

From Social Systems Theory to Transformation Trajectory Mapping: A Formative Method for Assessing and Developing Sustainable Organizational Change

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Abstract

Transformation initiatives frequently face a gap between ambitious claims of institutional or systemic change and the evidence available to substantiate them. Activities can be successfully delivered and even repeated without substantially changing an organization, while differences initiated through temporary projects may persist after the original activity has disappeared. This paper develops Transformation Trajectory Mapping, a formative method informed by social systems theory. The method combines two analytically distinguishable questions: At what organizational depth does, or would, the specified difference become consequential—event, structure, or system? And what has happened, or could happen, to that difference—possibility/enabling, variation/testing, selection, or restabilization/reproduction? These distinctions are translated into a 3 × 4 mapping tool and a set of practitioner questions concerning reference systems, organizational evidence, dependencies, and subsequent decisions. A precursor version of the tool was used by five teams responsible for transformative-leadership pilots within a European University Alliance. The exercise was a formative project activity rather than a research study; four completed mappings and facilitator reflection are therefore used only to examine issues arising in practice. The initial practice account illustrates how the method can accommodate restrained impact claims, make uncertainty and organizational dependencies discussable, and shift reflection from hoped-for transformation toward decisions that may make future reproduction of an intended difference more probable. The paper discusses the analytical contribution of distinguishing organizational depth from trajectory, the formative use of probability asymmetries, and the translation of systems-theoretical distinctions into a practical method.

1. Introduction: when does an initiative become organizational change?

Transformation initiatives face a deceptively simple evaluation problem. Projects can demonstrate that activities occurred, participants were reached, outputs were produced, and agreed targets were met. Yet successful project delivery does not by itself establish whether consequential organizational change has occurred or whether resulting changes will become sustainable (Corazza et al. 2024; Hock et al. 2025). The distinction matters because apparently similar project results can have very different organizational consequences. A leadership workshop may be successful and subsequently repeated without altering how an organization makes decisions. A temporary pilot may contribute to a new responsibility, procedure, program, or criterion for later decisions. An activity may disappear while principles developed through it continue to influence subsequent organizational operations. Conversely, a formally adopted policy or program may remain largely disconnected from everyday decision-making.

Evaluation research has already developed sophisticated responses to the limitations of output-oriented assessment. Impact-pathway approaches connect activities and outputs to outcomes and longer-term effects (Corazza et al. 2024). Complexity-aware and developmental evaluation foreground emergence, nonlinearity, context, and adaptation (Antadze and Westley 2012). Complexity-informed approaches have also reconsidered how evidence quality and causal pathways can be assessed when conventional

experimental standards are poorly suited to systems-change settings (Apgar et al. 2024). Sustainability research, meanwhile, treats durability as more than the continued delivery of an activity, emphasizing adaptation, propagation, and changing organizational conditions while distinguishing sustainability from institutionalization (Hock et al. 2025); recent work on European University Alliances similarly foregrounds governance, resilience, adaptability, and long-term organizational viability (Lenkauskaite 2026). The problem addressed here is therefore narrower: practitioners still need a way to distinguish the organizational depth of a specified difference from its possible organizational trajectory over time.

This paper develops Transformation Trajectory Mapping as one response to that problem. It translates selected distinctions from Luhmannian social systems and organization theory into a practical reflection method. The theoretical contribution of the approach is deliberately limited. It does not attempt to translate social systems theory as a whole into organizational practice. Instead, it asks which systems-theoretical distinctions help observers make more discriminating claims about organizational change and sustainability.

For this purpose, the method is organized around two analytically distinguishable but theoretically related questions. The first concerns organizational depth: At what level does, or would, the specified difference become consequential? Does it concern primarily an activity or interaction, does it make a difference to organizational expectations or decision premises, or does it concern the organization's broader operative mode across connected domains of decision-making? The second concerns trajectory: What has happened, or could happen, to that difference? Have enabling conditions been created, has the difference appeared as a variation, has it been organizationally selected, or has it become restabilized through recurrent reproduction in ongoing organizational operations? Organizational depth thus provides a way of differentiating impact, while trajectory addresses the sustainability of a specified difference—whether and how it becomes recurrently reproduced in organizational operations. More precise working definitions of both terms are developed in Section 5.1.

Crossing these two dimensions produces a 3×4 Transformation Trajectory Map. The map is accompanied by practitioner questions that translate the underlying systems-theoretical distinctions into a form that can be used for organizational reflection without requiring practitioners to master the technical vocabulary of social systems theory. The method also has a prospective dimension. Once practitioners have distinguished what can currently be observed from what is intended or hoped for, they can ask which present decisions might alter the premises of later decisions in ways that make a particular future trajectory more probable.

