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Creativity and Innovative Processes: Assemblages and Lines of Flight

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Abstract: The current research study presented assemblages theory and the theory of affordances to identify the elements that make up the processes of creativity, innovative, and creativity and innovation. Assemblages involve heterogeneous elements that are associated with and interact with external components. Assemblages include elements that can be either independent or as part of an assemblage. The assemblage comprises elements that contribute to the assemblage, but not all elements are active simultaneously. Each element's activation and intensity level varies based on context, environment, and constraints. This activation level is represented by lines of flight that aid in showing movement across the elements. Affordances identify agent-to-environment relationships that promote action (abilities and effectivities). The current article identified that creativity affords innovation and innovation affords creativity, interconnecting these two processes as a holistic and composite process from the perspective of affordances theory. The current article provides assemblage maps showing the elements related to creativity, innovation, and creativity and innovation. These assemblage maps highlight virtual and dynamic flight lines that represent potentially active components with varying intensity and direction. Mapping these lines of flight along with the elements for a particular construct (e.g., creativity and innovation) provides a tool for managers and practitioners to identify potentialities for future predictions better.

Keywords: creativity; innovation; assemblages; affordances; complexity

1. Introduction

Today's organizational landscape has changed drastically due to a "rise in global interconnectedness" [1] (p. 570), an increasing rate of unpredictable change [2], and intensive local and global competition [3]. This newly evolving and changing landscape is best characterized as complexity in which we have incomplete knowledge to understanding our world and the connections between our behaviors and outcomes [4]. Just as the organizational landscape is experiencing complexity, so too are other processes ranging from individuals, to local communities, to globally interconnected networks. At the individual level, creativity needs to account for this level of complexity. At the collective and organizational levels, innovative processes must also account for this complexity. Individuals possess the potential of transforming systems to better adapt to today's complexity while, at the same time, transforming themselves [1]. Complexity is a multidimensional and multilevel construct.

One problem with current research efforts is that it is challenging to determine whether creativity and innovation are similar, or different, constructs. The literature has not successfully differentiated between these two constructs as they are often used interchangeably [5]. A second problem is that previous research related to creativity and innovation have been fragmented, at best. Most research efforts have theorized and examined creativity and innovation as a single-level construct or perspective, have disregarded the complex nature

of creativity and innovation processes, and have mostly avoided the multiple interactions involved in such processes at the group, organizational, societal, and global levels of analysis [6]. These shortcomings have resulted in a lack of clarity between these constructs [6] with inconsistent definitions and explanations [7], furthering the need to investigate the boundary conditions for creativity and innovation [8].

Some researchers have called to "demystify innovation" [9] (p. 337). Other researchers have called for new methods of theorizing that produce new integrative frameworks that view creativity and innovation as multilevel constructs: "Encourage more bold multilevel designs to explore factors implicated in both creativity and innovation across multiple levels of analysis" [10] (p. 1302). With the innovative process defined as being complex, multilevel, and nonlinear [9,11] future research efforts must combine multiple perspectives to capture the aspects of complexity [9]. In looking at group innovation, West [11] identified innovation as being dynamic, calling for dynamic models to be developed that incorporate groups, group members, and their environment. Others called for new models to link the organization to the environment using a reciprocal model [11].

Innovation research has concentrated on three primary areas; diffusion of innovation, organizational innovativeness, and process theory [7]. Diffusion of innovation identifies how a new innovation is accepted by a group or organization, organizational innovativeness looks at the determinants of a group's or an organization's ability to be innovative, whereas process theory views the innovation process; "how and why innovations emerge, develop, grow, and (perhaps) terminate" [7] (p. 409). The current study focuses primarily on the process of innovation with an emphasis on creativity being part of the innovation process. This places both the creative and innovative processes as parts of a larger whole, as being multidimensional and multilevel. The current article is the first to address creativity and innovative processes as assemblages and affordances. It is the first to map the creativity, innovative, and creativity and innovative processes showing the elements for each construct along with potential lines of flight. This mapping process also meets the needs of demystifying creativity and innovation by making the processes more visual.

The current research study was designed to address the following calls from Woodman, Sawyer and Griffin [6]. First, a theory of creativity, innovation, or both, "must provide a framework encompassing the multiple levels of interest" [6] (p. 317). Second, in order to understand the complexity and social characteristics involved with the creativity and innovative processes the creative processes, products, persons, and situations [6] (p. 317) must be observed. This study was also designed to explore the boundary conditions (BC) of creativity and innovation in the context of assemblages, as called for by Busse, Kach and Wagner [8]. These BCs of a theory "depicts the accuracy of theoretical predictions for any context given a certain structure of the theory" (p. 604).

The authors wanted to expand current research on creativity and innovation by making each construct's elements and boundary conditions more visible for practice. By utilizing affordances theory to show that each construct (creativity, innovation) requires the other to complete the creativity/innovative process, and by mapping these processes using assemblages theory, the authors were able to answer a few questions. First, can affordance theory expand the literature to show that creativity and innovation are both needed to support one another? Second, can the processes of creativity, innovation, and creativity and innovation be explained and mapped from the perspective of assemblages theory? Third, how could an assemblage map of creativity and innovation be applied to support practice? These were a few of the questions that the authors attempted to answer in the current study.

The current article includes the following sections. First, we will present the methodology used for the current study. Second, we will look at how creativity, innovation, and the combination of both creativity and innovation are portrayed in current literature. Third, we provide an overview of the research study's theoretical perspective, identifying assemblages theory and the theory of affordances as the lens for integrating and understanding the creative and innovative processes. The remainder of the current study synthesizes the

literature by mapping the elements of creativity, innovation, and creativity and innovation (as a composite construct) from the perspective of assemblages theory.

2. Methodology

The current article incorporated a review of the literature as called for by Cooper [12] in his "Taxonomy of Literature Reviews". This first characteristic of a literature review involves the focus of the review. Reviews primarily focus on research findings, research methods, theories, or practices/applications [12] (p. 4, Table 1). While many reviews have one primary focus, many have more than one focus: "Literature reviews in psychology have a primary center of attention, but it is rare that they have only a single focus" (p. 3). The current study has more than one area of focus. The first focus involves reviewing the literature around the concepts of creativity, innovation, and creativity and innovation. The second focus is on the theories that provide the study's lens (assemblages theory, theory of affordances).

The second characteristic in Cooper's taxonomy involves the goal for the review: integration, criticism, or identification of central issues [12]. The current study's goal centralizes on integrating current literature as a bridge to expanding theories of creativity and innovation. The third characteristic involves perspective: neutral representation, or espousal of position. While the current article takes the perspective from assemblages theory and the theory of affordances, the authors do not take any position, they only present potentialities, placing this review as having a neutral representation.

The fourth characteristic includes the type of coverage included in the review. This coverage can include an exhaustive review of the literature, an exhaustive review with selective citation, a representative review, or a central or pivotal review [12]. The current study conducted a pivotal review of creativity, innovation, and creativity and innovation. A central or pivotal review of this literature included "works that have been central or pivotal to a topic" (p. 5). For the current study, the authors concentrated on pivotal articles for each construct (creativity, innovation, creativity and innovation). Secondary, a representative review was conducted for assemblages theory and the theory of affordances. The literature reviewed was representative because the literature reviewed was primarily of the originators of each theory or involve published works that focused on these original works.

The fifth characteristic involves the organization of the review itself: historical, conceptual, or methodological [12]. The current review provided a conceptual review of the constructs of creativity, innovation, and creativity and innovation, followed by a review of the theories (assemblages, affordances) that provided the framework for the synthesis of the literature (the conceptual framework).

The last characteristic in Cooper's taxonomy involves the audience for the review: specialized scholars, general scholars, practitioners or policymakers, and general public [12]. The audience for the current article is for specialized and general scholars, being that this study was reviewed by scholars as part of the review process. However, as part of the Special Issue with a focus on practitioners, the audience for the current article is also designed to support practitioners who deal with complexity in their workplace.

Synthesis

One shortcoming of literature reviews is their "lack of emphasis on synthesis" [13] (p. 409). Synthesis can be defined as "a creative act that results in the generation of new knowledge about a topic reviewed in the literature" [13] (p. 412) that provides readers with a "new perspective on the literature" [14] (p. 5). The current article synthesized the literature on creativity, innovation, and creativity and innovation from the perspective of assemblages theory and the theory of affordances. This type of synthesis, involving the synthesis of multiple constructs, sources, and theories is referred to as synthesized coherence: "*Synthesized coherence* puts together work that is generally considered unrelated; theory and research previously regarded as unconnected are pieced together" [15] (p. 93).

