

Computer Science Approach To Philosophy: Schematizing Whitehead's Processes

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Abstract—Diagrams are used in many areas of study to depict knowledge and to assist in understanding of problems. This paper aims to utilize schematic representation to facilitate understanding of certain philosophical works; specifically, it is an attempt, albeit tentative, to schematize A. N. Whitehead's ontological approach. It targets professionals and students in fields outside of philosophy such as computer science and engineering, who often look to sources in philosophy for design ideas or for a critical framework for practice. Yet students in such fields struggle to navigate thinkers' writings. The paper employs *schematization* as an apparatus of specification for *clarifying* philosophical language by describing philosophical ideas in a form familiar to computer science. The resultant high-level representation seems to be a viable tool for enhancing the relationship between philosophy and computer science, especially in computer science education.

Keywords—A. N. Whitehead; schematization; metaphysical ontology; diagrammatic representation; flow

I. INTRODUCTION

This paper aims to employ diagrammatic representation to facilitate understanding of philosophical works; specifically, it is an attempt, albeit a tentative one, to schematize A. N. Whitehead's ontological approach. It targets professionals and students in fields outside of philosophy such as computer science and engineering, who often look to sources in philosophy for design ideas or for a critical framework for practice. According to Schwill [1], "It is necessary that students obtain a sketch of the fundamental ideas, principles, methods and ways of thinking of computer science. Only these fundamentals seem to remain valid in the long term and enable students to acquire new concepts successfully during their professional career."

Yet students in such fields struggle to navigate thinkers' writings. The philosophy of Alfred North Whitehead is described as "arguably among the least understood and appreciated works of the Twentieth Century" [2]. For example, it is repeatedly stated that Whitehead's *Process of Reality* [3] is "a complex and a difficult book" [4]. Stengers [5] describes the book as "a text which has repelled so many readers" by its "astonishing difficulty."

Nevertheless, Whitehead put wide-ranging knowledge of science, history, philosophy, mathematics, and mathematical physics all together "in a way which seemed to many people to make the twentieth century world intelligible, that attracted readers far beyond the usual audience for philosophy" [6]

The importance of ... Whitehead does not lie in simply learning his philosophy, adopting his terminology, and applying it to a set of research problems. Instead, the demand is to rethink the conceptual and practical procedures and problems that we have inherited and dwell within. [7]

The focus on Whitehead's work "is warranted by both his impacts on science and the current relevance of his work for inspiring new approaches to numerous topics in science and the humanities" [8].

Accordingly, in addition to benefiting students in computer science and engineering, this paper utilizes schematization to achieve certain aims, as follows:

A. Schematization method

The paper employs *schematization* as an apparatus for specification instead of, say, a written description. Schematization is utilized for the purpose of *clarifying* philosophical language; i.e., specifying such language in a form familiar to computer science.

Schematization is conceptualized in this paper:

- as an abstraction
- as a mechanism, machine, process
- as a diagrammatic representation
- as a representational map (e.g., city traffic map)
- as a representation of (sequence) action scene
- as a construction tool for a conceptual model
- as an engineering-like schema with generalization

Accordingly, representing the user as a stickman, as in UML *use diagrams*, is not the type of schematization applied in this paper. As we will see, the *user* in the proposed model is depicted in terms of a sphere that includes five stages such as creating (e.g., an order), and receiving (e.g., an invoice).

Many scientific fields use diagrams to depict knowledge and to assist in understanding problems. "Today, images are ... considered not merely a means to illustrate and popularize knowledge but rather a genuine component of the discovery, analysis and justification of scientific knowledge" [9]. "It is a quite recent movement among philosophers, logicians, cognitive scientists and computer scientists to focus on different types of representation systems, and much research

has been focused on diagrammatic representation systems in particular” [10].

In philosophy, images and diagrams are old subjects. Plato’s allegory of the cave depicts knowledge configurations. “The diagram functions as an instrument of making evident the structure of ontology and epistemology... [Descartes made] two-dimensional geometric figures and linear algebraic equations mutually transferable” [9].

B. Aims of the paper

This paper explores the diagrammatic representation to be applied in schematizing *flows* and structured *events* in Whitehead’s ontology. Advantages of the resultant diagrams include a more concrete description, from the viewpoint of computer science, of philosophical concepts and problems, and new variations in consideration of these concepts and how to reflect about them.

However, a more ambitious aim of the paper is to explore the possibility of incorporating Whitehead’s philosophy into computer science. *Traditional* philosophical discussion seldom receives more than academic interest in computer science; nevertheless, several interesting philosophical problems have attracted attention, including the ontological position of software, intellectual property rights, privacy issues, and problems in artificial intelligence.

Many computer science theories are related to philosophy, e.g., object-orientated programming and concurrency. Philosophy can use computer science as a vehicle for “possible ‘experimental Philosophy’ which is able to provide practical tests for different philosophical ideas” [11]. The so-called philosophy of computer science is said to be concerned with conceptual issues that arise from reflection on the *nature* of computer science [12].

Nevertheless, one of the underlying motivations in this paper is the need in computer science for a broader connection to philosophy. This paper asks two main questions about philosophy in relation to computer science:

- How to *use* philosophy in computer science?
- How to *read* philosophy in computer science?