A precursor of the tool was used in a formative workshop with five teams responsible for designing and implementing transformative-leadership pilots within the PIONEER European University Alliance. The reflective practice account in Section 4 is used to examine what became visible when practitioners worked with the distinctions rather than as empirical validation of the method.

2. Systems-theoretical distinctions for mapping and developing transformation trajectories

Systemic practice has a long tradition of using theoretically informed distinctions and representations to structure inquiry into complex organizational situations rather than produce a single objectively correct description (Checkland 1981; Midgley 2000). Transformation Trajectory Mapping belongs broadly to this tradition but takes a more specific theoretical starting point. It uses Luhmannian social systems theory to observe how differences introduced through interventions become, or fail to become, consequential for subsequent organizational decisions. Transformation Trajectory Mapping does not use systems theory as a blueprint for engineering organizational transformation. It uses selected systems-theoretical distinctions to support both the observation and the formative development of transformation trajectories. The concepts introduced below are therefore included where they help practitioners distinguish what is currently occurring in organizational terms, assess the trajectory of a specified difference, or consider which decisions might alter the conditions of its further development.

2.1 Organizations as recursively connected decisions

Luhmann conceptualizes organizations as social systems that reproduce themselves through decision communication (Luhmann 2018). Decisions connect to further decisions, and previous decisions can become premises that constrain and orient subsequent ones. Later organization-theoretical work has developed this processual understanding of organizations and their recursive reproduction through decisions (Andersen 2003; Hernes and Bakken 2003; Roth et al. 2018; Schoeneborn 2011; Seidl and Becker 2006). This perspective shifts the object of organizational impact assessment. Changed attitudes, acquired competencies, new relationships, and successful activities may all be consequential. They do not, however, by themselves establish that organizational operations have changed. A stronger organizational claim requires attention to what later decisions take up, presuppose, or reproduce.

This has a direct implication for observation: Evidence of organizational change should be sought not only in what an intervention immediately produces but also in what becomes consequential for subsequent decisions. The corresponding practitioner question is: What later decisions are different because this happened? This question does not imply that an intervention can be isolated as the cause of those decisions. In complex organizational settings, later decisions are produced under multiple conditions. The question instead directs observation toward whether the difference introduced through the intervention has entered subsequent organizational operations at all.

The notion of difference provides the common analytical object of the framework. Bateson (1972, p. 315) conceptualizes information as “a difference which makes a difference”. In Luhmann’s account, information is system-relative: novelty does not enter an organization as ready-made information or effect but becomes consequential through the system’s own distinctions and communication (Luhmann 1995). Transformation Trajectory Mapping therefore begins by specifying the difference associated with

an intervention and poses two questions about it: at what organizational depth does, or would, this difference make a difference, and what has happened, or could happen, to it?

2.2 Observing event, structure, and system

Events are the temporal elements through which social systems operate: they occur and disappear (Luhmann 1995). Structures are not additional elements alongside these events. Rather, they consist in selections from a wider horizon of possible relations and connections among events (Luhmann 1995, 2012). By stabilizing some possibilities of connection rather than others, structures reduce contingency and make particular subsequent events and connections more expectable (Luhmann 1995, 2012). In organizations, this selective function becomes particularly visible in decision premises. Programs, personnel, communication channels, responsibilities, procedures, and decision criteria restrict and structure the possibilities to which subsequent decisions can connect (Luhmann 2018). They do not determine later decisions, but they make some connections more expectable than others.

A recurring activity is therefore not automatically evidence that the difference associated with an intervention has become structural. Similar events may simply recur. For the purposes of Transformation Trajectory Mapping, the first axis asks at what organizational depth a specified difference is, or would be, consequential. This is not yet a claim about whether that difference has been selected or restabilized/reproduced. It specifies the organizational level at which the difference makes, or would make, a difference. On this basis, the framework distinguishes three analytical depths: event, structure, and system:

- Event refers to a difference whose organizational relevance lies primarily at the level of an activity, interaction, or communicative occurrence—for example, a new pilot, workshop, course, interaction, or experimental format.
- Structure refers to a difference that makes, or would make, a difference to organizational expectations or decision premises through which subsequent decisions are oriented. This may concern a responsibility, criterion, program, procedure, communication channel, or other premise for later decisions.
- System refers to a difference that makes, or would make, a difference to the organization's operative mode (*modus operandi*): the broader logic through which decision communications are recursively produced and connected across organizational domains. This does not mean that the organization begins to use a different elementary operation—it remains an organization reproducing itself through decision communication—but that the relevant difference concerns a change in the mode or logic through which decisions connect across multiple structures or domains. A participatory leadership logic, for example, would constitute a system-level difference insofar as it becomes relevant to connected decisions concerning appointments, resource allocation, organizational development, and evaluation.