The current study provided a synthesized coherence by connecting assemblage theory and the theory of affordances with the constructs of creativity, innovation, and creativity and innovation.

3. Creativity

Creativity has been characterized as a process [11,16] that leads to "the generation of new and valued ideas" [11] (p. 357), as a complex phenomenon [5], that introduces something new that is valued by one's culture [17] (p. 25). Creativity is generally defined as "the generation of original and useful ideas [18], requiring "thinking 'outside the box', going beyond routines and common assumptions and experimentation" [18] (p. 965).

This reference to thinking outside the box is duplicated in the literature and refers to creating something novel, or new. For example, Amabile [19] described creativity as "the production of novel, appropriate ideas in *any* realm of human activity, from science, to the arts, to education, to business, to everyday life" (p. 40). This novelty must also be pragmatic and appropriate to the circumstances. One example of this would be in the development of networked computers. It would not have been a worthy idea if it was generated before computers were invented, only once computers were a common business and household item would this idea be appropriate given the current environment and circumstances. The definition of creativity also extends to being domain-specific: "Subjective judgment of the novelty and value of an outcome of a particular action" [5] (p. 1115), placing another requirement of creativity being related to its pragmatic value.

Csikszentmihalyi [17] related an item as being creative if it is found in the local culture, identifying that the creative product has been deemed to have value within a particular discipline or culture. Creativity has been identified as being a social process. As knowledge is cumulative, creativity is also viewed as being cumulative, building upon previous experiences. Additionally, creativity, just as knowledge, is positioned in a sociocultural context [17], placing both as social constructs. Creativity is influenced by the situation as well as the actions of others who came before us, placing creativity contextual and social [6].

Creativity has been presented as being most successful when one is able to work on a project that the creator is most interested in. Hence, people are most creative when they are intrinsically motivated and able to "work on something because it is interesting, involving, exciting, satisfying, or personally challenging" [19] (p. 39). Yuan and Woodman [9] placed one's intrinsic interests (motivation) as having a positive relationship with creativity.

Creativity as a Multilevel Construct

Creativity can also be identified as a team or organizational construct and not just an individual level construct. Creativity within the team literature has been defined as: "the processes by which employees generate novel and useful ideas to solve problems related to team productivity and effectiveness" [16] (p. 441). Here, creativity is contextual to the team setting and to the team's goals. This process does not come automatically, from an individual's or a team's perspective: "It requires meaningful [purposeful] task and interpersonal interactions among team members" [16] (p. 441. Creativity at the organizational level involves new product development. Organizational creativity has been portrayed in the literature as "the creation of a valuable, useful new product, service, idea, procedure, or process by individuals working together in a complex social system" [6] (p. 293). By identifying creativity as an individual, team, and organizational construct, the literature portrays creativity as a multilevel construct.

4. Innovation

Innovation is defined as: "The intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit role performance, the group, the organization or the wider society" [20] (p. 16). Where creativity has been identified as being an individual, team, or organizational construct, innovation is a collective construct (team, or-

ganizational, community). Innovation becomes a necessary collaborative effort that merges knowledge and experience from individuals into new knowledge to move that group or organization forward [21]. As an example, innovation involves "individuals work[ing] together in teams, teams work[ing] together in projects, organizations work[ing] together in alliances, and countries work[ing] together in international technology agendas" [21] (p. 125). The literature identifies, and supports, innovation as a multilevel construct beginning from the team or collective level and up to the organization or community levels of analysis. However, innovation typically is not considered an individual construct.

Innovation has been portrayed as a cyclical process in which knowledge is recycled and recombined into new products. For example, Flath, et al. [22] highlighted that innovations do not emerge from isolation, rather innovation emerges from the shared knowledge and from previous experiences of those involved in the process. Additionally, innovation is a cyclical process where innovation is considered to take place through recombination [22], where innovators "apply existing ideas to novel setting, recombine them in new ways or extract parts to integrate them into their own creations" [22] (p. 307). Another term for recombination is knowledge reuse [22]. As a cyclical process, innovation has been described in the literature as being a recursive process, involving both the processes of idea generation and implementation [10]. Idea generation involves cycles of relationship events [5] and implementation incorporates cycles of adaptation and stabilization [11].

The innovative process is a complex process, it involves nonlinear thinking, emerges under tumultuous conditions, and can be perceived as being opportunistic [9]. Innovation as a complex process involves "activities pertaining to both the generation/introduction of new ideas . . . and the realization or implementation of new ideas" [9] (p. 230). This connection between complexity and innovation had resulted in a new terminology for the term innovation. Rosing, Frese and Bausch [18] used the term "the complexity of innovation" (p. 957). Complex processes such as innovation, and complex adaptive systems (CAS), involve "concepts of non-linearity, self-organization and emergence" [23] (p. 230). In looking at the diffusion of innovation (DI), identified as the spread of an innovative product to potential adopters of that product, Wolfe [7] identified different attributes of DI that aid in implementing a new product: "relative advantage, compatibility, complexity, trainability, and observability" (p. 408).

Innovation is a dynamic, cyclical, process in which researchers must construct new dynamic models for innovation [11] while taking into account the complexity of the innovative process [18]. The next section looks at both creativity and innovation as one unit or process.

5. Creativity and Innovation

In keeping with the literature on creativity and innovation, the literature that looks at both creativity and innovation combined also view these processes as being complex, multilevel, and emergent phenomena [10]. Although these two constructs are related, they are not identical constructs [10]. In general, innovation has been identified as being composed of two separate processes, creativity and implementation [18]. Others have identified these two processes as idea generation and idea implementation [11,18], where idea generation is associated with creativity and idea implementation is associated with innovation. Although creativity and innovation are different constructs, they are both connected to the innovative process with creativity being related to the initial stages and innovation being identified as the collective process that takes place once the new idea/product has been created. "Creativity is the first step in innovation, which is the successful implementation of those novel, appropriate ideas" [19] (p. 40). West [11] combined the two constructs by highlighting creativity as the development of a new idea, with innovation being associated with the application of the new idea. Yuan and Woodman [9] differentiated between creative behavior (creativity) and innovative behavior (innovation), placing creative behavior with idea generation and innovative behavior with the implementation of new ideas.

Creativity and innovation are both non-linear processes and part of the same phenomenon, the innovative process [18]. These two processes overlap throughout the development of a new product/idea with differing levels of overlap at different stages in the process. At some stages in the process the phases could be purely creative or purely innovative, while other stages may involve different levels of both creativity and innovation. These variations can also differ depending on the product, the idea generation project, and the number of individuals involved in the overall process. This interplay between creativity and innovation can also vary based on the complexity of the project as well as the knowledge, skills, and abilities (KSA) of those involved and the resources made available to them to complete the overall process.

5.1. Definition of the Innovative Process

The cohesive process of innovation, including both functions of creativity and innovation, is best described by Anderson, Potocnik and Zhou [10] in the following definition:

> *Creativity and innovation at work are the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things. The creativity stage of this process refers to idea generation, and innovation refers to the subsequent stage of implementing ideas toward better procedures, practices, or products. Creativity and innovation can occur at the level of the individual, work team, organization, or at more than one of these levels combined but will invariably result in identifiable benefits at one or more of these levels of analysis.* [p. 1298, emphasis original]

The innovative process is a cross-functional process, meaning that it cannot be conducted in isolation at one single level of analysis. The innovative process crosses multiple levels of analysis and is a multilevel construct that needs to be represented by multilevel theories: "Creativity in organizational settings can best be conceived in terms of creative actions that may be simultaneously influenced and assessed across multiple social domains within and between levels of analysis" [5] (p. 1126). Being multilevel also identifies the process of innovation as a social process. Creativity can begin at the individual level, however, to continue the innovative process it must be supported by collaborative and social processes. Creativity must be supported by the social and group dynamics that come with the innovative process: "Diversity of knowledge and skills is a powerful predictor of innovation, but integrating group processes and competencies are needed to enable the fruits of this diversity to be harvested" [11] (p. 356).

5.2. Innovation in the Workplace, Management, and Organizations

Some literature within the management domain identifies organizational creativity as a subset of innovation, with innovation being a subset of organizational change [6]. Innovation and creativity have become critical antecedents to "organizational performance, success, and longer-term [organizational] survival" [10] (p. 1298).