The following case exemplifies the first question.

Ventura [13] asks, How do we perceive an object identity along time in the context of software applications? And, how to relate object-oriented software to philosophical theories?

A specific Client object in ... [an] application will contain the most updated contact information, and, therefore, it won’t contain, for instance, the previous phone number of the contact person. It doesn’t mean, of course, ... But still, the “historical” object itself ... will not contain the history of the selling activity that it documents. ... When we talk about an object’s history, we actually deal with one of the most profound issues of metaphysics ... the question of object continuity. [12]

Ventura [13] traces efforts to resolve the problem to two rather different philosophical approaches: the Perdurantism Approach and the Endurantism Approach. This example

illustrates the meaning of *exploring the possibility of incorporating Whitehead’s philosophy into computer science.*

Facilitating a broader movement in this direction leads to consideration of the second question mentioned above, how to read philosophy in computer science? *Schematization* is one of the main tools used in computer science to “read” a system, e.g., flowcharts, UML, and SysML; accordingly, the focus in this paper is on schematizing Whitehead’s processes.

Given the number of papers produced in the past fifty years on Whitehead’s writings, a separate review of literature is not necessary. Instead, quotations about a notion under discussion will be interwoven into the appropriate text in the paper. We assume that the reader is at least slightly familiar with Whitehead’s concepts and knows basic philosophical terminology such as the term ontology. Additionally, because of space limitation, only some of Whitehead’s ideas are discussed to demonstrate the viability of the diagramming method.

In the next section, the paper begins by reviewing the modeling tool, called the Flowthing Model (FM) [14-16], to be used in interpreting Whitehead’s notions through diagrammatic representations. Generally speaking, the word *model*, as used here, is a computer science term that refers to an abstract representation developed as a means of communication among *stakeholders* when building a complex system. FM has been adapted for several applications, and the *Earth seasons* example given here is another new contribution.

II. FLOWTHING MODEL

The Flowthing Model (FM) was inspired by the many types of *flows* that are found in diverse fields, including information flows, signal flows, and data flows in communication models. This model is a diagrammatic schema that uses *flowthings* to represent a range of items, for example, electrical, mechanical, chemical and thermal signals, blood, food, concepts, pieces of data, and so on. Yet, *flow* in FM does not designate only mobility; rather, it encompasses creation and transformation.

Flowthings are defined as *what can* be created, released, transferred, processed, and/or received (see Fig. 1). In the field of ontology, a flowthing can be called an object (substance ontology) or an actual entity (process ontology). Hereafter in the paper, flowthings are referred to as *things*. The (abstract) machine shown in Fig. 1 is a generalization of the typical input-process-output model used in many scientific fields (Fig. 2).

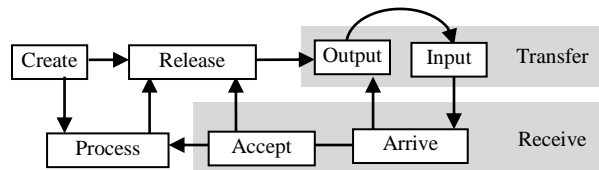


Fig. 1. Flow machine

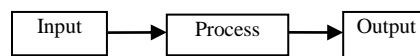


Fig. 2. Input-process-output model

FM depicts *flow* by using *flow machines* (Fig. 1) comprising up to six stages (states). The term *machine* is used here in the sense of *system* or *organism*. The machine is the conceptual fiber used to handle flowthings (to *change* them through stages) from inception or arrival to de-creation or transmission to outside the system. Hereafter, flow machines will be referred to as *machines*. Machines form the organizational structure of whatever is described. These machines can be embedded in a network of assemblies and hierarchies called *spheres*.

The stages in Fig. 1 can be described as follows:

Arrive: A thing reaches a new machine (curved arrow in Fig. 1).

Accepted: A thing is permitted to enter the machine. If arriving things are always accepted, *Arrive* and *Accept* can be combined as a *Received* stage.

Processed (changed): The thing goes through some kind of transformation that changes it without creating a *new* thing. The change may trigger the creation of new flowthings.

Released: A thing is marked as ready to be transferred outside the machine.

Transferred: The thing is transported somewhere from/to outside the machine.

Created: A new thing is born (created) in a machine and its sphere. It is the *becoming* of that which has no prior being (appearance of a new thing in the sphere), e.g., a new actor appears in a scene, not as a person coming from outside, but by suddenly being in the spotlight on a previously dark place on the stage.

In general, a flow machine is thought to be an abstract machine that receives, processes, creates, releases, and/or transfers things. The stages in this machine are mutually exclusive for atomic flowthings; that is, they are indivisible, nor do they spread over two stages. Suppose that a *car* is being created (manufactured); it cannot be released from the assembly line before the end (e.g., say at the stage where it is just a body with some electrical wiring). It must become a *car* and fulfill certain conditions before it can be released.

An additional stage of *Storage* can also be added to any machine to represent the storage of things (memory); however, storage is not an exclusive stage because there can be *stored processed* things, *stored created* things, etc.