These categories should not be interpreted as a canonical Luhmannian hierarchy. Every organization operates through events and depends on structures. “Event,” “structure,” and “system” are used here as

an evaluative heuristic for making different depths of organizational change observable. A further qualification concerns the temporal status of structure itself. In systems theory, a structure is not a durable organizational object that simply remains in place once established. Structures persist only insofar as relevant selections are recurrently actualized, confirmed, modified, or renewed through ongoing operations (Luhmann 1995, 2012). A selected structural difference may therefore remain dependent on exceptional or project-specific conditions for its continued activation—for example, dedicated resources, repeated facilitation, or the sustained attention of particular actors—or become recurrently taken up within the organization's ordinary decision processes without depending primarily on the originating intervention. This does not mean that the structure itself becomes autopoietic or turns into a system; rather, the difference becomes incorporated into the autopoietic reproduction of the organization.

For observation, this means asking at what organizational depth the specified difference is, or would be, consequential: at the level of activities or interactions, in organizational expectations or decision premises, or in the organization's broader operative mode across connected domains of decision-making. These distinctions are meaningful only relative to a specified reference system (Luhmann 1995). The same intervention may, for example, become a stable structure within a project while remaining an isolated event from the perspective of the organization; conversely, a practice may be structurally reproduced within one organizational unit while constituting only a possibility or a not yet selected variation at overall organizational level. The organizational depth of the relevant difference therefore cannot be assigned in the abstract but must be assessed in relation to the reference system whose change is being observed.

Consequently, the first practical question is not: Where are we in the matrix? It is: Whose change are we talking about?

2.3 Observing variation, selection, and restabilization/reproduction

A second theoretical source is Luhmann's evolutionary distinction among variation, selection, and restabilization (Luhmann 2012). Variation introduces a deviation or alternative. Selection concerns the structural relevance of that variation and may be positive or negative: a variation may be taken up in altered structures or rejected in favor of existing ones. Restabilization concerns the state of the system after selection and the integration of the consequences of selection into its continuing reproduction (Luhmann 2012; Seidl and Mormann 2014). For the practical purposes of Transformation Trajectory Mapping, the Selection column focuses on positive selection of the specified intervention-related difference. Something new can occur without being selected, and even a positively selected variation may fail to become recurrently consequential in subsequent organizational operations. Formal adoption therefore provides evidence of positive selection but does not by itself demonstrate restabilization/reproduction. The final category is termed restabilization/reproduction in order to make the sustainability question contained in restabilization explicit. Reproduction is not introduced as a

fourth evolutionary mechanism alongside variation, selection, and restabilization. Rather, it specifies what is being observed when restabilization is assessed from the perspective of the continued organizational fate of a selected difference: whether that difference is recurrently regenerated through subsequent organizational operations.

For practical assessment, Transformation Trajectory Mapping adds one category before Luhmann's evolutionary triad. Possibility or enabling captures conditions such as relationships, competencies, legitimacy, infrastructure, information, resources, or organizational attention that may make a variation possible without yet constituting the variation itself. The resulting framework therefore retains the distinction among variation, selection, and restabilization while extending it with an antecedent category that is particularly relevant to transformation projects.

The second dimension therefore distinguishes four analytical conditions:

- Possibility/enabling: conditions exist that make a different development possible.
- Variation/testing: a difference actually appears and becomes available for selection.
- Selection: subsequent organizational decisions take the difference up and incorporate it into relevant structures or decision premises.
- Restabilization/reproduction: the selected difference continues to be regenerated, used, modified, or renewed through subsequent organizational operations and thereby becomes part of the organization's continuing reproduction.

The two dimensions of Transformation Trajectory Mapping are analytically distinguishable but theoretically related. Luhmann's evolutionary theory itself associates variation, selection, and restabilization with the levels of element, structure, and system respectively (Luhmann 2012; Seidl and Mormann 2014). The framework therefore does not treat organizational depth and trajectory as two theoretically independent Luhmannian taxonomies. Instead, it cross-classifies these distinctions in order to pose two different questions about the same specified difference. The depth dimension asks at what organizational level the difference is, or would be, consequential: at the level of events, in organizational structures and decision premises, or in the organization's broader operative mode. The trajectory dimension asks what has happened, or could happen, to that difference: whether enabling conditions exist, whether it appears as a variation, whether it is positively selected, and whether it becomes restabilized through recurrent reproduction. The answer to one question does not by itself settle the other. A difference concerning the organization's operative mode may appear as a variation without subsequently being selected or reproduced, while an event-level activity may be recurrently reproduced without altering relevant decision premises or the organization's broader operative mode.