Within the organizational literature, innovation theories differentiate between idea generation (creativity) and idea implementation (innovation) [18]. The processes of exploration and exploitation are both fundamental to the creative and innovative phases [18]. Both processes must be present to facilitate the creative and innovative phases to completion. For example, Rosing et al., [18] identified teams needing to integrate both the explorative and exploitative processes, rather than separating the two processes (exploration and exploitation) among separate teams. It is the interchange between the exploration and exploitation processes, between creativity and innovation, that results in value creation. This balance, whether at the organization or team, results in ambidextrous processes that integrate both exploration and exploitation processes while flexibly switching between the two as needed [18]. This provides a background for Rosing et al.'s [18] theory of ambidexterity in the innovation process. Effective leaders need to provide the proper and temporally flexible balance between exploration and exploitation, leading to three elements of Rosing et al.'s [18] ambidextrous leadership theory: fostering exploration, foster exploitation, and providing temporal flexibility that allows followers to switch between

exploration and exploitation as needed. Essentially, this model begins with idea generation, creativity. Followed by leadership that provides a temporally flexible environment that facilitates the balance between exploration and exploitation, resulting in innovation [18].

Theories of innovation, much similar to Rosing's (2011) theory of ambidexterity in the innovation process, can be found in a variety of disciplines. Some of these theories focus on creativity while others on innovation, and some combine the two as one process.

6. Theoretical Perspective

The theoretical foundation for the composite theory of creativity and innovative processes as an assemblage come from assemblages theory [24,25] (see also [26–28]) and the theory of affordances [29] (see also [30–32]). Each of these theories will be described in the following sections.

6.1. Assemblages Theory

In describing an assemblage, the literature uses the term multiplicity in which two or more elements or objects interact together with no beginning or end [24] as each follows their own separate path while interacting to compose a whole which is yet part of an even larger whole. Each object can act on their own (e.g., creativity, innovation) or they can function together (e.g., creativity and innovative processes as an assemblage). Assemblages are "neither a part nor a whole" [28] (p. 23). Multiplicities involve component parts that can function one way independently, in a different manner with one assemblage involving other component parts, and still differently in another assemblage involving other component parts [24,28]. Context and the interactions between the component parts that make up an assemblage matter more than the individual component parts of an assemblage.

Multiplicities involve what Deleuze and Guattari [24] call "the line of flight". The line of flight represents an abstract line that marks the number of dimensions that are incorporated into the multiplicity. A book was used as an example by Deleuze and Guattari [24] showing how historical events, decisions, concepts, agents, groups, and social collectives can be connected throughout.

Three general points about assemblages come from Deleuze in an interview on the book "A Thousand Plateaus":

1. Assemblages are composed of heterogeneous elements or objects that enter into relations with one another. These objects are not all of the same type. Thus you have physical objects, happenings, events, and so on, but you also have signs, utterances, and so on. While there are assemblages that are composed entirely of bodies, there are no assemblages composed entirely of signs and utterances.
2. One aim in cultivating and evaluating assemblages lies in finding ways to escape items that prevent the formation of assemblages.
3. Consistency and coherence are not qualities that *precede* assemblages, rather they are *emergent* properties that do or do not arise *from* assemblage. [33] (p. three key points).

Assemblages follow the same logic as quantum entanglement from physics. Quantum entanglement refers to the phenomenon when two or more particles share spatial proximity and interact so that each independent particle cannot be described independently, their identity in their interactive space-time continuum remains as one [34]. Once the particles complete their interaction, if they are not destroyed, they separate and continue to have a new individual identity, or they join different particles to be part of a new holistic identity.

6.1.1. Two Dimensions

Assemblages operate across two basic dimensions. The first represents the roles that the component parts play while part of the assemblage. This dimension is a stratum consisting of content/material and expressions. The second represents the processes that stabilize or destabilize the assemblage's identity, known as territorialization and deterritorialization [27].

6.1.2. Content and Expressions

The first dimension of content and expressions operate as a stratum because each are mutually dependent on the other: "They are defined only by their mutual solidarity, and neither of them can be identified otherwise. They are defined only oppositively and relatively, as mutually opposed functives of one and the same function" [24] (p. 45). Content and materials are viewed as being external (exteriority) to the assemblage because they have been provided to the assemblage. In contrast, expressions are viewed as internal (interiority) to the assemblage because they belong to the component parts. Figure 1 shows the first dimensions of content and expressions.

CONTENT AND EXPRESSION DIMENSIONS

Content
Formed matters, substance and form.
Substance: Matters that are chosen.
Form: They are chosen in a certain order.

Expression
Functional structures, organization of form and substances.

Combined (as a stratum)
Content and expression vary from one stratum to another, intermingle, and multiply/divide together.
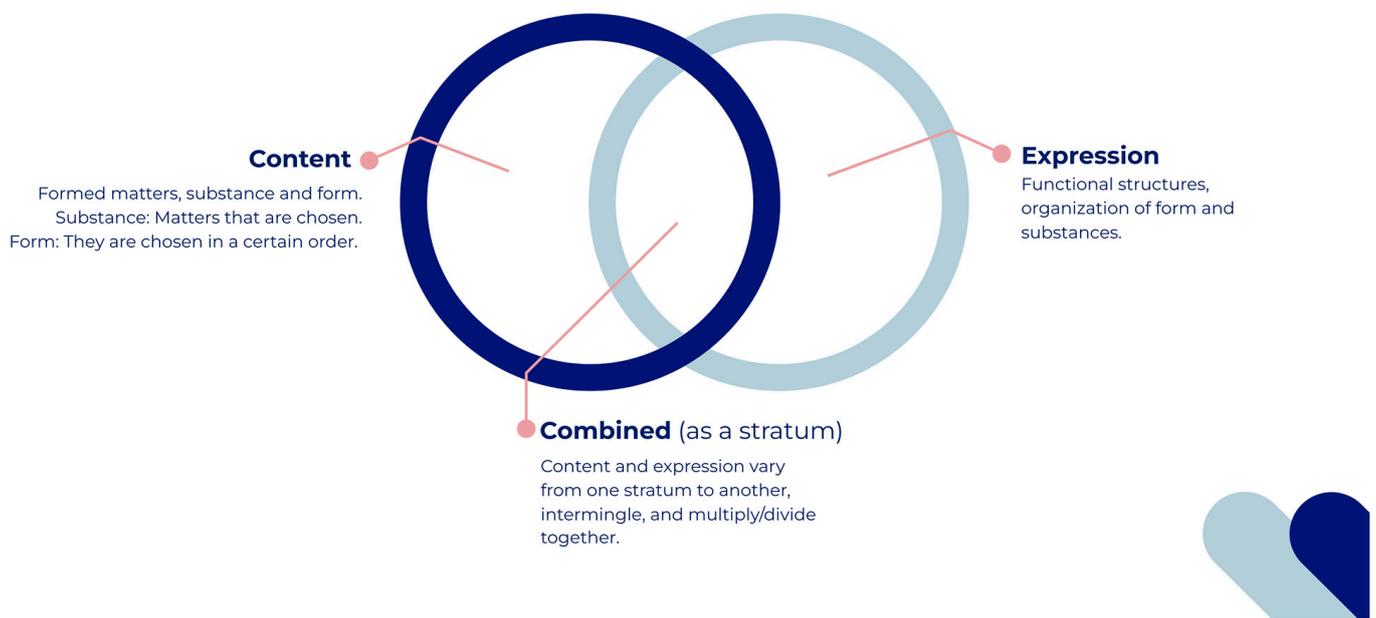
Figure 1. Content and Expression Dimensions.

As an assemblage, content/material and expressions must interact with one another for each to be contextual relevant to the goal of the assemblage: "This exterior and interior are relative; they exist only through their exchanges and therefore only by virtue of the stratum responsible for the relation between them" [24] (p. 49). The dimensions of content/material and expressions are defined with examples in Table 1.

Table 1. Content and Expression Dimensions.

Dimension 1	Definition	Examples
Content	Deleuze and Guattari [24] used the term content for formed matters, substance and form. Substance: matters that are chosen.Form: They are chosen in a certain order.	-Physical particles, chemical substances during their stable states (territorialization) [24] -A city's buildings, landscapes, architectural features [26]. -Natural resources, human resources, national and local boundaries [26].
Expression	Deleuze and Guattari [24] used the term expression for functional structures, organization of form and substances as to how they form compounds.	-Organization moves toward deterritorialization [24]. -A city's skyline, silhouette against the sky [26]. -Nation states expressed through flags and colors, anthems, state and national capital [26].