FM also uses the notions of *spheres and subspheres*. These are the network environments and relationships of machines and submachines. Multiple machines can exist in a sphere if needed. A sphere can be a person, an organ, an entity (e.g., a company, a customer), a location (a laboratory, a waiting room), a communication medium (a channel, a wire). A flow machine is a subsphere that embodies the flow; it itself has no subspheres.

FM also utilizes the notion of *triggering*. Triggering is the activation of a flow, denoted in FM diagrams by a *dashed arrow*. It is a (causative) dependency among flows and parts of flows. A flow is said to be triggered if it is activated by another

flow (e.g., a flow of electricity triggers a flow of heat), or activated by another point in the flow. Triggering can also be used to initiate events such as starting up a machine (e.g., by remote signal). Multiple machines captured by FM can interact by triggering events related to other machines in those machines' spheres and stages.

Example of FM representation: According to Whitehead [17], the *permanence of things* is exemplified by physical things such as the solid Earth, mountains, stones, and the Egyptian Pyramids; however, the Earth *flows* around the sun, as depicted in Fig. 3. Fig. 4 shows the corresponding FM representation. The FM representation indicates that each season is actually a sequence of transferring, receiving, processing and releasing of the flowthing Earth.

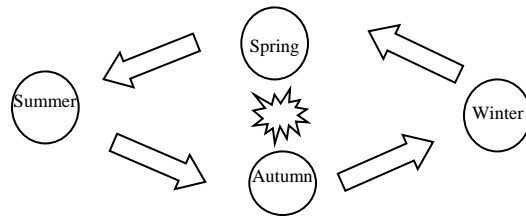


Fig. 3. Earth flows around the sun (redrawn from [18])

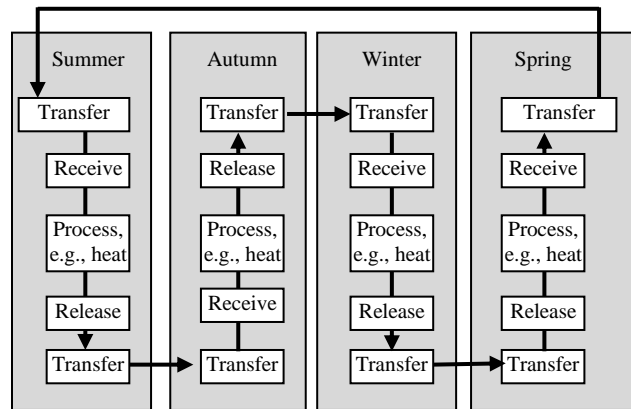


Fig. 4. Earth as a flowthing

Note that in Fig. 4, each season should have been modeled as a sphere that includes the Earth machine, as shown in Fig. 5; however, for simplicity's sake the machine and sphere boxes are represented by one box in Fig. 4.

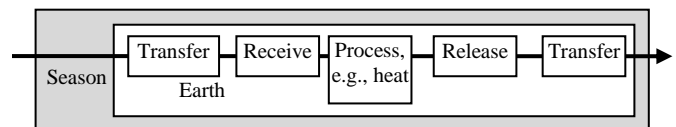


Fig. 5. Earth machine (system/organism) in the Season sphere

III. WHITEHEAD'S ONTOLOGY

Whitehead [17] refers to Heraclitus's statement that *all things flow* as the first generalization "around which we must weave our philosophical system." According to Whitehead [17], a rival antithetical notion (*substance* ontology) can be given for *all things flow* by pointing out the *permanence of things*. According to the ontology of material substance (from Democritus to Newton), everything can be reduced to basic

elements that interact mechanically and lack interiority themselves.

Substances are material things... comprising independent parts, each adapted for a specific function and moving in a specific manner... In substance ontology, processes rearrange matter and, since matter lacks a subjective nature, processes happen *to* matter. [19]

On the other hand, *process* ontology considers process a fundamental descriptor of reality [19]. A *process* indicates a mode of change: “Coordinated group of changes in the complexation of reality, an organized family of occurrences that are systematically linked to one another either causally or functionally. It is emphatically not necessarily a change in or of an individual thing, but can simply be related to some aspect of the general ‘conditions of things’. ... Processes are existentially fundamental; substance is mere appearance” [20]. Processes are partly self-determining (subjective), and can enter into relation with other processes [19]. “They are not themselves temporal. Each one is an indivisible epoch having no internal temporal phase” [21].

A. Actual entities

Dynamic reality exists in terms of *actual entities*. Actual occasions (events) are the basic units of process or *becomingness* [22]. *Becoming* refers to the process of emerging as a thing. Here, *actual* contrasts with *potential*. “To be actual is to be a process” [23].

The world is certainly an ongoing process, but it can become an object of attention, learning, analysis, communication, and record only to the extent that such processes are apprehended and arrested in presumptively static forms. [24]

Actual occasion features include the following, with emphasized notions given in italics:

- An actual entity is the growing together (*concrese*) of potentials [25]. The process of becoming of an actual occasion is called *concrecence*. The word *concrecence* is derived from the Latin verb meaning “growing together” [22].
- Actual entities are of a temporal nature, and they come into being and *perish* because of their temporal nature [26].
- “The *enduring* objects of our experience are nothing more than stable patterns of sequential actual occasions” [19; italics added]. Each actual occasion “is a process proceeding from phase to phase, each phase being the real basis from which its successor proceeds toward the completion of the thing in question” [17].
- Actual occasions possess a *subjective* (not conscious) nature that allows them attributes of memory and creativity.
- Complex objects are *societies* (nexuses) of actual occasions that endure cooperatively with emergent unity.

