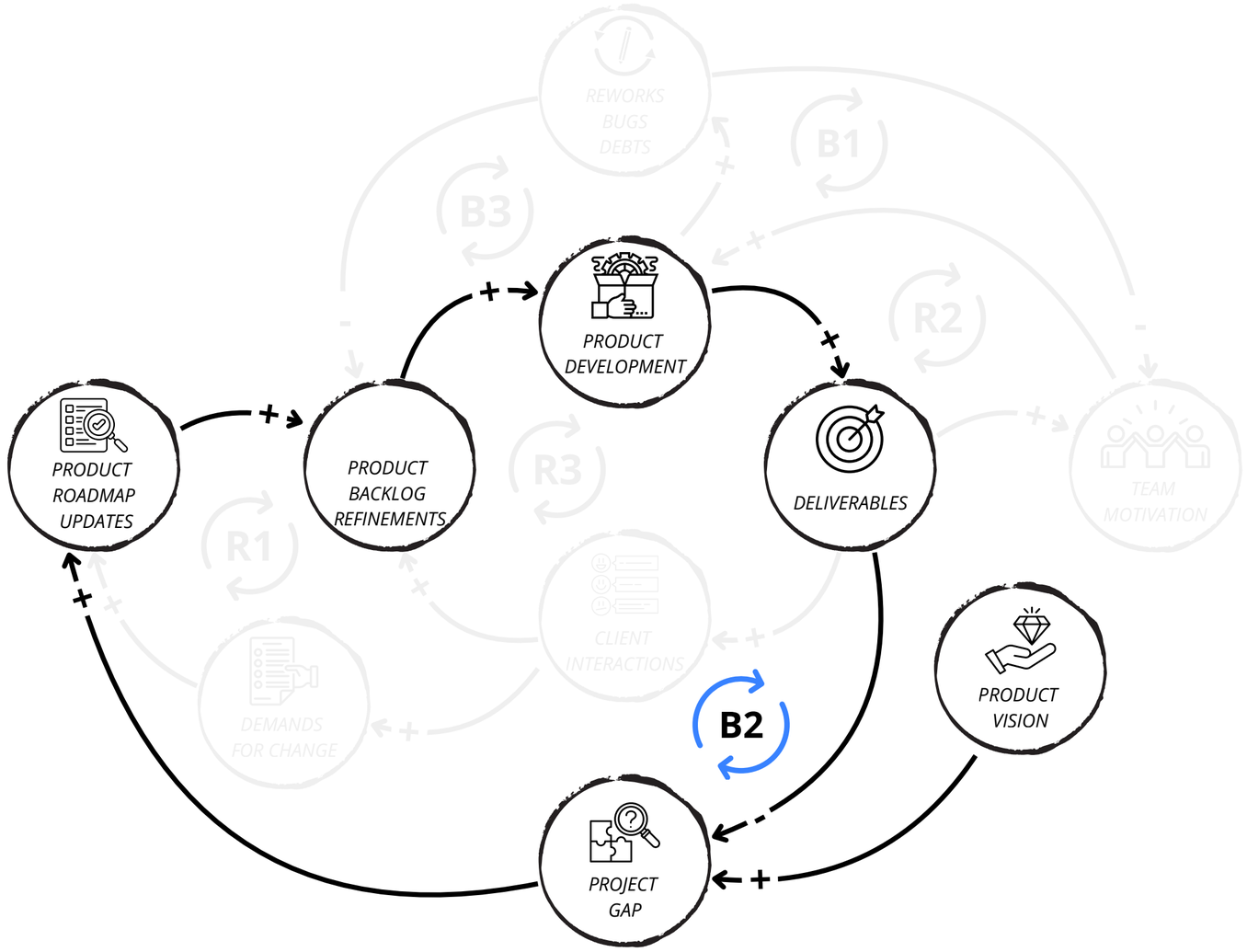
This model considers only the Release and Iteration levels of planning.

Scenario 1 | Following a Plan

The plan is followed by comparing the product vision with project deliverables, guiding long-term product development (B2)...

... through updates to the product roadmap that ensure team alignment with **project evolution**.