2.4 Programs as observable decision premises

Programming provides one organization-specific mechanism through which an intended change may become more durable. In Luhmannian organization theory, programs are decision premises that specify either purposes to be pursued or conditions under which particular decisions are considered appropriate

(Grothe-Hammer and Berthod 2017; Luhmann 2018). Changes to programs and related decision premises can translate a variation into recurring criteria, responsibilities, procedures, resource allocations, or review processes, thereby altering the possibilities available to subsequent decisions and providing evidence of organizational selection. It would be misleading, however, to equate such programming with restabilization/reproduction. A program can be formally established without becoming recurrently consequential in later organizational operations, and new programs may conflict with, be bypassed by, or remain weakly connected to existing decision premises. Programming is therefore better understood as one mechanism through which a difference may be selected and incorporated into organizational decision premises, while restabilization/reproduction remains an empirical question concerning whether and how that difference continues to be regenerated through subsequent organizational operations.

Recent systems-theoretical research on multifunctionality and organizational repurposing highlights the plurality of societal expectations organizations confront and the structural tensions that may arise when additional purposes are incorporated (Roth et al. 2018; Roth et al. 2025; Roth and Sales 2026; Krönig and Möbs 2026).

2.5 Formative development through probability asymmetries

The preceding distinctions do not only concern current and past developments. As a form of formative assessment, they also ask what might happen next. However, systems theory constrains how this question can be formulated: organizational structures and decision premises do not determine subsequent decisions; they condition possibilities and make some future connections more expectable or probable than others. A conventional prospective question might ask how an initiative can produce systemic change. The systems-theoretical formulation used here is different: Which present decisions could asymmetrize future decision possibilities in favor of the intended difference? In this application, asymmetrization refers to a change in the field of organizational possibilities rather than to a calculable probability. A decision can establish or modify premises so that some later selections become easier, more legitimate, more expectable, or more difficult to ignore than before.

For practitioners, the same question can be translated into less technical language: What could be decided now that would make it more likely that this difference enters later decisions and remains consequential? Transformation pathways can then be reconstructed as changing conditions of subsequent decisions rather than as predetermined sequences from intervention to outcome.

3. Transformation Trajectory Mapping

Transformation Trajectory Mapping consists of a representational tool and a structured reflection method. The Transformation Trajectory Map is the 3×4 analytical schema (see Table 1). Transformation Trajectory Mapping is the process through which practitioners specify a reference system, formulate the difference under assessment, locate its current organizational trajectory, examine evidence and

counterevidence, identify dependencies, and consider decisions that may alter future possibilities. Its intended output is therefore not a score. It is a reasoned and revisable account of a transformation trajectory.

3.1 The Transformation Trajectory Map

The map cross-classifies the two questions developed above. Its rows identify the organizational depth at which the specified difference is, or would be, consequential, while its columns identify what has happened, or could happen, to that difference.

Table 1
Transformation Trajectory Map

Organizational depth	Possibility / enabling	Variation / testing	Selection	Restabilization / Reproduction
Event	Conditions exist for a new activity or interaction: attention, relationships, legitimacy, resources, or opportunity.	A new activity, interaction, or communicative format actually takes place.	The activity is selected for continuation and connected to an owner, recurring schedule, or regular resource.	The activity recurs through ordinary planning and is repeatedly regenerated without depending primarily on the original project.
Structure	Conditions exist for changing roles, routines, programs, procedures, responsibilities, or decision criteria.	A different role, routine, program, procedure, or decision criterion is tried.	Subsequent decisions take up the difference and incorporate it into responsibilities, resources, procedures, programs, criteria, or other organizational decision premises.	The changed expectation or decision premise is recurrently used, renewed, modified, or adapted in subsequent organizational decisions.
System	A different organizational or collaborative logic becomes imaginable and communicatively available.	The alternative logic begins to appear across several connected decisions or organizational domains.	Several connected decision premises take up the changed logic across relevant organizational domains.	The changed logic recurrently shapes decisions across organizational domains and is reproduced through the continued use, modification, and adaptation of connected decision premises.

The matrix is deliberately not a maturity model. Its bottom-right cell is not inherently superior to all other positions. An experimental activity may appropriately remain an event. A variation may be rejected because it proves ineffective or conflicts with other organizational requirements. A deliberate decision not to institutionalize an innovation can represent learning rather than failure. Nor must an intervention occupy one cell only. Different aspects of the same initiative may follow different trajectories. A pilot may, for example, reproduce a recurring activity while simultaneously experimenting with a new organizational structure and creating possibilities for a more extensive organizational change. The map should therefore be understood as an analytical space rather than a ladder.