- Actual occasions *prehend* and integrate what the past sends to it by *eternal objects* (patterns/types) [21]. Eternal objects are possible ways in which actual occasions can be definite [25].

It should be pointed out that there is some disagreement among Whitehead scholars as to how far the term *actual entity* can be used to describe that which is commonly held to be an “enduring object” in the contemporary world [7].

B. Actual entities and flow machines

As mentioned, *flowthings* are defined as *what can be created, released, transferred, processed, and/or received* (see Fig. 1). According to Whitehead’s ontology, a flowthing is a stable pattern of sequential actual occasions. A flowthing can be visualized as actual occasions that are continuously *becoming*, “each actual entity...is a process proceeding from phase to phase, each phase being the real basis from which its successor proceeds toward the completion of the thing in question” [3].

Fig. 6 gives a general depiction of such a process where, in the context of the source (e.g., a raw material mine), raw materials are created, released, and transferred to the factory, where they are received and processed to trigger the creation of products.

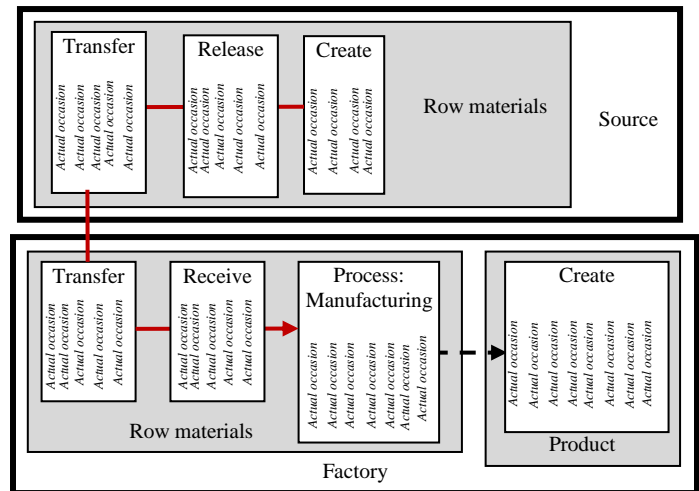


Fig. 6. Flowthings raw materials and product as actual occasions in the context of flow machines

Note the differences in meanings of terminology between FM and Whitehead ontology. The definition of *Process* in Whitehead ontology, given previously, refers to *microscopic* changes in the occurrences of becoming. The *Process stage* in FM is a *macroscopic* phase of the thing that does not create a new flowthing. The *Create* stage in FM refers to the appearance of a new flowthing in the context of a sphere. *Creation* in Whitehead ontology refers to a microscopic *becoming* or emerging into something (actual occasion). It is activity whereby actualities—conceived as individual instances of self-creation—come into being [27-28].

The notion of flow *machine* seems to *bubble up* through some of Whitehead’s expressions.

There are . . . two sides to the *machinery* involved in the development of nature. On the one side, there is a given environment with *organisms* adapting themselves to it. . . . The givenness of the environment dominates everything. . . . The other side of the evolutionary *machinery*, the neglected side, is expressed by the word *creativity*. The *organisms* can create their own environment. [29; italics added]

C. Firehose metaphysics

Bogost [30] identifies a notable weakness in the style of thinking underlying Whitehead’s metaphysics:

This is the general sense that for Whitehead reality surges forward like water going through a firehose, one prehension followed by the next without any set of systematic continuities behind, or carrying out, that forward propulsion. Bogost’s term for this, “firehose metaphysics,” is funny and in some ways apt. [3]

According to Bogost [30],

A process proceeds. First it awakens, then it showers, then it gets dressed, then it brews coffee, then it drives to work, then it opens Microsoft Excel. It travels between two points. Then, then, then, then. A metaphysical firehose.

FM presents a different picture of the style, as shown in Fig. 7. The figure depicts *awakening, then showering, then getting dressed, then brewing coffee, then driving to work, then opening Microsoft Excel*. First there is a person (circle 1) in the sleeping state (2), awakening (3) to shower (4), then dressing (5) and brewing coffee (6). Note that for simplicity sake’s, the person flow machine is not included in a box. Accordingly, the person goes to his/her car (7–10) to be transported (11) to his/her office (12–15) to open Excel.

This macroscopic description has an interesting variety of processes: Process as movement (from home to office), process as a state (awaken), process as an action (dressing), and process as an agent activity (transporting). An interesting picture, certainly not a firehose, emerges as these variant processes are mixed with triggering, flows, machines, and spheres. Additionally, there are “bricks (actual occasions)” that provide unity and continuity (Fig. 8). More amazing is that these bricks hide the “real” processes inside them. We see here the significance of FM representation in amplifying the true nature of metaphysical description.