This process is supported by ongoing refinement of backlog items, iterative development and delivery of increments through time-boxed sprints and planned tasks

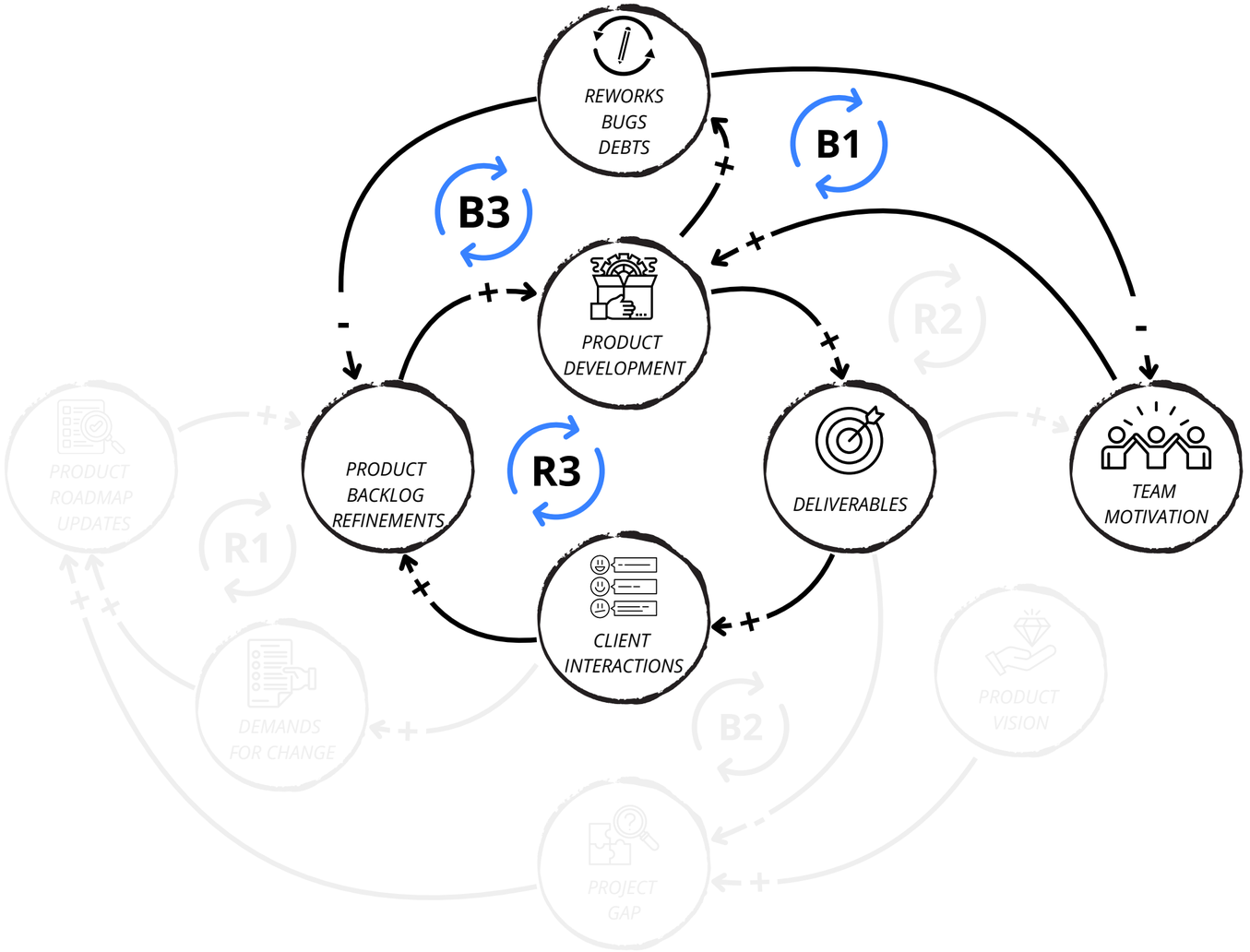


Scenario 2 | Responding to Change

The team responds to changes by interacting with clients during product development, refining the product backlog accordingly as the product evolves (**R3**)...