3.2 A practitioner translation of the analytical framework

The theoretical terminology is retained in the analytical matrix because the distinctions themselves are consequential. For practical use, these distinctions are translated into a parallel set of questions in Table 2:

Table 2
Practitioner translation of systems-theoretical distinctions

Systems-theoretical issue	Practitioner question
Reference system	Whose change are we talking about: a project, an organizational unit, the organization, the organizational ecosystem, or another system?
Difference	What is different compared with what happened before?
Depth of change	At what level does or would this difference become consequential: in an activity or interaction, in organizational expectations or decision premises, or in a broader organizational logic across connected decisions?
Selection	Which later decisions have actually taken this difference up?
Restabilization/ reproduction	If the original initiative ended and the original project actors stepped away, through which ordinary organizational roles, programs, routines, criteria, or decisions would this difference continue to be reproduced?
Probability asymmetry	What could be decided now that would make it more likely that this difference enters and remains consequential in future decisions?

The two layers serve complementary functions. The systems-theoretical vocabulary preserves the analytical distinctions on which the framework depends, while the practitioner questions translate these distinctions into a form that can be used in organizational reflection and development. The aim is neither to simplify systems theory until its distinctive concepts disappear nor to require practitioners to conduct an explicit theoretical analysis of concepts such as autopoiesis, decision premises, or recursive decision communication. Rather, the theoretical distinctions inform questions that help practitioners observe organizational change more precisely, examine the assumptions underlying their impact and sustainability claims, and consider which decisions might alter the conditions for subsequent development.

3.3 Using the map: a seven-step reflection protocol

Transformation Trajectory Mapping can be used as a facilitated group reflection organized around seven steps (see Table 3). Mapping begins by specifying what change is being observed and relative to which organizational system before locating that change within the matrix. It then moves from current evidence to future possibilities:

Table 3
Seven-step Transformation Trajectory Mapping protocol

Step	Task	Guiding question
1	Specify the reference system	Whose change are we assessing: a project, an organizational unit, the whole organization, the organization's ecosystem, or another system?
2	Formulate the relevant difference	What organizational difference is the intervention intended to make compared with the previous situation?
3	Distinguish observation from expectation	What can we currently substantiate, what do we expect or hope may develop, and what does that development depend upon?
4	Locate the current trajectory	What is the organizational depth of the difference, and what has happened to it so far?
5	Examine evidence and counterevidence	What supports this interpretation, and what evidence would make us question it?
6	Identify dependencies and bottlenecks	What currently enables or constrains recurrent reproduction of the difference through ordinary organizational operations?
7	Consider possible future decisions	What could be decided now that would change the conditions of later decisions and make the intended trajectory of the difference more probable?

The sequence is structured to clarify the object of assessment before participants locate the intervention within the matrix. An activity description such as “leaders participate in a development program” does not yet specify the organizational difference whose impact or sustainability is at issue. A formulation such as “participatory considerations recurrently enter leadership decisions” identifies a more specific difference and makes it possible to ask what evidence would indicate its occurrence as a variation, its organizational selection, or its restabilization/reproduction.

The protocol also deliberately separates current observation from anticipated development. Expectations and hopes are not treated as deficiencies; transformation initiatives necessarily operate with assumptions about futures that cannot be determined in advance. The purpose is instead to prevent future aspirations from being incorporated unnoticed into claims about present impact. Asking what a hoped-for development depends upon can make visible the organizational conditions, decisions, and decision premises through which a trajectory might become more probable.

Evidence and counterevidence are therefore central to the mapping process. A formally approved program, policy, or assigned responsibility may provide evidence that a variation has been selected and incorporated into organizational decision premises, but it does not in itself establish restabilization/reproduction. The stronger question is whether the relevant premise actually becomes consequential in subsequent organizational operations. Conversely, discrepancies between formal adoption and everyday decision-making should not simply be resolved away; they may reveal precisely where a transformation trajectory is currently encountering difficulty.

The final step gives the method its explicitly formative dimension. Once participants have distinguished current evidence from aspiration, they can consider which present decisions might alter the conditions of subsequent decisions. This connects assessment to organizational development by identifying possible changes in responsibilities, criteria, programs, or resource arrangements that may influence the subsequent trajectory.