Table 1. *Cont.*

Dimension 1	Definition	Examples
As a Stratum	"Content and expression are two variables of a function of stratification. They not only vary from one stratum to another, but intermingle, and within the same stratum multiply and divide ad infinitum." [24] (p. 44)	-"In biochemistry, there is a *unity of composition* of the organic stratum defined at the level of materials and energy, substantial elements or radicals, bonds and reactions. But there is a variety of different molecules, substances, and forms." [24] (p. 45)

6.1.3. Territorialization and Deterritorialization

As an assemblage's component parts merge, they practice territorialization behaviors that identify their constraints and sustain their task-specific activities while the assemblage exists. At the same time, however, there are deterritorialization forces that attempt to challenge these sustaining behaviors. These dimensions, territorialization and deterritorialization, are not to be conceptualized as being either-or, but as a continuous interplay between the two as two sides of the same coin: "Deterritorialization must be thought of as a perfectly positive power that has degrees and thresholds (epistrata), is always relative, and has reterritorialization as its flipside or complement" [24] (p. 54). Figure 2 shows the second dimensions of territorialization and deterritorialization.

TERRITORIALIZATION / DETERRITORIALIZATION DIMENSIONS

Territorialization
Identify constraints/boundaries, sustain activities, maintain homogeneity.

Deterritorialization
Challenge constraints/boundaries, break-down sustaining activities, favors heterogeneity.

Reterritorialization
Interlinks territorializating and deterritorializating forces into a circulation of intensities, operating between order and chaos.

Figure 2. Territorialization, Deterritorialization, and Reterritorialization.

The dimensions of territorialization and deterritorialization are defined with examples in Table 2.

Table 2. Territorialization and Deterritorialization Dimensions.

Dimension 2	Definition	Examples
Territorialization	"*Territorializing marks simultaneously develop into motifs and counterpoints, and reorganize functions and regroup forces*" [24] (p. 322). "Territorialization refers not only to the determination of the spatial boundaries of a whole . . . but also to the degree to which an assemblage's component parts are drawn from a homogeneous repertoire, or the degree to which an assemblage homogenises its own components" [26] (p. 31).	Drug addicts look for an escape, a territorialization that offers hallucinations, phantasy, temporary state of forgetting [24]. The territory of a community, city, or nation-state [26].
Deterritorialization	"The deterritorialization carries the expression and the content to a proximity where the distinction between them ceases to be relevant, or where the deterritorialization creates their indiscernibility" [24] (p. 307). Deterritorialization is relative and absolute. Relative associates with historical relationships with territories and external relationships. Absolute deterritorialization "can only be thought according to certain still-to-be-determined relationships with relative deterritorializations that are not only cosmic but geographical, historical, and psychosocial" [25] (p. 88).	Music, art, literature. [24] The Earth: "Like the earth inasmuch as it neither moves nor is at rest. Yet we have seen that the earth constantly carries out a movement of deterritorialization on the spot, by which it goes beyond any territory: it is deterritorializing and deterritorialized" [25] (p. 85).
As a Stratum Reterritorialization	"The two becomings [territorializations and deterritorializations] interlink and form relays in a circulation of intensities pushing the deterritorialization even further" [24] (p. 10). "Forms depend on codes in the parastrata and plunge into processes of decoding or drift and that degrees themselves are caught up in movements of intensive territorialization and reterritorialization" [24] (p. 54).	The wasp and orchid interaction results in the wasp reterritorializing the orchid's pollen [24]. Economy: "The merchant buys in a territory, deterritorializes products into commodities, and is reterritorialized on commercial circuits" [25] (p. 67). The interplay between territorialization and deterritorialization; reterritorialization [24].

6.1.4. Lines of Flight

Assemblages incapsulate synthetic capacities, dispositions, properties, and tendencies that are ever-present [26]. By being synthetic, these properties operate between the abstract and concrete as an affordance (see next section). Mapping real objects represent active properties whereas mapping virtual objects represent potentialities. As these properties go through various stages of reterritorialization, "movements of deterritorialization and destratification" [24] (p. 3), they become new synthetic representations of assemblages. This constant reterritorialization and emergence follow a path along a time-space continuum.

A "plane of consistency", as identified by DeLanda [26], represents "all movements of deterritorialization to their absolute threshold" (p. 112). This process can be mapped in two ways. The first is to show movement toward deterritorialization. The second breaks up the assemblages into discrete or discontinuous entities [26]. Deleuze and Guattari [24] conceptualized these discontinuous entities as segmented lines or as vectors with varying degrees of intensity and direction. These lines or vectors map the reterritorialization (territorialization, deterritorialization) phases at any time-space continuum. This is referred to as "lines of flight" by Deleuze and Guattari [24].

These lines of flight are better when they are conceived of as being vectors rather than lines to distinguish between linear and non-linear paths. Assemblages function in a non-linear path, constituting various levels of intensity and direction from the component parts, some reacting to other components while others driving different phases. These activities of and among the component parts, assemblages, operate in non-linear and emergent ways.

This was described by Deleuze and Guattari [24] in the following: "Comparative rates of flow on these lines produce phenomena of relative slowness and viscosity, or, on the contrary, of acceleration and rupture. All this, lines and measurable speeds, constitute an *assemblage*" (pp. 3–4). Emergent and non-linearity in the reterritorialization phases of any set of assemblage is best conceptualized by vectors rather than lines. However, for the current article, the authors will keep the original concept of lines of flight even though we are referring to vectors and not linear lines or processes.

6.1.5. Attractors

The lines of flight around an assemblage are concentrated along attractors, special properties or patterns of convergence. Attractors represent the synthetic capacities, dispositions, properties, or tendencies that are at high intensity and in high demand. When multiple attractors are present in one assemblage, the line of flight maps out a basin of attractors. It is the attractors, out of all the assemblage's potential components, that achieve the stated goal and aid in driving the reterritorialization iterations. One goal is to identify the basin of attractors along the line of flight to help aid their activities to drive the transformation or change. The basin of attractors for an assemblage helps provide stability and coherence [26] as the system converges around these attractors [35]. These attractors become the system's constraints:

> "Points located within a basin of attraction represent states with a greater than average probability of being visited by the system. Changes of state originating from one of those points will naturally tend toward a lower point in that basin, that is, toward states with an even higher probability. While in a stable regime, a system's behavior converges on its attractor. Finding oneself within a basin of attraction means that one's future behavior will be *constrained* by that attractor." [35] (pp. 152–153)

Assemblages and their basin of attractors provide stability for a system through these constraints. To change the behavior of a system, however, it requires reterritorialization activities that are directed toward these basins of attractors, otherwise the system would remain stable. This highlights not only the importance of identifying attractors in an assemblage but also reiterates the necessity of facilitating reterritorialization activities to the system to promote change.

6.1.6. Mapping

Mapping assemblages does not involve representing an environment's borders, boundaries, and constraints as is typically done with topographical maps. What is necessary when mapping assemblages is to represent the thresholds of intensity:

> "What needs to be mapped in this case are not the borders of the entities possessing a spatial organization, like the boundaries of an ocean, a lake, or another body of water, but thresholds of intensity causing changes from quantity to quality in the spatial organization of those bodies." [26] (p. 118)

An example of this in thermodynamics can be found in a liquid phase diagram. The diagram identifies pressure and temperature gradients for each of the different phases (ice, water, steam). The important points in such a diagram are not the changes in temperature or pressure, but the British Thermal Units (BTU) required to achieve a phase shift (e.g., water to steam). These phase shifts are representations of the thresholds of intensity [24,26].

Mapping is defined as, "*the structure of a possibility space*" [26] (p. 124). Maps are drawn on different scales depending on the number of properties or levels of order. For example, a system with two properties, the first representative of the x-axis and the second representative of the y-axis, are plotted on two-dimensions, three-variables in three-dimensions, and so on. A "system's state" lists each possible state of the system as, "an intersection of coordinates, a point or region in two, three or, more likely, multidimensional space" [35] (p. 152).

Providing a map of all possibilities along one plane, the elements available for creativity, innovation, and creativity and innovation can be shown. While all elements are not necessary for each activity, some may be required for one type of problem while others for different settings (e.g., product development, healthcare service). The mapping of the line of flight for an assemblage highlight the attractors and essential elements (abstract, concrete, virtual) for a given time-space continuum.

6.2. The Theory of Affordances

Affordances operate on the complimentarity principle that show how nature involves "unions of opposites: waves and particles, the observer and the observed, and so forth" [36] (p. 199). With social systems, we are mostly interested in the affordances that are provided between agents and the environment. The affordances that each provides to the other that would not be provided alone. Observing the interaction between the opposites in question (e.g., agent and environment) is the critical factor with affordances as it breaks the subject-object rigidity:

> "An affordance cuts across the dichotomy of subjective-objective and helps to understand its inadequacy. It is equally a fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and to the observer." [37] (p. 121)

By ignoring the subjective-objective dichotomy, those that have been co-joined, pre-defined, and pre-categorized as a normal grouping, new opportunities and utilities can be realized as this breaks down the preconceived defining features of traditional pairings. This is the point that Gibson [37] spoke of when he stated: "The theory of affordances rescues us from the philosophical muddle of assuming fixed classes of objects, each defined by its common features and then given a name" (p. 125).