IV. INSIDE THE ACTUAL OCCASION

At the microscopic level, we can use FM to describe what happens within actual occasion *spheres* (environments), as shown in Fig. 9, showing two instances of actual occasions. Assuming that the actual occasion on the left has already entered the state of *becoming*, or *prehension* (a type of *process* that embeds inheritance in FM; circle 1 in the figure), it is actualized (2) to *perish* while triggering (3) the process of becoming of the next actual (4) that is, in turn, actualized to perish (5), . . .

In the figure, the process of *transitio* refers to localizing eternal objects to a space-time region (not shown), and the process of *concrecence* is the process of coming into being.

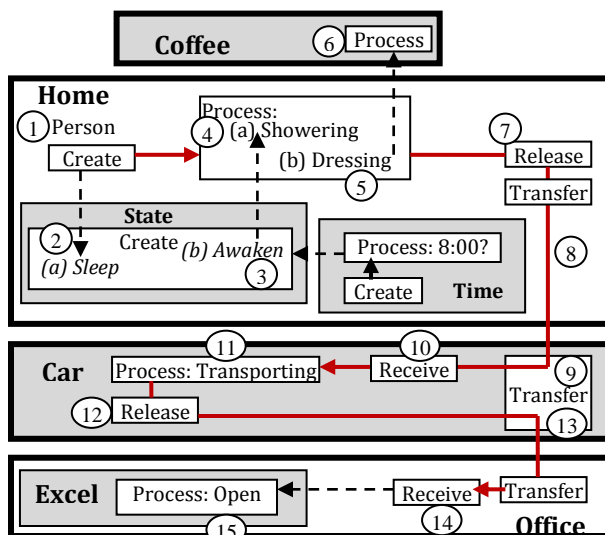


Fig. 7. FM representation of the firehose of processes

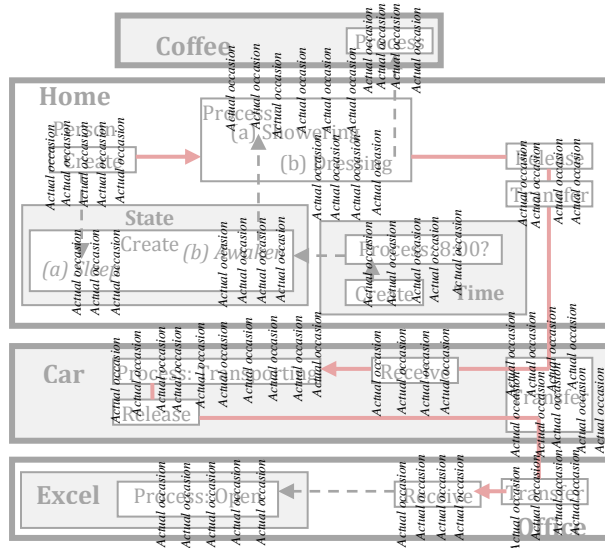


Fig. 8. Unity of the firehose of processes

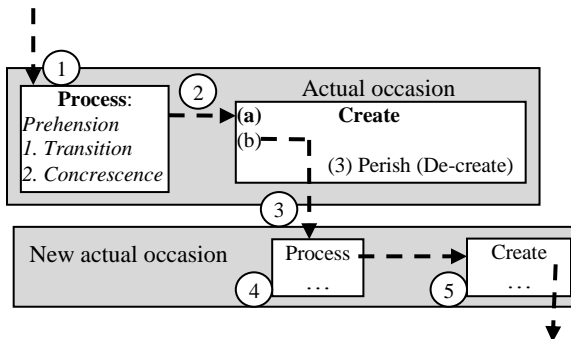


Fig. 9. FM representation of the becoming of a new actual occasion

From the initial set of eternal objects produced by transition, concrecence selects those that are actualized to create the occasion. As mentioned previously (with references),

eternal objects are possible ways (patterns/types) in which actual occasions can be made definite.

Flow (flux) is a change through *prehension*, in the sense of remembering a past (old actual occasion) and anticipating a future (new occasion). We say that the new actual occasion (called the *subject*) prehends the previous actual occasion (called the *datum*). Novelty arises from this prehension; thus “how an actual occasion becomes constitutes what that actual occasion is, so that the two descriptions of the actual occasions are not independent” [3]. Accordingly, prehension involves subject, and novelty (called *subjective form*).

In the literature of process philosophy, the ontological *nature of becoming per se* is a subject of great concern (e.g., [21], [28]). For example, the issues of continuity/discontinuity, unity and diversity, endurance of things, point of completion (satisfaction) of *creation*, duration, succession of two actual occasions,... According to [7], “Whitehead’s conception of existence is always focused on the ‘how’ of becoming (a concrescence of prehensions). For ‘how’ an actual entity becomes creates what that entity is.”

This concern is depicted diagrammatically in terms of the FM *Process* stage: a concrescence of prehensions that triggers a *Create* stage. Thus, schematization in the form of FM representation lends itself to *flowcharting of philosophy* in a systematic way. The result is expression of philosophical thought in computer science language. This merging of the two cultures could be used to establish a more overall view that would further bridge the two disciplines.