4. Initial practice use

A precursor version of the map was used during a formative PIONEER Work Package 3 (WP3) workshop on June 3, 2026. Five teams of three to six people participated. The teams were responsible for designing and implementing distinct transformative-leadership pilots and were beginning to reflect on their potential impact and sustainability. The prototype already contained the basic two-dimensional logic of the current framework. One axis distinguished eventual, structural, and systemic change. The other distinguished enabling, experimenting, institutionalizing, and diffusing. The instructions asked teams to discuss their pilot, decide where they would position it, explain their reasoning, and consider possible development toward other parts of the matrix and stronger sustainability.

The exercise also introduced an explicit distinction between continuation and stronger organizational reproduction. Continued workshops, networks, individual learning, or the continued availability of an online course were contrasted with changes in governance routines, institutional decision relevance, roles, incentives, and organizational structures. The current terminology was developed subsequently to align the categories more precisely with systems-theoretical concepts. This conceptual clarification is not itself the focus of the present paper. The underlying analytical problem remained the same.

The workshop was not designed as a research study. Teams worked collectively on their mappings, presented their reasoning, and discussed them in plenary. Four completed mappings remain available for the present reflective account. Because the exercise was not originally designed for publication and the relevant organizational community is comparatively small, pilot names and combinations of distinctive substantive details are not reported. The documents support statements about what the teams explicitly wrote or left unclaimed. Observations concerning plenary interaction are facilitator reflections and are reported as such rather than treated as interview or observational research data.

4.1 Restrained rather than maximal transformation claims

The available documents show that teams did not systematically position themselves in cells implying the deepest change or strongest sustainability. One team explicitly concluded that aiming for systemic change might be “a little bit too ambitious” given the limited influence the pilot could exercise over participating institutions. The group distinguished what it could establish at pilot level from what could not be assured institutionally. The same team characterized the pilot's current sustainability as weak and associated stronger sustainability with commitments involving organizational governance, structures, and policies. Another group treated potential systemic change primarily as an enabling prospect. It explicitly stated that deeper organizational effects depended on the roles and authority of participants and described its present sustainability assessment as deliberately realistic and provisional. A further documented mapping concentrated predominantly on structural change and planned organizational restructuring, while the systemic row remained effectively unclaimed.

These materials do not establish that the matrix caused participants to make more restrained assessments; such a causal conclusion would exceed the available evidence. They do show that the framework was used in a manner compatible with explicit uncertainty, conditional claims, and unoccupied high-transformation cells. The exercise accommodated “not yet,” “only under these conditions,” and “we cannot currently substantiate this” as legitimate outcomes of formative assessment.

4.2 From hope to organizationally specified trajectories

One team provided an especially instructive example. Its mapping described event-level and structural developments while referring to systemic change as something that would “hopefully” follow and eventually develop into a self-reproducing organizational orientation. At the same time, the team's own sustainability reflection differentiated the continuation of workshops, networks, acquired competencies, and an available course from stronger forms of organizational sustainability associated with governance relevance, changed roles and incentives, and organizational embedding. The mapping therefore already distinguished relatively concrete current activities from a more ambitious future state whose realization remained uncertain.

The language of hope is analytically revealing in two respects. First, it marks a boundary between what can currently be observed and what remains an anticipated future development. Hope is therefore neither evidence of failure nor evidence that the anticipated impact has already occurred. Second, however, when the connection between present activity and a desired future state is expressed primarily through hope, the organizational trajectory linking the two remains underspecified. It becomes difficult to identify which subsequent decisions, structures, or decision premises would constitute movement toward the anticipated change and, consequently, which present decisions might alter the conditions under which such a development becomes more probable. Hope thus makes uncertainty visible while at the same time potentially concealing the organizational pathway through which the hoped-for difference could appear as a variation, become organizationally selected, and eventually be restabilized through recurrent reproduction.

Based on the facilitator's recollection, the plenary discussion shifted from whether systemic change would eventually follow to the organizational conditions that could connect current enabling work with the hoped-for difference. The aspiration could therefore be reformulated as two questions: What would have to become different in subsequent organizational decisions for systemic change to become observable, and which present decisions might make those later developments more probable?

An aspiration toward a changed leadership logic becomes more organizationally specific when participants identify the decisions through which that logic would have to become consequential—for example, recurring responsibilities, appointment or review criteria, established programs, regular resource allocations, or governance processes. The move from hope to a transformation trajectory does not remove uncertainty; it makes the organizational assumptions, dependencies, and possible decision points contained in the aspiration more explicit.

4.3 Reference systems become part of the observation

The completed mappings also illustrate why the reference system cannot remain implicit. One team explicitly differentiated between what could be produced within the pilot and what depended on internal conditions within participating institutions. Without a specified reference system, statements such as “the pilot has become structural” remain ambiguous. Structural for whom? A network may be structurally established within a project but remain an occasional event from the perspective of a university. An Alliance initiative may create possibilities for institutional change without itself being able to decide whether member universities select those possibilities. Reference-system specification is therefore not an additional contextual variable surrounding the matrix. It is a condition for making a defensible observation in the first place.