Definitions of affordances and abilities, along with brief examples of each, are provided in Table 3.

Table 3. Affordances and Abilities.

	Definitions/Descriptions	Examples
Affordances	"The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill" [37] (p. 119).	Implies "complementarity" of the animal and the environment [37] (p. 119).
	"In any interaction involving an agent with some other system, conditions that enable that interaction include some properties of the agent along with some properties of the other system" [31] (p. 338).	-Direct perception: "Information for orientation and locomotion in space" [31] (p. 338). -Recognition: "information for identifying and classifying objects and events" [31] (p. 338).
	"Affordances, I argue, are relations between particular aspects of animals and particular aspects of situations" [30] (p. 186).	Shaquille is taller-than Tony. The term "taller-than" is not inherent with either Shaqulle or Tony, it is relative to the two: "It is neither of the person, nor of the environment, but rather of their combination" [30] (p. 187).
Abilities	"An ability relates attributes of an agent to an interactive activity with something in the environment that has some affordance" [31] (p. 338).	[action by agent] ⇒[good outcomes]; "A skilled practitioner's actions have effects that are functional in the activity" [31] (p. 339).
Affordances and Abilities	"Neither an affordance nor an ability is specifiable in the absence of specifying the other" [31] (p. 338).	Information that specifies the environment accompanies information that specifies the observer [37].

Table 3. *Cont.*

	Definitions/Descriptions	Examples
Effectivities	"Effectivities are properties of animals that allow them to make use of affordances" [30] (p. 184).	Body scale ratios (e.g., arm span, knee height) are properties of animals and are related to the affordances in the environment [30].
Affordances and Effectivities	"Affordances and effectivities are dispositional properties of things referring to a thing's potentialities-to what can happen" [38] (p. 262).	See Table 4 for examples.

For an affordance to be utilized by an agent, the agent must have the ability or effectivity to make use of an object, it must have value or utility for the user. There are slight differences between abilities and effectivities. Abilities are dispositions and effectivities are not [30]. Table 3 included examples for both. Abilities relate to normative behaviors, providing the misconception that individuals must behave per the perceived description of a particular ability (e.g., intelligence, charisma). In contrast, effectivities are dispositions that are not normative but provide variations based on one's perception in relation to the environment, it is more contextually and situationally relevant to the complimentarity (see Figure 3).

AFFORDANCES, ABILITIES, EFFECTIVITIES

Affordances
What the environment offers an agent, allowing it to interact with the environment.

>>>>>

Affordances & Abilities
Implies complementarity, agent and environment, both rely on the other.

<<<<

Abilities
Attributes of an agent that allows the agent to interact with the environment or in a situation

Affordances
Relates to properties of the agent and properties of the environment.

>>>>>

Affordances & Effectivities
Dispositional properties of potentialities, what can happen.

<<<<

Effectivities
Properties of agents that provide them the opportunity to make use of affordances.

Figure 3. Affordances, Abilities, and Effectivities.

Examples, from Turvey, Shaw, Reed and Mace [38], of a few basic affordances, effectivities, and potential activities that could come from such relationships is shown in Table 4.

Table 4. Affordances, Effectivities, and Activities.

Affordance	Effectivity	Activity
Write-on-to-able thing	Writer thing	Writing
Step-on-to-able thing	Stepper thing	Stepping
Drive-able thing	Driving thing	Driving
Eat-able thing	Eating thing	Eating
See also [38] (p. 261)		

Effectivities operate on the properties that an organism can effect activity with respect to an environmental situation [38]. In the examples included in Table 4, these properties could read that an animal acknowledges that something is eat-able, therefore it becomes an eating thing, resulting in the activity of the animal eating. For the current article, the authors will use the term abilities with the understanding that it could represent either abilities or effectivities.

Affordances and Creativity and Innovation

In line with the current topic of creativity and innovation, applying the theory of affordances, we could make the following statements:

- Creativity affords innovation.
- Innovation affords creativity.
- The complimentarity of these two sets of affordances co-creates value and meaning to the agent and observer.

An organism (agent) acknowledges that something is creatable, therefore it becomes a creative thing, resulting in the activity (innovation) of realizing (e.g., producing, distributing) the creative product. Creativity affords innovation and innovation affords creativity. The combined processes of creativity and innovation affords organizations to develop novel products and services that are valued by the customer or end-user. The combined processes afford the customer utility and the organization a competitive advantage through the novel product or service.

7. Assemblages and Creativity and Innovation

The following section synthesizes the literature on creativity, innovation, and creativity and innovation using the concepts from the previous sections on assemblage theory. Cursory maps will be provided showing potential dimensions (content, expressions, territorialization, deterritorialization) for each (Table 5, creativity assemblage dimensions; Table 6, innovation assemblage dimensions; Table 7, creativity and innovation assemblage dimensions). A map will also be presented for each (Figure 4, creativity assemblages map; Figure 5, innovation assemblages map; Figure 6, creativity and innovation assemblages map) showing a potential line of flight that connects each level of analysis (individual, team/group, organization) found in the creativity and innovation bodies of literature.
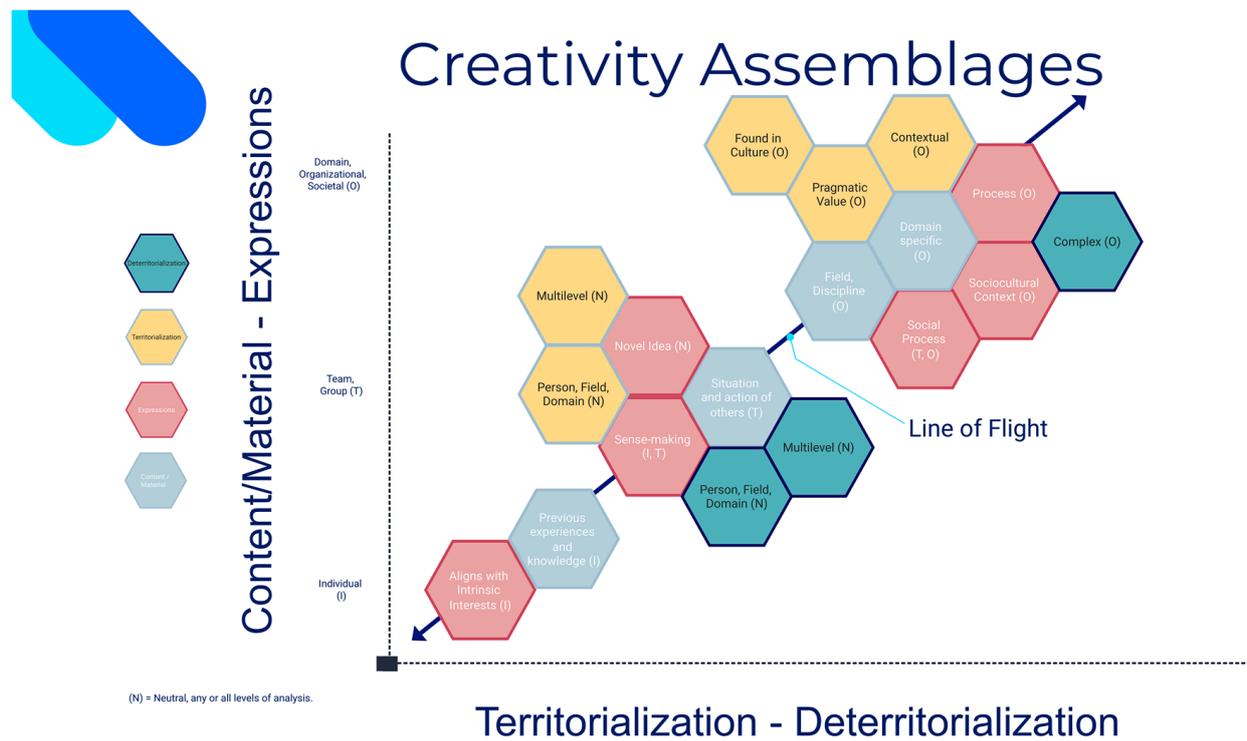
Figure 4. Creativity Assemblages Map.

7.1. Creativity

The literature on creativity was synthesized into Table 5, categorized into the two dimensions of content/material and expressions, and territorialization and deterritorialization. The components for each dimension is provided in Table 5 with each component identified by its level of analysis ([I], individual; [T], team/group; [O], organization; [N], neutral).