It is interesting to study actual occasions in separate macroscopic stages of create, release, transfer, receive, and process. The create stage, at this level, introduces a new flowthing into the system (note that we shift from a philosophical view concerned with existence in nature, to an engineering conceptualization with focus on a part of the world called a system). If this flowthing flows to a process stage, it will experience not only microscopic changes, but also macroscopic change (Fig. 6, previous section). The point here is that the schematization of Whitehead’s notion may raise new issues (namely, the effect of different macroscopic FM stages), but here we ignore such observations to pursue the main aim of the paper, which is to introduce this form of representation to facilitate understanding of Whitehead’s philosophy.

It is important to note that the purpose of demonstrating FM schemata is to show that this method lends itself to systematic representation of philosophical concepts; thus, some misunderstanding of the real meaning of Whitehead’s notion may be reflected. Still, the FM representation acts as a form of language that allows such misunderstanding to be expressed; the diagram can then be redrawn by a philosophy expert to correct the representation if necessary. FM provides a high-level representation of essential concepts and their interrelationships by using diagrammatic notations. Its purpose is to convey a common description without technical specification or written elaboration to facilitate communication between philosophers and nonphilosophers.

V. EXAMPLE: RAINSTORMS

Examples of actual (physical) processes include rainstorms, heatwaves, famines, thunderclaps, rumors, performances of symphonies [20]. Consider a rainstorm as a process. An actual occasion of a rainstorm is an instantaneous occurrence, and it’s happening is related to other actual entities that overlap one another. This *instance* of a rainstorm is a creative manifesting itself. However, a rainstorm can be conceptualized in FM as a nexus of flow machines, e.g., a rain machine, a lightning machine, wind machine, hail machine, etc. A specific actual occasion of a rainstorm occurs as shown in the upper half of Fig. 10 with fixed rain, wind, lightning, etc. The figure mixes microscopic (actual occasion) and macroscopic (flow machines) views. In the lower part of the figure, another instance of this rainstorm is shown after some change in one or more of its elements, whether rain, wind, or lightning.

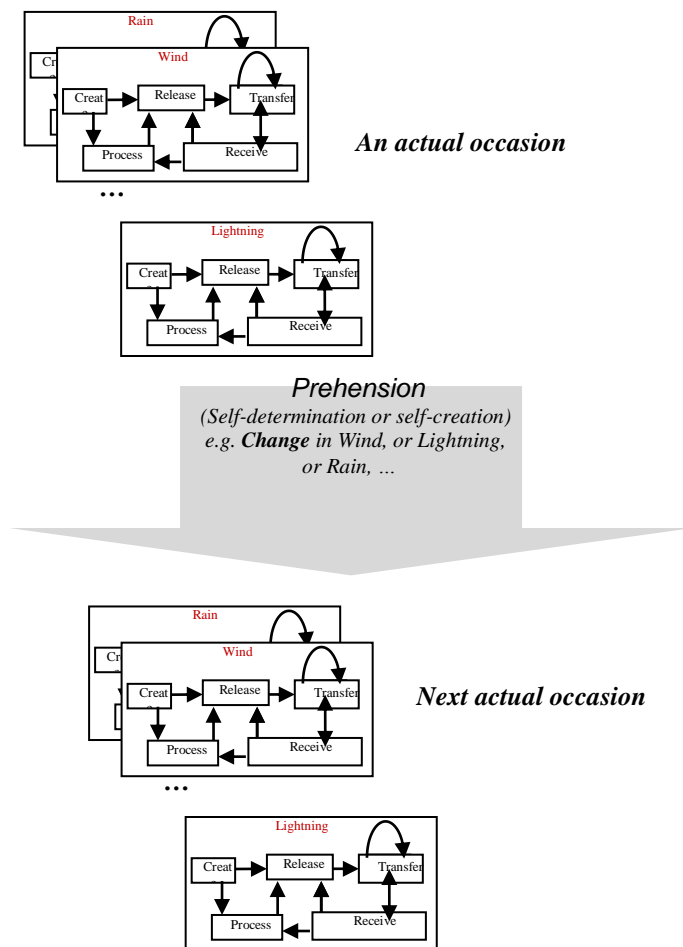


Fig. 10. Rainstorm as a process

As shown in the figure, with *prehension*, the actual occasion of an instance of the rainstorm determines its next instance by an internal change in one of its machines, e.g., now rain is *created*, next the rain is *released* and *transferred* to Earth. Accordingly, the rainstorm is a sequence of rainstorms created again and again, as shown in Fig. 11 (shaded areas in the figure denote earlier occasions). Focusing on a *change*, Fig. 12 shows this process in terms of a change in rain such as becoming heavier.