5. Discussion

The preceding theoretical development and initial practice use support three lines of discussion: the analytical distinction between organizational depth and trajectory, the connection between assessment and formative development, and the translation of systems-theoretical distinctions into a practical method.

5.1 Distinguishing organizational depth from trajectory

Distinguishing organizational depth from trajectory sharpens the relation between impact and sustainability. Although the two dimensions are theoretically related, the answer to one does not determine the answer to the other for purposes of organizational assessment. Identifying the organizational depth at which a difference is at stake does not establish whether that difference has been selected or restabilized/reproduced; conversely, observing recurrent reproduction does not by itself establish the organizational depth of the difference being reproduced. Keeping these questions analytically distinct avoids treating organizational depth and durability as interchangeable properties. A type of activity may be recurrently reproduced as a sequence of events without entailing a corresponding

structural transformation. Conversely, a variation may have potentially extensive organizational implications while remaining fragile because subsequent decisions have not yet taken it up. Formal institutionalization can likewise provide evidence of organizational selection by incorporating a difference into decision premises without demonstrating its restabilization/reproduction in later organizational operations. Sustainability of an organizational vehicle and sustainability of the difference it was intended to produce therefore need not coincide.

The distinction between organizational depth and trajectory also permits more precise working definitions of impact and sustainability. Within Transformation Trajectory Mapping, organizational impact refers to an observable difference associated with an intervention relative to previous organizational patterns within a specified reference system. Sustainability refers to the subsequent organizational fate of that difference: whether it is selected and, if selected, whether it becomes restabilized through recurrent reproduction in subsequent organizational operations. Sustainability is therefore not identical with the continuation of the intervention or of the organizational vehicle through which the difference was initially introduced. A project, course, network, or other activity may continue while the difference associated with it ceases to be consequential for organizational decision-making; conversely, the originating activity may disappear while altered responsibilities, criteria, programs, or other decision premises continue to shape subsequent decisions. Neither impact nor sustainability, in this analytical sense, implies that the observed difference is normatively desirable. Sustainable organizational impact can consequently be understood as the continuing reproduction of a consequential difference through organizational communication and decision.

These definitions are necessarily relative to a specified reference system, since the same difference may have different organizational statuses within a project, a member institution, and the Alliance.

5.2 Connecting assessment with formative development

The second implication concerns the prospective use of assessment. Once a desired difference has been specified in organizational terms and its current trajectory has been assessed, a further question becomes possible: which present decisions could change the conditions under which that difference enters subsequent organizational operations? Organizations reproduce themselves through recursively connected decisions, while structures and decision premises condition the connections available to subsequent decisions (Luhmann 2018). Prospective assessment can therefore focus on present decisions that alter those conditions—for example, by assigning an ongoing responsibility, introducing a review criterion, modifying a program, or allocating regular resources.

A transformation trajectory can therefore be understood as a revisable sequence in which decisions modify the conditions of further decisions. Drawing on the systems-theoretical notion of asymmetrization (Baraldi et al. 2021), the present framework uses “probability asymmetries” to describe how present decisions may alter the conditions of subsequent decisions without determining their outcomes. In practitioner language, the question becomes: What could be decided now that would make it more likely that this difference becomes recurrently consequential in later decisions?

Programming is one mechanism through which such asymmetries may be created, because programs and related decision premises can make selected differences recurrently available to later decisions. Yet the analysis in Section 2.4 also shows why programming cannot serve as a proxy for restabilization/reproduction: new programs may remain weakly connected to other operations or add competing demands to already crowded decision structures (Krönig and Möbs 2026; Roth and Sales 2026).

Formative assessment thus connects a diagnosis of the current trajectory with decisions about the conditions of possible further development. The gap between present and anticipated change becomes an organizational question about which later decisions would manifest the intended difference and which current decisions could make those connections more expectable.

5.3 Translating systems-theoretical distinctions into a practical method

The third implication concerns the translation of social systems theory into organizational practice. Transformation Trajectory Mapping does not translate Luhmann's theoretical architecture as a whole. Its approach is selective: concepts are retained where they generate distinctions that change what practitioners can observe, question, or consider in relation to organizational transformation.