Table 5. Creativity Assemblage Dimensions.

Dimension 1		Dimension 2	
Content/material	**Expressions**	**Territorialization**	**Deterritorialization**
Exteriority (provided to component parts)	Interiority (belong to component parts)	Sustaining Behaviors (constraints and task activities that maintain homogeneity)	Challenge Sustaining Behaviors
Creativity			
Field, Discipline [O] [17]	A process [O] [11]	Contextual [O] [6]	A complex phenomena [O] [5]
Domain specific [O] [5]	Aligns with intrinsic interests[I] (motivating) [9]	Has pragmatic value [O] [6]	Multilevel: Spans levels of analysis (individual, team, organization) [N] [6]
Previous experiences and knowledge [I] [17]	Novel or new ideas[N] [16]	Found in local culture–valued[O] [17]	Person, field, domain[N] [17]
Situation and action of others [T] [6]	Positioned in a sociocultural context [O] [6]	Multilevel: Spans levels of analysis (individual, team, organization) [N] [6]	
	Sense-making [I,T] [5]	Person, field, domain [N] [17]	
	Social process [T,O] [6]		

Notes: [I] = low level of analysis, individual, cognitive; [T] = mid-level of analysis, team, group; [O] = higher level of analysis, organization, discipline, field; [N] = Neutral, could apply to one or all levels.

The data included in Table 5 was used to map creativity as an assemblage. The content/material and expressions dimension were mapped along the y-axis and the territorialization and deterritorialization dimension along the x-axis. The levels of analysis are shown along the vertical axis and relevant components were mapped according to these levels of analysis. Components for the content/material and expressions dimension were plotted by levels of analysis along a line of flight with deterritorialization and reterritorialization components plotted on the periphery of the content/material and expressions dimension. The line of flight connects the different levels of analysis as it is essential to interconnect each level of analysis that makes up an assemblage. The components mapped along the line of flight (content/material and expressions) constitute potential attractors while the components along the periphery (territorialization and deterritorialization) constitute the thresholds of intensity that could be required to transition to a new emergent state.

In looking at Figure 4, there are four primary components that make up the content/material and expressions dimension. At the individual level of analysis there is "previous experiences and knowledge", at the team/group level of analysis there is "situation and action of others", and at the organizational level of analysis there are "field, discipline" and "domain specific". Because these components are necessary to interconnect the different levels of analysis they are mapped along the line of flight for their respective level of analysis. The next step involved mapping the expressions around the content/material items because each are dependent upon the other. The expressions for the individual level of analysis involved "aligns with intrinsic interests", with two at the team/group level of analysis, "sense-making" and "novel idea". Three expressions were found for the organizational level of analysis; "social process", "sociocultural context", and "process".

The next step in mapping the creativity assemblages was to contrast the territorialization components, located along the left-hand side of the content/material and expressions components, with the deterritorialization components, located along the right-hand side of the content/material and expressions components. This contrast represents the thresholds of intensities required between the components that make up this dimension to achieve a state of reterritorialization. While there were no components listed at the individual level of analysis for the territorialization and deterritorialization dimension, it could be inferred that an individual's intrinsic motivation (potentiality) interacts with previous knowledge and experience (rigid constraints) that result in reterritorialization that challenges pre-existing knowledge to allow for new and novel ideas to be formed. Because this reterritorialization process occurs at the individual level of analysis, it must be interconnected to the next higher level (currently shown with gaps between levels), the team/group level of analysis. This interconnection is shown by the path along the line of flight. The individual components of intrinsic motivation and previous knowledge must be integrated with the team/group components for there to be coherence across the basin of assemblages (closing the gaps across levels).

At the team/group level of analysis, there are two components that make up both the territorialization and deterritorialization components, "person, field, domain", and "multilevel". These are examples of components that could act as either/or and identified as neutral (N). These neutral components could provide reterritorialization to occur by its nature without necessarily requiring a contrasting event or attribute. A field's domain knowledge, for example, could include conflicting opinions that prevent the field from reaching a state of stability, it could be in a constant state of reterritorialization.

At the next stage, the lower level components from the team/group level must be interconnected to the upper organizational level of analysis in the same way that the individual level was connected with the team/group level. This path, the interconnection across levels, is shown by the line of flight. The organizational level of analysis includes three territorialization components ("found in culture", "pragmatic value", "contextual") and one deterritorialization component ("complex"). The reterritorialization occurs between

these components. For example, providing pragmatic value could conflict with a complex environment. If practical value was the expected outcome, it becomes nearly impossible to determine what this value might look like when the conditions are ambiguous with high levels of uncertainty. This back-and-forth results in a constant reterritorialization between these opposing components.

In looking at Figure 4, it becomes clear that creativity is not a process that belongs solely to one level of analysis. Much of the literature on creativity does identify creativity as belonging to the individual, however, much of the literature also identifies it as being a multilevel construct. The map shown in Figure 4 identifies the creativity process as being multilevel, involving all three level of analysis. Connecting each of the three levels of analysis is a main area of focus for practice. What attractors need support for them to make the connections across the various levels? This is an area of concentration when overseeing or managing a creative project in real-time.

7.2. Innovation

The literature on innovation was synthesized into Table 6 and mapped in Figure 5 according to the same dimensions highlighted previously for creativity.

Table 6. Innovation Assemblage Dimensions.

Dimension 1		Dimension 2	
Content/material	Expressions	Territorialization	Deterritorialization
Exteriority (provided to component parts)	Interiority (belong to component parts)	Sustaining Behaviors (constraints and task activities that maintain homogeneity)	Challenge Sustaining Behaviors
Innovation			
External demands [O] [11]	Collaborative (social)[T] [21]	Cyclical process (cycles of adaptation and stabilization) [O] [7]	Complex adaptive system (CAS) [T,O] [23]
Task characteristics [T,O] [11]	Group Processes [T] [11]	Division of innovation (relative advantage, compatibility, complexity, trainability, observability) [T,O] [7]	Complex process [O] [9]
	Introduction of novel ideas, process, products [N] [7]	Dynamic [T,O] [7]	Dynamic [T,O] [7]
	Knowledge (diversity in skills) [I,T] [11]	Multilevel: team, organization, society (typically not individual) [N] [21]	Emergent [T,O] [23]
	Knowledge creation [T] [21]		Multilevel: team, organization, society (typically not individual) [N] [21]
	Opportunistic [N] [9]		Non-linear [O] [9]
	Recombination/Exaptation (knowledge is recycled and recombined) [O] [22]		Person, field, domain [N] [17]
	Recursive process (idea generation and implementation) [O] [9,11]		
	Self-organizing [I,T] [23]		

Notes: [I] = low level of analysis, individual, cognitive; [T] = mid-level of analysis, team, group; [O] = higher level of analysis, organization, discipline, field; [N] = Neutral, could apply to one or all levels.

The components related to innovation are mapped out in Figure 5. As highlighted in the literature, innovation can occur at the team/group or organizational level, it is not typically identified as being individually based. Some of the expressions could be either individual (I) or team/group (T), mainly because they involve individuals in teams. One example can be found in the expression "self-organizing" that primarily refers to teams being self-organizing entities, but this requires individual's participating as they make up the team. Both are required for the team to be a self-organizing entity, so we identified this expression as being either individual (I), team/group (T), or both (I, T). However, innovation takes place primarily at two levels of analysis, team/group and organizational.

Two main elements were identified as belonging to the content/materials continuum, "task characteristics" and "domain specific". Innovation requires some assemblage of content knowledge, represented by domain specific, and information on how to complete relevant tasks. These primary elements should be aligned with the expressions listed ("self-organizing", "knowledge", "collaborative", "novel idea", "knowledge creation", "group processes", "opportunistic", "recombination/exaptation", "recursive processes").

The elements that make up the content/material–expressions dimension was positioned within the listed territorialization ("multilevel", "division of innovation", "cyclical processes", "dynamic") and deterritorialization elements ("emergent;" "dynamic;" "complex adaptive systems;" "complex processes;" "person, field, domain;" "non-linear;" "multilevel"). The iterative, back-and-forth, interaction between these territorialization and deterritorialization elements constitute the constant flux that results in producing novelty.