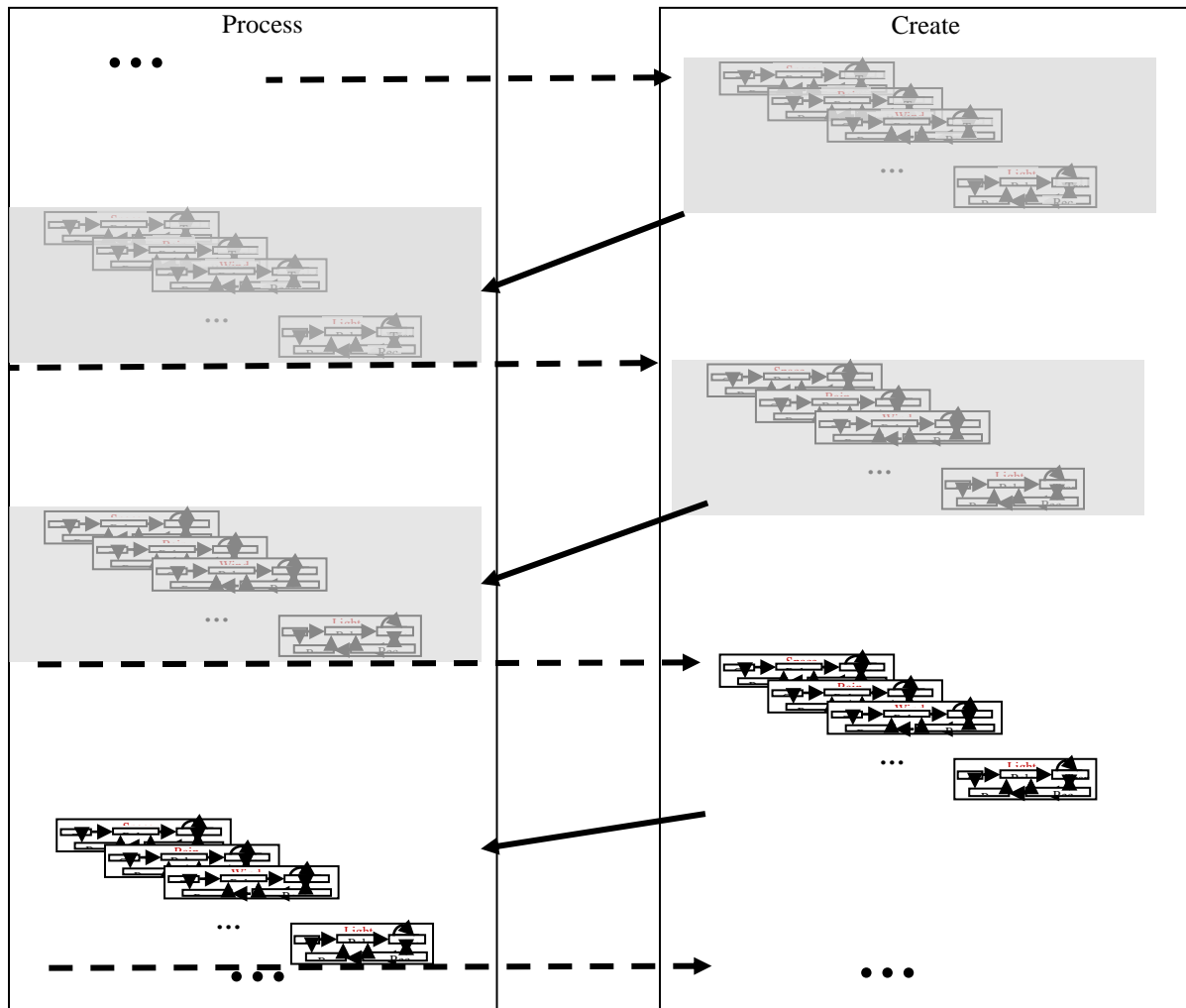


Fig. 11. Sequence of creating instances of a rainstorm

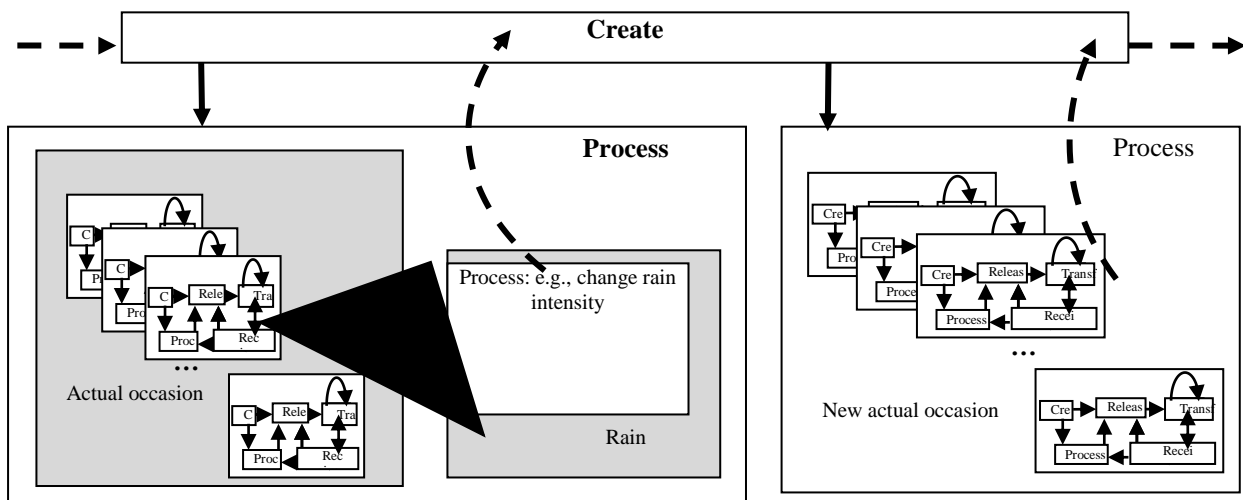


Fig. 12. Example of a change in Rain that causes the creation of a new instance of the rainstorm (dark triangle indicates magnification of a rain machine in the rainstorm)