This selectivity has methodological consequences. Concepts such as reference system, decision premise, variation, selection, restabilization/reproduction, and probability asymmetry remain part of the analytical architecture because they preserve distinctions that broader terms such as “impact,” “institutionalization,” or “sustainability” can collapse. Practical use, however, does not require practitioners to reproduce that theoretical vocabulary. Theory-practice translation occurs instead through the selective operationalization of distinctions: the matrix retains their analytical structure, while practitioner questions and the reflection protocol make them available for examining reference systems, evidence, organizational dependencies, subsequent decisions, and possible future development.

6. Limitations and future research

The initial practice use provides only a limited basis for assessing Transformation Trajectory Mapping. The June 2026 workshop was conducted as a formative project activity rather than as a research study. No standardized participant feedback was collected, facilitator recollections are retrospective, and the four completed mappings document how teams formulated their assessments but cannot establish participant experience, consistency of interpretation, or effects attributable to use of the method. The practice material should therefore be understood as an initial application through which the functioning of the distinctions can be examined, rather than as validation of the method.

The initial workshop used precursor terminology, so the practice account reflects experience with the underlying two-dimensional mapping logic rather than a test of the final formulation presented here.

Further research could examine the method under conditions designed specifically for systematic inquiry. Independent mappings of the same intervention could show where interpretations converge or diverge and whether disagreements arise primarily from different reference systems, evidence bases, or understandings of the distinctions. Longitudinal applications could follow mapped differences across subsequent organizational decisions and examine whether variations are selected, restabilized through recurrent reproduction, redirected, or discontinued. Comparative applications could explore whether the method differentiates interventions that appear similar when assessed primarily through activities, outputs, or stated outcomes.

System-level claims present a particularly demanding area for such research because they concern differences in the organization's broader operative mode across connected domains of decision-making. Evidence that such a difference has appeared as a variation cannot be inferred from a single policy, repeated activity, or isolated decision; it requires observation across connected decisions, decision premises, and organizational domains. Stronger claims of system-level restabilization/reproduction additionally require longitudinal evidence that the changed operative logic continues to be regenerated over time. Future applications could therefore investigate what forms and combinations of evidence permit defensible distinctions among system-level possibility, variation, selection, and restabilization/reproduction.

7. Conclusion

Transformation projects cannot infer sustainable organizational change from successful implementation alone. Activities may continue without altering the organizational conditions of subsequent decision-making, while differences introduced through temporary projects may persist after the originating activities have disappeared. Transformation Trajectory Mapping addresses this problem by posing two analytically distinct but theoretically related questions: at what organizational depth a specified difference is, or would be, consequential relative to a specified reference system, and what has happened, or could happen, to that difference. Crossing the distinction between event, structure, and system with the trajectory from possibility/enabling through variation/testing and selection to restabilization/reproduction produces a 3×4 map through which claims about impact and sustainability can be differentiated more precisely.

The initial use of a precursor of the method with leadership pilot teams illustrates how these distinctions can accommodate uncertainty, conditional expectations, and differences between current evidence and anticipated development without collapsing them into a single assessment of success. At the same time, the mapping can support a prospective move from assessment to formative development. Once the currently observable difference, its dependencies, and its anticipated trajectory have been specified, practitioners can ask which present decisions might alter the conditions under which that difference becomes consequential in subsequent organizational decisions. In systems-theoretical terms, the developmental question concerns which present decisions could asymmetrize future decision possibilities in favor of reproducing the intended difference. This connects assessment with formative

development by making the conditions of possible further change more explicit and organizationally addressable.

The practical contribution of social systems theory in this context consequently lies in the distinctions it makes available for organizational reflection. Rather than treating impact as the eventual endpoint of an intervention and sustainability as the continuation of its activities, Transformation Trajectory Mapping directs attention to the organizational difference associated with an intervention and to its subsequent fate in ongoing decision-making. Sustainable organizational impact, in this sense, is not merely the continuation of a project activity. It is the continuing reproduction of a consequential difference through organizational communication and decision.

Declarations

Competing interests

The author co-leads Work Package 3 (Transformative Leadership) of the PIONEER European University Alliance and is the developer of Transformation Trajectory Mapping. These professional roles are disclosed in relation to the framework and practice setting discussed in the article.

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Author Contribution

F.K.K. conceived the work, developed the theoretical framework and Transformation Trajectory Mapping method, reviewed the literature, interpreted the practice material, and prepared the tables. F.K.K. wrote and revised the manuscript, approved the final version, and agrees to be accountable for all aspects of the work.

Data availability

The practice account draws on four completed workshop mappings and retrospective facilitator reflections, as described in Section 4. The workshop materials are not included as public supplementary data because of confidentiality concerns in a small organizational community. Enquiries about access should be directed to the corresponding author; any access would be subject to the necessary permissions and confidentiality safeguards.

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