The elements for innovation provide a map of potentialities, possible attractors and detractors, that are entangled in an assemblage because they interact and support one another. While it is unclear at any given time which attractor(s) will be active, which will be the driver, and which will be following or hidden, these elements must have the flexibility to activate when called upon. Activity is a measure of intensity that leads an assemblage into becoming: "The concept is a selection of intensive elements that are continuous with one another. Furthermore, since intensities are constantly in flux, the concept itself is constantly becoming" [39] (p. 18).
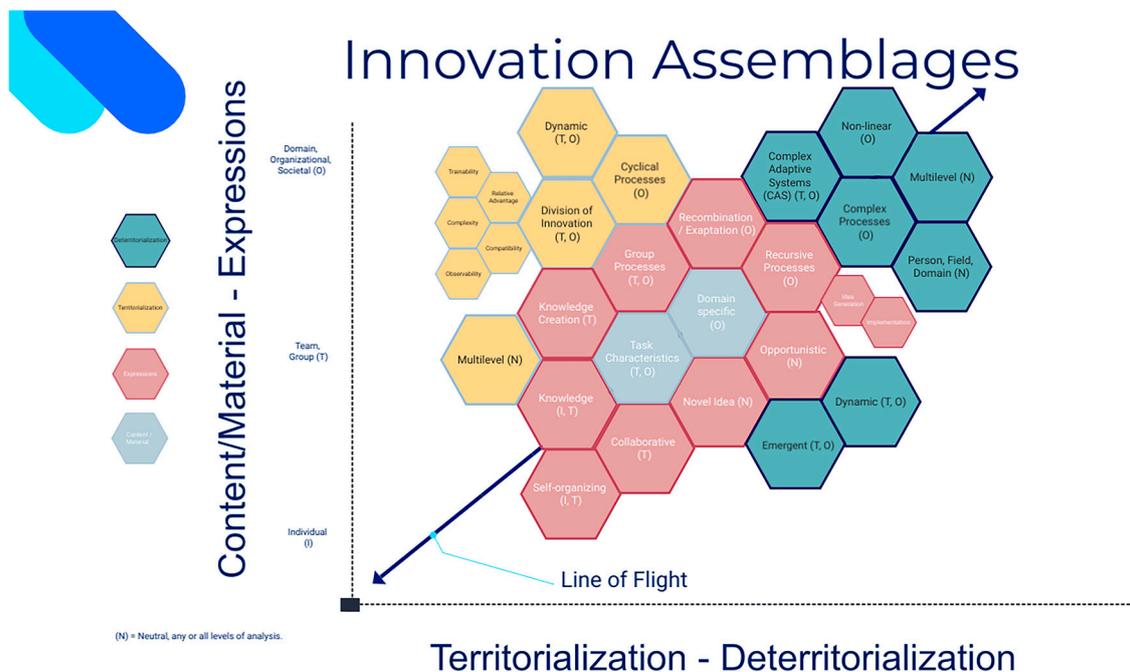

Figure 5. Innovation Assemblage Map.

7.3. Creativity and Innovation

The literature that combined creativity and innovation as part of a larger process is synthesized in Table 7 and mapped in Figure 6.

Table 7. Creativity and Innovation Assemblage Dimensions.

Dimension 1		Dimension 2	
Content/material	**Expressions**	**Territorialization**	**Deterritorialization**
Exteriority (provided to component parts)	Interiority (belong to component parts)	Sustaining Behaviors (constraints and task activities that maintain homogeneity)	Challenge Sustaining Behaviors
Creativity and Innovation			
Innovation [O] (organizational resources) [19];	Creative thinking skills [I] [19]	Ambidextrous [O] (fostering exploration, foster exploitation, temporal flexibility) [40]	Ambidextrous [O]; fostering exploration, foster exploitation, temporal flexibility) [40]
Organizational motivation [O] [19];	Cultural (intrinsically driven, group driven) [T,O] [41]	Contextual [O] [10]	Complex [O] [18]
Teams (team innovation) [T] [40,42,43]	Diversity [T] [10] [diversity leads to creativity] [44]	Cross-functional [O] (must occur with the other) [18]	Complexity perspectives [T, O] [40]
	Intrinsic motivation [I] [19]	Crosses multiple social domains [O] [5]	Convergent, parallel, and divergent streams of activity [T,O] [40,43]
	Knowledge [I, T] (expertise) [19]	Exploration [O]; search, variation, risk taking, experimentation, play, flexibility, discovery, innovation. refinement, choice, production, efficiency, selection, implementation, execution. [18]	Cross-functional (must occur with the other) [O] [18]
	Life-cycle [O] [40]	Interconnected processes [O] [9]	Emergent [T,O] [10]
	Overlapping processes [O] (various levels of creativity and innovation) [40]	Linear perspective [T,O] (phase models of innovation) [40]	Exploitation [O]; refinement, choice, production, efficiency, selection, implementation, execution. [18]
	Perspective-taking, temporal model [T] [40]	Multilevel [N] [18]	Focus on prolonged episodes of unconstrained creativity [T] [40]
	Teamwork [T] (group processes and competencies) [41];	Problem identification, idea generation, idea evaluation, implementation [T,O] [10]	Interconnected processes [O] [9]
	Teamwork skill [T] (group dynamics) [11]	Refrain from implementation too early [T,O] [40]	Multilevel [N] [18]
	Two non-identical constructs [T] (creativity and implementation; idea generation and idea implementation; exploration and exploitation) [11]		Non-linear [O] [18]
			Setbacks and surprises [T,O] [43]

Notes: [I] = low level of analysis, individual, cognitive; [T] = mid-level of analysis, team, group; [O] = higher level of analysis, organization, discipline, field; [N] = Neutral, could apply to one or all levels.
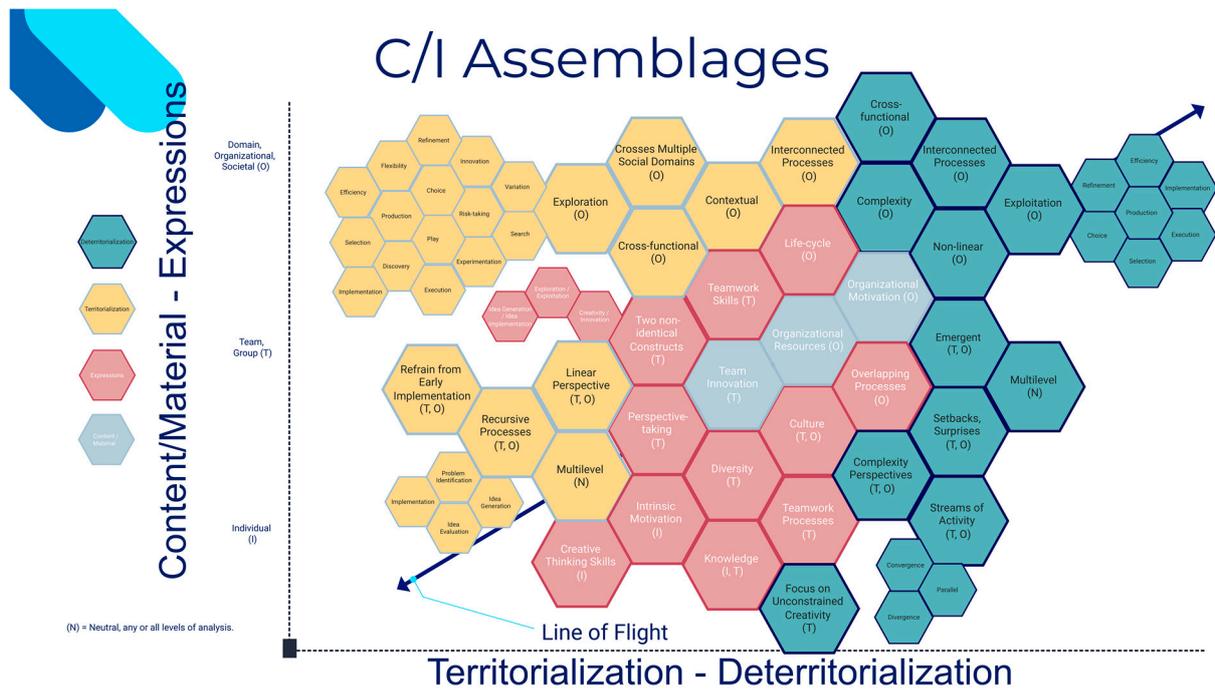
Figure 6. Creativity and Innovation Assemblage Map.

The elements that make up the creativity and innovation assemblage spans three levels of analysis (individual, team/group, organization). There are three primary content/material elements ("team innovation", "organizational resources", "organizational motivation") followed by 11 expressions ("creative thinking skills", "intrinsic motivation", "knowledge", "teamwork processes", "diversity", "perspective-taking", "culture", "overlapping processes", "two non-identical constructs", "teamwork skills", "life-cycle"). The territorialization and deterritorialization elements span two levels of analysis, team/group and organization.