VI. CLEOPATRA'S NEEDLE

The same type of representation can be applied by treating a solid and permanent object as an *event*. Whitehead [2] gives the example of Cleopatra's Needle, an obelisk situated on the Victoria Embankment in London. For Whitehead,

Cleopatra's Needle isn't just a solid, impassive object upon which certain grand historical events [actual changes]—being sculpted, being moved—have occasionally super-vened. Rather, it is eventful at every moment. From second to second, even as it stands seemingly motionless, Cleopatra's Needle is actively *happening*... At every instant, the mere standing-in-place of Cleopatra's Needle is an event: a renewal, a novelty, a fresh creation. That is what Whitehead means, when he says that events—which he also calls “actual entities” or “actual occasions”—are the ultimate components of reality. [32]

A physicist who looks on that part of the life of nature as a dance of electrons, will tell you that daily it has lost some molecules and gained others, and even the plain man can see that it gets dirtier and is occasionally washed. [3]

Fig. 13 shows two consecutive instances of Cleopatra's Needle. The flow machines of electrons and dirt (exemplified in the above quote) are drawn as *complete* flow machines to indicate that any change can happen, e.g., receipt or output of electrons... “Cleopatra's Needle is a society [the grouping of actual occasions], or an enduring object” [32].

We interpret an event (actual occasion) in terms of changes as shown in the figure. The following quotes from Stoney [33; italics added] shed some light on the process of becoming,

- “Events have some capacity, however slight, to select among alternatives” (circle 1 in the figure).
- “Each event feels the feelings of – is connected to [*prehension*] – earlier events.” (circle 2). Feeling, here, does not refer to a conscious experience.
- “Events have aims (*goals*; circle 3), namely to maximize creativity and intensity of feeling, that arise due to their participation with more dominant occasions of experience.”
- “This process of self-determination is *concrecence*... existence is a series of coming into beings”.
- “An event that has completed its concrecence has achieved *satisfaction*.”
- “The dominant occasion of experience [enduring objects - patterns] integrates the lower level actual occasions into a unity of purpose. For human beings, the dominant occasion of experience constitutes the mind.”
- “For any actual occasion, the future is open, i.e., unpredictable because of the alternatives available to it. This is the basis for the appearance of novelty.”

Such notions as prehension (synonym: feeling, as used by Whitehead) and goals can be incorporated into the diagram. They are machines, just like the physical machines of rain, wind, lightning, and hail. Actual entities follow each other like

drops of experience. An instance of a new occasion becoming occurs with prehension, i.e., connection to an earlier actual occasion [33]. Actual occasions begin; live their lives, attain completion (satisfaction), and perish [25].

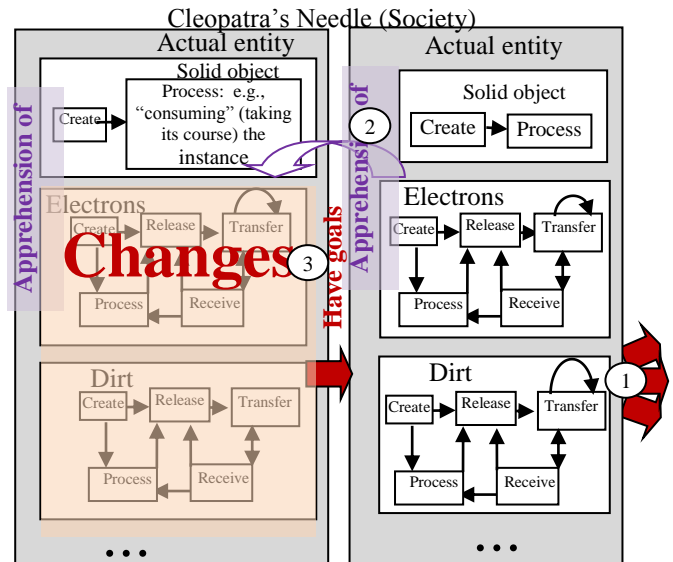


Fig. 13. Cleopatra's Needle as a process

VII. CONCLUSION

This paper has attempted to employ schematization *to understand* philosophical concepts. While the method is applicable to several philosophical works, it focuses specifically on a portion of Whitehead's ontology that is based on the notion of process. The approach uses a diagrammatic modeling tool to produce a conceptual representation of such notions as actual occasions, process, becoming, becomingness, and actual in contrast to potential. The resulting representation seems to introduce a new method of discussion of meanings embedded in Whitehead's philosophy. This initial attempt points to its viability in this context and is worthy of pursuit.

The paper hints at examining the notion of becoming in different macroscopic stages of the states of creation, release, transfer, receiving, and processing. That is, do these states of a *thing* have an effect on the relevant Whitehead processes?

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