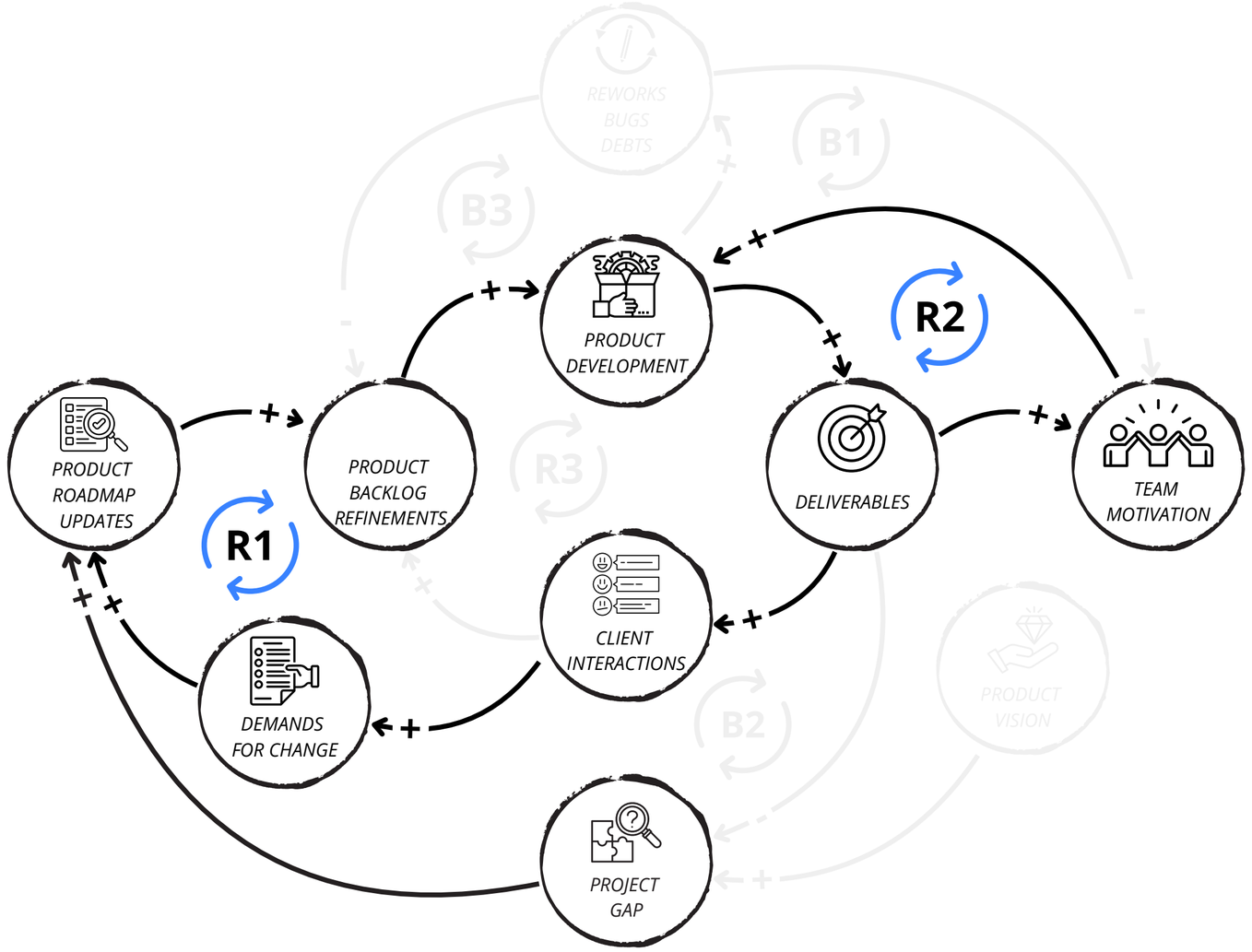
... which can **quickly be overwhelmed** by short-term demands, leading to frequent sprints updates, which may result in reworks, bugs, and debts (**B3**) ...

... usually **decreasing team motivation** (**B1**), since the deliverables are not enough to keep them motivated.



Scenario 3 | Unexpected Changes

Unexpected change requests arising from client interactions are also integrated into the updated roadmap, ensuring transparency and flexibility in product development and alignment with evolving user needs (**R1**) increasing the team motivation by released deliverables (**R2**)



Conclusions

- This work indicates that **just following agile practices is not sufficient** to **maintain** the **agile value** of “**responding to change over following a plan”.**
- **Scenario 2** presented a **software development project** dynamic **based only on** practices from the agile approach (**Scrum**) which demonstrated **adverse outcomes** such as **increased rework** and **decreased team motivation.**
- **Scenario 3** highlighted the need for a management structure capable to **incorporate unexpected changes in advance, through the product roadmap, making the environment less unpredictable.**
- This seems to **increase team motivation by protecting them from investing energy in problem-solving resulting from frequent changes to the product backlog** (scenario 2) .
- Another important conclusion is that **planning remains essential in software development projects** that involve uncertainty, as it enables teams to anticipate future deliverables and detail them as they are being developed (**scenario 1**).

Conclusions

- Despite the **focus of the work on a specific agile value**, the **other 3 values could be identified** in the causal diagram: - -
  - **Individuals and interactions related to team motivation**
  - **Working software by frequent value deliverables**, and
  - **Customer collaboration**
- Agile teams focused only on agile practices without seeing the principles (Repenning, Kieffer & Repenning; 2018) can **adopt this model as a guide for flexible planning in project management**.

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