In looking at the content/material elements, organizational motivation and resources need to be provided so that teams are able to be innovative. If you remove one of these elements, the assemblage breaks down and the levels become disconnected. For example, if organization resources were not provided to a team tasked with developing a new product, the team becomes constrained and incapable of achieving a level of emergence to produce a novel idea and prototype. The same issue can be seen in cases where there is little to no motivation from upper management for new product development, reducing the level of intrinsic motivation of individual members in the team. Notice that intrinsic motivation is one of the expressions at the individual level of analysis. As the intensity of organizational motivation increases, intrinsic motivation should also increase, highlighting how intensities in one component can affect other elements within the same assemblage. These examples show how the elements are entangled into a cohesive assemblage, requiring each to support the other throughout the creativity and innovative process.

Reterritorialization takes place between the iterative interactions between nine territorialization elements ("refrain from early implementation", "recursive processes", "multilevel", "linear perspective", "cross-functional", "exploration", "crosses multiple social domains", "contextual", "interconnected processes") and 11 deterritorialization elements ("focus on unconstrained creativity", "streams of activity", "complexity perspectives", "setbacks and surprises", "multilevel", "emergent", "non-linear", "exploitation", "complexity", "interconnected processes", "cross-functional"). A few of these elements include sub-elements ("recursive processes", "exploration", "streams of activity", "exploitation"), showing that maps of assemblages can increase in granularity based on one's need. These

sub-elements are included in Figure 6 to provide greater granularity on the potentialities for creativity and innovation.

8. Discussion

Assemblages are defined by the external relations, composition, and mixture of contextual elements and the environment, also known as a multiplicity [28]. The current article presented three assemblages; one for creativity, one for innovation, and a third for creativity and innovation. These assemblages provide the multiplicity of components that have been identified in the literature. Each of these assemblages is a synthesis of these three bodies of literature. Each assemblage provides examples of how the components of creativity, innovation, and creativity and innovation are interconnected, providing a coherent multiplicity of relevant elements.

The elements within each assemblage is made up of heterogeneous elements articulated by relations of exteriority [27]. Relations of exteriority identify elements that may attribute to the assemblage at one time while becoming independent or part of another assemblage at another time. In contrast, relations of interiority include stable elements that define one's identity, these elements become part of the system by constraining them from becoming independent. This distinction presents an assemblage as an open system rather than a closed system, one that is free to alter its composition as needed, while sustaining its identity. This is perhaps the biggest benefit of utilizing the concept of assemblages rather than attempting to identify a fixed, deterministic, set of constructs for a larger global concept such as creativity and innovation. There are no fixed constructs that fit every potential creativity and innovation setting; environmental conditions, human resources, technology, and the level of complexity vary based on the context and situation. Assemblages replace deterministic views for potentialities, removing the false perception of universals for evolutionary processes.

Concepts are a multiplicity and are defined by its components or constructs. In the current article we looked at the concepts of creativity, innovation, and creativity and innovation. Each concept is made up of several constructs, also identified as components or elements in assemblage theory. A concept in assemblage theory is in constant flux, it is constantly becoming: "The concept is a selection of intensive elements [constructs] that are continuous with one another. Furthermore, since intensities are constantly in flux, the concept itself is constantly becoming" [39] (p. 18). This constantly becoming relates to how the components that make up a concept are connected to other concepts and constructs. The assemblage maps presented in the current article provided three concepts (creativity, innovation, creativity and innovation) which were composed of elements that are also connected with other concepts or assemblages. These concepts are assemblages, they are each multiplicities.

The assemblage maps presented in the current article include potential lines of flight. These lines of flight identify potential interconnections across the assemblage's components. Lines of flight span reality (here and now) and virtual (dispositions). Dispositions represent tendencies and capacities that are potential but are not manifested at the present time (time of observation) [26]. The main benefit of mapping the line of flight is to assure that the content/material and expressions are coherent (interconnected across levels) and that the appropriate reterritorialization processes are in play. As an example, for creativity and innovation, the content/material elements of team innovation, organizational resources, and organizational motivation must be interconnected with one another through the expressions displayed in the "C/I Assemblages" map (see Figure 6). In addition, the items along the content/material and expressions strata need to be supported through the reterritorialization elements displayed in Figure 6. As an example, to prevent stabilization from occurring, the components of "exploration" and "exploitation" must be competing against one another. This competition provides the constant flux, constantly becoming, that is called for by assemblage theory.

Assemblage theory replaces discontinuity thesis with continuity thesis. The discontinuity thesis looks for stable components to create universalities whereas the continuity thesis views these periods of stability as temporary states which counter the idea of universalities [39]. Utilizing the continuity thesis, the elements for each of the assemblage maps presented in the current article provide potentialities rather than universalities. These elements are not ever-present for all creative, innovative, and creative and innovative activities. The elements for each assemblage include intensivities at varying rates and combinations, rarely replicating the same elements and frequencies for different contextual settings. All elements listed are potentialities and not universals. Managing the elements that are active and identifying potential lines of flight for a given context and setting, are the skills necessary for managers and leaders when facilitating creativity and innovative activities.

Intensivity includes continuity which provides a means of talking about "movement, development, [and] becoming" [39] (p. 16). Intensivities define the line of flight for a given assemblage. As specific elements become more active and interconnected, the level of intensity increases as does the multiplicity. This intensity across interconnected elements defines the line of flight and identifies potentialities for moving forward. This also allows managers and leaders to map activities in real time and to identify the next best moves for their teams.

Moving Forward with Assemblages Theory

One main stance, when dealing with complexity, is that one must become comfortable being uncomfortable. In today's environment, with disrupted global supply chains, to the impact of pandemics, everyone has been affected one way or the other. We have all become uncomfortable in the sense that our normal is no longer normal. Given this landscape, researchers and practitioners will need to become more familiar with assemblages theory to address these relations of exteriority.

We deal with multiplicities and heterogeneity more today than in previous years. This is uncomfortable because humans favor stability, predictability, and normalcy. Understanding that not everything can be described by universals is a beginning. Take for example research relating to leadership. There was a generation of researchers looking for universal traits for the *Great Leader*. After years of research, it was realized that there are no specific set of universal traits for a leader. Research then refocused to look at skills, then researchers moved to leader-follower interactions, then onto contextual and situations factors, and now leadership has expanded to include more heterogeneity in inclusive and global leadership theories. These theories involve traits, skills, contextual factors, and cultural and global components.

Today's leadership theories are truly multidimensional and include hybrid leadership theories that combine previous leadership theories to better meet contextual demands. This very description of the life-span of leadership research is a clear example of multiplicities and heterogeneity. Leadership is an assemblage, pure and simple, with some traits, skills, and contextual factors in high demand at one point in time with other traits, skills, and contextual factors in demand at other points in time. Leadership is constantly becoming, it is a plateau, also known as an assemblage. Unfortunately, leadership has not expanded to view the construct of leadership as an assemblage. The authors feel that the field of leadership is heading in that direction and future research utilizing the lens of assemblages theory will be forthcoming. This is the same lens that was used for the current study, only for creativity and innovation.

Additional areas that should begin incorporating assemblages theory, beyond those already mentioned, include team learning, team effectiveness, sense-making, self-identity, and extended cognitive structures to name only a few.

The main highlights, or take-aways, from the current research involve the following:

- Acknowledge relations of exteriority and interiority.

- Acknowledge multiplicities where everything is interconnected with varying degrees of intensities at different times.
- Expect potentialities over universals.
- Acknowledge intensivity, associated with movement and constantly becoming.
- Acknowledge reterritorialization, the constant interplay between stability and change.
- Acknowledge constant influence from heterogeneous content (material) and expressive objects.

9. Conclusions

The current article met the calls from Woodman, Sawyer and Griffin [6] in that the current study provides a framework that encompasses multiple levels of analysis [10] and multidimensional [9,11] aspects of creativity, innovation, and creativity and innovation. Assemblage theory aids in identifying the processes, agents, and situations that were called for from Woodman, Sawyer and Griffin [6]. Assemblages theory also aids in addressing the calls from Busse, Kach and Wagner [8] to explore boundary conditions of creativity and innovation. Assemblages theory, as mapped in the current article, aids in demystifying innovation as called for by Yuan and Woodman [9].

The current article contributes to the discipline by being the first to apply assemblage theory and affordances theory to the concepts of creativity, innovation, and creativity and innovation. New theoretical and pragmatic practices could be developed by the assemblage maps presented in the current study. Future research is called for to develop contextually relevant assemblage maps for organizations and across industries.

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